



Housing Affordability and Smart Growth in Calgary

Final Report

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August 2008

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Executive Summary

1. Introduction

The affordability of housing has taken centre stage in Calgary since the rapid inflation of prices and rents took hold after 2005. In a very short period of time the city went from a relatively affordable place to live by Canadian standards to a high-priced jurisdiction. No longer seen as an issue affecting only special needs and lower-income households, housing affordability has taken on much broader dimensions as a sign (or even symbol) of the malaise that can be engendered by a boom economy. Starter homes have become unaffordable for moderate and even some middle income earners and many households are being forced to reduce their housing expectations. Public leaders worry that high housing prices will undermine prosperity by deflecting new migrants unable to afford adequate shelter, driving up labour costs and damaging competitiveness.

One of the key methods used in Calgary to ensure housing price stability has been the periodic annexation of lands from surrounding jurisdictions (the Uni-City concept) and the orderly expansion of suburban areas. The resulting development patterns, however, have also begun to raise concerns. Infrastructure costs associated with the extension of the urban fabric in new communities throughout the urban area are straining departmental budgets, the provision of municipal services cannot always keep up with the needs of rapidly growing communities, commute times and household transportation costs are rising, and growing congestion on major roads all serve as daily reminders that the spread of auto-dependent suburbs has its economic, social and environmental downsides.

The City is responding to this situation by adopting new policies to increase densities, achieve a better mix of housing types and land uses, encourage growth in areas well-served by transit, improve transit services, and moderate automobile usage. At a more strategic level, Plan It Calgary is exploring development scenarios that will allow the city to accommodate the expected growth of 1.3 million persons and 600,000 jobs over the next 50-60 years. The Plan It Calgary initiative will result in a long-term (two generation) integrated land use and transportation plan for The City of Calgary. This project will provide the context for the comprehensive review and update of two of Calgary's major policy plans; the Calgary Plan (Municipal Development Plan) and the Calgary Transportation Plan. This process provides an historic opportunity to focus on affordability issues and to ensure that measures undertaken to encourage housing affordability in Calgary are in concert with other strategic themes, such as the need to constrain the spread of Calgary's urban fabric and promote alternatives to automobile dependency.

The purpose of the present study is to undertake and report on research that will assist the City of Calgary to address housing affordability through an increased understanding of the factors affecting housing costs including current policies and regulations, and the identification of policies to address housing affordability to be included within the integrated land use and mobility plan.

The objectives of the study are:

- To engage City staff, the development industry and homebuilders to identify the impacts of current policies, regulations and development processes as they relate to housing affordability.
- To identify strategic policy options regarding housing affordability for the integrated land use and mobility plan.

The scope of this study is limited to a consideration of the factors that influence the overall affordability of housing (especially for moderate income households) provided by the private sector within the city. Thus, the focus of this study is not on social or non-market housing for disadvantaged Calgarians, although policies that affect the availability of this type of housing will also be considered in cases where it would be difficult to disentangle from market housing provision.

2. Housing Trends and Affordability In Calgary

The past couple of years have seen dramatic growth in the value of new and resale housing in Calgary. Prices of existing homes appreciated by 38% during 2006 and by 19.4% during 2007, making this the highest rate of increase in housing resale prices in any other large metropolitan area in Canada, with the exception of Edmonton. Until 2005, the average increase in the price of new homes in Calgary was relatively stable, averaging around 5-7% annually. However, this changed dramatically in 2006 when the price of new homes jumped by 43%. In 2007, the average sales price for new housing units equalled \$474,000. The rental market has also recently experienced a price increase. In 2006, the rent for two-bedroom apartments increased by 19% and the rent for three-bedroom apartments increased by 14%.

The supply of new housing increased in response to rising prices, but has not kept pace with the dramatic increases in housing prices and rents. While the price of new and existing homes appreciated by over 38% in 2006, housing starts increased by only 25%. With the exception of 2001 and 2004, rental starts have accounted for fewer than 2% of the total starts in the past 10 years.

In 2006, the rental market experienced an almost one hundred percent occupancy with vacancy rates as low as .5%, suggesting a very tight housing market. These very low vacancy rates and skyrocketing prices of new and existing home have left low- to middle income households with few opportunities in the rental and non-rental housing market.

2007 CMHC figures suggest that the rental vacancy rate in Calgary has inched upwards again reaching 1.5%, which suggests some relief in the rental market. This may reflect an increasing tendency for condominium owners to hold on to their units in hope of further price escalation and to rent them out in the interim. The 2007 data released on the new home price index and housing starts for Calgary also indicates a moderating trend over the previous year. While resale

home values continued their climb upward in 2007, the change in the new home price index and housing starts have reported lower values than the one in 2006. New home prices therefore appreciated more slowly in 2007 than they did in 2006. These figures suggest that the housing market has stabilised in 2007 and may shed some of the gains in prices and rents in 2008.

While shelter costs have increased dramatically, real wages have not kept pace over the same time in Calgary. In 1990, the average price of an existing home was twice the average after-tax real income. By 2006, this ratio had more than doubled to 4.5. Most new housing units sold in 2007 catered to the housing needs of high-income earners. 56% of the new housing units sold for more than \$400,000 in 2007, whereas only 2.4% units were sold for less than \$250,000.

3. Smart Growth and Housing Prices

The interviews conducted for this study suggest that developers and builders in Calgary consider non-policy factors (especially soaring labour costs and material costs) primarily responsible for the sharp increase in housing prices over last two years. Although non-policy factors were acknowledged as dominant, interviewees also stressed that government policies were contributing to the problem and that planning agencies failed to react quickly enough to the housing crisis in order to moderate price increases. In particular, most interviewees claimed that the land supply policies that form the heart of the City's growth management process were partially to blame for the rapid escalation of prices. They claim that the City did not foresee the coming boom and failed to respond quickly enough (e.g., hire new staff, adopt more streamlined approvals process) to approve more land for development. As one builder put it, "everybody could see that the end of the land supply was in sight," which caused a scramble for serviced land and prices skyrocketed. Many interviewees predicted that the City's Land Use Planning and Policy Work Program for 2008, which postpones planning for major new greenfield communities, would lead to further housing price increases in the short- and medium-term.

The literature review conducted for the present study does not allow us to support the contention that municipal constraints on land supply are an important factor in determining house prices. The literature suggest that demand factors – such as employment levels, average incomes, and population growth – are key to understanding price escalations and speculative bubbles. Cities that attempt to moderate outward growth may put a gentle upward pressure on the market value of land and homes, but it is the increased desirability (the so called "amenity value") of cities with effective growth management processes that is pre-eminent in influencing prices. The most promising approach to affordability and growth management issues is to integrate housing affordability policies into a Smart Growth framework and promote intensification of established areas, less expensive housing forms and development control regulations and processes that reduce development costs and encourage a greater supply of moderately priced housing units.

4. The Determinants of Housing Price Dynamics in Calgary

The purpose of this chapter is to explore through time series econometric analysis why housing prices increased so significantly in a very short span of time (i.e., during 2006 and 2007). The chapter in particular tries to determine the impact of demand-side and supply side factors on housing prices. Economic theory suggests that the price of a commodity increases if it is in high demand and/or if a commodity's supply is either heavily regulated or constrained. In the case of housing prices in Calgary, this chapter tries to determine if demand factors, such as rising income, increase in population, or other demographic shifts, are behind the increase in housing prices. At the same time, the chapter tries to determine if the supply of housing is constrained either because of a sluggish response by homebuilders to an increase in demand, or due to insufficient supply of land being released for development through the City's growth management process.

The results from the econometric models suggest that the demand side variables, such as net migration, after tax household income, etc. are more robust determinants of housing price dynamics than the supply side variables. The supply side variables, such as residential building permits, turned out to be statistically insignificant predictors of housing price dynamics. In instances where supply side determinants were statistically significant, such as singles permits, the positive coefficient for the variable suggests that the builders were merely responding to the increase in housing prices by obtaining more permits. However, given the lag between obtaining permits and delivering a built unit, which could vary between eight to 24 months, often housing prices stabilize even before new housing units hit the market

The fact that housing prices fluctuate in short time periods raises the question as to what contributes to such a change. Bubbles in housing markets have been defined as the period during which housing prices increase beyond what could be explained by market fundamentals. Therefore, when the housing prices are significantly higher than what has been predicted by models using market fundamentals and demand variables (such as GDP, change/growth in employment and income, vacancy rates, etc.), the difference between the forecasted and actual transaction prices is referred to as a bubble.

We believe that the economic upturn in Calgary, which also attracted a large number of migrant workers from within and outside of Canada, created a spike in demand during 2006 and 2007. The housing market in Calgary was overwhelmed by this sudden spurt in demand for housing. Given the intrinsic lag between housing demand and supply, the housing prices increased in Calgary in response to the spike in demand. However, we also believe that homebuyers were forced to take speculative positions with respect to timing of their purchase. Home buyers assumed that strong housing demand would continue in the long run, which would result in a sustained increase in housing prices. This bid up the price of housing to levels higher than those justified by market fundamentals.

It is important to note that household incomes in Calgary have not risen as dramatically as housing prices. In fact, household incomes in Calgary has evolved in a way similar to income levels in other cities in Canada. The recent decline in housing prices suggests that

the housing market is now catching up with the reality of the slowing rate of in-migration and a modest increase in household incomes, both of which are out of step with the inflated housing prices in Calgary.

An interesting question pertains to what role if any could the City of Calgary had played in easing the pressure in housing market. Given the results presented in this Chapter, we believe that the supply side dynamics did not play a role in easing pressures in the housing markets. Therefore, the City could not have influenced housing prices by facilitating an increase in the housing supply during the period of high demand. By the time new housing enters the market, price hikes have usually already moderated.

5. Housing Price Forecast under Different Growth Scenarios

The econometric work presented so far has primarily focused on explaining the determinants of housing price dynamics in Calgary. In this chapter, we extend the forecast beyond the actual time series that ended in the fourth quarter of 2007 to the end of 2015 in Calgary.

The chapter first develops a forecasting model that employs the autoregressive model of housing prices and extends the forecasts to the year 2015. The estimated forecast suggests that housing prices are likely to follow a downward trend over the next few years. However, the model does not contain any explanatory variables and the forecast is based on the auto-regressive nature of the housing prices. Our next step was to develop a model that allowed us to test whether land supply or demand factors are behind the increase in housing prices in the city. Because we lacked historical data on the supply of developable land, we used building permits as a proxy measure. The results from the econometric model suggest that the demand side variables, such as net migration, after tax household income, and population growth are more robust determinants of housing price dynamics than the supply side variables. The supply of residential building permits, turned out to be a statistically insignificant predictor of housing price dynamics. In instances where supply side determinants were statistically significant, such as singles permits, the positive coefficient for the variable suggested that the builders were merely responding to the increase in housing prices by obtaining more permits.

This leads to a investigation as to what impacts on housing prices we can expect if Calgary undertakes to control the spatial spread of the city and re-orient its planning and development control system so as to give a greater emphasis to intensification. This is the general theme that animates the Plan It Calgary initiative, which has developed three spatial growth scenarios for discussion: Dispersed, Hybrid, and Compact.

To assess the impact of these scenarios on future housing prices in Calgary, we first sought to determine whether there is a correlation between housing prices and the type of housing being developed. For this purpose, we turned to the census data from 2001 to determine the correlation between housing mix within a neighbourhood and the price of existing housing in that neighbourhood. The results showed that housing prices are positively co-related with single detached housing and negatively correlated with doubles

and row housing. In other words, housing prices are likely to be higher in neighborhoods with a higher percentage of single detached housing, whereas housing prices are likely to be lower in neighborhoods with a higher incidence of doubles and row housing. The correlation between apartments and housing prices, albeit statistically insignificant, was positive.

We conclude from this analysis that the hybrid scenario is likely to result in lower overall housing prices for Calgary compared with the compact (likely to result in greater incidence of apartments) and dispersed scenarios (likely to result in greater incidence of single-detached housing). The compact scenario would force all new development into already built areas and result in a higher percentage of high density apartment units. Similarly, the dispersed scenario would result in neighborhoods with a greater percentage of single detached housing, which is also correlated with high housing prices in Calgary. The hybrid scenario, on the other hand, would result in a more balanced mix of housing types at moderate residential densities with a greater incidence of row and doubles housing, which are co-related with lower housing prices.

Next we developed a forecasting model based on historical data of the housing stock mix in Calgary, which allowed us to make projections of housing prices from the end of 2007 to the end of 2015. Using housing stock mix from the Civic Census going back to 1980, we modelled the dynamic interactions between housing mix of the existing housing stock and housing prices in Calgary. The forecasts obtained from the model suggest that real housing prices are likely to increase over time under the dispersed scenario. However, real housing prices are likely to decline over time under the compact and hybrid scenarios. Moreover, real housing prices are likely to decline more under the compact scenario than under the hybrid scenario.

Though the models reported in this chapter conform to micro economic theory, one should note that the housing supply variables did not return statistically significant coefficients. Instead, the demand side variables, such as increase in population, and auto-regressive parameters returned statistically significant coefficients.

6. Policies Affecting Housing Affordability

A broad range of policies promulgated by all three levels of government has an impact on housing affordability in Calgary. This chapter provides an overview of the programs, legislation, plans, regulations, standards and other policies and implementation tools that have a direct or indirect impact on housing affordability. The intent here is to set the stage for the discussion of policy measures that appears in the next chapter and the conclusions and policy recommendations that appear in the final chapter. Information for this chapter was drawn from interviews with industry representatives, City staff and other stakeholders, government documents, and internal and external reviews of affordable housing affordability policies (City of Calgary, 2004a; Calgary Chamber of Commerce, 2008).

The chapter begins with an industry perspective on this topic, outlining the main factors interviewees raised when asked to identify the key government actions that affect housing affordability in Calgary. We then present more detailed descriptions and assessments of these policies, organized by level of government.

Many of the policies covered in this chapter were raised as factors that affect housing affordability (both positively and negatively) during the interviews conducted for this study with developers, builders and development consultants. Overall, interviewees felt that the federal government did not have a strong influence on housing affordability. Provincial policies were seen to be more significant, in particular the MGA, wetland protection policies, open space requirements, building code, Condominium Properties Act, and Residential Tenancies Act. Most significant of all, however, were municipal policies. The main issue is the inefficiency and complexity of the approvals process. The growth management process was seen as largely effective in controlling land supply to keep prices down, although problems have arisen with the process over the last couple of years as demand has outstripped the supply of land. Wetland protection policies were frequently cited as an emerging threat to affordability. Some interviewees felt that the Land Use Bylaw was also contributing to affordability problems, along with engineering standards, open space requirements and development levies.

In addition to exploring these specific policies raised by industry stakeholders, this chapter presents the range of plans and strategies that make up the general policy framework that guides municipal decision-making on development proposals. In the most general sense, the City's planning policy framework has been evolving towards a Smart Growth perspective since the adoption of the Calgary Transportation Plan in 1995. While industry interviewees did not focus on particular planning initiatives, enough comments were made to gather that those with a stake in low-density greenfield development were largely opposed to this framework, while those involved in multi-family development generally supported the evolving policy framework. The chapter presents the planning framework in chronological order in order to capture its evolving nature and the interconnections among key documents. Included in the framework are the following items:

- Calgary Transportation Plan
- Sustainable Suburbs Study
- Calgary Plan
- Corporate Affordable Housing Strategy
- Transit Oriented Development Guidelines and Station Area Plans
- New Communities Residential Density Policy in the Calgary Plan
- imagineCALGARY Long Range Urban Sustainability Plan
- Sustainability Principles for Land Use and Mobility
- Centre City Plan

The planning policy framework described in this chapter – although somewhat fragmented – has evolved towards a Smart Growth approach. Some plans explicitly adopt an affordability lens (such as in the Sustainable Suburbs Study and the Corporate

Affordable Housing Study), but for the most part they take an indirect approach by promoting a range of housing types, intensification in suitable locations, and a development control process that will tend to reduce housing costs. The city lacks a full-fledged policy on housing affordability or even clear direction on this issue in the MDP, but the affordability issues are being addressed in a piecemeal fashion through the creation of subordinate plans, such as SAPs, revised ARPs, and the Centre City plan. This planning effort needs to be fully informed by the need to create the most inclusive city possible.

7. Policy Options

In this section, we examine a range of policy measures to improve housing affordability that the City of Calgary could consider in the context of the long-term land use and mobility plan and the City's other planning initiatives. The policy measures that were selected for inclusion here are those that have the potential for achieving both Smart Growth and housing affordability goals and that appeared most relevant to the situation in Calgary, i.e., a large city undergoing rapid growth with a robust private development sector. The main focus of these measures is on the land use planning and development control process as it affects the provision of housing in the private market. We have avoided including policy measures that would require direct subsidies from governments at any levels, although incentives for private sector developers are covered to some extent.

The policy capsules included in this chapter are organized into three sections:

- * **Intensification:** measures to increase the supply of housing in locations that can reduce the overall costs of housing and transportation – e.g., transit-oriented development, downtown housing, greyfields, brownfields, and commercial corridors.
- * **Housing Form:** measures to increase the supply of housing types (housing form and density) that are more likely to be affordable – e.g., rental accommodation, smaller lots and homes, secondary suites, mobile homes and modular houses.
- * **Development Process:** measures to reduce the cost of housing generally – e.g., transportation planning standards, alternative engineering standards, parking standards, improving the approvals process, and addressing NIMBY.

Each capsule follows a common format:

- * The topic is introduced generally, including a discussion of the links to housing affordability and growth management.
- * Current conditions in Calgary relevant to the policy area are described, as are existing policies.
- * Issues that have arisen in the city related to this policy area, barriers to the effectiveness of existing policies, and the potential for realizing gains in affordability and growth management area explored.
- * Relevant experiences from other cities are described.

- * Options for Calgary to consider are presented.
- * Implementation issues are considered that may arise if the policy options were put into practice.

Many of the key suggestions made in the context of the policy options chapter are summarized in the conclusions and recommendations, which follow.

8. Conclusions and Recommendations

This concluding chapter first summarizes our findings on the factors affecting housing costs in Calgary and then presents our policy recommendations to the City.

Factors Affecting Housing Costs

The empirical models developed for this study point in the same direction as the conclusions drawn from the literature review: Smart Growth, which seeks to constrain land supply on the urban margin but improve the overall mix of the housing stock throughout the urbanized area, cannot be directly faulted for the rise in housing prices. Rather, the rapid price escalation in the city over the last few years appears to be the result primarily of demand-side factors linked to Alberta's booming oil industry. These factors included: record annual population growth, record employment growth, and record income growth, a near record low interest lending rate, and one of the highest in-migration counts in Calgary's history.

The resulting housing demand surge was predicted by neither the industry nor the City. It overwhelmed developers and builders, who could not bring product to the market fast enough to keep up with the demand. Buyers with rising incomes bid up the price of the available housing and raised land values. Prices were boosted further by higher labour and material costs as developers and builders bid up prices as they competed for inputs with each other, other employers and with the infrastructure building boom the City was simultaneously engaged in. Home buyers assumed that strong housing demand would continue in the long run, which would result in a sustained increase in housing prices. This bid up the price of housing to levels higher than those justified by market fundamentals. As the demand started to ease in Calgary, housing prices began to fall in the second half of 2007.

The demand surge also swamped the City's approval process. Application reviews slowed down and a significant backlog of work built up. The City's staff resources were simultaneously being drawn down by a very high turnover rate as planners left for more lucrative positions in the booming private sector. Throughout this period, the City continued to manage the land supply using its well-established growth management system and supply remained relatively plentiful. If not for this accomplishment, the price boom would undoubtedly have been much more pronounced.

Other City policies had contradictory effects on housing prices. On the one hand, City land use policies were helping to raise densities, diversify the mix of new housing, and promote intensification, making more efficient use of the available land supply and providing households with some less expensive housing options. The expansion of the

LRT system brought a wider circle of residential precincts into easy commuting time of jobs in the downtown. All these factors, like the growth management system, undoubtedly helped to prevent greater price inflation than actually occurred. On the other hand mounting infrastructure levies, the introduction of more stringent wetland policies, and in some cases, higher parking standards were contributing to development costs and ultimately to the price at which homes sold. The impact of provincial policies was largely through their effect on constraining municipal actions that might have otherwise improved the supply of affordable housing.

Although the economic factors that were at the root of the demand shock that caused the spike in housing prices are largely beyond the control of local governments, Calgary's experience shows that municipalities can help influence housing affordability through a variety of means under local control. This is the basic premise of the policy recommendations in the next section.

Policy Recommendations

The policy recommendations are presented in two parts: those that pertain to the content of the integrated land use and mobility plan and those that relate to the implementation of the plan.

Planning Policies

A key challenge for devising an integrated land use and mobility plan is to manage growth while keeping housing affordable. Therefore, housing affordability should be explicitly addressed in – or even be one of the central themes of – such a plan. In particular, the plan should include a clear statement that promoting housing affordability is a strategic municipal policy goal and that municipal decisions related to land use, development and mobility will routinely consider impacts on the affordability of housing. One option would be to incorporate this goal as the 12th item in the list of principles guiding planning and development decisions and to incorporate the entire list into the land use and mobility plan. Based on the policies and principles to be found in the City-wide plan, more specific policies related to housing affordability should be incorporated into ASPs, ARPs, and other planning documents as the opportunity arises. The plan should set out a series of quantitative targets related to housing affordability (such as a global intensification target, density and unit type mix minimums in greenfield development, a minimum quantity of “inherently affordable” unit sizes and configurations in larger developments, and so on).

Growth management entails establishing a balance between intensifying existing parts of the city through infill development and redevelopment and expanding outward through greenfield development. The plan should address policies to ensure housing affordability in both these development modes.

If the rate at which the city expands outwards is to be curtailed significantly, the plan must recognize intensification of established areas of the City as the primary mode of growth and the main source of new housing. The plan should feature distinct sets of policies for the downtown, transit-oriented development around LRT stations, small-scale infill and large-scale redevelopment. In all cases, the policies should seek to maximize

not only the amount of housing in established parts of the city, but also to maximize the variety of housing choices.

Calgary's current prosperity and changing workforce has created a new market for high-density downtown living, which is now dominated by luxury high-rise condominiums. More and different kinds of housing, with varied building typologies and tenure, will be needed in and around downtown to create a more balanced social mix. Planning policies should support low- and mid-rise heights for townhouses and apartments in order to encourage the use of cheaper wood-frame construction. The plan should also contain policies to expand the use of density bonuses to reward the inclusion of certain unit configurations, such as more studio apartments, or multi-bedroom apartments that are family-friendly.

The integrated plan should incorporate and strengthen the City's evolving focus on transit-oriented development near LRT stations. The plan should emphasize the need for high-densities, a mix of uses, and a variety of housing types around transit stations. Special emphasis should be placed on high-quality public spaces, streetscape designs, building massing and aesthetic standards, similar to those included in the existing TOD policy guidelines.

Policies related to small-scale infill development should be concerned primarily with intensifying existing low-density residential areas. They should define the roles of different forms of small-scale infill in existing neighbourhoods, including: secondary suites or other types of secondary rental dwellings; fee-simple, single-family dwellings on split lots, including laneway housing; and multi-family housing. The plan should set out guidelines on where each of these forms should be developed, taking into considering the characteristics of existing neighbourhoods, the capacity of existing infrastructure, and the provision of sufficient services and amenities.

Policies related to large-scale redevelopment should be concerned primarily with residential development on underused lands or on lands dedicated to unproductive non-residential uses. There are two types of areas that should be the focus of redevelopment policies: greyfields and brownfields. In terms of the sheer number of dwellings created, greyfield and brownfield development are likely to be much more significant than small-scale infill and should be the subject of detailed policy prescriptions in the plan. Greyfield and brownfields are quite different in nature and entail distinct sets of issues; as such, they should be treated separately in the plan.

The plan should encourage the creation of new mixed residential-commercial corridors and the reinforcement of existing corridors through infill and redevelopment. The plan should aim to combine the intensification of mixed use corridors with high capacity transit service. This in turn can provide opportunities for location-efficient (i.e., car-independent) housing. As many greyfield sites are also likely to be adjacent to existing residential areas, the plan should provide direction as to the integration of greyfield redevelopment with adjacent residential uses.

Brownfield sites, in contrast, are sometimes separated from established residential uses by physical barriers such as highways and railways. A key policy consideration will therefore be weaving development on brownfield sites with the existing urban fabric, and preventing them from becoming isolated enclaves. Linking such sites to the street network and servicing them with public transit is an important consideration.

As for greenfield development, while its role will be diminished relative to historic trends, it will undoubtedly remain an important source of new housing. Policies concerning greenfield development should focus on providing a variety of housing options and tenures. This means providing a diversity of types and sizes of single-family homes (whether detached, semi-detached, or in rows) and encouraging the use of small lots and house sizes. The plan should encourage multi-family condominiums and rental housing, as well as secondary suites. The acceptability of mobile homes and manufactured housing should be addressed in the plan. The plan should seek to direct greenfield development around a framework of mixed-use nodes and corridors, well served by transit.

The plan should make reference to the need to maintain and preserve existing affordable housing. Although the City currently has few levers to directly prevent conversions or demolitions of rental stock, it could consider using a transfer of development rights system for this purpose and lay out incentives for property owners to rehabilitate rather than demolish existing structures.

Accessibility and mobility are important considerations for all future development, whether within the city or on the periphery. All development should seek to maximize local accessibility to employment, services, and amenities to reduce the need for long, motorized trips and maximize the use of non-motorized modes of transportation. At the same time, development should be oriented towards public transit to provide a high level of automobile-independent mobility. The synergy between housing affordability and independence from automobiles should be reflected in the plan.

The plan should encourage the use of alternative engineering standards that have the potential to reduce development costs and housing prices. The plan should include guidelines for variances or relaxations to existing standards for projects that meet municipal affordability criteria. The plan should signal to administrative staff that modifications to standards that prove successful should be recognized and permitted as routine options in future developments.

The land supply policies that the City uses to manage growth appear to be working well and do not require substantial changes. However, an intensification objective should be added to the three existing land supply objectives that govern the growth management process. A policy stating that intensification is expected to become a more significant component of total growth should also be included in the plan and there should be an ongoing effort on the part of the City to identify opportunities for intensification and stimulate developer interest in exploiting them. A global quantitative intensification target would help clarify the City's goals in this respect and allow the development industry to adapt accordingly.

At present, there are many key policies that affect land development and the affordability of housing that have not been incorporated into the Calgary Plan. This includes the City's growth management objectives, the Sustainability Principles, elements of the Sustainable Suburbs Study, the TOD policy, and others. The land use and mobility plan should gather together these policies in order to provide coherence and consistency in a clear expression of Council's will.

Implementation Measures

REVISE THE LAND USE BYLAW

A number of revisions to the LUB are suggested throughout this report. A significant gain could be made by modifying the LUB so as to treat multi-family housing as a permitted use rather than a discretionary one, obviating the need for a development permit and preventing delays and cost overruns due to lengthy appeals. A proposal that would require a more substantial overhaul of the LUB would be the use of form-based zoning, to prescribe the general nature of the built form but leave the uses up to market forces.

It is also suggested that LUB be modified to facilitate the creation of secondary suites and small, fee-simple homes by means of lot splitting. It is recommended that secondary suites be made a permitted use and that instead of prescribing strict planning standards for secondary suites (with regard to dimensions, placement on the lot, etc.) that the LUB instead prescribe performance-based standards. In terms of providing small, fee-simple dwellings, the LUB could be modified to provide planning standards for laneway housing, making it a legitimate, permitted use.

To further increase the diversity of housing options, the LUB could be modified to allow for more flexible tenure of existing buildings. In particular, changes could be made to allow individual rowhouses to be used as single dwellings or multiple dwellings, potentially with mixed tenure structures (e.g., owner occupied with tenants). Another modification that could entail important gains in affordability would be removing the distinction between conventionally-built homes and mobile homes in the LUB, thereby allowing mobile homes to be placed among stick-built or modular homes.

It is also proposed that the parking standards laid out in the LUB be modified. One modification is to add several location-specific parameters that would trigger as-of-right reductions to minimum parking requirements. The parameters would include several known automobile-use mitigating factors, not limited to proximity to transit. Another proposed modification is to place maximum restrictions on the number of parking stalls per unit for location efficient housing – i.e., in downtown and other mixed use areas, along transit corridors other than the LRT.

REVISE ENGINEERING AND STORMWATER MANAGEMENT STANDARDS

We have recommended revisions to existing standards governing the design of new neighbourhoods and this position is also expressed in the City's existing policy framework. As discussed earlier in this report, however, the City does not have an effective "institutional learning" mechanism for building upon previous experience with alternative standards. Developers report that they must fight each battle anew, which

stifles innovation and wastes opportunities to reduce development costs and housing prices. This situation should be addressed by working with the development industry to review past experience with alternative development standards, assessing their cost saving potential and identifying situations in which they could be used, and creating a “bank” of standards that are routinely available for implementation. The bank would cover planning, transportation, utility, and water management codes.

STRENGTHEN INCENTIVES FOR MARKET AFFORDABLE HOUSING AND SMART GROWTH

Pressure is building for City to take a proactive stance on housing affordability and introduce programs to stimulate market activity in this sector. Because the MGA does not provide explicit authority for municipalities in Alberta to mandate private sector provision of affordable housing, attention is being placed on the role of incentives (i.e., carrots instead of sticks). Incentives for the development of certain types of housing have been proposed in several instances in the report, including density bonusing, expedited approvals, approvals fee discounts, development levy discounts, property tax breaks, and discounted financing. They have been suggested as means of encouraging the development industry to provide more primary rental housing, more small lots and small homes, or more affordable multi-family units. Incentives are also needed to encourage owners of rental buildings to maintain existing stock and for developers to create new stock. Brownfield redevelopment would also benefit from incentives that could help address the large up-front costs sometimes involved in decontaminating such sites.

The current system of development levies already provides incentives for higher density housing in that they are based on development area (in greenfield locations) or linear (in the Centre City) measures. However, the current system does not take into account the differential impacts of development in different locations on infrastructure need, most significantly, transportation infrastructure. A system of impact-based levies, as proposed in the transportation impact assessment capsule, would simultaneously act as an incentive for less automobile-oriented forms of development and a disincentive to conventional, automobile-dependent forms of development. Development levies could also be reduced in areas targeted for intensification, such as around transit stations and in suburban activity centres, to help direct developer interest to these areas.

REVIEW INFRASTRUCTURE FINANCING INSTRUMENTS AND STANDARDS OF SERVICE

Development levies in new communities have been ratcheted up over time and these charges are generally passed on to home buyers in hot markets like Calgary's. The City has been exploring alternative revenue sources to help pay for infrastructure in suburban areas. The City should continue to explore these and other options as a way of reducing some of the burden of community infrastructure financing on new home buyers. From a Smart Growth point of view, the most desirable mechanisms would be those that simultaneously provide revenue for infrastructure and create incentives for development patterns and behaviours that are consistent with Smart Growth goals, e.g., vehicle registration tax, commercial parking tax, commuter tax, fuel tax, etc.

Another option is to review the levels of service that are currently used to evaluate the infrastructure needs of new communities. Some savings in infrastructure costs may be possible without noticeable changes in the quality of services delivered.

PRODUCE DESIGN GUIDELINES

It is suggested that the City establish design guidelines for various types of intensification projects. In particular, design guidelines are suggested for small-scale intensification, including secondary suites, laneway housing, small lot housing, and multi-family housing in single-family districts. Guidelines combined with checklists are suggested as a way of expediting the approvals process by providing concrete and easily verifiable criteria for approval. It is also proposed that secondary suites and multi-family dwellings to be treated as permitted uses, provided that they follow an appropriate set of design guidelines.

CONDUCT RESEARCH

Some of the policy directions suggested in this report would benefit from supporting research. For example, a detailed inventory of lands available for brownfield and greyfield redevelopment would be invaluable for determining their long-term role and shaping appropriate policies for their redevelopment. An assessment of the infill potential of existing communities would also be useful. Research is also needed on the impacts in established areas of a major shift in development patterns towards intensification, including both the long-term costs and benefits for the municipality. The City should also track housing needs over time and monitor and report on key housing affordability indicators. Finally, as experience grows with the use of alternative engineering standards, the City should track relevant outcomes to determine if the standards are able to meet financial, safety and efficiency objectives.

ADDRESS PUBLIC CONCERNS

In this report, we propose that the City undertake efforts specifically aimed at increasing public acceptance of intensification. A city-wide public engagement process, designed to educate and engage the public in a discourse on growth management and intensification, similar to the Ecodensity process undertaken by Vancouver, is proposed. At the neighbourhood scale, it is suggested that the public be involved very closely in the development of Area Redevelopment Plans through a collaborative planning process. The City is urged to make more extensive use of visualization techniques to help plan and improve community acceptance of intensification projects. In terms of resolving full-blown NIMBY conflicts between developers and community stakeholders, it is proposed that the City restore its defunct mediation program.

Beyond this, there will undoubtedly be a need for a broad public information/education campaign on Smart Growth and housing affordability. The emphasis here should be on presenting information on the need to manage growth responsibly now in order to avoid serious repercussions down the road, including environmental, social and economic problems.

PARTNER WITH THE DEVELOPMENT INDUSTRY

The chances of achieving developer buy-in for a Smart Growth and housing affordability agenda may be enhanced if the City presents the program as part of a package that includes reforms to the approvals process. Streamlining approvals has the dual benefit of meeting developer demands for a more efficient City administration while reducing the overall cost of development, which can help achieve affordability objectives. A number

of improvements to the planning approvals process are proposed in this report. The proposed measures include: a self-certification system for certain types of development applications; a fast tracking program for certain housing types; reducing the reliance on discretionary controls; and streamlining of the internal operations of the CPAG. In terms of the last item, the key improvements to be made are giving file managers more power to coordinate the review process and enforce timetables and increasing the role of generalists in the review process. More recruiting, better training and mentoring of new planners could also help ensure more appropriate decision-making on planning applications.

Beyond these reforms to the approvals process, developer support for a Smart Growth and housing affordability agenda may be strengthened by working with industry associations (especially UDI and HBA) to create a forum where industry leaders can share their experiences concerning innovative housing forms, urban designs, development contexts, and housing forms with other industry members. Finally, the City could consider linking the Smart Growth manual/checklist (which is currently being developed by planning staff to articulate City objectives with respect to the design of new development) to an incentive system that would help counteract the financial risk developers run in experimenting with new models. Incentives might include a reduction in infrastructure levies, expedited approvals, waivers of planning and building permit costs, density bonus, and so on.

MEET ADMINISTRATIVE CHALLENGES

Where facilitating more land efficient patterns of development is concerned, there is likely to be opposition from within the City's administration. The institutional tendency to oppose change can be addressed in part through improved staff training and research on successful implementation of innovative standards, housing forms, and planning processes from abroad and by building on the successes that the City has had in making past innovations (e.g., by turning exceptions into models). However, overall coordination among various departments on planning and management issues may require significant administrative changes, in short a new management model that improves cross-department communication, places responsibility and authority for decisions in the hands of specific individuals and rewards rapid decision making. The City Manager's Office should take the lead on reforming administrative structures to minimize turf protection and competition between business units to ensure that growth management, development policies and planning decisions apply an integrated city-wide perspective.

ADVOCATE CHANGES TO PROVINCIAL LEGISLATION

The policy measures proposed in this report call for changes to provincial legislation in several instances. The City should partner with other municipalities, municipal association, and public-interest groups who are advocating for more provincial leadership on housing affordability to advocate for legislative changes.

The most pressing issue is the Municipal Governance Act. Amendments that are suggested as part of the proposed policy measures in this report include giving clear direction allowing the City to: regulate on the basis of housing tenure and to restrict the conversion of private rental housing; use development levies to fund housing

affordability measures; require developers to replace lost rental units; deny permission to demolish a building containing primary rental units; require affordable units as a condition of redesignation; require developers to include a minimum number of affordable units in a project as a condition for redesignation; use density bonusing to promote affordable housing (market and non-market); to set up a loan reserve fund to provide developers of certain housing types with discounted loans, and; to allow municipalities to use municipal and surplus school reserve lands for affordable and appropriate housing initiatives.

Reforms to the Alberta Building Code are also needed, including: reducing or abolishing width requirements for streets to allow for more land-efficient engineering standards; making provisions for laneway housing, in terms of their structure and location with respect to serviced streets and street fronting homes, and; include a broader definition of secondary suites that includes forms other than basement apartments (e.g., carriage homes, garden suites). It is also suggested that the Condominium Properties Act be amended to enable the city to control rental-to-condo conversions.

ADVOCATE FOR EFFECTIVE REGIONAL PLANNING

We recommend that the City lobby the province to re-introduce a regional planning authority that imposes binding restrictions on land use and development in the Calgary region. The regional governance structure that was developed for the Edmonton Capital Region may serve as a model for Calgary in this regard. There, the province created the Capital Region Integrated Growth Management Board composed of mayors and Reeves from the 25 municipalities in the Capital Region. The board's main priorities are creating a 20-50 year long-range plan on regional land use and infrastructure such as roads and transit; and determining the quantity and location of affordable housing; water planning and waste management, policing, emergency services, social services, recreation and economic development.

1. Introduction

Housing Affordability and Growth Management

Housing is fundamental to the economic, social and physical well-being of Calgary's residents and communities. At a personal level, the quality of one's housing is a powerful determinant of the quality of one's life, providing not only shelter and safety, but enabling citizens to nurture themselves and their children. Housing is also the fundamental building block of healthy, inclusive neighbourhoods. Housing provides a home-base from which residents can weave their social networks and engage in their community. A diversity of housing types within neighbourhoods promotes social integration by mixing people of various income levels, and helps stabilize community and family relations as it allows family members to remain in their neighbourhood as they move through their life-cycle. Community prosperity is improved when all community members have access to appropriate housing from which they can engage in the local economy. All of this promotes the long-term sustainability and health of the city.

Fundamental to all of these functions of housing is its affordability. To ensure that housing is available for all, there must not only be a sufficient supply of housing that is diverse in form, tenure, as well as location, but it must be affordable to the diverse range of income groups in the city.

The affordability of housing has taken centre stage in Calgary since the rapid inflation of prices and rents took hold after 2005. In a very short period of time the city went from a relatively affordable place to live by Canadian standards to a high-priced jurisdiction (Figure 1). This rapid price inflation was not matched by commensurate increases in income, meaning that a greater share of resident's salaries were needed to purchase housing. A measure of this declining affordability is the Median Multiple, which is the ratio between the median free-market price of a dwelling unit and the median annual household income. As shown in Figure 2, Calgary's median multiple increased dramatically in 2006 and 2007 and is now higher than other large cities in Canada, including Toronto, Ottawa and Halifax.

No longer seen as an issue affecting only special needs and lower-income households, housing affordability has taken on much broader dimensions as a sign (or even symbol) of the malaise that can be engendered by a boom economy. Starter homes have become unaffordable for moderate and even some middle income earners and many households are being forced to reduce their housing expectations. Public leaders worry that high housing prices will undermine prosperity by deflecting new migrants unable to afford adequate shelter, driving up labour costs and damaging competitiveness.

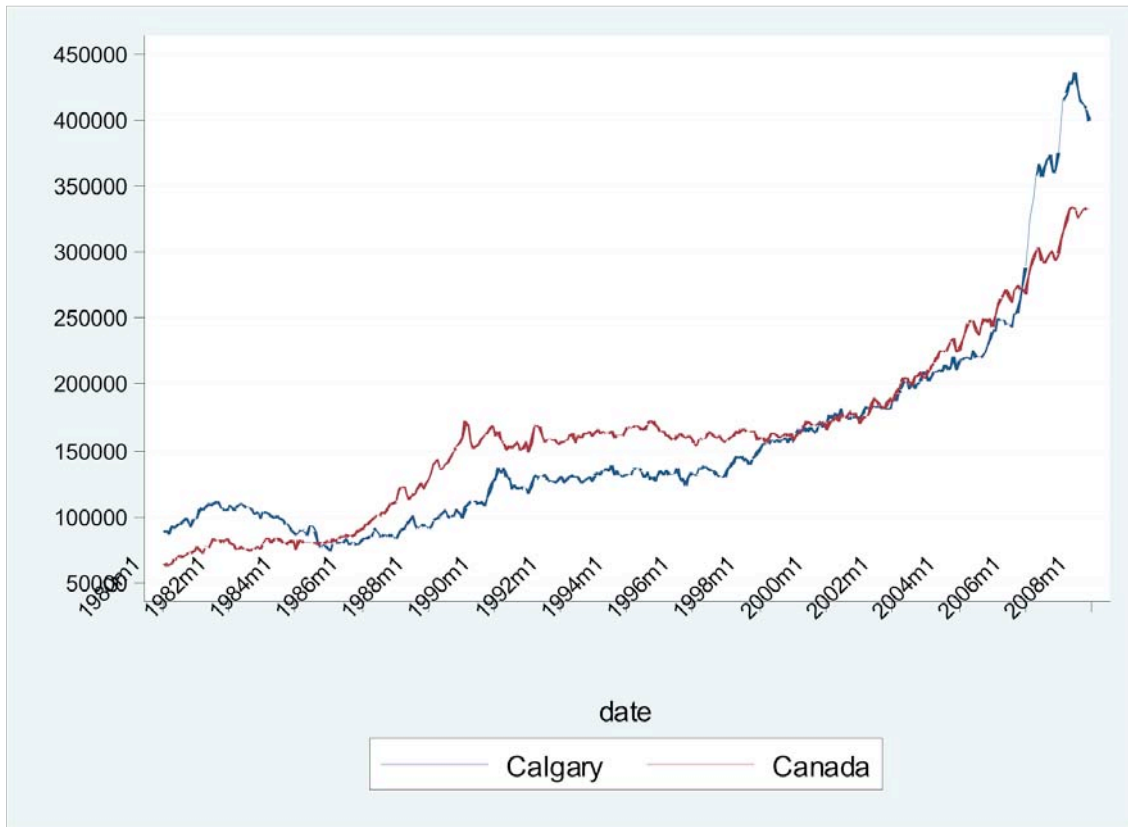


Figure 1: Calgary average housing prices and the average for 25 Canadian CMAAs
 Source: Statistics Canada

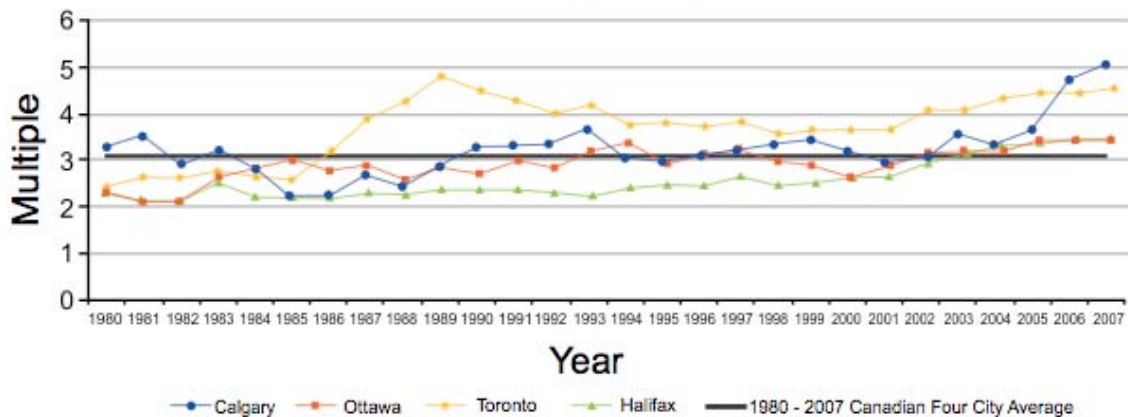


Figure 2: Median Multiple 1980-2007: Four City Comparison
 Source: Calgary Chamber of Commerce, 2008

Although Calgary has taken steps over the last few years to address affordability issues through its planning and development control processes, there are still barriers to affordability embedded in City regulations, policies and decision-making processes. For example, NIMBYism is still a powerful force in Calgary, preventing higher density and

infill development in many locations across the city. The approval process continues to hamper development with long delays and uncertain outcomes. Some lands ripe for redevelopment remain underused or vacant. And at the provincial level, the MGA and other provincial legislation and policies provide little support for those interested in making significant progress on housing affordability. Although prices have moderated somewhat in the last year, Calgary still ranks among the “seriously unaffordable” cities according to an international survey, tied with Toronto in the ranking (Demographia, 2008).

One of the key methods used in Calgary to ensure housing price stability has been the periodic annexation of lands from surrounding jurisdictions (the Uni-City concept) and the orderly expansion of suburban areas. The resulting development patterns, however, have also begun to raise concerns. Infrastructure costs associated with the extension of the urban fabric in new communities throughout the urban area are straining departmental budgets, the provision of municipal services cannot always keep up with the needs of rapidly growing communities, commute times and household transportation costs are rising, and growing congestion on major roads all serve as daily reminders that the spread of auto-dependent suburbs has its economic, social and environmental downsides.

The City is responding to this situation by adopting new policies to increase densities, achieve a better mix of housing types and land uses, encourage growth in areas well-served by transit, improve transit services, and moderate automobile usage. At a more strategic level, Plan It Calgary is exploring scenarios that will allow the city to accommodate the expected growth of 1.3 million persons and 600,000 jobs over the next 50-60 years. The key directions for this exercise include the need to achieve a balance of growth between new greenfield communities and the intensification of already urbanized areas, promote a greater mix of land uses and housing types within each community, and direct population growth to areas with good transit facilities and access to amenities and employment. Three growth scenarios have been put forward in the context of the initiative (Compact, Hybrid, and Dispersed), but the presumption is that business as usual is not a feasible option.

Although the Plan It Calgary project is still in its early stages, the development industry has made it clear that it does not support the more compact growth scenarios contemplated by the initiative. In a letter circulated to industry members and Calgary officials, the President of the Canadian Home Builders' Association in Calgary stated that “CHBA - Calgary Region is concerned that with the restrictive land use policies and severely limited future growth opportunities represented in Plan It Calgary, there will be a steep decline in affordability and push many potential homebuyers out of the market” (Shergill, 2008).

This reaction, if taken seriously, would tend to place the city in a vicious circle: rising housing prices fuelling the spread of the urban fabric, raising tax burdens and transportation costs, which ultimately undermine affordability in the larger sense. However, the fear that managing growth to reduce sprawl and redirect development energy into already urbanized areas will contribute to spiralling housing costs cannot be

dismissed lightly. Efforts to constrain growth at the margin can certainly contribute to rising housing prices if not accompanied by measures to increase densities in new communities and the supply of affordable housing in established areas. This tension between the need for suburban development and intensification is expected as a city evolves. The issue is not to eliminate either tendency, but to balance them in order to obtain the greatest benefits to the widest number of people while minimizing costs to the community as a whole.

Smart Growth is the rubric that is now being attached – both in Calgary and elsewhere – to this aspiration. Smart Growth addresses both affordability and growth management issues by focusing on win-win solutions such as more transit-oriented development, redevelopment of brownfield and greyfield sites, increased prevalence of mixed-use projects, provision of secondary suites, more compact new communities, innovations to bylaws and regulatory environments, and creativity in city planning models and methods. Smart Growth is geared towards creating a “virtuous circle” whereby compact development options provide opportunities for a wider range of housing forms and prices while the creation of affordable housing in suitable locations, in turn, helps realize growth management goals such as reduced commuting distances, greater reliance on public transit, biking and walking, a geographical balance among housing of jobs, and less pressure for development at the city margins or beyond.

How Smart Growth and Affordability can Work Together in Calgary

Experience in other jurisdictions has shown that the promotion of affordable housing is not only compatible with growth management, but a necessary complement to it: implementing better growth management can advance housing affordability, and affordable housing can help achieve growth management goals. Smart Growth strategies to achieve this are often criticized as distorting market signals, but in fact more intelligent growth management strategies work precisely because they resolve longstanding distortions in the housing market, by improving the ways in which the costs and benefits of growth are allocated between municipalities, developers, and households. Thus, growth management and affordability can support one another, and in a way that accords with Calgary’s political climate and values. The city’s success is due in no small part to the open and friendly culture which is Calgary’s hallmark, and building stronger local communities across income groups and household types will be necessary for maintaining that culture and extending that success. Calgary’s urban structure and development pattern have created serious urban growth problems that threaten the city’s economic vitality and social fabric. Four stand out as major urban growth challenges for the city, and affordable housing can contribute to solutions for each.

First, **the distance between employment centres and housing** is widely recognized as one of Calgary’s most pressing growth issues. With the growing concentration of blue-collar industrial and commercial jobs in northeast and southeast Calgary, workers looking for cheap housing have to go to the northern, western and southern urban fringe to find it. This jobs-housing split encourages long-distance (and thus more likely automobile) commutes for industrial and commercial workers. The tradeoff of a long commute for

less-expensive housing on larger lots increases vehicle miles travelled, and having more cars on the road for longer periods of time contributes to increased traffic congestion. Downtown, which has few residents, has managed to accommodate a rapidly growing number of head-office jobs, without turning to a new highway or river crossing to improve access. This decision has directed most downtown commuter traffic onto the C-Train system, giving transit a high share of downtown trips. However the C-Train is already overloaded in peak hours, even as planned and much-needed extensions will add even more riders to existing lines. A stressful journey on crowded transit vehicles will lessen the appeal of more sustainable transportation options for downtown workers from all income levels. This can contribute to the attraction of auto-centered commutes, which leads lower-income households to opt for more distant housing on cheaper land.

Affordable housing located closer to both the east side and downtown job centres helps shorten commutes and relieve congested transportation links. To extend these potential benefits to the industrial and commercial workforce will require affordable housing for skilled and unskilled workers alike on the east side of Calgary. A shorter commute without a harrowing cross-town journey will reduce the number of vehicle miles travelled for drivers, and increase the practicality of transit and non-motorized modes. In and around downtown, additional housing would encourage short walking and cycling commutes, lowering commute costs for households and infrastructure costs for municipal government. While the recent interest in downtown condominium development will open this option for higher-income households, affordable and family-friendly housing in inner Calgary will extend these advantages to larger numbers of service-industry employees. Initiatives such as the East Village, Beltline, and Bridges projects, which include improved public spaces and streetscapes, are already planning for a mix of uses. These and other downtown and central city projects will have to include a mix of unit types and price levels to become affordable as well as hospitable. Bringing more workers closer to their jobs will relieve some of the pressure on the C-Train system, attracting more riders into new stations along the extensions and permitting greater density and intensification around stops closer to downtown.

A second growth issue is Calgary's **pace of land consumption**. City policies that bring a multi-decade supply of developable land into the municipal boundary set the expectation that the urban fabric will continue to spread indefinitely out into the prairie. While the southern Alberta landscape is indeed wide open and there is no shortage of high-quality agricultural land, unchecked urban development will negatively impact watersheds and other threatened and environmentally sensitive areas. Given the sour-gas wells that block further residential development into much of the rural land east of the city, developers who follow conventional low-density suburban development practices, and whose product is aimed at middle- and moderate-income households, will continue to seek out inexpensive land at the urban fringe to the north, west and south. This sets the stage for the vicious cycle of urban sprawl, in which jobs and services move out to be close to residential areas, which in turn opens up the potential for new residential development even further from the urban core.

The right placement of affordable housing can reduce pressure on undeveloped land beyond the existing built-up area, by directing growth to sites within the urbanized perimeter. The appeal of lower land costs that keep housing costs down in land-intensive conventional development can be offset with better designs and higher-density housing types that cut costs by reducing the amount of land they consume. The tradeoff between plot size and affordability can be mitigated by including generous public spaces and high-quality public facilities and improving local aesthetics while promoting resident satisfaction and greater community interaction. A more constrained land supply does not have to translate into higher housing prices, if developers and architects respond creatively to market conditions that place a premium on more centrally located sites that offer advantageous access to jobs and services.

Third, low-density development patterns **reduce the efficiency of infrastructure and increase the cost of services**. Growth in undeveloped areas requires infrastructure extensions, making a significant increase in the length of sewer, water and power lines to serve a small increment of new residents. The necessity of vital infrastructure requires that these capital investments be made up front, placing a significant financial burden on debt-wary municipalities and forcing them to use development charges and increase taxes to offset higher costs. Developers and free-market advocates frequently cite front-loaded development charges as an obstacle to affordable housing, as builders pass them on to consumers in the form of higher housing prices, while higher property taxes increase the cost of owning property and can dissuade moderate-income households from buying property. Development practices that seek to reduce the price of new housing by building on inexpensive undeveloped land thus actually increase the costs borne by the city and the household.

More compact development can lower these costs by reducing the overall amount of infrastructure required to service each dwelling, and encourages developers and households to pursue further savings through a more efficient use of land and interior space. While compactness reduces the need for new infrastructure when building new housing, directing development to underutilized sites within the built-up area, which already have infrastructure in place, can eliminate it altogether. Using existing infrastructure more fully reduces costs not just for households in new development, but for all those that connect with municipal services. Lower development charges result in lower housing prices, and the lower total amount of property taxes paid on smaller parcels helps make homeownership more affordable for households. At the same time, higher land values and higher built densities on previously underutilized land can increase the total amount of property taxes paid into city coffers, giving Calgary additional fiscal capacity to invest in improved public spaces, renewed infrastructure and better public services.

Lastly, **conventional development patterns separate housing types and land uses from one another**. This is true at the metropolitan level, as discussed in the paragraphs about jobs and housing above, but it also applies at the neighbourhood level. Separating dwellings from the retail stores and other services that households need to have handy leads to increased car travel necessary, and lowers the quality of life by making everyday

needs more inconvenient. For households with children, putting parks, rinks, pools and schools into more distant facilities, or in locations that are difficult to access on foot, can turn parents into chauffeurs for outgoing kids. More subtly and perniciously, the division of housing types from one another isolates income groups and household types.

Calgarians' well-earned reputation as a welcoming and inclusive community is not enough to overcome the social and economic segregation that results from a housing monoculture of single-family detached houses in the suburbs and high-rise condominiums downtown, giving households few options as to where they can find housing that is appropriate to them. The influx of large numbers of newcomers from across Canada and around the world makes it even more important that neighbourhood bonds and mutual support networks develop between families of all stages and sizes.

Affordable housing can help all households save time and money, and is a step in overcoming social and economic differences to build stronger communities. Higher densities and retail-friendly streetscapes can help put daily needs within easy reach for pedestrians, eliminating parking hassles while saving energy and boosting (if modestly) physical activity. Putting additional jobs near where people already live helps enliven areas that would otherwise be bedroom communities, giving retail businesses a daytime clientele, increasing the need for nearby housing that can accommodate the full range of employees, and helping mitigate the east-west jobs-housing split. Recreational and educational activities in places that young people – not to mention adults – can walk or ride their bicycles to saves parents the effort and expense of shuttling their children or themselves around. Making facilities accessible to all income levels will require making the communities where they are located affordable for a variety of incomes. As Calgary is a good place to retire as well as a good place to raise a family, different housing types will be needed so that new Calgarians can put down roots in a neighbourhood and stay there as their needs, incomes and household sizes change. The social capital accumulated by long-term residents is widely understood as a key element of success for households and cities alike; affordable housing can help individuals and communities build and retain these precious and intangible connections with one another.

Purpose of this Report

The Plan It Calgary initiative will result in a long-term (two generation) integrated land use and transportation plan for The City of Calgary. This project will provide the context for the comprehensive review and update of two of Calgary's major policy plans; the Calgary Plan (Municipal Development Plan) and the Calgary Transportation Plan. This process provides an historic opportunity to focus on affordability issues and to ensure that measures undertaken to encourage housing affordability in Calgary are in concert with other strategic themes, such as the need to constrain the spread of Calgary's urban fabric and promote alternatives to automobile dependency.

The purpose of the present study is to undertake and report on research that will assist the City of Calgary to address housing affordability through an increased understanding of the factors affecting housing costs including current policies and regulations, and the

identification of policies to address housing affordability to be included within the integrated land use and mobility plan.

The objectives of the study are:

- * To engage City staff, the development industry and homebuilders to identify the impacts of current policies, regulations and development processes as they relate to housing affordability.
- * To identify strategic policy options regarding housing affordability for the integrated land use and mobility plan.

The scope of this study is limited to a consideration of the factors that influence the overall affordability of housing (especially for moderate income households) provided by the private sector within the city. Thus, the focus of this study is not on social or non-market housing for disadvantaged Calgarians, although policies that affect the availability of this type of housing will also be considered in cases where it would be difficult to disentangle from market housing provision.

Definition of Affordable Housing

The meaning of affordability varies greatly among jurisdictions, but in Canada it is normally a variation on a definition established in 1986 by CMHC and provincial authorities, i.e., that affordable housing must be suitable (i.e., has enough bedrooms for the size and make-up of the occupying household) and adequate (i.e., does not require major repairs) and that the occupants should not spend more than 30% of their gross (pre-tax) income on housing costs. For ownership housing, housing costs include monthly mortgage payments of principal and interest, taxes and utilities (plus condo fees if applicable). Rental housing costs include rent and payments for utilities (water, fuel, and electricity) where they are paid separately from rent.

In 2002, City Council adopted the Corporate Affordable Housing Strategy, which included the following definition of affordable housing:

Affordable housing adequately suits the needs of low- and moderate-income households at costs below those generally found in the Calgary market. It may take a number of forms that exist along a continuum from emergency shelters, to transitional housing, to non-market rental (also known as social or subsidized housing), to formal and informal rental and ending with affordable home ownership.

Affordable housing projects are targeted to households with 65 percent or less of the area median income... For housing to be affordable, the Canada Mortgage and Housing Corporation has defined that a household should not spend more than 30% of its gross income on shelter costs. Highest priority for affordable housing are “core need households” that spend more than 50% of their income on shelter costs (City of Calgary, 2002: 18).

This definition is not suitable for the purposes of the present report. First of all, housing occupancy, cost and tenure cannot be directly addressed in planning processes, such as the land use bylaw or statutory plans, under current provincial legislation. Secondly, the primary focus of the current report is on the affordability of market housing, not the provision of subsidized, non-market units to special needs groups or low-income households. Thirdly, there is an increasing tendency to incorporate transportation costs into the meaning of housing affordability. This flows from the fact that households that move into fringe areas in search of cheaper housing will likely have to pay more for transportation whereas locations near amenities and jobs may have higher housing costs but will enjoy lower transportation costs.

An alternate approach, the one used in present report, focuses on housing affordability as it is affected through land use planning and development in the private market. Housing affordability refers to the ability of the development industry to supply housing units in appropriate locations that would be affordable to the broadest range of users. Here “affordable” means that housing costs do not consume an unreasonable share of the household budget, leaving sufficient income to meet other basic needs (Gabriel and Yates 2005). This is similar to the definition used by the City in its 2004 review of the former Land Use Policy (City of Calgary, 2004). As noted in that document, this definition acknowledges that land use planning policy alone cannot “provide” housing that is affordable to particular income groups – rather, it can facilitate the provision of housing that is less costly to build.

The principles ways in which land use planning can facilitate the provision of affordable housing include:

- * measures to reduce the cost of housing generally – e.g., speeding up approvals process and ensuring an adequate supply of developable land in both greenfield and intensification contexts.
- * measures to increase the supply of housing types (housing form and density) that are more likely to be affordable – e.g., inclusionary zoning, alternative planning and engineering standards, incentives such as fast-tracking approvals, and addressing NIMBY.
- * measures to increase the supply of housing in locations that can reduce the overall costs of housing and transportation – e.g., transit-oriented development, downtown housing, greyfields, brownfields, and commercial corridors.

Methodology

The study was conducted in a series of five steps:

1. Describe housing affordability trends in Calgary.

The consultants reviewed existing data and municipal reports to characterize housing affordability trends in Calgary. The review included both ownership and rental housing and covered trends for different housing types. The emphasis was placed on overall

housing affordability, not on social or non-market housing for disadvantaged Calgarians. The review highlighted the key affordability challenges facing residents of the city.

2. *Determine and describe the range of factors that affect housing affordability in Calgary, including policy and non-policy factors.*

The consultants reviewed the federal, provincial and municipal regulatory standards, policies and programs that impact the cost of providing housing in Calgary. The consultants identify the broad range of non-policy factors that may help explain trends in housing prices in Calgary. Information sources for this step included interviews with municipal officials, developers and builders, complemented by program and policy documents.

3. *Assess the importance of land supply policies in influencing housing price trends in Calgary relative to other factors.*

The consultants developed an econometric model to assess the importance of Calgary's land supply program relative to other factors affecting the cost of housing of different types. Building permits were used as a proxy for land supply and data for this model was gathered from existing sources.

4. *Evaluate the potential impact of various future growth scenarios on housing prices in Calgary.*

The consultants developed a forecasting model to estimate the housing prices that might result from implementation of different growth scenarios being considered in the context of Plan It Calgary.

5. *Explore measures available to the City to improve housing affordability.*

A broad range of potential measures that could be adopted by the City of Calgary in the context of its upcoming review of land use and transportation plans were identified. Each measure was assessed for its suitability to the Calgary context and its potential impact on housing affordability and a short list of 15 measures were selected for further analysis. Information on affordability measures was drawn from the previous work of the consultants, the literature on housing affordability measures, and descriptions of measures used in other cities in Canada and the US. Information on applying the measures to Calgary was gathered from interviews with municipal officials, developers, builders and other stakeholders as necessary.

Outline of this Report

The subsequent chapters are organized as follows:

- 2) Housing Trends and Affordability In Calgary: examines housing trends in Calgary and explores the nature of the housing affordability issue.
- 3) Smart Growth and Housing Prices: Reviews the literature on how pursuing a Smart Growth agenda might impact housing prices in a growing metropolis like Calgary.
- 4) The Determinants of Housing Price Dynamics in Calgary: uses econometric modelling to explore why housing prices increased so rapidly in Calgary over the last couple of years.

- 5) Housing Price Forecast under Different Growth Scenarios: looks at the impact of a changing mix of housing types on prices.
- 6) Policies Affecting Housing Affordability: provides an overview of the programs, legislation, plans, regulations, standards and other policies and implementation tools that have a direct or indirect impact on housing affordability.
- 7) Policy Options: examines a range of policy measures to improve housing affordability that the City of Calgary could consider in the context of the long-term integrated land use and mobility plan and the City's other planning initiatives.
- 8) Conclusions and Recommendations: offers conclusions on factors affecting housing costs and recommendations on policies and implementation measures to address housing affordability.

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2. Housing Trends and Affordability In Calgary

In this chapter, we examine housing trends in Calgary and explore the nature of the housing affordability issue. We begin by presenting the views of the industry on this matter, garnered from the interviews conducted with developers, builders and consultants representing the various industry sectors. We then proceed with an empirical analysis, including trends in population growth, immigration, employment, and household structure, all factors that are thought to influence housing demand. We then look at trends in the housing market, including tenure, housing type, and the spatial distribution of new housing. Next we delve into the dynamics of the housing market, including prices of resale and new homes, housing costs, housing starts, rental vacancy rates, and housing affordability indicators. Trends for the most part are tracked from the beginning of the 1990s up to the most recently available data.

Industry Perspective

Those interviewed for this study were asked whether or not they felt housing affordability is a problem in Calgary. Virtually all of the interviewees agreed that there is an affordability problem. Many of the interviewees, especially developers specialized in greenfield development, defined the problem in terms of the ability to purchase a starter home – i.e., a modestly sized single-family detached home. They noted that the cost of this type of dwelling (along with the cost of all other types of dwellings) has increased drastically in recent years. Interviewees reported that starter homes are now selling above \$300,000, rendering them unattainable to many first time homebuyers – even middle-income buyers. As a result, claimed a few interviewees, it is now more difficult for first-time buyers to get into the housing market. First-time buyers are now typically purchasing dwellings in categories other than the conventional starter home, namely semi-detached, town house, and multi-family condominium. According to interviewees, dwellings in these categories are being supplied, both through new construction and, in the case of multi-family condominiums, through conversion of existing rental buildings. Nonetheless, the prices for such dwellings are also relatively high, making them unattainable to first-time buyers in lower income brackets.

While most of the interviews perceived the problem in terms of home ownership, a few interviewees noted that the affordability problem is also manifested in the rental market. It was pointed out that rents have risen and that vacancies are almost non-existent. The supply of rental units is likely to have decreased given that many former rental units have been converted to condos and virtually no new rental units have been produced in recent years. However, some interviewees mentioned that some rental units may have been created indirectly. Speculators have bought condo units in new multi-family buildings and that those who have not flipped their units have been renting them out. It is also likely that the low vacancy rates and high prices have spawned unofficial or illegal secondary suites in existing neighbourhoods, particularly in the inner city.

Regardless of how they conceive of the problem, most interviewees expressed concerns about the general high cost of housing in Calgary. A few interviewees expressed concern that, as a result of the high cost, development might leapfrog from the City of Calgary to surrounding municipal districts. Others expressed the concern that people may begin shunning the entire Calgary region as a place to live, going instead to regions where they could get better homes for the same money.

Demographics and Metrics of Housing Demand

The demand for new and existing homes is tied to the population pressures and economic activity in a regional housing market. Therefore, this report on housing market affordability in Calgary begins with a discussion of the underlying demographics and the socio-economics prevalent in Calgary CMA.

With a population base of slightly over a million, the Calgary Census Metropolitan Area is the fifth largest urban centre in Canada after the Toronto, Montreal, Vancouver, and Ottawa-Gatineau CMAs. While not the largest in population, it is the fastest growing large urban centre in Canada. From 2001 to 2006, the Calgary CMA's population increased by 13.4%, compared to 10.4% for the Edmonton CMA, its closest competitor (Table 1).

Table 1: Population figures in the 10 most populous urban centres (CMAs) in Canada

City	Pop 2006	Pop 2001	Growth
Toronto (Ont.)	5,113,149	4,682,897	9.2
Montréal (Que.)	3,635,571	3,451,027	5.3
Vancouver (B.C.)	2,116,581	1,986,965	6.5
Ottawa - Gatineau (Ont./Que.)	1,130,761	1,067,800	5.9
Calgary (Alta.)	1,079,310	951,494	13.4
Edmonton (Alta.)	1,034,945	937,845	10.4
Québec (Que.)	715,515	686,569	4.2
Winnipeg (Man.)	694,668	676,594	2.7
Hamilton (Ont.)	692,911	662,401	4.6

Source: Statistics Canada

The Calgary CMA population has been growing at a stable pace since 1990 (Figure 3), with a slight increase in growth rate beginning in 1996-97 (Figure 3).

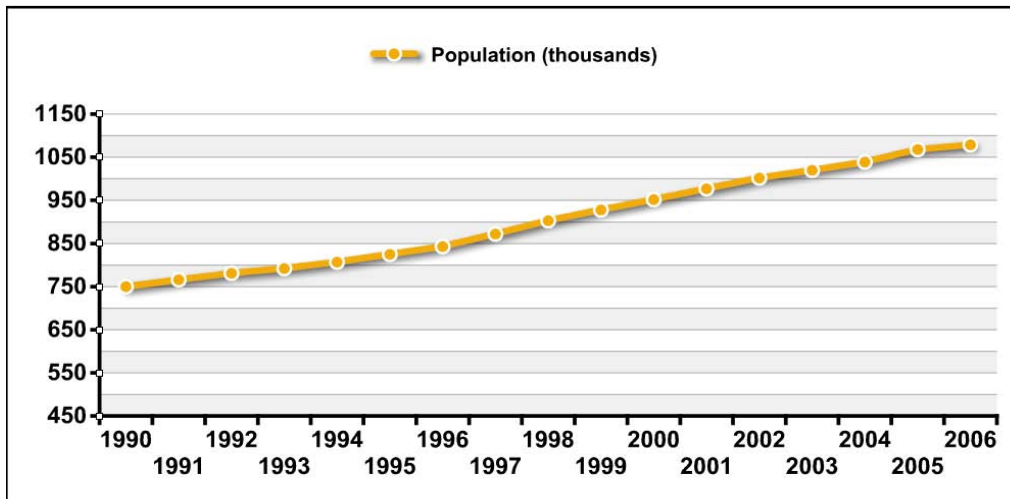


Figure 3: Calgary population growth since 1990

Source: CMHC's Housing Market Indicators

Population Growth and Immigration

According to the 2006 Census, three-fourths of Calgary residents were born in Canada, Table 2). For a fast growing metropolis, the share of international immigrants appears relatively small. Consider that in 2006, 45% of the population in Toronto and 40% in Vancouver consisted of immigrants. Almost half of the immigrants in Calgary moved to Canada before 1991. Recent immigrants to Canada, i.e. those who relocating after 1991, comprise only 12.7% of the population. These figures suggest that population growth in Calgary is driven primarily by relocation within Canada rather than by foreign immigration.

Table 2: Immigration status of Calgary residents

Immigrant status and period of immigration	Total	Percent
Total population	1,070,295	100
Non-immigrants	805,645	75.3
Immigrants	252,770	23.6
Before 1991	127,460	11.9
1991 to 2000	67,370	6.3
2001 to 2006	57,940	5.4
Non-permanent residents	11,880	1.1

Source: Statistics Canada

According to Statistics Canada, most residents of Calgary (almost 80%) did not move in the year prior to the 2006 Census (Table 3). In other words, 20% of Calgarians reported changing their residence during 2005-2006. Another 16% moved from one municipality to another within the Calgary CMA or moved to the CMA from elsewhere in the province during that year. Only 3% of residents in Calgary had moved to the CMA from a different province that year and an additional 1.6% had lived in a different country during that 12 month period.

Looking at a five-year period, we see that 48% of Calgarians had not moved since 2001. A further 32% had moved around within the same municipality within the Calgary CMA

and another 6% had moved to the Calgary CMA from elsewhere in the province. Only 8% residents had moved to the Calgary CMA from a different province since 2001, and an even a smaller percentage of residents (6.3%) reported living in a different country in 2001. This implies that fewer than 15% of Calgary's residents in 2006 had moved to Calgary from outside of Alberta. The remaining residents, accounting for more than 85% of the population, had either lived in Calgary or in Alberta during 2001 and 2006.

Table 3: Mobility status of Calgary CMA residents reported in 2006

Mobility status - Place of residence 1 year ago	Total	Percent
Total population 1 year and over	1,056,385	100
Lived at the same address 1 year ago	842,885	79.8
Lived within the same province or territory 1 year ago; but changed addresses within the same census subdivision (municipality)	144,865	13.7
Lived within the same province or territory 1 year ago; but changed addresses from another census subdivision (municipality) within the same province or territory	22,175	2.1
Lived in a different province or territory 1 year ago	30,060	2.8
Lived in a different country 1 year ago	16,400	1.6

Source: Statistics Canada

Table 4: Mobility status of residents in 2001

Mobility status - Place of residence 5 years ago	Total	Percent
Total population 5 years and over	1004465	100.0
Lived at the same address 5 years ago	480615	47.8
Lived within the same province or territory 5 years ago; but changed addresses within the same census subdivision (municipality)	323745	32.2
Lived within the same province or territory 5 years ago; but changed addresses from another census subdivision (municipality) within the same province or territory	56875	5.7
Lived in a different province or territory 5 years ago	80405	8.0
Lived in a different country 5 years ago	62830	6.3

Source: Statistics Canada

Figure 4 presents Calgary's annual net migration (the difference between in-migration and out-migration) as a percentage of the CMA's population. It can be seen from the figure that net migration to Calgary increased from 1993 to 1998 as a share of the CMA's population. This represents the time where employment seekers from different parts of Canada relocated to Calgary at an increasing rate. From 1998 to 2003, the share of net migration to Calgary declined. From 2003 to 2005, the figure suggests that Calgary reemerged as a magnet, attracting workers from Canada and abroad.

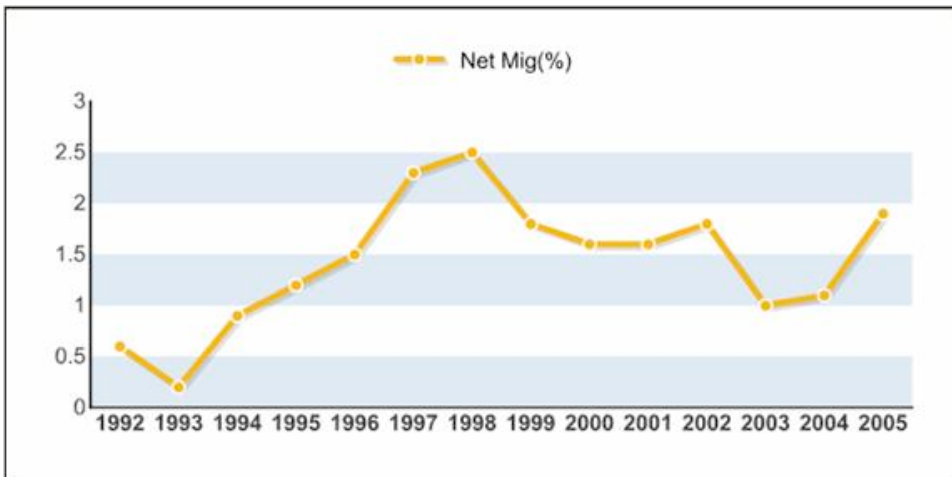


Figure 4: Share of net migration in Calgary's population
 Source: CMHC's Housing Market Indicators

Figure 4 offers data only up to 2005; anecdotal and other evidence however suggests that these trends continued during 2006. The situation in 2007, however, appeared to be shifting. Even though in-migration continued to outpace out-migration in Calgary, Statistics Canada expected a 41% decline in net migration in 2007 from the one observed in 2006.¹ As for the inter-provincial flows, Statistics Canada reported a net loss of 3,300 people for Alberta in the third quarter of 2007. This was the first inter-provincial migration loss reported for Alberta since 1994.

Household Structure

Table 5). Households consisting of couples accounted for 58% of total households. Couples with children accounted for 31% of households and couples without children accounted for 27% of households. Almost one in four households in Calgary consists of a single person. The average household size in 2006 was 2.6 persons.

Table 5 presents a snapshot of household structure in Calgary in 2006, it is also important to understand the evolution of household structures over time. Table 6 presents a summary of how household structures have evolved over the past three decades. There has been a slight decline in the percentage of households made up of families from 1971 to 2001. Within the one family households, the percentage of couples with children has declined from 62% in 1971 to 50% in 2001. There has been a simultaneous increase in the share of couples without children from 28% in 1971 to 36% in 2001. Similarly the percentage of lone parents has also increased from 9% in 1971 to 14% in 2001. As for non-family households, the majority are one-person households.

¹ Canada Mortgage and Housing Corporation. January 2008. *Housing Now Calgary CMA*. Pp. 4

Table 5: Households structure and the presence of children

Households and children	Households	%
Total private households	415605	100%
Households containing a couple (married or common-law) with children	128900	31.0%
Households containing a couple (married or common-law) without children	111335	26.8%
One-person households	103545	24.9%
Other household types	71820	17.3%
Average household size	2.6	

Source: Statistics Canada

When Calgary's population is differentiated by tenure, the difference in household structure between owners and renters becomes obvious. For instance, while the share of couples with children for owner households declined since 1971, the share of couples with children increased significantly amongst the rental households. Whereas the share of couples without children amongst owner households has increased only marginally, the same group increased significantly for rental households from 1971 onwards. For rental households, the share of non-family households has declined from 66% in 1971 to 52% to 2001.

The above discussion suggests that taken together the share of household made up of couples with children has declined in Calgary over the years. This is reflective of the aging population where couple households are increasingly seeing their children leaving for universities or starting their own households. The data also shows that rental units are increasingly occupied by families, with the greatest increase in couples with or without children.

While there has been a general increase in the percentage of lone parents in Calgary, the share of lone parents amongst the rental households has declined whereas the share of lone parents has increased amongst owner households.

The increase in one-person households over the years in Calgary suggests that the headship rate may be increasing. Furthermore, given the increase in the share of lone-parent and one-person households, and a simultaneous declined in the share of couples without children, one may argue that the change in household demographics will impact the type of housing to be built in Calgary in the future. The transition from couples with children to households comprised of single persons or lone parents will result in an increase in the demand for smaller housing units.

Table 6: Evolution of household structures in Calgary

Owners and renters	1971	1976	1981	1986	1991	1996	2001
All household types	100	100	100	100	100	100	100
Family households	78	75	71	70	71	70	70
One-family households	99	99	99	99	98	98	97
Couples with children	62	58	55	54	53	52	50
Couples without children	28	32	34	34	34	35	36
Lone parents	9	10	10	12	13	13	14
Multiple-family households	1	1	1	1	1	2	2
Non-family households	22	25	29	30	29	30	30
One person only	74	73	69	77	76	77	78
Two or more persons	26	27	31	23	24	23	22
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Owners	1971	1976	1981	1986	1991	1996	2001
All household types	100	100	100	100	100	100	100
Family households	88	85	80	80	83	81	80
One-family households	99	99	99	99	98	98	97
Couples with children	68	64	62	62	59	57	54
Couples without children	31	34	36	35	33	34	35
Lone parents	2	2	2	3	8	9	11
Multiple-family households	1	1	1	1	2	2	3
Non-family households	12	15	20	20	17	19	20
One person only	70	66	63	73	77	79	82
Two or more persons	30	34	37	27	23	21	18
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Renters	1971	1976	1981	1986	1991	1996	2001
All household types	100	100	100	100	100	100	100
Family households	34	36	44	48	51	49	48
One-family households	98	98	99	99	99	98	97
Couples with children	1	7	18	22	38	38	35
Couples without children	1	10	28	28	38	35	39
Lone parents	98	83	55	50	24	27	26
Multiple-family households	2	2	1	1	1	2	3
Non-family households	66	64	56	52	49	51	52
One person only	76	79	75	81	76	76	74
Two or more persons	24	21	25	19	24	24	26

Source: Statistics Canada

Metropolitan Economy

Calgary's metropolitan economy has generated thousands of new jobs over the years and has therefore attracted workers from across Canada and abroad. Although Calgary is still a comparatively small labour market compared to that of Toronto and Montreal, it has been expanding rapidly over the years. The unemployment rate has followed a downward trend since the recession in the early 1990s. Standing at around 3%, Calgary's unemployment rate is the lowest among large CMAs in Canada (Figure 5).

Accompanying the decline in unemployment rate is the increase in the labour force participation rate in Calgary (Figure 5). However, the past few years depict an interesting dynamic. The participation rate started declining in 2002 only to change course in 2005. The recent dramatic increase in Calgary's labour force participation rate is a result of the jobs created due to the increased productivity in the petroleum sector.

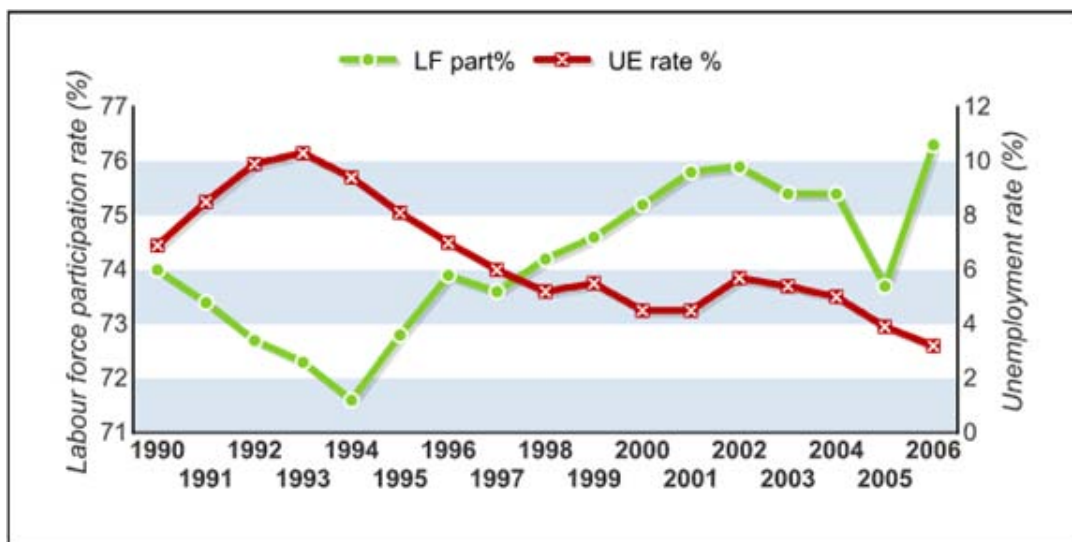


Figure 5: Labour force participation and unemployment rates in Calgary

Source: CMHC's Housing Market Indicators

One consequence of a robust labour market is the increase in wages. Calgary and Edmonton have experienced significant increases in real incomes since 1990. Figure 6 presents the change in real median after-tax incomes (2005 constant dollars) for Calgary, Edmonton, and Canada. Incomes have increased in Calgary and Edmonton at a faster rate than the Canadian average. This is reflective of the faster economic growth in Alberta when compared with rest of Canada. Furthermore, the rate of increase in real disposable income in Calgary and Alberta is quite similar suggesting that wage gains are similar in the two metropolitan economies.

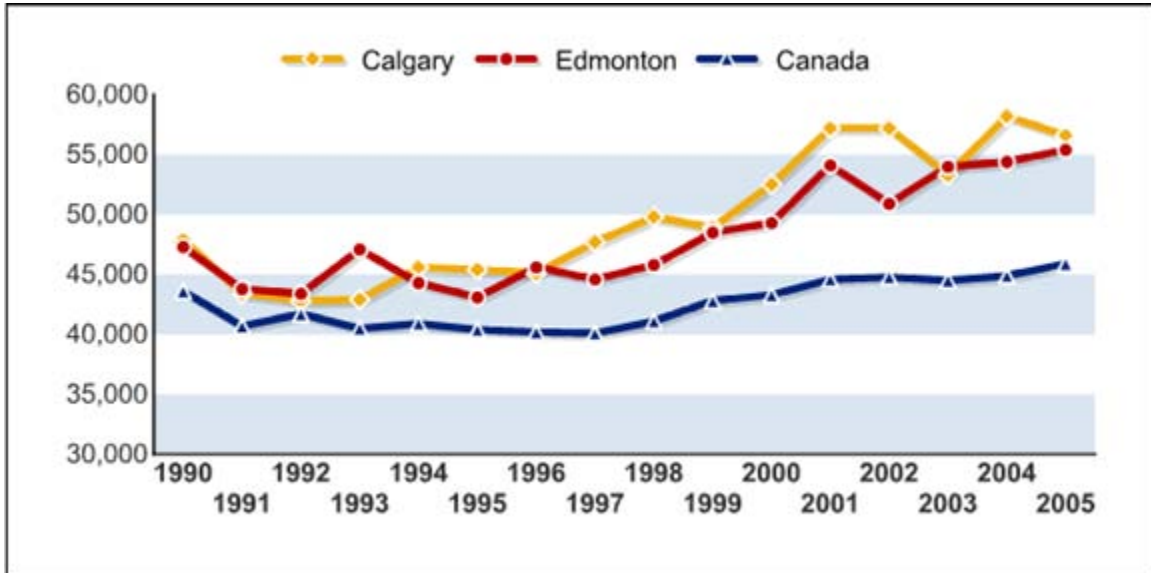


Figure 6: Increase in real median after tax incomes (2005 constant Dollars)

Source: CMHC's Canadian Housing Observer

While the real median disposable income in Calgary has increased over the years, real incomes of owner households have increased much faster than those of renters in Calgary (Figure 7). In fact, real incomes of renter households have not experienced any noticeable gains since the early 1990s, whereas those for owner households have increased significantly. Rapidly increasing incomes may be partly responsible for rising prices in the ownership market, which may spill over into higher rents even though incomes in the rental market are stagnant. These differences have implications for housing affordability if renters and owners are competing in the same housing market. We will discuss these issues later in the section on housing affordability.



Figure 7: Difference between real median after tax incomes of renters and owners (2005 constant Dollars)

Calgary's Housing Market

According to the 2006 census, the total housing stock in the Calgary CMA was comprised of 415,605 units (Table 7). Ownership housing represented 74% of the stock and rental units represented the remaining 26%. The age of the housing stock suggests that Calgary is a fairly young city. In fact, almost 42% of housing units in Calgary were built between 1986 and 2006.

Table 7: Housing characteristics, 2006

Housing Characteristics	Data
Total private dwellings occupied by usual residents	415,605
Number of owned dwellings	307,920
Number of rented dwellings	107,680
Number of dwellings constructed before 1986	239,240
Number of dwellings constructed between 1986 and 2006	176,365
Dwellings requiring major repair - as a % of total occupied private dwellings	4.8
Average number of rooms per dwelling	6.8
Dwellings with more than one person per room - as a % of total occupied private dwellings	1.1

Source: Statistics Canada

Most housing in Calgary appears to be in good shape. Fewer than 5% of housing units required major repairs in 2006. The average dwelling size was slightly less than seven rooms per unit. Given that the average household size was 2.6 persons in 2006, this suggests a lack of crowding in Calgary. Indeed, only a handful (1.1%) of dwelling units reported more than one person per room. However, this statistic should be reviewed separately for renters and owners to ensure that crowding is not an issue for renters. Furthermore, the same statistic needs to be estimated for households spending more than 30% of their income on shelter. At this stage, we do not have access to disaggregated data that would allow us to identify crowding effects in particular sub-sectors.

Temporal Trends

The structure of the housing market over the past 10 years has remained stable (

Table 8). Single-family detached housing, representing 60% of the total housing stock, continues to be the dominant type of housing in Calgary. The second most common housing type (15%) is apartment buildings of fewer than five storeys. Semi-detached housing, rural houses, duplexes and tall apartment buildings account for the remaining housing stock.

While the mix of housing types has not changed significantly over the last 10 years, major shifts in tenure have occurred in Calgary; owned homes increased from 65% in 1996 to 74% in 2006. This mirrors trends in other Canadian cities, where homeownership rates have risen due to higher employment levels, lower mortgage rates and more flexible terms. This increase in demand would likely exert pressures on the price of owner-

occupied housing. At the same time, as households move into owner-occupied housing, one may expect vacancy rates in the rental housing market to increase, as long as migration into the City is modest. Vacancy rates are discussed later in the report.

Table 8: Comparison of dwelling characteristics from 1996 to 2006

Dwelling	2006	2001	1996
Single-detached house	59.6	61.3	59.2
Semi-detached house	5.8	6.0	6.3
Row house	8.8	8.8	8.8
Apartment, duplex	4.0	3.3	3.7
Apartment, building of five or more storeys	6.3	6.7	7.3
Apartment, building of fewer than five storeys	15.0	13.2	13.8
Other single-attached house	0.0	0.1	0.1
Movable dwelling	0.5	0.6	0.7
Owned	74	71	65
Rented	26	29	35

Source: Statistics Canada

A review of the housing stock growth over the past six decades will help develop an appreciation of the pace of development that has taken place in Calgary. Immediately after WWII, Calgary lagged far behind Toronto and Montréal, with 14,000 households. From that point the city grew steadily, but in the 1970s it saw a construction boom that has not been repeated since; almost a hundred thousand housing units were added to the stock in that one decade (Figure 8). The 1980s witnessed a slowdown in housing construction. However, the pace of residential construction picked up again in the early 1990s, corresponding to the economic growth in the region due to the oil boom.

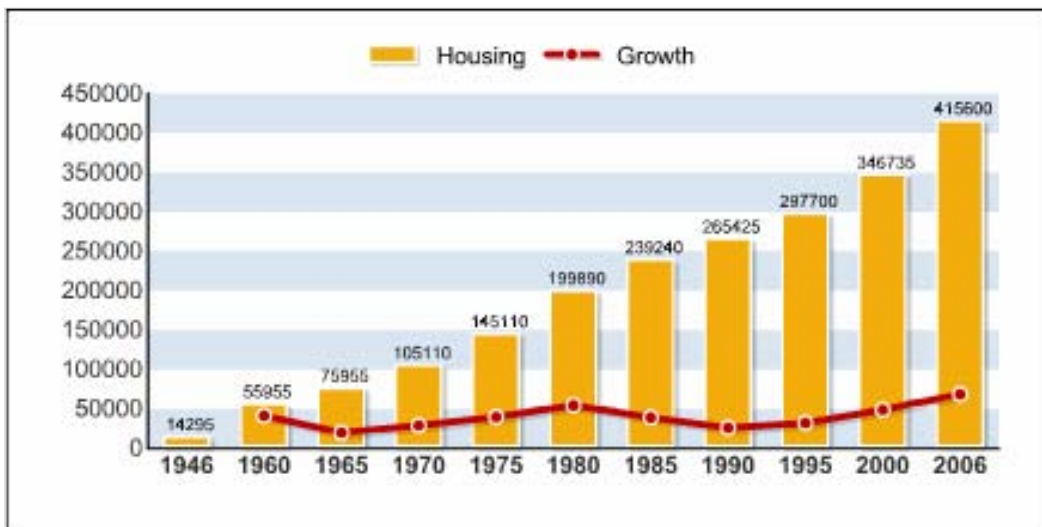


Figure 8: Housing Stock and growth in Calgary

Source: Statistics Canada

Spatial Distribution

The spatial distribution of housing constructed since 1990 in Calgary suggests a process of rapid suburbanization. Using data reported from the 2006 census, Figure 9 plots the percentage of housing within each census tract that was built between 1991 and 2006. Neighbourhoods that experience extensive construction since 1990 are located at the urban periphery. In centrally-located neighbourhoods, fewer than 20% of housing units were constructed over that time period. This indicates that limited infill development has taken place in Calgary and that most housing construction in recent years has been focused in the suburbs.

Figure 10 shows that the type of housing built in the suburbs was of the single-family detached type. In fact, more than 86% of the housing stock in the suburban neighbourhoods that attracted most construction in the recent past was of the single-family detached type. Figure 11 shows that recent housing construction in Calgary has produced neighbourhoods where the average housing density has been less than 425 houses per square kilometre. With the exception of a few centrally-located areas, most residents of Calgary live in neighbourhoods where population densities are lower than 1000 houses per square kilometre.

From these statistics, it appears that recent trends in housing construction do not bode well for housing affordability in Calgary. Most recently constructed housing units have been built in the suburbs and are of the single-family detached type. By design, single-family detached housing is larger in size and, on average, demand higher prices than other housing types. There has been little construction of low or moderately priced new housing types.

A detailed analysis of the type and price of newly constructed housing is presented in the following section.

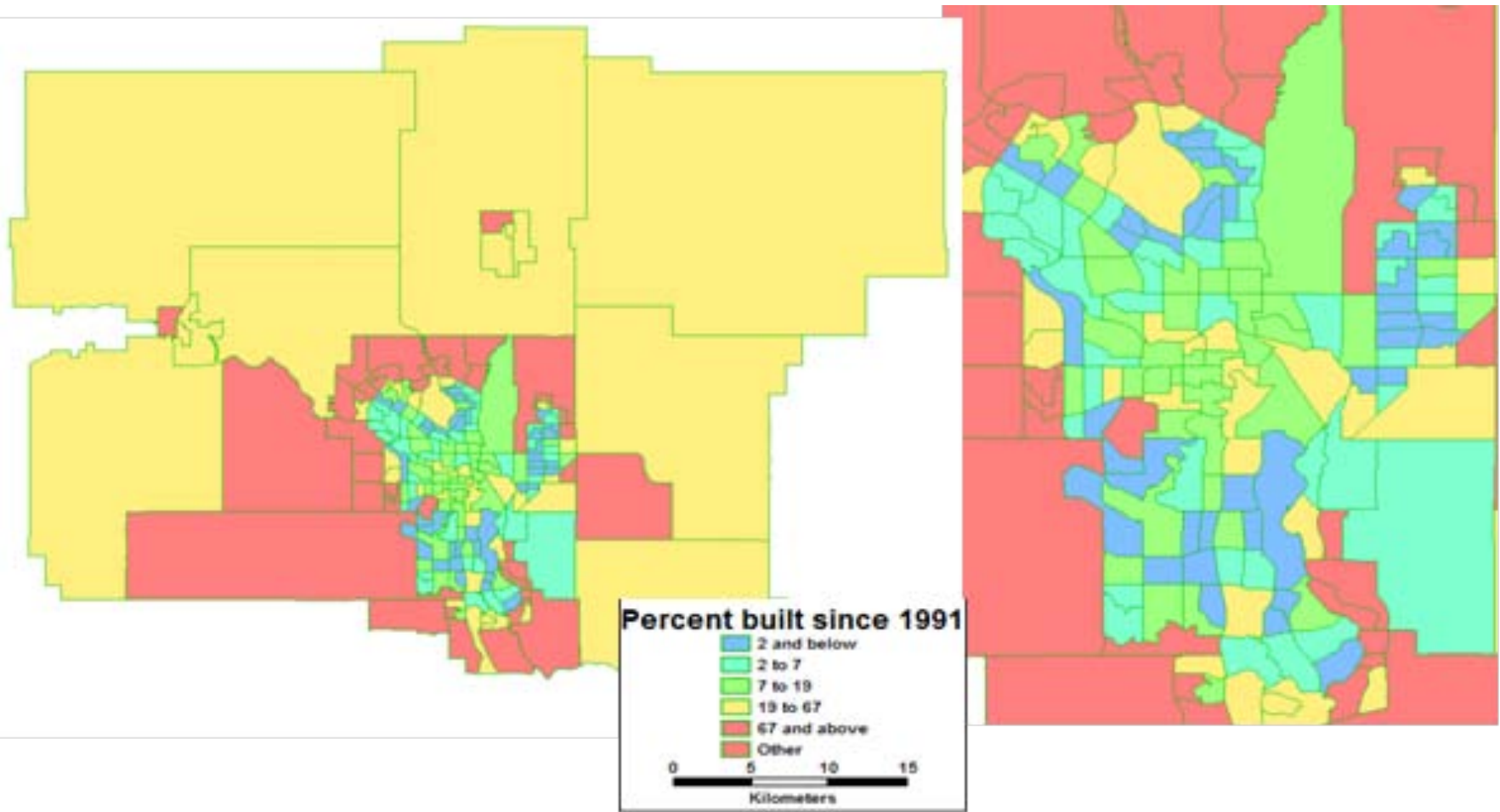


Figure 9: Construction of new housing since 1990 in Calgary
 Source: Statistics Canada

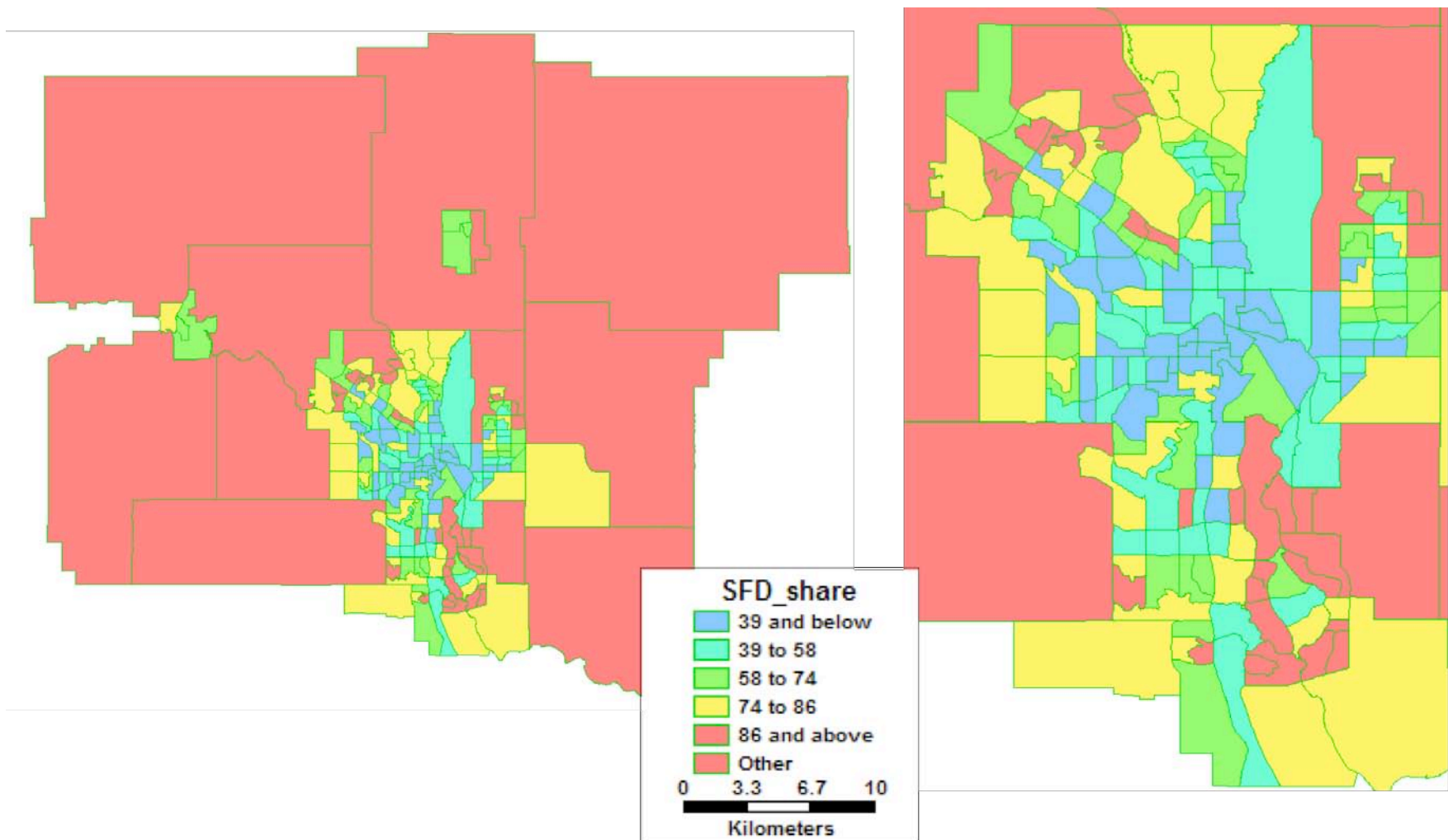


Figure 10: Concentration of SFD housing in 2006
 Source: Statistics Canada

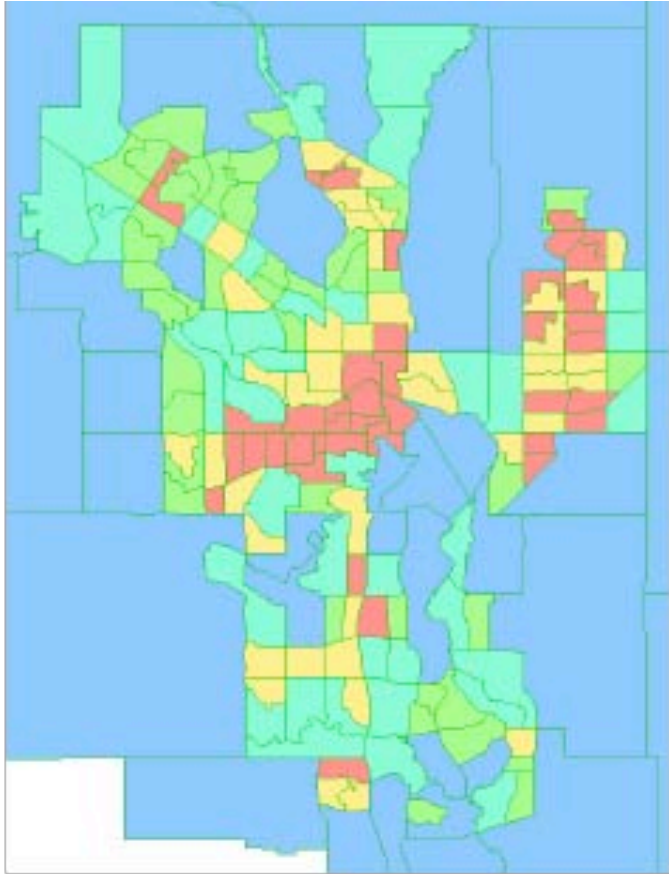
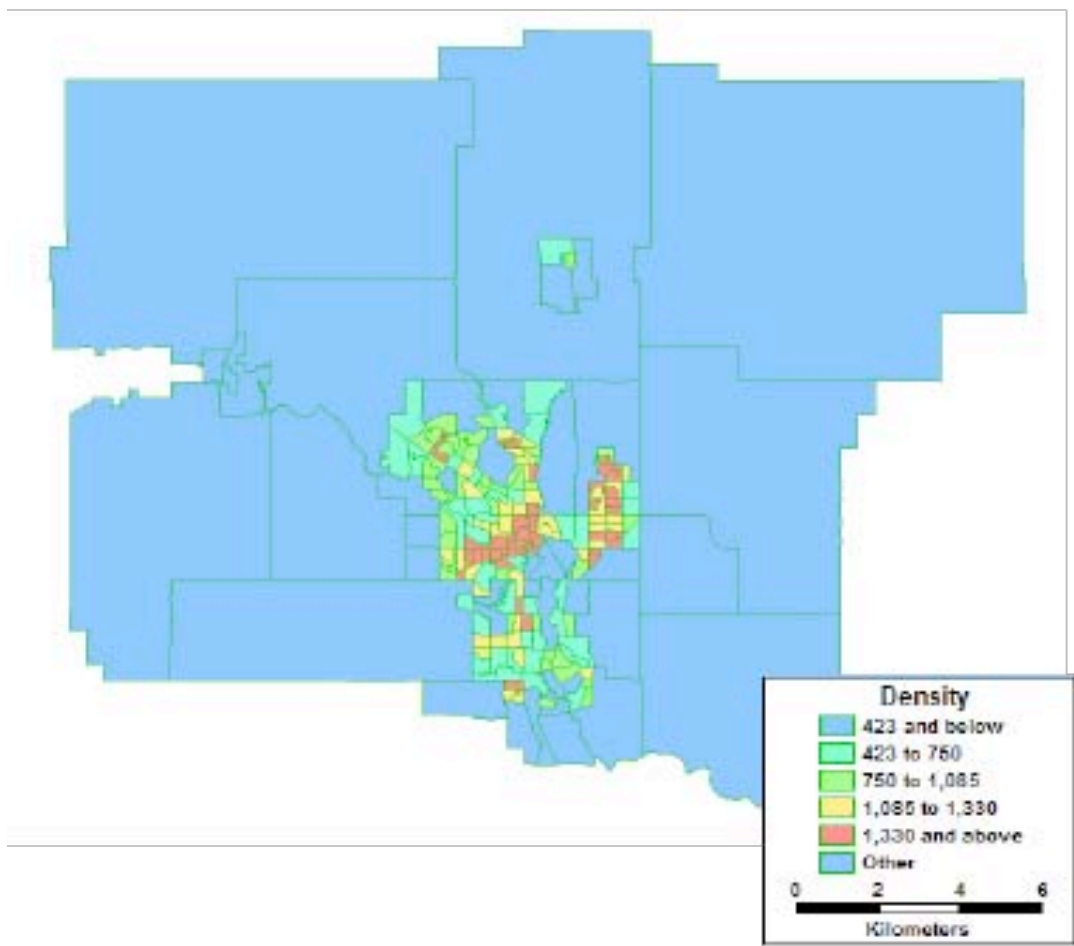


Figure 11: Housing density in Calgary (2006)
Source: Statistics Canada

Housing Market Dynamics

Calgary's housing market has experienced one of the sharpest increases in housing prices ever recorded during low levels of inflation in Canada. The most substantial increase in housing prices was witnessed in 2006. While there has been a significant decline in the rate of appreciation of housing values since 2006, prices have nevertheless continued to appreciate in Calgary at rates higher than in most other metropolitan areas in Canada. The following paragraphs explain the housing market dynamics observed in the recent market.

- *Housing Prices in the Resale Market*

Figure 12 shows that resale housing prices in Calgary remained stable from 1990 to 1995. The number of units sold in Calgary first increased after 1990 and then rapidly declined until 1995. From 1995 onwards, housing values started to climb, accompanied by an increase in the number of sales. Since 2000 there has been a significant increase in the number of sales and housing prices.

The past couple of years have seen dramatic growth in the value of resale housing in Calgary. Prices of existing homes appreciated by 38% during 2006 and by 19.4% during 2007. With the exception of Edmonton, the rate of increase in housing prices in Calgary surpassed that of any other large Metropolitan area in Canada. For instance, housing prices rose by 12% in Vancouver and by 7% in Toronto during 2007.

While housing prices continued their upward climb in 2007, reaching an average all-time high of \$416,509 in December 2007, other signs suggested that the market may be slowing down. The number of units sold in the resale market in 2007 was less than the units sold in 2006 (Figure 12). Average sale prices continued to climb upward, but at a slower rate. Whereas housing prices in the resale market increased by 38.2% in 2006, the rate of increase was halved to 19.4% in 2007.

Despite the fact that 2.6% fewer homes were sold in 2007 than in 2006, the total dollar value of sales during 2007 increased by 16.4% over the previous year. An increase in the average number of listings in 2007 by 21% suggests a recent easing of pressure on the housing market in Calgary.

While the pressure on housing has eased in Calgary, the other two large urban centers in Alberta experienced rapid gains in housing prices and listings of existing homes. In Edmonton, the price of resale homes increased by 35% and new listings increased by 60% in 2007. At the same time housing prices increased by 32% and new listings increased by 45% in Red Deer. In 2006, housing prices appreciated by 29% in Edmonton and 27% in Red Deer.



Figure 12: Resale housing market, prices and sales
 Source: CMHC's Canadian Housing Observer

A key statistic used to measure liquidity in housing markets is the sales-to-listing ratio (SLR), which measures the number of sales in a given time divided by the number of housing units listed on the Multiple Listing Service. A higher value for the ratio is indicative of a tight market, and a lower value suggests a buyers' market.

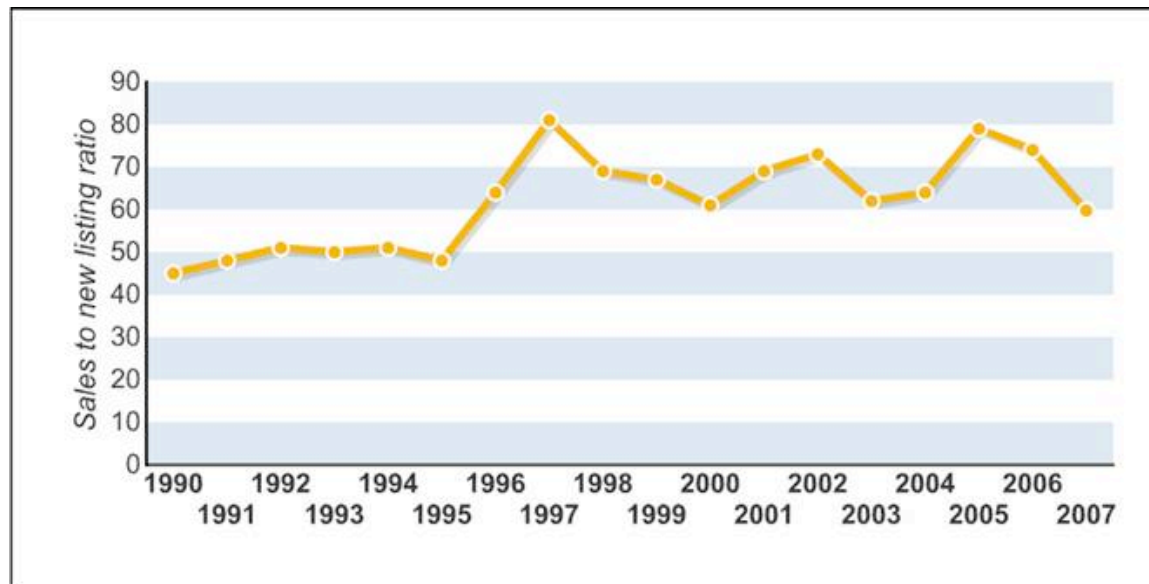


Figure 13: Long-term trend in Sales to new Listing Ratio for the resale housing market
 Source: CMHC's Housing Market Indicators

The sales-to-listing ratio in Calgary remained around .50 between 1990 and 1995 (Figure 13). However, the ratio increased dramatically from 1995 to 1997, reaching a high of .80.

From 1997, the SLR experienced a gradual decline until 2000. The demand for existing homes rose again in 2000, and maintained a generally upward trend after that. In 2006, the SLR exceeded .70, suggesting a seller's market characterised by high sales prices. The latest figures for 2007 suggest that the SLR has continued its decline since the highs reached in 2005. As the SLR declines, it suggests that the upward pressure on housing prices should also ease.

The above discussion suggests that the housing market dynamics in 2006 and 2007 have gone through a cycle of ups and downs. The last two figures present these dynamics on an annual scale, which may be hiding the flux in housing markets that may only be noticeable at a monthly frequency. The analysis is presented below.

Figure 14 presents the change in housing prices and SLR at a monthly frequency from January 2006 to December 2007. The SLR declined from January 2006 to July 2006. During this period, the housing prices increased slowly and became flat by July 2006. The SLR increased from Sept 2006 to February 2007. The same period reported a marginal increase in nominal housing prices. Since February 2007, the SLR has been on a decline accompanied by a slow-down in housing price appreciation and then by a decline in housing prices starting June 2007.

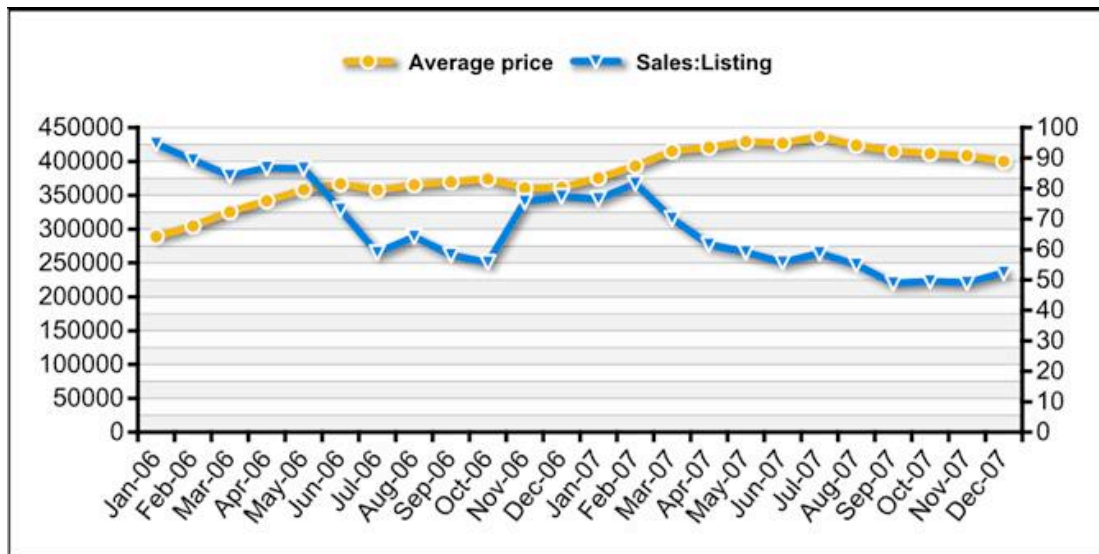


Figure 14: Resale housing prices during 2006 and 2007
Source: Canadian Real Estate Association

The above discussion suggests that the upward pressure on housing prices in the existing homes market has eased considerably in 2007. The supply of new units in the resale market and the simultaneous slowing of demand for housing in 2007, which is depicted by the declining SLR since January 2007, have helped in the decline of housing prices in the later half of 2007.

- *New Home Prices*

Until 2005, the price of new housing being built in Calgary remained relatively stable. The increase in the price of new homes in Calgary averaged 5 to 7% annually. However, this changed dramatically in 2006 when the price of new homes jumped by 43% (**Error! Reference source not found.**). This unprecedented increase in the price of new homes had no parallels either in Calgary or in any other city in Canada. The same index increased by 29% in Edmonton in 2006.



Figure 15: Resale housing values

Source: Statistics Canada

- *Rental Prices*

A breakdown of rents by the size of rental units is presented in Figure 16. As expected small bachelor units command lower rents than larger units. One can see from the figure that two bedroom units carry higher rents than one bed room units. However, the difference between two- and three-bedroom rents is not significant. Similar to housing prices, one can see a sharp increase in rents starting in 2006-07.

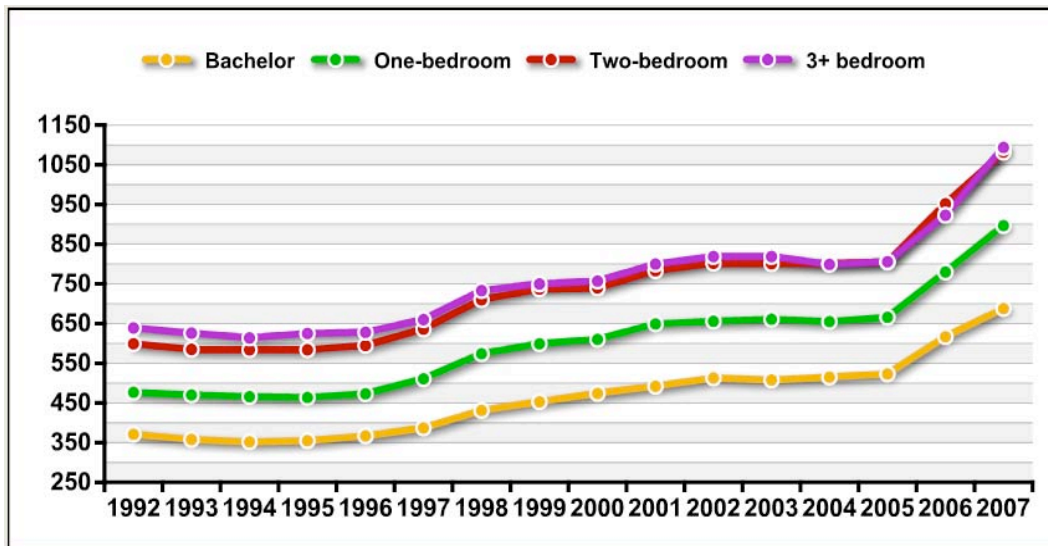


Figure 16: Rents in Calgary for various types of housing
 Source: Statistics Canada's CANSIM database

- *Housing Costs*

The year-by-year change in housing costs for both rented and owned housing are depicted in Figure 15. Owned housing costs include monthly mortgage payments of principal and interest, taxes and utilities (plus condo fees if applicable). Rental housing costs include rent and payments for utilities (water, fuel, and electricity) where they are paid separately from rent. Both owned and rental housing costs declined in the early 1990s, coinciding with the economic recession. After 1994, ownership costs increased by an average of about two to three percent per year for ten years, and spiked by 19% in 2005. Over the same time, rental accommodation costs have oscillated gently around a stable rate.

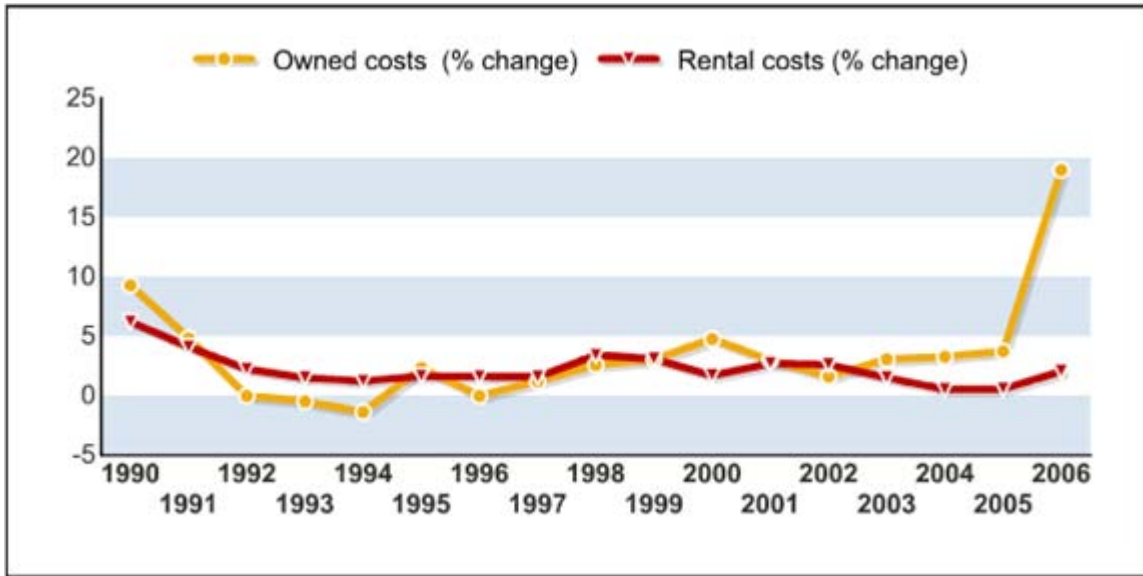


Figure 17: Temporal change in housing costs for rental and owned housing
 Source: Metrics computed by authors using data from CMHC's Housing Market Indicators

In 2006, the price of existing homes increased by 38% in Calgary, whereas the rent for two-bedroom apartments increased by 19% and the rent for three-bedroom apartments increased by 14%. During this period, the consumer price index increased by 4.6%. Thus, the price of existing homes increased seven times faster and the average rent increased four times faster than the consumer prices, suggesting strong inflationary pressures in shelter costs.

Supply of New Housing

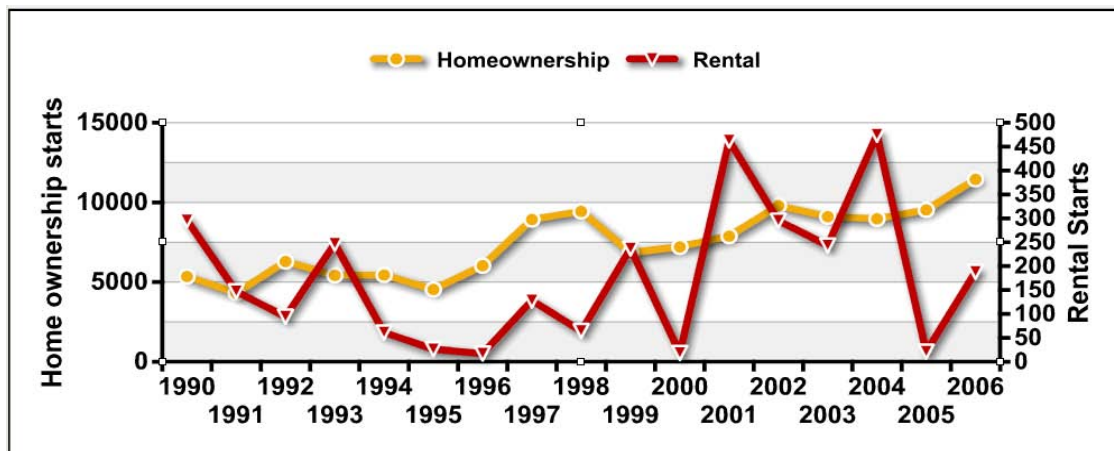


Figure 18: Housing starts by intended use
Source: CMHC's Housing Market Indicators

Table 9 presents the temporal distribution of housing starts for various types of housing. New home construction in Calgary during the early 1990s was dominated by the construction of single-family detached homes. There has been a significant shift in these trends over the years. The share of single-family detached units declined from 87% in 1991 to 61% in 2006. At the same time, the share of apartment units increased from 4% in 1991 to 26% in 2006. The combined market share of semi-detached units and row housing has remained at less than 15% over the years.

While Table 9 presents a breakdown of housing being built by structural type, it does not shed light on the intended tenure of these units. This has been addressed in Figure 19. To understand the implications of tenure for new housing, the housing market has been divided into three categories, namely: homeownership or freehold units, condominiums, and rental units. Since the early 1990s, the share of freehold properties of total housing starts has been declining in Calgary. However, the same time period is associated with a consistent and stable increase in the share of condominiums amongst the new housing starts. In 2006, freehold properties represented 70% of the housing starts, whereas condominiums represented approximately 30%. Rental starts have fluctuated between 0.1% of the total starts to a maximum of 4% since 1990. With the exception of 2001 and 2004, rental starts have accounted for fewer than 2% of the total starts in the past 10 years.

One obvious indicator of a tight housing market is the vacancy rate in rental units. In 2006, rental vacancy rate average around 0.5%, suggesting a very tight housing market (Figure 20). The vacancy rate increased from 2001 to 2004 but suffered a precipitous decline in 2005 and 2006. Given these very low vacancy rates, it is likely that low-income households would face a tough time finding reasonable rental accommodation in Calgary. At the same time, new and existing home prices have also skyrocketed leaving low- to middle-income households with fewer opportunities in non-rental housing stock.

However, the latest figures released for 2007 by CMHC suggest that the rental vacancy rate in Calgary has inched upwards again reaching 1.5%, which is still low, but suggests some relief. If the trends in housing prices and new housing construction along with the slowing of net migration to Calgary continue, it is likely that the rental vacancy rate may climb higher in 2008.

Table 9: Housing starts by type (percentages)

Year	SFD	Semis	Row	Apartment
1990	79	4	10	7
1991	87	5	4	4
1992	85	5	7	2
1993	79	5	13	4
1994	75	5	10	10
1995	77	4	10	9
1996	82	4	6	7
1997	77	4	9	10
1998	74	4	6	16
1999	62	5	6	26
2000	61	6	7	27
2001	67	6	8	19
2002	66	5	8	21
2003	62	6	9	22
2004	59	7	7	28
2005	64	7	8	21
2006	61	7	6	26

Source: Statistics Canada

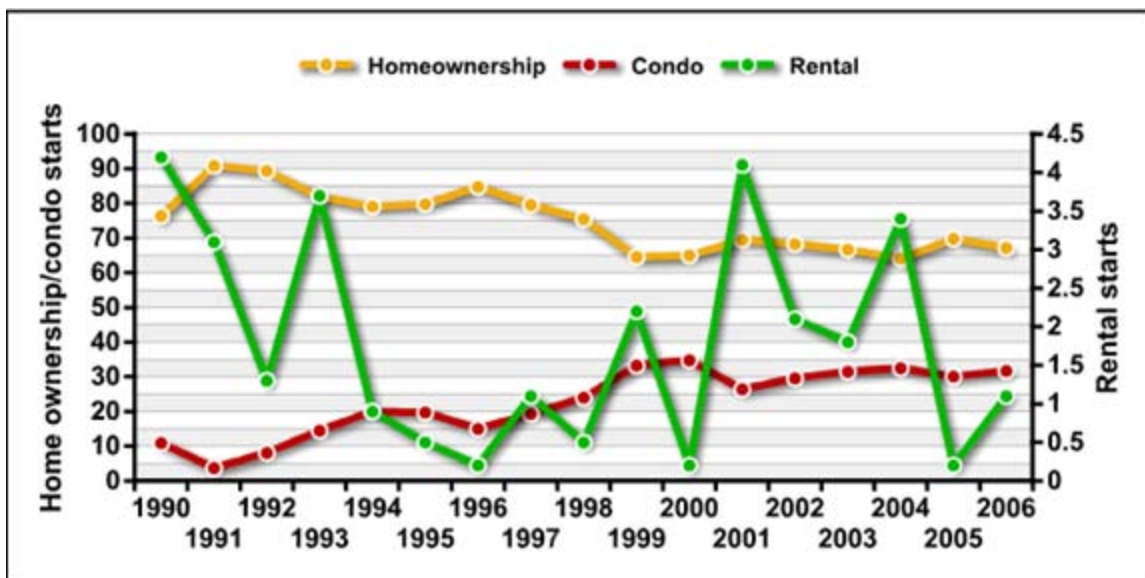


Figure 19: Housing starts by intended market (percentages)

Source: CMHC's Housing Market Indicators



Figure 20: Rental vacancy rates in Calgary (percent)

Source: CMHC's Housing Market Indicators

Housing Affordability Indicators

The final section of this chapter reviews housing affordability in Calgary. The discussion so far has established the following facts:

- * housing prices and rents have increased significantly in the past few years
- * the supply of new housing has not kept pace with the dramatic increases in housing prices and rents
- * the rental market is experiencing almost a hundred percent occupancy with vacancy rates as low as .5%

When housing costs are normalized by income, a more reflective picture of the shelter cost burdens emerges. Figure 21 presents two metrics for housing affordability. For owned homes, the average sales price has been divided by the real after tax income of households living in owned homes. For rental homes, annual rents have been divided by real after tax income of households living in rental units.

In 1990, the average price of an existing home was twice the average after-tax real income. By 2006, this ratio had more than doubled to 4.5. This implies that the average price of an existing home in 2006 was 4.5 times real after tax income of households living in owned homes. Interestingly, rental households in Calgary experienced a greater shelter cost burden in the early 1990s than homeowners; the rent to income ratio was 3.5 in 1992, while the home price to income ratio was around 2.5.

Over the years, the home-price-to-income ratio has increased faster than the rent-to-income ratio in Calgary. As of late, both measures of housing affordability have risen significantly. These numbers suggests that housing prices and rents have risen much faster than average wages in Calgary. While the rate of housing price appreciation has declined in 2007, housing prices continue to increase at a faster pace than incomes in Calgary.

CMHC has created a new rental housing affordability indicator, which uses a three-year moving average values for median income of rental households and median rent for a two-bedroom apartment. The underlying principle in devising the indicator is that a household should spend less than 30% of its gross income on housing averaged over a three-year period. The indicator is presented in Figure 22. A value of 100 suggests that 30% of median income is required to rent a two-bedroom apartment rented at median rents. The indicator value above one hundred suggests that less than 30% of median income is required to rent a two-bedroom apartment, whereas indicator value of below hundred suggests more than 30% of median income is required to rent a two-bedroom apartment at median rents. In summary, when the rental affordability indicator rises, the rental market becomes more affordable and vice versa.

CMHC's indicator suggests that the rental market affordability worsened in the late 1990s, but improved slightly in the beginning of 2000 and remained stable until 2005.

The declining value of the indicator since 2005 suggests worsening of rental housing affordability in Calgary. The values reported in Figure 19 for 2006 and 2007 are not actual values but forecasts.

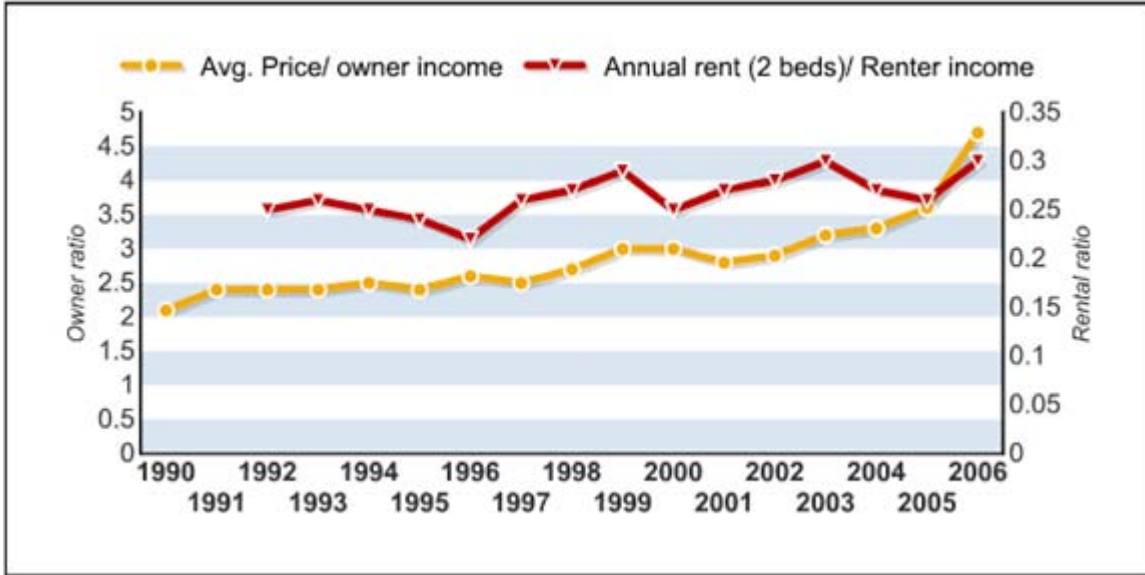


Figure 21: Housing affordability indicators in Calgary for owned and rental units
 Source: Metrics computed by authors using data from CMHC’s Housing Market Indicators

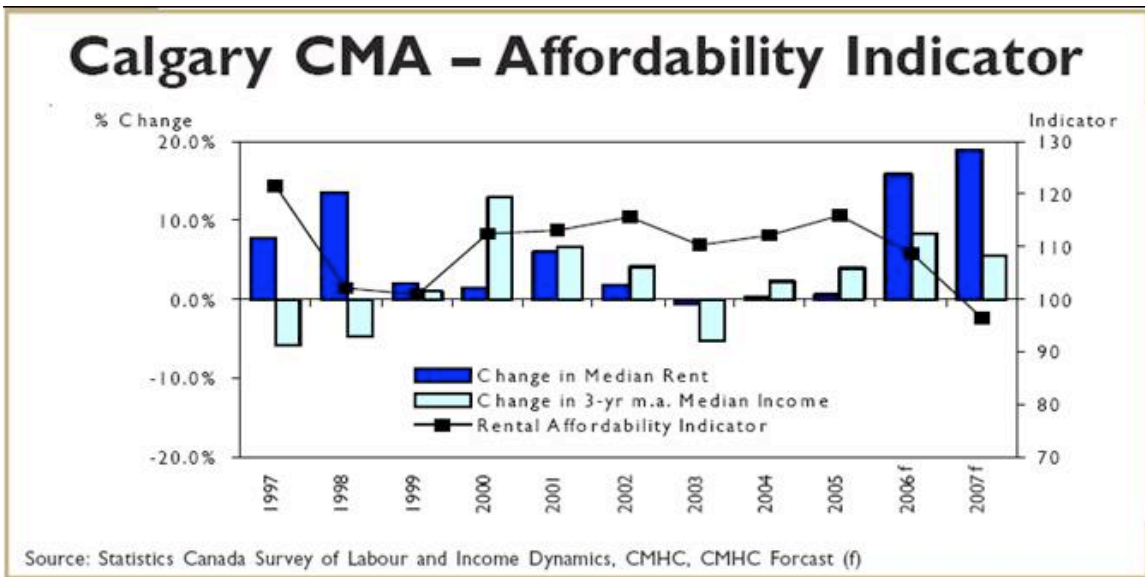


Figure 22: CMHC’s rental housing affordability indicator
 Source: CMHC, *Rental Market Report Calgary CMA*, December 2007.

While the supply of new housing in 2006 and 2007 has eased pressures on housing prices, which started to fall in the second half of 2007, the true impact of new housing supply on improving housing affordability requires one to review price segmentation in

new housing. A key indicator of pricing for new housing is the sale price of absorbed housing, which are completed new housing units that have either been sold or rented.

Table 10 reveals that most new housing units sold in 2007 catered to the housing needs of high-income earners. 56% of the new housing units sold for more than \$400,000 in 2007, whereas only 2.4% units were sold for less than \$250,000. This is in stark comparison to 2006 when 19.3% new housing units were sold for less than \$250,000. Moreover, only one in five new housing units was sold for over \$400,000 in 2006. The average sales price for new housing units in 2007 equalled \$474,000.

Table 10: Price segmentation of absorbed housing in Calgary CMA

Absorbed housing	December 2007	December 2006	Year-to-date 2007	Year-to-date 2006
< \$250,000	0.5	8.2	2.4	19.3
\$250,000 - \$299,999	0.6	23.7	7.1	25.5
\$300,000 - \$349,999	9.7	24.4	15.5	22.2
\$350,000 - \$399,999	15.6	19.2	18.6	12.6
\$400,000 +	73.6	24.5	56.4	20.4
Total units	864	583	9,173	8,298
Median Price (\$)	451,896	333,490	417,947	310,711
Mean Price (\$)	531,182	382,518	474,511	353,662

Source: Canada Mortgage and Housing Corporation. January 2008. *Housing Now Calgary CMA*. Pp. 20.

Conclusions

The past couple of years have seen dramatic growth in the value of new and resale housing in Calgary. Prices of existing homes appreciated by 38% during 2006 and by 19.4% during 2007, making this the highest rate of increase in housing resale prices in any other large metropolitan area in Canada, with the exception of Edmonton. Until 2005, the average increase in the price of new homes in Calgary was relatively stable, averaging around 5-7% annually. However, this changed dramatically in 2006 when the price of new homes jumped by 43%, an unprecedented increase in the price of new homes in Calgary or in any other city in Canada. In 2007, the average sales price for new housing units equalled \$474,000. The rental market has also recently experienced a price increase. In 2006, the rent for two-bedroom apartments increased by 19% and the rent for three-bedroom apartments increased by 14%.

The supply of new housing increased in response to rising prices, but has not kept pace with the dramatic increases in housing prices and rents. While the price of new and existing homes appreciated by over 38% in 2006, housing starts increased by only 25%. With the exception of 2001 and 2004, rental starts have accounted for fewer than 2% of the total starts in the past 10 years.

In 2006, the rental market was experiencing an almost one hundred percent occupancy with vacancy rates as low as .5%, suggesting a very tight housing market. These very low vacancy rates and skyrocketing prices of new and existing

home have left low- to middle income households with few opportunities in the rental and non-rental housing market.

2007 CMHC figures suggest that the rental vacancy rate in Calgary has inched upwards again reaching 1.5%, which suggests some relief in the rental market. This may reflect an increasing tendency for condominium owners to hold on to their units in hope of further price escalation and to rent them out in the interim. The 2007 data released on the new home price index and housing starts for Calgary also indicates a moderating trend over the previous year. While resale home values continued their climb upward in 2007, the change in the new home price index and housing starts have reported lower values than the one in 2006. New home prices therefore appreciated more slowly in 2007 than they did in 2006. These figures suggest that the housing market has stabilised in 2007 and may shed some of the gains in prices and rents in 2008.

While shelter costs have increased dramatically, real wages have not kept pace over the same time in Calgary. In 1990, the average price of an existing home was twice the average after-tax real income. By 2006, this ratio had more than doubled to 4.5. Most new housing units sold in 2007 catered to the housing needs of high-income earners. 56% of the new housing units sold for more than \$400,000 in 2007, whereas only 2.4% units were sold for less than \$250,000.

3. Smart Growth and Housing Prices

In this chapter we review the literature on how pursuing a Smart Growth agenda might impact housing prices in a growing metropolis like Calgary. To set the stage for this discussion we first present views of the development industry as garnered from interviews conducted for this study. The thread running through the industry observations is that constraining the supply of land in suburban areas will put upward pressure on land prices and increase the price of housing that the industry brings to market. This claim is examined through a review of the academic literature on urban containment, focusing largely on the experience gained in Portland, Oregon.

Industry Perspective

The interviews among industry stakeholders conducted for this study suggested that they consider non-policy factors primarily responsible for the sharp increase in housing prices over last two years. Some pointed to the role of off-shore speculators investing in land and looking for short-term profits but most interviewees identified two key factors: soaring labour costs and material costs. Both of these factors were attributed to the oil sands-driven economic boom in Alberta. The oil sands and the booming construction industry in the Alberta's cities are putting competing demand on a limited supply of both materials and labour, leading to rapidly escalating costs. The fact the City of Calgary was also competing for contractors and materials to undertake major infrastructure upgrades (which were long overdue) also helped inflate prices. A few developers noted that the cost of some construction materials, especially concrete, were already quite high before the recent boom. In effect, the boom aggravated an existing problem in this regard.

Although non-policy factors were acknowledged as dominant, interviewees also stressed that government policies were contributing to the problem and that planning agencies failed to react quickly enough to the housing crisis in order to moderate price increases. In particular, most interviewees claimed that the land supply policies that form the heart of the City's growth management process were to blame in part for the rapid escalation of prices. They claim that the City did not foresee the coming boom and failed to respond quickly enough (e.g., hire new staff, adopt more streamlined approvals process) to approve more land for development. As one builder put it, "everybody could see that the end of the land supply was in sight," which caused a scramble for serviced land and prices skyrocketed. Interviewees also claimed that this situation was being aggravated by the lengthening planning approvals process, which had the effect of reducing the supply of new housing by inordinately delaying construction.

Suburban developers predicted that the City's Land Use Planning and Policy Work Program for 2008, which does not include planning for major new greenfield communities, would lead to further housing price increases in the short- and medium-term. They were of the opinion that the City's move towards a Smart Growth model, with the associated limits on greenfield development, would profoundly affect prices in the

long term. Such a “cure”, they argued, would be much worse than the disease. In the opinion of most interviewees, urban sprawl was not an important issue in Calgary as growth is well-managed, suburban densities are high compared to US cities, and there is no leapfrog development within the city limits. Housing consumers, they argued, have expressed their preference for detached housing in suburban locations. Smart Growth – understood as an effort to deflect housing supply from low density forms in greenfield suburbs to higher density forms in established areas – would be profoundly out of step with market forces; the result would be in an oversupply of higher density housing and a catastrophic increase in the price of detached housing. The response from housing consumers and developers might very well be to decamp to exurban locations beyond the city limits. In other words, a Smart Growth policy might backfire and create the very sprawl it quixotically tried to prevent.

Smart Growth

Smart Growth focuses on the need to manage growth in a way that reduces automobile dependency, concentrates development in the community's already built-up area, and enhances the community's quality of life (Canadian Urban Institute, 2001; SGBC, 2001; Pim and Ornoy, 2005). The Smart Growth movement emerged in the US in the 1990s in reaction to the depredations of urban sprawl. There, the Smart Growth approach to community planning has been endorsed by a wide array of senior government agencies like the US Environmental Protection Agency and Department of Energy, NGOs like the Sierra Club and the Natural Resources Defence Council, and professional associations like the American Planning Association, all of which provide educational and research resources. There are also several important networks and associations devoted to developing resources to support municipal efforts towards Smart Growth, including Smart Growth America, the US Smart Growth Network, and the Smart Growth Canada Network (SGCN, 2007). A dozen or so US states have adopted Smart Growth legislative frameworks to guide municipal planning and a number of cities have adopted Smart Growth plans, such as Austin, TX (City of Austin, 1995).

With the creation of Smart Growth BC in 1999, the Smart Growth movement came to Canada. Together with the Design Centre for Sustainability at University of BC, and the Real Estate Institute of BC, Smart Growth BC leads a program called *Smart Growth on the Ground*, through which it works with municipalities and local stakeholders to develop and implement a community or neighbourhood sustainability plan (DCS and SGBC, 2008a). There are currently three BC municipalities participating in the program – Maple Ridge, Squamish, and Oliver – with Prince George about to join (DCS and SGBC, 2008b). Elsewhere in Canada, the Conservation Council of Ontario operates a Smart Growth Network in that province while Vivre en Ville serves this function in Quebec. The Neptis Institute, a private foundation and think tank, is well-known for its research supporting Smart Growth approaches to regional planning in the Toronto region. The concept of Smart Growth was used as a basis for regional planning around the Golden Horseshoe in southern Ontario and has been used by a number of cities to structure comprehensive community planning strategies, such as in Niagara, Edmonton, Guelph, Ottawa, and Halifax (Tomalty and Curran, 2003).

Smart Growth is supported by many environmental groups, professional planning organizations, affordable housing advocates, sustainable transportation advocates, and some innovative architects and developers. It is opposed by many developer and builder organizations and some academics/consultants, most notably Wendell Cox (2004), Robert Bruegmann (2005), Peter Gordon and Harry Richardson (1997, 1998, and 2000). Several private think tanks in the US (e.g., Cascade Policy Foundation, Heartland Institute, Public Purpose, RailRoading America, Reason Public Policy Institute, Thoreau Institute, Cato Institute) and Canada (Clayton Research, and Fraser Institute) are opposed to Smart Growth. These critics can be divided into two general groups: those that oppose a particular aspect of Smart Growth out of self-interest (i.e., they or their industry will lose benefits or bear costs), and those that have an ideological opposition, on the assumption that Smart Growth increases government intervention in a free market (Litman, 2007a).

Urban Containment

One of the key goals of Smart Growth is urban containment, which has three basic purposes: 1) to promote compact, contiguous, and accessible development; 2) to provide with efficient and cost-effective infrastructure and public services; and 3) to preserve open space, agricultural land and environmentally sensitive areas that are not currently suitable for development (Easley, 1992). Urban containment consists of drawing a line around an urban area within which development is encouraged. Land outside the boundary is generally restricted to resource uses and to very low-density residential development by limiting the extension of utilities, wastewater services and other infrastructure. Enough undeveloped land is left within the urban containment boundary to accommodate a certain amount of greenfield growth over the planning timeframe (often 10, 20 or even 30 years). The higher the proportion of growth that is expected to be accommodated through intensification of the existing fabric and the higher the average density of new growth in the greenfield areas, the less land that is required to be kept in reserve. Normally, the boundary can only be moved in the context of a community plan review or referendum process.

The oldest and best-known example of urban containment in North America was launched in metropolitan Portland (Oregon) in the late 1970s. The UGB is administered by Metro, the regionally-elected body that covers the City of Portland and surrounding suburban jurisdictions. The boundary was designed to accommodate growth for about 20 years. Metro is required to conduct a review of the land supply every five years, and, if necessary, expand the boundary to meet that requirement. Since 1979, the boundary has been moved about three dozen times. These have been mostly small moves of 20 acres or less but several moves involved hundreds or thousands of acres. In total, however, the UGB has changed very little in total land area since its inception: the land area has increased only nine percent while the population has grown almost 50% in the same time period (Nelson et al., 2004; Metro, 2008).

Other leading examples of metropolitan containment in the US include Miami-Dade

County, FL; Sacramento, CA; and Seattle, WA. In Canada, Saanich and Nanaimo are usually cited as having rigorous growth boundaries. The new Green Belt in the Greater Golden Horseshoe has created a de facto growth boundary for many municipalities in southern Ontario.

Housing Affordability as a Goal of Smart Growth

Smart growth refers to an overall set of broad goals designed to counteract sprawl. These usually include (1) limiting outward expansion, (2) encouraging higher density development, (3) encouraging mixed-use zoning, (4) reducing travel by private vehicles, (5) revitalizing older areas, and (6) preserving open space. Although it is not always the case, many Smart Growth advocates include housing affordability as one of their key tenets. Affordability is among the various lists of Smart Growth principles proposed by Smart Growth America (“neighbourhoods should be... affordable” by “eliminating divisions by income and race and enabling all residents to be beneficiaries of prosperity”). In Canada, Smart Growth BC (“Create diverse housing opportunities. People in different family types, life stages and income levels can afford a home in the neighbourhood of their choice”) and the Smart Growth Canada Network (“Create a range of affordable, quality housing choices”) both explicitly identify housing affordability as a principle of Smart Growth. In fact, Smart Growth BC (2008) recently released a major report on housing affordability and Smart Growth.

Other Smart Growth organizations indirectly advocate housing affordability by including a greater housing variety in their basic goals, usually in response to a growing desire to accommodate various types and sizes of households (differing not just in their incomes but in their ages, family configurations, and levels of physical ability) within the same neighbourhood (Myers and Gearin, 2001; Katz, 1994). This includes the American Planning Association (“expand the range of... housing choices in a fiscally responsible manner”, the Smart Growth Network (“create a range of housing opportunities and choice”), the US EPA (“provide a range of housing options giving people the opportunity to choose housing that best suits them”), and the US HUD (“expand housing options such as multifamily, multi-unit housing”) (Ye et al., 2005).

Housing affordability is tied to several other Smart Growth goals. Varying housing forms away from single-family tracts or monotonous apartment complexes will permit for a whole range of different dwelling sizes and building types that will typically correspond to a broader range of housing costs. Mixed-income neighbourhoods that include varied types of affordable housing, and that are compact and walkable, are held to encourage everyday interaction between diverse groups of neighbours (Leyden, 2003; Talen, 2003) and thus to be more socially sustainable (Brain, 2005; Tregoning et al. 2002). The search for lower housing costs is a prime driver of urban spread as land values tend to be lower near the urban fringe and households can afford to purchase or rent more space per housing dollar. The availability of affordable housing in areas closer to the city centre and near amenities such as transit facilities, schools and hospitals not only reduces pressures contributing to urban sprawl but helps to lower public service costs and strengthens transit systems. Redevelopment areas (such as brownfield and greyfield sites)

offer prime opportunities for expanding the city's stock of affordable housing. Directing housing growth into areas rich in employment also reduces commuting distances and times, and favours transit and non-motorized modes over car use. The overall reduction in per capita motorized travel improves air quality, reduces traffic congestion and accidents, and contributes to a higher quality of life (Tomalty and Alexander, 2005).

Critics of Smart Growth

Despite the emphasis placed by Smart Growth advocates on the need to ensure an adequate supply of housing at affordable prices, critics claim that Smart Growth reduces housing affordability by reducing urban land supply, limiting the feasibility of building detached homes on large lots (QuantEcon, 2002; Mills, 1999; Gordon and Richardson, 2000; Cox, 2003). At its most basic, this position holds that growth control – especially urban growth boundaries – limits the supply of land available for low-density housing, commercial, and industrial development. Conventional suburban development strategies have looked to inexpensive land at the edge of the built-up area (and even beyond) in order to offer single-family detached dwellings with ample private yards. When planning policies make land unavailable for conventional development, the critics charge, land costs go up and purchasers refuse to consider multi-unit housing that is less land-intensive than single-family detached units – if zoning restrictions do not forbid it altogether (Holcombe, 2004; Cox, 2004; Cox, 2002). Thus they claim that growth management will increase the cost of housing and penalize the most economically vulnerable households.

Opponents also critique the other time and cost savings that Smart Growth advocates assert, claiming that higher densities will in fact increase traffic, lower travel speeds and put upward pressure on infrastructure costs (Cox and Ziv, 2005; O'Toole, 2007; O'Toole 2001). Finally, some critics argue that policies designed to restrict automobile usage will reduce transport affordability and economic opportunities for disadvantaged groups (women, minorities, low-income people) by restricting their ability to drive (Pisarski, 1999; Green, 1995).

The Evidence

The academic evidence suggests that these criticisms of Smart Growth are too simplistic. Housing prices are determined by a large number of supply and demand variables such as the availability of serviced and appropriately zoned land, the pattern of land ownership, the cost of construction, population growth, household size, employment and income levels, the desirability of the residential environment, the amount of residential choice and mobility in the area, to name a few (Nelson et al., 2002). While many studies utilize simple trends in housing price levels (usually ownership housing) to determine the impact of growth management policies, fewer studies take into account the large number of confounding variables over a time period sufficiently long to derive meaningful conclusions.

For example, in Portland the price of land per acre is \$150,000 near the metropolitan centre, \$120,000 near the edge of the UGB, and \$18,000 just beyond the UGB (Phillips and Goodstein, 2000). According to one estimate, 80,000 Portland homes became unaffordable between 1995 and 1997 due to dramatic housing-price appreciation within the UGB (Staley et al., 1999). At first glance, this may lead one to conclude that the UGB is solely responsible for limiting the supply of the housing stock and driving up prices. However, Phillips and Goldstein concluded that while the UGB has created an upward pressure on housing prices in Portland, the effect was statistically weak in magnitude. More significant factors were rising income levels, increased demand for housing, and speculation caused by the surge in demand. The authors conclude that the UGB increased housing prices in Portland by less than \$10,000 or 7% (Phillips and Goodstein, 2000). Urban growth policies strengthened the urban core and made Portland an attractive destination with a high quality of life, which may have increased the demand for housing (Knapp and Nelson, 1992).

In 2002, Anthony Downs examined Portland’s urban growth boundary (UGB) for its impact on housing prices. He compared house price changes in 85 metropolitan areas, including Portland, from 1980 to 2000 and concluded that Portland’s growth boundary had statistically significant effects on home prices only in the first half of the 1990s “and then only small effects.” Downs said “it is erroneous to conclude from Portland’s experience that UGBs inevitably cause home prices to rise faster” (Downs, 2002). William Fischel (2002) maintains that house price inflation in Portland could have been avoided if it had been more successful at promoting infill development.

A comparison between Portland (with its rigorously enforced UGB) and the city of Atlanta (which is considered to have sprawl-oriented development policies) shows that although housing prices did rise much faster in Portland between the mid-1980s and the mid-1990s, so did incomes. Thus, the average portion of household income devoted to housing remained the same for both regions: i.e., around 20%. The two regions differed significantly in other dimensions related to Smart Growth goals. As shown in Table 11, vehicle miles travelled increased at a much lower rate in Portland (2%) compared to Atlanta (17%), commute times were reduced in Portland by 9% but rose in Atlanta by 1%, ozone days dropped 86% in Portland but climbed 5% in Atlanta, and overall energy consumption declined in Portland by 8% while it rose in Atlanta by 11%. Moreover, Portland residents increased their rating of housing and neighbourhood quality much more than did their Atlanta counterparts. These figures suggest that population and income growth, along with a higher urban design and environmental quality, are the cause of increased housing prices, rather than Smart Growth policies (Nelson, 2000).

Table 11: Comparing Portland and Atlanta, mid-1980s to mid-1990s

	Portland	Atlanta
Growth Style	Urban Containment	Business As Usual
Population Growth	+26%	+32%
Job Growth	+43%	+37%
Income	+72%	+60%
Government Revenue	+34%	+56%
Property Tax	-29%	+22%
Vehicle Miles Travelled	+2%	+17%

Commute Time	-9%	+1%
Air Quality in Ozone Days	-86%	+5%
Energy Consumption Per Capita	-8%	+11%
Opinion of Neighbourhood Quality	+19%	-11%
Opinion on House Quality	+2.2%	+1.3%

Source: Nelson, 2000

Although the empirical evidence is not conclusive, the balance of the evidence in the rest of the academic literature supports these observations: it is the demand factors that are the primary determinants of housing prices, not regulatory constraints on land supply (Downs, 2004). Smart Growth policies tend to improve the quality of the built environment and the quality of life in metropolitan regions, increasing demand for housing in those regions and driving up housing prices. Moreover, Smart Growth policies tend to be implemented when communities experience rapid population and economic growth, which also put upward pressures on housing prices. But this does not mean that Smart Growth causes such price increases. On the contrary, as Todd Litman argues, the best response to rising housing prices in regions with Smart Growth communities is to build more Smart Growth communities to meet the growing demand and reduce prices (Litman, 2007b).

Growing Smarter and Affordably

It is true that growth management strategies can reduce housing affordability if not properly thought out and implemented. Growth management may reduce affordability when restrictions on the supply of land for urban development are too tight and do not sufficiently accommodate the need for growth. This is arguably what happened in parts of California where growth boundaries were drawn so tightly that housing supply fell relative to demand and prices rose dramatically. Poorer residents were forced out of these communities or forced to live in overcrowded conditions.

Growth management policies that limit the supply of greenfield land on the urban fringe must be balanced by an efficient development review processes, engineering and planning standards that reduce underlying costs, and policies that remove barriers to higher density and mixed-income infill development. These are necessary to ensure that first time homebuyers and moderate-income households are not unduly impacted by attempts to control sprawl on the urban fringe.

Zoning and land-use controls can prevent market actors from responding to market signals. If municipalities restrain urban growth but fail to permit higher densities, smaller lots and smaller dwelling units, the cost of the conventional, land-intensive housing types that they do permit will increase. Higher densities will erode livability and satisfaction if they are not accompanied by improved open spaces and facilities that put common, public amenities within easy reach. Growth management is not just about limiting the supply of land but a new approach to urban development that requires increased flexibility in land use regulation and focuses more attention on public amenities (Bengston et al., 2004). Anthony Downs refers to this strategy as “removing barriers to urban design innovation”, which can free developers to pursue “pedestrian-friendly

communities, mixed land uses, town centers, and other design elements that make communities more interesting” (Downs, 2001). Advocates of looser regulation and market mechanisms can, therefore, find points of agreement with Smart Growth advocates who want to change restrictive single-family residential zoning to allow the creative integration of new housing forms and mixed uses in complete communities (Staley et al., 2005; Farris, 2001).

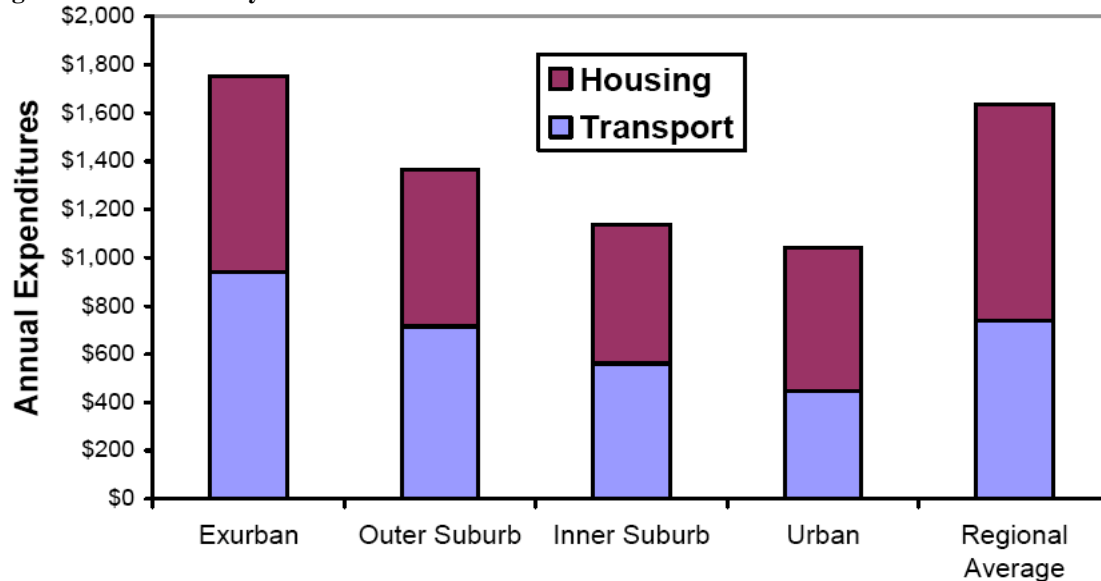
Some specific strategies can help ensure that Smart Growth increases housing affordability and provides other consumer cost savings. Higher density development with reduced road and parking requirements can reduce housing costs by allowing more units on a given parcel of land, and by reducing private construction costs and public service costs (Jia and Wachs, 1998). Even modest increases in average densities can offset the land supply reductions from urban growth boundaries. Smart Growth also encourages development of multi-family housing, secondary suites, apartments over shops, and loft apartments, which represent a major share of affordable housing supply but are prohibited by current zoning in many communities.

Further cost advantages of growth management are realized through encouraging transit-friendly densities, which reduce household expenditure on transportation, government expenditure on highways, and the amount of land unproductively occupied by parking lots (McCann, 2000). By directing growth to already developed areas with sufficient infrastructure capacity in place, municipal governments can avoid expensive service extensions to greenfield sites. Households in low-density areas that segregate housing from jobs and services have a high level of vehicular travel built in to their daily routines, while those in more compact neighbourhoods have been found to save time (and thus money) in reaching everyday destinations more conveniently (Burchell et al., 1998).

Conventionally, households interested in less-expensive housing will look at properties on the urban fringe where land is cheaper. This can be a false economy, however, as transportation costs and travel time will typically go up for households on the periphery, even as the distance from job concentrations (and thus the likelihood of a longer commute) increases (Brueckner, 2000).

A study comparing housing and transportation costs in a typical Midwest urban area (Based on CTOD and CNT), found that although average household expenditures on housing are similar in different geographic locations, transportation expenditures are much higher in outer suburbs and exurban areas than in inner suburbs and cities, as illustrated Figure 23. According to this study, annual transportation costs average 19% of household expenditures overall, but range from about 10% in multi-modal communities up to about 25% in automobile dependent communities. To the degree that Smart Growth reduces household transportation costs it can increase overall affordability and offsets any increased housing costs.

Figure 23: Affordability Index



Source: Litmann, 2007a, based on CTOD and CNT, 2006.

Miller, et al. (2004) compared housing and transportation costs for residents of various locations in the Toronto region. The researchers concluded that average household transportation expenditures rise, as expected, as one moves out from city centres towards suburban locations. They also observed, rather surprisingly, that although house prices fall as one moves out from the city centre, the amount of money households spend on housing – broadly defined to include utilities and other costs, for both owners and renters – actually rises as one moves out. This is due to the fact that increases in house size outweigh the effect of falling land values as one moves away from the city centres. The researchers raised the question as to whether lower-income households should be migrating to urban margins in search of more affordable lifestyles, and concluded that an alternative distribution of affordable housing that resulted in less costly travel patterns for such households would be highly desirable.

As suburban developers claim, it is true that “numerous surveys show consistency between people’s overwhelming stated preferences for low-density living and their revealed preferences in the housing market” (Gordon and Richardson, 2000). That consumers aspire to large dwellings on large lots is unsurprising – after all, given the choice, most of us would like to live in the most luxurious setting possible. However, the mass provision of inexpensive single-family dwellings that characterizes the postwar North American dream incurs significant costs that mount over time and are not reflected in the cost of housing. Consumers will end up paying those costs, if not in their mortgage bills, then in the form of higher transportation costs, higher taxes and reduced economic competitiveness (Burchell and Mukherji, 2003). Limiting sprawl may slightly increase the cost of land, but land is only one of the many factors that determine the cost of housing and a realistic accounting of affordability will have to consider the total amount that households spend as a consequence of their housing decisions (Voith and Crawford 2004; Carlson and Mathur 2004).

Conclusions

The literature does not allow us to support the contention of some suburban developers in Calgary that municipal constraints on land supply are an important factor in determining house prices. The literature suggest that demand factors – such as employment levels, average incomes, and population growth – are key to understanding price escalations and speculative bubbles. Cities that attempt to moderate outward growth may put a gentle upward pressure on the market value of land and homes, but it is the increased desirability (the so called “amenity value”) of the city that is pre-eminent. The most promising approach is to integrate housing affordability policies into a Smart Growth framework and promote intensification of established areas, less expensive housing forms and development control regulations and processes that reduce development costs and encourage a greater supply of moderately priced housing units.

Much of the evidence we looked at in this chapter pertained to Portland’s growth management system. As noted in a City of Calgary report on growth dynamics, Calgary’s growth management policies, particularly the Uni-city concept and the 30-year land supply, appear to be somewhat analogous to the urban growth boundary of Portland (City of Calgary, 2005). But no matter how suggestive, the literature review does not speak directly to the Calgary situation – critics could always argue that conditions in Calgary differ too much from that found in Portland or the other cities discussed above. In order to explore these issues in Calgary itself, we have developed a number of empirical methods that will be reported in the next two chapters. Chapter 3 describes an econometric model that allows us to reach some conclusions as to how land supply over the last two decades has influenced housing prices in the Calgary. In Chapter 4 we report on forecasting models and correlational analysis that explore the impact of different growth scenarios on housing prices.

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4. The Determinants of Housing Price Dynamics in Calgary

Housing prices in Calgary have risen at an unprecedented pace during 2006 and 2007. The purpose of this chapter is to explore why housing prices increased so significantly in a very short span of time. The chapter in particular tries to determine the impact of demand-side and supply side factors on housing prices. Economic theory suggests that the price of a commodity increases if it is in high demand and/or if a commodity's supply is either heavily regulated or constrained. In the case of housing prices in Calgary, this chapter tries to determine if demand factors, such as rising income, increase in population, or other demographic shifts, are behind the increase in housing prices. At the same time, the chapter tries to determine if the supply of housing is constrained either because of a sluggish response by homebuilders to an increase in demand, or due to insufficient supply of land being released for development through the City's growth management process.

This chapter is organized as follows. The next section discusses various modelling techniques to capture housing price dynamics. This is followed by a brief introduction to time series econometrics, which is the method followed in this chapter. A brief description of the data set is presented afterward. The analytical part of this chapter comprises two sections. The first section presents a descriptive analysis of the data set and the second section presents a systematic econometric analysis of housing prices in Calgary. The final part of this chapter offers some conclusions on the interaction of demand and supply variables in determining housing price changes.

Methodology

We have adopted time series econometric methods to model housing price dynamics in Calgary. Our choice of the modelling technique was informed by a review of the housing literature, which cites numerous examples of the use of time series methods to forecast housing prices. In particular, we have followed the modelling approach adopted by John M. Quigley as he tried to explain the link between real estate prices and economic cycles (Quigley, 1999). Quigley is an internationally recognized authority in housing research. He has published extensively on housing markets and he is on the board of leading urban economics journals (Englund et al., 1998; Quigley, 1987; Mason and Quigley, 1996; Raphael et al., 2003).

While we have adopted the methods suggested by Quigley in 1999 to model housing prices, we have refined the methodology by using more robust determinants of housing supply and demand, as well as using advanced econometric methods, which were not adopted in Quigley's earlier work.

Brief Introduction to Time Series Econometrics

Housing prices can be seen as an economic time series, which is defined as a collection of data obtained by observing a response variable at periodic points in time. A time series can exhibit a secular trend, which is an increase or decrease over a long period of time. The cyclical fluctuations of the secular trend often result from the cyclical behaviour of markets that correlate with the underlying time series. There can also be seasonal trends, which depict seasonal variations. In the context of housing markets, an example of a seasonal variation would be the slower construction activity that results from extreme winter conditions.

Time series econometrics became popular with the seminal work of Box and Jenkins (1970). They proposed a new forecasting approach that relies solely on the past behaviour of the dependant variable. The traditional econometric approach was to use explanatory variables to forecast a time series. A common ground was reached between the two approaches by using Box and Jenkins approach for estimation with the inclusion of covariates.

If the value of a time series is correlated in time, i.e., values at t are correlated with values at $(t-1)$, this violates the basic assumptions of the Ordinary Least Squares (OLS) model. OLS tools that test the validity and robustness of the models could no longer be used.

Even in the presence of correlated residuals, the estimates of β_x are unbiased. However, OLS models in such cases will return smaller standard errors and inflated t-statistics. It is recommended to check for the presence of autocorrelation in a time series. The **Durbin-Watson** (DW) test is most commonly used to test if residuals are correlated. DW is expressed as follows:

$$d = \frac{\sum_{t=2}^n (\varepsilon_t - \varepsilon_{t-1})^2}{\sum_{t=2}^n \varepsilon_t^2}$$

The DW statistic tests the null hypothesis, H_0 : No residual correlation against the alternative, H_a : Positive residual correlation. The above equation reveals that the DW statistic could only capture the first-order serial correlations. The following are the critical values for the DW statistic:

Uncorrelated residuals	$d = 2$
Positive correlation	$0 < d < 2$
Negative correlation	$2 < d < 4$

Discussion on cyclical behaviour of time series requires a brief discussion on **stationarity**. "A stationary time series model for regression residuals is one that has mean 0, constant variance, and autocorrelations that depend only on the distance between time points" (Mendenhall and Sincich, 1996). Such time series can best be modelled using **autoregressive models**(AR). The advantage of using autoregressive techniques is

that they improve the overall fit of the model and by reducing the mean square error. The estimated coefficients return almost the same value by both OLS and AR techniques. However, the AR model returns higher standard errors for estimators, thus returning lower t-values. Use of OLS to model a time-series with autocorrelation will result in the inclusion of insignificant variables, since such variables will return inflated t-statistics.

Apart from the long-term trends and seasonality in the time series, data are also impacted by business or seasonal cycles. It has been argued that, theoretically, a time series realization begins in the infinite past and continues into the infinite future. To forecast a time series, the minimum requirements are that the mean and the covariance structure (the covariance between the current and past values) should be stable over time and finite. Such data are referred to as **covariance stationary**.

For a covariance stationary time series, the autocovariances should depend upon displacement, τ , and not 't'. This implies that the auto-covariance function (presented later in the descriptive analysis) does not change over time, yet it changes only with displacement. In addition, the autocovariance function is symmetric, i.e., the direction of displacement (forward or backward) does not influence the autocovariance function ($\gamma(\tau) = \gamma(-\tau)$). Violations of covariance stationarity are trends and seasonality, i.e., the mean increases with time or attains different values in different seasons. Often it has been observed that if the series violates covariance stationarity in levels, the same series in growth rates is stable. In other words, if y_t is not stable, $y_{it} = y_t - y_{t-1}$ often ends up being stable.

The covariance stationarity assumption is tested using the **autocorrelation function (ACF)**. We prefer ACF to the autocovariance function because ACF is normalized by the standard deviations of the underlying variables and its value falls in the interval [-1, 1]. A plot of ACF against displacements is called a **correlogram**.

The **partial autocorrelation function (PCF)** is in fact the coefficient on $y_{t-\tau}$ in a population linear regression of y_t on $y_{t-\tau}$. The underlying assumption in the population linear regression is that the regression coefficients are estimated using an infinite sample of data. The PCF or $p(\tau)$ is primarily an autoregression model. Similarly, the sample PCF is computed from the sample rather than the population. While the ACF captures the simple correlation between y_t and $y_{t-\tau}$, the PCF measures the association (partial correlation) between y_t and $y_{t-\tau}$ after controlling for $y_{t-1}, \dots, y_{t-\tau+1}$. We plot ACF and PCF with displacements at the x-axis. The Bartlett bands (two times standard error ($\frac{2}{\sqrt{T}}$)) are also shown on the plots. Bartlett (1946), quoted in Gujarati (1995, p. 717), has established that for purely random processes, ρ_τ are approximately normally distributed with zero mean and variance $1/T$, where T is the sample size. For a standard

normal distribution, a 95% confidence interval for the autocorrelation function is given

by $\pm 1.96 \frac{1}{\sqrt{T}}$.

If the correlogram of a series does not dampen gradually, the series may be non-stationary. Diebold (2001, p.121) argues that all covariance stationary processes have the autocorrelation and partial autocorrelation functions approach zero at large displacements. Kennedy (1996, p.260-61) offers some advice on diagnostics. If $\rho(1)$ is significantly different from zero, while autocorrelations at higher lags are not significantly different from zero, this indicates a **moving average** MA(1) process. Similarly if $\rho(1)$ and $\rho(2)$ are significantly different from zero, while autocorrelations at higher lags are not significantly different from zero, this suggests a MA(2) process. If the ACF declines geometrically, it suggests an AR(1) process, although it could also be an AR(2) process. If the ACF declines geometrically, but reverses sign at each displacement, it suggests an AR(1) process with a negative coefficient. If $\rho(1)$ is significantly different from zero, but does not display a geometrically declining pattern, it might suggest an **autoregressive moving average** ARMA(1,1) process. A significant $\rho(\tau)$ at every 12th displacement suggests seasonality. A controversial measure of lags for the correlogram is suggested to be 1/3 of the sample size (Gujarati (1995), p. 716). When ρ_τ coefficients fall outside of the Bartlett bands, we conclude that ρ_τ are significantly different from 0.

It is important to introduce at this stage the concept of **white noise**. A process with mean 0, constant variance, and no serial correlation is called white noise. If y is the observed time series, we assume that $y_t = \varepsilon_t$, then

$$\varepsilon_t \sim (0, \sigma^2)$$

The shock ε_t is uncorrelated over time. It could also be expressed as $\varepsilon_t \sim \text{WN}(0, \sigma^2)$ and hence $y_t \sim \text{WN}(0, \sigma^2)$. If y_t is serially independent, then y_t is independent white noise. Hence $y_t \sim_{iid} \text{WN}(0, \sigma^2)$, which implies that that y is independently and identically distributed with 0 mean and constant variance. If y is normally distributed and serially uncorrelated, then y is Normal white noise or Gaussian white noise. The ACF of white noise is constant at $\tau = 0$, and 0 at $\tau \geq 1$. The PCF for white noise is 1 at $\tau = 0$, and 0 at $\tau \geq 1$. It should be noted that when we refer to 0 mean, we in fact are referring to deviations from a series mean, i.e., $y_t - \mu$ and not just y_t . It is argued that one step ahead forecast errors should be white noise.

Moving Average and Autoregressive Models

When the “current value of an observed series is expressed as a function of current and lagged shocks” the model is called a moving-average model (MA). For MA models, we model the time series “directly as distributed lags of current and past shocks.” (Diebold, 2001, p. 144). The first-order moving average or MA(1) model is expressed as follows:

$$y_t = \varepsilon_t + \theta \varepsilon_{t-1}$$

where $\varepsilon_t \sim \text{WN}(0, \sigma^2)$.

A moving average model of q th order is presented below:

$$y_t = \varepsilon_t + \left(\sum_{i=1}^q \theta_i \varepsilon_{t-i} \right)$$

The ACF for MA(1) is the autocovariance function scaled by variance. The ACF ($\rho(\tau)$) = $\frac{\gamma(\tau)}{\gamma(0)}$ for $\tau = 1$ is equal to $\frac{\theta}{1 + \theta^2}$ and 0 for $\tau > 1$. This implies that there is a sudden cut-off at $\tau > 1$ for the ACF of a MA(1) process. Similarly, autocorrelations of a MA(q) process are 0 beyond displacement q . If the absolute value of $\theta < 1$, the MA (1) process is called **invertible**. This implies that the current value of the series could be expressed in terms of a current shock and a lagged value of the series. Such a process is referred to as the **autoregressive representation**. A good starting point therefore is the MA model, which could offer insights for future modelling directions. In other words, if $|\theta| < 1$, we know that the series could be expressed as an AR representation. Diebold (2001, p. 147) describes the difference between MA and AR processes as "an autoregressive representation has a current shock and lagged observed values of the series on the right, whereas a moving average representation has a current shock and lagged unobserved shocks on the right." The AR processes, on the other hand, are always reversible. The finite order MA(q) process is similar to MA(1) process in the sense it is covariance stationary for any value of its parameters. The MA(q) process is invertible if the inverses of all the roots are within the unit circle.

The AR model thus represents the current value of a series as "linearly related to its past values, plus an additional stochastic shock." (Diebold, 2001, p. 152) The following equation should represent the AR model of the first order.

$$y_t = \phi y_{t-1} + \varepsilon_t$$

Where $\varepsilon_t \sim \text{WN}(0, \sigma^2)$.

If $|\phi| > 1$, the coefficients in the AR representation alternate in signs.

A finite order moving-average process is always covariance stationary. However, an AR(1) process is covariance stationary if $|\phi| < 1$. In addition, for a true AR(1) process, the PCF is 0 for a displacement greater than 1. The ACF for an AR(1) process may not

dampen to 0, but it should display a "damped monotonic display" when $\phi > 0$. The AR process of p^{th} order is represented as follows:

$$y_t = \left(\sum_{i=1}^p \phi_i y_{t-i} \right) + \varepsilon_t$$

where $\varepsilon_t \sim \text{WN}(0, \sigma^2)$.

For an AR(2) process, the absolute value of ϕ_2 should be less than 1. The ACF of an AR(p) process also decays gradually with displacement.

The ACF and PCF of ARMA processes do not cutoff at any particular displacement. These functions instead dampen gradually. An ARMA model with independent variables is called ARMAX model.

Theoretical Model

The purpose of this chapter is to explore the determinants of housing price dynamics in Calgary. In its simplest form, the model should be able to explain the housing price dynamics in Calgary at a given time t as a function of some explanatory variables at time t .

$$\text{Price}_t = f(\text{explanatory variables}_t)$$

Given the dynamic nature of the model, we have to account for the impact of prices and other factors on housing prices in the previous time period. This is because housing prices are often correlated in time, i.e., the price at time t may be related to the housing price at time $t-1$ (i.e., the previous time period). Furthermore, there are issues with the functional form of the model. Should the model be based on log-transformed variables or should the model be estimated using the percentage change in the variables? In order to address these issues, we reviewed the housing literature to gain insights on modelling techniques. Our research led to a model of housing prices developed by Quigley, which is discussed below.

Quigley argues that housing prices at any time t are a function of demand and supply interactions. The demand for housing is determined by the price for housing, household income level, and other relevant independent determinants of housing demand. Housing supply on the other hand is determined by supply of land and new housing, vacancy rates, and the price of housing as well. Both buyers and builders decide to consume more housing as a function of housing prices respectively. Quigley relied on the following demand-side variables in his model:

- population at time t ;
- average household income at time t ;
- employed labour force at time t ;

Quigley used the following variables for supply-side determinants:

- vacancy rates
- housing supply are represented by building permits

In accordance with the econometric methodology, Quigley used two lags of housing prices as explanatory variables to control for the auto-regressive nature of the time series. He estimated the log transformed versions of the following model:

$$\text{Price}(t) = \text{Constant} + B1 * \text{Population}(t) + B2 * \text{Household income}(t) + B3 * \text{Employment}(t) + B4 * \text{Permits}(t) + B5 * \text{Vacant Units}(t) + B6 * \text{Price}(t-1) + B7 * \text{Price}(t-2)$$

B1 to B7 represent the coefficients estimated using the OLS method. B6 and B7 are the two lagged price coefficients that capture the impact of the previous market prices on current housing values.

We have built upon Quigley's modelling approach by retaining the theoretical constructs he had posited. However, we have applied improved time series econometrics methods, such as auto correlation functions to test temporal autocorrelations and have further used auto regressive moving average (ARMA) models to account for temporal autocorrelation in the dependant variable, i.e., housing prices.

Before we explain detail how we have built upon the methodology used by Quigley in modelling housing price dynamics, we would like to offer a brief review of the application of time series methods in analysing housing price dynamics. There exists a vast body of literature on modelling house price dynamics using a variety of empirical modelling techniques for analysing housing prices. However, the use of time series econometrics has been more pronounced than other methods, such as system dynamics and agent-based simulations. Time series models emerged as the preferred choice of modelling price dynamics because of the rigorous treatment of the economic fundamentals in such models. Furthermore, time series models are capable of capturing the dynamic relationship between prices and the exogenous variables as well as generating out-of-sample forecasts for housing prices.

In a recent study of the linkages between economic indicators and housing prices, Capozza et al. (2004) devised an Error Correction Model, which is a type of time series method. Another variation of time series technique, Vector Autoregression (VAR) has been used to study the interdependencies between multiple time series, such as housing prices and the supply of new housing. In one such use of VAR models, Dipasquale and Wheaton (1994) forecasted housing starts as a function of the price of new housing and other explanatory variables. Time Series methods have also been applied to determine the impact of development regulations on housing prices. The results suggested that zoning and other growth controls were behind the spike in housing prices in certain jurisdictions in the United States (Glaeser and Gyourko, 2002).

Time series models have also been used to compare housing price dynamics in the 15 OECD economies (Englund and Ioannides, 1997). Delving further into the probable causes behind housing price changes, researchers have used time series techniques to conclude that speculation could be a possible determinant of housing prices in London (Levin and Wright, 1997). Others have concluded the same suggesting that even after controlling for economic and demographic determinants, housing prices were impacted by the speculative demand (Riddel, 1999).

In Ireland, the use of cointegration analysis (a time series technique) discovered a stable relationship between housing prices, housing stock, mortgage rates, and income. Furthermore, the models revealed that a sudden spike in demand may cause housing prices “to overshoot their long-run equilibrium level” (Kenny, 1999).

So far we have discussed modelling housing prices as a function of housing supply and other economic/demographic forces. However, if one were to invert the logic, the supply of housing could also be modelled as a function of housing prices under the assumption that an increase in housing prices may encourage builders to supply more housing. Using time series models, researchers observed that an increase in housing prices results in a significant increase in housing supply (Mayer and Somerville, 2000).

Returning to the discussion on how we have improved upon the methodology proposed by Quigley, we would like to mention that we have used net migration rather than the population to account for the demand pressures. We have preferred net migration to population for the reason that most large cities in Canada depict a rather stable upward trend in population and employment, which may not be able to capture the peaks and turfs in housing markets. Net migration, on the other hand, depicts a non linear trend that may better capture the increase and decline in the demand for housing.

We have also used net international migration to capture the impact of high-income migrants from abroad who are likely to exert higher demand for housing by consuming higher-end real estate as well as consuming more shelter space per capita. Another important distinction between the two approaches is that while Quigley used vacant units as a proxy for housing market conditions, we have relied on sales to new listings ratio (SLR) as a proxy for the housing market conditions. SLR simultaneously captures the rate of sales and the rate at which the units are being listed in the market. When SLR is increasing, it suggests that the demand is exceeding supply. Similarly, when SLR falls, it suggest that while new housing units are being added to the market, which represents owners willingness to sell, prospective buyers prefer to stay on the sidelines, resulting in a decline in housing prices.

Our final point of distinction from Quigley’s approach is that we have used after-tax household income instead of the pre-tax household income in our model. We believe that after-tax household income is a superior proxy for a household’s ability to consume shelter and other goods or services for the reason that the household income, net of taxes, is the income that a household uses to create its budget and the decisions to buy or rent.

We have followed Quigley's approach by using building permits as a proxy for housing supply, slightly enhancing the methodology by breaking down the building permits by housing typology (singles, doubles, apartments, and row housing) to account for the supply of different type of housing on the price of housing. Although other proxies for land supply were available (such as housing starts or developable land available for construction), we believe that housing permits are a better choice for several reasons. Consider using developable land as a proxy for housing supply. In the case of Calgary, the City releases land in anticipation of future demand for land for residential and other urban land uses. There are two limitations that make developable land a poor choice for a proxy. First, information about the supply of developable land in Calgary at monthly or quarterly or annual frequency is limited to the recent past, making it unsuitable for use in econometric models.

Moreover, the fact that land has been earmarked for development does not result in the immediate start of construction. There are numerous examples of land being earmarked for development and not developed at all or developed in stages over a period of 10, 15 or more years. Housing permits, on the other hand, are issued once the builder has pre-sold significant number of units in the new subdivision, suggesting that construction would commence in the near future. Thus, when the intent is to analyze short-term escalation in housing prices, the supply side dynamics will be better captured by housing permits, which are likely to result in housing units soon, than the developable land, which may stay as undeveloped land for years or decades and may have no real impact on housing prices in the short run.

Mathematically, the model is presented below:

$$\text{Price}(t) = \text{Constant} + B1 * \text{Net migration}(t) + B2 * \text{After tax Household income}(t) + B3 * \text{SLR}(t) + B4 * \text{Permits}(t) + B5 * \text{Price}(t-1) + B6 * \text{Price}(t-2)$$

Housing prices have been adjusted for inflation. We have used the log transformed version of most variables. However, some variables, such as net migration, return negative values for certain months; we have therefore not log transformed such variables because log transformation would have returned an error for the negative values. Also, the estimated coefficients in a log transformed model are interpreted as elasticity for models where both explanatory and the dependant variable is log transformed.

The length of the economic time series is always a question of debate. Often practitioners and researchers wonder if they have sufficient observations to develop their models. While there are no hard and fast rules, general guidelines do exist. It has been argued in the literature that 36 data points are often sufficient to develop a time series model (Finmatria Inc, 2001).

Data Set

The data for the above-mentioned variables were obtained from a variety of sources. The real estate market data, including housing prices, sales and listings, were obtained from the Canadian Real Estate Association. The demographic data on migration, household

income, as well as details on building permits were obtained from the CANSIM database of Statistics Canada for the Calgary Census Metropolitan Area (CMA).

All variables were aggregated or disaggregated to a quarterly frequency. Unlike the monthly time series, the quarterly time series depicts less noise, which influenced our choice of quarterly rather than monthly time series. The data set covers the period between the first quarter of 1980 (1980.q1) to the last quarter of 2007 (2007.q4)

The following section presents a brief descriptive analysis.

Descriptive Analysis

Figure 24 plots nominal and real housing prices from 1980.q1 to 2007.q4. Housing prices remained relatively stable from 1990 to the beginning of 1997. Housing prices started their upward climb in late 1997 and continued until the end of 2004. Although housing prices were growing during this period, the rate of growth was moderate. It was only in 2006 and 2007 that housing prices in Calgary experienced a steep hike where the real home (average price for all types of housing) prices jumped by over \$90,000 in approximately 12 months (2005.q3 to 2006.q3).

Also evident from Figure 24 is that the housing frenzy started to subside in Calgary by mid 2007. Real housing prices fell in the third and fourth quarter of 2007.

Figure 26 presents the partial autocorrelation function (PCF), for real home prices. The autocorrelation function declines with increasing lags. This suggests that the time series is likely to be stationary. Furthermore, Figure 25 reveals that the correlation function for the first six lags is significant. The PCF, shown in Figure 3, reveals that the partial correlations change signs at each displacement. Furthermore, the first five values fall outside the confidence interval bands suggesting these values are significantly different from zero.

Figure 27 illustrates that most building permits issued over the years were of the single-family housing type. However, in the recent past building permits of other types of housing (namely doubles, apartments, and row housing) have been catching up to singles. Figure 28 captures the relationship between residential construction permits and real housing prices. It could be seen from the figure that there is a positive correlation between building permits and real housing prices, suggesting that as housing prices increase, so do the number of residential construction permits issued. A positive correlation also exists between housing prices, new listings, and sales (Figure 29).

However, when new listings and units sold are combined in a single variable, the **sales to listing ratio**, the positive correlation between real home prices is further augmented by the information on the lags and leads between the two variables. Figure 30 suggests that SLR is a leading indicator for real home prices, suggesting that as SLR increases, so do the home prices. A cross correlogram has been plotted between SLR and real home prices to determine the dynamic nature of the correlation (Figure 31). According to the figure, one can see that correlation between the two variables increases up to six lags,

suggesting that an increase in SLR is likely to result in the increase in real home prices over the next six quarters. Therefore, SLR can be used as a leading indicator of the changes in the new home prices and one could forecast the direction of home prices using SLR as an explanatory variable.

Real home prices and net migrants are also positively correlated. However, the lead and lag structure of the relationship has been rather complex. Initially, net migration acted as a leading indicator for real home prices, however since 2005 real home prices have led net migration instead (Figure 32).

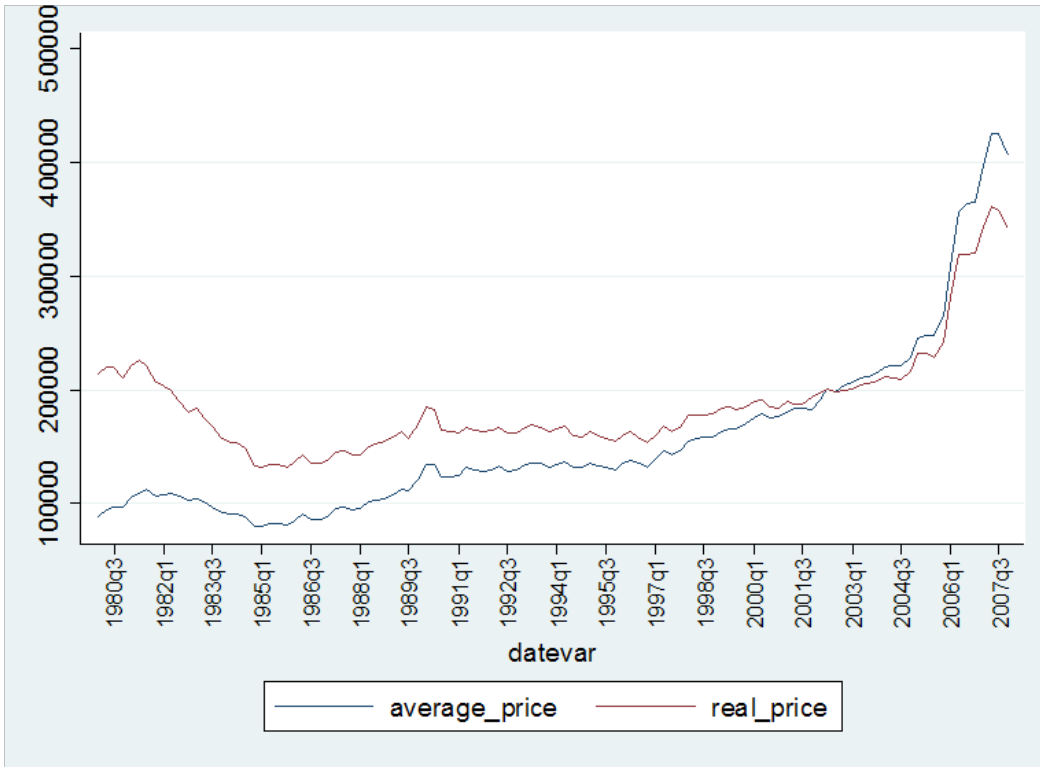


Figure 24: Graph of nominal and real housing prices in Calgary

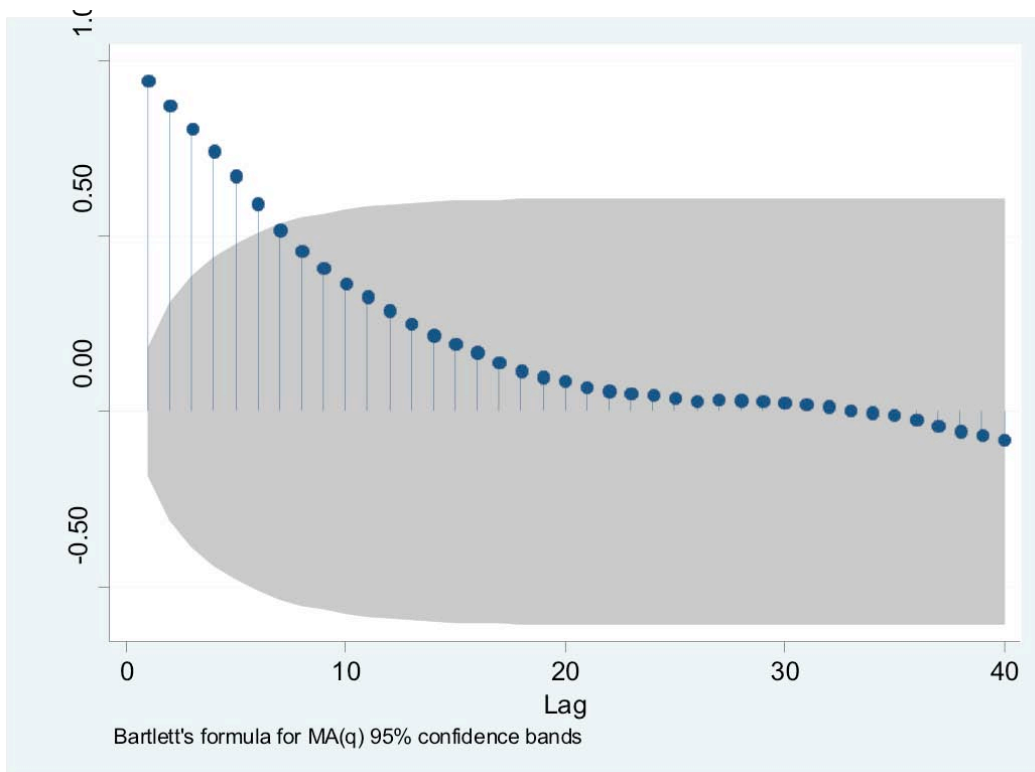


Figure 25: ACF of log transformed real housing prices

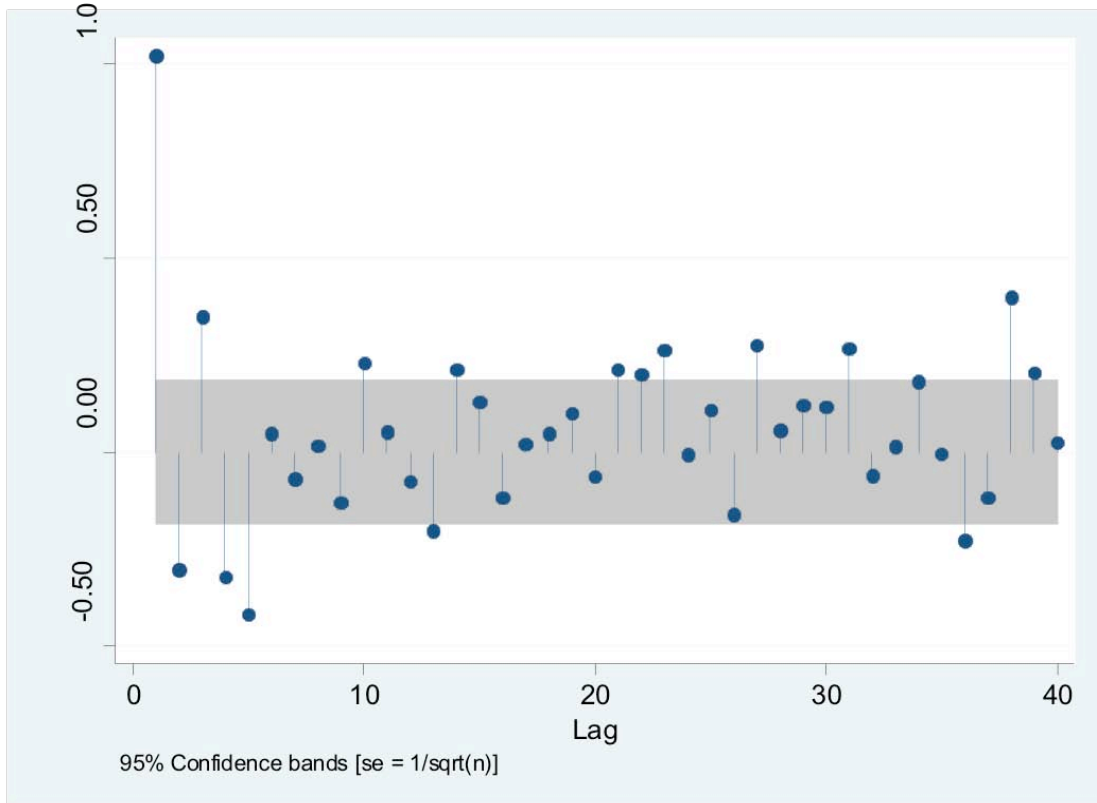


Figure 26: PCF of the log transformed real housing prices

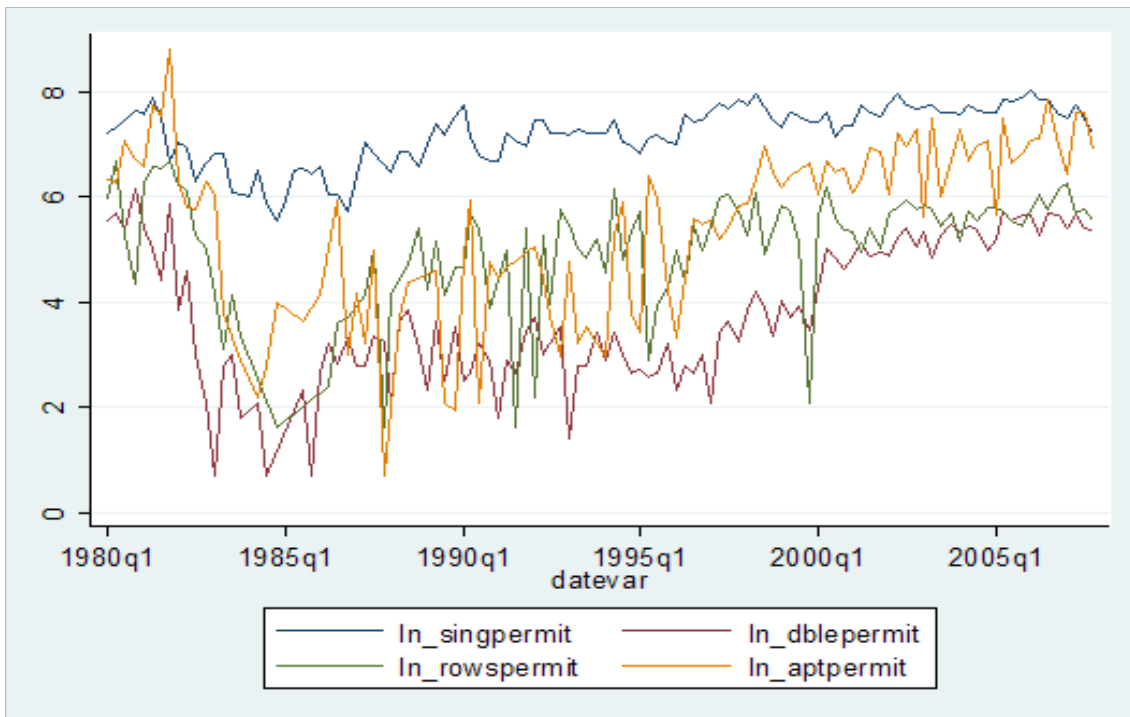


Figure 27: Log transformed permits by type of housing

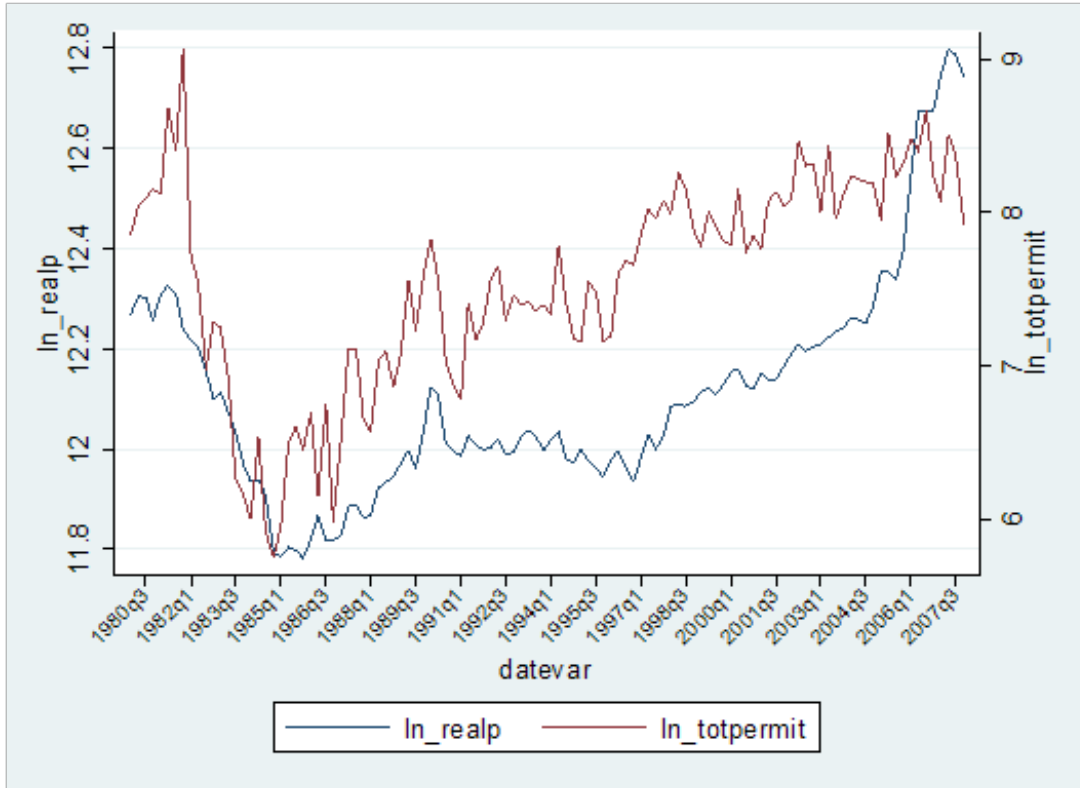


Figure 28: Total permits and real housing prices in Calgary

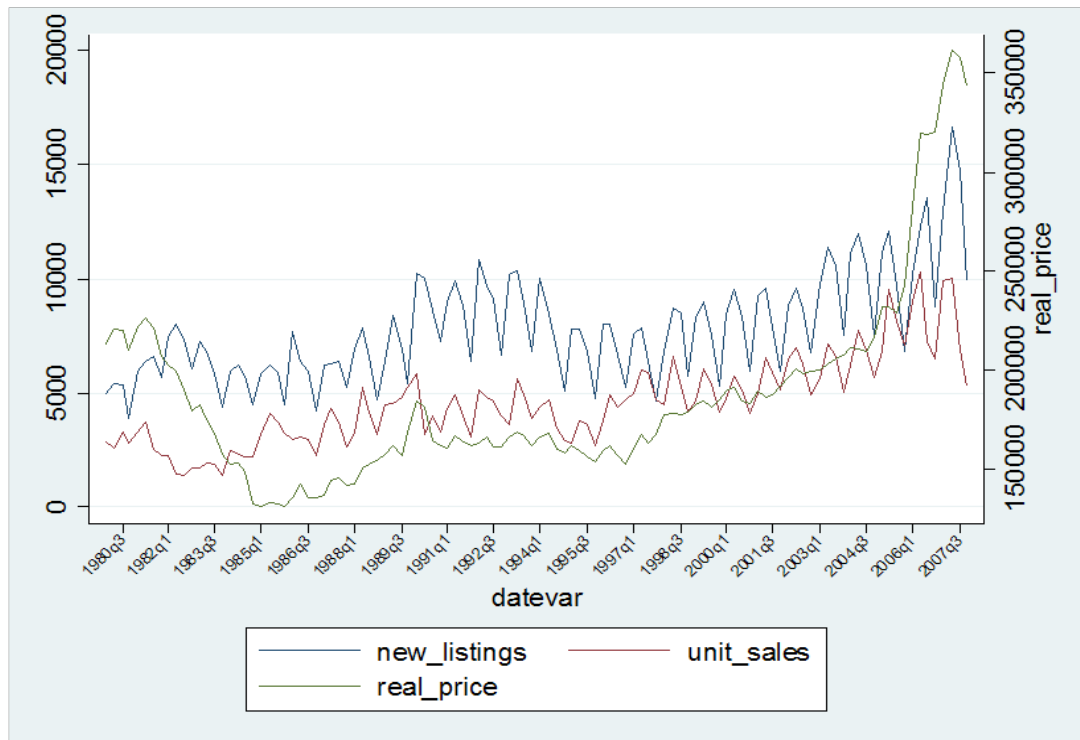


Figure 29: Relation between new listings, sales, and housing prices

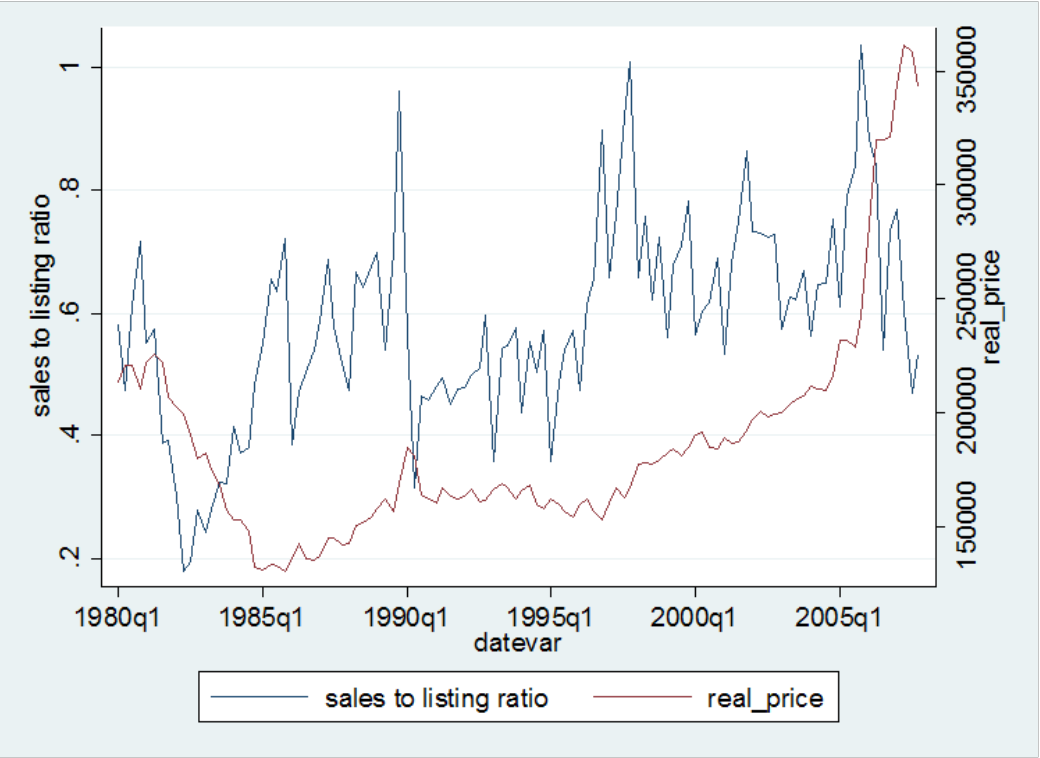


Figure 30: SLR and real housing prices

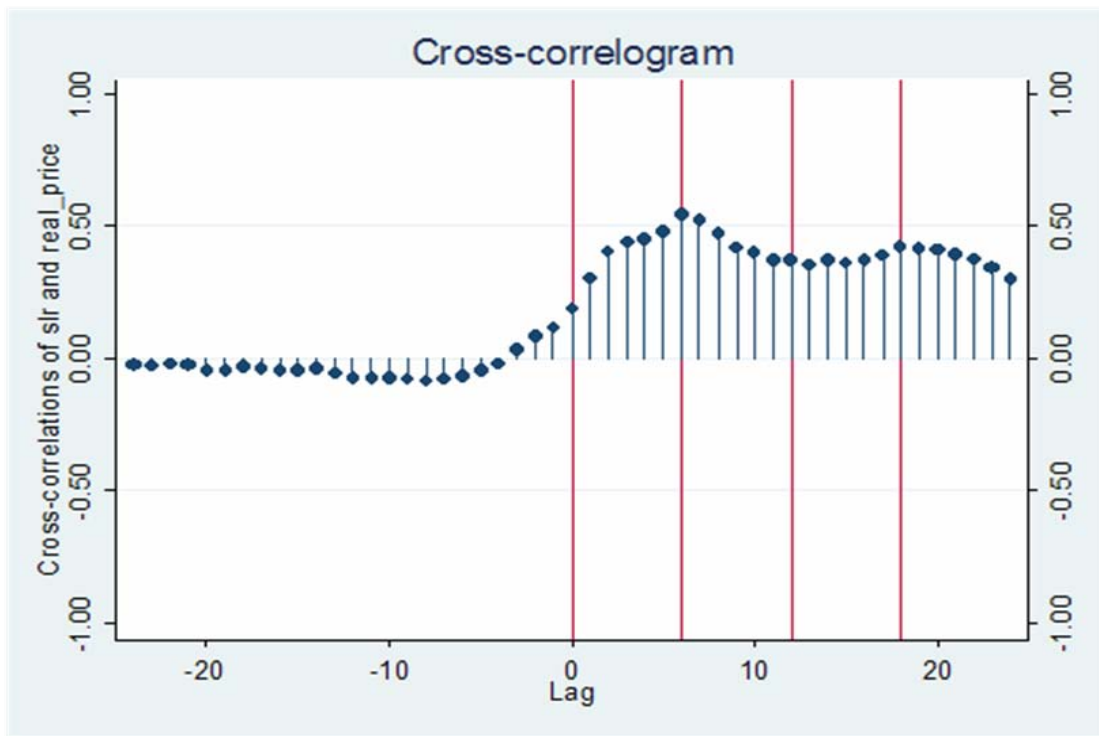


Figure 31: Correlation between SLR and real home prices

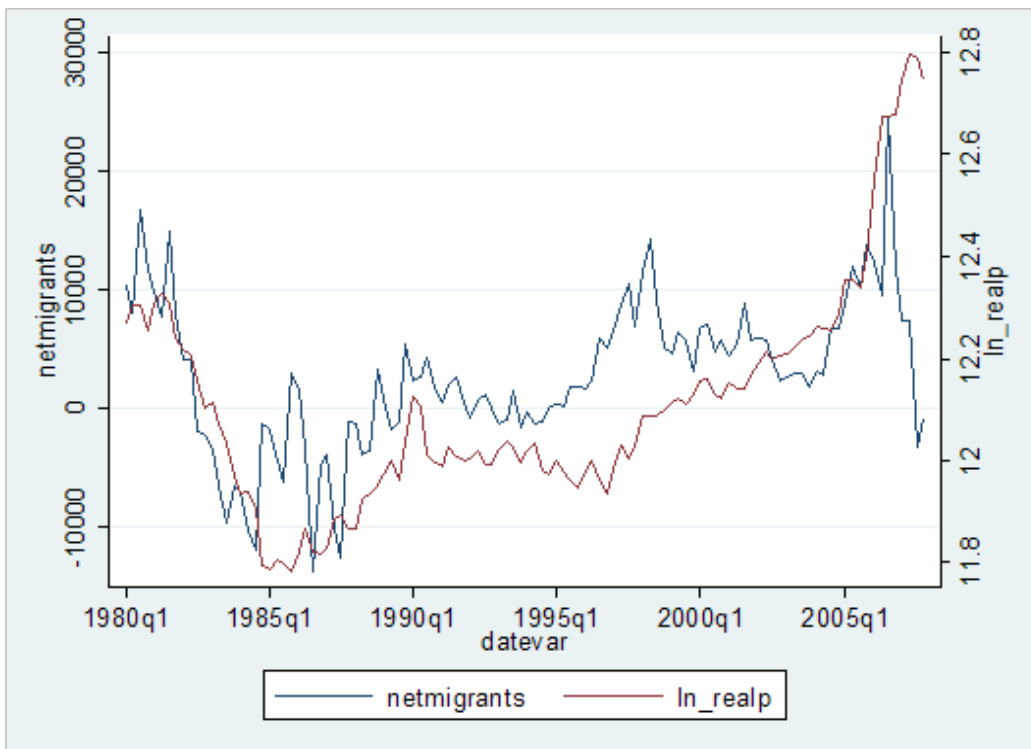


Figure 32: Relationship between net migrants and real home prices

Econometric Models

In this section, we present econometric models depicting the relationship between real home prices and their determinants. We begin our reporting of results with a series of OLS models. A series of seven models labelled from A to G are presented in Table 12. Starting with the most parsimonious model under column A, the model depicts a positive relationship between contemporaneous housing prices and the ones lagged by one quarter. The model suggests that a percentage increase in the housing prices in the last quarter is correlated with a 1.02% increase in the current prices. The three stars next to the estimated coefficient indicate that the estimated coefficient is statistically significant at the 99% level.

The adjusted R square of 97% is typical of the models with lagged values of the dependant variable used as an explanatory variable. Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC) are other indicators of the model fit that are also reported in the table. Unlike R Square, models returning lower values for AIC and BIC are preferable.

In the second model, labelled as B, we introduce the second lag of housing prices as an explanatory variable. The two lagged price variables, controlling for the auto-regressive nature of the time series, are both statistically significant. The model fit has slightly improved over A. So far we have not introduced an independent variable into the model. We begin by introducing after tax household income to model C. The demand side variable suggests that one percent in the after tax income is correlated with a 0.17% increase in housing prices. Furthermore, the coefficient is statistically significant at 95% level.

The other demand side variable introduced in the model is the net migration after rescaling the variable by dividing it by 1,000. The variable has been rescaled to assist with the interpretation. The coefficient for net migration suggests that for a net increase of 1000 Canadian migrants, the housing prices increase by 0.13% (0.0013×100). However, in Model C, the coefficient is statistically insignificant. This coefficient changes to negative in later models, but remains statistically insignificant.

When we introduce the rescaled variable for net international migration in Model D, we obtain a statistically significant coefficient suggesting that an increase of 1000 international migrants is correlated with a 1.8% increase in housing prices.

We have used only the demand side variables and the two autoregressive variables in the model so far. The next step is to introduce the supply side variables to the model to determine if the housing prices are in fact impacted by the change in supply variables. Our hypothesis is that the supply side variables should enter the model with a negative sign to account for the fact that as supply of a commodity increases, its price declines. We introduce total residential permits issued in Model E. The positive coefficient for the variable rejects our hypothesis that the supply of housing is correlated with a decline in

housing prices. Furthermore, the coefficient for total permits is statistically insignificant, suggesting that all else being equal, the supply of housing is not correlated with housing prices. This statement is true for short-term dynamics in the housing markets.

The coefficient for permits in Quigley's model was also positive, which he believed was an indication that construction activity increases when housing prices increase and it subsides when prices decline.

When we breakdown the supply side by the type of housing (singles, doubles, apartments, and rows), we obtain more revealing results in Model F. First, the coefficient for doubles, rows, and apartments return negative coefficients. Secondly, the coefficient for rows and apartments are not statistically significant. The coefficient for doubles suggests that a percentage increase in these housing permits is correlated with a 0.01% decline in housing prices. Stated otherwise, a two times increase in doubles permits is correlated with a 1% decline in housing prices. Even though the coefficient for doubles permits is statistically significant, the magnitude of change in housing prices is very small. Furthermore, doubles permits on average represented less than 10% of the total housing permits issued during 2006-2007. The majority of the permits (51%) belonged to single detached housing in the same time period.

Lastly, single detached permits returned a highly significant positive coefficient, suggesting that a percentage increase in singles permits is correlated with .05% increase in housing prices. We believe that the positive correlation between singles permits and housing prices is a reflection of the fact that homebuilders are responding to the increase in housing prices by obtaining building permits. The model is capturing the reaction of homebuilders depicted by the positive coefficient for singles permits. It is not the increase in permits that raises prices but builder response to rising prices that leads them to take out more building permits.

The final model is reported under column G. This model carries an additional variable SLR that serves as a proxy for housing market conditions. The coefficient for SLR was positive, suggesting that an increase in SLR is correlated with higher housing prices. However, the coefficient is statistically insignificant.

The model fit as depicted by adjusted R square, AIC and BIC suggest that Model G offers the best fit.

So far the results presented here were obtained from OLS models. Table 13 presents results obtained from autoregressive moving average (ARMA) models. The earlier discussion about the theoretical model suggests the merits of using ARMA models.

We have experimented with a variety of models using different lag structures. Based on our results and experimentation, we have narrowed down the lag structure to two. This implies that we have used two lags for the autoregressive parameter as well as the moving average parameter. The first model in the series is presented in Table 13, which contains two autoregressive parameters and no moving average parameters. The model is

represented as an ARMA (2,0,0) model. The demand side coefficients of the model include household income, domestic net migration, and international net migration. Furthermore, the model includes SLR as well. Similar to the results obtained from OLS models, the coefficient for permits returned a statistically insignificant coefficient. Similarly, the coefficient for net migration was also insignificant yet negative. The net international migration returns a positive, as well as statistically significant coefficient. Unlike the OLS models, the ARMA models returned a statistically insignificant coefficient for household income.

The coefficient for SLR returned a highly significant, yet negative coefficient. We had hypothesized a positive correlation between SLR and housing prices. This was borne out by the results obtained from OLS models. However, ARMA models have returned statistically significant negative coefficient. This variable needs to be examined more to see if it is highly correlated with other explanatory variables in the model.

The second model reported in Table 13 is of the type ARMA (2,0,2), which contains both moving average and autoregressive parameters with two lags each. While the coefficients in both models, i.e., ARMA (2,0,0) and ARMA (2,0,2) are very similar in magnitude and signs, the criterion for model fit suggest that a simpler model, ARMA (2,0,0), offers the better fit. This could be seen from lower values for AIC and BIC for the ARMA (2,0,0) model.

The third model in Table 13 is again of the type ARMA (2,0,0). However, this time the total permits have been replaced by a breakdown of permits for various housing types. The model suggests that the demand side variables (net migration and household income) were statistically not significant. However, SLR returned a statistically significant yet negative coefficient.

Similar to the trends observed in the OLS model, the coefficient for single housing permits returned a statistically significant and positive coefficient. In contrast, the coefficients for the three other types of housing permits returned statistically insignificant coefficients. Based on the results obtained in this model, one could argue that the two autoregressive parameters, which are controlling for the dynamic nature of the time series where prices are correlated in time, are the most significant determinants of housing prices. Given the fact that the demand and supply side variables mostly returned insignificant coefficients, one could also estimate a ARMA (2,0,0) model with no independent explanatory variables. The last column in Table 13 reports results from the simple ARMA model. The criteria for model fit (AIC and BIC) suggest that this model does not offer the best fit. However, given its simplicity and the fact that it offers the second best fit of the four models (based on BIC), we would recommend the simple model (ARMA 202X in Table 13) as the preferred model for in-sample and out-of-sample forecasting.

We have plotted the real home prices as well as the forecasted home prices based on the simple ARMA model, which suggests a close fit between the forecasted as well as the real home prices (Figure 33). It is interesting to note that the model captures the

nonlinear trends in house prices, which suggest that it could be used to make out-of-sample forecasts.

Similarly, we have also plotted real home prices, forecasted home prices and residuals for the coefficients reported for the OLS Model G in Table 12 (Figure 34). A visual inspection of the last two figures suggests that ARMA model captures more closely the nonlinearity in housing prices.

It should be noted that the out-of-sample forecasting (where a forecast is extended beyond the duration of the original time series) using models with independent variables (i.e., explanatory variables) require forecasts for the independent variables as well. For instance, in order to forecast the impact of building permits on housing prices in the future, one has to estimate or simply guess the future values of permits. While this is a standard practice in time series forecasting, the out-of-sample forecasts reflect the assumptions made about the explanatory variables by the modellers. A simple ARMA model with no explanatory variables relies primarily on the autoregressive parameters (i.e., it relies on historic values of home prices) to forecast out of sample housing prices and thus poses a smaller data burden for forecasting. On the other hand, if one is strictly interested in determining the impact of an explanatory variable, such as building permits, on housing prices in the future, one needs to rely on models with independent variables.

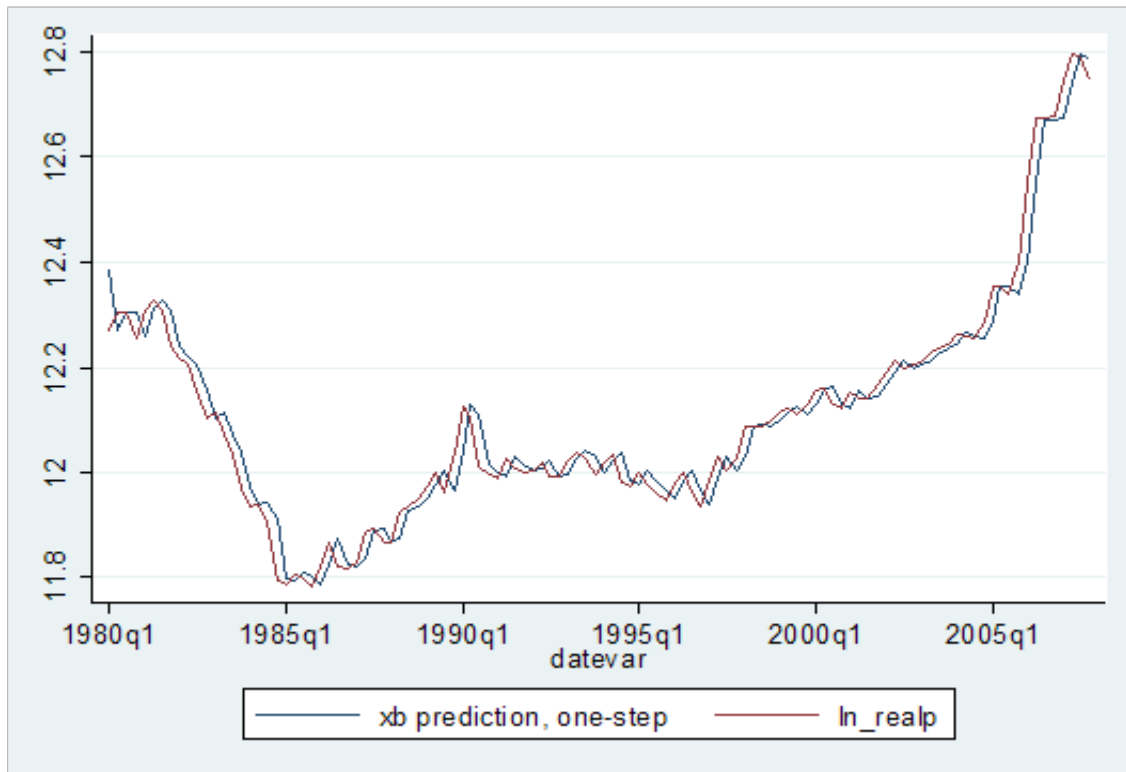


Figure 33: Plot of real home prices and the forecasted prices from ARMA model

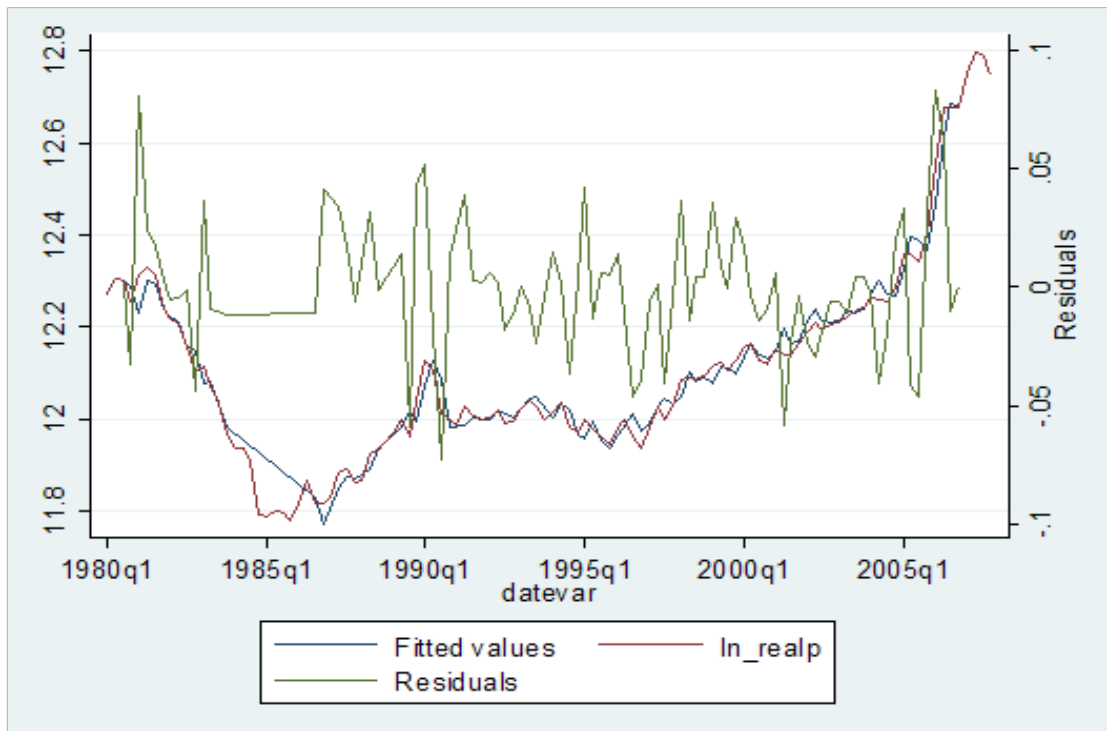


Figure 34: Plot of real home prices and forecasted prices from Model G in Table 12

Conclusions from the Modelling

We have presented an empirical analysis of housing price dynamics in Calgary using time series econometric methods. Our results conclude that housing price dynamics in Calgary are not explained by the supply-side variables. This implies that the estimated models have not discovered statistically significant relationship between housing prices and building permits (a proxy for supply-side dynamics). The results presented here further suggest that one cannot conclude that increasing supply of housing will exert a downward pressure on housing prices in the short run.

The results from the econometric models presented above suggest that the demand side variables, such as net migration, after tax household income, etc. are more robust determinants of housing price dynamics rather than the supply side variables. The supply side variables, such as residential building permits, turned out to be statistically insignificant predictors of housing price dynamics. In instances where supply side determinants were statistically significant, such as singles permits, the positive coefficient for the variable suggested that the builders were merely responding to the increase in housing prices by obtaining more permits.

We believe that the builders enter and exit the construction phases in response to changes in housing prices. This phenomenon is demonstrated in Figure 28. When the real home prices collapsed in early eighties, builders and developers retreated from the market as a response to the falling home prices. The declining graph of building permits followed the declining graph for housing prices in early eighties. It could be argued that the decline in building permits in a slow housing market is primarily a result of the withdrawal of builders from active building activity, rather than a result of strict rationing of building permits by the municipal authorities.

During boom cycles, builders respond to the increase in housing prices by obtaining permits and initiating construction on housing projects. Figure 28 provides evidence for this argument. As the home prices initiated their upward climb in 1997, these were immediately preceded by an increase in building permits. However, one could see from Figure 35 (a zoomed in version of Figure 28) that the sustained rapid increase in housing prices starting in 2004 was not accompanied by a comparable increase in building permits. Furthermore, building permits started to decline as soon as the housing prices appeared to be stabilizing during the second and third quarter of 2006. Interestingly, as the housing prices resumed their upward climb in the last quarter of 2006, the declining building permits also switched their direction.

The above discussion leads us to conclude that small changes in housing prices (+/- 5 to 10%) correlate with huge shifts (as high as 70% increase) in the building permit activity. Builders rush into the market to capitalize on the rising housing prices. However, given the lag between obtaining permits and delivering a built unit, which could vary between eight to 24 months, often housing prices stabilize even before new housing units hit the market.

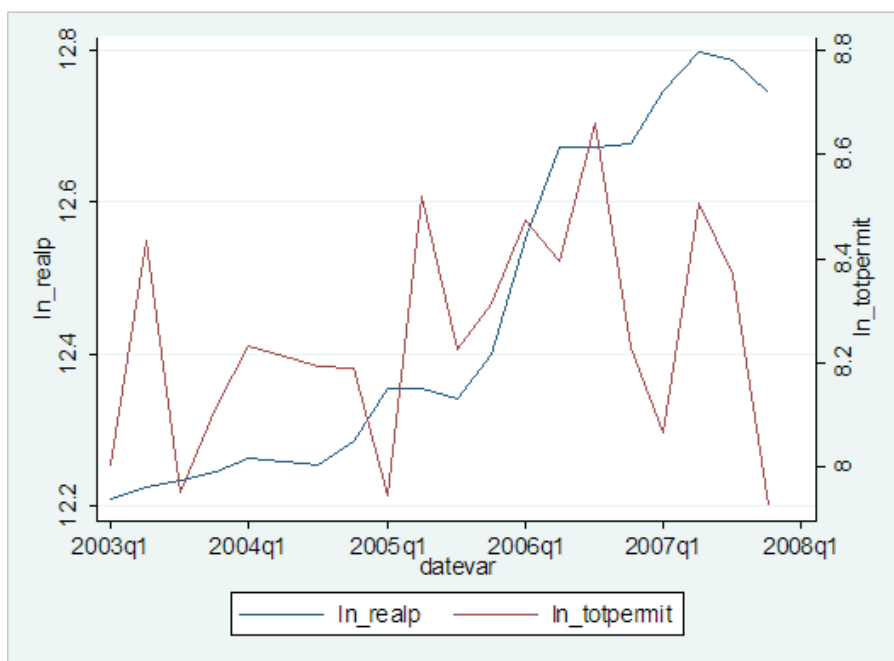


Figure 35: Home prices and permits in Calgary since 2003

It appears that the spike in housing prices in Calgary during 2006 and 2007 was more akin to the concept of flash floods. It is hard to plan for flash floods. Furthermore, by the time precautionary or protective measures are taken to deal with a flash flood, the flood is long gone and the rivers revert to normal flow.

The rapid increase in housing prices over a short period of time has occurred in the past in other jurisdictions as well. For instance, Hong Kong in the mid-1990s experienced a similar price hike and so did London, England, during the early-1970s and mid-1980s. These events have raised questions in Hong Kong and London about what caused the sudden price hikes. Could this be attributed to speculation or that the price hike is a result of volatility in demand conditions? Furthermore, questions have also been raised about the causality between housing prices and speculation. For instance, research in the Hong Kong housing market has revealed that speculation does not cause the prices to rise, but instead rapid increase in housing prices causes speculation to occur (Ho and Kwong, 2002). However, another study of price hike during 1971-73 and 1985-88 in the Greater London Area accuses speculation and suggests that the homebuyers may have been forced to take “speculative position(s) with respect to the timing of their purchase and sale contract” (Levin and Wright, 1997).

The fact that housing prices fluctuate in short time periods raises the question as to what contributes to such a change. The bubbles in housing markets have been defined as the period during which housing prices increase beyond what could be explained by market fundamentals (Stiglitz, 1990). Therefore, when the housing prices are significantly higher than what has been predicted by models using market fundamentals and demand variables such as GDP, change/growth in employment and income, vacancy rates, etc.,

the difference between the forecasted and actual transaction prices is referred to as a bubble.

While there is not much debate about the definition of bubbles, the debate on what causes bubbles in housing and other markets remains far from being settled. One of the recent papers addressing the housing price dynamics in Ireland suggests that apart from a relatively short period of high price volatility in late-1990s, housing prices in Ireland could be explained as a function of economic and demographic fundamentals (Stevenson, 2008; Levin and Wright, 1997). The question is can we conclude the same about Calgary.

We believe that the economic upturn in Calgary, which also attracted a large number of migrant workers from within and outside of Canada, created a spike in demand during 2006 and 2007. The boom in the natural resource economy in Alberta brought in migrants workers from within Canada and abroad. The housing market in Calgary was overwhelmed by this sudden spurt in demand for housing. Given the intrinsic lag between housing demand and supply, the housing prices increased in Calgary in response to the spike in demand. However, we also believe that similar to what was observed in Greater London during early-1970s and mid-1980s (Levin and Wright, 1997), homebuyers were forced to take speculative positions with respect to timing of their purchase. Furthermore, the underlying assumption that the increase in migrant workers, many of whom belonged to the high-income category, would continue in the long-run proved false. The sudden increase in the number of migrant workers in Calgary in 2005-06 followed an equally dramatic decline in 2007. This is illustrated in Figure 32 above.

The speculation about the sustained increase in the number of migrant workers may have fuelled the housing price inflation in Calgary. Home buyers assumed that strong housing demand would continue in the long run, which would result in a sustained increase in housing prices. This bid up the price of housing to levels higher than those justified by market fundamentals. But as the demand started to ease in Calgary, housing prices began to fall in the second half of 2007.

The models presented in this chapter suggest that the demographic determinants of housing demand as well as housing market indicators do explain, to a large extent, the sudden hike in prices in Calgary. However, homebuyers were forced to take speculative positions with respect to timing of their purchases. The sudden increase in housing demand in 2006 moderated by the end of 2007, resulting in a decline in housing prices by the end of 2007. Those buyers who could postpone their purchase avoided paying the speculative prices during the bubble.

It is important to note that household incomes in Calgary have not risen as dramatically as the housing prices. In fact, the household income in Calgary has evolved in a way similar to the income levels in other cities in Canada. The recent decline in housing prices suggests that the housing market is now catching up with the reality of the slowing rate of in-migration and a modest increase in household incomes, both of which are out of step with the inflated housing prices in Calgary.

Furthermore, housing rents have experienced a modest increase during the same time period, also suggesting that the increase in housing values is driven by speculation. Consider that the market rent derived from a housing unit determines its value. If the average annual rent commanded by a housing unit is \$18,000 and the market interest rate is 7%, the price of that unit is estimated at \$257,000 ($18000/.07$). The difference between the rent-based price of a house and the transaction price could be attributed to speculation because the buyer is basing the decision to purchase not on future rent, but on the assumption that the unit could be flipped in a short time period for a higher price.

The other interesting question pertains to what role if any could the City of Calgary had played in easing the pressure in housing market. Given the results presented in this Chapter, we believe that the supply side dynamics did not play a role in easing pressures in the housing markets. Therefore, the City could not have influenced housing prices by facilitating an increase in the housing supply during the period of high demand. As we have argued earlier, by the time new housing enters the market, price hikes have usually moderated. Furthermore, other research in land supply in Portland has shown that land constraints had a small impact on housing costs. The real culprit was the initial surge in housing demand. If, however, there is a wide-spread *perception* of land shortages, prices can surge higher (Phillips and Goodstein, 2000: 342).

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5. Housing Price Forecast under Different Growth Scenarios

In this chapter we develop long-run estimates for housing prices for Calgary. The econometric work presented so far has primarily focused on explaining the determinants of housing price dynamics in Calgary. For instance, we have evaluated the impact of supply-side and demand side determinants of housing prices in Calgary and have concluded that the demand side determinants, such as income, migration, etc. are stronger determinants of housing price changes in comparison with the supply-side variables. In this chapter, we extend the forecast beyond the actual time series that ended in the fourth quarter of 2007 to the end of 2015 in Calgary.

The chapter first develops a forecasting model that employs the autoregressive model of housing prices and extends the forecasts to the year 2015. However, the initial model developed in this chapter does not contain any explanatory variables and the forecast is based on the auto-regressive nature of the housing prices. We then develop a model that captures the impact of the mix of new housing being developed on housing prices. This is followed by an analysis of the mix of existing housing stock and housing prices. The chapter then outlines the three development scenarios namely compact, hybrid, and dispersed by the City of Calgary and develops forecasts for housing prices in light of the three development scenarios. Finally, the chapter concludes with a discussion of key findings and recommendations.

ARMA Models

We have developed an ARMA model with no independent variables. The model uses four lagged values of the dependent variable, i.e., natural log of real housing prices in Calgary. We have explained earlier in the chapter that developing long-term forecasts with explanatory variables, such as after-tax household income, would require one to first forecast explanatory variables into the future and then use those forecasts to determine the correlation between explanatory variables and the independent variable, i.e., housing prices.

Given the complexity and uncertainty involved in forecasting a host of explanatory variables, it is often the practice that out of sample forecasts (referring to forecasts for the time period for which data are not available, i.e., beyond 2007q4) are made without using independent variables. In some instances modellers have deployed guessed values for explanatory variables. The results obtained from such models should be treated with caution as the forecasts for the dependent variable in such cases are merely an artefact of the modellers' subjectivity.

We have experimented with various lagged structures to develop forecasts using ARMA models. Once we had developed a forecast, we undertook exploratory analysis of

residuals to determine the accuracy of forecasts. Based on the residual analysis, we have opted for ARMA(4,0,0) model. Table 14 presents the output from the model.

Table 14: ARMA model results used for out-of-sample forecasting

Log likelihood	220.02648			
AIC	-430.05297			
SBC	-416.46047			
	Analysis of Variance:			
	DF	Adj. Sum of Squares	Residual Variance	
Residuals	107	.12893815	.00115113	
	Variables in the Model:			
	B	SEB	T-RATIO	APPROX. PROB.
AR1	1.499009	.08922603	16.800132	.00000000
AR2	-.936404	.15139878	-6.185014	.00000001
AR3	.772312	.15180802	5.087425	.00000156
AR4	-.344956	.09144951	-3.772092	.00026579
CONSTANT	12.310013	.22570622	54.539981	.00000000

The partial autocorrelation function of the residuals of the above-mentioned model is plotted below, which indicates that most partial autocorrelations lie within the confidence intervals, suggesting that the residuals appear to be white noise, a fact also confirmed by Box-Ljung statistics (not reported here) for small displacements.

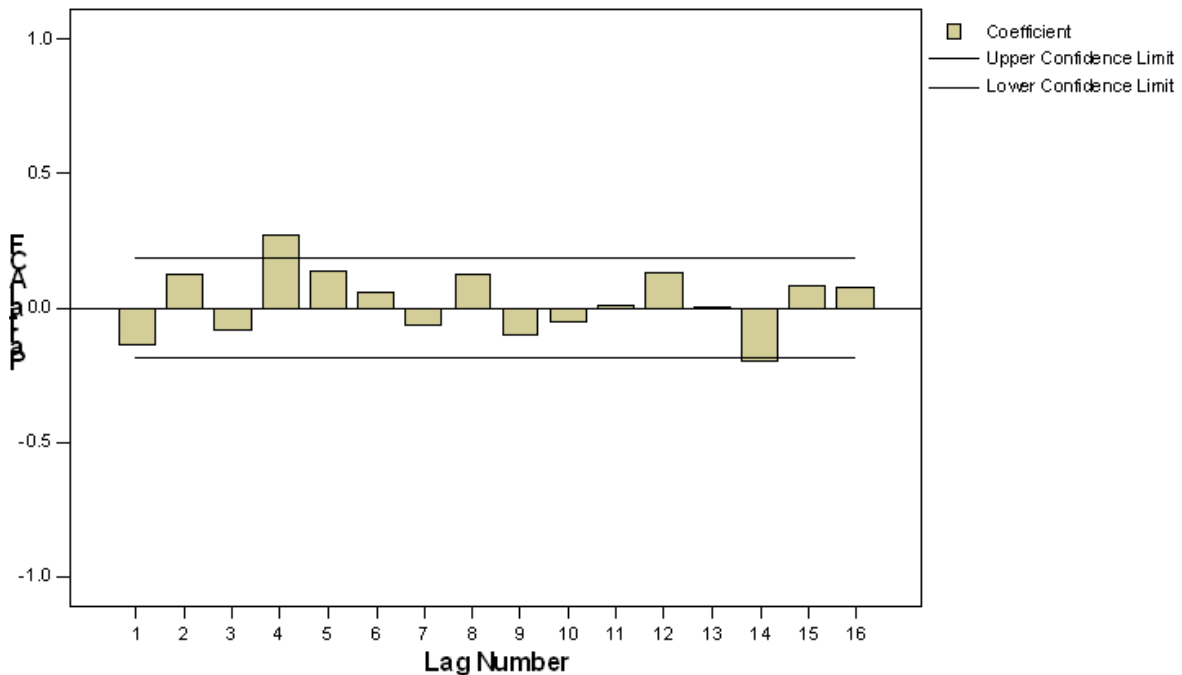


Figure 36: Plot of Partial Autocorrrelation Function of residuals to test for white noise

The residual analysis leads us to conclude that the estimated model is statistically robust and it can be used to develop forecasts.

Housing Price Forecasts

Using the above-mentioned model, we developed a housing price forecast from 2008 to 2015, which is presented in Figure 37. It is interesting to note that the model has been able to capture the housing price dynamics from 1980 to the end of 2007. The forecasted and actual housing prices (log transformed real housing prices) are almost identical for the in-sample forecasts (referring to the time period for which the data are available, i.e., 1980q1 to 2007q4). Also plotted in the figure is a 95% confidence interval around the forecasted values. Figure 37 shows four distinct lines representing real home prices (log transformed), forecasted home prices (also log transformed) and the 95% confidence level bands. From 1980q1 to 2008, real home prices and the modelled home prices lie close to each other. Starting in the first quarter of 2008, we present the forecasted home prices and the upper and lower confidence intervals around those prices.

The estimated forecast suggests that housing prices are likely to follow a downward trend over the next few years. However, since this forecast is based primarily on the lagged values of the dependent variable and other explanatory variables have not been included in the model, the forecasts generated here are not reflecting the influence of other factors, such as change in household income levels, etc. on housing prices in the future. It is unlikely that the housing prices will continue to decline until 2015 as predicted by the model. The trends in this forecast is primarily driven by the downward trend in housing prices observed in the second half of 2007. However, a short term forecast of declining housing prices in 2008 and 2009 is likely to be more credible. Furthermore, one could see from the figure that as the forecast is extended into the future, the confidence interval around the forecast expands dramatically suggesting that long-term forecasts could fluctuate in a wide interval.

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Figure 37: Plot of log transformed real home prices, forecasted home prices, and the confidence intervals around the forecasts

Growth Scenarios and Housing Prices

We would like to determine the impact of different growth scenarios on housing prices in Calgary. The City of Calgary has identified three growth scenarios for discussion in the context of the Plan It Calgary initiative, namely: Dispersed, Hybrid, and Compact scenarios (City of Calgary, 2008). Table 15 shows targeted new population location and estimated housing mix at the end of the planning period (i.e., about 60 years) under each scenario. We first discuss briefly the three scenarios and then offer projections for housing prices in light of the three scenarios.

Dispersed Scenario

The dispersed scenario assumes a continuation of current trends and existing City policies. Most new development will occur at the urban fringe, with 73% of the new population accommodated in greenfield developments. Under the dispersed scenario, urban growth is assumed to extend past current city boundaries. Redevelopments of existing areas would accommodate 27% of the new population around LRT stations and

other strategic transport corridors. Rapid transit lines are expected to continue expanding in a radial manner, using the urban core as a hub. Single detached homes would make up 60% of the city’s housing stock while higher density dwellings would constitute the remaining 40%.

Compact Scenario

The compact scenario offers a radical shift from the dispersed scenario. The compact scenario restricts all future growth to existing urban areas with no new consumption of greenfields for urban development and foresees 100% of the new population accommodated within the existing urbanized area. Intensification within the already urbanized area is assumed to result in redevelopment of the existing single-family detached housing stock in a denser format, including mixed-use apartments, town houses and duplexes. The compact scenario assumes that 40% of the existing single-family homes would be redeveloped as higher density neighbourhoods. Redevelopment would create mixed-use neighbourhoods near transit and along commercial corridors, favouring alternatives to driving such as walking or biking and public transit. Under this scenario, the share of single-family homes would drop to 15% of the city’s new housing stock.

Hybrid Scenario

The hybrid scenario is situated somewhere in between the compact and dispersed scenarios. This scenario accommodates 28% of the new population in greenfield development but limits all new growth to within existing municipal boundaries. The remaining 72 percent of new population would be accommodated through redevelopment of already urbanized areas. The hybrid scenario assumes that the majority of new employment and residences would be located within targeted activities centres and along rapid transit lines. The share of single detached housing in the housing stock is projected to be about half of what it would be under the dispersed scenario.

Table 15: Population location and housing stock mix under the three growth scenarios

		Dispersed	Compact	Hybrid
New population location	New communities	73%	0%	28%
	Existing areas	27%	100%	72%
New Housing Mix	Single detached/doubles	60%	15%	31%
	Townhouse/row	7%	14%	15%
	Apartments, four storey and over	30% ²	65%	47%
	Apartments, five storey and over	3%	6%	7%

Source: City of Calgary, 2008.

Given the non-spatial nature of our time series models, we are unable to account for spatially-targeted developments. However, we can attempt to model the essence of the interventions proposed in the various scenarios. Our time series data base offers a breakdown of building permits by housing type. The average mix of permits issued over

² The source document contains an error in the estimation of the housing mix for the dispersed scenario. The various housing types add up to only 91%. We have adjusted the numbers to add up to 100%.

the last five years (2002-2007) was 56% singles, 6% doubles, 8% town/rowhouses, and 29% apartments. Thus, the dispersed scenario assumes that the current mix of housing types will continue more or less unchanged, whereas the hybrid scenario gives greater weight to medium density housing forms such as rows and townhouses and the compact scenario gives greater weight to apartments.

The goal here is to determine the correlation between housing prices in Calgary as a function of the type of new housing being developed. We return to the same database to explore answers to the questions discussed above. We estimated an ARMA(2,0,0) model with the following independent variables:

- Percentage of single-detached permits issued in a year
- percentage of doubles permits issued in a year
- percentage of apartment permits issued in a year
- percentage of row housing permits issued in a year
- a variable "trend" to account for the fact that prices have generally increased over time

We have converted the actual permits data into percentages and re-estimated models. One can recall that previous models did not find any significant correlation between the number of building permits issued and housing prices. However, we have transformed the permits data from their absolute values to percentages to reflect the mix of housing being developed. The transformed variables result in a different correlation structure with respect to housing prices than the one where building permits are used as absolute values. The model is presented below:

Table 16: ARMA model to determine correlation between housing type and housing prices

Variable		
ln_realp	trend	.00408798
	per_sing	.0002331
	per_dbl	-.00260429
	per_apt	-.00004511
	per_row	.00084653
	_cons	12.032662***

ARMA	L.ar	1.3181819***
	L2.ar	-.33399837***

sigma	_cons	.03572406***

Statistics	N	112
	aic	-406.52657
	bic	-382.06008

legend: * p<0.05; ** p<0.01; *** p<0.001

From the table, we see that housing topology proxies, i.e., building permits by type of housing, returned statistically insignificant coefficients. This is similar to the results presented earlier where the supply side determinants were found to be insignificant determinants of housing prices. However, the negative coefficients for the percentage of doubles and percentage of apartments suggest that provision of these types of housing is correlated with lower housing prices. The positive (albeit statistically insignificant) coefficient for percentage of single detached housing suggests that this type of housing has a positive correlation with housing prices.

While the above-mentioned results do not offer conclusive evidence of short-term interdependencies between housing prices and the supply of a particular type of housing, the negative coefficient for doubles and apartments suggest that perhaps in the long run this relationship may hold. Furthermore, housing prices within a neighbourhood are determined primarily by the existing stock, and not by the housing being built or housing planned for future construction. This suggests that one should explore the relationship between existing housing mix and housing prices.

For this purpose, we turn to the census data from 2001 (2006 data on housing prices have not yet been released by Statistics Canada) to determine the correlation between housing mix within a neighbourhood and the price of housing. Using the census tract data for 2001 we determined the percentage of housing for the above-mentioned housing types and estimate correlation between housing typology and housing prices. The results are presented in Table 17.

Table 17 offers evidence in support of the argument that higher density housing is correlated with lower housing prices. However, given that the percentage of apartments returned a positive, yet statistically insignificant, correlation with housing prices, these results need to be interpreted with care. One could see that housing prices are positively co-related with single detached housing and negatively correlated with doubles and row housing. Therefore, one can argue from the above results that housing prices are likely to be higher in neighborhoods with higher percentage of single detached housing, whereas housing prices are likely to be lower in neighbourhoods with higher incidence of doubles and row housing. As we have indicated above, the results for apartment housing remain inconclusive because of the statistically insignificant correlation coefficient between percentage of apartments in a census tract and corresponding housing prices.

Table 17: Correlation between housing mix of the existing housing stock and housing prices

	owner_avgval\$	Per_singles	Per_dbles	Per_row	Per_apt
Pearson Correlation owner_avgval\$	1	.180*	-.266**	-.317**	.028
Per_singles	.180*	1	-.257**	-.334**	-.866**
Per_dbles	-.266**	-.257**	1	.160*	-.059
Per_row	-.317**	-.334**	.160*	1	-.097

Per_apt	.028	-.866**	-.059	-.097	1
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*. Correlation is significant at the 0.05 level (2-tailed).

** . Correlation is significant at the 0.01 level (2-tailed).

From the above discussion, we can conclude that the compact and hybrid scenarios are likely to result in lower overall housing prices for Calgary compared with the dispersed scenario, which is likely to result in greater incidence of single-detached housing. The compact scenario would force all new development into already built areas and result in a higher percentage of high density apartment units.

The above analysis of the data for housing mix and prices suggest that housing mix is correlated with housing prices. The above analysis is based on a snapshot of the housing market observed in 2001. Would these relationships hold in a dynamic model that links housing mix and other demand variables with housing prices? The next section attempts to answer this question. We build a new time series database of housing mix, population, and employment for the Calgary CMA and apply ARIMA models to capture the relationship between the housing mix of the existing housing stock (not merely that of building permits) and housing prices. Furthermore, we use the new model to forecast housing prices based on the simulated housing stock for the three development scenarios proposed by the City of Calgary.

Housing Prices and Mix of Housing Stock

This section explains the development of a time series database to model the dynamic interactions between housing mix of the existing housing stock and housing prices in Calgary. The database, which is drawn from Calgary's Civic Census, includes a breakdown of housing by structural type: singles, doubles, row, and apartments. Figure 38 presents the composition of the housing stock in Calgary during the study period. One could see that the percentage of housing stock comprising single detached housing declined slightly during the 1980s, but started to increase yet again in the 1990s. At the same time, apartments, which constitute the second largest segment of housing in Calgary, experienced an increase in their market share in mid-1990s, only to be followed by a slight decline in apartments' market share during 1990s and beyond.

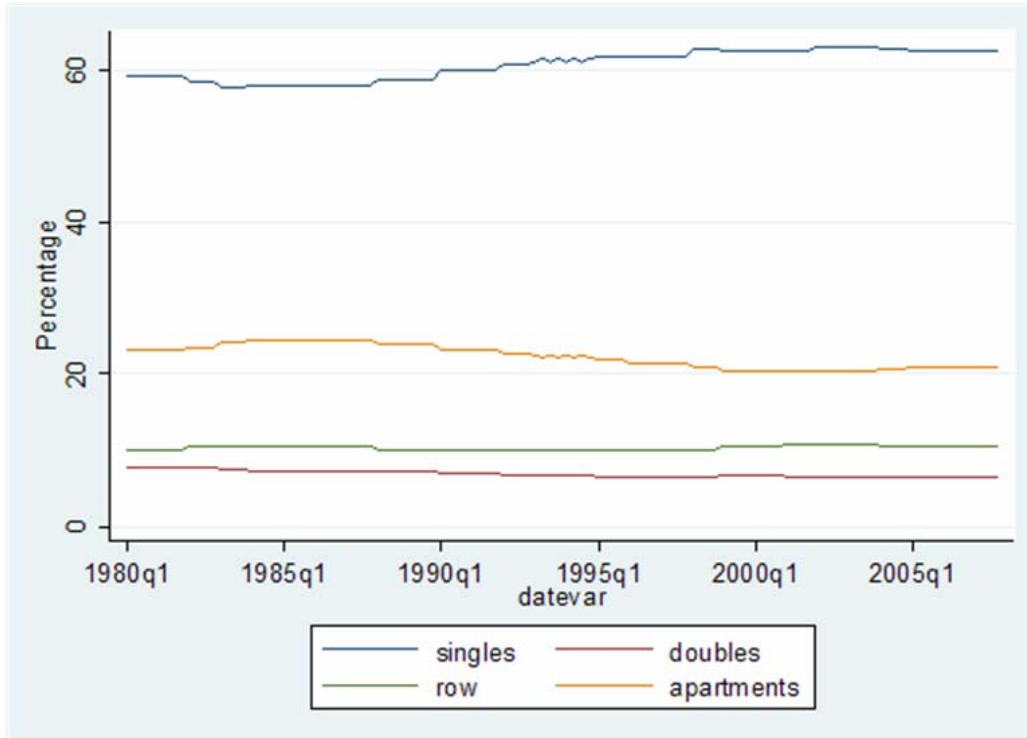


Figure 38: Breakdown of housing stock by structural type over the study-period

Source: City of Calgary

We also obtained data for population and employment from Statistics Canada for the same time period to use as proxies for housing demand in the econometric model. Mathematically, we estimated the following model:

$$\text{LN}(\text{housing price}_t) = f(\text{housing mix}_t, \text{population}_t, \text{employment}_t)$$

The model was estimated using data for the period 1987.q1 to 2007.q4. Since the employment and population data were available only for the shortened time series starting in 1987, we had to estimate the model for the truncated time series rather than the longer time series that began in 1981. A breakdown of the dependent and explanatory variables used in the model is presented in Table 18.

Table 18: Summary statistics of the variables used in the model

Variable	Obs	Mean	Std. Dev.	Min	Max
singles	112	60.59412	1.933448	57.71658	63
doubles	112	6.858915	.4729906	6.26237	7.735692
row	112	10.30707	.2418102	9.944893	10.59686
apartments	112	22.27717	1.521042	20.3653	24.47043
ln_realp	112	12.11048	.2211262	11.78209	12.79721
ln_pop	108	13.60814	.1848392	13.29252	13.93623
ln_emp	83	13.08299	.1964514	12.79802	13.45128

We experimented with various specifications for the econometric model. We started off with an autoregressive specification carrying two lags of the dependent variable, followed by another autoregressive specification with four lags, followed by a third specification

with two autoregressive and two moving average parameters. Based on the goodness of fit statistics reported in Table 19, we have selected ARMA (2,0,0) as the chosen model because it produced the lowest values for AIC and BIC.

The ARMA (2,0,2) model, reported first in Table 19 suggests that the demand-side variables, represented by population, are significant determinants of housing prices as well as the two autoregressive parameters. Furthermore, the housing mix variables returned statistically insignificant coefficients, yet suggesting a negative correlation between housing supply and housing prices.

Table 19: ARIMA models to capture relationship between housing prices and the stock mix

Variable	ARMA_200	ARMA_400	ARMA_202
-----+-----			
ln_realp			
singles	-.01539841	-.00980605	-.01815362
doubles	-.00550336	-.079362	-.06455915
row	-.0570614	.05499872	.00463443
apartments	-.03321731	.01662967	-.00495114
ln_pop	1.916331**	1.7144362*	1.8925128**
ln_emp	-.35080615	-.10619587	-.2936173
_cons	-7.1570933	-9.699558	-8.2873307
-----+-----			
ARMA			
L.ar	1.2731063***	1.548819***	.02212756
L2.ar	-.31966112**	-1.1633474***	.77999525***
L3.ar		.92605866***	
L4.ar		-.36073921***	
L.ma		1.6551909***	
L2.ma		.76140071***	
-----+-----			
sigma			
_cons	.03340302***	.02919832***	.03021042***
-----+-----			
Statistics			
N	83	83	83
aic	-305.82095	-323.29741	-317.35871
bic	-281.63254	-294.27132	-288.33263
-----+-----			
legend: * p<0.05; ** p<0.01; *** p<0.001			

Once we had estimated the model, the next task was to generate in-sample (up to 2007q1) forecasts for housing prices as well as out-of-sample forecasts (2008q1 to 2015q4) using the explanatory variables listed in the model. The in-sample forecast generated by the model is presented in Figure 39, which shows that the model is able to capture housing price dynamics in Calgary.

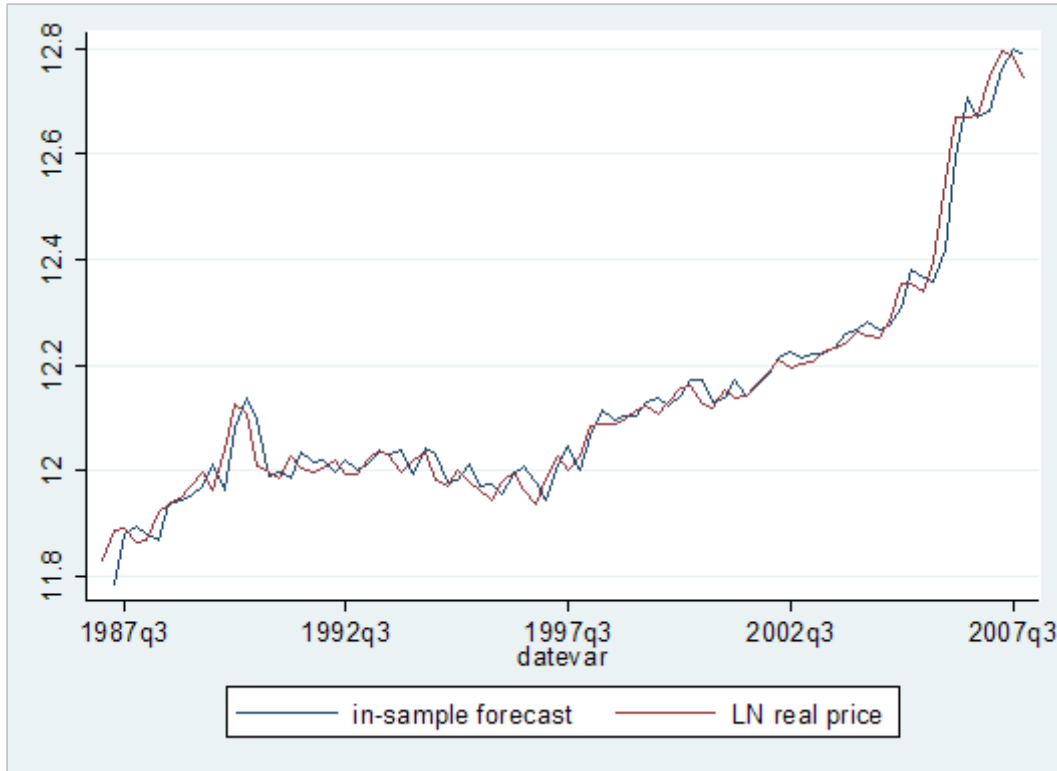


Figure 39: In-sample forecast using ARMA(2,0,0) model

The out-of-sample forecasts require one to make assumptions about the future values of housing mix, population, and employment. Based on the three development scenarios: compact, dispersed, and hybrid, we have developed three realizations of the future (simulated) housing mix in Calgary. For the forecast time period (2007q1 to 2015q4), the average mix for the singles for the dispersed scenario is 60.5%, for hybrid 58% and for compact scenario 55.6%. However, the real dynamic is in the gradual change in the housing mix under each type of scenario that is more explicitly revealed in a graph.

Figure 40, Figure 41, and Figure 42 present the dynamic change in the simulated housing mix under hybrid, compact, and dispersed scenarios. Figure 40 figure reveals that the proportion of singles declines over the forecast years from a high of 62% to a low of 58% for the dispersed scenario. Whereas the proportions of other types of housing increase during the same time period. We generated the simulated housing mix for dispersed and compact scenarios and then applied the model to forecast housing prices under the three development scenarios. A comparison of the housing price forecasts obtained from the development scenarios is presented in Figure 43.

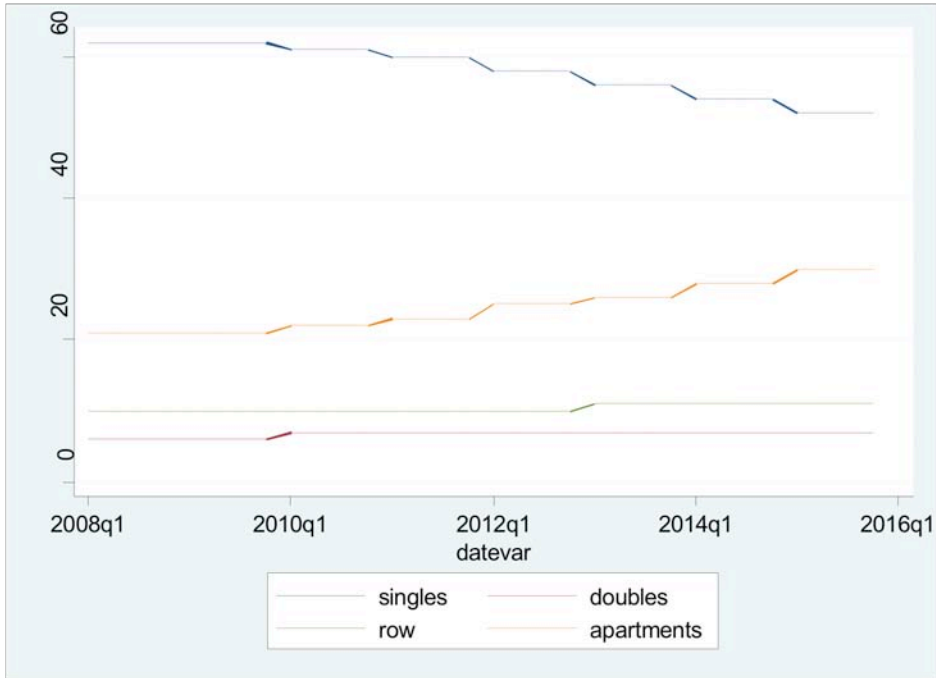


Figure 40: Housing mix for hybrid scenario from 2008q1 to 2015q4

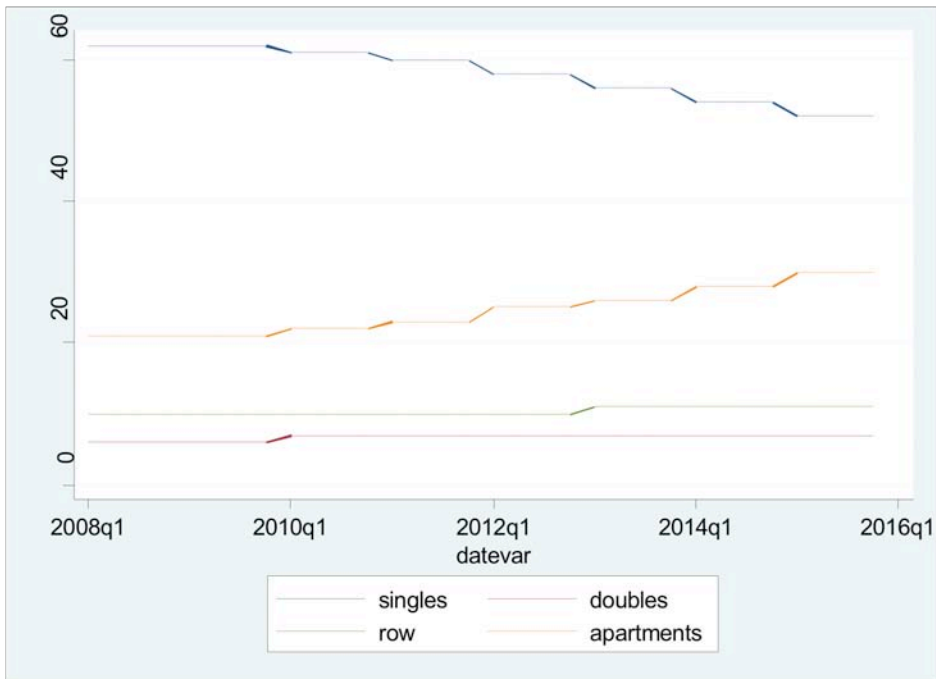


Figure 41: Housing mix for compact scenario from 2008q1 to 2015q4

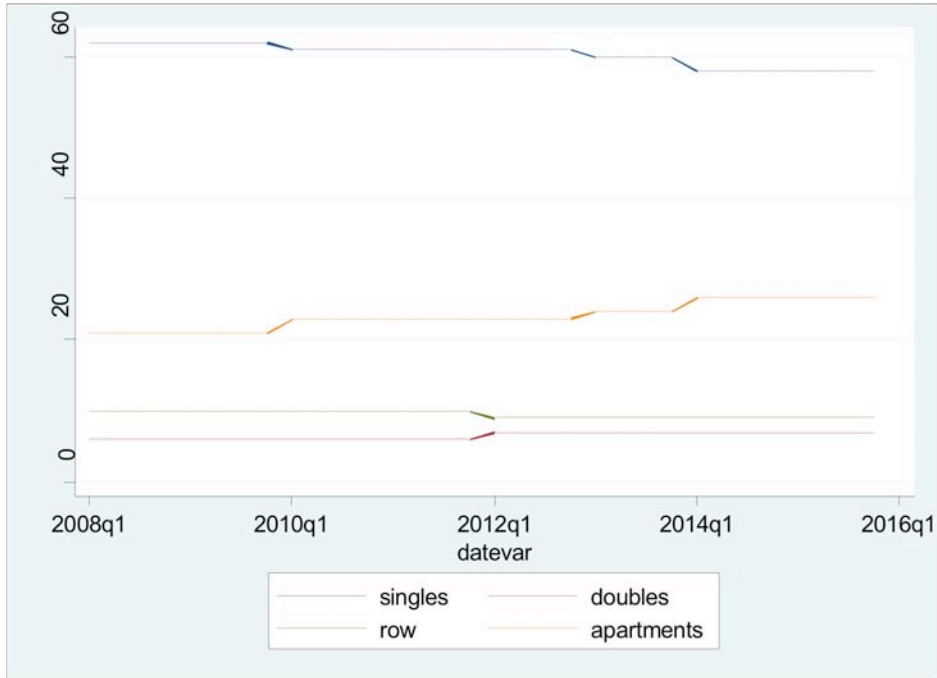


Figure 42: Housing mix for dispersed scenario from 2008q1 to 2015q4

The figure below presents four time series: log-transformed real housing prices and the three housing price forecasts corresponding to each development scenario. The forecasts obtained from the model suggest that real housing prices are likely to increase over time under the dispersed scenario. However, real housing prices are likely to decline over time under the compact and hybrid scenarios. Moreover, real housing prices are likely to decline more under the compact scenario than under the hybrid scenario.



Figure 43: Housing price forecasts for the three development scenarios

Before we discuss these results any further, a few caveats are in order. First, these forecasts are generated using a simulated housing stock mix variable derived from the growth targets outlined by the City for purposes of its Plan It exercise. The forecasts are therefore a reflection of the subjective input used in generating the housing mixes. Furthermore, we have relied on the population and employment forecasts generated by Urban Futures for the Sustainable City Team (Urban Futures, 2008). Once again, the forecasted growth in employment and population reflects the subjectivity of the consultants. Lastly, the jump in housing prices observed in 2008q1 is a result of a jump in population and employment forecasts generated by Urban Futures. Afterwards, the population and employment numbers grow in a linear fashion.

The results presented here suggest that the dispersed scenario, which is likely to target new housing to the urban fringe, will generate larger and more expensive homes in the future. On the other hand, compact and hybrid scenarios, which are designed to create more high density housing, are likely to produce smaller homes in central built-up areas. Such small-sized homes are likely to be less expensive and therefore the average housing prices would decline under the compact and hybrid scenarios.

That a more mixed housing stock would put downward pressures on the overall price of housing in Calgary makes theoretical sense. The housing stock gradually changes as developers and homebuilders react to market demands in the context of the planning and development environment created by City policies. Altering the housing type mix does not significantly alter the number of households active in the housing market; even when

the demand for housing is high, it is still influenced by the finite number of households looking for new housing. When prices are high, home buyers and renters tend to reduce their housing expectations and move to higher density housing forms, such as multi-family units. If the growing demand for multi-family units is met through builder and policy responsiveness, pressures on the single-family market should subside and prices tend to stabilize. Multi-family housing units are generally lower in price than the single-family housing units and therefore the average price of the entire housing stock made available at a given time would be lower in the presence of more multifamily and single-family housing units. In an unresponsive market, there is less choice as to housing form and some households who would otherwise prefer to reduce housing costs (e.g., smaller households comprising of singles, couples without children, or households with one child) are constrained to remain in detached units, consuming more housing than optimally required. The lack of housing choices may therefore inadvertently result in higher price inflation for single-family units.

Conclusions

The analysis presented in this chapter suggests that a shift in housing mix is likely to have an impact on housing prices. We have simulated housing prices in light of the suggested housing mix under the three development scenarios. The results obtained from the time series econometrics models suggest that the low-density development, which is the expected outcome under the dispersed scenario, is likely to correlate with an increase in real house prices in future. However, the high-density development under the compact scenario, and the relatively high-density development under the hybrid scenario, are likely to result in a decline in housing prices in future.

The results obtained from the econometric model reinforce the results obtained from the correlation analysis of existing housing stock and housing prices reported in the 2001 Census. The Census data also returned a positive correlation between low density housing and housing prices and vice versa.

Though the models reported in this chapter conform to the micro economic theory, one should note that the housing supply variables did not return statistically significant coefficients. Instead, the demand side variables, such as increase in population, and auto-regressive parameters returned statistically significant coefficients.

References

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6. Policies Affecting Housing Affordability

A broad range of policies promulgated by all three levels of government has an impact on housing affordability in Calgary. This chapter provides an overview of the programs, legislation, plans, regulations, standards and other policies and implementation tools that have a direct or indirect impact on housing affordability. The intent here is to set the stage for the discussion of policy measures that appears in the next chapter and the conclusions and policy recommendations that appear in the final chapter. Information for this chapter was drawn from interviews with industry representatives, City staff and other stakeholders, government documents, and internal and external reviews of affordable housing affordability policies (City of Calgary, 2004a; Calgary Chamber of Commerce, 2008).

We begin with an industry perspective on this topic, outlining the main factors interviewees raised when asked to identify the key government actions that affect housing affordability in Calgary. We then present more detailed descriptions and assessments of these policies, organized by level of government. The industry perspective is woven into this discussion as appropriate but other sources are also used to provide a balanced presentation.

Industry Perspective

Many of the policies covered in this chapter were raised as factors that affect housing affordability (both positively and negatively) during the interviews conducted for this study with developers, builders and development consultants. Overall, interviewees felt that the federal government did not have a strong influence on housing affordability, except through activities of CMHC and the GST. Provincial policies were seen to be more significant, in particular the MGA, wetland protection policies, open space requirements, building code, Condominium Properties Act, and Residential Tenancies Act. Most of these policies were described as having a negative effect on affordability by either restricting the municipality from undertaking actions to promote affordability or by increasing the costs of residential development and construction.

Most significant of all, however, were municipal policies. The main issue raised by almost every interviewee is the inefficiency and complexity of the approvals process, which they see as a key factor driving up costs. The growth management process was seen as largely effective in controlling land supply to keep prices down, although problems have arisen with the process over the last couple of years as demand has outstripped the supply of land. Wetland protection policies were frequently cited as an emerging threat to affordability as the City and Province requirements for conservation or mitigation have recently been raised.

Some interviewees felt that the LUB already allowed for small enough lots, while others thought more could be done in this respect to encourage lower costs housing. Although

secondary suites have been legitimized in the new LUB, some interviewees considered the conditions for adding them to an existing property to be quite restrictive. Parking standards in the LUB were seen to be adding costs for multi-family housing. Where road standards are concerned, there was consensus that narrower roads would help reduce costs but developers who have experimented with alternative standards reported encountering stiff opposition from city administrators. Finally, open space requirements and recent changes to the way development levies are assessed are also adding to housing costs, according to several interviewees.

Federal Policies

The federal government does not have direct responsibility for housing matters in Canada, but various departments and agencies of the federal government are nonetheless important participants in influencing the affordability of housing in Canada. Overall management of the economy, financing (including interest rates and the supply of funds for assisted housing), taxation policy, creation of model building and energy codes, assistance for municipal infrastructure, and research and information dissemination all influence the availability, demand for and cost of housing in Canada. While a large number of federal agencies are involved in these activities, the main federal agency involved in affordable housing is the Canada Mortgage and Housing Corporation (CMHC).

CMHC

Founded in 1946, CMHC originally engaged in direct mortgage financing for returning veterans, later shifting its strategy to focus on guaranteeing mortgage loans lent by private banks to private and non-profit developers. After growing to develop mixed-income projects in the 1960s and 70s, the 1980s and 90s saw deep cuts in the total amount of federal assistance and retrenchment around funding low-income housing. As housing is an area of shared jurisdiction between the federal and provincial governments, agreements and accords that combine federal and provincial money in provincially-administered programs continue to characterize CMHC's approach.

In addition, CMHC works in partnership with the housing industry to encourage the design and development of affordable market housing. It enhances the private housing market through activities such as permitting the use of registered retirement savings plans as down payments for home ownership, and more recently, waiving the requirement for down payments altogether. Partnerships with private and non-profit organizations have been encouraged through the Centre for Public-Private Partnerships within CMHC. This has led to the ad hoc development of affordable housing projects throughout the country, using a variety of tools and resources. Proposal Development Funding (PDF) enables private or non-profit housing proponents to develop affordable housing project proposals to the point where they can apply for mortgage financing.

CMHC assists the development industry to respond to affordability issues through its housing research and information dissemination program. The agency conducts research

on housing affordability and related topics, posting results on its web page, operating the Canadian Housing Information Centre, and organizing workshops with industry stakeholders across the country. CMHC is also a partner with the Federation of Canadian Municipalities and the Canadian Home Builders Association in the Affordability and Choice Today (ACT) program, a research/demonstration initiative that encourages regulatory innovations leading to lower housing costs and an improved range of housing choices.

GST Rebate

The federal government has contributed to the affordability of new housing by progressively reducing the GST rate from 7% to 5% over the last two years. The GST/HST New Housing Rebate program provides a rebate on part of the GST paid purchase of most newly constructed or substantially renovated houses used as a primary place of residence. The rebate reduces the GST paid from 5% to approximately 3.5% for homes valued at \$350,000 or less. The rebate is gradually reduced to zero for homes valued from \$350,000 to the maximum value of \$450,000. According to some developers, the fact that these thresholds have not changed over the years is contributing to rising housing prices, as progressively fewer houses qualify for the rebate.

Provincial Policies

The provincial government sets the overall regulatory environment within which municipalities in Alberta act. The Municipal Government Act (MGA) is the statute in Alberta that enables municipalities to govern. It establishes the regulatory structure for land use planning and development. Other statutes such as the Condominium Property Act and Residential Tenancies Act also impact the supply of affordable housing.

The Municipal Government Act

In Alberta, municipalities are created by and derive their powers primarily from the Municipal Government Act (MGA). Under the MGA, municipalities have broad powers to act and pass bylaws in many ways that directly or indirectly affect housing affordability. Municipalities can only exercise their powers for municipal purposes, which are broadly stated by the Act: to govern effectively, provide public services and infrastructure, and develop and maintain safe and viable communities.

The MGA provides municipalities with two main sources of power to accomplish these purposes. Firstly, municipalities have “natural person powers”, meaning they have all the rights that the common law attributes to a natural person. This includes the power to borrow and lend money, buy and sell land, make investments, restrict activities on land that they own, etc. These natural person powers are subject to any express restrictions set out in the MGA or other legislation.

The second main source of municipal authority is the general power to pass and enforce bylaws. Municipalities may pass bylaws respecting a variety of municipal issues, including:

- (a) the safety, health and welfare of people and the protection of people or property;
- (b) people, activities and things in, on or near a public place or place that is open to the public;
- (c) nuisances, including unsightly property;
- (d) transport and transportation systems;
- (e) businesses and business activities;
- (f) services provided by or on behalf of the municipality; and
- (g) public utilities.

The MGA provides that the general bylaw power is stated in general terms to give broad authority to councils to respond flexibly to present and future issues in their municipalities. In addition to this general power, the MGA provides municipalities with specific land use planning powers, control and management of roads and water bodies, authority to expropriate and annex land, and the power to raise revenues through property, business and other taxation. These powers and those listed above are exercised through the passing of bylaws, resolutions, and related municipal policies.

While the wording of the Act seems broad, there are several issues on which the Act is silent, and which therefore tend to constrain municipal activity with respect to housing affordability. At a general level, the Act does not give municipalities the power to regulate tenure, price or occupancy. More specifically, the Act does not provide explicit authority for municipalities to establish inclusionary land use regulations (i.e., require the provision of housing units that are affordable to target populations as a condition of planning approvals for residential development and redevelopment proposals). Nor does it allow municipalities to restrict the conversion or demolition of private rental housing or require developers to replace lost rental units. While it permits density bonusing, it does not specify that this can be used to encourage affordable housing. And because the act does not identify affordable housing as a municipal planning objective, density bonusing for this purpose might be open to legal challenge (City of Calgary, 2004b).

The Act also sets the terms of financial relationships between municipal government and private businesses. Municipalities are able to cancel or refund all or part of a tax or fee or defer the collection of a tax or fee. They can also dispose of lands at below market value. This provides municipalities with some leverage to encourage developer interest in providing affordable units. However, the Act does not allow municipalities to provide discounted loans to private developers who would like to produce low-cost housing.

Residential Tenancies Act

The basic statutes that define leases and the relationship between landlords and tenants are set out in the 1992 *Residential Tenancies Act* (RTA). Some provisions of the RTA permit landlords to charge one-time fees and raise rents in ways that can lead to a rapid escalation of housing costs for tenants and negatively impact affordability. The RTA

allows for application fees, pet fees, key fees, parking fees, and re-rental fees (to terminate a lease early), though the courts have ruled that these fees must correspond to legitimate expenditures or risks incurred by the landlord and not become punitive or excessive. Alberta law places no limits on the amount of rent increases. While there is a slight variation depending on the length of the lease (weekly, monthly or for another term), the RTA effectively permits rent to be raised every six months for such periodic tenancies, with three months' notice. For fixed-term leases, the lease agreement can contain language permitting the landlord to increase rent during the lease, and once the term of the lease ends the landlord is free to change any of the terms. Calgary's white-hot housing market puts pressure on landlords to take advantage of the frequent opportunities to raise rents offered by the RTA. Rental property owners with an interest in conversion to condominium sometimes raise rents to exorbitant levels expressly to encourage renters to vacant units.

Condominium Property Act

The Condominium Property Act (CPA) is a provincial statute passed in 2000 that outlines how condominium buildings are operated and managed in Alberta. Stipulations in the CPA can significantly inhibit a municipal government's ability to control the conversion of existing rental housing into condominiums, and thereby affect overall housing affordability. Section 10(2)(a) of the *Condominium Property Act* provides that a municipal authority may prohibit the demolition or conversion of an existing rental unit building if the building was constructed prior to August 1, 1966. However, the City has no power to decline a conversion permit for buildings constructed after 1966. As a result, the City of Calgary has seen its supply of affordable private rental housing decline at an alarming rate. Between 2001 and 2006, 4,794 rental units in Calgary were lost through conversion to condominium or demolition, representing 10 percent of the city's rental stock.

Wetland Policy

Published in 2007, the Provincial Wetland Restoration/Compensation Guide provides information to government regulators, land developers, the public and wetland restoration agencies on the application of the Water Act in case of wetland loss. The guide stipulates that, once an approval to impact a wetland is issued under the Water Act, the developer must restore three hectares of equivalent wetland for each hectare of natural wetland impacted or lost. This 3:1 replacement ratio is a suggested minimum; the ratio may reach 10:1 depending on the type of wetland, its degree of permanency, the distance of restoration from the impacted site and the importance of species at the impacted site (Alberta Environment, 2007). The provincial policy is implemented through the development approval process administered by the City. See the section on Wetland Conservation Policies below.

Alberta Building Code

The Alberta Building Code is a provincial statute that is based on the National Building Code of Canada and modified to suit the Alberta legislative framework. It provides minimum requirements for buildings to ensure that they are structurally sound, safe from fire, free of health hazards and accessible. The code's safety standards apply to the construction of buildings (including extensions and renovations) and the evaluation of existing buildings undergoing a change of use or occupancy. Recently, the Government of Alberta modified its building and fire codes to reflect the changing needs of the province's real estate market. The new Alberta building and fire codes came into force on September 2, 2007.

With the need to provide a range of housing options for the population, building codes must strike a balance between safety and affordability concerns. Although they are important tools to assure minimum levels of housing safety and quality, building codes can also add to the cost of housing and discourage innovation, thereby reducing housing affordability and variety (CMHC, 1996).

Provincial and national building codes often require that secondary suites be built according to apartment or duplex standards (Amery and Lord, 2006). Given that the newly developed provincial building and fire codes provides standards for basement suite development exclusively, they ignore important components of secondary suites, namely garden suites and garage suites. This in turn reduces the positive repercussions that building code adjustments have on housing affordability and choice.

Builders of multi-family buildings in Calgary claim that the Alberta building code is pushing up the cost of housing by gradually imposing higher standards, such as sound attenuation between apartment units and fire safety requirements. Moreover, the code no longer allows for fire lanes on top of parking structures, reducing the footprint of such structures. This presents the developer with a choice between accepting higher development costs (by stacking the parking structure) or reducing densities, both of which will raise housing prices.

The multiplicity of fire resistance rating requirements (i.e., duration that a building's passive fire protection system can withstand a fire resistance test) also tends to increase the cost of housing in mixed-use developments. For a single-use residential building, a 2-hour fire resistant separation is required. If the development contains commercial and residential uses, a 4-hour rating is required, which is effectively more expensive to build.

Finally, the building code defines a street as having a minimum road width of 9.0 m, which is sometimes used by municipal engineers to reject changes for smaller, less-expensive carriageways in appropriate locations.

Municipal Policies

Municipal land use planning has a significant impact on housing affordability. Using its authority to plan for and service land, the municipality can influence the location,

intensity of use, mix of uses, and transit provision to new communities. Using the planning and development control powers granted by provincial legislation, the municipality guides development either to greenfield or intensification sites, influences the form that housing will take, creates engineering and parking standards that influence the costs of development, sets out the opportunities for public input into development decisions, and establishes the rules that developers must follow in order to obtain approval for their projects. The municipality can also influence housing prices through its fiscal policies, such as infrastructure levies, and environmental policies, which may affect housing prices by influencing the amount of developable.

The presentation of municipal policies is divided into two sections: first we cover the regulations and development processes that directly affecting how land is planned and developed and then we present the range of plans and strategies that serve to create the more general planning framework.

Municipal Regulations and the Development Process

- *The Land Use Bylaw*

The new LUB, which came into effect on June 1, 2008, improves flexibility and removes several barriers to housing affordability that had been present in the previous bylaw. In terms of intensification potential, the new contextual multi-family residential land use districts provide a template for the integration of multi-family projects into existing neighbourhoods, where the multi-family project might be considerably taller and have a higher density than the surrounding built form. In itself, the new LUB does not represent a significant barrier to brownfield or greyfield development, to downtown development, to TOD or to the transfer of development rights.

The new LUB provides opportunities for creating diverse forms of housing. In particular, it goes a long way towards allowing smaller homes on lots. The new R-1N and R-C1N land use designations combine the best features of several slightly different small lot formats from the old LUB. Few municipalities in Canada allow lots as narrow and as small for single-detached homes as those afforded by the new Calgary LUB. Another significant feature is the introduction of fee-simple, narrow frontage rowhouses. Progress has also been made in accommodating secondary suites – they are now recognized as a legitimate use, albeit a discretionary one, and can now be built on sufficiently large lots in low-density (i.e., single-family) land use districts.

Nevertheless, certain further changes to the LUB could create more opportunities for infill development and further increase the potential for creating more affordable forms of housing. Multi-family housing remains by and large a discretionary use, even in the land use districts that are intended specifically for this type of housing. As a result, multi-unit projects invariably require development permits and are therefore subject to NIMBY responses through the appeals process. Though secondary suites have been legitimized in

the LUB, the conditions for adding them to an existing property are quite restrictive. Also, as they are a discretionary use, secondary suites require a development permit and are therefore open to NIMBY-based appeals. The LUB also poses a barrier to fee-simple laneway housing due to setback requirements.

The new LUB is more streamlined than the old LUB and therefore much easier to interpret. There are fewer land use district categories and each category allows for a greater degree of flexibility. This is likely to have a positive effect on the ease of reviewing planning applications, especially those for land use redesignations. On the other hand, the continued classification of potentially affordable dwelling types as discretionary uses may slow development of these types and make them vulnerable to NIMBY objections. As mentioned earlier, multi-family apartment building and secondary suites are both listed as discretionary uses and therefore require development permits.

The new LUB is notable for its parking standards. The current standards, which came into force even before LUB 1P2007, impose quite modest minimum residential parking requirements compared to those of other Canadian cities. The minimum requirements are decreased on the basis of proximity to downtown, LRT stations and high frequency bus corridors – a progressive feature. Moreover, maximum limits are imposed on the number of parking spots provided for apartments near suburban LRT stations. However, reductions below the current standard would be desirable at certain locations in order to improve affordability. The LUB still does not allow as-of-right reductions to minimum parking requirements for a number of factors that are known to mitigate car use – e.g., employment density, mix of uses, carsharing, walkability, etc. Furthermore, except for apartments near suburban LRT stations, the LUB does not impose maximum restrictions on the number of parking stalls per dwelling.

Finally, current minimum parking requirements for residents and visitors in multi-family buildings may be excessive. Higher than necessary parking requirements also impose indirect limits on density as developers avoid building more units on a site than can be served by a single-level of underground parking. Single-level underground parking is already fairly expensive; adding a second level increases construction time and sends costs soaring – potentially as high as \$15,000 per unit in a 60-upa development. Instead, developers tend to reduce the unit count, which increases the cost of land per unit. One builder reported that a 25% increase in parking requirements for suburban multi-family projects, which was imposed about three years, increased per unit land costs by \$6,000. With extra parking costs of \$4,000 per unit, the new regulation raised his building costs by about \$10,000 per unit.

- *Engineering Standards*

Engineering standards govern the physical size and placement of the infrastructure that services a development, including: lot grading; widths of roads and sidewalks; placement of public infrastructure such street lighting, storm sewers, and fire hydrants; and the placement of underground utilities such as electrical cables, telephone wires, gas pipes,

and water pipes. Engineering standards are specified in manuals used by staff in Urban Development to review development proposals.

Calgary's current engineering standards require a substantial amount of land in new developments to be set aside for streets, utilities, and stormwater management – up to 30% in a conventional suburban development – which adds considerably to the cost of land development. One barrier to changing the standards, as mentioned above, is the Alberta Building Code, which sets a minimum road width of 9.0 m. Another barrier is the tendency of engineers, public safety officials and private utility companies to oppose changes to engineering standards being proposed by outside agencies, usually out of concern for public safety and long-term infrastructure maintenance costs.

Despite this opposition, Calgary has experimented with alternative engineering standards in a number of new communities including McKenzie Towne and Garrison Woods. The developers of both projects had to negotiate intensively with approval authorities before being allowed to proceed with alternative standards, a process that delayed approvals and drove up project costs. A key issue seems to be that precedents set by past developments do not carry over to new developments. Planners for Canada Lands' Currie Barracks project say that they are being required to renegotiate engineering standards for which they had already received approval in Garrison Woods.

Traffic standards can also have an impact on housing affordability. Calgary has modified its land use bylaw to increase density limits or removed them altogether in many land use districts. As a result, in many locations, the maximum density of development may now be dictated by road capacity. It is not uncommon for modifications to development proposal to be required on the basis that proposed density would generate more traffic than the road network can handle. In effect, insuring an acceptable level-of-service on the road network may be acting to reduce densities, even in transit-friendly locations, and therefore to increase per residential unit costs.

In terms of storm water management, the City's current standards are still largely oriented towards off-site management. Standards oriented towards on-site storm water management, which have the potential to reduce life-cycle costs, are currently being developed by the Water Resources Department. However, buy-in from other departments is not strong and progress on this front may be slow.

- *Wetland Conservation Policies*

In 2004, Calgary City Council approved the Calgary Wetland Conservation Plan, which outlines policies and procedures for the identification, conservation and mitigation of Calgary Wetlands. The Plan's content adheres to provincial and federal laws and policies related to wetlands (e.g., Provincial Water Act, Fisheries Act). Where a development disturbs or destroys a wetland, the developer will be responsible for mitigating their impacts by restoring, enhancing or replacing the affected wetland. Otherwise, developers who wish to proceed with development in a timely fashion may opt to pay the City a compensation for the disturbance or loss of wetland. Funds to be provided as

compensation are equal to the sum of the cost of wetland enhancement/creation and the cost of land where disturbance or loss occurred (City of Calgary, 2004c).

In 2007, Calgary City Council adopted the Environmental Reserve Setback Guidelines, which requires that a buffer of at least 30 meters be provided from the edge of a wetland that serves important environmental functions. The City may reduce the setback width requirement if the primary function of the wetland is the provision of stormwater treatment rather than functioning as a natural wetland (City of Calgary, 2007b).

The guide stipulates that the developer is responsible for land acquisition, restoration work, monitoring/maintenance and administration fees of a wetland restoration project whose size is equal to the wetland replacement ratio determined by government authorities. Building and land developers have expressed concerns that such compensation will affect housing affordability in Calgary by limiting developable land or increasing development costs.

Provincial and municipal wetland regulations are implemented through the planning approvals process in Calgary. Outline plans are circulated to both the provincial government and the Calgary parks department for their comments. The City compiles comments from the City and the Province and sends them to the developer. The City makes the key decisions on the file.

According to interviewees in the development industry, the compensation and setback requirements for wetlands are putting a significant upward pressure on the price of housing in greenfield areas by reducing developable areas or increasing development costs. A further problem, according to a few interviewees, is that the definition of what constitutes a wetland is very broad. For example, a depression in a field that fills up only once every few years after a major rainfall might be considered a wetland.

- *Open Space Requirement*

Under the MGA, local authorities in Alberta are permitted to exact 10% of any land for which the property owner is applying for subdivision. This land is typically used for municipal parks and school sites. Many industry interviewees commented that the open space requirement added substantially to project costs, somewhere in the order of \$7,000 to \$10,000 per detached unit. Moreover, the open spaces produced as a result of this exaction are not being well used – i.e., the School Board does not build schools on many of these lands, dedicating them instead to uses with little added value such as soccer fields. An agreement with the City says that if the School Board no longer wants a site, it must give the City right of first refusal. However, the MGA prevents the City from using the site for any purpose other than recreation. The city currently has about 80 school sites that are vacant, some of them for up to 50 years (McGinnis, 2007). Many of these parcels are 10-12 acres in size and ripe for intensification.

- *Development Levies*

In growing suburban communities, Calgary levies development charges to pay for off-site infrastructure, such as storm sewers, major roads, expressways, inspection, local parks and recreational facilities. The formula for calculating the assessment is revised annually by the City (after consulting with the UDI) and set out in the standard development agreement (City of Calgary, 2007a). The levy is based on the acreage of development, an approach that tends to encourage higher density development as the charge per unit is reduced as density increases.

While the acreage assessment appears to be well structured from a Smart Growth point of view, greenfield developers interviewed for this study suggested that infrastructure charges for which they are liable are contributing to higher housing costs. The acreage assessment has increased dramatically over the last few years, going from \$17,000 per hectare to almost \$100,000 today. The increase was due to the inclusion of 3/5 of the cost of building highway interchanges in the items covered by the charge, introduced in 2004, and to a new levy to cover the costs of community and recreational facilities, introduced in 2006.

At the same time, the City appears to be relying more heavily on front-ending agreements where development is occurring ahead of infrastructure investment schedules. The developer will eventually be reimbursed front-ending charges, but he is still liable for the carrying costs in the interim, which could be many years. Interviewees estimated the total (acreage assessment plus front-ending) levy at \$10,000 to \$20,000 per lot. Many greenfield developers interviewed believed that the City was relying too heavily on development levies and that general taxation or other revenue measures should take a heavier burden for funding growth-related municipal infrastructure.

In established areas, the City is moving towards the introduction of formula-based development levies to pay for upgrades needed to aging sewer and sanitary systems. The first established area to see development levies imposed was Centre City, which has experienced significant development activity and a population increase over recent years. The new levies are applied on a per front metre basis, which tends to favour intensification of land uses as the charge does not increase with increasing density and can be defrayed over a greater number of units. At only \$4-5,000 per front metre, the per unit charge could be as little as \$2,000 on an 8 FAR site. Although the actual charge will vary, depending on the density, average charges in Centre City are lower than those paid in greenfield settings, which again favours intensification of existing areas.

Multi-family stakeholders active in the central area welcome the levy as a way to ensure that the needed municipal infrastructure is provided in a timely manner. Prior to the charge being introduced, some projects were derailed at the 11th hour when huge unexpected charges for off-site infrastructure were levied against the property owner. This discouraged developers from being the “first in” to an area needing revitalization. The new system identifies infrastructure needs in advance and spreads the cost of funding those needs across all benefiting developers on a rational, predictable basis. There was no indication that the system has led to a general increase in development costs or housing

prices.

- *The Planning Approvals Process*

Calgary's land use and development processes are directed by a set of interrelated plans, both statutory and non-statutory. The highest level of planning direction comes from the Municipal Development Plan (The Calgary Plan). All subordinate plans such as regional policy plans, area structure plans, and area redevelopment plans, must be consistent with the MDP. Together these plans set the framework for subdivision, redesignation, development permit and building permit approval processes.³

Development application and approval processes can add to the cost of housing through the delays and uncertainty they cause in the development process. If a project is delayed beyond the expected completion date, financing costs climb and must be folded into the selling price of the home. The academic literature reports that the final selling price of a residential unit must be inflated by approximately one to two percent for each month of delay in the approvals process (Seidel, 1978). This concurs with an estimate provided by one interviewee that a \$300,000 unit would escalate in price by about \$4,000 a month in order to cover the carrying costs. Thus, a four-month delay would add \$16,000 to the cost of the unit.

Delays also add to project uncertainty as market conditions may change and the demand for specific products may shift before construction begins. In addition to the cost of delays, there are the administrative and financial costs of complying with the requirements of the approval process, including preparing plans and drawings, undertaking studies, and negotiating with city administrative staff. As the complexity of the requirements go up, so do the costs to the developer.

There is a broad consensus among industry stakeholders that the planning approval process in Calgary is complicated and time consuming and that it is contributing significantly to higher housing costs. Among the numerous factors that slow the process down or increase compliance costs, two main themes emerged from the interviews:

- * the number and complexity of planning requirements: over the last few years the approval process has become slower due in part to an increase in the number and complexity of policy requirements (see section on Municipal Planning Policies below). Outline plans and land use redesignation have slowed because many finer-grained details are now established at an earlier stage in the development process. Obtaining a development permit is an especially time-consuming process as negotiations over architectural features (which are not explicit in the land use bylaw) are time-consuming.
- * internal administrative issues: One issue is the lack of coordination between departments. Developers reported that they receive replies from

³ More details on the planning approvals process and the problems associated with it are given in the policy capsule on this topic in Chapter 7 of this report.

different departments that often include conflicting recommendations. File managers are often inexperienced and refuse to “stick their necks out” by making decisions to resolve issues and consolidate replies into a coherent set of comments. The delays and the lack of coordination are likely to be the result of insufficient human resources at the City.

The industry position on the approvals process is more or less borne out by the City’s own monitoring program, which reports upon, among other things, the City’s average response times on applications. In the third quarter of 2004, 65% of applications were completed on time. By the third quarter of 2005, only 18% of applications were completed on time and this number declined to 15% during the fourth quarter of 2007. In addition, the average number of days needed to obtain a detailed review on an application has steadily increased. In the third quarter of 2004, the average processing time was 45 days. By the third quarter of 2007, the average processing time nearly doubled to 85, far in excess of the City’s own target times. The total time taken from application to final decision can be as much as 159 days, about five months (City of Calgary 2007c).

The City acknowledges that approval times are stretching out and that it needs to work with the industry to streamline the process and improve performance (City of Calgary, 2008a). In its own defence, the City points out that the number of planning applications it has had to deal with has escalated rapidly in the last few years. From 2004 to 2005, the total number jumped 17%, and increased a further 6.5% in 2006 (City of Calgary 2007c). This high application volume essentially overwhelmed the approvals process and resulted in a substantial backlog of applications. By the end of 2007, however, the volume of most application types levelled off or declined. As a result, the City has been able to reduce the overall application deficit significantly in 2008.

- *The Growth Management Process*

The City of Calgary has a sophisticated, transparent growth management process that is well supported by data gathering on land supply and demand, as well as regular reporting on trends and needs. The overall goals of the process are to ensure that the extension of the urban fabric takes place in a reasonably geographically contiguous fashion, ensure that municipal infrastructure investment in land development is timely, that there is a sufficient supply of land that is properly planned and budgeted for municipal infrastructure investment so as to accommodate fluctuations in growth rates over time, and to support a competitive suburban land market that will moderate changes in land prices.

The process is based on three land supply objectives:

1. Maintain a thirty-year land supply within The City’s jurisdiction: The City endeavours to maintain a thirty-year developable land supply within its municipal boundaries. Municipal boundaries are periodically expanded (i.e., through annexation) to meet this objective, the Uni-City concept.

2. Maintain a fifteen-year planned land supply: The City endeavours to maintain a fifteen-year supply of suburban land with approved policy plans in place (e.g., Area Structure Plans).

3. Maintain a five-year serviced land supply: The City manages investments in infrastructure to provide a three- to five-year supply of serviced land, in a variety of locations.

The City's Corporate Economics section provides population and employment projections for the city as a whole. The population and employment distributions for five-year time horizons, out to thirty years, are used by the various business units for strategic planning and growth management purposes. They are a key input into regional transportation modelling and provide the base information for reports produced by City-Wide Planning, including the Suburban Residential Growth Information Update, and Accommodating Growth: A Framework for Coordinating Municipal Capital Investment.

The Suburban Residential Growth report is an inventory of development activity that compares the existing supply of residential land to the anticipated development demand (based on forecasts provided by the Corporate Economics section) over the next five years. The inventory measures lot capacity from adding together registered lots from the annual Civic Census (vacant, under construction, newly built), subdivided but not registered lots (in approved and pending tentative plans), unsubdivided areas (from outline plans), and remaining areas within approved community plans. Updated on an annual basis, the report also identifies the infrastructure needs over the five-year period as a result of the anticipated growth.

The Accommodating Growth Framework is a longer-term planning document that sets out where new residential development is expected to occur over the next 10-15 years and how suburban expansion relates to the City's capital investments. It identifies the long-term infrastructure and servicing needs to support anticipated growth and ensures that infrastructure investment occurs in a coordinated, phased way. The framework is updated annually.

Most industry interviewees indicated that they viewed the City's growth management system favourably, saying it was an essential component of their own business planning. The system is transparent and identifies where development will be supported by the City through planning activity and infrastructure investments. This allows industry members to properly assess the risks in purchasing land in particular locations and largely determines the price they should pay for the land. The system has been developed in close collaboration with the industry and the key documents are widely circulated for comment by industry associations before being submitted to Council. According to industry interviewees, the system worked well for many years because the rate at which the City brought land into the planning system nicely matched the demand for land. Moreover, new communities were being planned in a variety of locations, this not only ensured that most developers could have active lands at any given time, but helped meet the City's goal of maintaining competition in land markets.

Recently, stresses have appeared in the growth management system, especially with regard to infrastructure needs. In the last few years, infrastructure investment requirements have ballooned due to the need to catch up from under-investment in city-wide infrastructure during the 1980s-1990s slump and the need to replace or upgrade aging infrastructure in established areas. Meanwhile, the number of greenfield communities that were being planned in order to address the current boom⁴ has grown to about 34. This has further strained the infrastructure servicing capacity of the City by spreading out growth and delaying build out, i.e., municipal services must be introduced into new communities years prior to the time when they would normally be justified according to municipal standards. All these strains have come together to raise questions as to the financial sustainability of the current growth management system.

The large number of communities being planned has also strained staff resources at a time when the planning department is involved with other major planning initiatives, including Station Area Plans, the Integrated Land Use and Mobility Plan, and the Calgary Regional Land Use Plan (with the Calgary Regional Partnership). As a result of these financial and staff concerns, the City announced (through planning department's work program) at the end of 2007 that it would postpone planning for newly annexed areas (City of Calgary, 2008b).

The development industry responded negatively to this announcement (Thomas, 2007). Although City planners estimate there is a 15-year supply of planned land, industry experts disagree, saying it is more likely between five and seven years. This they claim will put upward pressure on housing prices and could cause a scramble for land within a few years if the City does not reverse its position and bring more land into the planning process. City planners, however, point out that developers appear to underestimate the supply of lots because they don't include in their supply calculations lots with Tentative Plan approval, which are serviced and ready to transfer to builders.⁵ In other words, once a developer has subdivided the land, he considers the land to have been removed from the inventory of available supply, while the City continues to track it for two to three years until it is absorbed. At any rate, the UDI accepted the 2008 SRG report without challenging the City's numbers, which showed a healthy serviced land and lot supply.

A review of the land supply process conducted by the Calgary Chamber of Commerce and funded by the Alberta Real Estate Foundation, two organizations that are hardly hostile to the development industry in Calgary, concludes that Calgary's "land supply over the last decade has generally been quite generous. As the population has increased, the supply of developable land (i.e., property with approved zoning in place) has been more than sufficient to accommodate growth... In the absence of this policy, it is likely that housing price would have been far higher" (Chamber of Commerce, 2008: 28).

⁴ The average number of residential building permits issued from 2002-2006 was for 13,732 units. The average for the previous five years was 10,022.

⁵ There appears to be a bottleneck in the preparation of lots for sale to builders in that some developers are having difficulty finding contractors to install shallow utilities and pave roadways.

Municipal Planning Policies and Strategies

In this section, we present the range of plans and strategies that make up the general policy framework that guides municipal decision-making on development proposals. In the most general sense, the City's planning policy framework has been evolving towards a Smart Growth perspective since the adoption of the Calgary Transportation Plan in 1995. While industry interviewees did not focus on particular planning initiatives, enough comments were made to gather that those with a stake in low-density greenfield development were largely opposed to this framework, while those involved in multi-family development generally supported the evolving policy framework. Although greenfield stakeholders were not entirely hostile to the framework, they pointed out its downsides: claiming that the framework was out of step with market trends, added complexity and expense to the permitting process and lengthened approval times. Densities, they claimed, were increasing due to market pressures and that the best strategy would be to let the market do its work and remove policy distortions. Multi-family stakeholders saw the framework as a needed counterbalance to prevailing development patterns, a necessary redirection of development energies into more sustainable channels. Policy measures to increase densities were welcomed as a way to reduce housing prices in high land-cost areas of the city.

The planning framework is presented here in chronological order in order to capture its evolving nature and the interconnections among key documents. The various documents are presented in some detail because these initiatives are crucial to the consideration of potential policy measures raised in the next chapter and to the conclusions and recommendations made in the final chapter of this report.

- *Calgary Transportation Plan*

The Calgary Transportation Plan (GoPlan), approved by City Council in 1995, identified land use-transportation interactions as central to creating new housing options, and set out that new development and redevelopment should include a higher-density mix of housing types located close to a range of jobs. The plan also advocates a variety of housing types in new suburbs, and community design that reduces the costs associated with construction and maintenance of infrastructure.

Key policies from the GoPlan that would facilitate the provision of affordable housing forms and encourage housing in appropriate locations included:

- * New suburbs will contain a variety of housing types.
- * Sensitive types of housing intensification will be encouraged in all neighbourhoods.
- * New suburbs will accommodate a mix of compatible land uses within a comfortable walking distance of each other.
- * New housing close to transit facilities and within mixed use centres will be encouraged to support transit and pedestrian mobility choices.

In terms of measures to reduce the overall cost of development, the plan stated that:

- * New suburbs will be capable of achieving a density of at least 7 units per acre (17.3 units per hectare).
- * The City will continue to protect and manage its long-term growth requirements within the Uni-City framework.
- * New suburbs will be designed with an aim to reducing the costs associated with the construction, operation and maintenance of public infrastructure.

The 2005 review of the GoPlan noted that Calgary has made some modest progress in increasing densities, but that mixed housing types and access to varied employment areas remain rare in Calgary.

- *Sustainable Suburbs Study*

Also adopted by City Council in 1995, the Sustainable Suburbs Study was designed to complement the GoPlan by providing specific guidelines for the planning of Calgary's new residential suburbs, where most of its population growth occurs. The study was motivated by a desire to reduce the costs of development in greenfield areas in response to the ongoing withdrawal of provincial funding for municipal infrastructure and in response to concerns about the social and environmental health of the city. The document, which was drawn up using a broadly consultative process, proposed a substantial departure from the way that new communities were being designed.

The study advocated a built form that includes many of the neighbourhood characteristics that would indirectly support housing affordability, including:

- * A minimum density of 17.3 units per gross ha (7 units per gross acre).
- * An activity centre with a mix of land uses that would provide a variety of goods and services to meet residents' daily needs.
- * Parks, schools and shops within a comfortable walking distance to homes.
- * Pedestrian and cyclist-friendly streets with direct connections to community and transit facilities and to the regional pathway system.
- * A wide range of local employment opportunities.
- * A public transit service that provides a viable alternative to the car.
- * A wide choice of housing types, including basement suites, apartments, townhouses, semi-detached units, lofts, over garages, particularly in locations close to transit stops, the community centre and neighbourhood nodes.

The study also advocated policies targeted directly to improve the supply of affordable housing, including:

- * A minimum of approximately 10% of all dwelling units in a community targeted at households earning no more than the median household income.
- * Policies and guidelines ensuring that an adequate choice of low to medium income housing is provided in suburban communities shall be developed as part of a new comprehensive city-wide package of policies on affordable housing.

By way of implementation, the Study proposed the development of a City-wide policy on Affordable Housing (defined as “housing that is within the purchasing power of households earning the median household income for the City of Calgary”), and suggested a review of the Land Use Bylaw, notably to allow for secondary dwelling units. It also recommended the adoption of new street design standards and the creation of a suite of indicators of sustainability. The authors proposed that the Study guidelines be implemented in the planning of new communities over the following three to five years (1995 to 2000), and that the City monitor success in achieving the policy objectives.

The study recognized that many people were excluded from certain communities because of lack of housing choice and adequate mobility and proposed a comprehensive policy framework for facilitating the provision of affordable housing and tangible implementation steps. The study has become one of the primary policy documents used by the City of Calgary to support more integrated community planning and to help implement the land use and transportation principles contained in the 1995 Calgary Transportation Plan. However, some weaknesses in the approach are apparent. Although the study has guided City planners in their decisions on development applications, many of the policies in the study are dependent on the voluntary cooperation of developers. Thus, little progress has been made on some of the urban design principles in the Study, especially those related to the mixing of land use. With the exception of a few innovative developments, for the most part, suburban growth continues in the same mould, although denser and with a better housing mix. Another weakness relates to the policies encouraging housing that would target specific household income groups. Using land use policies to regulate residential development by price would be difficult under the provisions of the MGA. Also the requirement to establish unit prices linked to median income levels and control prices over the long term would be cumbersome for both the City and the developer.

- *Calgary Plan*

In 1998, the City adopted the Calgary Plan (Municipal Development Plan), a statutory plan required under the Municipal Government Act and the pre-eminent plan guiding growth and development within the City of Calgary. It addresses land use, development, transportation and matters related to the health of the environment, vitality of the economy and social well-being of the community. The plan brought together many of the policies found in the Calgary Transportation Plan and the Sustainable Suburbs Study.

The Calgary Plan’s vision of the future includes a range of housing options for all ages, income groups, family types and lifestyles. The Plan identifies the provision of affordable, appropriate housing options for all Calgarians as one of the four major residential development goals. The plan promotes housing forms that are likely to be more affordable and contains some policies to encourage intensification in areas well served by transit and other amenities. Relevant policies from the plan include:

- * Promote the development of a more varied housing mix
- * Encourage research and experimentation to reduce the cost of housing through innovation in housing types and construction methods

- * Encourage the provision of an adequate supply of rental accommodation for different socio-economic groups in all parts of the city
- * Promote greater land use efficiency and convenience by encouraging new housing close to transit facilities and within mixed-use centres to support transit and pedestrian mobility choices
- * Encourage the sensitive intensification of housing in all neighbourhoods
- * Support healthy residential precincts in the downtown area.

In terms of measures to reduce the overall cost of development or to increase the supply of affordable housing, the plan commits the City to:

- * Work towards a density range of 6-8 upa in new communities
- * Endeavour to have at least a 30-year supply of developable lands for all uses
- * Endeavour to provide a preplanned and pre-budgeted inventory of easily serviceable residential lands ready for development
- * Examine infrastructure and service standards that add to the basic cost of housing and consider the opportunities to relax them where appropriate
- * Encourage research and experimentation to reduce the cost of housing through innovation in housing types and construction methods
- * Review existing subdivision standards and engineering requirements and monitor the effect of changes in them with the objective of allowing experimentation with community design, building design and with various lot sizes and layouts
- * Investigate on an on-going basis ways to speed up the development process

Clearly, the Calgary Plan promotes a wide range of policies that would indirectly support the creation of more affordable housing and a competitive development industry, intended to keep prices down. However, the affordability statements in the plan are contained in preamble text while the actual policies do not specifically mention affordability. There is no overall policy statement on the City's commitment to promote affordability or to require that municipal decisions in all fields be made taking into account impacts on housing affordability. There are no affordability targets or monitoring provisions in the plan. Moreover, the plan contains few policies to encourage or guide the intensification of the existing urbanized area (e.g., intensification of established neighbourhoods, brownfield redevelopment, transit-oriented development around stations areas). Policies are kept at a very high level and seem to assume that subordinate plans will work out the implementation details.

- *Corporate Affordable Housing Strategy*

In 2002, the City developed a Corporate Affordable Housing Strategy to fulfill affordability commitments made in the 1998 Calgary Plan. The purpose of the Strategy was to bring together the various policies for improving the supply of affordable housing and to focus the City's future efforts in a consistent manner. The Strategy was drafted by the Corporate Affordable Housing Steering Committee, a committee of Council, with

input from several City Business Units, including Community Strategies, Corporate Properties, Calgary Housing Company, and Planning and Transportation Policy.

The City's actions relate to a "dynamic housing continuum", with five components along its span:

- Emergency shelters
- Transitional housing
- Non-market/social rental
- Formal and informal rental
- Affordable homeownership

The City makes different and specific interventions along this continuum, based on the needs of each clientele. The goal is to move individuals and households up the continuum, directing resources to giving households the capacity to move to the next step and reduce the City's direct involvement in housing them. Therefore, it repeatedly emphasizes the need to create spaces at each part of the continuum so that homeless can move off the street, social housing tenants can move into affordable private rental properties, and renters can move into affordable owner-occupied units.

The Strategy defines eight roles that the City of Calgary plays in providing affordable housing:

- Management and operation of non-market housing
- Administration of resources from other governments
- Direct funding and development
- Strategic partnerships
- Planning and regulation
- Community development and education
- Research
- Advocacy

For each role, the Strategy sets an overarching goal for the City, determines the core elements of the relevant policy, and sets operating principles to define the priority actions to be taken by the City and its partners in executing each policy.

The focus of the plan is obviously on non-market housing, but some of the plan's prescriptions relate to the affordability of market housing, especially the section on planning and regulation. Under this section, goals included:

- * To encourage competition and choice in the housing marketplace;
- * To support and provide implementation tools for affordable housing initiatives;
- * To facilitate research and experimentation to reduce housing costs through innovation in housing types and construction methods;
- * To explore ways to expedite the development process for affordable housing projects;
- * To actively pursue changes to statutory regulations and the building code to facilitate affordable housing.

Core elements included:

- * Develop regulatory incentives to encourage the private sector to provide and protect lower cost housing;
- * Encourage the development of new rental housing and the protection and enhancement of existing rental housing stock;
- * Support actions to encourage competition and choice in the housing marketplace by implementing the policies of the Calgary Plan;
- * Enforce building and fire safety standards to regulate older, multiple unit rental housing and the demolition of that housing if required; and
- * Where appropriate on a site specific basis facilitate the provision and retention of affordable housing by supporting changes to land and building development standards and land use by-law regulations.

Relevant operating principles included:

- * City Council will be requested to reduce / waive / relax development fees and standards where doing so clearly enhances the viability and affordability of the project.

The Strategy was developed as a corporate document and therefore does not enjoy the broad scope, legitimacy and public profile that a community-oriented strategy conducted with broad public engagement would have. Implementation of the Strategy was the responsibility of Council's Affordable Housing Team, the Corporate Affordable Housing Steering Committee, both of which have been since disbanded. The Strategy has resulted in a number of tangible initiatives to promote non-market housing but few of the land use and planning objectives of the plan, which would affect the affordability of market housing, have been implemented so far. For example, no changes have yet been made to development fees to encourage private sector developers to create more affordable housing.

- *Transit Oriented Development Guidelines and Station Area Plans*

The City of Calgary released its TOD Policy Guidelines in 2004 (amended in 2005), applying to areas within 600 metres of projected or existing CTrain or BRT stations. While earlier policies had addressed TOD ideas, including overall plans like the Calgary Plan (1998) and the Calgary Transportation Plan (1995), the TOD policy lays out transit-oriented development options to meet its six policy objectives of mixing land use, increasing density, promoting pedestrian accessibility, making station areas distinctive and high-quality places, managing traffic and parking, and fitting new development into the existing neighbourhood context. The policy makes no direct mention of housing affordability. It does, however, include several references to the need for a variety of housing types as an important component of TOD, encouraging the placement of "new housing forms to support community demographics" in TOD areas (ibid: 31).

In 2004, Council picked six LRT stations to undergo a Station Area Plan (SAP) design process as demonstration projects. SAPs turn the conceptual designs of the TOD policy

into more practical master plans specific to a given station and detail the relevant land use and transportation improvements. The preliminary SAPs propose using vacant or underutilized sites to develop retail and office space alongside high-rise, low-rise, townhouse and live/work residential units.

- *New Communities Residential Density Policy in the Calgary Plan*

In September 2006, City Council adopted a new residential density policy that applies to subdivision and development in Calgary's new communities. This amendment to the Calgary Plan requires a minimum of 7 units per gross residential acre with no prescribed density ceiling. The new policy indirectly promotes affordability by encouraging the efficient use of the urban land base. The policy also promotes a range of dwelling types and other growth management policies, including:

- * Achieving a minimum residential density of seven units per gross residential acre
- * Providing liveable and complete communities that include a mixture of single and multiple dwelling types, densities and land use such as commercial and employment
- * Ensuring a more compact urban form that efficiently utilizes land and infrastructure
- * Creating areas of higher residential density to take advantage of transit and reduce reliance on the private automobile
- * Designing pedestrian, cyclist and transit oriented communities that reduce reliance on the private automobile
- * Providing attractive public spaces and commercial areas that encourage walking and a vibrant community life.

- *imagineCALGARY Long Range Urban Sustainability Plan*

As part of the framework for current work to revise and update the Calgary Plan, the imagineCALGARY process used extensive public consultation to create a Long Range Urban Sustainability Plan in 2006. The Sustainability Plan refers explicitly to a "complete communities" approach to improve housing affordability while increasing densities and promoting walkable neighbourhoods. It recognizes that the context-sensitive densification of existing communities can help improve affordability by lowering the costs associated with new development, and that innovation and flexibility in the type and placement of new housing can open new options for affordable housing. To that end, it calls for changes to existing provincial and municipal policies, including zoning and land-use regulations and the Alberta Building Code, to encourage experimentation with new housing types. Among the suggested avenues for further City of Calgary research and policy development are integrating affordable housing with the wider community, encouraging mixed-income neighbourhoods, streamlining the approval process for innovative and affordable developments, establishing quotas for affordable housing, setting aside land and acting as a land banker, and supporting the construction trades to control labour costs associated with new housing development.

- *Sustainability Principles for Land Use and Mobility*

In January 2007, City Council approved the Terms of Reference for the Integrated Land Use and Mobility Plan, which will result in the review and amendment of the Calgary Plan and the Calgary Transportation Plan. As part of the report, Council approved 11 Sustainability Principles for Land Use and Mobility that will act as the overarching direction for the project. In addition, Council approved the use of the sustainability principles as guiding principles for major land use and transportation studies until the Integrated Land Use and Mobility Plan. Current projects that are informed by these principles include the intermunicipal development plans, transportation network plans, regional policy plans, area structure plans, area redevelopment plans, major outline plans and major development permits.

The Sustainability Principles were based on the concept of Smart Growth as defined by US and Canadian organizations, current City of Calgary policies, including those found in the Calgary Plan and the Calgary Transportation Plan, and the imagineCALGARY Long Range Urban Sustainability Plan.

As the document states, the sustainability principles should be considered as a whole and are not to be used as individual statements. The principles are as follows:

1. Create a range of housing opportunities and choices.
2. Create walkable environments.
3. Foster distinctive, attractive communities with a strong sense of place.
4. Provide a variety of transportation options.
5. Preserve open space, agricultural land, natural beauty and critical environmental areas.
6. Mix land uses.
7. Strategically direct and manage redevelopment opportunities within existing areas.
8. Support compact development.
9. Connect people, goods and services locally, regionally and globally.
10. Provide transportation services in a safe, effective, affordable and efficient manner that ensures reasonable accessibility to all areas of the city for all citizens.
11. Utilize green infrastructure and buildings.

Although the document includes a number of principles that can indirectly promote housing affordability, its impact in this respect is weakened by the fact that it does not contain a principle that targets affordability directly.

- *Centre City Plan*

The Centre City is expected to accommodate 20,000 to 40,000 new residents, 13,000 to 26,000 new dwellings, and over 60,000 new employees by the year 2035. With these

significant changes in mind, City Council adopted the Centre City Plan in 2007, which outlines a new vision for the Centre City. The plan positions Downtown as the leading regional office concentration, supplemented by an increased residential population and improved connections to surrounding mixed-use Centre City neighbourhoods.

The Plan underlines that the Centre City currently accommodates a high proportion of rental units and that “future development and policy should seek to at least preserve and ideally increase that type of housing stock”. In order to do so, the Plan mentions that measures such as limiting condominium conversions during low vacancy periods could be put in place.

Conclusions

From the above review, it is clear that municipal policies have the most influence on housing affordability in Calgary. However, it is important to recognize that municipal actions are framed by provincial legislation, which gives the City the authority to act on some fronts, but reduces the policy options open to the City on other fronts.

The City of Calgary has taken many steps since the mid-1990s to reform its planning and development control system in order to reduce development costs, encourage intensification, and deliver a better mix of housing types. While not all these measures have been successful and more work remains to be done, the city is clearly moving in the right direction.

One of the City’s greatest successes has been its program to ensure an orderly development of land and to maintain a competitive land development industry. Although land costs are expected to gradually rise as a metropolitan area grows, the City growth management system has ensured that land supply was sufficient to accommodate projected growth. The surge in demand for housing that emerged in 2006 could not be predicted and overwhelmed the ability of the development industry to bring product to the market, but did not result from a constrained land supply. The City’s infrastructure planning system has for the most part kept public costs down without compromising community quality of life, although, as noted above, costs have mounted as of late and public finances are strained.

The approvals process appears to have had a significant impact on the price at which developers and builders can bring their products to the market. Applications are slow to move through the process due to the multiplication of policy requirements and studies needed, the high volume of applications in recent years, and administrative problems within the approvals branch.

Regulatory issues of key importance (in the assessment of the industry stakeholders interviewed) include the prevalence of discretionary controls in the LUB, especially for multi-family development and secondary suites, parking standards that are too high for multi-family dwellings, engineering standards that are difficult to vary, traffic standards that indirectly impose limits on density, wetland conservation policies that reduce

developable land, open space requirements that may be excessive given the fact that many school sites sit vacant, and escalating development levies. The relative importance of these issues in terms of their impact on housing prices is difficult to assess given that their impact depends heavily on the nature of the development in question.

The planning policy framework described above – although somewhat fragmented – has evolved towards a Smart Growth approach. Some plans explicitly adopt an affordability lens (such as in the Sustainable Suburbs Study and the Corporate Affordable Housing Study), but for the most part they take an indirect approach by promoting a range of housing types, intensification in suitable locations, and a development control process that will tend to reduce housing costs. The city lacks a full-fledged policy on housing affordability or even clear direction on this issue in the MDP, but the affordability issues are being addressed in a piecemeal fashion through the creation of subordinate plans, such as SAPs, revised ARPs, and the Centre City plan. This planning effort needs to be fully informed by the need to create the most inclusive city possible.

In the next chapter, we turn to a detailed consideration of policy and implementation measures that could help to address some of these issues.

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7. Policy Options

In this chapter, we examine a range of policy measures to improve housing affordability that the City of Calgary could consider in the context of the long-term land use and mobility plan and the City's other planning initiatives. The policy measures that were selected for inclusion here are those that have the potential for achieving both Smart Growth and housing affordability goals and that appeared most relevant to the situation in Calgary, i.e., a large city undergoing rapid growth with a robust private development sector. The main focus of these measures is on the land use planning and development control process as it affects the provision of housing in the private market. We have avoided including policy measures that would require direct subsidies from governments at any levels, although incentives for private sector developers are covered to some extent. As we have seen, the City is operating under a fairly restrictive legislative mandate from the provincial government; we make note where changes to provincial legislation or regulations would be required in order to implement aspects of the policy measures included here.

The policy capsules included in this chapter are organized into three sections:

- * Intensification: measures to increase the supply of housing in locations that can reduce the overall costs of housing and transportation – e.g., transit-oriented development, downtown housing, greyfields, brownfields, and commercial corridors.
- * Housing Form: measures to increase the supply of housing types (housing form and density) that are more likely to be affordable – e.g., rental accommodation, smaller lots and homes, secondary suites, mobile homes and modular houses.
- * Development Process: measures to reduce the cost of housing generally – e.g., transportation planning standards, engineering standards, parking standards, improving the approvals process, and addressing NIMBY.

Each capsule follows a common format:

- * The topic is introduced generally, including a discussion of the links to housing affordability and growth management.
- * Current conditions in Calgary relevant to the policy area are described, as are existing policies.
- * Issues that have arisen in the city related to this policy area, barriers to the effectiveness of existing policies, and the potential for realizing gains in affordability and growth management area explored.
- * Relevant experiences from other cities are described.
- * Options for Calgary to consider are presented.
- * Implementation issues are considered that may arise if the policy options were put into practice.

It is important to note that while programs and policies of other jurisdictions are presented here, this study does not include a review of the legislation in other jurisdictions. Some of the programs reviewed operate under provincial legislation that differs substantially from the Alberta legislation. For example, in Alberta, municipalities cannot regulate tenure, ownership, occupancy (i.e., in demographic terms such as income level or age) or price. This is possible in some jurisdictions such as Vancouver, which operates under substantially different legislation.

Intensification

Greyfields and Commercial Corridors

- *Introduction*

Greyfields are urban sites with untapped redevelopment potential, consisting of obsolete structures surrounded by large surface parking lots. Typically underused, shuttered or declining retail facilities, greyfields are held distinct from brownfields in their lack of major soil contamination and their relative ease of re-use. As commercial property trends are in continuous evolution, commercial facilities can fall behind the times, rapidly becoming unsuitable for contemporary retail approaches and unprofitable for property owners (CNU, 2002). Population, too, can shift outward and put newer commercial centers within a shorter drive of new residential neighbourhoods. Older commercial greyfields retain considerable value as residential or mixed-use redevelopment sites, however, for the same factors that contributed to their initial success: a good location in a well built-up area, a prominent position on a major transportation corridor, inexpensive land occupied by parking lots, and simply-built structures that are straightforward to demolish (Chilton, 2004). Medium- or high-density redevelopment at these choice locations can help direct population growth, retail and jobs back towards the urban centre, helping reverse the urban sprawl that led to their decline (CNU, 2005).

“Greyfield” refers to both smaller sites, like strip malls, that offer local commercial services to a nearby residential population, as well as larger sites in heavily commercial areas. Shopping malls rarely stand alone, and postwar conventional suburbs feature extensive commercial zones along arterial roads. Taken as a whole, these commercial corridors are typically made up of a series of commercial facilities with large parking lots, and thus share the same basic potential for redevelopment as more isolated greyfields (Roberts et al., 2007). The continuity of the corridor creates some additional possibilities for large-scale redevelopment, including positioning new construction closer to the street to establish a coherent street wall, and reconfiguring roadways to serve as urban boulevards with improved streetscapes and public transportation (UGA LUC/GDCA, 2004). Maintaining continuous retail at street level helps revive street life in redeveloped greyfields and commercial corridors. A mix of apartments, offices or institutional spaces can occupy the floors above, providing local shops with customers and local residents with handy access to jobs and services. Different types of medium- and high-density housing, including rental apartments, small multi-family buildings and

rowhouses, can take advantage of upgraded transit corridors and offer new households appropriately priced and sized housing in more socially diverse communities.

- *Existing Policies and Conditions*

The possibilities of redeveloping commercial sites have not, until recently, been a major theme in Calgary's upper-level planning policies. The Calgary Plan (1998) makes little mention of commercial redevelopment or major corridor intensification, but does recognize that changing retail patterns will shift interest away from some existing commercial areas to newer sites. The Transportation Plan (2005) deals with larger-scale relationships between transit and land use, noting that earlier attempts to create mixed-use nodes were largely unsuccessful, and calls for greater cooperation with the development industry and supportive transit service for TODs, but does not directly address the requalification of commercial areas and corridors.

Existing and upcoming Calgary citywide plans address underused commercial sites and redevelopment corridors more directly, as prime opportunities for urban intensification. The Long Range Urban Sustainability Plan produced by the imagineCALGARY public planning exercise calls for greyfield sites to be used to increase residential densities and provide complete mixed-use neighbourhoods, and for reduced parking requirements that would reduce the need for surface parking lots (City of Calgary, 2007a). Plan It Calgary process has made the closest examination yet of the possibilities for commercial redevelopment, and identified several promising intensification corridors: the 16 Avenue North, 17 Avenue Southeast and Centre Street North "urban corridors", and the 17 Avenue Southwest, 9 Avenue Southeast, 4th Street Southwest and Kensington Road Northwest "neighbourhood corridors" (City of Calgary, 2007b).

Still, the City of Calgary has no existing greyfields policy. Current informal efforts to address greyfield opportunities are focused on giving developers clear guidance from the City on greyfield intensification concepts, and finding other niches where the City can take the lead: buying and redeveloping small, unviable greyfield sites, and promoting intensification on City-owned sites like surplus emergency services lands and the unused portions of roadway expropriations. Like the City's guidelines and policies on intensification, downtown redevelopment and TODs, the hope is to introduce and demonstrate new development concepts to developers and the public through examples of quality greyfield design. Once these ideas are in circulation among stakeholders, it is hoped that developers will be prepared to identify greyfield intensification opportunities on their own, and residents will understand the benefits of redeveloped commercial sites. The City is in the very preliminary stages of identifying specific greyfield redevelopment problems for which it can take a leadership role or offer incentives, such as streamlining the development approvals process, clarifying redevelopment policy, or revising development charges.

City staff believes that the discussions about TOD areas and LRT extensions are serving as a "wake-up call" for developers about the potential for commercial redevelopment. So far, the ample supply of greenfield land and commercially-zoned development sites has

limited the amount of greyfields under consideration, but the evolution of the retail landscape is changing that. Grocery stores, in particular, have recently started closing smaller, scattered neighbourhood facilities to move into much larger buildings in big box or lifestyle centre locations, and the loss of such a key anchor tenant may prove fatal for small strip malls serving a localized clientele. Newer mall sites at the periphery are beginning to siphon business off from some older commercial centres, and although the trend is still small enough that property owners and managers are not particularly nervous, the City is anticipating a municipal role in addressing the issue.

The development of new policies for commercial corridors is more advanced, and reflects many of the same approaches, which the City is floating as potential greyfield development options. The Southeast 17 Corridor in near southeast Calgary is undergoing a redevelopment study to improve streetscapes and public transit on an existing commercial, industrial and residential stretch between Deerfoot Trail and the Ring Road land reservation, where an interchange will connect the 17 Avenue to the future circumferential highway. The corridor connects older gridded areas with newer suburbs, and the 600-metre radius around the road under examination in the current study overlaps with other redevelopment areas and special planning schemes for nearby neighbourhoods. Existing land uses along this urban arterial corridor are primarily highway-oriented commercial, with buildings set back far from the street, frequent curb cuts, and an uninviting streetscape. An existing commercial organization for the “International Avenue Corridor” has worked to make some aesthetic improvements and rejuvenate the business community along the Avenue’s strip of ethnic-oriented businesses, but the City is working to create plans for more intensive redevelopment. The planning process for 17 Avenue includes a series of ongoing public visioning exercises and consultative workshops, from which more detailed site and urban design prescriptions will be developed over the course of 2008. While the exact plan for the corridor has yet to be determined, the public consultation is focusing on an improved pedestrian experience, bus services that are more convenient and easier to use, and redevelopment of existing sites to accommodate a more thorough mix of uses and a more pedestrian-oriented, consistent streetscape (City of Calgary, 2007).

- *Issues, Barriers, and Potential*

The lack of a formal greyfield policy is, in part, a reaction to the vigorous property market and the rapid growth of Calgary; in a city that is made of largely of postwar construction and where development is proceeding at a ferocious pace, there are relatively few aged retail facilities lying fallow. However, increased development interest in the older postwar and prewar central city neighbourhoods, which are served by aging strip malls, is boosting developer interest in scattered greyfield sites and driving municipal planners to create design options and redevelopment concepts. Slightly further out, where street patterns become coarser, land parcels larger, and corridors wider, greyfields and auto-oriented commercial zones present concomitantly greater opportunities to redevelop from the ground up.

As with other intensification mechanisms presented elsewhere in this report, developers are concerned that such a wholesale reworking to accommodate greater density and improved streetscapes will not be supported by the market. Calgarians' appetite for housing types other than single-family housing is perceived as limited, and the commercial viability of pedestrian- and transit-oriented neighbourhoods is seen as uncertain outside of some older zones and central city areas. The approval process for major developments, which typically takes two to three years and gives ample opportunity for community and Council opposition, is a difficult hurdle in an environment where annual wage and materials inflation runs in the double digits. City staff who are working on redevelopment issues believe that while the approval process does present major problems for developers, greater public and developer familiarity with greyfield and commercial corridor redevelopment concepts will stimulate more creativity on the part of builders and broader acceptance among residents.

Plan It Calgary's land use, urban design and streetscape concepts include several explicit redevelopment concepts, which clearly refer to an overall node-and-corridor intensification and redevelopment strategy. Retail facilities and other parking-intensive land uses are to give way to a hierarchy of major, community and neighbourhood "activity centres," repurposing surface parking as building sites to provide different levels of services to different-sized catchment areas. Mutual reinforcement between increased residential densities, a wider range of housing types, and mixed-use service nodes are intended to further encourage intensification over time. "Urban" and "neighbourhood corridors" are auto-oriented commercial strips, sorted by their parcel and building sizes into larger or smaller redevelopment sites for mixed commercial, residential and institutional uses. The "road and street palette" presents a range of urban design concepts for turning unfriendly roadways into more inviting landscaped, pedestrianized and multi-modal corridors, also sorted into a hierarchy of heavier- or lower-traffic streets (City of Calgary, 2007c)

- *Lessons from Other Cities*

Thornhill, Markham, ON

The Thornhill neighbourhood of Markham includes single-family residential areas, a section of a major regional arterial (Yonge Street) and a former shopping centre that was falling into disuse by the late 1980s. The Thornhill Secondary Plan, developed starting in 1990 and implemented in 1997, designated the neighbourhood's various commercial centers as mixed-use "Community Amenity Areas". At these sites, higher-density retail and residential redevelopment can go forward as-of-right and has to respect building envelope, site planning, streetscape, and other design requirements. In 2000, an application to develop one 6.1 hectare site on the Yonge Street corridor, which included a big-box commercial store, was rejected as it did not respect the streetscape and pedestrian orientation mandated in the Secondary Plan. The Town of Markham continued to oppose the project through developer appeals to the Ontario Municipal Board, which upheld the Town's decision. Since then, Markham has continued to develop and apply more explicit urban design prescriptions and planning structures that will shape redevelopment in commercial corridors along the major Thornhill arterials. In 2002, more precise and site-

specific design requirements were created and applied to the original shopping centre site, focusing on a pedestrian-oriented streetscape. A joint study for the Yonge Street corridor, undertaken in 2003 with the other corridor municipality, the City of Vaughan, emphasized a continuous street wall, landscaping, and public space improvements. A new Markham plan for the corridor, centered on directing higher-density development to Yonge Street and creating public spaces and low-rise development to interface with adjacent single-family neighbourhoods, further refined the street-oriented redevelopment vision for this medium- to high-density commercial and residential corridor (CMHC, 2004; Town of Markham, 2007, 2003).

Don Mills, Toronto, ON

The Don Mills area was built as an ambitious postwar development that pioneered many conventional suburban development practices, including an outdoor mall, the Don Mills Centre built in the 1950's and converted to a typical indoor mall in the 1970's. Located at the center of a well-established neighbourhood, at the intersection of two major urban arterials and a kilometre away from a regional highway, the site presented a significant development opportunities and challenges, including an active local population concerned about the fate of the mall and potentially problematic interfaces with adjacent residential areas. A new Secondary Plan for the commercial corridors and residential neighbourhoods around the Don Mills Centre was created in 2006, whose goals included introducing a broader range of housing types and including mixed uses. The developers' plans incorporate new roads breaking up the commercial superblock into smaller development blocks and connecting with the surrounding medium-density residential fabric. High-rise and mid-rise residential towers will incorporate setbacks and gradual massing along the edges of the site near existing residential areas, while commercial uses will be built closer to the busy arterial roads and focused around a new street and public square (CF/FRAM, 2007; CoT, 2006).

Heritage Mall/Century Park, Edmonton, AB

Edmonton's Heritage Mall was a large interior shopping mall in the city's southwestern reaches, shut down in 2001 after waning tenant interest in an outdated retail site. After the mall was shuttered, an extension to the LRT system and a bicycle and pedestrian trail connection was announced, including a station and bus terminal right at the edge of the mall site and a continuous trail connecting the site with the University of Alberta campus to the north. Increased developer interest in the 17.5-hectare site led to an ambitious billion-dollar plan to remake Heritage Mall into Century Park, a mixed-use development including some new commercial spaces. At the core of the development is a residential cluster intended to house 3,000 people at build-out, including a mix of high-, mid- and low-rise residential towers and apartment buildings. Viable portions of the original mall structure, housing professional offices, have been retained. A new grid of streets, pedestrian ways and park corridors connects the new housing with the conventional suburban neighbourhoods in the vicinity (Ilich, 2005; CoE, 2006).

- *Options for Calgary*

As already noted, public consultation and clear guidelines on redevelopment plans help to

pre-empt and address community objections, and send clear signals to potential developers about the preferred form of new development. Presenting realistic and accurate renderings of proposed new facilities, along with thorough explanations of the redevelopment process, at public workshops can – and already do – take redevelopment ideas from discussions of zones and floor-area ratios to concepts that community members can readily comprehend. Public support and public interest are necessary for homebuyers to start contemplating reconfigured and denser neighborhoods, and for developers to understand the City’s expectations. Straightforward design guidelines and a more decisive approval process simplifies the work of developers, allowing the City to become a crucial partner in identifying and guiding opportunities for the development industry. Good standards and guidelines for new development sends a message to the development community, and, if applied rigorously, can help prevent inappropriate or auto-centered redevelopment from eroding the intensification opportunities that greyfields present.

To further highlight the possibilities of greyfields, the City should identify additional commercial corridors and greyfield areas for redevelopment. While the development industry may be wary of redevelopment concepts that are locally untested, closer attention and more detailed planning will help to demonstrate their potential and their viability. A citywide inventory or review of commercial sites and a survey of their condition, estimated lifespan and local context will help highlight retail dynamics and anticipate challenges and opportunities for the commercial property sector. To facilitate the redevelopment of scattered neighbourhood commercial sites, a willingness to quickly support new residential intensification opportunities with transit and other public services will help make higher-density, mixed-type and mixed-use nodes possible within existing single-family neighbourhoods.

Still, the redevelopment approval timeline must be shortened so as not to render greyfield and commercial corridor redevelopment financially impractical. Even if developers and homebuyers embrace redevelopment concepts, they need to be viable from the viewpoint of banks and backers as well. Form-based area and corridor plans, coupled with workable design guidelines, would be an important element in permitting new kinds of high-quality projects to go forward more swiftly.

- *Implementation Issues*

The City has already made impressive headway in demonstrating greyfield redevelopment ideas to the public, pointing out key intensification opportunities, and identifying the approval process as a stumbling block for the development industry. The approach seems promising so far, and the planning process itself has gained considerable publicity for the work of the City in making the case for changing the way that Calgary builds, lives and does business as it grows. Even if the Municipal Government Act does not allow Calgary to control rental tenure or other market affordability factors, the City has a high degree of control and flexibility in managing zoning and land use regulation. Putting the City’s capabilities to good use in these areas will help earn the administrative

and political credibility it needs to gain more control over the direction of its development in others.

More forceful and concrete action on redevelopment will require more detailed planning work and public engagement, which in turn require more planners and planning activities in Land Use Planning and Policy. Additional resources and staff in Development and Building Approvals are also needed in order to resolve conflicts between the wishes of developers and the direction of the City, and to save all parties significant time, money and effort by allowing projects to move forward within a financially realistic timeframe; saving developers money is likely the most effective way to get them onside with new development concepts. Calgary is on the right track with regards to greyfield and commercial corridor redevelopment ideas, but how far and how fast the City can move will depend on continued and increased political commitment to its approach, and the ability to direct sufficient resources to capitalize on the opportunities that it generates.

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Brownfields

- *Introduction*

Brownfields are development sites, often home to a large, disused or underused industrial facility, whose economic potential is hampered by suspected or actual environmental contamination (Alker et al., 2000). The environmental impacts of contaminants, generally soil and groundwater pollution, can be significant in limiting the redevelopment potential of a brownfield, but their economic and legal impacts play a greater role (De Sousa, 2006). Ownership, tax, and liability issues increase the risk of financing brownfield redevelopment and stifle the market for brownfield land, while even the perception of contamination can discourage investors, purchasers or the public from participating in brownfield projects (NRTEE, 2003).

Brownfield redevelopment favours housing affordability by increasing the land supply, turning underutilized sites into locations for development and lowering overall land costs. Putting additional residents close to established public services helps increase the efficiency of infrastructure, saving money for government and taxpayers (Greenberg et al., 2001). The location of the newly available land is also significant for growth management. Brownfields frequently occupy older sites in locations near the urban core, thus opening new land in areas with existing services and transportation connections that can make them more desirable than peripheral sites for new development (McCarthy, 2001). This favours both better metropolitan form overall, concentrating new construction at the centre, and better built form, facilitating higher densities.

- *Existing Policies and Conditions*

The City of Calgary has several upper-level policies that directly support brownfield redevelopment. In 2003, Council approved a Contaminated Sites and Facilities Management Plan, which is not a detailed document but a broad five-year commitment that individual City business units review and develop policies to manage contamination on City-owned sites. The City's Triple Bottom Line budget framework includes commitments to carry out environmental review of development proposals, and includes the redevelopment of vacant or underused sites among its Smart Growth themes (City of Calgary, 2005). The process for assessing site conditions, and planning and confirming their remediation, was laid out by the Environmental Management business unit in the 2005 Environmental Development Review Policy (EDRP, City of Calgary 2005). The imagineCALGARY Long Range Sustainability Plan sets an ambitious goal of remediating at least 30% of the existing contaminated sites, and suggests developing a contaminated site inventory of redevelopable brownfields to help achieve it (City of Calgary, 2006).

The 2007 Environmental Action Plan includes the rehabilitation of contaminated land as a means of promoting the efficient use of land, and highlights two current Council

Priorities as a basis for further work: priority 4.11, to develop a Brownfield Strategy, and priority 2.18, to develop a Contaminated Sites and Facilities Management Plan (City of Calgary, 2007). The Brownfield Strategy has two components; the Brownfield Reclamation Strategy, dealing with City-owned sites, has been created and approved, but the parallel Brownfield Redevelopment Strategy to address public and private brownfields, has not. Calgary's individual corporate and planning policies have identified brownfield redevelopment as a priority for the City, but working them into a coherent whole and taking action on them has proven challenging. As a consequence, Council directed City staff to prepare a Brownfield Advocacy Strategy, approved in March 2008. This strategy outlines legislation at the provincial and federal levels where the City will advocate for changes to facilitate brownfield redevelopment (City of Calgary, 2008).

The City's area-specific policies, including several of its Redevelopment Area Plans, also mandate brownfield remediation and re-use. Plans for the central East Victoria Crossing, Downtown and Beltline areas all include redevelopment of the plentiful brownfield and greyfield sites. The Rivers District, a large redevelopment area east of Downtown, is an important gateway to central Calgary, but 80 years of heavy industry polluted its soil with heavy metals and polycyclic aromatic hydrocarbons. To fund remediation and redevelopment, the Alberta government passed special legislation allowing tax-increment financing through a TIF scheme called the Community Redevelopment Levy. The levy is calculated from a December 31, 2007 baseline; for 20 years after that date, the tax revenue from any increase in property assessments is put into a dedicated fund. The fund is used to pay off loans from the City to the Calgary Municipal Lands Company (CMLC), a municipally-owned company that manages the redevelopment, to pay for brownfield remediation, infrastructure and public space in the redevelopment area. In this way, the large upfront investments facilitate the revitalization that pays their way – between \$750 and \$1.2 billion over the life of the program, with \$50 million dedicated to brownfield remediation (City of Calgary, 2007a; 2007b). So far, about \$135 million has been invested in the area by the CMLC, including about \$20 million for environmental remediation work.

Several brownfield redevelopment projects have already been completed or are underway in other parts of the city. The Riverside Quays development in the Inglewood neighbourhood will contain up to 700 units of housing on a former industrial site adjacent to the Bow River (City of Calgary, 2006a), and soil pollution on this brownfield site was modest enough to permit developer-funded site remediation. The large Greyhound site located Downtown, formerly used to store and maintain intercity buses in a complex of garages and shops for over fifty years, is also undergoing a five-phase redevelopment including over 1,000 units of housing. The Garrison Woods development in southeast Calgary was managed by Canada Lands Company, and included some brownfield areas where fuel tanks on the former military base had contaminated the soil and required Canada Lands to undertake a \$1.5 million cleanup to bring it up to residential standards (CMHC, 2004).

- *Issues, Barriers, and Potential*

Despite a smaller number and area of brownfield sites compared to older cities in eastern and central Canada, Calgary's rapid growth has spurred increased municipal interest in brownfield redevelopment. Well-located building sites close to the regional centre would promote better metropolitan development patterns, and reforms to clarify the process of brownfield remediation would help make the development that occurs on brownfield sites more affordable. Yet of the five major barriers for brownfield development in Alberta identified by the Environmental Law Centre – liability, regulation, cost, planning issues, and lack of public awareness – the first two are both the most important and the least amenable to municipal action (ELC, 2006). As discussed in the previous section, the City has taken steps to address remediation costs in the Rivers District, and engaged with stakeholders to create brownfield assessment and remediation policies in the Brownfields Strategy. However, other hurdles remain at the provincial level, including some important legal issues that cannot be resolved by the City alone.

Alberta provincial policies and laws frame the legal, financial, and technical constraints on brownfield redevelopment. The *Environmental Protection and Enhancement Act* (EPEA) assigns liability for the release of a toxic substance to a “person responsible”, who is then required to prevent any further adverse effects from the substance and to restore the site to standards set by Alberta Environment. The ministry employs a risk-based set of guidelines for soil and groundwater remediation (based on the land use intended for the contaminated site), which were significantly tightened in 2007 (AMoE, 2007). When those standards have been reached, a “compliance letter” can be issued certifying that the work has been carried out; this, however, neither terminates civil liability for persons responsible nor closes the door on future regulatory liability if standards or land uses change.

However, certain aspects of the compliance framework outlined in EPEA have reportedly not been implemented, resulting in uncertainty about the remediation process in terms of future regulatory action and liability. The statutory environmental evaluation of sites is required at three major points. First, due diligence in property acquisition requires full understanding of any environmental contamination issues prior to purchase. Second, if a contamination release occurs, the EPEA states the owner has a duty report the release, duty to eliminate the contamination source and duty to identify and remediate the contamination. Finally, in accordance with the City EDRP, sites with contamination are evaluated in cooperation with the provincial regulators to ensure that the site is acceptable for the intended use. The challenge of obtaining a reasonable assessment of site conditions, and gaining agreement with provincial regulators on the investigation and remediation requirements, creates process uncertainty, increases costs, and thus may dampen developer enthusiasm for a potential brownfield project. Information about brownfield conditions is itself legally sensitive, as a property owner could become designated a “person responsible” merely by having his or her property tested and discovering pre-existing site conditions, and owners are thus understandably reluctant to obtain this knowledge, much less share it with a municipal or provincial agency. This forestalls the development and use of a comprehensive brownfield inventory or other summary of the scope of the brownfield problem, beyond the patchwork of voluntary

disclosures and compliance requirements that currently exist.

Several other barriers exist that highlight the need for more active provincial support for municipal brownfield efforts:

- Municipalities have no protection from civil liability, beyond the due diligence defence, for the normal exercise of their planning and zoning powers, or for polluted sites acquired due to tax arrears.
 - The *Municipal Government Act* prohibits municipalities from making loans or guaranteeing loans to for-profit entities, which rules out some strategies to finance the remediation of privately-owned brownfields. Grants, however, are permitted by the MGA..
 - The municipal and provincial land use and redevelopment frameworks do not tie in directly with the site assessment and cleanup frameworks, leading to potential inconsistencies between municipal and provincial brownfield approaches. This may be addressed in the forthcoming provincial Land Use Framework (ELC, 2006; RCI Consulting, 2007).
 - The implementation of municipal TIF tools like the Community Improvement Levy requires an act of the provincial legislature to go forward; while these measures have seen little opposition so far, bringing a bill forward requires considerable administrative and political effort and raises hurdles for the rapid deployment of TIF instruments.
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- *Lessons from Other Cities*

Hamilton, ON

Hamilton started the Environmental Remediation and Site Enhancement (ERASE) program in 2001, which applies to the portion of the city's core industrial area that is targeted for redevelopment. Separate elements of the overall ERASE program offer three years of relief from school taxes (potentially including matching provincial school tax relief), waivers of development charges equal to the amount spent on remediation, and financial help with site studies. One component, the ERASE Redevelopment Grant, functions in a roughly similar manner to a TIF district: 80% of the increase in property value after remediation is refunded to the property owner for up to 10 years, to match the cost of remediation and new infrastructure work undertaken by the developer (CMHC, 2005, 2005a; City of Hamilton, 2005).

Halifax, NS

The Halifax Regional Municipality has a long history of maritime and military activity, both of which often leave behind highly contaminated soils. As part of a wider assessment of the residential redevelopment possibilities in the regional core, HRM identified 40 brownfield sites in central Halifax and adjoining Dartmouth, adding up to 195 hectares of land. The study argued that urban sites can accommodate higher densities than sites at the fringe, meaning that every hectare of centrally located brownfield could hold as many housing units as 4.5 hectares of suburban or rural land. The 125 hectares of vacant industrial land throughout Halifax, therefore, represent a potential savings of 562.5 hectares of undeveloped greenfield land. Larger sites, such as the 566-hectare site

at the former Shearwater military base and other sites concentrated on the Halifax and Dartmouth waterfronts, were noted for their ability to house socially integrated redevelopment projects. (HRM, 2003, 2002; Tomalty and Cantwell, 2004).

Chicago, IL

Chicago created a successful brownfield strategy in the early 1990s, developed by a dedicated team of participants led by the mayor's office and coming from a range of city departments (among them environment, finance, property management and law). Under the program, the city combined its own resources with capital support from federal, state and local governments to fund the purchase and remediation of some brownfields. Others were decontaminated by the private sector, which took advantage of state and federal remediation tax credits, a city-operated TIF, and a county brownfield property-tax credit to fund cleanup (City of Chicago, 2003, 1995). After carrying out remediation, the municipal government sought out partners in the private and community sectors to develop affordable housing and various employment activities on the sites. Disseminating information to the public and interested stakeholders succeeded in dispelling some private-sector reluctance to get involved with brownfield projects; the state government was able to certify that the sites were fully remediated, which lenders accepted as proof that liability issues had been resolved (City of Chicago, 1997).

- *Options for Calgary*

The provincial government can help streamline and encourage brownfield redevelopment by clarifying pollution liability and regulations in ways that promote predictable and workable solutions to common brownfield problems. Changes to civil and regulatory liability should permit the development of a robust brownfields registry and inventory system that will compliment the risk-management approach of EPEA and improve overall transparency in brownfield transactions and remediation. An approach that balances responsibility for cleanup with an open and straightforward approach to remediation costs and planning will make private brownfield redevelopment a more attractive option.

The creation of a comprehensive brownfield inventory would allow the City to quantify the total area of brownfield lands across Calgary, determine the financial and technical scope of brownfield challenges, and identify particularly problematic or expensive contamination issues that may require major remediation. The effort made to assess City-owned brownfield sites through the Brownfield Reclamation Strategy is a good first step, but a better picture of privately-owned brownfields will be needed to understand the full scope of brownfield issues in Calgary and to move forward with the Brownfield Redevelopment Strategy.

All of the successful case studies illustrate the need for provincial-municipal coordination and increased municipal administrative capacity to sort through contentious brownfield issues and provide a clear and comprehensible process for private-sector partners. This can take the form of cooperative funding arrangements, but coordination on land use regulations and liability issues is necessary to reduce the real and perceived risks for

private developers. Without strong mandates for affordable housing components from municipal and provincial governments, and practical solutions to liability issues, affordability is likely to fall by the wayside as developers can point to the increased financial and legal risks as reasons to offer solely market-rate housing.

Waiving some or all infrastructure charges would be one way for the City to encourage brownfield site assessment and remediation. Brownfield cleanup is a front-loaded cost that can form a significant financial barrier to redevelopment, and infrastructure charges are a similar front-loaded cost that are under the City's control. Remediation costs for major sites can run into the millions, but the lower costs on smaller sites, such as gas stations or former dry cleaning plants, could be substantially offset by a full or partial waiver of development fees.

Calgary is well-positioned to expand its use of TIF districts. Property markets are active and the long-term prospects for increased property assessments are good, which favours consistent property tax revenues. Simultaneously remediating land and renewing infrastructure, as is being pursued in the Rivers area, requires significant upfront investment but helps urbanized brownfield sites compete with fringe greenfield sites for new construction. The Rivers Community Improvement Levy is in its earliest stages and should be monitored and adjusted as warranted, but appears to be successful so far and could serve as a model for similar redevelopment efforts elsewhere in the city. Were Calgary to have the power to deploy additional TIF districts on its own initiative, the municipal and provincial governments could avoid the burdensome process of obtaining provincial legislative assent for each step.

- *Implementation Issues*

Implementing these policy options will first and foremost require provincial legislative and administrative action, and Calgary will likely have to demonstrate a clear need for such changes and point to a record of successful brownfield efforts to demonstrate that the municipal authorities are ready to take advantage of new powers and structures. Overhauling the civil liability framework would entail close coordination with the legal and judicial community, and regulatory changes would need to maintain polluter accountability while offering a workable way forward for property owners who wish to address contamination problems meaningfully and in good faith. Changes to the provincial regulatory liability framework are reportedly already in the works, which will offer municipalities and property owners greater regulatory certainty and protection from regulatory liability. Improvements in legislative liability and clarification of civil liability would help encourage private brownfield redevelopment.

Resolving these thorny civil and regulatory liability issues would allow a publicly-accessible municipal brownfield inventory, as well as the private-sector component of the Calgary Brownfield Strategy, to go forward. However, a public inventory of brownfield sites could result in stigma claims or legislative action against the City from neighbouring property owners, and putting privately owned sites on the list can create legal issues.

More immediately, offering waivers of infrastructure charges is already within the City's control. This option requires further study to identify their potential on servicing budgets, ways of offsetting them over the short and long term, and the scope of remediation costs for the private developers that undertake cleanup. Continued close collaboration with regulators and improvements to the planning and development process will also help clarify requirements for brownfield redevelopment.

Extending TIF to other areas of Calgary will also need provincial legislation, as well as municipal actions to determine how to delineate TIF districts so as to generate sufficient revenue given changing economic projections. Sources report generally good relationships between the City of Calgary and the Alberta government with regards to brownfield issues, but these will have to be extended and maintained despite a political environment in which Calgary's urban context and specific needs are coming into conflict with the laissez-faire approaches traditionally favoured by the province.

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Transit-Oriented Development

- *Introduction*

Transit-oriented development (TOD) entails building new construction or focusing revitalization efforts around transit facilities, to create areas of greater density in the immediate vicinity of transit stations. This frequently takes the form of rezoning and redesigning neighborhoods to intensify activities and diversify land uses near existing transit stops, or carefully planning development around future transit corridors to provide a ready-made source of patronage for the new line. While the boundaries of TOD areas vary depending on the level of transit service and the form of the local neighbourhood, they are generally defined as the area within a 500- to 1000-metre radius of the transit station. The basic idea of focusing urban intensity around transit is routinely employed in wide-ranging conceptual plans for metropolitan growth (Calthorpe, 1993) and has accumulated a substantial record of success, project by project (Bernick and Cervero, 1997; Dittmar and Ohland 2004).

TOD takes advantage of the symbiotic relationship between density, neighbourhood quality, and non-automobile modes of transportation such as public transit, walking, and biking. Helping central areas accommodate additional residents while preserving and enhancing livability can potentially limit the land needed for new development, providing alternatives to greenfield sites to house a growing population. Given the direct costs of automobile ownership, and the indirect costs to residents (in land, time, and quality of life) of auto-centered developments, TOD is often used to integrate affordable housing into urban neighborhoods that are walkable and convenient to transit, offering households the chance to live in housing that is more affordable and appropriate to their needs while accessing jobs via public transportation, saving them the expense of auto ownership and travel. Placing higher density development and a greater variety of land uses near transit stations can facilitate easy access to transportation, shopping, services, and employment by foot or bicycle, if neighbourhood streets are appropriately designed to make local trips simple, direct, and safe. Better-quality streetscapes and public spaces in TODs can also increase resident satisfaction and raise the quality of life, making denser and more central locations livable and successful alternatives to lower-density locations on the urban periphery.

- *Existing Policies and Conditions*

The City of Calgary released its TOD Policy Guidelines in 2004 (amended in 2005), a direct outcome of the Council's policy commitment to Smart Growth, applying to areas within 600 metres of projected or existing CTrain or BRT stations. While earlier policies had addressed TOD ideas, including overall plans like the Calgary Plan (1998) and the Calgary Transportation Plan (1995), the TOD policy lays out transit-oriented development options to meet its six policy objectives of mixing land use, increasing density, promoting pedestrian accessibility, making station areas distinctive and high-quality places, managing traffic and parking, and fitting new development into the

existing neighbourhood context. A parallel Best Practices Guide (City of Calgary, 2004a) incorporates practical lessons from the experience of other cities.

While the TOD policy objectives “must” be followed in designing station areas, the guidelines do not set hard targets for meeting them. The non-statutory TOD guidelines were developed, and are presented, not as a narrowly interpreted set of rules but as a body of ideas that are intended to stimulate innovation when developing statutory land use plans and policies. As such, their language is not prescriptive; the guidelines “should inform” station area planning, “should help to define” new land use by-laws for station areas, and will “help guide discretion” on development approvals (City of Calgary, 2004: 6). The policy makes no direct mention of housing affordability. It does, however, include several references to the need for a variety of housing types as an important component of TOD. The relationship between housing type mix and social mix is implicit rather than explicit in the TOD policy, encouraging the placement of “new housing forms to support community demographics” in TOD areas (ibid.: 31).

Since the TOD policy guidelines were developed, City planning staff has used its framework to guide planning and public consultation on several Station Area Plans (SAPs). SAPs apply to a rough 600-metre radius around transit stations; this radius is a rough guide, and thus the SAP can incorporate parcels beyond the radius if they are well suited for redevelopment, or the radius can be drawn more narrowly if the station area is already extensively built-up. SAPs turn the conceptual designs of the TOD policy into more practical master plans specific to a given station and detail the relevant land use and transportation improvements. The first draft SAPs (Chinook and Anderson, discussed below) are fairly detailed area plans, including minimum and maximum densities, land uses, changes to the street network, suggested building massing and aesthetic guidelines for streetscapes and street walls.

In 2004, Council picked six LRT stations to undergo a SAP design process as demonstration projects, which started up through 2007 and 2008. Planning and consultation for the Chinook station is well advanced; a single planning process is underway to develop SAPs for the Lions Park, Banff Trail and Brentwood stations on the northwest LRT line; the Anderson SAP process started in mid-2007; and public planning for the Canyon Meadows station has yet to begin. The preliminary SAPs for Chinook and Anderson TODs (City of Calgary 2007, 2008) both propose using sites currently used as parking lots, large commercial buildings, and park-and-ride facilities to develop retail and office space alongside high-rise, low-rise, townhouse and live/work residential units. New pedestrian-friendly streets and corridors (including new rear laneways) are to break up large land parcels into smaller development blocks and connect the stations with nearby existing retail centres. Almost 2,300 units of housing and 52,000 square metres of office and retail space are planned at Anderson, while Chinook projections estimate between 1,425 and 3,650 dwellings, and 205,000 to 370,000 square metres of retail and commercial space (ibid.).

In addition to these six SAP demonstration projects, the TOD guidelines have also been used to frame other plans. The Hillhurst/Sunnyside Project is applying the TOD policy to

modify the ARP for the area (substantially larger than the 600-metre radius) around the Sunnyside LRT station. The draft ARP defines mixed-use and commercial corridors within a largely residential area, and shapes density by setting minimum and maximum permissible building heights (ranging between 2 and 19 stories), setbacks, and densities. Other than existing residential areas, where densities are capped at 75 units per hectare, maximum densities range between 2.0 and 4.0 FAR (City of Calgary, 2007a). Consultations are underway for new land use plans in the planned West LRT corridor, including amendments to the ARP for the Sunalta station area, just west of downtown, followed by more general planning for the neighbourhoods around the three stations that follow to the west (City of Calgary 2008a, 2008b).

- *Issues, Barriers, and Potential*

The TOD policy applies to the 37 stations on the CTrain network, to which 22 new stations will be added under planned extensions to the system, and the existing land use and development pattern around LRT stations varies widely. While the TOD policy and the SAPs generally leave single-family residential areas untouched, at least 14 stations are located near large-scale commercial centres with extensive surface parking. In addition to privately owned commercial and industrial sites, Calgary Transit's own park-and-ride lots hold considerable redevelopment potential. Assuming that one parking space (and the aisles required to access it) takes up 25 square metres, the over 12,000 surface parking stalls make up approximately 303,800 square metres of developable land in the immediate vicinity of CTrain stations.

Even when more open-minded developers and City policies are in agreement as to the desirability of higher densities on transit-accessible sites, policy processes can obstruct the successful development of TOD projects. Like other City policies, the TOD policy and the resulting SAPs are non-statutory. Area Redevelopment Plans (ARPs) are statutory – their land use and density requirements are not mere guidelines, but are passed as binding bylaws. So while SAPs outline what the City wants on a given site, and guide the discretionary decisions made during development review and approval, ARPs change zoning from the outset.

However, developers report that they often submit plans for higher-density, mixed-use, and mixed-housing-type projects in keeping with the TOD policy, only to run into problems with vague language in ARPs. Relative terms in the ARP, such as those that call for “higher densities” on a particular site without specifying the exact range of permitted densities, for example, allow opponents of the project to successfully claim that the proposal should be reviewed and the ARP needs to be updated. The review and ARP process can go on for months or even years, drawing developers – who thought that they were responding appropriately and positively to the City's policy leadership – into an iterative, elaborate and highly politicized process of counterproposals and public review. In this way, the approval process encourages opposition from NIMBY elements and Council members at the worst possible time: when developers are ready to build, and have prepared financing and development plans that are time-sensitive.

The TOD demonstration projects generally rely on either “direct control” zoning designations to back up their plans for key sites, or existing commercial-area zoning that already allows for very high densities. As station areas and the built context are understood to differ widely from one another, there are no plans as of yet for a general TOD zoning framework that could be applied to multiple station areas. Instead, the City has used non-statutory SAPs to present redevelopment plans for station areas. SAPs are understood as sending strong signals to development stakeholders, having been approved by Council, serving as model projects whose realistic build-out times could number in the decades. Where greater specificity and narrower strictures are necessary, the technical latitude and Council backing of direct control allows TOD planners to circumvent the limitations of conventional zoning, and avoid elaborate wholesale rezoning where it is not pressing or crucial. Enacting SAPs, by applying conventional zoning and going through the process of amending or revising the standing ARP, is thus perceived by City staff to be more or less unnecessary, and would incur a months-long delay in moving forward with the demonstration projects.

- *Lessons from Other Cities*

Arlington, VA

Arlington is a suburban city directly across the Potomac from Washington, is moving from its historic success with TOD to change approaches for a new TOD corridor. In some respects the original TOD redevelopment project, the low-density suburban Wilson Boulevard corridor was transformed during the 1980’s and 90’s by the construction of five stations on a new heavy-rail Metro subway line and the implementation of a thorough policy for mixed-use high-density redevelopment in station areas. Careful modulation of building height and massing has created a very visible rhythm of density as it rises toward Metro stations and falls away from them, and the stations are close enough together (from roughly 2/3 to a mile apart) that all points on the corridor are within a direct and brief walk of a station (Dittmar and Ohland, 2004, ch. 7). Arlington’s Columbia Pike corridor, a mix of retail and medium to low-density housing, is experiencing many of the same problems and opportunities as Wilson Boulevard did in the 1980’s. A new form-based code details exacting density and streetscape specifications for a number of different kinds of centers along Columbia Pike, in anticipation of a new BRT or light rail line connecting with the Metro system and major regional job centers. The code specifies the building envelope, architectural details, and streetscape standards for four different kinds of intensification areas along the corridor, and developers are obliged to provide certain kinds of public spaces and amenities at key sites (WMATA, 2005; CoA, 2003).

Austin, TX

Austin attracts many new residents and businesses thanks to its lively culture, educational opportunities and concentration of high-tech research firms. To combat the classic headaches of a boomtown – increased traffic, urban sprawl and unaffordable housing – Austin is integrating affordable housing into its TOD policy. The City’s “S.M.A.R.T. Housing” policy explicitly includes accessibility, income mix, “reasonable” cost (defined as no more than 30% of gross income for households earning 80% or less of the city’s

median income) and transit orientation among its goals, which apply to rental and owner-occupied housing. For new housing that meets the S.M.A.R.T. criteria, the City of Austin offers partial or total development fee waivers and expedited development approval times (CoA, 2007). Conversely, Austin's TOD policy also includes explicit reference to affordable housing, and after both policies were developed the City of Austin set a goal that 25% of new housing in TOD areas conform to the S.M.A.R.T. guidelines (CoA, 2005). The TOD policy applies to areas around several stations on Austin's planned rapid bus and commuter rail lines. It sets basic interim TOD zoning regulations (mandating higher-density residential types and prohibiting certain auto-centered land uses altogether) in the station areas, pending more detailed station area plans that are currently under development and which will also be statutorily instituted through permanent zoning changes (CoA, 2005a).

Regional Municipality of York, ON

York is using TOD to support new transit investments and create mixed-use neighbourhoods. The intensification sought by York Region will help it shift population growth from fringe areas – where the provincial Greenbelt places limits on new housing development – to higher-density centres. Earlier New Urbanist developments in Markham were designed with transit in mind, and major projects like the Vaughan Corporate Centre and Downtown Markham are being designed around projected rapid transit and busway corridors. York Region introduced TOD guidelines in 2006, at the same time that it rolled out an integrated transit system featuring BRT service with new vehicles and a modern fare system (YR, 2006). A new Housing Supply Strategy was introduced during this period as well, which moved beyond promoting subsidized units to consider the role of rental units and affordable owner-occupied homes in the overall affordability picture (YR, 2002). The strategy called for rigorous implementation of intensification plans, permission for secondary suites, development fee reductions, new transit services and tax changes to stop the erosion of rental units and encourage the development of new, transit-accessible, ones. Currently, to follow up on the regional land use plan, York Region is developing sustainable development standards, including compact and transit-supportive neighbourhood form and social integration, to apply to new greenfield development (YR, 2007).

- *Options for Calgary*

To build and capture the full range of synergies possible between TOD and affordable housing, Calgary should expand and integrate its affordable housing and TOD efforts. Given the financial benefits of lower automobile use and appropriately sized housing, TODs are an ideal location for affordable housing. Similarly, the variety of housing types needed to create a TOD density gradient around transit stations forms a natural opportunity for the development of socially and economically integrated communities. Given these parallels, using TOD as a vehicle to further affordable housing goals (and vice versa) offers meaningful advantages when high-density mixed-use zoning allows developers to realize economies of scale and pass them on to households. Special emphasis on high-quality public spaces, streetscape designs, building massing and

aesthetic standards, like those included in the TOD policy guidelines, will help mitigate common objections to higher-density development, rental tenure and transit access.

To improve clarity for developers while encouraging constructive and well-timed public input, ARPs should be updated to reflect specific SAPs and the overall TOD policy. The draft SAPs that have already been produced (Chinook and Anderson) are thorough and workable, and given the expected build-out time there is little downside to putting the full density and design prescriptions of the SAPs into effect through an ARP amendment or revision. Where direct control or conventional zoning has not been fully updated to reflect the TOD policy guidelines, discrepancies between statutory and non-statutory plans and policies serves to confuse developers who hold a favourable and cooperative view of the City's initiatives and goals, and creates unnecessary public fears of negative impacts from increased density. Working out potentially contentious issues before proposals and initial outlays are made improves transparency for all parties, and a shorter development approval process saves both developers and the City administration money, effort and political squabbles.

To permit a market-led mix of uses within station areas of appropriately moderated density, Calgary should rely more heavily on form-based regulations. Form-based codes help take some of the functional guesswork out of land-use decisions, letting market conditions determine the exact mix of uses while planners determine building massing and control functional impacts. Developers in the heavily regulated Washington area were prepared to let Arlington authorities determine the mix between residential, office and retail development, but Calgary's more independent-minded developer community has some reservations about the appeal of TOD and the market's capacity to absorb high-density space. A form-based code would offer developers the ability to shift the mix of retail, residential and office uses, providing flexibility with which to offset for the risk of undertaking high-density station area development.

- *Implementation Issues*

The City is already investing substantial administrative resources into the TOD policy and its associated SAPs, and the six pilot projects are important, high-visibility tests of this new push for better development patterns. Now that the planning work is completed or well underway, and direct control can be used for transitional zoning of important sites, ARP revisions can be pursued. However, more effective stakeholder engagement and zoning will be needed to address developers' concerns about unclear language in ARPs, and ensure conformity between policy goals and the regulatory framework. While public engagement and policy development have made tremendous strides in recent years, interviewees still report that there are often unnecessary delays and confusion – which increase developer uncertainty and ultimately raise housing prices – in developing TOD projects. Updated ARPs and zoning, that are embraced by the community and that lay out development requirements from the outset, will allow builders to develop and move forward with TOD projects as-of-right, in conformity with both non-statutory policies and statutory zoning bylaws.

Promoting the TOD package of higher densities and lower transportation costs is one of the avenues of promoting affordable market housing that is open to Calgary under the MGA. Albertans' changing outlook on the world, and the influx of newcomers from more established, socially integrated and diverse cities in central Canada, make this a good time to embrace big-city density and vibrancy as a selling point for the City and its TOD neighbourhoods. Lowering costs for rental development in TODs is one way of encouraging social mix and affordable housing in them. Density bonuses offered to retail, commercial and condominium developers should be configured to entice those developers, rather than those building rental housing, to build costly public amenities. Shared parking or other common infrastructure for TODs could lower infrastructure costs for new rental development. Discretionary decisions on rental housing proposals should show the greatest possible favour and offer flexibility to their developers as a way of encouraging additional rental housing.

The TOD SAPs already adapt some form-based approaches, requiring street-level retail, building massing and setbacks, and governing certain aesthetic aspects. Form-based approaches are a natural fit for special direct control guidelines, but City staff should evaluate their evolving experience of TOD development under partially form-based zoning with a view toward incorporating form-based elements more widely in conventional zoning. The development of the Beltline neighbourhood, where the ARP establishes what amounts to a mixed-use form-based zone, may also offer some instructive lessons on broadening and deepening the use of form-based codes. Emphasizing the flexibility that form-based codes can give developers could help overcome other developer objections to, or scepticism of, TOD.

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Downtown Development

- *Introduction*

Downtown areas serve as a city's living heart, the physical and economic center of the urban region. After a period of decline following WWII, when postwar highways drained offices, factories, retail stores and residents from central cities, North American downtowns are enjoying resurgent interest as places to live, work and spend time. Municipal governments are seeking ways to make their downtowns competitive with rival suburban centres for both retail and residential functions (Sohmer and Lang, 2003). Calgary's compact downtown area, until relatively recently a sleepy and low-rise neighbourhood, is experiencing a wave of development that is remarkable even by the standards of the city's overall property boom. The sixty-odd cranes that swing among the downtown skyline are some of the most prominent visual signs of its rapid growth, and new public spaces and redevelopment projects are introducing new residents and renewing streetscapes.

Downtown is of central importance to Calgary's urban structure, serving as the cultural and economic hub of the region, home to its largest corporations, biggest gathering places, most important cultural institutions, and greatest concentration of jobs. Calgary's economically dynamic and residentially liveable urban center is not just a prestige item or point of pride, but an increasingly substantial counterweight to the drift of population and employment to the urban periphery (Bunce, 2004; Filion, 2003). Over 6,000 new residents moved downtown between 1986 and 2006, a 66% increase, while the number of dwelling units went up by 27% during the same period (City of Calgary, 2007). The current projections included in the Centre City Plan anticipate 20,000 to 40,000 new residents between now and 2035, which would require 13,000 to 26,000 new units of housing (City of Calgary, 2007a). In this capsule, the term "downtown" is used in a loose sense, to refer to the Downtown planning area (a rectangle bounded by 8th Street SW, the CPR tracks, 3rd Street SE, and 3rd and 4th Avenues) along with the East Village, Eau Claire, Chinatown, West End and Beltline/Midtown neighbourhoods that make up Centre City.

- *Existing Policies and Conditions*

Calgary used fairly conventional zoning and bonus tools to shape its downtown and promote the development of high-density office towers in its 1970s and 80s boom years. This approach raised density limits overall and granted building height and density bonuses to developers who included at-grade public open space, such as plazas or small parks, on their sites, and who incorporated publicly accessible interior passages – the "+15" system – that connected to other properties via enclosed, elevated walkways. This same framework remained in place through the 1990s, while ideas about successful downtowns shifted to emphasize the advantages of improved streetscapes and lively pedestrian environments over climate-controlled indoor corridors, and the need for high-quality public spaces to attract and complement private development. At the same time,

some higher-level policies helped cement downtown as the most significant regional office node. The 1998 Calgary Plan set broad directions for downtown development, including such policies as “promote the downtown as the principal centre of economic activity”, “enhance the Downtown’s role as a major employment, housing, shopping and cultural focal point of the City”, and “encourage the build-out of downtown residential areas to support walking choices for downtown employees” (City of Calgary, 1998).

Efforts to revamp and update policies for Centre City started with the 2002 Framework for Planning the Future of Calgary’s Downtown. The Framework worked from the understanding that policymaking for downtown needed to change in three key areas: in the outdated zoning and regulatory scheme; in the planning for major public facilities and landmarks, such as museums and cultural venues; and in designing, managing and enhancing public spaces (City of Calgary 2002). To address these, the framework proposed developing an Urban Structure Plan to control overall downtown land use planning, along with a Program for Public Improvements to set public priorities for upgrading urban design and physical infrastructure. In this vein, the 2007 Centre City Plan outlined a set of concepts for the urban structure, positioning Downtown as the leading regional office concentration, supplemented by an increased residential population and improved connections to surrounding mixed-use Centre City neighbourhoods. To improve the level of animation and add street life, the Plan also calls for a new central library near City Hall, lays out street-oriented aesthetic guidelines for new development, and proposes ways to update the density bonus system (City of Calgary, 2007a).

One rung below these broader visions, the City uses Area Structure Plans and Area Redevelopment Plans to manage the development of individual Centre City neighbourhoods at a finer scale. The Beltline area, immediately south of the Downtown high-rise cluster, has attracted substantial planning attention due to the advantages of its central location, the potential for re-use and requalification of its stock of early 20th century industrial buildings, and the challenge posed by the rail line that cuts across the area. A 2004 design study for Midtown (another name for the Beltline area) set out a general scheme for prioritizing different uses (“work”, “live”, “play”) in different parts of the Beltline within an overall pattern of mixed-use development, as well as new under- and overpasses to cross the CP viaduct and an ambitious plan to turn 10th Avenue into a grand east-west boulevard (City of Calgary, 2004). The Beltline ARP includes a density bonus system that allows developers to build at higher-than-approved densities in exchange for providing community space, publicly accessible open space, non-market affordable housing units, heritage preservation or sustainable building features, or for contributing to a Beltline Community Investment Fund that supports streetscape improvements, public space and public art (City of Calgary, 2007b).

Similar land use plans for the other Centre City neighbourhoods – East Village, Chinatown, Eau Claire, West End, Victoria Crossing and Stampede Park – have also been developed. The first four of these neighbourhoods include surface parking lots and a high proportion of vacant and underused land – 123 hectares, almost 21% of the total downtown land – that is tightly integrated with the downtown high-rise core and close to

the Bow River and established parkland (City of Calgary, 2004a). In the latter three, south of downtown and the Beltline area, an existing framework of gridded streets, older single- and multi-family housing forms, schools and parks can be reinforced with additional ground-oriented housing. Land use plans for these areas mandate a mix of townhouse and low-rise units, with continuous retail facilities along busy streets and continuous residential frontage along quieter side streets. The East Village ARP, for example, encourages a variety of lot sizes to encourage a variety of housing types and unit sizes, and its design guidelines support podium-and-tower development with high-rise towers at intersections connected with continuous rowhouses in between (City of Calgary, 2005).

- *Issues, Barriers, and Potential*

Since the 1998 Plan included a policy to “support the continued growth of jobs in the downtown to support transit ridership”, transit has become the most popular mode for commuters into and out of downtown, with a mode split in auto-dominated Calgary that rivals the transit ride share seen in the well-known “transit cities” of Vancouver, Toronto and Montreal. Between 1996 and 2006, among commuters entering downtown from outside (i.e., not counting those who both live and work there), the share of auto drivers and passengers dropped from 60.9% to 44.8%, while the share of transit users increased from 32.4% to 45.1% (City of Calgary, 2007c). In fact, the 1998 diagnosis is now reversed; transit capacity (especially the C-Train, which is currently at capacity in peak directions) needs to expand in order to support the concentration of jobs downtown. The decision not to build a major downtown highway, reinforced by Council’s 2000 policy of not expanding arterial roadway capacity into or out of Centre City and the high cost of parking downtown, has helped reinforce this highly transit-oriented dynamic. The 2005 Transportation Plan notes the success of these efforts in leading 2/3 of all new downtown commuters to use transit, and calls for continued limits to parking and road capacity to maintain high transit ride share (City of Calgary, 2005a). Driving downtown is becoming more expensive, while transit, pending planned capacity increases, is near its limit in terms of the number commuters it can move in and out of downtown. In these circumstances, the appeal of walking or cycling to work from downtown-area housing is considerable, and presents an opportunity to shift residents downtown onto human-powered modes of transportation, and off of crowded roadway and transit links.

Calgary’s current prosperity and changing workforce has created a new market for high-density downtown living, which is now dominated by high-rise condominiums. The high costs of building up have led to a situation in which high-rises are limited to the upper end of the housing market, and luxury condominiums dominate the new high-density housing being built in and around downtown. The City’s current Economic Development Strategy sees efforts that promote equity, creative activity, and social mix – including more affordable housing for workers, quality downtown streets and public spaces, and centrally located cultural and entertainment districts – as key to Calgary’s ability to continue to diversify its economy and compete on a new global stage (City of Calgary, 2007d). More and different kinds of housing, with varied building typologies and tenure,

will be needed in and around downtown to create the kinds of places that attract and retain the new workforce.

Downtown retail, too, competes with a highly developed network of suburban malls. While entertainment uses, Chinatown shops, and high-end retail have all had success downtown, a wider variety of both everyday and “destination” retail is essential to maximize the livability of Centre City and attract a wider variety of households. More retail, in conjunction with more cultural and entertainment facilities, extends activity past office hours, animating streets and making the heart of the city a place of encounter and exchange.

Although City staff believe that the high-rise condominium trend will continue to dominate downtown residential development, there is some evidence a more varied development pattern can increase the variety of households, and the overall demand for housing, downtown. A 2005 study identified residential growth opportunities in the townhouse and family apartment segments, growing elements of the Calgary housing market that have had little presence so far in the downtown area. Land use regulations and design guidelines that support low- and mid-rise heights for townhouses and apartments will encourage the use of cheaper wood-frame construction, which are quicker to build, less financially risky, and have lower per square foot construction cost than concrete high-rise buildings, all of which may translate into lower purchase or rental costs for households.

A parallel survey found that current downtown residents, mostly smaller households across a wide span of age groups, are mostly satisfied with downtown life, and that 47% of Calgarians living outside downtown would consider relocating there if additional services and residential amenities were introduced. The results of these studies indicate that the market for downtown housing is larger and more diverse than many assume, and that many Calgarians in low-rise neighbourhoods are surprisingly receptive to the possibility of living in a densely developed and highly urbanized downtown (Corolis, 2005, 2005a).

- *Lessons from Other Cities*

Toronto, ON

Toronto’s downtown is older and less dominant in the regional market for urban commercial space than Calgary’s. Like Calgary, however, downtown Toronto encompasses fringe areas around a central high-rise core, with older industrial and commercial structures concentrated in the vicinity of active railway lines. Along with more narrowly-defined and prescriptive plans for the arts-themed Distillery District and large waterfront redevelopment areas, Toronto is carrying out a unique planning experiment by loosening zoning strictures in the two downtown “shoulder” areas, around King and Spadina streets just west of downtown and King and Parliament streets to the east. In 1996, restrictions on land use, parking, and density were removed and replaced with form-based regulations that set general standards for the building envelope. Within these loose criteria, developers are free to build and renovate as-of-right, saving

considerable time and expense by significantly streamlining the approval process. The experiment has been an economic development success, with new commercial and live/work units established in former industrial buildings – where “creative class” industries such as marketing, publishing, software and media services have concentrated – and new residential construction on vacant land a testament to the neighbourhood’s desirability (CoT, 2002; CMHC, 2004).

Montreal, QC

Like Calgary, Montreal has retained its downtown’s position as the leading regional center for head offices, with relatively few prominent local firms opting for suburban office-park locations despite a shift in industrial and logistics functions to suburban locations closer to the airport and highways. With growth prospects relatively flat for new office space, municipal and private-sector interests are focusing on culture to revitalize the eastern section of Montreal’s downtown. The Quartier des spectacles (“shows district”) already encompasses one of Canada’s largest concentrations of entertainment and nightlife venues, and the City has set up a public-private partnership to collaboratively market and promote events and venues within the area, while emphasizing its role as a broadcast and production center for television, radio and new media. The partnership has planned (and the City is building) new public spaces in the area to house outdoor festivals and frame new development, and is deploying colourful façade lights and networked LED screens to highlight cultural venues and promote events. New performance venues, and a clutch of new condominium, office and institutional projects, have already moved forward since the partnership started in 2003.

Vancouver , BC

Vancouver has a growing downtown with a mature office sector, and has successfully spurred strong residential growth in the downtown core and in adjacent redevelopment areas. Requiring family-sized units in new major projects has helped draw more families downtown, but so has the “point block” development style, with towers at the corners and rowhouses in between, mandated by urban design and zoning controls. Vancouver planners determined that the variable in attracting families is not low densities, or the presence of private yards per se, but appropriately sized units with two, three or four bedrooms, and access to family amenities like day care, schools and shopping. A set of guidelines for developing high-density housing with children, created in 1992, identified household mix and child-friendly design features (courtyards, play areas, walkable access to elementary schools) as essential to the attractiveness of downtown as a socially integrated neighbourhood with all kinds of households, and as tangible signs of commitment to family needs (Planning Commissioners Journal, 2006; CoV, 2000, 1992).

- *Options for Calgary*

Calgary could extend the use of form-based codes to permit the market to establish a dynamic and fine-grained mix of uses in downtown revitalization areas. The Beltline and Midtown plans already take a step in this direction, loosening land-use prescriptions while setting a clear building envelope. Full-fledged form-based codes are neutral toward the types of housing and land use that exist within that envelope, making it possible to

integrate housing in a variety of ways with office and retail uses. The ability to mix smaller and more affordable residential units with larger and more profitable ones, or other lucrative functions, within the same space opens up possibilities for creatively including affordable residential units on a voluntary basis in mixed-use projects. Bringing living and working environments closer together can help extend the hours of activity in downtown neighbourhoods, maximizing the benefits of improved public space and helping to spread infrastructure loads throughout the day. Unambiguous and firm form-based zoning could additionally help make the development approval process clearer, simpler and shorter, relieving developer worries about administrative delays in the development timeline, lowering the financial risk of development, and thus potentially lowering the cost of new housing or commercial space.

Encouraging smaller and more affordable units for non-family households could be achieved through wider use of density bonusing. Downtown is one area of Calgary where convincing developers to build bigger and higher is not a hard sell, although the tendency to higher-end development frequently pushes unit sizes up in high-rise buildings. Expanding density bonuses to reward the inclusion of certain unit configurations, such as more studio apartments that are often more affordable, or multi-bedroom apartments that are family-friendly, could lead developers to vary the size of the units they offer in new projects.

Enhanced and coordinated cultural development helps cement downtown's centrality to the wider city and its citizens. Calgary is planning for additional institutions downtown, but a wider view of culture that encompasses cultural and media production along with performance and exhibition helps leverage the economic power of the cultural sector as well as its social benefits. Increased promotion and integration of downtown cultural offerings helps highlight existing cultural options in a cost-effective way, raising the profile and pride of home-grown creative enterprises in ways that capital-intensive cultural building projects cannot. Creating livelier and more interesting central places makes downtown and inner-ring neighbourhoods more desirable places in which to live and work, offering opportunities that suburban areas will find it difficult to match.

A more attractive downtown with a complete mix of higher-level uses will put greater emphasis on completing Centre City's range of institutions and urban functions, and make greater use of its natural advantages. The educational/institutional areas designated in the East Village will, when built out, bring new functions and demands for affordable housing downtown, and the City should consider downtown as a potential location for future major institutional facilities for education or health care. A close mix of specialized educational institutions and commercial spaces can facilitate commercial spin-offs from new facilities, a powerful economic development dynamic that is already happening around the University of Calgary and could be extended to downtown. A successful cohabitation of uses needs quality public spaces to tie everything together, and to smooth potential conflicts between adjacent land uses. Paying more attention to connections between new existing downtown parks and waterside attractions will put a signature natural asset to better use.

Recognition and support of the housing and service needs of downtown families will help socially integrate new downtown development with a wider range of housing and residents, not just condominiums and professionals. Survey data suggests that a large number of Calgarians are interested in the kind of lifestyle downtown has to offer, but are still conscious of the need for additional residential services and amenities there.

- *Implementation Issues*

Form-based codes and new density bonuses are not prohibited under the Municipal Government Act. Density bonuses and types of form-based regulation are already in place for the Beltline area, and tweaking their provisions to get developers to reach for a wider mix of unit sizes and uses within existing projects could be an acceptable way to bring down the cost of smaller units for smaller households within the constraints of the MGA. However, the act does not identify housing affordability as an explicit municipal planning objective, so there is some concern that the density bonusing provisions could be open to legal dispute (City of Calgary, 2004).

Much of the planning for public space and streetscape improvements to downtown and Centre City is already well underway, and the greater attention given to open spaces and parkland will help Calgarians appreciate a greener side of their urban core. New cultural venues will help support cultural life, but City planners will have to pay greater attention to the full range of cultural activities and productions in Calgary to understand the full economic impact of culture and the kinds of spaces that cultural enterprises and cultural workers will need. Locating educational and health care institutions downtown would reinforce the concentration of a range of jobs and housing in the central area, but current long-range planning generally directs major new institutions into their own precincts in new development areas. Liveliness, creativity, and a diversity of high-level functions need to be facilitated and embraced as downtown's unique selling proposition – something that can't be replicated elsewhere in Calgary, and an attractive quality that suburban areas can't offer households.

Making downtown more attractive to a wider variety of households, including families, will require a wider variety of housing types and unit sizes, including family-friendly apartments and townhouses that have a relatively large floor area but are not geared toward the luxury market. Vancouver's most important family-friendly housing tool, a requirement that 25% of new units in large new developments be large enough to welcome families with children, is not an option for Calgary under the Municipal Government Act. The City can still take positive steps to support more family-oriented affordable housing downtown, such as setting site planning and zoning standards to encourage wood-frame townhouses and low-rise apartments, providing family services, and considering the needs of children when designing public recreational space. Of course, many child- and family-friendly features, such as safe and pedestrian-friendly streetscapes or convenient everyday commercial needs, will benefit households of any age.

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Transfer of Development Rights

- *Introduction*

Transfer of development rights (TDR) policies allow property owners to sell or otherwise trade the right to develop a specific parcel of land to another parcel. The transfer can be accomplished by rezoning the properties involved, or using permanent easements or deed amendments are typically to restrict the permitted density of the seller's parcel and increase that of the recipient's. Voluntary TDR programs, which forgo legally enshrining the transfer and function on the honour system, also exist. Thus, the total amount of development permitted in a given area remains the same, and property owners are able to take advantage of their development rights, but by permitting them to "unbundle" the right to develop from their other property rights, density can be concentrated in the most advantageous and appropriate section of the area.

The transfer of air rights is the most basic and widely used form of TDR; originally developed and frequently practiced in New York City, this allows property owners to sell the air rights – the unused portions of the zoning envelope permitted beyond existing structures – to the owners of a nearby property. In an area zoned for five-storey buildings, the owners of a three-storey building could sell their air rights to the owners of the neighbouring lot, who would then be permitted to build up to seven stories. This approach is usually employed for immediately adjacent or nearby properties in more densely built-up areas; it has been frequently employed in building and financing land-intensive transportation facilities, and encouraging denser development near them. Outside of urbanized areas, TDR is also used to protect farmland and ecologically sensitive lands from development, and to help encourage nodes of higher-density construction at the urban fringe (Chomitz, 2004). Opening a market for development rights over a larger geographic area can be facilitated by government-operated clearinghouses or exchanges that link sellers with potential buyers.

- *Existing Policies and Conditions*

The City of Calgary, like most other Canadian jurisdictions, has no TDR mechanism currently in place. A preliminary analysis has shown that although the Alberta Municipal Government Act does not explicitly authorize TDR, there appear to be few direct legal impediments for Calgary or other municipalities subject to the MGA to implement a TDR framework (Kwasniak, 2004). While large-scale density transfer is not currently practiced over wide areas in Calgary, however, the City does have some experience with density transfer. The example of the heritage density transfer, which operates along similar principles, offers some indications that a TDR program could help lessen development pressure on environmentally sensitive land or areas at the urban fringe, while increasing densities in more appropriate places.

Density bonuses are already used in Downtown Calgary, to reward developers for

building conventional public amenities such as plazas and plus-15s, as well as encourage them to build in ways that reinforce continuous commercial and residential streetscapes and ensure a good interface between new development and public spaces. The East Village ARP, to take one example, offers a 1.0 FAR bonus for developments that include child care facilities, public or semi-public spaces, or apartment blocks that feature at-grade townhouses at their base, and even higher bonuses for mixed-use projects that include educational facilities (City of Calgary, 2005). Density transfer is also used to help encourage historic preservation in the urban core. Bylaw 1P2007 allows a Heritage Conservation Density Transfer for downtown properties that are designated as Municipal Historic Resources. Under this framework, the transferable density is calculated as the difference between what is allowable as-of-right on the site and the floor area of the existing heritage building, which can be applied to other sites within the same downtown CM-1 zone.

- *Issues, Barriers, and Potential*

TDR would offer Calgary a market mechanism with which to limit the development of agricultural land, while preserving the property rights of landholders who expect a windfall from low-density development at the urban periphery. A well-designed TDR program could overcome some potent objections to development control mechanisms and preserve undeveloped and environmentally sensitive sites in the same way that the density transfer has helped preserve heritage buildings downtown.

The scale of the TDR program is an important unresolved question. TDR schemes that apply to large numbers of parcels in broad swathes of developed and undeveloped land, frequently serve as markets for development rights, and as in the examples below, defining the boundaries of contributing and receiving areas requires balancing the functional needs of this market with the policy goals it is intended to favour. Applying TDR to a more limited area, like the Downtown density transfer mechanisms, is an alternative to a citywide market or markets, and could be used to focus density in a finer-grained way within individual neighbourhoods.

TDR has a marked advantage in a political context that favours property rights and is skeptical towards prescriptive development planning, in that it permits landowners to take full financial advantage of the development potential of their property, while (in some forms) allowing the market to decide the value of density and where it should go. This applies both to built-up areas, where it can help divert pressure to start development that will radically change the face of existing neighbourhoods, as well as to undeveloped or agricultural land at the urban fringe. Separating development rights from ownership rights can help maintain the viability of agricultural activities on land that is in close proximity to highways, removing the pressure on landowners to give in to the advancing line of urban sprawl.

Approaches such as urban growth boundaries or greenbelts, which delineate hard development boundaries, can backfire when low-density development leapfrogs out beyond the control area to create a secondary ring of urban sprawl, and can cause

hardship for landowners who suddenly lose the right to develop their land and the value that it represents. TDR programs can avoid some of these pitfalls, by permitting purchasers of rights the flexibility to apply them within the built-up area, and sellers of the rights to maintain the full value of their property while maintaining its agricultural use.

- *Lessons from Other Cities*

New Jersey Pinelands Commission, NJ

The Pine Barrens of South Jersey are a million-acre region of highly acidic, sandy soils that support a thick cover of conifers. While the unique characteristics of this densely forested region have saved much of it from general agricultural development, the Pinelands make up almost ¼ of the land area of a rapidly growing state and are subject to considerable pressure to accommodate urban sprawl from Philadelphia and New York. In 1978, the federal government designated a National Reserve covering most of the region, and the state followed suit the next year by creating a Pinelands Commission to control development. The Commission prepared a general land use and zoning plan for the entire area, and local municipalities are required to bring their plans and zoning into conformity. In some parts of the Pinelands that are ecologically sensitive, or where specialty farming (generally blueberries and cranberries) is practiced, the Commission offers landowners development credits for downzoned agricultural or ecological land. The credits (amounting to over 46,000 units of housing) can be sold to property owners in designated receiving areas within the Reserve, where development is allowed. To provide a workable market for the credits, the state maintains the Pinelands Development Credit Bank to facilitate and supplement private exchanges, and a county government operates its own credit exchange to promote the sale of its development credits. While the Commission has succeeded in developing a small market for the credits, limited infrastructure capacity (particularly in water and sewer systems) in designated development areas is a severe constraint on actually using development rights (Johnston and Madison, 1997; Pizor, 1986).

Montgomery County, MD

Montgomery County's TDR program is often cited as the most successful example of a strategy to limit the consumption of rural land. An inner ring of highly-urbanized towns around the county's border with Washington is home to most of the county's population, but further out from the city farmland and various national and state parks and nature preserves predominate. The Maryland-National Capital Parks and Planning Commission handles open-space and regional planning for Montgomery and adjacent Prince George's counties, and established the Montgomery County TDR program in 1980 to halt the rapid development of farmland that threatened the ecological integrity of nearby conservation lands. Under the program, the rural northern third of the county was designated an agricultural reserve. Landholders were awarded one housing unit credit for every five acres of land, which they can sell to property owners outside of the agricultural reserve area. In this case, TDR was supplemented by a strong array of other development control instruments, including the purchase of development rights, a conservation easement strategy, and detailed growth plans to shape development in the urbanized portion of the

county (ibid.; Brabec and Smith, 2002; Song, 2002).

Vancouver, BC

The construction of a new Skytrain line through industrial and suburban areas of Burnaby, west of Vancouver, brought frequent transit service to a swath of properties close to the regional core. In assembling the property needed for the right-of-way, BC Transit sold the development rights to the undevelopable land under the elevated guideway to the owners of neighbouring properties. This paved the way for higher-density transit-accessible development, increasing passenger traffic on the new Skytrain line (Tomalty and Cantwell, 2004). The City of Vancouver has used a Heritage Density Transfer to supplement its heritage policy since 1993, and identical provisions to support open space, views and other public amenities have since been incorporated into the same TDR program. Downtown Vancouver and the surrounding “Central Area” are characterized by rapid residential growth, which has resulted in a particularly acute need to support the preservation of heritage properties. The City permits developers to transfer density from heritage sites in the Central Area to nearly any development site in the Central Area; beyond downtown, density can be transferred within the same zoning block (City of Vancouver, 2008, 2002).

- *Options for Calgary*

A successful TDR program will require efficient and liquid markets for development rights, which is partly a question of geographical scope and partly one of market operations. The New Jersey and Maryland examples show that this requires careful attention to designating workable areas for sending rights as well as for receiving them; credits will not be actively traded if there is nowhere for them to be employed. These examples also demonstrate the importance of regional and multi-jurisdictional agencies in creating TDR programs of sufficient geographical breadth and harmonizing them with other metropolitan development control strategies, which may require stronger provincial and intermunicipal support for regional governance than currently exists in metropolitan Calgary. Municipally or provincially operated clearinghouses for those rights may need substantial startup capital and active government participation in order to keep the market liquid, and establishing what is essentially a small-scale commodity market is a challenging undertaking.

To get the most impact from TDR mechanisms, they must be implemented with other development control practices in a mutually reinforcing way. While TDR has largely been applied as a mechanism for farmland preservation, its effectiveness in promoting transit-supportive densities near transit infrastructure is less certain. Careful design of receiving areas will be needed to sculpt density around transit stations and ensure successful interface with nearby areas. Placing too-restrictive limits on the extent and form of those areas may, however, stifle the market for development rights, requiring yet another delicate balance in implementing it. When advanced alongside other mechanisms, though, TDR could be a major asset. In the older inner-ring suburbs on the grid, homeowners who appreciate the pleasant character of their streetscapes face pressure to split or redevelop their lots to take advantage of their central location. A TDR

program that allows those homeowners to benefit financially from the development rights they possess, by selling the rights and permitting higher density on other sites nearby, could encourage the preservation of the urban fabric and neighbourhood character. Even well-preserved older neighbourhoods offer development and intensification opportunities in local greyfields and other underused commercial or industrial sites, which form a convenient nearby destination for development rights from the surrounding community. Therefore, as part of a multifaceted policy approach, TDR can help achieve intensification, housing variety and greyfield goals, while permitting homeowners to reap the full financial benefit of their property rights.

- *Implementation Issues*

While TDR's appeal is potentially significant in a political culture that firmly appreciates free markets, setting up those markets is legally and technically complex. Establishing a framework for "debiting" development rights from properties that have sold them, and "crediting" those rights to the receiving properties, can be a delicate process that complicates property assessment and taxation. Using zoning mechanisms to transfer rights may be less administratively burdensome than carrying out modifications to property title, but more detailed legal analysis will be needed to determine which approach will appropriately balance administrative complexity with overall effectiveness. Even if TDR is accepted by private housing actors as a workable open market in which to trade density, keeping the market humming along will mean more administrative attention and resources from public-sector actors, not less.

The use of TDR and other tools to increase built density has obvious implications for growth management, but less obvious potential to facilitate affordable housing. The understanding of "affordable housing" that prevails in municipal and provincial policy is mandated and legally protected municipally, provincially or charitably operated housing units, often destined for specific groups in need. As was mentioned earlier, the MGA constrains the ability of municipalities to plan for and require specifically affordable units. However, there is considerable untapped potential for lowering the cost of housing in Calgary through diversifying the size and type of housing units, and helping households achieve more cost-efficient lifestyles through creating (and preserving) walkable and transit-accessible neighbourhoods with convenient local shopping. Directing higher densities to certain areas, while improving quality of life through investments in streetscapes and public services, will help achieve this, as will market mechanisms that make density a desirable commodity for builders and a lucrative asset for property owners.

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Housing Form

Rental Housing

- *Introduction*

A healthy supply of rental housing is considered to be an essential component of the housing mix for any city. There are various types of households for whom homeownership may not be a viable option, including students, senior citizens, recent immigrants, single parent families and, more generally, households with modest incomes. Each of these types of households requires rental housing that is affordable and that meets their specific needs. Thus, a healthy housing market requires a sufficient supply of various types of rental housing.

There are a number of ways in which the stock of affordable private rental housing can decline, the most common of which is demolition and redevelopment. A typical example is when a building with affordable rental units is demolished to be replaced by a condominium apartment building. On a smaller scale, rental units are lost when homes with secondary suites are demolished and replaced with larger homes with no secondary units. Even without demolition, the gradual gentrification of areas rich in moderately priced rental housing can erode the supply of affordable units. In this case, units are either moved towards the upper end of the rental market through extensive renovations or are taken off the rental market through conversion to condominiums.

Common strategies for the retention of existing rental housing include: (1) restricting demolition or conversions; (2) requiring replacement of demolished or converted low-rent units; (3) charging fees and levies for demolition or conversion; and (4) transferring development rights. These strategies can be used on their own or in combination (CMHC, undated).

Regulations restricting the demolition and conversion of rental housing are usually tied to vacancy rates, i.e., demolition and conversions are allowed only when the vacancy rate exceeds a specified minimum. Such restrictions can be applied to the municipality as a whole or tailored to meet the conditions in specific districts. For instance, by setting the minimum vacancy threshold for demolition or conversion higher in transit-rich and/or service-rich areas, the municipality can help prevent low- and moderate-income households from being pushed out to locations with poor accessibility to employment and services.

Regulations requiring the replacement of demolished or converted rental units may be preferable to restrictions on demolition and conversion in some cases. Demolition can be warranted or even desirable in cases where rental buildings are of little heritage value and in a state of severe disrepair, whereas conversion may be desirable in cases where rental buildings have significant heritage value and are in need of investment for the sake of

conservation. To reconcile maintaining the supply of rental housing with allowing warranted demolitions and conversions to go through, the municipality can leverage the replacement of lost units with demolition and conversion permits. As a condition for obtaining a demolition or conversion permit, the municipality can require that a number of rental units equal to or greater than the number of units lost be built at another location. The conditions need not apply to all rental units; rather, the municipality can selectively require that certain types of units – especially the types that are in shortest supply – be replaced. For example, if single-room occupancy units are in short supply (e.g., Vancouver – see case study below), the conditions for replacement can be applied specifically to that type.

Charging fees and levies for demolition or conversion is an approach that is less onerous on developers than requiring the complete replacement of units. In this case, the issuance of a demolition or conversion permit is contingent upon the payment of fees or levies, which are subsequently used to support the construction of replacement units. For instance, the funds can be used to create financial incentives for the construction of private rental housing. Alternatively, the money could be allocated to a housing trust.

A different approach is the transfer of development rights (TDR). The difference between the actual floor area of a building and the maximum floor area allowed by the zoning bylaw at a given location is a “development right”. The development rights of a rental building that the municipality wishes to preserve can be purchased and transferred to another site, allowing for additional floor area above the maximum prescribed by zoning at the site. The proceeds from the sale of the development rights of a particular building can be used to pay for maintenance and upgrades of that same building and can also potentially help fund the construction of new rental-units. For more details, see the case study on Seattle below as well as the capsule on TDR.

Aside from trying to retain existing units, municipalities with a limited supply of moderately priced rental units usually also undertake initiatives to stimulate the construction of private new rental units. Such initiatives include offering developers surplus municipal lands at little or no cost, waiving of development fees and charges, accelerating development approvals, providing financial incentives in the form of cash grants or discounted loans as well as favourable property tax rates. In most cases, municipalities will combine several similar initiatives to better entice developers to undertake rental construction (CHRA, 2002).

Another way of maintaining or increasing the supply of low-cost rental housing is to increase the stock of secondary suites, either as part of the home itself or as an independent structure on the same parcel. Secondary suites improve affordability in two ways: (1) they increase the supply of small, inexpensive rental units; and (2) they provide homeowners with a stable revenue stream, in effect decreasing their homeownership costs. For more details, see the capsule on secondary suites.

- *Existing Policies and Conditions*

Policy 2-3.2.2D of Calgary's Municipal Development Plan states that the City should "encourage the provision of an adequate supply of rental accommodation for different socio-economic groups in all parts of the city". Yet, the City has no regulations to protect existing rental housing nor has it undertaken any sustained initiatives to increase the supply of primary rental housing. It has however taken some modest steps in recent years to facilitate the creation of secondary rental housing in the form of secondary suites.

Where the preservation of existing rental units is concerned, provincial legislation gives the City little scope to impose restriction on either demolition or conversion of rental buildings. The City can only decline a demolition application on grounds of building heritage value but not on grounds of preserving rental units. In terms of conversions, Alberta's Condominium Property Act only gives the City discretion over conversions of buildings constructed prior to 1966; otherwise, the City cannot decline a conversion permit (City of Calgary, 2004). Provincial legislation also does not enable the City to require replacement of lost units or to charge levies to fund rental housing programs. While the Alberta MGA enables the City to impose a variety of conditions on development permits, such as the construction of new streets, sidewalks, parking facilities, and water and sanitation infrastructure, it does not allow the City to require that developers build replacement rental units. Much the same applies to demolition fees – they can only be used to fund new infrastructure but cannot be used to fund programs for improving housing affordability (City of Calgary, 2004).

The City has no initiatives in place specifically for stimulating the creation of primary rental housing by the private sector. The City has however taken some steps to increase the supply of secondary rental housing by enabling the creation of secondary suites on single-family residential properties under certain conditions. Calgary's land use bylaw (LUB) provides regulations for setting up secondary suites in low-density residential land use districts. However, the regulations are fairly restrictive, allowing secondary suites only on large parcels with very modest coverage. The Alberta Building Code also imposes a variety of restrictions on the structure of secondary suites and their location with respect to the main building on the property. Together, the LUB and the Alberta Building Code limit the potential for creating legal secondary suites. See the capsule on secondary suites for more details.

Rental housing as a share of all housing in Calgary has been in steady decline over the last ten years. In 1996, 35% of housing in Calgary was rented; by 2001, that share dropped to 29%; and by 2006 it was down to 26%. Over the same period, rental housing starts have remained low, hovering in a range between 0.1% and 4% of all housing starts. In 2006, rental starts constituted around 1% of all starts. The average vacancy rate the same year was around 0.5%, an all-time low, indicating a very tight rental housing market. According to CMHC, the vacancy rates have since been inching up, reaching 1.5% in 2007 and are projected to reach 2% in 2008. The rise in vacancy has been attributed to slower condo sales; around 40% of unsold rental units completed last year have been placed on the rental market (CBC, 2008).

In 2006, Calgary lost 946 rental units through conversion to condominiums. Another 383 units were demolished for a total of 1329 units lost in that year alone. This amounted to about 3% of a total traditional rental stock of approximately 44,393 units. Between 2001 and 2006, the total lost through conversions and demolition was 4,794, or over ten percent of the stock (City of Calgary, 2007). By contrast, in Toronto – a city with a population almost three times Calgary's and about 350,000 rental units – city council approved conversions for only 650 units between 1998 and 2007 (Cryderman, 2007).

- *Issues, Barriers, and Potential*

A key issue for preservation of rental housing in Calgary is the lack of rent controls. Although the Alberta government enacted legislation last year requiring landlords to give tenants 12 months' notice if they are going to do a condo conversion, there are no regulations preventing landlords from raising rents to force tenants to leave their units. Pricing out tenants not only facilitates conversion to condominiums, but also demolition for redevelopment (Cryderman, 2007). Where condominium conversions are concerned, another significant issue is that little rental housing was built before 1966. As a result, the potential for using the discretionary powers afforded by the Condominium Property Act to prevent conversions is limited.

There is virtually no primary private rental housing presently being built in Calgary and the City currently offers no incentives to stimulate its construction. Several developers interviewed for this study indicated that they are not pursuing the construction of primary rental housing because they believe the potential profits are too low and the financial risks too high.

Where the secondary rental market is concerned, there is potential for both condominium-to-rental conversion and the creation of secondary suites. As noted above, a significant number of recently constructed condominium units (about two in five) have been put on the rental market and are driving up overall vacancy rates (see CBC, 2008). However, given that many of these are upscale units (on average 30 percent more expensive than other traditional apartments, according to CMHC), they may not help increase the availability of moderately priced rental housing. In terms of secondary suites, the existence of a significant number of clandestine units of this type in Calgary is a testament to the demand for very small and inexpensive rental units, suggesting that the potential for legal secondary suites is likely to be high. Nevertheless, the LUB and the Alberta Building Code are barriers to the wider development of legal secondary suites – changes to both may be required to facilitate the expansion of this form of rental housing. See the capsule on secondary suites for more details.

- *Lessons from Other Cities*

Seattle, WA

The City of Seattle set up its Downtown Transferable Development Rights Program in 1985. The program was set up to protect heritage buildings and low- and medium-density

rental housing. Under the program, development rights are either bought directly by developers or can be purchased by the City and sold to developers later. To do the latter, the City set up a Transferable Development Rights Bank in 1988 to purchase and “store” the development rights for a number of landmark buildings and low-cost rental buildings, thereby protecting both from demolition for redevelopment. Development rights can be sold either by a private building owner, a non-profit housing agency, or by the City itself. However, there are strict conditions attached to the sale. Private owners are only allowed to use the proceeds of the sale to fund rehabilitation of existing rental units or to build new rental units. The rehabilitated or newly built units must remain affordable for 20 years, not exceeding half the metropolitan median rent by more than 30%. Similar restrictions apply to non-profit housing agencies, albeit they are also allowed to combine proceeds from TDR with other public funding for low-cost housing. When the City sells development rights for one of its own properties, it uses the proceeds to purchase development rights for other buildings as well as rehabilitating or constructing additional City-owned housing. The price paid for development rights depends on market conditions at the time of sale. Through the 1990s, close to 500 downtown rental units were preserved and rehabilitated thanks to the program. In addition, by taking advantage of dips in the real estate market to purchase development rights, storing them in the TDR bank, and then reselling them when the market recovered, the City earned revenues of over \$1.5 million that were applied to other housing initiatives (CMHC, undated b).

Vancouver, BC

Between the 1970s and 1990s, Vancouver experienced a sharp decline in the supply of affordable rental housing, particularly single-room occupancy units (SROs), in its downtown core. Since the late 1990s, Vancouver has adopted a set of policies, called the Replacement Program, to stem the loss of affordable units in the City’s center. The program is based on three main elements: (1) one-to-one replacements of SROs; (2) a \$1,000 per unit demolition fee; and (3) a development cost levy. The first policy requires that a developer who converts, closes, or demolishes a certain number of SROs replaces them with precisely the same number of SROs. Revenues from the application of the second policy are used for the operation and rehabilitation of existing SROs and the provision of additional social (i.e., non-market) housing. The third policy stipulates that developers building in designated neighbourhoods be charged a supplemental development levy, which is used to upgrade existing SRO units and to subsidize the construction of new social housing and private rental housing. The levy, which is enabled by provincial legislation, can be fairly significant. For example, in Vancouver’s Downtown South district, of \$6.18 charged per square foot in levies, 45% or \$2.78 is directed to replacement housing. All three policies are applied concurrently – i.e., a developer who demolishes an SRO building and redevelops property must replace the lost SROs, pay the demolition fee for each unit, and is liable for the development levies (CMHC, undated c).

Ottawa, ON

Ottawa has adopted a number of policies for increasing the supply of market and non-market rental housing. Notably, among market initiatives, the City has recently revised its zoning bylaws to allow for the wider development of secondary suites across the city. However, given the slow rate at which new rental is being built, the city has also taken

measures to prevent the loss of existing rental housing. Ottawa has adopted a strict no-conversion policy that is depended on the current vacancy rates. Conversion permits cannot be issued in the central city whenever vacancy rates drop below 3%; in the rest of the city, the same is the case when vacancies dip below 5% (CMHC, undated). Similar policies have been adopted by other Canadian cities, such as Montreal and, more recently, in Saskatoon (The Star Phoenix, 2008).

Peterborough, ON

In 2002, the City of Peterborough passed a resolution to launch an interrelated set of initiatives to stimulate revitalization of its downtown area and the creation of “affordable” housing, which in this case means low-cost private rental housing. The initiatives were recommended in a report commissioned by City’s Planning Committee (City of Peterborough, 2002). The report recognizes the City is unable to provide sufficient publicly funded social housing and that it is therefore necessary to stimulate private sector involvement in the provision of moderately priced housing. Of the proposed initiatives, the most relevant ones include: the *Central Area Community Improvement Plan*, which allows the City to offer loans, grants, and tax incentives for the creation of low-cost rental housing; the *Central Area Conversion Loan Reserve Fund*, a self-sustaining source of loan funds at preferential interest rates for the creation of rental housing; and the *Municipal Incentive Policy*, which allows for a variety of fees (planning application fees, building permit fees, parkland and parking cash in-lieu fees) to be waived for low-cost rental housing projects. The remaining proposed initiatives are more narrowly targeted at small, community-based or non-profit housing projects (CHRA, 2002).

Toronto, ON

The City of Toronto’s Residential Rental Property Demolition and Conversion Bylaw (No. 885-2007) came into force in July 2007. The bylaw stipulates that demolition of or conversion of rental units requires a special permit, called a Section 111 Permit. The name comes from section 111 of the *City of Toronto Act, 2006*, the provincial legislation that defines the scope of the City’s powers, which enables the City to prohibit and regulate the demolition and conversion of residential rental properties (City of Toronto, 2007 a). In terms of demolition, the bylaw not only provides a means of preventing total demolition of rental buildings, but also allows the City to restrict demolition activities, such as building renovation that remove rental units. In terms of conversion, the bylaw can be used to prevent conversion to co-ownership as well as to other uses, such as commercial or office uses. The bylaw generally applies to all residential rental properties with six or more units, but rental units in buildings registered as condominiums fall beyond its scope. The bylaw itself does not lay out the conditions for allowing or denying demolitions and conversions. Rather, policies pertaining to the retention of rental units are laid out in the City’s Official Plan. Thus, the bylaw is a tool that enables the implementation of these policies (City of Toronto, 2007 b).

- *Options for Calgary*

Although most would require changes to provincial legislation, there are a variety of policy options Calgary could consider to help stem the loss of primary rental housing. The most urgent matter is to regulate condominium conversions. Conversions could be halted when vacancy rates are low, as is the case in Ottawa. The restriction could be citywide or district-by-district – i.e., in a particular district, conversions would only be allowed when the vacancy rate is above a certain minimum level. Conversion restrictions could also be applied to specific types of units; those that are in shortest supply could be subjected to bans on conversion. This would require amendments to the Condominium Property Act. Alternatively, the City could ask the province to grant it the power to prohibit or regulate conversion and demolition of residential rental properties, while leaving it up to the City to establish the criteria for protecting rental units – similar to the powers granted to the Toronto under section 111 of the *City of Toronto Act, 2006*. The City could then pass a bylaw that would implement its desired criteria for protecting rental units.

The City could also adopt a policy for replacing demolished rental units. In this regard, it would seem that the best option for Calgary would be the adoption of TDR. Despite the administrative complexity of TDR, it is an attractive strategy for Calgary because it would not require changes to provincial legislation. Current legislation does not prevent the acquisition or sale of developing rights by the City or any public or private entity. Likewise, there appears to be no obstacle preventing the City from stipulating how proceeds from the sale of development rights are to be used. For more information on how to implement TDR in Calgary, see the capsule on this subject.

The City could consider requiring the construction of replacement rental housing as a condition for obtaining a development permit where demolition of rental units is involved. The requirement could be applied only to the types of rental units that are in shortest supply, as Vancouver did with SRO units. The City may wish to stipulate that replacement units have similar characteristics, such as floor area, number of rooms, and amenities, to the demolished units. In particular, the City may wish to ensure that units are not rebuilt in a location with significantly lower accessibility to services and public transit than the original location. The MGA would need to be amended to allow any of these conditions to be attached to development permits.

Rather than directly requiring the construction of new rental housing, the City could instead use current development levies or charge a new levy that could be used to fund an incentive program for the construction of new, private rental housing, following Vancouver's example. Whether using existing levies for this purpose or charging a new levy, an amendment to the MGA would be required, as the legislation presently does not enable the City to use levies for this purpose.

Revenues from development levies could help fund a package of incentives to stimulate the development of rental housing as part of the intensification of existing neighbourhoods, as Peterborough did for its central area. Some or all of the incentives in the package could be targeted specifically at private primary rental housing. Examples of

incentives that would be amenable to being targeted at rental housing include expedited approvals, development levy waivers, planning and building permit waivers, providing City land at a discount, and property tax relief measures. Another targeted initiative could be a loan reserve fund, which could offer discounted loans to developers of rental housing. Again, changes to the MGA would be required.

- *Implementation Issues*

The implementation of a municipal bylaw preventing condominium conversions would require an amendment to the Condominium Properties Act, while a policy enabling the City to regulate both conversions and demolition would require an amendment to the MGA. In introducing conversion or demolition control measures, the City would most likely face opposition from property owners, whose ability to sell or redevelop their properties could be limited by restrictions on conversions.

As noted, introducing a replacement requirement for demolished rental units would require that the MGA be amended to enable the City to make this a condition for issuing a development permit. Such an initiative would likely be unpopular with developers, as it would saddle them with a significant administrative and financial burden, and could lead to higher housing prices in the developer's main project.

The MGA also stands in the way of using development levies to fund incentive programs for the development of private rental housing. If the MGA were changed to allow this, the City would most likely face opposition from developers to charging a new levy for rental housing replacement. If the City were to use a portion of existing levies for rental units, developers would likely object less. However, using existing levies for this purpose would sap the amount of funds available for other purposes, particularly the provision of essential infrastructure. On the other hand, inner city developments may not require major outlays for new infrastructure as sufficient capacity may already be in place. In this case, the levies charged may in fact exceed the actual cost of providing infrastructure for the new development and could be applied to rental housing construction.

In terms of stimulating the voluntary development of new market rental housing, the City would have to assemble a package of incentives that would be sufficiently attractive to overcome private developers' reluctance to provide this form of housing. Expedited approvals, development levy waivers, planning and building permit waivers, providing City land at a discount, and property tax relief measures are currently permitted under the MGA. Setting up a loan reserve fund may require changes to the MGA (Jozsa and Tomalty, 2004). Moreover, there is a risk that rental units benefiting from special incentives might be converted to condominium units or that the building owners might escalate rents above an affordable level. To avoid such outcomes, the City would have to attach conditions to the incentives such that benefiting developers undertake measures to preserve the rental housing at affordable levels for a specified period of time.

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Smaller Lots and Homes

- *Introduction*

The size of lots and the homes occupying them are strongly influenced by the planning standards set out in zoning regulations. Planning standards have bearing both on greenfield development as well as on infill development and redevelopment. They have two basic goals: to ensure development in a given area is consistent; and to ensure development matches the available infrastructure and environmental services. Planning standards define the basic dimensions of lots and buildings by specifying the range of allowable lot dimensions, minimum building set backs from the edges of the lot, the maximum area of the lot covered by the building, and maximum height of the building.

While ensuring that the above-mentioned goals are met, planning standards risk limiting the variation of building types in an area. As a result, they can impose architectural monotony and can prevent socio-economic diversification. In some cases, planning standards might stand in the way of producing less expensive housing, either by setting minimum lot dimensions at sizes that are larger than needed by some potential buyers or by allowing buildings to cover too large a proportion of the lot. Planning standards can have the most significant impact on the affordability housing forms with the highest land component in their cost structures, i.e., single-detached homes, semi-detached and “plex” type homes as well as townhouses or rowhouses (CMHC, 2000).

Planning standards can be modified in two principal ways to improve affordability, by reducing lot dimensions and changing levels of site coverage. In terms of lot dimensions, allowing smaller lot areas can reduce land costs per dwelling. Also, allowing narrower frontages can reduce the length of road and linear utilities per dwelling, also allowing cost savings. Site coverage can be increased to keep the maximum allowable size of a home constant while reducing the minimum allowable size of the lot. In this situation, cost savings result from reducing the lot size only. However, an excessive increase in lot coverage would allow larger homes and could potentially offset affordability gains made by decreasing minimum lot size. Decreasing lot coverage, or keeping it constant while decreasing maximum lot size reduces the maximum allowable size of homes, which is another way of improving affordability.

Another way to provide opportunities for the creation of more moderately priced housing through infill development is to modify zoning regulations to allow sufficiently large lots to be severed to allow the construction of a second, fee-simple home. One way of doing this is to allow lots to be severed laterally, creating two street-fronting lots. In areas with rear laneways, another way is to sever lots in parallel to the street, turning the rear portion of the lot into a laneway fronting property. Most zoning regulations would make the latter type of severance impossible because they do not require a minimum amount of street frontage, regardless of laneway frontage. Planning standards generally require ample setbacks from the rear property line, which in many cases would prohibit the

creation of a laneway fronting home behind an existing home. Thus, to allow the construction of a small, fee-simple residence behind an existing home, zoning regulations would have to be modified to allow residential properties to front on laneways and to reduce the required depth of backyards.

Zoning regulations that allow for small homes on small lots are not necessarily enacted solely for the sake of improving affordability. Rather, they are often associated with other planning goals, such as growth management and sustainability, tending to engender more compact and walkable developments that are easier to service with transit. A number of municipalities in Canada and the US have pursued alternative planning standards under the banner of New Urbanism or Traditional Neighbourhood Design.

- *Existing Policies and Conditions*

Policy 2-2.2.2B in Calgary's Municipal Development Plan states the City should encourage "innovative approaches to the design and development of communities". Specifically, the policy calls for increasing residential densities and pursuing more efficient land development; increasing the variety of housing types available within a community; and providing the capability to add new units after the initial build out of a community. Policy 2-2.2.2H calls for reviewing existing "subdivision standards and engineering requirements" and monitoring the effect of changes. The objective of this policy is "allowing experimentation with community design, building design and with various lot sizes and layouts". Thus, these policies can be interpreted as mandating experimentation with innovative zoning regulations to increase housing diversity.

Calgary's Land Use Bylaws (LUB) provides planning standards for single-detached and duplex dwellings on relatively small lots. In the *Developing Area*, land use districts designated R-1N accommodate single-detached dwellings on lots as small as 233 m², with a 7.5 m minimum frontage and 60% maximum lot coverage; land use districts designated R-2 can accommodate a duplex (side-by-side or stacked) on lots as small as 400 m², with 13.0 m minimum frontage and maximum lot coverage of 50%; and land use districts designated R-2M can accommodate rowhouses on lots as small as 160 m², with a 5.0 m minimum frontage and 60% maximum lot coverage. In this case, only one dwelling is allowed per lot. In the *Developed Area*, the land use districts have slightly different designations but for the aforementioned dwelling types the planning standards are the same as those in the *Developing Area*.

Research conducted by the City while preparing the new LUB showed that, in 2004, only 11% of the City's low-density dwellings were located in areas designated R-1A, RS-1 or RS-2, the land use categories in the former LUB (2P80) that allowed the smallest lot sizes. Because these designations allow a range of lots sizes, it is not know how many lots used the smallest possible lot size allowed in each land use district. According to a planner involved in development application reviews, only 5 to 10% of current applications for single detached homes feature the 7.5 m frontages – the narrowest for single family homes. It is therefore safe to assume that the overall supply of modestly sized single-family homes remains limited.

Alternative planning standards – i.e., standards other than those provided by the LUB – are possible in *Direct Control* (DC) districts. An example of a residential development subject to direct control is Garrison Woods. The developer, Canada Lands, required “customized” lot designs because of the constraints of the site (including existing heritage buildings and mature trees) and because the desired neo-traditional urban design was incompatible with the planning standards prescribed in the old LUB (2P80). Also, the developer included a number of secondary suites in the form of carriage houses, a use that was not possible under the old LUB (neither as a permitted or discretionary use) and for which there were therefore no planning standards.

- *Issues, Barriers, and Potential*

As discussed above, Calgary’s new LUB already provides planning standards for relatively small and narrow lots. However, developers may be reluctant to use the smallest possible lot sizes afforded by the LUB. For example, in R-1N districts, developers can provide lots as wide as 11.0 m, with no upper limit on lot depth or total area. Even when homes are being built on the smallest possible lot size, they often end up being fairly large – as large as, 1,400 square feet. Such large floor areas are possible because the LUB also allows lot coverage up to 60% and allows projections out from the main structure of the house, which in effect further increase lot coverage. Developers prefer to build the larger units because they believe that these can yield better profit margins. They also have a standardized approach to housing construction, whereby the width of the building is determined by stock measurements for construction materials. As a result, builders may be slow to adopt narrower frontages.

Although it is possible for developers to stray from the standards provided by the LUB in DC districts, this does not necessarily result in overall cost reductions. Canada Lands went through protracted negotiations with the City before obtaining approval for the custom designs used in Garrison Woods. The developer is once again having difficulties getting customized designs approved that do not conform with LUB planning standards its new development, Currie Barracks. In particular, the developer is considering creating small, fee-simple dwellings fronting on the laneways behind larger street front houses. While the custom design approach used by Canada Lands has the potential to create a more land-efficient pattern of development, the lengthy negotiations and slow approvals entailed by this approach are liable to minimize the potential for cost savings.

The current requirement that all residential properties must have a minimum amount of street frontage in effect prohibits fee-simple laneway housing. Even if a property were allowed to front on a laneway, the current requirement for a set back of at least 7.5 m from the rear property line would require that the street-fronting and laneway-fronting homes be separated by a minimum of 15 m. Few existing lots are likely to have a rear yard deep enough to accommodate a second home 15 m behind the primary home.

Given the abundance of laneways in Calgary, there may be considerable potential for intensification through the development of laneway housing. The potential is likely to be

especially high in areas that have front-drive garages but also have laneways. Indeed, there appears to be significant public interest in the creation of laneway housing in Calgary; the idea was a major theme at the Beltline Urban Forum, held September 20th, 2007. Forum panellists included three notable advocates of laneway housing from London, Toronto, and Montreal. An official from Canada Lands stated that his organization is examining the potential for including fee-simple laneway houses in Currie Barracks.

- *Lessons from Other Cities*

Laneway Housing, Montreal, QC

In the late 1990s, the *Société Habitat sur mesure* began to explore the potential for creating fee-simple laneway-fronting dwellings in the backyards of existing residential properties. *Habitat sur mesure* had three objectives: (1) to explore the barriers to laneway housing; (2) to propose amendments to municipal bylaws; and (3) to develop design guidelines for backyard housing to serve as models for municipal governments, builders, architects, as well as property owners. At the time the project was initiated, planning standards in Montreal made laneway housing impossible. Among other restrictions, they did not allow principal building access from a laneway, allowed only one building per lot, and required a rear setback of at least three meters. *Habitat sur mesure* recommended that the City remove these restrictions and allow laneway housing on sites located no more than 20 m from the main street, adjacent to two alleys, and having their supply of water (i.e., independent from the main building on the lot). Guidelines were developed for five design variations, each having the same basic elements: adequate size, sufficient private exterior space, privacy from neighbours, adequate building height relative to alley width, and a separate, identifiable entrance. *Habitat sur mesure* was authorized to build a seven-unit demonstration project on a laneway in downtown Montreal. The units have an average floor area of 146.8 m² (1,580 sq. ft.), a small private yard and a garage. At around \$150,000 per unit, they were both affordable for the consumer and profitable for the builder. The City of Montreal has yet to adopt *Habitat sur mesure*'s recommendations and allow laneway housing as-of-right (ACT, 2004 a). A group of architects in Toronto have undertaken a similar project in their city (see ACT, 2004 b).

Next Home, Montreal, QC

The Next Home is a narrow, three-storey rowhouse design developed by the Low Cost Housing unit at McGill University's School of Architecture. Unlike conventional rowhouses, Next Homes can be configured as either single-family units, stacked duplexes, or stacked triplexes. Thus, it can provide three different dwelling sizes in a single envelope. The design is also amenable to modular production techniques, providing scope for reduced construction costs. It is also highly heat efficient, as its narrow façade reduces exposed surface area and consequently minimizing heat loss (Friedman, 2000).

Los Angeles, CA

The Small Lot Subdivision Ordinance, developed by the Los Angeles Planning Department, was adopted by the City Council in late 2004. The ordinance was adopted in

the hope of reducing the cost of home ownership while providing innovative housing solutions. Cost reductions are achieved through land-efficient planning standards and using a fee-simple property structure, avoiding fees and various restrictions associated with creating a condominium (City of Los Angeles, undated). The ordinance allows parcels in areas zoned for medium-density multi-family development to be subdivided into small lots and sold as fee-simple properties rather than condominiums, provided that the project complies with the density requirements set by zoning and the City's General Plan. The minimum width for each lot is 15 feet (4.6 m) and the minimum area is 600 sq. feet (55.7 m²). Maximum lot coverage is 80% when no common open space is set aside on the subdivided parcel; if at least 20% of the parcel is set aside, then lot coverage can be 100%. Setbacks are required only on the periphery of the parcel but not between individual lots on the parcel. Vehicular access to the lots can be provided either directly from the street, from a laneway, or through an internal driveway on the parcel (City of Los Angeles, 2004). Planners envisioned that small lot developments permitted by the ordinance would take the form of modern versions of bungalow courts, courtyard housing, and row houses. The City sponsored a design competition to generate ideas on how to design housing under the Small Lot Subdivision Ordinance⁶. Taking ideas from competition entries, the Planning Department devised a set of design guidelines for small lot subdivisions⁷. It has been noted that this form of development is likely to be more acceptable to neighbours in established neighbourhoods than condominium apartment buildings.

- *Options for Calgary*

The City could revise the LUB to allow laneway housing under certain conditions. Laneway housing could be built into new greenfield or brownfield developments or be added to established neighbourhoods in order to increase density and the variety of housing options. In either case, the City would have to revise the LUB by adding planning standards for laneway housing, distinct from those for street-fronting housing. To make laneway housing feasible, the standards would have allow little or no setbacks from the laneways and from the property rear property line. Laneway housing could be allowed as-of-right under certain conditions (e.g., sufficient open space on the lot, proximity to a serviced street). Where proposed laneway projects do not meet the criteria for as-of-right development, the City could also consider allowing them as a discretionary use. In Toronto, for example, a "laneway committee" has been proposed to assess applications and give discretionary approvals to laneway housing (ACT, 2004 b). Aside from providing a new form of potentially inexpensive dwellings, laneway housing could also help improve the affordability of the existing homes by reducing the size of its lot. Severing a portion a property makes the property less expensive and lowers its property taxes⁸.

⁶ See www.smallbutsmart.org

⁷ <http://cityplanning.lacity.org/HousingInitiatives/DesignGuidelines/des.guide-tableofcontents.pdf>

⁸ While property taxes for the existing may go down, the total property taxes collected by the City would most likely go up as a result of severing the lot and adding the laneway house.

The R-2M land use category in the new LUB accommodates fee-simple, narrow frontage rowhouses. The R-2M category stipulates that only one rowhouse unit can be built per lot. Thus, a rowhouse can only function as a single dwelling unit. The R-2M land use category could be revised to allow the implementation of the Next Home concept – allowing a three-story rowhouses to function as one, two, or three dwellings. Being a three-story home on a small lot, the Next Home is intrinsically a land efficient form of housing. By allowing flexible subdivision of three-story buildings, a range of dwelling sizes could be provided using the same building envelope and the same planning standards. From the builder’s point of view, using the same structure to provide differently sized units provides scope for savings, as it opens the door to economies of scale through prefabrication (see capsule on manufactured housing). Given that the same template is repeated over and over, it may also provide scope for simpler approvals.

The City could consider adopting standards for small lot subdivisions on modestly sized parcels zoned for medium-density development, both on infill and greenfield sites. The standards, which can be modelled on those in the Los Angeles Small Lot Subdivision Ordinance, could allow fee-simple properties on significantly smaller lots than allowed under the new LUB. Following LA’s cue, the lots could be as small as 55 m², or about a third of the minimum size allowed for townhouse lots in R-2M districts. Like in LA, the standards could be set to allow 100% lot coverage as long as 20% of the original parcel is set aside for common open space, or a very high level of lot coverage (as high as 80%) even if no common open space is provided. Also following LA’s example, lots would not be required to have direct vehicular access from the street but could instead rely on the laneway or a private driveway. This type of development would offer an alternative to condominium apartment buildings while maintaining a similar level of density. It is could potentially be more appealing to families that prefer ground related housing over apartments. In terms of intensifying developed areas, it may be more acceptable to neighbours than apartment buildings.

Another strategy is to take measures to encourage developers to create smaller lots and build smaller homes on greenfield sites. The City could consider requiring that a certain share of houses in a development be built on lots with the narrowest frontage and smallest area allowed by the planning standards for the given land use district – a type of inclusionary housing policy, but once based on the size of property rather than its price). Alternatively, the City could consider a voluntary measure to accomplish the same end. For instance, the City could offer small discounts on development levies for including small lots. The planning standards themselves could be tweaked to limit the size of houses. In their present form, the standards for single-detached dwellings are too permissive, allowing fairly large homes to be built on small lots. By setting lot coverage lower than 60% and reining in allowances for projections, the City could encourage developers to build smaller and therefore cheaper homes.

- *Implementation Issues*

Public safety officials, particularly the fire department, are likely to oppose laneway housing, primarily on the grounds that such housing is difficult to access with emergency

vehicles. Laneway housing might also violate fire safety requirements in the Alberta Building Code. The code specifies the minimum width for roads on which residential properties are fronted; some laneways might not meet this requirement. Another major issue with laneway housing, as with any form of intensification, is likely to be community opposition (see capsule on NIMBY responses for more details).

A potentially tricky issue for implementing flexible occupancy, multi-story row houses akin to the Next Home is the provision of sufficient parking. The demand for parking spaces per building is likely to vary depending on the number of units in the building – i.e., a Next Home with three units is likely to generate different parking requirements than one that acts as a single dwelling. Given that these would be rowhouses on narrow lots, on-street parking would offer little scope for absorbing any overflow from off-street parking.

Fee-simple residential subdivision with very small lots could be challenging to design. The designer must find a way to accommodate required off-street parking stalls and sufficient floor areas and open space while keeping the development attractive. The City may wish to provide a set of design guidelines to help developers with this task, similar to those provided by the City of Los Angeles. Developers may be reluctant to experiment with a novel built form that is challenging to design. Homebuyers may also be unwilling to buy into a product with which they are unfamiliar. To address such concerns, the City could sponsor one or several demonstration projects. Otherwise, medium density fee-simple housing on very small lots is likely to face obstacles similar to those for laneway housing – i.e., opposition from fire and EMS departments, on the grounds that units without street frontage are hard to access, and building code compliance issues.

Developers are likely to oppose requirements on lot sizes as well as changes to the LUB that would limit the size of homes they can build. Their opposition would likely be grounded in the belief that smaller homes are liable to be less profitable than larger ones. Developers would doubtless prefer a voluntary system with incentives for providing smaller lots and smaller homes.

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Secondary Suites

- *Introduction*

A secondary suite is a private, self-contained unit within a single-family home or detached from the primary residence and located behind it or above a private garage on the parcel. This kind of suite has its own entry door, bathroom, kitchen, and living and sleeping areas, but usually shares yards and parking facilities with the primary residence. Growing attention is being given to secondary suites in major urban areas because of their potential to increase the stock of affordable housing in a socially-inclusive way, provide financial benefits to homeowners, and help achieve urban growth management goals.

Secondary suites can significantly contribute to a city's affordable housing options since they typically rent at lower rates than conventional apartments. Based on research conducted in Canadian cities, secondary suites can represent a 10 to 15 percent saving for tenants compared to other rental housing options (City Spaces, 2007). By increasing the amount of rental housing supply, secondary suites can effectively slow down rent increases.

From a social point of view, the upgrading of existing non-conforming and creation of new conforming secondary suites allows for non-intrusive integration of lower income housing throughout the city.

Secondary suites also benefit homeowners by providing them with additional revenue that can go towards mortgage payments. Providing that they are legal and conforming to municipal bylaws, financial institutions recognize income coming from secondary suites when assessing homebuyers for mortgages.

Lastly, secondary suites represent an important option to consider for a metropolitan area's growth management strategy. By intensifying low density areas, these suites can bring a range of environmental benefits related to more compact urban form and make better use of existing municipal infrastructure. In particular, increasing density can have a positive impact on transit usage and overall public transit cost-efficiency.

- *Existing Policies and Conditions*

In 2002, the City of Calgary began reviewing its Land Use Bylaw (LUB), including consideration of secondary suites as a means to broaden the range of housing options and promote affordable housing. During the review process, community stakeholders and some Council members pointed out that secondary suites were not recognized as a housing form under the old Land Use Bylaw (2P80) and that, despite their prevalence, no policy regulated their use or development. Many secondary suites are therefore illegal under current regulations. Some secondary suites built before the adoption of Land Use

Bylaw 2P80 in 1980 are considered legal non-conforming suites. Although they do not conform to current zoning regulations, they were grandfathered and are therefore considered legal. In 2005, the LUB review team recommended that Council provide clear direction to incorporate secondary suites into the City's land use planning strategy (Calgary Land Use Bylaw Review, 2007).

In the absence of a regulatory framework under the old LUB, the City has approved the construction of secondary suites under Direct Control Guidelines in new select communities such as Garrison Woods and McKenzie Towne. In these neighborhoods, about 10 percent of homeowners have made use of Direct Control Guidelines to accommodate secondary suites on their property (City Spaces, 2007).

Calgary's new Land Use Bylaw (1P2007) formally recognizes secondary suites for the first time and includes regulations to guide their development. When it comes into effect on June 1, 2008, the new LUB will list secondary suites as a discretionary use in districts zoned for single detached, semi-detached and duplex dwellings in both developed (R-C2 district) and developing areas (R-2 district). This means that based on the particular circumstances (e.g., location, parcel specifications, servicing, access and transportation requirements) of an application, the development authority reserves discretionary power in the approval of a development permit for a secondary suite. Homeowners on parcels in R-C1 and R-1 zones (districts accommodating single detached dwellings in developed and developing areas, respectively) interested in building an additional suite will be able to apply for a land use redesignation to a new district called R-C1s and R-1s (developed and developing areas, respectively), which would permit secondary suites as a discretionary use. Developers will also be able to apply for the new zoning district at the initial stages in developing areas, thus avoiding the need for subsequent land use redesignation.

In order to reduce barriers to secondary suite implementation, the City of Calgary has introduced a 50 percent reduction in fees for redesignation and development permits. The City is also considering the implementation of an Enterprise Housing Program that would encourage the development of affordable housing through a partnership between the private, public and non-profit sectors. With the goal of annually upgrading at least 50 existing non-conforming suites, a maximum of \$25,000 per suite would be allocated to homeowners on a first come basis (City of Calgary, 2007a). In addition, it is proposed that the program include interest free loans of up to \$25,000 for 20 years to encourage the construction of secondary suites in newly developing areas.

Implementing regulatory standards for secondary suites is an important measure to insure that dwellings are built and maintained safely. With this goal in mind, an MLA Review Committee on Secondary Suites recommended changes to the Alberta Building and Fire Codes that establishes specific safety standards for secondary suites in both new and existing homes. The provincial government accepted the committee's recommendations and implemented new Building Code standards for new secondary suites that came into force on December 31, 2006. Fire Code amendment regulations will take effect on December 31, 2008 for existing suites.

Although no data is currently available to estimate the number of secondary suites occupied in Calgary, some estimates have been made about the extent of the city's "informal" rental housing market (i.e., secondary suites, privately rented homes/condominiums). It is said that some 73,000 units rented in Calgary come from this "informal" or secondary rental market (City Spaces, 2007).

- *Issues, Barriers, and Potential*

Although Calgary's new LUB does provide some direction for the development of secondary suites, it is unlikely to significantly increase the supply of suites in the city because of significant financial and application barriers. The construction of secondary suites is expected to be much more important in newly developing areas than in existing neighborhoods. This can be attributed to a number of different factors affecting homeowners' decision to build secondary suites.

Under the new LUB, existing and eventual secondary suites in R-C1 developed areas and R-1 developing areas will remain illegal until a formal land use redesignation to R-C1s and R-1s districts takes place. The redesignation process represents an important disincentive for many homeowners wishing to build a secondary suite on their property or legalize an existing one. Following an application to Council to redesignate a land use district, the development authority needs to assess development applications on a case-by-case basis. A development permit is only allocated after the development authority judges that a secondary suite is appropriate for a given parcel. Significant amount of time is required for City staff and Council to assess and approve redesignation and development permits. Furthermore, some stakeholders have also expressed that the larger parcel width requirements for R-1s and R-C1s districts represent barriers to extensive secondary suite implementation. The monetary cost of implementing secondary suite standards has been assessed at \$4,000 and higher for existing homes and \$10,000 and higher for new homes (poverty Reduction Initiative, 2007). Financial considerations then become another important factor in the decision to build or renovate secondary suites.

Minimum parcel width requirements for secondary suite construction contained in the new LUB also represent important barriers to suite construction. As it stands, the new LUB requires that parcels have a minimum width of 15 meters in developed areas and 11 to 13 meters (depending on the type of suite) in developing areas to permit suites as a discretionary use. In comparison, one dwelling districts that exclude secondary suites in developed and developing areas have minimum width requirements of 12 and 10 meters, respectively.

Community opposition to land use redesignation could also discourage potential applicants. During the public hearing on the proposed Land Use Bylaw, a number of people expressed objection to inclusion of secondary suites in the new LUB, especially as a discretionary use in developed low density residential zoning districts (Calgary Land Use Bylaw Review, 2007). Because of citizen hostility in some neighborhoods where secondary suites are not a permitted use and considerable disincentives to apply for

redesignation, it can be expected that take-up will likely be much higher in newly developing areas.

It may be that a lack of knowledge about secondary suite possibilities among current homeowners also reduces the likeliness that this type of housing option will be broadly implemented. In November 2007, the Calgary City council approved terms of reference and budget requirements for public consultation and education on secondary suites. This process will include a survey to assess the level of general awareness, attitudes and perceptions towards secondary suites, as well as the level of interest in developing secondary suites in the City (City of Calgary, 2007b).

Stakeholders have expressed concerns about the living conditions of a number of illegal secondary suites currently occupied in Calgary. Because many homeowners consider the process of bringing suites to code as cumbersome, tenants end up living in unsafe circumstances. According to some, the proliferation of illegal suites has led to a culture of non-compliance and is mainly due to financial and application barriers, as well as a lack of knowledge about suite standards (Poverty Reduction Initiative, 2007).

Although the newly developed Provincial Building and Fire Codes do promote secondary suite development, their application is restricted to basement suites. New Building and Fire Codes therefore ignore important components of secondary suites, namely garden suites and garage suites.

Lastly, it is important to note that in light of rising housing prices, there is evidence that public opinion is shifting with regards to secondary suites. A survey conducted by Ipsos in 2007 revealed that 72% of Calgary citizens supported the development of secondary suites in their neighbourhood (Ipsos, 2007).

- *Lessons from Other Cities*

Saskatoon, SK

Secondary suites are permitted on regular sized lots in all residential zoning districts after obtaining necessary permits. As an incentive for the creation of new and legalizing of existing secondary suites, the City offers rebates on permit fees for building, plumbing and development permits. All secondary suites are eligible for this rebate as long as they comply with or are seeking compliance with the City of Saskatoon's Zoning Bylaw (City of Saskatoon, 2007). In addition, the Province of Saskatchewan offers homeowners forgivable grants of 50 percent of construction or renovation costs to add secondary suites to existing homes, up to a maximum of \$24,000 in southern Saskatchewan and \$28,000 in the north (Province of Saskatchewan, 2007). The grants are aimed at increasing the supply of secondary suites for low- to moderate-income renters.

Regina, SK

Through its Inner City Housing Stimulation Strategy, the City of Regina has introduced a time limited property tax exemption for construction of a new residential unit within an existing owner-occupied dwelling. Depending on the area of the city in which the home

is located, the owner-occupants are eligible for a five-year tax exemption of 90 percent to 100 percent of total property taxes (City of Regina, 2002).

Vancouver, BC

Secondary suites are a permitted use in all one family residential zones with the tenure of appropriate permits and an annual license. At over 25,000 units, secondary suites now represent a higher number of housing units than all non-market housing (City Spaces, 2007). The proposed introduction of incentives such as ‘suite-ready’ requirements applying to all one family dwellings could significantly reduced barriers to implementation of secondary suites. ‘Suite-ready’ building standards facilitate the approval of legal suites at point of construction by requiring developers to comply with fire and life-safety requirements for new one-family dwellings. Under the proposed requirements, all new single family constructions would be required to install fire and sound separation, separate electrical service capacity and interconnected smoke alarms between the principal dwelling and the space set aside to accommodate a future secondary suite (Whitlock, 2004). This would avoid costly retrofitting of homes when adding secondary suites. The City has also focused on relaxing zoning regulations and building code standards for suites in order to facilitate the legalization process.

Edmonton, AB

In December 2007, City Council adopted new Zoning Bylaw changes as part of the Edmonton’s Cornerstone Plan for affordable housing. The amendments to the City’s Zoning Bylaw significantly increase the opportunity for secondary and garage suites within most residential zones in the city. Suites are now a permitted use in almost all low density residential neighborhoods and a discretionary use in medium to high density zones (City of Edmonton, 2008). Through the Cornerstone Plan, homeowners are eligible for financial assistance in the form of grants to create or upgrade secondary and garage suites for affordable housing.

- *Options for Calgary*

In the short term, the City of Calgary should consider allowing secondary suites as a discretionary use in low density developing areas without redesignation. Eliminating the need for land use redesignation from R-1 to R-1s would facilitate the secondary suite implementation process in new communities by reducing application barriers. The City should also revise its minimum parcel width requirements for suite construction contained in the new LUB. Allowing secondary suites on smaller lots could encourage suite development by reducing regulatory barriers and lowering the average cost of lots intended to accommodate a suite. Lastly, a clause in the new LUB requires that secondary suites have a separate entry from the primary residence. Removing this requirement would make regulations more flexible and bring them in accordance to the Alberta Building Code, which permits shared exits (Poverty Reduction Initiative, 2007).

In order to support the development of secondary suites as an affordable housing option in Calgary, the City needs to develop a clear policy that gives long-term direction and support for secondary suites. The policy would provide incentives and regulatory reforms

to facilitate the upgrade and legalization of secondary suites in developed and developing areas (see below). It is expected that a citywide secondary suite policy or program would encourage compliance with current and future regulations by providing a consistent framework that would increase “perceived fairness” in regulations among homeowners (City Spaces, 2007). In order to strengthen acceptance of and compliance with an eventual secondary suite policy or program, a broad public education campaign would have to be executed. The public consultation and education process adopted by Council in November 2007 is a good first step in developing such a strategy. Further research on the current state of the secondary suite market would be a necessary next step to better understand what policy options are applicable to the Calgary context.

Incentives for legalizing existing secondary suites should be put in place given that current regulations do little to address the thousands of illegal suites located throughout the city. A major barrier to legalizing existing suites is the financial cost borne by homeowners. This could be addressed by providing financial assistance for the required upgrade renovations. Forgivable loans, grants and time limited property tax exemptions are options that could be considered by the City to increase take-up rate. A step-by-step guide for creating a new suite or bringing an existing suite into compliance could also facilitate the legalizing process for homeowners.

‘Suite-ready’ requirement such as the ones proposed by the City of Vancouver could also be considered as an option to improve opportunities for secondary suites as an affordable housing option in the City of Calgary. As previously mentioned, applying simple requirements to all new one family homes at point of construction significantly reduces renovation costs when adding a secondary suite.

In order to encourage a wider mix of housing forms in low density residential areas, the City of Calgary has begun exploring the use of performance based zoning. In other North American cities that have adopted this approach (e.g., Edmonton, Alberta and Bucks County, Pennsylvania), alternative uses such as secondary suites are permitted in low density districts as long as they comply with specific performance standards. The physical characteristics of secondary suites are therefore assessed in relations to predetermined standards (City of Saskatoon, 2004). These set standards may include noise level, traffic, parking requirements and architectural detail indicators that a proposed development needs to meet. Compared to traditional zoning bylaws, performance based zoning gives developers much more flexibility to build alternative housing forms such as secondary suites and can therefore add to a city’s affordable housing options.

- *Implementation Issues*

Implementation of the proposed policy options will require staff and budgetary commitments from the City. For secondary suites to become an integral part of Calgary’s affordable housing and growth management strategies, human and financial resources will be required to conduct public consultation and education, administer redesignation and development applications in a timely manner and enforce regulatory framework.

Furthermore, resources will be needed in terms of research and development for an eventual citywide secondary suite policy or program. The above-mentioned options will also require legislative changes to be implemented. Citizen opposition to the inclusion of secondary suites as permitted or discretionary use in certain neighborhoods can be expected. Public consultation and education initiatives are perhaps the most effective tools to address potential resistance to integration of secondary suites in the City's long-term planning strategy. Lastly, in order to assure maximum effectiveness of secondary suite regulatory framework, the City should be prepared to adapt its regulations to changing housing market conditions (City of Saskatoon, 2004). Allowing for re-evaluation and flexibility as the City develops its policy framework will assure the long-term viability of a secondary suites program.

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Mobile Homes and Modular Housing

- *Introduction*

Mobile homes are generally single-family dwelling that are almost entirely assembled off-site. They are built upon rigid platforms, allowing the entire homes to be lifted onto a flatbed trailer and transported to a 'pad' – i.e., a foundation providing utility connections. Mobile homes can be occupied as soon as they are placed on a pad and connected to utilities. They can subsequently be disconnected and moved to another pad. Land use or zoning bylaws tend to treat mobile homes as distinct from conventionally built homes and may impose restrictions on where they may locate. In many cities, they can only locate in designated mobile home parks.

Modular housing is assembled on-site out of a set of prefabricated components. On-site work consists of laying a foundation and assembling the prefabricated modular panels upon it. The final, on-site assembly is usually quite rapid, taking a few weeks rather than a few months in the case of a site-built home (Kirk, 2007). Unlike mobile homes, which are almost exclusively single-detached dwellings, the modular construction approach is also suitable for producing semi-detached dwellings, town houses, and small multi-family dwellings. Also unlike mobile homes, they are amenable to being modified and expanded. Land use or zoning bylaws tend to treat modular homes in the same way that they treat on-site 'stick-built' homes. Prefabrication is considered to be merely an alternative production technique, subject to same codes and regulations as stick-built homes.

Raw material costs for both types of manufactured homes tend to be higher than those for comparable on-site stick-built homes because their structures need to be reinforced to survive transport from the factory to the building site (Haughey, 2006). Nevertheless, the savings on labour costs that prefabrication allows almost always exceed the additional material costs. Labour cost savings are derived from the use of assembly line methods and, in many cases, from employing non-unionized labour. On-site final assembly work also requires relatively little labour and little skill. Mobile homes can be up to 35% cheaper to build than a comparably sized stick-built home (DCS-UBC, 2005), while modular homes are up to 15% cheaper to build than comparable stick-built homes (Haughey, 2006). The use of modular construction techniques also significantly reduces soft costs, especially financing costs, by allowing a compressed development timetable.

Prefabrication can allow for a very high level of quality control. The benefits of enhanced quality control include exact conformity to building codes, high levels of energy efficiency, and reduced repair costs. Prefabrication allows for rapid and year-round construction. As a result, mobile and modular home communities can be developed much more rapidly than site-built home communities, a big advantage in places experiencing rapid growth and high demand for housing.

Mobile homes offer an additional advantage: it is possible to buy one without having to purchase the land it sits on. It is very common for owners of mobile homes to lease the

parcel of land upon which their homes are placed. By avoiding land purchase, mobile homes can allow entry into homeownership at a much lower price than other types of market housing. The combined house mortgage and rent payments for the pad is usually considerably lower than the mortgage payment for a comparably-sized stick-built home (City of Calgary, 2008).

One of the key problems with mobile homes is that they are liable to be stigmatized. They are often unjustly associated in popular culture with entrenched poverty and a variety of social ills. Mobile home parks or subdivisions risk being seen as an aesthetic blight on the urban landscape. Furthermore, the speed with which mobile home communities can be developed can irk nearby, established communities. For these reasons, developments consisting of mobile homes are likely to be the object of NIMBY responses. This may also explain why many municipalities impose restrictions on where they are allowed to locate.

Modular homes are less likely to be the object of NIMBY responses. However, reliance on modular construction techniques can potentially impose cookie-cutter monotony if care is not taken to introduce a variety of designs. With current production techniques, this need not be an issue; modular homes can be built according to a wide array of designs, can employ a broad variety of materials and finishes, and are now highly customizable.

- *Existing Policies and Conditions*

Section 2-2.2.2 of Calgary’s Municipal Development Plan states that “modular housing is ... a nontraditional housing form which can play a role in the provision of affordable housing”. Policy 2-2.2.2G commits the City to encourage innovation in housing types and construction methods in order to reduce housing costs. The document does not specifically address mobile homes.

Calgary’s former Land Use Bylaw (LUB), 2P80, clearly distinguished between mobile homes and modular construction. For mobile homes, the LUB provided a special land use category, R-MH. The only other land use category in which they were allowed was UR (Urban Reserve). This land use category is intended to allow temporary land uses on lands that have been annexed by the City but have yet to be subdivided for development. In contrast, Clause 25 in Section 20 of the bylaw specified that modular construction techniques could be used in all land use districts in which residential uses were allowed. The new LUB, 1P2007, has roughly the same restrictions as its predecessor, but features a slight change of nomenclature. What were called “mobile homes” in 2P80 are now called “manufactured homes”. The same land use designation, R-MH, is used to accommodate mobile (“manufactured”) homes. Mobile homes are also allowed on the new S-FUD (Special Purpose – Future Urban Development) land use category, which is similar to the UR category in the old LUB. AS in LUB 2P80, there are no restrictions on the use of modular construction techniques in any residential land use district, but mobile homes remain prohibited in all except R-MH and S-FUD.

In 2006, there were 2,754 mobile home units in Calgary, representing 0.7% of the City's housing stock. The vast majority of these units is on leased land in mobile home parks, some of which are located at the outskirts of the city or on marginal lands with little or no amenities in the vicinity (City of Calgary, 2008). There are some mobile home parks, however, that are in high-amenity locations – e.g., the Midfield and Watergrove parks. Some of the existing mobile home parks are currently facing redevelopment pressure and, according to a senior planner, and are at risk of being relocated.

Exact data on the number of homes built in Calgary with modular construction techniques was not available. According to an industry representative, only 10% of new homes in Alberta are being built with modular construction techniques, and 95% of those are in rural locations (Kernick, 1998). This suggests that the number of homes being built using modular techniques in Calgary is very limited.

- *Issues, Barriers, and Potential*

A recent internal report, prepared at the request of City Council (City of Calgary, 2008), examined the potential of mobile homes as affordable housing. The report found that a used mobile home on a leased pad would entail monthly costs between \$1,040 and \$1,860 and would therefore be suitable for households with a gross income between \$41,600 and \$74,400 (assuming housing costs should not exceed 30% of gross income) and thus have the potential to contribute to housing affordability for moderate incomes in Calgary. Moreover, the report points out that the cost of owning a mobile home is lower than the cost to purchase an entry-level semi-detached house, townhouse, or even an apartment unit. The costs of owning a used mobile home at the low-end of the resale price range might even be less than low-end rents for a comparable dwelling. As a result, the report concludes that used mobile homes can be an option for households that do not qualify for subsidized housing.

According to the report, the key barrier to providing more mobile homes is that private developers are not interested in creating new mobile home parks. Inhibiting factors include the high cost of land and servicing with respect to the number of dwelling units provided, a longer period of return on investment than conventional development, and lower overall rates of return.

As for modular homes, according to a representative from the manufactured home industry, the key barrier to the wider use of modular construction is lack of knowledge, both on the part of the construction industry in Alberta and that of the general public (Kernick, 1998). Given how few houses in Alberta are built using modular construction, most of the construction industry has no experience with this approach and is unlikely to appreciate the potential benefits of employing it. As the supply of modular housing is limited, the public's exposure to such homes is likely to be limited. Apparently, NIMBY responses can be an issue; the public is liable to misperceive modular housing as being low quality, cookie cutter housing. Yet, the potential for cost savings through the use of modular techniques is quite high. The industry representative claimed that the production of a modular home requires 300 to 500 person-hours in the plant and 50 to 500 person-

hours on building site. In comparison, a site-built home would require between 3,000 and 5,000 or even more person-hours. The construction costs for a 1,200 square foot modular home could be as low as \$45,000 (\$40 per square foot).

- *Lessons from Other Cities*

Seattle, WA

Noji Gardens, completed in 2002, is 75-unit development located about 6.5 km south of downtown Seattle. The 6.5 acre site features a mix of two-, three-, and four-bedroom single-family homes, ranging from 1,300 to 1,400 square feet; two-bedroom 1,000 square foot town houses; and three-bedroom 1,400 square foot townhouses. About two-thirds of the homes were built using manufactured, modular components. The developer, HomeSight, a nonprofit specializing in providing moderately priced homes on infill sites, had to key objectives for the homes: (1) they were to have two stories to provide sufficient living space on the site's small lots; and (2) they were to be architecturally consistent with the surrounding neighbourhoods. It took nearly three years to design modular homes that met these objectives. The resulting homes are believed to be 15% cheaper to build than comparable built with conventional methods. However, the new design required approval from the US Department of Housing and Urban Development (HUD), a process that was much slower than initially expected. There were also delays in obtaining certain approvals from the City's engineering department. The delays and additional work that was required to obtain approvals ended up contributing 40% of the final cost of the homes in Noji Gardens. Nevertheless, the development is considered to be a successful demonstration of the cost reduction potential of modular construction techniques (Haughey, 2006).

Carbondale, CO

A 52-unit community of affordable and energy efficient modular homes has been built in Carbondale, Colorado. Due to its proximity to the resort town of Aspen, Colorado, housing costs in Carbondale are high and many low- and middle-income families have difficulties finding houses they can afford to buy. The homes in the development are designed by the Consortium for Advanced Residential Buildings (CARB), a group of builders that are working towards creating net-zero energy homes under the US Department of Energy's Building America program. The development includes 16 multi-family units and 36 single-family units, all of which are built from prefabricated components and feature high-performance windows, wall and roof insulation, a tight envelope, and a highly efficient mechanical system. The units have been carefully designed to blend in with the local "mining town" aesthetic. The general contractor who assembled the homes believes that, without prefabrication, houses with such a high level of energy performance could not have been sold at affordable prices (CARB, 2004).

Montreal, QC

The Grow Home is a modular housing design that is amenable to prefabrication developed by Professors Avi Friedman and Witold Rybczynski at the McGill University School Architecture in Montreal (Rybczynski is now at the University of Pennsylvania). It is a two-storey, narrow-frontage single-family row house affording approximately

1,000 square feet of floor area. It is intended to be both affordable and energy efficient. The basic design has an un-partitioned floor plan that can be customized by individual builders, thereby allowing Grow Homes to be adapted to suit prevailing tastes in different markets. Between 1990 and 2000, some 6,000 Grow Homes and Next Homes were built in the Montreal area. The Grow Homes sold for prices 15-20% below the average price for homes in the area (Friedman, 2000).

- *Options for Calgary*

The City could try to increase the mobile home housing stock by encouraging private developers to create new mobile home parks. Given the high up front costs that servicing new land for mobile homes would require, and given the low rate of return that mobile home pad rents tend to yield, private developers would be unlikely to develop new mobile home parks on their own initiative. Thus, the City could consider offering private developers incentives, such as fast-tracked development approvals, fee waivers, reduced acreage assessments, and so on. An alternative or complimentary approach would be to allow mobile homes in residential land use districts other than R-MH. In other words, this means treating mobile homes the same way as stick built or prefabricated modular homes, allowing them to be placed in any residential land use district as long as they conform to the planning and design standards in that district. The City could also require or encourage developers to integrate a certain number of mobile home pads into conventional developments.

The City could also try to encourage developers to use modular construction techniques. One approach might be a promotional campaign targeting the local construction industry. The campaign could tout the financial benefits of the modular construction approach and provide information on successful modular housing developments, such as those mentioned above. Another, potentially complimentary approach could be to undertake demonstration projects. Projects, like Noji Gardens in Seattle, can help showcase the merits of modular construction to local developers and the public. Also, demonstration projects can help to build local expertise and bolster the development of a supply chain for modular construction.

- *Implementation Issues*

According to a senior planner, the City is not likely to encourage the creation of new mobile home parks. The City wishes to increase the density of development; mobile home districts tend not to lend themselves to the densities that the City is targeting. Another barrier is that there is currently no serviced land that could accommodate a new mobile home park; new land would have to be serviced to accommodate new mobile home parks. The cost of servicing new land for a mobile home park would be comparable to that for a single-detached subdivision. However, developers are likely to stay away from creating new mobile home parks because it takes longer to recover development costs, profits are likely to be lower, financial risk may seem greater than those entailed by conventional development. This reluctance on the part of developers will have to be

considered in developing any incentives that would aim to stimulate the creation of new mobile home parks.

Allowing mobile homes to be placed alongside stick-built and modular homes could be unpopular with residents, particularly in established neighbourhoods. Residents are especially likely to have concerns about the architectural integration of modular homes. To minimize the potential for NIMBY objections, the City could develop landscaping and architectural guidelines for integrating mobile homes into conventional neighbourhoods.

The City may be unwilling or unable to carry the costs of a demonstration project for modular housing on its own. A demonstration project could be carried out in collaboration with the private sector, government agencies or both. Modular home producers from Alberta or even other provinces might be willing to help sponsor such a project. Government agencies such as the CMHC and the Federation of Canadian Municipalities could be tapped for support; both have supported a number of affordable housing demonstration projects in other cities.

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Development Process

Transportation Impact Assessments

- *Introduction*

Any new real estate development will generate and attract traffic and is likely to have an impact on a city's transportation systems. In most North American cities, traffic engineers perform mandatory studies to estimate the impact a proposed development will have on the city's arterial road network (Nelson\Nygaard, 2005). Usually, such studies focus almost exclusively on the automobile traffic generated by the proposed development and its impact on the arterial road network and are therefore usually referred to as *traffic impact studies*. In some cities, the naming convention has changed to *transportation impact studies* to reflect the greater focus on other modes of transportation, but the methodologies and principal focus on automobile traffic remain intact (Calgary, 2008).

The main purpose of traffic impact studies is to ensure that the traffic generated by the proposed development will not exceed the available capacity on the arterial network. If the study reveals that the traffic generated would exceed available capacity, either the density of the development is reduced to curb the amount of traffic generated or the capacity of the arterial road network is increased (Nelson\Nygaard, 2005). Both of these outcomes can have an impact on development costs. In cases where it is not possible to increase arterial road capacity, traffic impact assessments essentially impose a limit on the density of a new development. Lower density generally translates into higher land development and infrastructure costs per unit. In cases where increases in road capacity are feasible, the road improvements needed to accommodate the additional traffic generated by the new development can entail considerable costs, which in many cities are borne by developers through development impact fees or levies.

The first step in calculating a proposed development's impact on the arterial road network is to determine its automobile trip generation rate. For this purpose, most traffic engineers in North America use the Institute for Transportation Engineers' (ITE's) *Trip Generation* report and the accompanying *Trip Generation Handbook*, considered to be the most authoritative references for this purpose. *Trip Generation* provides a rich set of

empirical data on the number of automobiles trip generated at different times of day by a variety of different land uses.

The data in *Trip Generation* is collected from new developments across the US, primarily conventional suburban developments – i.e., stand-alone, auto-oriented greenfield developments. The data presented in *Trip Generation* is not differentiated by location (e.g., greyfield or brownfield versus greenfield, transit proximate or not) and is indifferent to design features and context (i.e., net residential density, mix of land uses in close proximity, quality of pedestrian or bicycle infrastructure, etc.). The ITE acknowledges some of these deficiencies in the *Trip Generation Handbook* and warns traffic engineers to collect local data and adjust its *Trip Generation* rates when estimating traffic impacts for sites near downtown or well-served by public transit. In practice, traffic engineers tend to ignore the ITE's warnings and apply standard trip generation rates in locations for which they may not be appropriate. Traffic engineers tend to default to the ITE standard trip generation rates because local data is often unavailable and because there is no widely accepted methodology for adjusting the ITE standard rates in the presence of factors that mitigate automobile use (Nelson\Nygaard, 2005).

Given this reality, the California State Department of Transportation together with several state air quality management agencies decided to devise a standard methodology for adjusting the ITE's automobile trip generation rates. The formula takes several locational and programmatic parameters into account to calculate a reduction in automobile trip generation rates. The locational parameters include: net residential density, mix of uses, local-serving retail, and transit service. The programmatic parameters include: the presence of affordable and/or senior housing⁹, parking supply, parking pricing, free transit, telecommuting, and other traffic demand management measures. The formula can discount standard ITE standard trip generation rates by over 90% for residential land uses and over 60% for non-residential uses (Nelson\Nygaard, 2005).

The formula has been incorporated into URBEMIS (URBan EMISsions), a computerized model for estimating the air quality impacts of new developments. Although it is primarily intended as a tool for estimating emissions generated by new developments, URBEMIS also provides estimates of automobile trip generation rates and can therefore be used for performing traffic impact assessments. Although developed in California, URBEMIS is intended to be applicable nationwide in the US. So far, URBEMIS has only been used to assess the traffic impacts and emissions generated by a number of new developments in California (Nelson\Nygaard, undated; City of Emeryville, 2008).

Beyond using a better model for estimating the rate at which automobile trips are generated, the way in which traffic engineers conceive of road capacity can also be enhanced. Traditionally, traffic engineers have aimed to avoid congestion by maintaining a traffic volume-to-capacity ratio of 0.9 – i.e., at peak times, the estimated number of cars

⁹ Affordable and senior housing are both assumed to generate significantly fewer daily automobile trips based on evidence that such households own fewer cars and drive less than other than typical middle- or high-income households.

on the road is around 90% of the road's theoretical capacity, leaving a small margin to accommodate some variability in traffic patterns (City of Calgary, 2008). As cities are now struggling to curb automobile use and encourage alternative modes of transportation, traffic engineers are beginning to shift away from the predominant congestion mitigation approach to what is called the congestion management approach. Under this approach, congestion is no longer seen as something to be avoided. In effect, a certain degree of road congestion is considered to be desirable as it compels trip makers to use alternate modes of transportation. Transportation engineers are experimenting with setting theoretical volume-to-capacity ratios closer to 1 – i.e., volume equal to capacity at peak times. The assumption is that the excess demand can be shifted to other modes of transportation. This approach can have benefits in terms of development costs because it allows either greater development density with respect to available road capacity or less need for road system expansion where development density exceeds road capacity.

In sum, there are two ways in which traffic impact assessments can be modified that would provide scope for improved housing affordability. First, the method for calculating the number of automobile trips generated by a particular development can be modified to take into consideration various factors that mitigate automobile use. URBEMIS is an existing model for calculating trip generation rates that takes such factors into consideration. Second, the volume of automobile traffic generated by a new development can be allowed to match or exceed available road capacity. Taken together, these two modifications allow significantly greater density of development for the same road capacity. Building at higher densities provides scope for lower development costs per unit and therefore has the potential to improve affordability. Cities could also base development levies for any roadwork required by a new development on traffic impact assessments with these two modifications. In this, developments with low impacts on the road network would pay lower development levies than those that require an expansion of the road network.

In terms of growth management and sustainability, the improved method for assessing traffic impacts would encourage new developments to be more compact and more transit- and pedestrian-oriented. There would be a systemic incentive to include features that mitigate automobile use, such as locally serving commercial uses, reduced and/or priced parking, etc.

- *Existing Policies and Conditions*

Calgary has modified its land use bylaw to increase density limits or removed them altogether in many land use districts. As a result, in many locations, the maximum density of development may now be dictated by road capacity. Calgary's traffic engineers have modified their methodology for assessing traffic impacts of new developments to take into account the City's policy goal of increasing the modal share of transit and non-motorized modes of transportation. Specifically, the number of automobile trips generated is now discounted at a fixed rate in certain zones, including downtown, the inner city, near LRT and BRT stations, and in certain well-defined transit corridors. Despite the discounted trip generation rates, it is still not uncommon for modifications to

development proposal to be required on the basis that proposed design would generate more traffic than the road network can handle. In effect, insuring an acceptable level-of-service on the road network remains an important preoccupation for traffic engineers in Calgary.

Officially, the Calgary Plan supports the congestion management approach to transportation planning. Clause 2-2.3.1E of the Calgary Plan calls for “strategically managing congestion in the system to encourage a variety of transportation choices”. In recent years, the City has allowed traffic volume-to-capacity ratios to exceed 0.9 near designated TOD projects.

Calgary charges development levies, which are used in part to pay for road improvements. However, the levies are charged at a fixed rate per unit of area; they are not differentiated by the actual traffic generated by a particular development. Developers interviewed during this study who worked on high-density and mixed-use infill development suggested that their real estate projects impose a much lower burden on City infrastructure than suburban greenfield developments with comparable number of units and yet they were liable for the same levies (charged on an acreage basis).

- *Issues, Barriers, and Potential*

The current approach to traffic impact assessments in Calgary is a potential barrier for reducing housing costs because it can limit the density of development in certain situations. Also, by continuing to emphasize the provision of sufficient road capacity for automobiles, the current approach might be preventing the transportation modal split from shifting further in favour of transit and non-motorized modes. Moreover, it is liable to lead to pressure to expand the freeway network and to build new river crossings, both being very costly undertakings that the City may wish to avoid.

As Calgary’s development levies for roads are insensitive to actual rates of automobile trip generation, they may impose an undue financial burden on developments that have a limited impact on the road network. Thus, the levies can be seen as a barrier to achieving greater affordability, especially for developments in locations with a mix of land uses and frequent transit service. Also, the current levy system is liable to undercharge conventional, low density greenfield developments for their actual impacts on the road network, providing a cost advantage to a form of development that is incompatible with the City’s growth management objectives.

- *Lessons from Other Cities*

Pittsburg, CA

The Transportation and Land Use Coalition (TALC), an advocacy group working for sustainability and social justice in the San Francisco Bay Area, has been promoting the use of URBEMIS for calculating the traffic impacts of transit-oriented developments. TALC has applied the URBEMIS model to two proposed developments in the Bay Area

municipality of Pittsburg, one a TOD near a commuter train (BART) station and the other a conventional suburban subdivision further from the train line. The TOD features 1,590 units on 45 acres (35 upa) and is served by 78 trains and 1,559 buses within a quarter of a mile (400 m). In contrast, the conventional development has 2,771 on 512 acres (5.4 upa) and is served by no commuter trains and only 22 buses daily within a quarter mile. According to URBEMIS, the TOD would generate 2.6 daily trips per household while the suburban development would generate 7.2 trips a day (Great Communities Collaborative, 2008). The Pittsburg example illustrates the URBEMIS model's responsiveness to land use and locational parameters that influence automobile use.

Emeryville, CA

The City of Emeryville retained Fehr and Peers, a transportation consultancy, to assess the transportation impacts of developing five large sites over the next decade. The City wanted a traffic impact study that reflects the increased levels of transit use, cycling, and walking and decreased levels of automobile use that it wishes to achieve in the future. Fehr and Peers' task was therefore to estimate the volume of automobile traffic generated assuming high levels of use of the alternative modes of transportation. They used the ITE's *Trip Generation* as the basis for their calculations, but corrected the numbers to reflect the higher use of the alternative modes. Meanwhile, Nelson\Nygaard, the consultancy that developed URBEMIS, was working on an Alternative Transportation Plan for the City of Emeryville. City council amended the contract with Nelson\Nygaard, requesting that they assess the traffic impacts of the five large future development sites using URBEMIS. The trip generation rates calculated with URBEMIS were similar albeit slightly smaller than those calculated by Fehr and Peers. The total weekday peak hour trip generation rate for the five sites calculated with URBEMIS was 38% lower than the ITE standard rate; Fehr and Peers calculated a rate 31% lower than the ITE standard (City of Emeryville, 2008). The Emeryville experience demonstrates how URBEMIS can be used as an effective tool for modelling traffic impacts in a mixed-mode transportation system. The similarity between the URBEMIS and Fehr and Peers calculations could be taken as evidence of the validity of the URBEMIS approach.

Orlando, FL

The City of Orlando started charging transportation impact fees in 1986. Initially, the fees were originally independent of location – the same fee would be assessed for a given land use regardless of its location. In the late 1990s, after analyzing the relative impacts of development at different locations across its territory, the City concluded that projects in the inner city tended to have smaller impacts on the road network due to the presence of the higher interdependency of land uses and better access to regional transit services. As a result, the City added a *trip generation factor* (TGF) to its formula for calculating traffic impacts. The TGF is used to adjust the standard ITE trip generation rate due to locational characteristics, such as high rates of transit use and walking. The TGF allows developments in the inner city to receive transportation impact fee discounts as high as 38%. Developments in certain locations outside the inner city with traditional (pre-automobile era) land use patterns also qualify for impact fee discounts albeit somewhat smaller (JTC, 2001). The impact fee schedule was last revised in 2006; although fees have risen across the city due to increased road construction costs, the new schedule

continues to discount fees in the inner city areas and traditional neighbourhoods (RPG, 2006; City of Orlando, 2006).

- *Options for Calgary*

Calgary could use URBEMIS instead of the current scheme for calculating automobile trip generation in new developments. The current scheme provides fixed reductions to trip generation rates for developments in specific locations. The main consideration for calculating these reductions was proximity to frequent transit service. URBEMIS would provide a more flexible method for calculating trip generation rates that consider several other parameters that mitigate automobile use, including those mentioned above (residential density, mix of uses, local-serving retail, the presence of affordable and/or senior housing, parking supply, parking prices, free transit, telecommuting opportunities, and other traffic demand management measures). It could reveal new potential for discounted trip generation both inside and outside the zones that are currently subject to discounted rates. This would in turn allow for greater density of development and better prospects for affordability in certain locations. Using URBEMIS would also allow the City to assess the impacts of new developments in terms of air pollution and green house gas emissions.

The City could also explore the potential of raising volume-to-capacity thresholds in areas other than designated TODs. In certain areas with high levels of transit service outside TODs there may be considerable potential for letting traffic volumes exceed the theoretical maximum capacity threshold. This measure would also allow for higher densities of development and would create further scope for lower housing costs.

Finally, Calgary could also use URBEMIS to assess impact fees for any road upgrades that a new development will require. Developments that require little or no road upgrades would then be liable for lower development fees, which could lead to lower housing costs. This measure would also act a disincentive for less efficient patterns of development that have greater impacts on the road network and that also result in higher energy use and emissions.

- *Implementation Issues*

URBEMIS was designed as a national model for estimating trip generation and emissions in US cities. The applicability of URBEMIS to Canadian cities is unknown. Of particular concern is the fact that public transit use in Canadian cities tends to be higher than in US cities of a comparable size. As a case in point, consider that ridership levels on the C-Train dwarf those of virtually any LRT systems built in the US in the last three decades. This suggests that there may be significant differences in travel behaviour between US and Canadian urban populations. Given Canadians' greater proclivity to use transit, it is possible that the URBEMIS model would overestimate the number of automobile trips generated and would have to be recalibrated for application in Canada.

URBEMIS estimates only automobile trip generation rates – it does not estimate trip generation for other modes of transportation. Traffic studies and impact fee assessments using URBEMIS should carefully consider the available capacity on public transit. The URBEMIS model considers only the proximity of transit services, but not their available capacity.

Where road capacity is concerned, raising capacity thresholds can lead to complete gridlock if not carried out strategically. For congestion management to succeed, transit service plus pedestrian and bicycle facilities must have sufficient capacity and operate in the same corridors as saturated arterial roads. However, the alternative modes will have to offer a speed advantage over automobiles to successfully convert motorists to transit users. It follows that this strategy would work best in corridors where transit runs in a separate right-of-way or in reserved lanes. Otherwise, transit vehicles ensnared in traffic together with private vehicles will fail to take a greater share of the modal split.

The key barrier to allowing higher development density with respect to road capacity and using road congestion as a means of encouraging the use of other modes of transportations is political in nature. Calgary is by most standards a very auto-oriented city and its population is accustomed to unfettered automobile use. Citizens are likely to oppose a policy that would in effect increase road congestion. Politicians, especially those representing the suburbs, are therefore likely to be loathe to support such a policy. Traffic engineers, who as a group tend to be conservative, are also likely to resist the adoption of an alternative model for traffic impact assessments.

URBEMIS is not yet proven as a basis for assessing transportation impact fees. It would be prudent to verify its accuracy and effectiveness for this purpose through appropriate testing procedures. Developers, especially those who primarily undertake conventional greenfield development, are likely to oppose a system of differential transportation impact fees. In the present system, all developers contribute equally to road construction; in an URBEMIS based system, developers of conventional suburbs would be burdened with higher cost than other developers.

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Managing NIMBY Responses

- *Introduction*

New development within or near existing communities often attracts some degree of public opposition. However, projects that feature higher densities or a different form of housing than that which predominates in the surrounding area are especially liable to incite not-in-my-back-yard (NIMBY) reactions. Community opposition can delay development and cause significant cost increases and, in the worst case, can even lead to the cancellation of a project.

NIMBYism is widely recognized as an important barrier to improving housing affordability (CMHC, 2001). NIMBYism can affect affordability by increasing the cost of developing new housing or by limiting the supply of new housing. Private sector development generally involves large amounts of borrowed money. NIMBY objections delay development and therefore increase the cost of borrowing. They limit the supply of new housing by forcing projects to downgrade density or by getting projects cancelled altogether. A 2002 survey by the Canada Mortgage and Housing Corporation of over 100 Canadian Municipalities found that NIMBYism was the most important obstacle to supplying affordable housing (SRA et al., 2001).

NIMBYism can also be a major barrier to growth management. The key to growth management is limiting suburban greenfield development and focusing instead on infill development and intensification. However, infill and intensification projects – i.e., development that significantly increases the density of existing neighbourhoods – are much more likely to be mired in lengthy NIMBY battles with existing communities than greenfield projects. As a result, infill development and intensification processes are slower than greenfield development, and the cost overhead due to fighting NIMBY responses is liable to be much higher.

Opposition to intensification is grounded in the belief that such projects drive down property values in adjacent areas and create disamenities such as traffic, parking problems, and overcrowding of public facilities. Another typical concern is that an intensification project will clash with the existing neighbourhood character by introducing buildings of a different style and scale. When the project entails the provision of housing that is less expensive than most in the existing neighbourhood, a social clash may be feared – i.e., because the development will attract demographic groups other than the prevailing one in the neighbourhood. While some of these fears may be well grounded, many of them, such as those concerning the effect of intensification projects on property values, are unjustified.

Despite its propensity for delaying development proposals, the public's participation in development decisions is considered to be of great value. The public's input is needed to help ensure that projects are sensitive to the neighbourhood context and consistent with community goals. Thus, curtailing the public's ability to participate in development decisions is not a desirable option for addressing the NIMBY problem. Rather, the

desirable solution is to mitigate unfounded NIMBY objections while continuing to foster a culture of public participation in the planning and development process.

Strategies for mitigating NIMBYism can be divided into two broad categories: proactive and reactive strategies. Proactive strategies are those that seek to defuse NIMBY responses before they even occur, or at least to reduce their severity when they do. They can be further divided into two subcategories: communication strategies and participative planning and design processes. Reactive strategies are those that seek to resolve conflict over a project once it has occurred.

Communication strategies seek to build understanding and acceptance of intensification projects by educating the public about the real effects of such projects on property values, traffic, parking, crime and so on. It can also be useful to demonstrate to neighbourhood residents what types of occupants the new, perhaps less expensive, housing would have. Communication strategies can also be oriented towards helping the community accept a particular infill project. In this case, the strategies can be focused on making the development process transparent, keeping the public well informed about a given project from the earliest planning stages up to its completion.

One technique for accomplishing this goal is project visualization, which uses computers and graphic software to create a 3-D representation of the project under discussion and its immediate surrounds. Users can “walk” around the project, look at the project from any vantage point from within the simulation and literally see how the project will affect sun and shade, open space and views as part of the design process. By visualizing different possible development scenarios (e.g., building orientation, density and massing), community members have the means to explore contentious issues and negotiate important design issues rather than reacting to vague descriptions of intensification projects. Visualizations can also have an educational effect in that they help participants identify the key planning issues involved and allow them to focus their attention on the parameters of greatest interest to them (Levy, 1999).

While the role of the public in communication strategies is usually passive, collaborative participative neighbourhood planning processes actively engage the public in the development process. Collaborative planning processes can instill a constructive dialogue among stakeholders, including developers, planners, and neighbourhood residents. The experience of a number of cities shows that this has the potential to build understanding and acceptance of intensification initiatives. Also, being engaged in a collaborative process gives the community a sense of control over its environment and may lead it to accept novel forms of development more readily (Thibert, 2007).

Conflict resolution first and foremost seeks to build understanding between adversaries – i.e., project proponents and the community. Conflict resolution is a two-way process in that it not only seeks to inform the public on the development process and the proponents’ activities, but also seeks to inform proponents of the public’s preoccupations and its particular concerns surrounding a given project. In the interest of expediting the creation of much-needed housing, a municipality can provide a mediator when

community opposition bogs down a project. A municipal staff member, such as a planner, or a professional mediator hired by the municipality can take on this role.

- *Existing Policies and Conditions*

In Calgary, for most development projects, there are two stages in the development process that are liable to be bogged down by NIMBY responses: (1) land use redesignations and (2) development permits.

To change the land use designation for any parcel of land, an amendment to the Land Use Bylaw is required. The Alberta Municipal Governance Act (MGA) requires that a public hearing be held before any amendment to a municipal land use bylaw is approved. Such hearings can become a platform for NIMBY responses. Many intensification projects are likely to require land use redesignations – especially large-scale projects that propose a significantly higher density and a different type of built form than that which prevails in the surrounding area. For example, this is generally the case for TOD projects.

All projects that require a development permit, whether they require a land use designation change or not, can be subject to NIMBY responses because these permits can be appealed by any member of the public. As required by the MGA, any development permit can be appealed to the Subdivision and Development Appeal Board (SDAB) within 14 days of being published in the Calgary Herald and Calgary Sun newspapers. New, low density infill does not require a development permit if it falls within the scope of permitted uses in the given land use district. However, all but the most modest (less than four units) multi-family infill is considered a discretionary use and requires a development permit. This involves notifying the community and the alderman, circulating the application among City departments, and review by the Development Authority and the Planning Commission.

In the new Land Use Bylaw (2007), secondary suites are included among the discretionary uses in certain residential land use districts. This means that, under certain limited conditions, secondary suites can now be built. However, as a development permit is required, they are susceptible to NIMBY and the appeals process.

Beyond the standard appeal process, the City does not currently have any other formal or informal mechanism for settling disputes between developers and project opponents. The City did have a short-lived Planning Mediation Program, developed in 1998 and coordinated by a senior planner. The program was designed to aid City staff in managing land use and development related conflicts by allowing the use of trained third-party contract mediators. Only disputes that could not be resolved through the City's regular procedures were referred to the program. The disputes that were successfully resolved through the program included intensification projects in the Windsor Park and Ogden areas (CMHC, undated). The senior planner who ran it has since left the City and the program has faded away.

In 2003, City Council adopted the *engage! Policy*, the City's official policy with respect to public engagement in municipal decisions – including but not limited to planning and development decisions. Under this policy, all major planning exercises, such as those pertaining to intensification around LRT stations and redevelopment in existing neighbourhoods, are to include an extensive consultation process involving citizens, community stakeholders as well as internal stakeholders – i.e., any units within the municipal corporation with a stake in the decisions being taken. The policy proposes five key strategies for engagement: (1) to inform – providing information that will help stakeholders understand issues; (2) to listen and learn – allowing the City and stakeholders to learn about each others views and concerns; (3) to consult – obtaining feedback from stakeholders and using it to inform analysis, decisions, alternative solutions; (4) to collaborate – having stakeholders participate in analysis, decision, and building alternative solutions; and (5) to empower – delegating certain aspects of the decision making process to stakeholders. The policy stipulates that the Engagement Resource Unit is to provide advice, facilitate the design of engagement processes, and provide City staff with training and orientation on public engagement.

The City is committed to engaging the public in planning decision that could lead to the intensification of developed areas. There are two planning exercises, Area Redevelopment Plans and Station Area Plans that are relevant to intensification. The former are established in order to direct future development within established neighbourhoods whereas the latter are development plans for areas near LRT stations. As both are to be prepared with extensive public participation, they can potentially become venues for collaborative planning for intensification.

- *Issues, Barriers, and Potential*

The use of discretionary controls is a cost issue because it can cause significant project delays. Even in the absence of increasingly common administrative delays for processing development permits, the appeals process can take months while engendering contentious disputes between property owners, neighbours, aldermen and community groups.

On a citywide scale, there are several factors contributing to NIMBY responses to intensification projects. One factor is the perception that areas designated for intensification so far have been chosen in an arbitrary way. It seems that the City's criteria for selecting certain areas for intensification are not transparent, or at least not well understood by the public. The problem may be due in part to the lack of a city-wide public debate on intensification. Another factor is that many individual residents do not know how to obtain information about planning and development projects and related public engagement processes. As a result, NIMBY reactions occur because residents are misinformed about projects. This may be due to the lack of a single, easily accessible information source on planning and development projects and the related public engagement processes. Although such information is generally available on the City's website, it is scattered across different pages and consequently difficult to access.

Another issue is that public engagement processes tend to be inconsistent from project to project. In particular, the nature of the public engagement processes employed for the development of Area Redevelopment Plans, many of which include plans for intensification, has varied considerably. While the *engage! Policy* commits the City to organizing a public engagement process for any important planning or development initiative, it leaves the design of the actual process open so that it can be tailored to each project. There are no clear requirements as to the quality of a public engagement processes, and there is no enforcement mechanism in place to ensure that these processes are consistent with the goals of the *engage! Policy*. The actual nature of the process is largely up to the manager of the project in question. It has been suggested that there is a tendency among certain business units to view public engagement as a necessary evil that is to be minimized. In the absence of clear requirements, some managers may undertake only token engagement processes. Aside from the project managers' priorities, a factor that affects the nature of engagement processes are time and budgetary constraints on projects – insufficient time and money can limit the quality of an engagement process. Public push back to certain projects is a direct result of the resulting inconsistency of an inconsistent or insufficient public engagement processes. The Planning, Development and Assessment Department, according to one of its officials, recognizes this issue and is currently undertaking a review of its public engagement practices in order to develop a more consistent and effective approach to public engagement at various stages of the planning process.

Computer-aided visualization has already been used for public engagement purposes in a number of planning projects in Calgary. In 1998, a visualization consultant worked with the community association and developer for a project in Windsor Park to model different zoning scenarios and come up with solutions that would meet the proponent's density goals while respecting the views and shading concerns of surrounding single family homes. More recently, computer aided visualization was used in a community visioning process to review the ARP for the area around the Sunnyside LRT station,. In this case, the technique allowed the community and developers to reach agreement on several key issues, including the addition of a 12-storey building surrounded by a public square. Visualization techniques have also been used in recent TOD planning exercises. The City's Business and Technical Services division has already developed some expertise in 3D modelling, having already created a digital model of the City centre. According to an official, the City intends to continue expanding this expertise as resources permit.

- *Lessons from Other Cities*

District of North Vancouver, BC

In the late 1990s, the District of North Vancouver devised a bylaw legalizing secondary suites under certain conditions, which it hoped would help increase the of affordable rental housing. The District had experienced longstanding opposition to secondary suites; some apprehensive residents were demanding that the District adopt strict regulations to protect their neighbourhoods from the potential ill effects of secondary suites. Given such sentiments among community residents, the municipality decided to undertake an

information and public consultation campaign before adopting the new bylaw. First, the District created four factual documents intended to expose and deflate misperceptions about secondary suites. The documents included a profile of suite owners and tenants, comparing them the rest of the population; an examination of the building code issues related to secondary suites; an analysis of the costs of creating a building code compliant secondary suite; and an examination of the types of complaints the District had received about secondary suites and the controls it was putting into place. The documents were circulated to local builders, developers, and a number of community groups. To obtain input from the public at large, the District also organized a televised public forum on secondary suites. Although they did not defuse all opposition, these initiatives are believed to have contributed significantly to community acceptance of secondary suites (ACT, 1999).

Toronto, ON

In 2001, the City of Toronto approved a proposal for a high-density development in the vicinity of the historic Fort York. A community group, the Friends of Fort York, was concerned that the new development would compromise the visual integrity of the fort. The group solicited the help of the University of Toronto's Centre for Landscape Research (CLR) to produce a 3-D visual model of the proposed development, to be viewed and scrutinized in the centre's Immersive Visualization Lab. The lab's equipment allowed the group to do simulated, real-time ground level walkthroughs to explore the visual impacts of the proposed development. With the voluntary assistance of local urban design professionals, the Friends of Fort York developed a number of alternative development scenarios that maintained the same level of density as the proposed development but minimized the visual impacts. Ultimately, the City and the developer rejected the group's proposals and decided to proceed with the development as planned. However, the City of Toronto recognized the value of real-time visualizations as an effective vehicle for public participation in the planning process. Future planning proposals for the Fort York area are to be evaluated using immersive visualizations. Developers in the area are voluntarily participating in the process to reduce opposition and to avoid lengthy and expensive appeals at the Ontario Municipal Board, the province's adjudicating body for planning decisions (Lindquist and Danahy, 2006).

Vancouver, BC

In 2006, the City of Vancouver launched a major planning initiative, championed by Mayor Sam Sullivan, called Ecodensity. The main goal of the initiative is to develop a plan to intensify neighbourhoods outside the downtown. The initiative recognizes that the City of Vancouver has virtually no remaining developable land and can only add new residents by increasing the density of existing neighbourhoods. However, density is not presented as an end in itself but rather as a means of achieving other goals. Most importantly, increased density is to reduce the City of Vancouver's ecological footprint (hence *Ecodensity*) by providing more scope for walkability and efficient transit, among other things. Higher density is also presented as a way of increasing housing affordability. The Ecodensity planning process has thus far relied on extensive public participation. The City hoped that by engaging citizens in a dialogue about density, and by seeking their input on how density should be increased in different parts of the city, opposition to eventual intensification projects would be minimized. The public

information and participation process has thus far included the launch of a website for providing information on the Ecodensity planning process and seeking feedback; a two-day, interactive Ecodensity fair; a series of public lectures (available on the website); followed by a series of community workshops to help develop a draft version of the Ecodensity Charter. A public forum, in front of the Mayor and Council, was held to seek feedback on the draft version of the plan. A second draft was developed along with a series of proposed initial policy changes and sent to community workshops to seek further input. The final version of the Ecodensity Charter was adopted in June 2008 (City of Vancouver, 2008).

Los Angeles, CA

The Los Angeles Housing Department, in collaboration with Karin Pally Associates and Livable Places, an advocacy group for affordable housing in Southern California, has developed a website promoting the development of new housing through intensification. The website has three main sections: Framing the Issues; Getting the Facts; and Taking Action. The first of the three explains the City's housing issues and importance of addressing them. The second section defines housing affordability more generally and describes strategies for preserving and increasing affordable housing. The same section also provides information on related themes, such as planning and zoning, traffic and parking, density and design, and civic infrastructure. The section on density and design is particularly notable; it includes schematic visualizations and photo galleries of different housing densities from 20 upa up to 100 upa. (City of Los Angeles, 2008).

- *Options for Calgary*

The City could make land use regulation more permissive to allow a greater number of projects to be built as-of-right, thereby mitigating the impact of NIMBY responses and avoiding lengthy appeals at the SDAB. This might be achieved by increasing the number of permitted uses and decreasing the number of discretionary uses. In particular, the City could make mid-density multi-family developments a permitted use provided that they conform to specific design guidelines. In contextual multi-family districts, the LUB already provides design guidelines for integrating a new building into the context; projects that abide by these guidelines could be made a permitted use.

The City could facilitate the creation of more moderately priced housing by helping to improve acceptance of intensification projects in existing communities on a city-wide scale. The City could engage citizens in a large-scale public consultation process on increasing density, similar to Vancouver's Ecodensity initiative. The process could begin with a public information campaign to engage the public in a dialogue on intensification, stressing themes such as limiting sprawl, improving public transit, reducing car use, and ultimately reducing Calgary's ecological footprint. After the city-wide information and education campaign, the City could then organize a number of community workshops, to have individual communities across the City engage in a discussion on intensification in their area. The community workshops could be used to devise and review a city-wide intensification policy, similar to the Ecodensity Charter recently adopted in Vancouver. Once a city-wide policy has been established, the City could engage citizens in a review

of existing ARPs or create new ARPs in order to implement the policy at the neighbourhood scale. The development of new ARPs should rely on a collaborative planning process with community advisory committees – already an established practice in Calgary. Wide use of collaborative planning at the neighbourhood scale would have the potential to set the stage for intensification projects across existing areas of the city by minimizing community resistance to such projects.

The City could more aggressively develop its computer-aided visualization capacity. Visualizations could be used extensively for planning, design and public consultation purposes at all of the City's main intensification areas (e.g., around LRTs, commercial corridors, brownfield sites, etc.). Developers could be required to submit a digital rendition of their proposals as part of their application package. The file would be properly coded using the City's geo-coordinate system so that it could plug into the base map and allow users to examine the project in its virtual surroundings. Besides allowing City staff to better visualize the project and identify planning issues to discuss with the proponent, the system could be used in public meetings or charrettes to gather community input. The system should allow the users to test alternative scenarios related to the density, setbacks, massing and location of buildings. Outside users should be able to download the architectural file from the City's website and view it using freeware such as SketchUp, which works a plug-in to Google Earth (also available at no charge). If integrated into an interactive web site, the public could use the system to provide input on projects that might affect them, whether major or minor.

The City should try to further improve acceptance of secondary suites. A public information campaign, such as the one undertaken by the District of North Vancouver, could be emulated in Calgary. The campaign could, among other strategies, employ visualization techniques to help Calgarians illustrate a number of different types of secondary suites and their visual impacts in particular neighbourhoods in Calgary. Alternatively, the City could make secondary suites a permitted use under certain conditions, allowing them to be built as-of-right to avoid NIMBY responses.

For full-blown NIMBY disputes, the City could provide resources for conflict resolution between project proponents and community stakeholders outside the formal appeal process. To this end, the City could restore the defunct Planning Mediation Program or create a similar program. The City could consider dedicating such a program exclusively to resolving disputes related to intensification projects, or at least giving priority to projects that are likely to help improve housing affordability.

- *Implementation Issues*

It is as of yet too early to determine whether Vancouver's Ecodensity initiative has genuinely helped increase acceptance of intensification. Calgary should track the unfolding of this initiative and use Vancouver's experience as a model for a similar program.

Planning staff facilitating neighbourhood planning processes should be careful to strike a balance between pushing the intensification agenda and accommodating the community's desires for stability in the built form. If the community feels it is being coerced into something it does not want, the process' legitimacy and, ultimately, its ability to defuse NIMBY responses may be compromised.

Collaborative planning processes can be extremely time consuming as conflicts between stakeholders can make consensus difficult to reach or can derail the process entirely. The oversight of collaborative neighbourhood planning processes may consume considerable City staff hours. However, downstream, it may reduce staff hours spent on dealing with conflict surrounding development proposals.

Although computer-aided visualization can help resolve some contentious planning issues, it is not a panacea. In some cases, it may aggravate differences by clearly highlighting incommensurable positions. It works best when used among participants that are within "negotiating range" and in the context of a decision making process that is focused on achieving solutions. If participants sense that the planning authority is vacillating or unable to take positions, the visualization process may only help to polarize views and delay decision-making.

Calgary's previous conflict mitigation program faded away because the staff member who supervised it left the City. Steps should be taken to ensure the stability and permanence of a new mediation program. The City could create a permanent staff position to administrate the program. Also, oversight of the program could be given to an administrative body, such as the Calgary Planning Commission, to ensure continuity in case of staff turnover. Moreover, the CPC or another body could be given the discretion to decide which projects may benefit from City-sponsored mediation, or at least which projects should have priority.

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Parking Standards

- *Introduction*

Parking standards are used to regulate the amount of off-street parking space that is to be provided for various land uses, including residential. Parking standards usually specify the minimum and/or maximum number of parking stalls and their dimensions or, alternatively, the minimum and/or maximum area to be dedicated for parking. In the case of multi-family residential buildings, parking standards may specify the amount of parking required for residents as well as the amount required for visitors.

In most cities in North America, land use bylaws specify the minimum number of off-street parking stalls to be included per residential unit. Generally, the requirements are insensitive to factors that might affect the actual level of demand for parking, such as the level of transit service and access to other modes of transportation, proximity to places of employment, and level of car ownership and car use at the particular location. In many cases, this can result in an oversupply of parking stalls. In locations with high land costs, parking requirements entail a significant cost per residential unit.

Parking standards can be modified in certain locations in order to reduce costs. The required minimum number of stalls per unit can be reduced or removed altogether. The locations most appropriate for this type of modification are those where there is a mix of land uses, or where a wide array of amenities and places of employment are nearby, or where there is a high level of transit service. In mixed-used developments, parking stalls can be shared between residential and commercial units, each having a complementary parking schedule – i.e., commercial parking allowed by day, residential parking allowed by night. Municipalities can also offer to reduce parking requirements for developers who commit to providing transit or improved bicycle and pedestrian facilities (Litman, 2008 a). A more recent innovation is to reduce parking requirements for developments that provide a car sharing facility (Filosa, 2006). Cuddy (2007) lists a number of factors that influence parking demand and proposes reductions to minimum parking requirements that reflect these factors (see Table 20).

The benefits of reduced parking requirements are not limited to cost savings. Dedicating less space to off-street parking can allow for better urban design and a more compact pattern of development that encourages walking and cycling. Reduced parking availability has been shown to discourage car use and encourage alternative forms of transportation. Reducing outdoor off-street parking can reduce the relative proportion of paved area, mitigating both storm water runoff and heat island effect (Litman, 2008 b).

Table 20: Parking Requirement Adjustment Factors

Factor	Description	Typical Adjustments
Vehicle Ownership and Use	Rates of vehicle ownership and use in the immediate context	Adjust parking requirements to reflect variations in levels of vehicle ownership and use based on census and travel survey data.

Residential Density	Number of residents or housing units per acre/hectare.	Reduce requirements 1% for each resident per acre: Reduce requirements 15% where there are 15 residents per acre, and 30% if there are 30 residents per acre.
Employment Density	Number of employees per acre.	Reduce requirements 10-15% in areas with 50 or more employees per gross acre.
Land Use Mix	Range of land uses located within convenient walking distance.	Reduce requirements 5-10% in mixed-use developments. Additional reductions with shared parking.
Transit Accessibility	Nearby transit service frequency and quality.	Reduce requirements 10% for housing and employment within 1/4 mile of frequent bus service, and 20% for housing and employment within 1/4 mile of a rail transit station.
Carsharing	Whether a carsharing service is located nearby.	Reduce residential requirements 5-10% if a carsharing service is located nearby, or reduce 4-8 parking spaces for each carshare vehicle in a residential building.
Walkability	Walking environment quality.	Reduce requirements 5-15% in walkable communities, and more if walkability allows more shared and off-site parking.
Demographics	Age and physical ability of residents or commuters.	Reduce requirements 20-40% for housing for young (under 30) elderly (over 65) or disabled people.
Income	Average income of residents or commuters.	Reduce requirements 10-20% for the 20% lowest income households, and 20-30% for the lowest 10%.
Housing Tenure	Whether housing are owned or rented.	Reduce requirements 20-40% for rental versus owner occupied housing.

Source: Cuddy, 2007 (in Litman, 2008 b)

- *Existing Policies and Conditions*

Although Calgary’s Municipal Development Plan has several policies that pertain to parking, most have no bearing on residential parking standards. The only relevant policy is 2-3.3.2F, which calls for ensuring a pleasant and quiet atmosphere in residential areas through traffic-calming street design and by encouraging on-street parking.

The 2005 Calgary Transportation Plan features a number of policies pertaining to parking. For the central city (Section 6), the plan recommends continuing the policy of limiting road and parking capacity downtown while improving infrastructure for alternative modes of transportation, although it does not specifically refer to the provision residential parking. In the section on parking management (Section 8), the plan recommends that parking requirements for all types of development should be reduced, particularly where alternative modes of transportation are available, such as in transit-oriented development. In the same section, the plan also recommends that the Residential Parking Program (the on-street parking permit program) should “updated and strengthened” to protect neighbourhoods from the intrusion of non-resident traffic. This last recommendation essentially echoes the Municipal Development Plan’s emphasis on providing on-street residential parking.

The current parking standards for residential units were established in 2005 and have been incorporated in the City’s new Land Use Bylaw (1P2007). The minimum parking

requirements vary depending on proximity to downtown Calgary as follow: in downtown, 0.5 stalls per unit; in the belt immediately surrounding downtown (Area 3 in LUB 1P2007), 0.9 stalls per unit; in the next concentric belt (Area 2), 1.0 stalls per unit; and everywhere else (Area 1), 1.25 stalls per unit¹⁰. These requirement cover only parking for residents; in addition to required stalls for residents, parking stalls for visitors must be provided everywhere except downtown. Multi-family buildings adjacent to downtown (Area 3) need only provide 0.1 visitor parking stalls per unit. Otherwise (in Areas 1 and 2), the requirement for visitors parking is 0.15 stalls per unit. If a dwelling is considered a live-work unit, the visitor parking requirement is higher, at 0.5 stalls per unit.

There are conditions under which the abovementioned parking requirements can be reduced as-of-right. For multi-family housing in the suburbs (Areas 1 and 2), the parking requirement for residents is reduced by 10% if the development is located within 600 m of an LRT station or if the development is within 150 m of a street with frequent bus service; the visitors parking requirement remains the same. For multi-family housing in the outer suburbs (Area 1), the requirement for resident parking drops from 1.25 to 1.0 stall per unit for units that are smaller than 60 m² (approximately 650 square feet); in other areas, the requirements for multi-family units are independent of the size of the units. Other reductions are possible on a discretionary basis. Developers of multi-family buildings may submit a parking study demonstrating that the proposed development will require less than the minimum required number of stalls.

There only maximum parking restrictions in Calgary apply to projects in the downtown Restricted Parking Area and to suburban multi-family projects within 600 m of an LRT station. In the downtown Restricted Parking Area, developers are to provide 50% of the required parking stalls per unit, as required by the Land Use Bylaw, and must pay the City in-lieu for the remaining required stalls. The restriction applies equally throughout downtown, regardless of proximity to the LRT. For multi-family developments in the suburbs (Areas 1 and 2), there is a maximum limit is 1.5 parking stalls per unit within 600 m of an LRT station in the outer suburbs (Area 1) and 1.25 parking stalls per unit in the inner suburbs (Area 2). According to a planning official, the purpose of the policy is to increase the likelihood that households living in dwellings near transit stations will use transit. In effect, the restriction may act as a filter on homebuyers if those willing to own fewer cars and use transit are more likely to buy such units.

Table 21: Parking Requirement for Multi-Family Units (stalls/unit)

	Downtown	Area 3 Inner City	Area 2 Inner Suburbs	Area 1 Outer Suburbs
Minimum Resident Parking	0.5	0.9	1.0	1.25
Minimum Visitor Parking (live-only)	n/a	0.1	0.15	0.15
Minimum Visitor Parking (live-work)	n/a	0.5	0.5	0.5
Transit Proximity	n/a	n/a	-10%*	-10%*
Maximum Total Parking	50% of min, rest cash in-lieu	n/a	1.25	1.5

¹⁰ This is higher than the requirement in the previous LUB, which required only 1.0 stall per unit in suburban locations.

*Reduction applies only to resident parking; visitor parking remains constant.

Developments in planned TOD areas are currently treated no differently than other developments in terms of parking regulations. Planned TOD areas, such as the Chinook LRT station area, have been planned using the land use categories provided by the Land Use Bylaw. Hence, the parking regulations provided by the LUB, described above, apply to nearly all developments in planned TOD areas. The only exception is developments in Direct Control land use districts, for which parking requirements are established on a case-by-case basis. According to an official involved in planning in TOD areas, less than 5% of land in these areas is currently designated Direct Control.

- *Issues, Barriers, and Potential*

Compared to other large cities in Canada, Calgary relies more on private automobiles and less on transit and non-motorized modes of transportation. The provision of sufficient parking at places of residence and at destinations across the City remains an important concern for citizens and politicians as well as for developers. Nevertheless, there appears to be potential to further relax parking standards, especially for multi-family developments. Developers specializing in multi-family buildings indicated that current minimum parking requirements for residents and visitors in multi-family buildings are excessive. They noted that, for buildings located near transit facilities, it was difficult to sell all the required parking stalls to residents. In terms of visitor parking, a study commissioned by a group of builders revealed that visitor parking stalls had average occupancy rates from 30% to 40% of capacity, indicating that capacity could be reduced by half. Developers also pointed out that parking requirements essentially impose limits on density. Developers are likely to avoid building more units than can be served by a single-level of underground parking, as the cost per stall for multi-level indoor parking is much higher than single-level indoor parking.

- *Lessons from Other Cities*

San Francisco, CA

The City of San Francisco has revised parking standards for central commercial (C-3) districts, eliminating minimum parking requirements for housing. The new standards allow a maximum of one parking space for every four housing units. Moreover, developers are required to unbundle parking costs from housing prices – i.e., parking stalls are to be sold or rented separately (RBC, 2008). This is likely to have a considerable impact on housing affordability; according to a study by the University of California Transportation Center (Jia and Wachs, 1998), the average cost of housing without off-street parking in the San Francisco Bay in the late 1990s was about \$46,000 less than that for housing with off-street parking. As housing costs have escalated since then, the difference is likely to be even greater today.

Portland, OR

The City of Portland has undertaken several parking management strategies that are intended to help increase housing density and facilitate the transit-oriented development. Minimum parking requirements have been eliminated in the central city and for sites located within 500 feet of major transit nodes. Maximum parking requirements have been set for projects outside the central city. The maximum limits vary depending on land use and the distance from the nearest LRT station. Minimum parking requirements outside the centre are reduced for such factors as car sharing, transit access, and availability of bicycle parking. Also, shared commercial-residential parking has been allowed. By using the reduced parking requirements, the Buckman Heights and Buckman Terrace projects, both mixed-use developments outside the central city, were able to keep their development costs low and succeeded in providing a number of moderately-priced residential units (Litman, 2008 a).

Victoria, BC

In 1997, the City of Victoria initiated a community planning project in the Harris Green district, adjacent to downtown. This led to a number of zoning amendments, which included the elimination of minimum parking requirements. Numerous apartment buildings were built in the following years. Most units in these apartments were sold or rented without parking, reducing prices considerably for residents who do not own cars or relied on parking off-site. For residents who wanted an on-site parking spot, parking spaces could be bought or rented separately. Developers have reported that an average of 0.5 parking spaces were required per unit, whereas conventional zoning requires that 1.0 to 2.0 spaces be provided (Litman, 2008 a). Relaxed parking standards are proliferating across Victoria; the City's Official Plan allows developers to apply for a zoning variance for the elimination of parking requirements. This is likely to have a very large impact on housing prices, especially in downtown Victoria where an underground parking space can cost as much as \$20,000.

- *Options for Calgary*

Calgary's general parking standards are already comparatively modest. Nevertheless, certain improvements to the standards could be made to improve affordability, particularly in the case of multi-family housing.

The City could consider allowing further reductions to minimum parking requirements as-of-right under specific circumstances. At present, the City allows developers to provide less parking than required by the LUB on a case-by-case basis. To have parking requirements lowered, developers have to submit a parking study and negotiate modifications to parking standards during the approval process. Such negotiations are liable to lengthen the approval process and result in cost increases. Allowing more as-of-right reductions to minimum parking requirements rather than relying on discretionary approval would in itself help reduce development costs.

The City could also consider setting as-of-right reductions to minimum parking requirements for several different factors that mitigate automobile use. The City could

adjust minimum parking requirements as-of-right for any of the factors identified by Cuddy (2007) and listed in Table 20. Even for proximity to transit, which already triggers as-of-right reductions, the City could consider deeper reductions, in line with those proposed by Cuddy. It should be noted that in mixed-use areas, as per Cuddy's recommendation and as exemplified by the City of Portland, Calgary could consider providing significant reduction to minimum parking requirements. This is possible for developments with commercial uses overlapping with or adjacent to residential uses. In this situation, the commercial and residential uses could share a certain number of parking stalls, with the commercial uses making use of the parking by day, and residential uses by night. Ideally, the commercial uses that share parking with residential uses would be those that operate only during business hours on weekdays, when resident demand on parking is likely to be at its lowest.

In addition to lowering minimum parking requirement, there may be potential for extending maximum parking restrictions to a number of additional locations. Parking maximums could be imposed for multi-family housing in non-LRT transit corridors or around transit hubs that are not LRT stations. They could also be imposed in amenity-rich clusters, or neighbourhood centres, outside of downtown.

Finally, another idea worth considering in Calgary is reducing or abolishing parking requirements for developments that offer car sharing facilities. Car sharing facilities as a means of reducing parking requirements are likely to work best in *location efficient developments* – i.e., developments in locations that have both a high mix of uses in close proximity and are well served by transit (Litman, 2007 a). Thus, downtown Calgary, transit corridors, and mixed-use areas near transit hubs would be the best candidates for this type of initiative. Housing affordability could be improved thanks to the reduction in the number of parking spots that must be provided. The provision of car sharing facilities can also improve affordability in another, less direct way: by allowing reduced car ownership, it can help households reduce their transportation expenditures and direct more of their financial resources towards housing.

- *Implementation Issues*

Given the culture of car use in Calgary, the general public and politicians in Calgary are likely to oppose reductions of minimum off-street parking requirements or the imposition of maximum limits. This is especially likely to be an issue for infill and intensification projects. One of the common fears associated with not-in-my-backyard (NIMBY) responses to intensification projects is that they are likely to cause on-street parking shortages. Changes to parking regulations that would lower the number of off-street stalls provided by intensification projects would be liable to aggravate these fears. The imposition of expensive on-street parking permits to mitigate spillover from new developments with limited off-street parking is likely to be very unpopular, as residents are likely to feel entitled to free or at least cheap on-street parking.

While developers might generally not oppose the lowering of minimum parking requirements, they are likely to oppose the imposition of maximum parking limits. They

are likely to oppose limits on the grounds that an insufficient number of parking stalls could make their projects unmarketable – that they would be at risk of being shunned for units elsewhere, where there are no restrictions on the number of parking stalls per unit.

The sharing of parking spots between residential and commercial land uses could be problematic. The parking requirements of residential uses tend to be very stable over time, while those of commercial uses can vary significantly with the tenants of commercial spaces. Tenants of commercial spaces tend to change relatively frequently and can have highly divergent requirements in terms of parking. Some commercial tenants might require spaces only for their employees while other may require them for both employees and clients.

For development with car sharing facilities and little or no parking provided, there are two key issues: (1) accessibility to amenities in the immediate vicinity must be high and transit service must be sufficient to obviate most car trips; (2) a sufficient number of shared vehicles must be available to meet demand.

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Alternative Engineering Standards

- *Introduction*

The basic purpose of engineering standards is to govern the physical size and placement of the infrastructure that services a development, including: lot grading; widths of roads and sidewalks; placement of public infrastructure such as street lighting, storm sewers, and fire hydrants; and the placement of underground utilities such as electrical cables, telephone wires, gas pipes, and water pipes. Engineering standards are specified in manuals used by municipal engineers in urban development, transportation and water management departments to review development proposals. The standards are based on the need to maximize efficiency and public safety and minimize the need for costly maintenance and repairs in the future.

Alternative engineering standards can be adopted to achieve certain social goals without compromising public safety and increasing the probability of expensive repairs in the future. One of the possible motivations for pursuing alternative engineering standards is cutting development costs, thereby improving housing affordability. Standards may also be altered in order to accommodate unconventional development practices, such as those inspired by New Urbanism or other forms of compact or neo-traditional community design.

Common strategies to reduce cost through engineering standards include narrowing roadways; consolidating infrastructure trenches; spacing manholes, sluice boxes, and fire hydrants further apart; eliminating sidewalks on one or both sides of streets; and eliminating curbs or using roll-on curbs to avoid making cutouts for driveways. It is important to note that some of these modifications, such as eliminating sidewalks, may be at odds with the imperatives of sustainable development, such as encouraging walking and discouraging automobile use.

Alternative standards are also pursued under the auspices of low-impact development (LID), or development practices that aim for reduced environmental impacts. LID practices differ from conventional development primarily in the way that they treat storm water. Conventional engineering standards focus on channelling water into sewers, through which it is then carried off-site. In contrast, LID engineering standards focus on absorbing storm water into the ground on-site and eliminating or reducing the amount of runoff that is channelled into sewers to be carried off-site. Case studies on LID show that the approach can reduce costs associated with storm water sewer infrastructure and site preparation work, such as clearing and grading, by as much as 25 or 30% (LIDC, undated). The other main benefit of LID is that it reduces water pollution by reducing the volume of storm water runoff and reducing the amount of suspended solids in the runoff.

The different motivations for pursuing alternative engineering standards, such as cost reductions, compact growth, and sustainability, can overlap in many cases. For example, reducing street widths can yield cost savings by reducing the paved surface area and by consuming less land; at the same time, it can allow a more compact pattern of

development, allow for better walkability, and can also improve on-site storm water infiltration by reducing the amount of impermeable surface area.

- *Existing Policies and Conditions*

The City has allowed deviations from its engineering standards in Calgary's two New Urbanist developments, McKenzie Towne and Garrison Woods. In both cases, the deviations from the standards were allowed on an *ad hoc* basis to accommodate narrower streets and smaller setbacks. In the case of Garrison Woods, the developer estimates that the engineering costs were higher than in a conventional subdivision on a per area basis, but the greater unit density resulted in lower per unit costs. The extra costs arose from the complex nature of the site; existing buildings and mature trees constrained the configuration of public ROWs and utilities. It is also partly attributed to the project's emphasis on urban design and the creation of a high quality pedestrian environment, with wide sidewalks, lanes, and an interconnected street grid. Finally, the novel designs proposed by the developer entailed increased costs due to extensive use of consultants and the increased amount of time required to obtain approvals from the City. A City official contends that some of the delays occurred because the developer submitted designs that were not consistent with those to which the City had previously agreed.

The Transportation Department is currently leading a project on narrower road designs. The department has designed a new 'kit of parts' (a set of basic residential street types) with narrower carriageways. The standard carriageway width for residential streets in Calgary is 9.0 m – the minimum width allowed by the Alberta Building Code (ABC).¹¹ The new design proposes a width of 8.5 m, slightly below the ABC specification. By reducing the paved area by 2.5 m² per unit, the narrower gauge is expected to allow for cost savings. Another cost saving arises from placing sidewalks on one side only. However, the new design features wider boulevards on each side of the street to accommodate trees in the public ROW, offsetting the gains made by narrowing the roads and including only one sidewalk. As a result, the total width of the public right-of-way (ROW) is 14.9 m, just slightly narrower than the current standard of 15.0 m. Because the public ROW is no narrower, it does not offer an opportunity for saving on land costs. It should also be noted that shallow utilities remain outside the public ROW. They are located in 2.4 m easements on both sides of the ROW – slightly narrower than the conventional standard, which requires 3.5 m per side (City of Calgary, 2006).

In terms of storm water management, the City's current engineering standards are still largely oriented towards off-site management. Standards oriented towards on-site storm water management are currently being developed by the Water Resources Department. The department has been conducting research on bio-retention as a means of retaining and filtering runoff; on the use of porous paving surfaces to facilitate on-site infiltration; and the on-site reuse of storm water for park irrigation. Storm water management features, including a system of vegetated swales and water-friendly landscaping, are

¹¹ There is some disagreement on the interpretation of the ABC, with some developers claiming that the 9 metre minimum width refers to the legal right of way, not the paved carriageway.

being tested in a subdivision in West Rockborough. The system is proving effective, removing 90% of total suspended solids (TSS) and reducing the volume of storm water runoff by 50%. Other precedents are currently under development. Notably, these include Currie Barracks and the recently approved Saddleton¹² project, both of which are to feature on-site storm water retention and absorption features. In the case of Saddleton, the City has retained a performance security in the amount required to install regular stormwater servicing in the area in case the alternative storm water management system fails to perform as expected.

Water Resources has proposed a new street ROW design that can be used to retrofit public ROWs in existing subdivisions. The design's key features are a bio-swale within the public ROW and rain gardens in the private easements straddling it. To accommodate the swales, the width of the carriageway is reduced to 7.5 m, allowing parking on only one side. The carriageway is flat and slightly sloped towards the side with the swale; the swale-side curb is flush with the road surface to allow water to drain over it. Water Resources wishes to retrofit an existing, conventional subdivision with the new street design to assess its performance. Despite support from Council, the design has yet to be approved by the fire department and other approving bodies. In the interim, Water Resources is collaborating with the Calgary UDI on a major study (The Residential Low Impact Subdivision Study) on the use of LID practices in conventional subdivisions. The study will assess, among other things, the costs of LID versus conventional engineering standards in a mock conventional subdivision (City of Calgary, 2008).

Although engineering standards remain oriented towards off-site storm water management, the City has made some progress in encouraging developers to include green infrastructure in their projects. Specifically, the Parks Department now allows up to 33% of the required land reserve in a project to be used for storm water management, but only if storm water management is a secondary use – i.e., the area's primary use is park but it can double as a storm water pond after substantial rainfall. If storm water management is a primary land use, such as in the case of swales, only 50% of the area is counted towards a maximum of 10% of the land reserve requirement.

- *Issues, Barriers, and Potential*

Calgary's current engineering standards are conservative, requiring a considerable amount of land in new developments be set aside for streets and utilities – up to 30% in a conventional suburban development. One barrier to changing the standards, as mentioned above, is the ABC, which mandates minimum road widths of 9.0 m. Although this limit has been subject to lax enforcement, allowing road widths to be squeezed down to 8.5 m, it is unlikely it can be flouted any further. Another barrier is the tendency of engineers and public safety officials to oppose changes to engineering standards, the former on the

¹² Saddleton is to feature a *fused grid* street pattern, a hybrid of the rectilinear traditional street grid with the postwar cul-de-sac curvilinear street pattern. In the fused grid, certain links in what would otherwise be a rectilinear grid are removed and replaced with vegetated patches that serve as storm water retention and absorption areas. See CMHC (2007) for more information.

grounds that they will increase long-term maintenance cost liabilities for roads and deep utilities and the latter on the grounds that they will compromise public safety by impeding the movement of emergency vehicles. Private utility companies are also loath to have standards for shallow utilities changed. Case in point, they opposed placing shallow utilities under sidewalks in the new street design, insisting that they must be located in private easements next to the ROW to facilitate maintenance (City of Calgary, 2006).

Despite the stiff opposition, there are precedents for alternative engineering approaches, as mentioned above, which notably include McKenzie Towne and Garrison Woods. The developers of both projects had to negotiate intensively with approval authorities before being allowed to proceed with alternative standards (CABE, undated). A key issue seems to be that precedents set by past developments do not carry over to new developments, an issue that Canada Lands is presently facing with its Currie Barracks project. Planners at Canada Lands say that they are being required to renegotiate engineering standards for which they had received approval in Garrison Woods.

- *Lessons from Other Cities*

Surrey, BC

The East Clayton development in Surrey uses a combination of alternative planning and engineering standards to limit its ecological footprint. The modifications to engineering standards include narrower streets, elimination of curbs, and natural storm water management. The development's innovative storm water management system relies primarily on natural infiltration rather than sewers – up to 80% of storm water is to be absorbed on-site. The development relies on a minimization of impermeable surfaces, such as roofs and driveways, drainage gradients that direct runoff into yards rather than onto the street, and a system of green spaces dotted with shallow ponds that can function as temporary infiltration basins allowing water to be gradually absorbed into the soil during periods of heavy rain. Nevertheless, due to concerns about liability, the City required that a regular storm sewer system be included. (ACT, 2007). While devised primarily as an environmental measure, the green storm water management system on its own is cheaper than a conventional storm water system. It is not necessarily more land intensive – land set aside for parks and schools can be used for this purpose.

Moncton, NB

In the early 1990s, the City of Moncton began running out of serviced land for development. The land that remained, being expensive and serviced for large lots, would only be able to accommodate high-end housing. To help create more affordable housing, the City together with the local homebuilders association decided to look into modifying planning and engineering standards to reduce development costs. The proposed cost-cutting modifications to engineering standards included: reduced ROW widths, from 18 m to 15 m; reduced pavement widths on residential streets, from 10 m to 8.5 m; increased manhole spacing, from 152.5 m to 183 m; increased fire hydrant spacing for 122 m up to 305 m (the maximum distance believed to be safe); for parallel infrastructure, single trench under roadway for water, sewer, and storm water mains instead of three; for lateral

infrastructure, single trenches between lots allowing one trench to service two houses, instead of one trench per house; and eliminating sluiceboxes wherever possible by replacing them with catchbasins. The City implemented or partially implemented all but one of these proposals, the increased fire hydrant spacing. The cost savings permitted by these modifications are believed to be significant. Notably, increased manhole spacing and single trenching yielded savings of about 16% on the cost of water, sewer and storm water infrastructure. The City also allowed an increase in the spacing of access panels yielding a 10% saving per foot on road construction (CMHC, undated).

Snohomish County, WA

Snohomish County, northeast of Seattle, is presently developing a new set of development standards for urban residential areas (Snohomish County, 2008). The proposed street palette includes a type called *woonerf* – an idea that originated in the Netherlands in the 1970s. A *woonerf* (Dutch for “street for living”) is a narrow street with a single, paved surface – there is no grade separation between the sidewalks and the roadway. Sidewalks can however be demarcated with bollards, planters, or trees. In the Netherlands, the law grants pedestrians and cyclists right of way on the entire surface of the *woonerf*. They have speed limits of no more than 20 km/h plus obstacles such as planters or bulb-outs, which serve as traffic calming measures by forcing motorists to follow a zigzagging path. In Snohomish, the *woonerf* is to be a through connection between two sections of the access street system. However, they are intended only to feed the housing built along them, not as through connection. As such, they are intended to serve a average maximum of only 150 daily trips. The minimum required width is 12 feet (3.7 m) or 20 feet (6.1 m) in the case of *woonerf* that serves as a fire lane. Like in the Netherlands, they are to be surfaced with materials other than asphalt. The *woonerf* concept has generated a great deal of interest among planners and urban designers across North America and a few rare examples have been built (Scheer, 2004). Nevertheless, no municipality before Snohomish has adopted it as a development standard.

- *Options for Calgary*

The City could try to devise a mechanism that would allow engineering standards precedents set by previous development to be replicated in new developments. After a precedent-setting design has been implemented, its performance could be evaluated; if the design proves to perform satisfactorily, it should be possible to reproduce it in a similar development context in the future without going through drawn-out negotiations anew. Enabling developers to use new but proven design precedents would save them time, money, and personal frustration, and would likely reduce the strain on the City staff.

Following the example set by Moncton, the City could explore the possibility for cutting development costs by changing the requirements for the distribution of fire hydrants and manholes as well as single-trenching parallel and lateral deep utilities.

If the Residential Low Impact Subdivision Study (mentioned above) concludes that low impact standards would entail significant short- or long-term savings in development

costs, the City could adopt such standards for all new development and redevelopment. The City could base the new standards on local precedents, such as those set in Rockborough, Currie Barracks, and Saddleton as well as on experiences from developments in other cities, such as East Clayton in Surrey. Regulations with respect to using green infrastructure to offset the 10% land reserve requirement could be updated in concert with engineering standards. The amount of green infrastructure that can be counted towards the land reserve could be increased considerably; at present no more than 1% of the total area of a development can be dedicated primarily for storm water management and counted towards the land reserve requirement. An effective in-site storm water management system, combining street side and off-street water retention and absorption areas, could reduce or obviate the need for expensive deep pipes and off-site infrastructure, such as retention ponds. Furthermore, the approach has been proven to provide significant ecological benefits, including reduced river pollution due to suspended solids in storm water runoff and replenishment of the groundwater table.

The City could take measures to further reduce the footprint of residential street networks in new developments by further reducing the width of public ROWs. This could be achieved by placing shallow utilities under the sidewalk, which would eliminate the need for utility easements on either side of the street and allow trees to be planted on front lots. As a result, the boulevards on both sides of the carriageway could be narrowed, consisting only of the sidewalk¹³. The City could also request that the province reduce the required minimum road width from the current 9.0 m standard.

The City might also consider using the *woonerf* street concept in new residential developments for a variety of reasons. Most importantly, *woonerven* have very small footprints – the fire lane *woonerf* proposed by Snohomish is only 6.1 m wide. Even a slightly wider *woonerf* that would allow for on-street parking would still be much narrower than the current standard ROW, affording higher density of development and lower land costs per unit. The smaller footprint and absence of curbs would also be beneficial from the point of view of storm water management – the *woonerf* would integrate well with street side swales and rain gardens. Another reasons to build *woonerven* is the high level of safety that they afford due to their traffic-calming effect. Moreover, the experience of the Netherlands and other countries that have embraced the concept (e.g., Britain and Germany) is that *woonerven* create very vibrant social spaces.

- *Implementation Issues*

The City's civil engineers and public safety officials are likely to oppose the idea of allowing precedents to carry forward to new projects. For city engineers, recognizing new engineering standards would multiply the number of standards that they must keep track of, both for the sake of approvals and, further down the road, for the sake of maintenance. This suggests that additional administrative capacity might be required to handle approvals and oversee the implementation and maintenance of public infrastructure.

¹³ Alternatively, the trees could remain in the boulevard and front set backs could be reduced instead. This would not narrow the public ROW per se, but could still yield considerable land savings.

Engineers can also be reluctant to allow new designs to proliferate because the long-term maintenance cost liabilities for these designs may be unknown. To help address this issue, the City could systematically evaluate the performance of precedent-setting, non-standard designs over time, particularly tracking maintenance and repair costs. Designs that perform well in terms of ongoing costs could be established as new standards, to be replicated in other comparable developments. A more immediate solution could be require that developers proposing novel designs perform long-term cost modelling and to detail cost liabilities over time in their development permit application.

Public safety officials are likely to oppose modifications to the distribution of surface infrastructure such as streetlights and fire hydrants on grounds of comprising public safety, despite the experience of cities like Moncton, which demonstrates that this can be done without significantly compromising safety.

For on-site storm water management, Surrey's experience shows that municipal engineers might doubt its effectiveness and require that conventional drains be included anyway, defeating its cost-saving potential. Past experiences suggest that different approving authorities are liable to take issue with certain elements of an on-site storm water management system. For instance, the roads department might resist curb cutouts and porous pavement on the grounds that they may interfere with the operation of snowplows. The Residential Low Impact Subdivision Study (mentioned above) may help address some of these concerns.

There are a number of potential obstacles to eliminating utility easements and reducing ROW widths. The private utility companies are likely to resist the placement of shallow utilities under the sidewalk on the grounds that it makes maintenance considerably more complicated and expensive, as they did when the City designed the new street standard (Calgary, 2006). The gas company may also argue that it makes detection of leaks more difficult. Municipal public safety officials are likely to oppose the narrowing of carriageways on the grounds that this frustrates the movement of emergency vehicles, especially fire trucks. The provincial legislature may not wish to amend the minimum street width specified in the ABC on the same grounds. Furthermore, some proposed changes that would narrow ROWs and cut costs might conflict with Calgary's Plan It objectives. For example, narrowing the road ROWs by eliminating sidewalks on one side of the street would conflict with the Plan It goal of prioritizing walking. The City may face other tradeoffs between meeting its sustainability and urban design objectives and trying to improve housing affordability through modified street standards.

The *woonerf* street design concept is likely to be the most controversial of all the proposed measures. It runs counter to the long established tradition of separating pedestrians and automobiles and is likely to face opposition from transportation engineers as well as public safety officials, who tend to be conservative. Unlike in the Netherlands, the *woonerf* is not recognized in Alberta's traffic regulations, granting special status to pedestrians and cyclists. Also, the province would have to amend the ABC to allow the widths comparable to those proposed for *woonerven* in Snohomish.

All of the above alterations to existing engineering standards would tend to increase friction among the various departments involved in development control and tax already over-extended staff. This might undermine the expected cost savings to developers by extending approval times. These negative outcomes could be minimized by engaging staff and the development community in a comprehensive charrette on engineering standards, with the aim of educating participants and achieving consensus on the modifications to be implemented.

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Planning Approvals

- *Introduction*

Development review and approvals processes are lengthy and unpredictable in many communities in North America. Due to the high up-front costs associated with holding land, uncertainty and timing delays increase the risk and the financing costs associated with development. In terms of residential development, the additional “soft costs” incurred by developers are ultimately passed on to homebuyers and renters, decreasing housing affordability. As mentioned above, the academic literature reports that the final selling price of a residential unit must be inflated by approximately one to two percent for each month of delay in the approvals process

Approval delays can occur for a variety of reasons. A common issue in many communities is that application procedures are unclear and, as a result, applications are stalled or rejected due to unfulfilled requirements. More often, however, delays occur due to internal administrative problems. Typical administrative issues that slow application reviews include overlapping or competing jurisdictions between municipal departments; complicated and poorly coordinated administrative procedures; and inadequate staff resources due to inexperience, insufficient training, or understaffing. Other typical issues include repeated postponement of decisions (due to community opposition, among other factors), inefficient mechanisms for public consultation, and appeals of decisions to the relevant tribunals.

Across North America, approval times have generally been increasing over the last few decades as regulations pertaining to development have become increasingly complex and application requirements more rigorous. Recognizing that slow planning approvals can have serious repercussions on housing costs and on a community’s socioeconomic well-being, a number of North American cities have undertaken efforts to reform approval processes in order to shorten approval times and to make them more predictable.

There are two general types of reforms – the streamlining of the approvals process for all applications and the fast tracking of approvals for certain types of projects. Streamlining can consist of simplifying and clarifying application requirements as well as improving the administration of the approvals process. This can include better coordination between departments involved in the approval, the establishment and enforcement of strict timeframes, increased staffing levels and better staff training. Another related strategy is reducing the reliance on discretionary decision-making and instead using detailed development checklists and point systems to make more expedient decisions. Some communities have taken steps to reduce approval time delays related to community opposition – see the capsule on managing NIMBY responses for more details.

Whereas streamlining applies to all development projects, fast tracking is focused on decreasing approval times for projects that meet specific criteria. Projects are fast tracked by being placed ahead of other projects in the approvals queue, by having supplementary

staff resources assigned to them, or both. Although fast tracking is most often used for social housing projects, it has also been applied to other types of projects that can improve housing affordability, such as for market rental housing projects (CMHC, undated a).

Beyond allowing a reduction in development costs and potential improvements in housing affordability, approvals process reforms can have other benefits. Faster approvals can mean prompter responses to changes in the housing market. Where reforms are focused on streamlining administrative procedures, they can save the municipality money by reducing the number of staff hours dedicated to each approval.

- *Existing Policies and Conditions*

The current regulatory environment in Calgary requires that developers undergo up to three stages of approvals before beginning project construction.

The first stage consists in obtaining a land use redesignation. This is a required stage for virtually all greenfield development and for many infill projects as well. When requesting a land use redesignation, developers are required to submit studies that demonstrate that the proposed land use conforms with all planning policies that apply to the development site. Relevant policies are found in the Municipal Development Plan and the Regional Policy Plan, as well as an Area Structure Plan in the case of greenfield development or an Area Redevelopment Plan in the case of development in established areas. Applications for land use redesignation are reviewed by the Calgary Planning Commission (CPC) and subjected to a public hearing before City Council, as required by the Municipal Governance Act. Council is the approving authority for redesignations.

The second stage consists of obtaining approval for the subdivision of land. This stage is required for all projects that entail servicing the development site with new streets and utilities. In most cases, project proponents must submit an Outline Plan (OP) followed by a Tentative Plan (TP) of Subdivision. OPs establish the general dimensions and layout of streets, utilities and land reserves, and the general distribution of land uses across the development site. OPs are submitted together with applications for land use redesignation and the two are jointly reviewed by the CPC. Unlike decisions regarding land use redesignation, decision regarding OPs are not statutory and therefore cannot be appealed. The CPC is the approving authority for OPs. A TP is prepared once the OP has been approved. TPs flesh out in greater detail the information contained in OPs. For example, whereas an OP details the number of lots and their general dimensions, the TP will contain a map showing the exact locations and dimensions of proposed lots. TPs are statutory and decisions concerning them can be appealed by the applicant. The approving authority is the Chief Subdivision Planner or the CPC (City of Calgary, 2002).

The third and perhaps most crucial stage is obtaining a development permit. This stage is required for all development projects, regardless of location or scale. Project proponents must submit an application that demonstrates that the proposed development meets the requirements of the Land Use Bylaw for the land use designation(s) on the project site

and conforms to any guidelines or other policies, as required by City Council. The application must show overall density, planned lot dimensions and building coverage, building heights, provision of off-street parking, landscaping and amenity space, and the project's integration with the surrounding context. Development permits are reviewed by representatives of a number of City business units that have a stake in the development project, such as engineering, roads, parks, schools, and so on. The approving authority is the City's Development Officer or the CPC, depending on the nature of the project. Generally, the CPC vets projects that are unusual or complex in nature, or that are being built on strategic sites, such as near LRT stations.

In 1997, to streamline and expedite review of the three types of development applications described above, the City set up the Corporate Planning and Applications Group (CPAG). The CPAG was created as a single point of contact between developers and the City in order to simplify and better coordinate application procedures, but also to ensure that application reviews and approvals reflect an integrated, corporate perspective. To this end, the CPAG is staffed by generalists as well as specialists from business units such as those concerned with engineering, roads, parks, and planning. Applications are initially reviewed by generalists, who may choose to pass the application, or elements thereof, to specialists. Once the review team completes a review, successful applications are forwarded to the relevant approving authority to obtain official assent. The target timeframe established as part of the Standard Development Agreement (SDA) for the approvals (review plus revisions) of combined land use redesignation applications and OPs is 180 days, while for development permits the target is 90 days (WMC, 2007).

In 2005, the team consensus decision model used by the CPAG was modified slightly to increase accountability and to help break decision-making deadlocks. The modification consisted in mandating Lead Planners to resolve conflicts at the team level and to ensure that team members were following required procedures and correctly applying all policies and rules while reviewing applications (CPAG, 2005).

The New Community Design and Subdivision Services section of the Planning, Development and Assessment unit is currently working on a Smart Growth manual. The manual is to be used to assess land use redesignation applications in terms of compliance with the principles of Smart Growth and the contribution the development will make to the City's growth management objectives. Housing affordability is included in the manual, but as a minor criterion.

- *Issues, Barriers, and Potential*

Developers interviewed for this study have indicated that all three types of applications (land use redesignations, subdivision plans, and development permits) are very slow to be reviewed. In terms of general complaints about all approval stages, developers complained that CPAG's file managers are ineffective at seeing proposals through the review process in a timely and coordinated way. Apparently, file managers have little authority to enforce review timeframes. Developers also mentioned that there was often an apparent lack of coordination in the review process, manifested in the separate,

sometimes conflicting comments on applications that they receive from representatives of different departments. A few interviewees suggested that the delays and the apparent lack of coordination are likely to be the result of a lack of human resources – file managers and reviewers are overstretched. The CPAG acknowledges that the volume of applications exceeds its administrative capacity (CPAG, 2007).

As mentioned above, applications are supposed to be shepherded by generalists to provide a unified voice and reflect a corporate perspective. In practice, however, generalists tend to be risk-averse and avoid taking decisions themselves, especially on technical issues related to roads, water and sewer, and fire safety, preferring instead to delegate decisions to specialists. Thus, applications routinely end up being circulated to a number of different specialists. One factor explaining this tendency is that staff turnover is very high and therefore many generalists are very young and relatively inexperienced. As such, they are unwilling to “stick their necks out” by taking decisions themselves. The CPAG has acknowledged that the circulation of applications to specialists needs to be reduced. The CPAG has recently undertaken a number of initiatives to increase the number of development permits receiving only generalist (4A) reviews and to limit the number that undergoes specialist (4B) reviews (CPAG, 2007).

In terms of specific issues related to land use redesignations and subdivision plans (OPs and TPs), some developers mentioned that application requirements have become more onerous in recent years. In general, the number of studies that developers are required to submit and the number of policy documents with which their proposals must comply has increased. Some interviewees singled out the Regional Policy Plan (RPP), saying that it adds as much as a year to the development process because of the extra time it takes to conduct the required studies (biophysical, storm, servicing, historical studies). Other requirements have also multiplied. One developer mentioned that applications for land use redesignation have become more onerous and approvals slower because many finer-grained details (such as front door orientations, location of trees) are now established at this stage rather than at the subdivision or development permit stage. The same issues are often addressed again at the development permit stage, duplicating effort and slowing approval times.¹⁴

According to several interviewees, the development permit stage is the slowest stage of the development process, largely due to the over reliance on discretionary controls. The problem is apparently more acute for multi-family projects, as they are subject to more discretionary controls than single-family housing types. Developers especially took issue with the discretionary control over architecture features. When a development proposal includes discretionary uses, developers are required to submit supplementary studies on the impacts of the discretionary features on the surrounding area. The resulting application is more complex and slower to be reviewed. They are also more prone to

¹⁴ The City has recently undertaken a review of the RPP process and Area Structure Plan (ASP) processes to more clearly define the purpose and scope of these stages in the planning process. Preliminary experience suggests that efficiencies can be gained in the Regional Policy Plan process (now called Regional Context Studies).

requiring major revisions, which may mean that they have to be resubmitted, resulting in further delays.

To reduce the need to send development permit applications back to developers for revisions, the CPAG organizes pre-application meetings. The meetings are attended by project proponents, CPAG staff, and stakeholders from different municipal business units. In principal, the meetings are supposed to help iron kinks out before the applications are reviewed, thereby reducing time lost for revisions and resubmission. In practice, an interviewed planner suggested, pre-application meetings have little effect because the developer and consultants have by the time of the meeting already worked on the application for over a year and are usually unwilling to introduce substantial changes at such an advanced stage in the game. The planner suggested that a “pre-pre-application” consultation, when the developer and consultants are only beginning to prepare the application might be more effective.

Such a process was used to vet development concepts for Mahogany, a 1300 acre new community in southeast Calgary. A charrette was held early in the planning process in order to discuss some novel features being proposed by the developer, including an unprecedented level of density and unusually-sized school sites. Participants included developers, planners and other administrative stakeholders. Given the atypical features of the proposal, the charrette format was used to hammer out issues that were likely to impede approvals before submitting the project for review.

- *Lessons from Other Cities*

Surrey, BC

In 1989, the Surrey Municipal Council adopted a fast tracking policy for rental housing. At the time, Surrey was participating in British Columbia’s Provincial Development Incentive Grant Program, developed by the province to help municipalities experiencing extremely low vacancy rates stimulate the creation of new rental housing. In Surrey, when developers intend to build multi-unit market rate rental housing or social housing, they must inform the Planning and Development Department of their intention to use the program. Applications flagged under the program are given priority treatment at every step of the review process. Planning and engineering prioritize flagged applications and are required to work closely with the developers on any necessary revisions to get the project approved as soon as possible. The program decreased the processing time for rezoning applications by a half – i.e., from 18 months down to about 9 months. This has allowed developers to significantly reduce their carrying costs and is believed to have made the development of rental housing viable again in Surrey (CMHC, undated b).

Central Saanich, BC

In 2000, Central Saanich, a municipality in BC’s Capital Regional District, undertook a Housing Needs Assessment. The assessment identified a few gaps in the municipality’s housing supply, including: insufficient affordable housing for young families; a lack of new rental housing; and a lack of appropriately designed housing for independent seniors wishing to remain in the community. To encourage the private development industry to

help fill the housing gaps, the municipality introduced a set of evaluation guidelines for residential development applications. The evaluation guidelines apply primarily to infill projects that require zoning changes and are therefore to be approved by Council. They are to be used in conjunction with the *Central Saanich Design Guidelines for Infill Housing*. Project proposals are evaluated on the following aspects: (1) conditions for increased density, (2) mix of tenure types, (3) level of access to services, and (4) neighbourhood acceptance. When submitting their projects, proponents are required to fill out an evaluation checklist to verify that the proposal is consistent with basic policy requirements and assess how the proposal addresses the municipality's housing objectives. The proponent must fill out a table with specific information on the number of moderately priced dwellings, such as secondary suites, small lots/small houses, "plexes", non-profit/sponsored ownership units, and independent housing for seniors. The proponent must also provide information on how these units will meet the needs of target groups – i.e., young families and seniors – in terms of size, amenities, price, etc. The checklist also features items for evaluating the proposal's sensitivity to the neighbourhood context and extent of public consultation that occurred in its preparation (Central Saanich, 2003).

New York, NY

In 1995, New York City initiated a self-certification program, enabling registered architects and professional engineers to certify that building applications, plans, and surveys comply with local regulations and building code requirements. The New York City Department of Buildings controls the quality of the self-certification process by auditing approximately 20 percent of self-certified applications to verify compliance with regulations. In 2006, almost half of all applications were self-certified. In 2007, increasing concern about the quality of self-certified applications compelled the City to adopt legislation allowing the suspension or permanent revocation of certification privileges of professionals found to have knowingly certified an application containing false information or for having certified an application not fully compliant with all applicable regulations. Names and penalties dealt to violators are listed on the Department of Buildings website. The new legislation does not allow professionals who have been put on probation by the State Board of Regents to provide self-certifications and requires that they complete courses on buildings codes and local regulations before their certification privileges are restored (HousingPolicy.org, 2008).

- *Options for Calgary*

A strategy to improve the quality of development applications, and especially development permit applications, would be to incorporate pre-application charrettes, such as the one held for the Mahogany development, into the approval process. The charrette could be optional – i.e., it would be organized at the developer's request – but would be encouraged for applications with atypical features. Ideally, charrettes would be held earlier in the process than current pre-application meetings, at a stage at which the developer has a general concept but has not yet worked out most details. The charrette would not necessarily supplant the pre-application meeting; rather, the meeting could still

be held to verify the application's compliance with requirements and regulations prior to submission.

The City could also consider establishing a formal fast tracking option for developments that address the City's housing needs and other policy priorities, such as growth management and sustainable development. In terms of housing affordability, fast tracking could be made available to developments that provide a certain number of rental units, small lot houses, secondary suites, and other housing types that are likely to be moderately priced. Emulating the Surrey approach, fast tracking could be based on queue jumping for eligible projects. In addition to queue jumping, additional staff-hours could be dedicated to reviewing eligible projects.

A residential development application evaluation checklist that directly addresses the City's housing supply gaps, akin to that used by Central Saanich, could be a useful tool for streamlining the application process. The checklist could be derived from the Smart Growth Manual for new subdivisions that is presently under development, but adding more evaluation criteria with respect to housing affordability. Care would have to be taken to ensure that the checklist is aligned with all citywide policies. This type of evaluation checklist could be used as a means of determining eligibility for a fast tracking program, such as the one proposed above. Alternatively or complementarily, it could also serve to determine eligibility for fee discounts. Checklists combined with infill design guidelines, as in Central Saanich, could be used in lieu of discretionary controls, which would allow many small infill projects to avoid the need for a development permit and proceed directly to the building permit stage. This would save the developer time and money, reduce the CPAG's workload, and avoid delays due to NIMBY objections and development permit appeals.

The City could establish a self-certification system for certain types of development applications, modelled on New York City's program. A self-certification system might especially be useful for issuing development permits and/or building permits for multi-family residential buildings. The self-certification program could be developed in conjunction with a development application checklist, as described above. The role of certifiers would then be to ensure full compliance with the requirements detailed on the application checklist. Certifiers could be Alberta-registered professionals including planners, architects, and engineers. From the City's perspective, a self-certification initiative for certain types of applications would reduce the CPAG's workload, allowing staff to focus on other, more complex types of applications that require discretionary decisions. On the developers' end, self-certification would provide a means of rapid, responsive certification for the selected types of applications.

The City could also do more to streamline the approvals processes. Application requirements could be reviewed to reduce or eliminate any redundant requirements between the different development stages. More efforts could be made to have applications reviewed by generalists. Aside from providing generalists with more training, which is an initiative that CPAG has already undertaken, a new effort to reduce staff turnover may be required, as experienced generalists capable of making autonomous

decisions appear to be invaluable to the review process. When specialists review applications, better horizontal coordination between them could help provide more integrated responses and avoid giving developers conflicting directives. To this end, the CPAG should consider giving its file managers a stronger mandate to coordinate the activities of all parties involved in the review process and to enforce a review timetable. File managers should also be given greater authority to take decisions on issues around which there are conflicting opinions among different City departments. A bonus system could be introduced to reward file managers for respecting published time frames.

The City is already taking steps to reduce “comment creep”, the tendency for comments to multiply and conditions to become ever more specific and applied at earlier stages of approval. The approvals branch has created a library of appropriate comments; if a comment is not on the list, the person making it has to justify why it should be imposed at that point in time. The library has been prepared for Outline Plans and Development Permits and should be expanded to include other types of planning applications.

- *Implementation Issues*

Considering the volume of applications that the City receives, holding a two or three-day charrette for each application could require additional staff, separate from approvals staff, and could consume a very large number of staff-hours. However, if charrettes do iron out issues that would reduce the number of application revisions and resubmissions, the initial investment in staff-hours could be more than offset by staff-hours saved during the review process, reducing the average total number of City staff-hours per applications. The City could consider entering into some type of agreement with the development industry to help fund a charrette program. The funding mechanism should be structured so as to avoid the perception that developers have an undue influence in the approvals process.

The key issue with providing fast-tracked approvals is ensuring that the resulting development does in fact provide affordable units. The City may wish to place certain conditions on the nature of the units built through fast tracking, such as gross square footage and the quality of finishing, to ensure that fast tracked market units are indeed more affordable. For fast-tracked rental units, the City may wish to place conditions restricting their conversion to condominium for a certain period of time. As the MGA does not enable the City to control tenure, only land use, and as the Condominium Property Act does not provide grounds for preventing conversions on this basis, the City currently does not have the power to enforce such conditions. Changes to the aforementioned provincial legislation would be required.

Application evaluation checklists, particularly if used in lieu of discretionary controls, must be designed to balance city-wide priorities, such as housing affordability, growth management, and sustainability, with the priorities of individual neighbourhoods. Thus, while giving weight to intensification and the diversification of housing options,

checklists should nevertheless also evaluate integration with the neighbourhood context and the extent of public engagement involved in the preparation of the project proposal.

The key implementation issue for self-certification of development permit and/or building permit applications is ensuring a high standard of quality. The City could consider setting up an educational program that would train professionals who wish to provide self-certifications on City policies and regulations and on specific application requirements. The City could require that eligible professionals complete such a course of study to be allowed to provide third-party certifications. The City could follow New York's example and perform audits on a certain share of self-certified applications. Violators could have their self-certification privileges suspended or, in more severe cases, have their professional credentials suspended or revoked by the relevant professional organization.

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8. Conclusions and Recommendations

As outlined in the introduction, the purpose of this report was twofold: to improve understanding of the factors affecting housing costs, including current policies and regulations, and the identification of policies to address housing affordability to be considered in the preparation of the Integrated Land Use and Mobility Plan. In this concluding chapter we first summarize our findings on the factors affecting housing costs in Calgary and then we present our policy recommendations to the City.

Factors Affecting Housing Costs

Housing prices in Calgary rose at an unprecedented pace during 2006 and 2007. Some of the industry stakeholders interviewed for this study were of the opinion that an important factor in this price surge was the lack of supply of developable land at a crucial time when demand was dramatically increasing. While it is true that the last couple of years have revealed some stresses in the City's growth management system (and in particular, the infrastructure investment regime), there is no evidence that a dearth of land planned for development was the main, or even a subsidiary factor at play. We explored this issue through a review of the literature on Smart Growth and housing affordability and through empirical analysis of land supply and housing price trends in Calgary.

The literature review does not allow us to support the contention that municipal constraints on land supply are an important factor in determining house prices. It is true that growth management strategies can reduce housing affordability if not properly thought through and implemented, but the literature suggests that demand factors – such as employment levels, average incomes, and population growth – are key to understanding price escalations and speculative bubbles. Cities that attempt to moderate outward growth *may* put a gentle upward pressure on the market value of land, based on location within the growth boundary but the demand for housing in such cities is pre-eminent in affecting land prices. One of the demand factors of relevance here is the attractiveness of the city in terms of its living environment. In other words, when housing prices increase rapidly in Smart Growth cities, it is more likely to be a reflection of the increased draw of the city as a desirable place to live than the land supply restrictions that help to create that livability.

We developed econometric models to explore this issue in the Calgary context. The models allowed us to test whether land supply or demand factors are behind the increase in housing prices in the city. Because we lacked historical data on the supply of developable land, we used building permits as a proxy measure. The results from the econometric models suggest that the demand side variables, such as net migration, after tax household income, and population growth are more robust determinants of housing price dynamics than the supply side variables. The supply of residential building permits, turned out to be a statistically insignificant predictor of housing price dynamics. In instances where supply side determinants were statistically significant, such as singles

permits, the positive coefficient for the variable suggested that the builders were merely responding to the increase in housing prices by obtaining more permits.

This leads us to a discussion as to what impacts on housing prices we can expect if Calgary undertakes to control the spatial spread of the city and re-orient its planning and development control system so as to give a greater emphasis to intensification. This is the general theme that animates the Plan It Calgary initiative, which has developed three spatial growth scenarios for discussion: Dispersed, Hybrid, and Compact.

To assess the impact of these scenarios on future housing prices in Calgary, we first sought to determine whether there is a correlation between housing prices and the type of housing being developed. For this purpose, we turned to the census data from 2001 to determine the correlation between the existing housing mix within a neighbourhood and the price of housing in that neighbourhood. The results showed that housing prices are positively co-related with single detached housing and negatively correlated with doubles and row housing. In other words, housing prices are likely to be higher in neighborhoods with a higher percentage of single detached housing, whereas housing prices are likely to be lower in neighborhoods with a higher incidence of doubles and row housing. The correlation between apartments and housing prices, albeit statistically insignificant, was positive.

From the above discussion, we can conclude that the hybrid scenario is likely to result in lower overall housing prices for Calgary compared with the compact (likely to result in greater incidence of apartments) and dispersed scenarios (likely to result in greater incidence of single-detached housing). The compact scenario would force all new development into already built areas and result in a higher percentage of high density apartment units. Similarly, the dispersed scenario would result in neighborhoods with a greater percentage of single detached housing, which is also correlated with high housing prices in Calgary. The hybrid scenario, on the other hand, would result in a more balanced mix of housing types at moderate residential densities with a greater incidence of row and doubles housing, which are co-related with lower housing prices.

Next we developed a forecasting model based on historical data of the housing stock mix in Calgary, which allowed us to make projections of housing prices from the end of 2007 to the end of 2015. Using housing stock mix from the Civic Census going back to 1980, we modelled the dynamic interactions between housing mix of the existing housing stock and housing prices in Calgary. The forecasts obtained from the model suggest that real housing prices are likely to increase over time under the dispersed scenario. However, real housing prices are likely to decline over time under the compact and hybrid scenarios. Moreover, real housing prices are likely to decline more under the compact scenario than under the hybrid scenario.

The empirical models developed for this study point in the same direction as the conclusions drawn from the literature review: Smart Growth, which seeks to constrain land supply on the urban margin but improve the overall mix of the housing stock throughout the urbanized area, cannot be directly faulted for the rise in housing prices.

This conclusion is also consistent with the findings of a recent review of Calgary's land development policies and regulations and their impact on housing affordability, conducted by the Chamber of Commerce. The authors of that report concluded that the rapid price escalation in the city over the last few years appears to be the result primarily of demand-side factors, a "demand shock" as they say. These factors included: record annual population growth, record employment growth, and record income growth, a near record low interest lending rate, and one of the highest in-migration counts in Calgary's history. The authors noted that most of these factors are linked to Alberta's booming oil industry and the favourable taxation, regulatory and investment climates created largely at the provincial level (Calgary Chamber of Commerce, 2008).

The resulting housing demand surge was predicted by neither the industry nor the City. It overwhelmed developers and builders, who could not bring product to the market fast enough to keep up with the demand. Buyers with rising incomes bid up the price of the available housing and raised land values. Prices were boosted further by higher labour and material costs as developers and builders bid up prices as they competed for inputs with each other, other employers and with the infrastructure building boom the City was simultaneously engaged in. Home buyers assumed that strong housing demand would continue in the long run, which would result in a sustained increase in housing prices. This bid up the price of housing to levels higher than those justified by market fundamentals. As the demand started to ease in Calgary, housing prices began to fall in the second half of 2007.

The demand surge also swamped the City's approval process. Application reviews slowed down and a significant backlog of work built up. The City's staff resources were simultaneously being drawn down by a very high turnover rate as planners left for more lucrative positions in the booming private sector. Throughout this period, the City continued to manage the land supply using its well-established growth management system and supply remained relatively plentiful. If not for this accomplishment, the price boom would undoubtedly have been much more pronounced.

Other City policies had contradictory effects on housing prices. On the one hand, City land use policies were helping to raise densities, diversify the mix of new housing, and promote intensification, making more efficient use of the available land supply and providing households with some less expensive housing options. The expansion of the LRT system brought a wider circle of residential precincts into easy commuting time of jobs in the downtown. All these factors, like the growth management system, undoubtedly helped to prevent greater price inflation than actually occurred. On the other hand mounting infrastructure levies, the introduction of more stringent wetland policies, and in some cases, higher parking standards were contributing to development costs and ultimately to the price at which homes sold. The impact of provincial policies was largely through their effect on constraining municipal actions that might have otherwise improved the supply of affordable housing.

Although the economic factors that were at the root of the demand shock that caused the spike in housing prices are largely beyond the control of local governments, Calgary's

experience shows that municipalities can help influence housing affordability through a variety of means under local control. This is the basic premise of the policy recommendations in the next section.

Policy Recommendations

The development demands faced by Calgary are myriad: population and job growth, maintaining population levels in inner city neighbourhoods, downtown revitalization, open-space preservation, natural resource protection, transportation improvements, and fiscal soundness among others. Critical to the viability of all of these elements is an approach to planning that not only ensures the appropriate quantity, quality, and distribution of affordable housing for residents, but is also integrally linked to a comprehensive growth strategy.

Smart growth, through its emphasis on development that serves the economy, the community, and the environment, provides a framework for communities to better respond to affordable housing needs than have traditional approaches to development. Although somewhat constrained by provincial legislation, there is a wide range of policies and approaches available to the City for achieving Smart Growth and increasing available affordable housing. Contrary to the assertion that these two issues are inherently at odds, these approaches are closely linked. By identifying the effects of development decisions and highlighting the importance of housing in the context of development, these policies and approaches can strengthen the hand of advocates of Smart Growth and affordable housing both within the municipal corporation and the community.

The policy recommendations are presented in two parts: those that pertain to the content of the integrated land use and mobility plan and those that relate to the implementation of the plan.

Planning Policies

A key challenge for devising an integrated land use and mobility plan is to manage growth while keeping housing affordable. Therefore, housing affordability should be explicitly addressed in – or even be one of the central themes of – such a plan. In particular, the plan should include a clear statement that promoting housing affordability (as defined in this report) is a strategic municipal policy goal and that municipal decisions related to land use, development and mobility will routinely consider impacts on the affordability of housing. One option would be to incorporate this goal as the 12th item in the list of principles guiding planning and development decisions and to incorporate the entire list into the land use and mobility plan. Based on the policies and principles to be found in the City-wide plan, more specific policies related to housing affordability should be incorporated into ASPs, ARPs, and other planning documents as the opportunity arises. The plan should set out a series of quantitative targets related to housing affordability (such as a global intensification target, density and unit type mix minimums in greenfield development, a minimum quantity of “inherently affordable” unit sizes and configurations in larger developments, and so on).

Growth management entails establishing a balance between intensifying existing parts of the city through infill development and redevelopment and expanding outward through greenfield development. The plan should address policies to ensure housing affordability in both these development modes.

If the rate at which the city expands outwards is to be curtailed significantly, the plan must recognize intensification of established areas of the City as the primary mode of growth and the main source of new housing. The plan should feature distinct sets of policies for the downtown, transit-oriented development around LRT stations, small-scale infill and large-scale redevelopment. In all cases, the policies should seek to maximize not only the amount of housing in established parts of the city, but also to maximize the variety of housing choices.

Calgary's current prosperity and changing workforce has created a new market for high-density downtown living, which is now dominated by luxury high-rise condominiums. More and different kinds of housing, with varied building typologies and tenure, will be needed in and around downtown to create a more balanced social mix. Planning policies should support low- and mid-rise heights for townhouses and apartments in order to encourage the use of cheaper wood-frame construction. The plan should also contain policies to expand the use of density bonuses to reward the inclusion of certain unit configurations, such as more studio apartments, or multi-bedroom apartments that are family-friendly.

The integrated plan should incorporate and strengthen the City's evolving focus on transit-oriented development near LRT stations. The plan should emphasize the need for high-densities, a mix of uses, and a variety of housing types around transit stations. Special emphasis should be placed on high-quality public spaces, streetscape designs, building massing and aesthetic standards, similar to those included in the existing TOD policy guidelines.

Policies related to small-scale infill development should be concerned primarily with intensifying existing low-density residential areas. They should define the roles of different forms of small-scale infill in existing neighbourhoods, including: secondary suites or other types of secondary rental dwellings; fee-simple, single-family dwellings on split lots, including laneway housing; and multi-family housing. The plan should set out guidelines on where each of these forms should be developed, taking into considering the characteristics of existing neighbourhoods, the capacity of existing infrastructure, and the provision of sufficient services and amenities.

Policies related to large-scale redevelopment should be concerned primarily with residential development on underused lands or on lands dedicated to unproductive non-residential uses. There are two types of areas that should be the focus of redevelopment policies: greyfields and brownfields. In terms of the sheer number of dwellings created, greyfield and brownfield development are likely to be much more significant than small-scale infill and should be the subject of detailed policy prescriptions in the plan. Greyfield and brownfields are quite different in nature and entail distinct sets of issues; as such, they should be treated separately in the plan.

The plan should encourage the creation of new mixed residential-commercial corridors and the reinforcement of existing corridors through infill and redevelopment. The plan should aim to combine the intensification of mixed use corridors with high capacity transit service. This in turn can provide opportunities for location-efficient (i.e., car-independent) housing. As many greyfield sites are also likely to be adjacent to existing residential areas, the plan should provide direction as to the integration of greyfield redevelopment with adjacent residential uses.

Brownfield sites, in contrast, are sometimes separated from established residential uses by physical barriers such as highways and railways. A key policy consideration will therefore be weaving development on brownfield sites with the existing urban fabric, and preventing them from becoming isolated enclaves. Linking such sites to the street network and servicing them with public transit is an important consideration.

As for greenfield development, while its role will be diminished relative to historic trends, it will undoubtedly remain an important source of new housing. Policies concerning greenfield development should focus on providing a variety of housing options and tenures. This means providing a diversity of types and sizes of single-family homes (whether detached, semi-detached, or in rows) and encouraging the use of small lots and house sizes. The plan should encourage multi-family condominiums and rental housing, as well as secondary suites. The acceptability of mobile homes and manufactured housing should be addressed in the plan. The plan should seek to direct greenfield development around a framework of mixed-use nodes and corridors, well served by transit.

The plan should make reference to the need to maintain and preserve existing affordable housing. Although the City currently has few levers to directly prevent conversions or demolitions of rental stock, it could consider using a transfer of development rights system for this purpose and lay out incentives for property owners to rehabilitate rather than demolish existing structures.

Accessibility and mobility are important considerations for all future development, whether within the city or on the periphery. All development should seek to maximize local accessibility to employment, services, and amenities to reduce the need for long, motorized trips and maximize the use of non-motorized modes of transportation. At the same time, development should be oriented towards public transit to provide a high level of automobile-independent mobility. The synergy between housing affordability and independence from automobiles should be reflected in the plan.

The plan should encourage the use of alternative engineering standards that have the potential to reduce development costs and housing prices. The plan should include guidelines for variances or relaxations to existing standards for projects that meet municipal affordability criteria. The plan should signal to administrative staff that modifications to standards that prove successful should be recognized and permitted as routine options in future developments.

The land supply policies that the City uses to manage growth appear to be working well and do not require substantial changes. However, an intensification objective should be added to the three existing land supply objectives that govern the growth management process. A policy stating that intensification is expected to become a more significant component of total growth should also be included in the plan and there should be an ongoing effort on the part of the City to identify opportunities for intensification and stimulate developer interest in exploiting them. A global quantitative intensification target would help clarify the City's goals in this respect and allow the development industry to adapt accordingly.

At present, there are many key policies that affect land development and the affordability of housing that have not been incorporated into the Calgary Plan. This includes the City's growth management objectives, the Sustainability Principles, elements of the Sustainable Suburbs Study, the TOD policy, and others. The land use and mobility plan should gather together these policies in order to provide coherence and consistency in a clear expression of Council's will.

Implementation Measures

The City's own review of land use policies and housing affordability, conducted in 2004, concluded that the planning policy framework was adequate, but "[w]hat is generally lacking in the plans is a strategy to implement the policy. A strategy for each of the plans – including responsibilities, mechanisms for implementation, guidelines and monitoring – needs to be developed" (City of Calgary, 2004: p. 2.18) Here we present some recommendations concerning implementation issues.

- *Revise the Land Use Bylaw*

A number of revisions to the LUB are suggested throughout this report. Most of the proposed modifications are concerned with facilitating intensification and the diversification of housing options.

In terms of large-scale intensification, a significant gain could be made by modifying the LUB so as to treat multi-family housing as a permitted use rather than a discretionary one, obviating the need for a development permit and preventing delays and cost overruns due to lengthy appeals. A proposal that would require a more substantial overhaul of the LUB would be the use of form-based zoning, to prescribe the general nature of the built form but leave the uses up to market forces. This would allow developers more flexibility (and creativity) in meeting City planning goals and would allow land uses to change as a development matures over time without the need to return to Council for approval with each change. Such an approach would be especially appropriate in areas that are expected to gradually intensify over time, such as the downtown, around LRTs, and along commercial corridors.

In terms of small-scale intensification, it is suggested that LUB be modified to facilitate the creation of secondary suites and small, fee-simple homes by means of lot splitting. It is recommended that secondary suites be made a permitted use and that instead of prescribing strict planning standards for secondary suites (with regard to dimensions, placement on the lot, etc.) that the LUB instead prescribe performance-based standards. In terms of providing small, fee-simple dwellings, the LUB could be modified to provide planning standards for laneway housing, making it a legitimate, permitted use.

To further increase the diversity of housing options, the LUB could be modified to allow for more flexible tenure of existing buildings. In particular, changes could be made to allow individual rowhouses to be used as single dwellings or multiple dwellings, potentially with mixed tenure structures (e.g., owner occupied with tenants). Another modification that could entail important gains in affordability would be removing the distinction between conventionally-built homes and mobile homes in the LUB, thereby allowing mobile homes to be placed among stick-built or modular homes.

Beyond modifications concerned directly with facilitating the provision of certain types of housing, it is proposed that the parking standards laid out in the LUB be modified. One modification is to add several location-specific parameters that would trigger as-of-right reductions to minimum parking requirements. The parameters would include several known automobile-use mitigating factors, not limited to proximity to transit. Another proposed modification is to place maximum restrictions on the number of parking stalls per unit for location efficient housing – i.e., in downtown and other mixed use areas, along transit corridors other than the LRT.

- *Revise Engineering and Stormwater Management Standards*

We have recommended revisions to existing standards governing the design of new neighbourhoods and this position is also expressed in the City's existing policy framework. As discussed earlier in this report, however, the City does not have an effective "institutional learning" mechanism for building upon previous experience with alternative standards. Developers report that they must fight each battle anew, which stifles innovation and wastes opportunities to reduce development costs and housing prices. This situation should be addressed by working with the development industry to review past experience with alternative development standards, assessing their cost saving potential and identifying situations in which they could be used, and creating a "bank" of standards that are routinely available for implementation. The bank would cover planning, transportation, utility, and water management codes.

- *Strengthen Incentives for Market Affordable Housing and Smart Growth*

The City has long taken the view that intervention in the market economy is not an appropriate municipal role. However, with spiralling housing prices and rents and so much demand for low end market housing with virtually no supply, there is growing acknowledgement that the market is not working well for people of low and moderate incomes. Thus, pressure is building for City to take a proactive stance and introduce

programs to stimulate market activity in this sector. Because the MGA does not provide explicit authority for municipalities in Alberta to mandate private sector provision of affordable housing, attention is being placed on the role of incentives (i.e., carrots instead of sticks). One justification for incentives is that they can help developers and builders overcome market barriers to low and moderately priced housing, such as high up-front costs or low returns on investment.

Incentives for the development of certain types of housing have been proposed in several instances in the report, including density bonusing, expedited approvals, approvals fee discounts, development levy discounts, property tax breaks, and discounted financing. They have been suggested as means of encouraging the development industry to provide more primary rental housing, more small lots and small homes, or more affordable multi-family units. Incentives are also needed to encourage owners of rental buildings to maintain existing stock and for developers to create new stock. Brownfield redevelopment would also benefit from incentives that could help address the large up-front costs sometimes involved in decontaminating such sites.

The City has begun to experiment with incentives for affordable housing through the Enterprise Housing Program (City of Calgary, 2007), but the range of incentives needs to be enhanced and funding levels increased if the program is to have a significant impact on the production of low-end market housing.

The current system of development levies already provides incentives for higher density housing in that they are based on development area (in greenfield locations) or linear (in the Centre City) measures. However, the current system does not take into account the differential impacts of development in different locations on infrastructure need, most significantly, transportation infrastructure. A system of impact-based levies, as proposed in the transportation impact assessment capsule, would simultaneously act as an incentive for less automobile-oriented forms of development and a disincentive to conventional, automobile-dependent forms of development. Development levies could also be reduced in areas targeted for intensification, such as around transit stations and in suburban activity centres, to help direct developer interest to these areas.

- *Review Infrastructure Financing Instruments and Standards of Service*

Development levies in new communities have been ratcheted up over time and these charges are generally passed on to home buyers in hot markets like Calgary's. Development charge levels that cover the full cost of off-site municipal services in greenfield settings are desirable from a Smart Growth point of view in that they force developers to internalize the full cost of services needed to support their business activities and produce more efficient land markets (Tomalty, 2001). However, they can reach levels that make homes difficult to afford, even for households of moderate income, and threaten to undermine inclusionary goals, also important to the Smart Growth approach. The City has been exploring alternative revenue sources to help pay for infrastructure in suburban areas, including:

- * sharing of revenues with other orders of government, as well as reducing the Provincial Education Taxes to increase taxation capacity for municipalities;
- * pursuing legislative changes that would provide a suite of taxation options, including a Property Transfer Tax and a Community Infrastructure Tax; and
- * use of existing taxation options such as Local Improvement Taxes, Assessment Sub-Classes and Special Taxes (City of Calgary, 2005a).

The City should continue to explore these and other options as a way of reducing some of the burden of community infrastructure financing on new home buyers. Each of these existing provisions has its own limitations and unique implementation challenges, which we cannot go into here in any detail here. From a Smart Growth point of view, the most desirable mechanisms would be those that simultaneously provide revenue for infrastructure and create incentives for development patterns and behaviours that are consistent with Smart Growth goals, e.g., vehicle registration tax, commercial parking tax, commuter tax, fuel tax, etc. (Tomalty, 2007).

Another option is to review the levels of service that are currently used to evaluate the infrastructure needs of new communities. Some savings in infrastructure costs may be possible without noticeable changes in the quality of services delivered. Deeper cuts to service standards may be possible if research shows that new residents would be willing to accept them in exchange for lower housing prices. Planners in each department dealing with community facilities should be able to identify the possible levels of service reductions and the potential savings for public discussion. Another possibility would be to increase residential densities while keeping the levels of service the same. The City should conduct research on how density factors influence the need for different facilities as a basis for discussion on this matter.

- *Produce Design Guidelines*

It is suggested that the City establish design guidelines for various types of intensification projects. In particular, design guidelines are suggested for small-scale intensification, including secondary suites, laneway housing, small lot housing, and multi-family housing in single-family districts. Guidelines combined with checklists are suggested as a way of expediting the approvals process by providing concrete and easily verifiable criteria for approval. It is also proposed that secondary suites and multi-family dwellings to be treated as permitted uses, provided that they follow an appropriate set of design guidelines.

- *Conduct Research*

Some of the policy directions suggested in this report would benefit from supporting research. For example, a detailed inventory of lands available for brownfield and greyfield redevelopment would be invaluable for determining their long-term role and shaping appropriate policies for their redevelopment. An assessment of the infill potential of existing communities would also be useful.

Research is also needed on the impacts in established areas of a major shift in development patterns towards intensification, including both the long-term costs and benefits for the municipality. Such a study could help determine if existing infrastructure in areas targeted for intensification has the capacity to accommodate higher population densities and identify the likely impacts of changing built form and demographics on city services (e.g., can emergency vehicles be properly manoeuvred in a high density situation and do public services have the equipment and training needed to service higher-density neighbourhoods and buildings?). Research in this direction has already begun with the Cost of Growth Study, but further work is required to identify the ongoing operating, maintenance and lifecycle costs associated with intensification as well as the benefits of such growth, including an increased assessment base, savings from increased economies of scale, increase in collection of user fees, and growth of the economy in Calgary (City of Calgary, 2005b).

The City should also track housing needs over time and monitor and report on key housing affordability indicators. Finally, as experience grows with the use of alternative engineering standards, the City should track relevant outcomes to determine if the standards are able to meet financial, safety and efficiency objectives.

- *Address Public Concerns*

A recurring implementation issue for the policy measures proposed in this report is the anticipated public reaction. Calgary has a very active network of community associations that are adept at using the public consultation process to forestall or modify development proposals that they consider out of character with the neighbourhood or otherwise inappropriate. In particular, the public is liable to resist specific intensification projects in existing neighbourhoods and regulatory measures that would facilitate intensification, such as the relaxation of restrictions on secondary suites.

In this report, we have proposed that the City undertake efforts specifically aimed at increasing public acceptance of intensification. A city-wide public engagement process, designed to educate and engage the public in a discourse on growth management and intensification, similar to the Ecodensity process undertaken by Vancouver, is proposed. At the neighbourhood scale, it is suggested that the public be involved very closely in the development of Area Redevelopment Plans through a collaborative planning process. The City is urged to make more extensive use of visualization techniques to help plan and improve community acceptance of intensification projects. In terms of resolving full-blown NIMBY conflicts between developers and community stakeholders, it is proposed that the City restore its defunct mediation program.

By putting an emphasis on transparent communications and good design, the City can overcome much of the public resistance that is typically encountered to intensification. Beyond this, there will undoubtedly be a need for a broad public information/education campaign on Smart Growth and housing affordability. The emphasis here should be on presenting information on the need to manage growth responsibly now in order to avoid serious repercussions down the road, including environmental, social and economic problems. The need for greater housing affordability should be presented as an essential

element of the Smart Growth approach (whose basic tenets, according to a public opinion survey commissioned by the Plan It team, Calgarians strongly endorse). The focus should be placed on the quality of life benefits that can accompany intensification and a better mix of housing types, including additional retailing, services, improved transit, the safety advantages of narrower roadways, more animated and engaging streets, and the greater opportunities for residents to remain in their neighbourhoods as they move through their life cycles. An effort should be made to dispel negative perceptions about density and mixed-use. In conducting such a campaign, the City should seek partnerships with community groups that support the overall approach, e.g., Sustainably Calgary, the Poverty Reduction Coalition, and the Calgary Urban Initiative.

- *Partner with the Development Industry*

Although some developers and builders are known for their innovation and willingness to embrace change, many are wary of the financial risks that arise when straying from tried and tested modes of development. Thus, they may be slow to undertake novel forms of development made possible through the changes to the LUB or new engineering standards and may be unwilling to take up unfamiliar construction techniques, such as prefabricated modular construction. The level of interest in building rental housing or modestly sized homes will remain low as long as profit margins are higher on larger, single-family homes and well-appointed condominiums. More generally, private sector developers may shy away from novel forms of development because they have limited experience in the design, marketing, and financing of such projects. The industry would also resist requirements for replacing demolished rental housing, or policies restricting the demolition of rental housing for redevelopment.

The chances of achieving developer buy-in for a Smart Growth and housing affordability agenda may be enhanced if the City presents the program as part of a package that includes reforms to the approvals process. Streamlining approvals has the dual benefit of meeting developer demands for a more efficient City administration while reducing the overall cost of development, which can help achieve affordability objectives. A number of improvements to the planning approvals process are proposed in this report. The proposed measures include: a self-certification system for certain types of development applications; a fast tracking program for certain housing types; reducing the reliance on discretionary controls; and streamlining of the internal operations of the CPAG. In terms of the last item, the key improvements to be made are giving file managers more power to coordinate the review process and enforce timetables and increasing the role of generalists in the review process. More recruiting, better training and mentoring of new planners could also help ensure more appropriate decision-making on planning applications.

Beyond these reforms to the approvals process, developer support for a Smart Growth and housing affordability agenda may be strengthened by working with industry associations (especially UDI and HBA) to create a forum where industry leaders can share their experiences concerning innovative housing forms, urban designs, development contexts, and housing forms with other industry members. Finally, the City could consider linking the Smart Growth manual/checklist (which is currently being

developed by planning staff to articulate City objectives with respect to the design of new development) to an incentive system that would help counteract the financial risk developers run in experimenting with new models. Incentives might include a reduction in infrastructure levies, expedited approvals, waivers of planning and building permit costs, density bonus, and so on.

- *Meet Administrative Challenges*

Where facilitating more land efficient patterns of development is concerned, there is likely to be opposition from within the City's administration. The engineering department is liable to resist new engineering standards, such as single-trenched deep utilities, shallow utilities under the sidewalk and the replacement of storm sewer systems with in-site storm water management, on the grounds that such features take longer to approve and more expensive to maintain. The roads department may oppose narrower streets on the grounds that they are more difficult to manage in the winter. Emergency services are likely to object to the same on the grounds that narrower roads impede the movement of emergency vehicles. Traffic engineers, who often prioritize the need for efficient automobile movement over other forms of transportation, may oppose switching to a congestion management approach to transportation planning. They might also reject the use of an alternative model for making transportation impact assessments, such as URBEMIS.

The institutional tendency to oppose change can be addressed in part through improved staff training and research on successful implementation of innovative standards, housing forms, and planning processes from abroad and by building on the successes that the City has had in making past innovations (e.g., by turning exceptions into models). However, overall coordination among various departments on planning and management issues may require significant administrative changes, in short a new management model that improves cross-department communication, places responsibility and authority for decisions in the hands of specific individuals and rewards rapid decision making. The City Manager's Office should take the lead on reforming administrative structures to minimize turf protection and competition between business units to ensure that growth management, development policies and planning decisions apply an integrated city-wide perspective.

- *Advocate Changes to Provincial Legislation*

The policy measures proposed in this report call for changes to provincial legislation in several instances. The City should partner with other municipalities, municipal association, and public-interest groups who are advocating for more provincial leadership on housing affordability to advocate for legislative changes.

The most pressing issue is the Municipal Governance Act (MGA). Amendments that are suggested as part of the proposed policy measures in this report include giving clear direction allowing the City to: regulate on the basis of housing tenure and to restrict the conversion of private rental housing; use development levies to fund housing affordability measures; require developers to replace lost rental units; deny permission to

demolish a building containing primary rental units; require affordable units as a condition of redesignation; require developers to include a minimum number of affordable units in a project as a condition for redesignation; use density bonusing to promote affordable housing (market and non-market); and to set up a loan reserve fund to provide developers of certain housing types with discounted loans. Many of these issues could be addressed simply by identifying housing affordability as a planning objective in the act. Another item that is often put forward by affordability advocates is to amend the MGA to allow municipalities to use municipal and surplus school reserve lands for affordable and appropriate housing initiatives.

Reforms to the Alberta Building Code are also needed. Proposed changes to the code include: reducing or abolishing width requirements for streets to allow for more land-efficient engineering standards; making provisions for laneway housing, in terms of their structure and location with respect to serviced streets and street fronting homes, and; include a broader definition of secondary suites that includes forms other than basement apartments (e.g., carriage homes, garden suites). The code should also be reviewed more generally to identify requirements that add unnecessarily to housing costs. It is also suggested that the Condominium Properties Act be amended to enable the city to control rental-to-condo conversions. This would allow the City to tie conversion permits to vacancy rates.

Of course, changes to provincial legislation are unlikely to be achieved overnight. Moreover, if the desired changes *are* achieved, the province may use the occasion to transfer more responsibility for non-market housing to municipalities. Thus, the City should be cautious as how its demands for more planning and regulatory authority over market-related housing are phrased.

- *Advocate for Effective Regional Planning*

As part of the integrated transportation and mobility plan, the Plan It Calgary initiative is coordinating with the Calgary Regional Partnership (CRP). The CRP is an informal regional association between the City of Calgary and 18 other local governments in the Calgary area that seeks to address regional development issues through inter-municipal cooperation (Calgary Regional Partnership 2008). The Partnership addresses regional growth, environmental, transportation, and infrastructure issues. In 2007, CRP launched a regional land use planning initiative that is on a similar timeline to the Plan It Calgary project. Although it is still in the conceptual stage, the plan that is emerging appears to favour walkable town centres, transit connections, and a jobs/housing balance (CRP, undated).

The plan does not deal directly with housing affordability (or non-market housing), but it is expected to advocate more efficient development patterns to reduce infrastructure costs, a broader mix of units in logical locations, and transit access. There is no discussion so far of limiting growth outside the City of Calgary. This could threaten the City's ability to implement a Smart Growth agenda if constraints on suburban development result in leap-frog development beyond the municipality's borders.

The CRP is a voluntary partnership, and any plan it develops will have no legislative enforcement authority. As such, it is a pale successor to the regional planning commissions that once provided strong leadership in the Calgary region, which imposed binding planning decisions on member local governments to conserve agricultural land, protect environmental features, and preserve an urban-rural distinction by limiting development in the fringe areas outside the urban centre. All regional planning commissions, including Calgary's, were abolished by the province in 1995 (Tomalty 2005).

We recommend that the City lobby the province to re-introduce a regional planning authority that imposes binding restrictions on land use and development in the Calgary region. The regional governance structure that was developed for the Edmonton Capital Region may serve as a model for Calgary in this regard. There, the province created the Capital Region Integrated Growth Management Board composed of mayors and reeves from the 25 municipalities in the Capital Region. The board's main priorities are creating a 20-50 year long-range plan on regional land use and infrastructure such as roads and transit; and determining the quantity and location of affordable housing; water planning and waste management, policing, emergency services, social services, recreation and economic development.

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Appendix A: Statistical Backgrounder

Brief Introduction to Time Series Econometrics

Housing prices can be seen as an economic time series, which is defined as a collection of data obtained by observing a response variable at periodic points in time. A time series can exhibit a secular trend, which is an increase or decrease over a long period of time. The cyclical fluctuations of the secular trend often result from the cyclical behaviour of markets that correlate with the underlying time series. There can also be seasonal trends, which depict seasonal variations. In the context of housing markets, an example of a seasonal variation would be the slower construction activity that results from extreme winter conditions.

Time series econometrics became popular with the seminal work of Box and Jenkins (1970). They proposed a new forecasting approach that relies solely on the past behaviour of the dependant variable. The traditional econometric approach was to use explanatory variables to forecast a time series. A common ground was reached between the two approaches by using Box and Jenkins approach for estimation with the inclusion of covariates.

If the value of a time series is correlated in time, i.e., values at t are correlated with values at $(t-1)$, this violates the basic assumptions of the Ordinary Least Squares (OLS) model. OLS tools that test the validity and robustness of the models could no longer be used.

Even in the presence of correlated residuals, the estimates of β_x are unbiased. However, OLS models in such cases will return smaller standard errors and inflated t-statistics. It is recommended to check for the presence of autocorrelation in a time series. The **Durbin-Watson** (DW) test is most commonly used to test if residuals are correlated. DW is expressed as follows:

$$d = \frac{\sum_{t=2}^n (\varepsilon_t - \varepsilon_{t-1})^2}{\sum_{t=2}^n \varepsilon_t^2}$$

The DW statistic tests the null hypothesis, H_0 : No residual correlation against the alternative, H_a : Positive residual correlation. The above equation reveals that the DW statistic could only capture the first-order serial correlations. The following are the critical values for the DW statistic:

Uncorrelated residuals	$d = 2$
Positive correlation	$0 < d < 2$
Negative correlation	$2 < d < 4$

Discussion on cyclical behaviour of time series requires a brief discussion on **stationarity**. "A stationary time series model for regression residuals is one that has mean 0, constant variance, and autocorrelations that depend only on the distance between time points" (Mendenhall and Sincich, 1996). Such time series can best be modelled using **autoregressive models**(AR). The advantage of using autoregressive techniques is that they improve the overall fit of the model and by reducing the mean square error. The estimated coefficients return almost the same value by both OLS and AR techniques. However, the AR model returns higher standard errors for estimators, thus returning lower t-values. Use of OLS to model a time-series with autocorrelation will result in the inclusion of insignificant variables, since such variables will return inflated t-statistics.

Apart from the long-term trends and seasonality in the time series, data are also impacted by business or seasonal cycles. It has been argued that, theoretically, a time series realization begins in the infinite past and continues into the infinite future. To forecast a time series, the minimum requirements are that the mean and the covariance structure (the covariance between the current and past values) should be stable over time and finite. Such data are referred to as **covariance stationary**.

For a covariance stationary time series, the autocovariances should depend upon displacement, τ , and not 't'. This implies that the auto-covariance function (presented later in the descriptive analysis) does not change over time, yet it changes only with displacement. In addition, the autocovariance function is symmetric, i.e., the direction of displacement (forward or backward) does not influence the autocovariance function ($\gamma(\tau) = \gamma(-\tau)$). Violations of covariance stationarity are trends and seasonality, i.e., the mean increases with time or attains different values in different seasons. Often it has been observed that if the series violates covariance stationarity in levels, the same series in growth rates is stable. In other words, if y_t is not stable, $y_{\Delta} = y_t - y_{t-1}$ often ends up being stable.

The covariance stationarity assumption is tested using the **autocorrelation function (ACF)**. We prefer ACF to the autocovariance function because ACF is normalized by the standard deviations of the underlying variables and its value falls in the interval [-1, 1]. A plot of ACF against displacements is called a **correlogram**.

The **partial autocorrelation function (PCF)** is in fact the coefficient on $y_{t-\tau}$ in a population linear regression of y_t on $y_{t-\tau}$. The underlying assumption in the population linear regression is that the regression coefficients are estimated using an infinite sample of data. The PCF or $p(\tau)$ is primarily an autoregression model. Similarly, the sample PCF is computed from the sample rather than the population. While the ACF captures the simple correlation between y_t and $y_{t-\tau}$, the PCF measures the association (partial correlation) between y_t and $y_{t-\tau}$ after controlling for $y_{t-1}, \dots, y_{t-\tau+1}$. We plot ACF and PCF with displacements at the x-axis. The Bartlett bands (two times standard error (

$\frac{2}{\sqrt{T}}$)) are also shown on the plots. Bartlett (1946), quoted in Gujarati (1995, p. 717), has established that for purely random processes, ρ_τ are approximately normally distributed with zero mean and variance $1/T$, where T is the sample size. For a standard normal distribution, a 95% confidence interval for the autocorrelation function is given by $\pm 1.96 \frac{1}{\sqrt{T}}$.

If the correlogram of a series does not dampen gradually, the series may be non-stationary. Diebold (2001, p.121) argues that all covariance stationary processes have the autocorrelation and partial autocorrelation functions approach zero at large displacements. Kennedy (1996, p.260-61) offers some advice on diagnostics. If $\rho(1)$ is significantly different from zero, while autocorrelations at higher lags are not significantly different from zero, this indicates a **moving average** MA(1) process. Similarly if $\rho(1)$ and $\rho(2)$ are significantly different from zero, while autocorrelations at higher lags are not significantly different from zero, this suggests a MA(2) process. If the ACF declines geometrically, it suggests an AR(1) process, although it could also be an AR(2) process. If the ACF declines geometrically, but reverses sign at each displacement, it suggests an AR(1) process with a negative coefficient. If $\rho(1)$ is significantly different from zero, but does not display a geometrically declining pattern, it might suggest an **autoregressive moving average** ARMA(1,1) process. A significant $\rho(\tau)$ at every 12th displacement suggests seasonality. A controversial measure of lags for the correlogram is suggested to be 1/3 of the sample size (Gujarati (1995), p. 716). When ρ_τ coefficients fall outside of the Bartlett bands, we conclude that ρ_τ are significantly different from 0.

It is important to introduce at this stage the concept of **white noise**. A process with mean 0, constant variance, and no serial correlation is called white noise. If y is the observed time series, we assume that $y_t = \varepsilon_t$, then

$$\varepsilon_t \sim (0, \sigma^2)$$

The shock ε_t is uncorrelated over time. It could also be expressed as $\varepsilon_t \sim \text{WN}(0, \sigma^2)$ and hence $y_t \sim \text{WN}(0, \sigma^2)$. If y_t is serially independent, then y_t is independent white noise. Hence $y_t \sim_{iid} \text{WN}(0, \sigma^2)$, which implies that that y is independently and identically distributed with 0 mean and constant variance. If y is normally distributed and serially uncorrelated, then y is Normal white noise or Gaussian white noise. The ACF of white noise is constant at $\tau = 0$, and 0 at $\tau \geq 1$. The PCF for white noise is 1 at $\tau = 0$, and 0 at $\tau \geq 1$. It should be noted that when we refer to 0 mean, we in fact are referring to

deviations from a series mean, i.e., $y_t - \mu$ and not just y_t . It is argued that one step ahead forecast errors should be white noise.

Moving Average and Autoregressive Models

When the “current value of an observed series is expressed as a function of current and lagged shocks” the model is called a moving-average model (MA). For MA models, we model the time series “directly as distributed lags of current and past shocks.” (Diebold, 2001, p. 144). The first-order moving average or MA(1) model is expressed as follows:

$$y_t = \varepsilon_t + \theta \varepsilon_{t-1}$$

where $\varepsilon_t \sim \text{WN}(0, \sigma^2)$.

A moving average model of q th order is presented below:

$$y_t = \varepsilon_t + \left(\sum_{i=1}^q \theta_i \varepsilon_{t-i} \right)$$

The ACF for MA(1) is the autocovariance function scaled by variance. The ACF ($\rho(\tau)$)

$= \frac{\gamma(\tau)}{\gamma(0)}$ for $\tau = 1$ is equal to $\frac{\theta}{1 + \theta^2}$ and 0 for $\tau > 1$. This implies that there is a sudden cut-off at $\tau > 1$ for the ACF of a MA(1) process. Similarly, autocorrelations of a MA(q) process are 0 beyond displacement q . If the absolute value of $\theta < 1$, the MA (1) process is called **invertible**. This implies that the current value of the series could be expressed in terms of a current shock and a lagged value of the series. Such a process is referred to as the **autoregressive representation**. A good starting point therefore is the MA model, which could offer insights for future modelling directions. In other words, if $|\theta| < 1$, we know that the series could be expressed as an AR representation. Diebold (2001, p. 147) describes the difference between MA and AR processes as "an autoregressive representation has a current shock and lagged observed values of the series on the right, whereas a moving average representation has a current shock and lagged unobserved shocks on the right." The AR processes, on the other hand, are always reversible. The finite order MA(q) process is similar to MA(1) process in the sense it is covariance stationary for any value of its parameters. The MA(q) process is invertible if the inverses of all the roots are within the unit circle.

The AR model thus represents the current value of a series as "linearly related to its past values, plus an additional stochastic shock." (Diebold, 2001, p. 152) The following equation should represent the AR model of the first order.

$$y_t = \phi y_{t-1} + \varepsilon_t$$

Where $\varepsilon_t \sim \text{WN}(0, \sigma^2)$.

If $|\theta| > 1$, the coefficients in the AR representation alternate in signs.

A finite order moving-average process is always covariance stationary. However, an AR(1) process is covariance stationary if $|\phi| < 1$. In addition, for a true AR(1) process, the PCF is 0 for a displacement greater than 1. The ACF for an AR(1) process may not dampen to 0, but it should display a "damped monotonic display" when $\phi > 0$. The AR process of p^{th} order is represented as follows:

$$y_t = \left(\sum_{i=1}^p \phi_i y_{t-i} \right) + \varepsilon_t$$

where $\varepsilon_t \sim \text{WN}(0, \sigma^2)$.

For an AR(2) process, the absolute value of ϕ_2 should be less than 1. The ACF of an AR(p) process also decays gradually with displacement.

The ACF and PCF of ARMA processes do not cutoff at any particular displacement. These functions instead dampen gradually. An ARMA model with independent variables is called ARMAX model.

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