

Finding the “Generationed City”

The Form and Structure of Young Adult Settlement
Patterns

by

Robert Walter-Joseph

A thesis
presented to the University of Waterloo
in fulfillment of the
thesis requirement for the degree of
Master of Arts
in
Planning

Waterloo, Ontario, Canada, 2015

© Robert Walter-Joseph 2015

Author's Declaration

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

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

Abstract

This thesis examines the present patterns in the residential geographies of young adults in major cities in Canada and the United States. It explains how the differences and similarities in young adult residential patterns across metropolitan regions are shaped by the wider context of post-Fordist economic restructuring, urban planning, and the neoliberal remaking of the city. Research has shown that since the early 1980s, the young adult population has been centralizing. The sharpened division of space by demographic variables has been understood as a result of an amalgam of post-Fordist neoliberal restructuring (gentrification, “condofication” and revalorization) and unique generational dimensions such as increased educational requirements for employment and delays in marriage and child rearing among millennials. Considering 57 major metropolitan regions in Canada and the United States, this study examines the form and structure of young adult settlement (persons 25-34) through geographic information systems and spatial analytical methods. The degrees of centrality, concentration and form of the distributions of young adult residence are used to describe structure. The study identifies the predominance of downtown settlement in young adult residential patterns. The results point to a dominant pattern of centrality and poly-centricity in young adult settlement. Where regional spatial distributions exhibit strong concentrations in centralized neighbourhoods, there also exist meaningful concentrations in suburban centres. In some cities, decentralized patterns are also identified. The geography of young adult settlement is strongly associated with mixed uses, dense housing forms and accessibility through public transit. Through neoliberal forms of reinvestment and development, this blend of features is most often available downtown. “Youthification”, the process driving the centralization of young adult living, is seen in the ability for the current young adult cohort to trade residential space to maintain an affordable cost of living. The space produced in the redeveloped city is divided and consumed at a constant total cost by the young adult cohort while older populations with larger household sizes are displaced. In finding the generationed city, this study finds a built form that reflects a moment in time, built from a specific economic context for a very specific market. As millennials age, research suggests that generational requirements for residence will change greatly. It is the challenge of planners, politicians and policy makers to adopt strategies to address this form of neighbourhood change. Planners must adapt the built form throughout entire city regions to accommodate the unique demands of many generations.

Acknowledgements

I would like to thank my supervisor Markus Moos for his guidance and encouragement throughout my time at Waterloo - from my undergraduate thesis to now completing this document. Thanks to his advice and the time he provided for discussion, I have learned so much about my chosen field.

I would also like to thank Pierre Filion who along with Markus was available to discuss my research.

I am very fortunate to have friends who continually provided many words of encouragement that saw me through months of research and who provided respite during my months of writing.

A special thank you to Jacqueline and to David for their care, support and understanding and for being entirely there for me whenever I called on them. You both have been a great cheering squad and excellent base coaches, reminding me to maintain balance during my writing.

I am particularly grateful for the support of my family - for my mother who, over the course of my life, has continually reminded me of the importance of a good education. I am grateful for her patience, our weekly phone calls, and our Thanksgiving and Christmas meals at home.

I owe a heart-felt thank you to everyone who has carried me this far; your support has meant more than I know how to express.

Table of Contents

AUTHOR'S DECLARATION	ii
ABSTRACT	iii
ACKNOWLEDGEMENTS	iv
LIST OF FIGURES	vi
LIST OF TABLES	vii
1 INTRODUCTION	1
1.1 Research Question	5
2 LITERATURE REVIEW	7
2.1 History of North American Central Areas: The Rise of the Neoliberal City	7
2.2 Urban Ecological Processes	13
2.3 Socio-Spatial Polarization	16
2.4 Trends in the Age Composition of Canadian and US Cities	22
2.5 The Residential Ecology of Young Adults	26
3 METHODS	30
3.1 Study Area	31
3.2 The City Centre	32
3.3 Defining Age	36
3.4 Observing Residential Settlement	38
3.5 Functional Form Analysis	41
3.6 Classification of Metropolitan Young Adult Settlement Patterns	42
4 CASE STUDY CITIES	51
5 FINDINGS AND ANALYSIS	63

5.1	Linear Models	65
5.2	Logarithmic Models	67
5.3	Quadratic Models	69
5.4	Cubic Models	72
5.5	Age-Distance Distributions By Metro-Region Classified By Functional Form	76
5.6	Classifying Young Adult Settlement	77
6	DISCUSSION	99
6.1	Producing and Reproducing the Generationed City	99
6.2	Trends in Centrality: Patterns of Investment	103
7	CONCLUSION	108
7.1	Limitations	111
7.2	Further Research	112
7.3	Planning Relevance	113
8	REFERENCES	117
	APPENDIX A: Model Results from Functional Form Analysis	124
	APPENDIX B: Spatial Organization of Young Adults in Major Metropolitan Regions in Canada and the United States	133

List of Figures

Figure 2 - Change in average individual income, City of Toronto, relative to the Toronto CMA, 1970-2005: Average individual income from all sources, 15 years and over, census tracts (Hulchanski, 2010)	19
Figure 3 - Summary conceptualization of the Third Age divisions of the life course (Townshend, 1997)	24
Figure 4 - Classification Procedure for Age-Distance Distributions by Metro Region	45
Figure 5 - Classification Hierarchy for Age-Distance Distributions by Metro Region	46
Figure 6 - Example Centralized Polycentric Age-Distance Distribution. Darker colours represent higher location quotients.	48
Figure 7 - Example Centralized Standard Age-Distance Distribution. Darker values represent higher location quotients.	48
Figure 8 - Example Decentralized Polycentric Age-Distance Distribution. Darker values represent higher location quotients.	49

Figure 9 - Example decentralized Standard Age-Distance Distribution. Darker values represent higher location quotients.	49
Figure 10 - Example High Concentration Age-Distance Distribution. Darker values represent higher location quotients.	50
Figure 11 - Example Low Concentration Age-Distance Distribution. Darker values represent higher location quotients.	50
Figure 13 - Results: Classification of Age-Distance Distributions of Young Adult Settlement by Metro Region	64
Figure 14 - Results: Metro Regions Classified By Patterns Of Young Adult Settlement	77
Figure 15 - Young Adult Settlement in Boston-Cambridge-Quincy MSA Mapped By Location Quotient, 2010 US Census Data.	80
Figure 16 - Young Adult Settlement in Toronto CMA Mapped By Location Quotient, 2011 Canadian Census Data.	81
Figure 17 - The Dividing Line: looking west from University Avenue along Queen Street. To the south is a centre of intense young adult settlement extending well into the distance. High-rise development is concentrated within this southern district.	83
Figure 18 - Row houses and low-rise apartments on a side street north of Queen Street (view of Brock Avenue from Middleton Street).	84
Figure 19 - Young Adult Settlement in Cleveland-Elyria-Mentor MSA Mapped By Location Quotient, 2010 US Census Data.	86
Figure 20 - Young Adult Settlement in Houston-Sugar Land-Baytown MSA Mapped By Location Quotient, 2010 US Census Data.	87
Figure 21 - Impromptu Fire Dancing, Kensington Market, Toronto	88
Figure 28 - Direction of Money Transfers in Metropolitan Detroit (Bunge, 2011)	105

List of Tables

Table 1 - Study Cities, total population, population of young adults	57
Table 2 - 5 Number Summary: Distance-LQ Young Adults Linear Regression Coefficient	65
Table 3 - Metro Region Linear Regression Coefficients Sorted By Quartile (Distance-LQ Young Adults), Reporting R ² Value	66
Table 4 - 5 Number Summary: Distance-LQ Young Adults Logarithmic Regression Coefficient	68
Table 5 - Metro Region Logarithmic Regression Coefficients Sorted By Quartile (Distance-LQ Young Adults), Reporting R ² Value	68
Table 6 - 5 Number Summary: Distance-LQ Young Adults Quadratic Regression First-Order Coefficient	70
Table 7 - Metro Region Quadratic Regression First-Order Coefficients Sorted By Quartile (Distance-LQ Young Adults), Reporting R ² Value	70
Table 8 - 5 Number Summary: Distance-LQ Young Adults Quadratic Regression Second-Order Coefficient	71
Table 9 - Metro Region Quadratic Regression Second-Order Coefficients Sorted By Quartile (Distance-LQ Young Adults), Reporting R ² Value	71
Table 10 - 5 Number Summary: Distance-LQ Young Adults Cubic Regression First-Order Coefficient	73
Table 11 - Metro Region Cubic Regression First-Order Coefficients Sorted By Quartile (Distance-LQ Young Adults), Reporting R ² Value	73
Table 12 - 5 Number Summary: Distance-LQ Young Adults Cubic Regression Second-Order Coefficient	73
Table 13 - Metro Region Cubic Regression Second-Order Coefficients Sorted By Quartile (Distance-LQ Young Adults), Reporting R ² Value	74
Table 14 - 5 Number Summary: Distance-LQ Young Adults Cubic Regression Third-Order Coefficient	74

Table 15 – Metro Region Cubic Regression Third-Order Coefficients Sorted By Quartile (Distance-LQ Young Adults), Reporting R² Value	74
Table 16 – Age-Distance Distributions By Metro-Region Classified By Functional Form	76

1 Introduction

Young adults, here defined as persons 25-35, live centrally. This is something that is generally understood in popular culture. Television shows like 'Girls' tell the story of university educated 20-somethings struggling to make a life for themselves in New York. The film 'The F-Word' tells of a 20-something medical school dropout working a miserable job in Toronto. 'Portlandia', another television show, proclaims that the city is "where young people go to retire". Television has long had a habit of capturing the zeitgeist of generations, but what in fact is it that distinguishes this current young adult cohort from those past? How do these distinguishing factors contribute to the housing decisions made by this cohort? Work has been done exploring how contemporary circumstances contribute to the shifting experiences of generational cohorts creating generally coherent characteristics across a generation (see Ryder, 1965; Townshend, 1997; Moos, 2012). This thesis is motivated by Moos' (2012; 2014) work on the geography of young adults in Montreal and Vancouver, and extends his theory and empirical work explaining the link between societal change and the notion of a "generationed city" to a larger number of metropolitan areas.

Young adult settlement tends to occur in distinct patterns between metro regions. In metropolitan regions across North America, this study ultimately finds patterns similar to those found by Moos in Montreal and Vancouver. Young adults are living centrally. In some metro regions they also cluster outside of central areas in distinct patterns.

Moos identifies key characteristics of the young adult cohort that were consistent between cities: declining incomes over time, increases in housing density, small household sizes and high rates of rental tenure. Moos identified key differences in young adult settlement patterns between the cities of Montreal and Vancouver. In terms of young adult settlement, Montreal's urban core area is identified by Moos as the predominant node, owing primarily to income-based decisions and the availability of affordable built forms. Housing form and cost were found to remain a key consideration in Vancouver. However the supply of multiple-dwelling condo buildings extending along a high-density corridor (following the Sky Train route) together with the greater dispersion of employment nodes in Vancouver has led to a comparatively decentralized pattern of young adult settlement in Vancouver. This study extends these findings, attempting to characterize various patterns of young adult settlement by degrees of nodality, concentration and centralization. The patterns identified by these characteristics are created by differences in built form and spatial organization across metro regions. The interaction of global forces and localisation effects are found in this study to be a key determinate of generational residential patterns.

The end of the 1980s marked the emergence of a new world order brought on by the economic and political upheaval of the previous decade. The political regime that had provided structure in global politics following the Second World War had ended (Lebow et al., 1995). That regime, which had been the foundation for unprecedented economic and demographic growth over the same period, lay in disarray and was quickly being disassembled in many parts of the western world.

By the start of the 1990s, currents of change had been gathering force for nearly two decades. Wages had stagnated while productivity continued to rise. Industrial employment diminished and the fortunes of the middle class were bifurcating. Western governments actively disassembled the Fordist-Keynsian regime responsible for the post-war economic miracle (Hackworth, 2007). International trade competition undercut domestic industry and technology led to the fragmentation and globalization of those industries. The new neoliberal regime—characterized by decreased government spending on social support and an entrepreneurial orientation of local governments aimed at stretching tax revenues and attracting development—would lead to changes in the economic organization of cities and changes in patterns of urban development (Hackworth, 2007).

In fact, a vast body of research notes the changes to urban form resulting from this evolution of economic-government organization (See Smith, 1979; Florida and Jonas, 1991; Wyly, 1999; Walks, 2001; Skaburskis and Moos, 2008). Researchers describe the remaking of the city through processes of revalorization, gentrification and new patterns of disinvestment (Hackworth, 2005; Hackworth, 2007; Skaburskis and Moos, 2008).

While the city is remade, society also changes, subject to the same external forces. Generational changes led to the gradual reorganization of the life-course, generally delaying a shift from young adulthood to adult independence (Townshend, 1997). The emerging generation exists within an unprecedented economic context, facing occupational polarization, expanded education requirements and less secure

employment arrangements (contract, part-time and temporary work). Income structures now differ from a generation ago (Moos, 2013). Studies have observed key generational shifts: household sizes are shrinking and housing consumption is delayed in the life-course. Townshend (1997) observes the extension of the young adult lifecycle stage as years of education are extended and marriage, employment and housing arrangements are delayed.

Challenges to the young adult cohort have mounted as housing affordability and income polarization grew. Drawing on Vancouver and Montreal as case studies, Moos (2012) identifies changing patterns in the residential settlement of young adults. Moos observes young adults involved in the resettling of the city, now settling in dense, concentrated patterns, more often drawn through a preference to maximize what Wyly (1999) describes as the “use value” of neighbourhoods over investment maximizing residential decisions. Household sizes have diminished over a generation and settlement has concentrated, sometimes attracted to amenity rich inner cities, sometimes towards dense transit corridors even outside of the central city (Moos, 2014).

Following Moos (2012, 2013, 2014), this study extends the knowledge of the residential geography of young adults. This study describes patterns of young adult residential settlement in all major cities in the United States and Canada. Adding knowledge of regional and city-by-city variations across 57 metropolitan areas, this study will contribute to an understanding of young adult settlement in the post-Fordist, neoliberal context, in full light of local variations and complexities. The aim

is to begin to understand patterns according to regional, economic and urban development variations. Other research has revealed variations in urban reinvestment and disinvestment patterns (Hackwoth, 2007). Complex geographies of housing boom and bust have emerged in key American cities. Unprecedented valuations in property markets like Vancouver and Manhattan, no doubt have originated their own patterns of spatial organization. The modes of urban development in different cities will shape the geography of young adults in unique ways, although we do also expect some general trends since urban development is not “random” (Hackworth, 2005).

1.1 Research Question

This study answers the following questions:

- 1. What are the present patterns in the residential geographies of young adults in major cities in Canada and the United States? Do they conform to or deviate from previous findings in Moos' study?*
- 2. How are the differences and similarities across major cities in young adult residential patterns shaped by the wider context of post-Fordist economic restructuring, urban planning, and the neoliberal remaking of the city?*

This study will build an understanding of the impact of societal forces that have contributed to sharper divisions in values, beliefs and norms that define the young adult cohort. This will allow for an understanding of the conditions leading to the specific arrangement of space by age (see Moos, forthcoming). The research

questions are addressed using a combination of GIS and statistical analysis of different functional forms describing young adult geography.

Findings are expected to help build new understanding about the link between societal changes and residential geographies.

This thesis begins with a literature review exploring methods of analysis and contemporary changes to cities as well as generational developments impacting the young adult cohort. The methods chapter presents the methods employed in this study. *Case Study Cities* explores the unique conditions of metropolitan areas selected as a part of this study. Results are presented and reviewed in the Findings and Analysis chapter. A comparison to Moos' findings is also presented in the chapter. The Discussion chapter explores the findings within the context of wider societal and economic change.

2 Literature Review

2.1 History of North American Central Areas: The Rise of the Neoliberal City

Entering World War II, North American cities were in the midst of the turmoil of the Great Depression, a period of acute and widespread economic stagnation. Following the war there emerged a 'spatial fix' involving coordinated government action, leading to widespread suburbanization and the growth of consumer industries. Cities grew outwards, opening space for suburbanization and significant capital investment, directing growth to the periphery of cities. This transformation was widespread involving rapid economic, demographic and technological growth leading to employment in new industries, the rise of the baby boomer population, increased household consumption and accelerating patterns of housing development. This spatial fix is the result of capital and policy decisions but economics and demographics also had a hand to play. Rising wages allowed families to relocate to new developments, greatly influencing individual preference for suburban forms. Suburbanization is observable as a near ubiquitous trend in North American cities, occurring both in Canadian and US cities.

The economic expansion was due in some part to the Fordist-Keynsian organization of society in Canada and the US in which production gains were realized by the subdividing of tasks along the assembly line and the government supported economic expansion through favourable policy conditions and key investment in industry and urban infrastructure (Florida and Jonas, 1991).

The post-war spatial fix would greatly impact the central city. Investment in the spatial expansion of the city beginning in the post-war period would begin to move employment, investment and population away from the central city and eventually contribute to capital depreciation in the inner city (Smith, 1979). This period of disinvestment was largely a US phenomenon, as Canadian central areas were sustained by private home improvement and renovation brought on by new immigrants arriving after the Second World War (Bunting and Filion, 2010). The history of the decline of US central areas was one of interrelated economic, political and social processes involving property depreciation, blockbusting, redlining and social-economic phenomena such as the 'white flight' which initially resulted from racial tensions and would be sustained by worsening fiscal disparity between suburban and inner city areas (Smith, 1979; Frey, 1977; Florida and Jonas, 1991).

Central areas were now also competing against attempts to ease the movement of commuters in and out of the CBD. The quality of life in central areas declined with new expressway construction. This occurred in both the United States and Canada (Newman, 2004; Bunting and Filion, 2010).

Challenges to the Fordist-Keynsian system mounted. As production and population decentralized over the period, tax revenue waned for local governments attempting to support vulnerable inner-city populations and new investment in transportation infrastructure for decentralized populations. In the United States, to bolster tax-bases, urban renewal projects were undertaken, consisting of slum clearance and commercial revitalization. Displaced populations were resettled in high-density

projects, reflecting the high cost of land assembly in central areas (Florida and Jonas, 1991). Canadian cities also experienced urban renewal and public housing projects, however, the blight associated with US central areas was not as pervasive in Canada (Bunting and Filion, 2010). In Canada, as in the US, government led major private-sector investment in commercial development in inner city areas. With the decentralization of industrial uses, inner areas were reoriented towards consumption, cultural and residential use (Bain, 2010).

The Fordist-Keynsian system had its limits and productivity growth began to retract entering the 1970s. Further, economic realities were also changing. Cyclical volatility and declining wages reduced demand for consumer goods and increased the share of household income devoted to housing costs (Florida and Jonas, 1991). A series of economic shocks in the mid-1970s and 1980s and the liberalization of international trade placed further pressure on the Fordist-Keynsian system. The city faced an accumulation crisis that would again require a spatial fix.

Rising government indebtedness and the continued challenges to the Fordist system brought on by declining productivity at home and increased trade competition from abroad, cast the continuity of the Fordist-Keynsian system into doubt. This eventually would lead to its collapse. The rise of the neoliberal city in its place marked a reduction in government involvement in the economy as well as a reduction in redistributive policy and social programs (Bunting and Filion, 2010).

The rise of the neoliberal city also coincided with the accelerated decline in industrial employment as industries fell victim to trade liberalization.

Deindustrialization led to expansion of the service sector. Neoliberalism coupled with deindustrialization would lead to the emergence of interesting new spatial regimes brought on by the new spatiality of intra-urban capital investment.

Neoliberalism, as it would apply to governing the city, is best described here by Hackworth (2007):

“Neoliberalism (...) is an ideological rejection of egalitarian liberalism in general and the Keynesian welfare state in particular, combined with a selective return to the classical liberalism, most strongly articulated by Hayek and Friedman.” (p. 9)

As a system, the neoliberal city would counter much of what had gone before. A retrenchment of market forces rather than a redistributive system of government-supported growth would dominate capital flows. The emergent form would be widespread across Canadian and US cities although with complex varieties of local variation.

In the neoliberal era, central areas were transformed yet again. To say there exists a neoliberal spatial fix partly obscures its complexity and variation, but there are identifiable spatial-economic patterns of the neoliberal period (Hackworth, 2005; Skaburskis and Moos, 2008). A key aspect of the neoliberal spatial fix in many cities has been reinvestment in the inner city and, to some extent disinvestment in the inner suburbs (Hackworth, 2007). Emerging from the economic shock and sustained disinvestment of the 1970s and 1980s gentrification began a process of inner city valuation and socio-economic displacement (Hackworth, 2007). Disinvestment in

central areas during the Fordist-Keynsian period had left an undervalued inner city. In many cities, lower-income groups began to be displaced by a well-educated 'new middle class' employed in the quaternary sector. These owner-occupiers would invest in their homes, rehabilitating neighbourhoods. Corporatized gentrifiers then entered the market, further accelerating the gentrification process. In the US, state involvement through new neoliberal mechanisms would further accelerate gentrification by reducing the requirement for replacement of demolished public housing (Hackworth, 2007). Further, entrepreneurial governance by local governments has seen more direct government involvement in the business of real estate.

This new population in central areas would influence political power and demand inner-city investments from government in support of its new affluent residents (Skaburskis and Moos, 2010). What is made clear in the gentrified core is the absence of the former Keynesian system of regulation and programs aimed at mitigating the inequality inherent in capitalism (Hackworth, 2007). A gentrified core has meant the dispersal of poverty and the further disenfranchisement of poor populations in the neoliberal system. Early waves of gentrification tended to create new districts where the change in the composition of population tended to look remarkably similar (Wyly and Hammel, 1998). In global cities, where high-order employment tends to concentrate in inner areas, an additional wave of gentrification has been observed further augmenting and concentrating the income and occupational composition; "financification" where these workers flood into already gentrified areas (Hackworth, 2007). Gentrification now diffuses outwards

from the reinvested core as pioneers and corporations seek new investment opportunities.

Hackworth (2007) acknowledges variation in the pattern of this new spatial fix. In several major American cities, the inner city continued its devalorization joined by the inner suburbs. Reinvestment would not arrive and inner area rentals would not increase relative to the outer zones in cities like Los Angeles, Detroit and Houston. In these cities valorization continued in newer suburban and exurban areas

Deindustrialization, immigration, gentrification and demographic change have led to the prominence of a particular socio-legal form developed in inner areas.

Condominium development, particularly high-rise and mid-rise condominium development has occurred in many North American cities. The condo as a form of tenure has been widely successful in leading high-density inner city development offering home ownership in the inner city to a new middle class. Young adults, who are professionally employed and who choose to delay child rearing are able to consume condominium housing, often preferring to enjoy neighbourhood and condo amenities than live in less concentrated amenity-poor areas (Rosen and Walks, 2013). This tendency is observed by Wyly (1999) as a preference to maximize the use value of neighbourhoods. Condominium developments are also generally more affordable as cost-considerations frequently factor high in the purchasing decision (Skaburskis, 1988).

The emerging era of economic restructuring would also see the return of a diversity of functions to the inner city. The post-war period had seen the concentration of

corporate offices in the CBD but by the neoliberal period, long departed were the Fordist forms of production (Hutton, 2008). Office development continues in the CBDs of global cities but has declined in regional centres. Central areas have emerged as office, retail, recreational, cultural and creative centres, home to the infrastructure, residents and producers of the new economy (Hutton, 2008; Hackworth, 2007).

2.2 Urban Ecological Processes

The idea of identifying and generalizing the causes and interrelationships of patterns of intra-urban spatial location originates with the ideas of the Chicago school. The ability to examine and describe incredibly complex spatial patterns should here be explained briefly. The attempts of the Chicago school to identify and explain spatial patterns should not be seen as attempts to mask complexity of the heterogeneity of forms but rather ways of explaining emergent complexity in a diversity of resultant forms of social and economic spatial organization (Hackworth, 2005). The study of local variation is important in understanding the interaction of processes (Skaburskis and Moos, 2008). A multitude of ecological processes are able to lead to the emergence of complex spatial forms.

Davies (1984) provides a synthesis of several ecological processes that appear in theoretical considerations of social variation. Here, some of the aspects of Davies' explanation of urban ecological processes that may lead to patterns of age separation are presented. Complex emergent spatial patterns can be understood as being the result of systems of interactions.

Land-use segregation is largely driven by the bid-rent mechanism. Subject to some constraints, land-use is determined by the greatest ability to pay. Higher return uses will always have the ability to pay for a more desirable location. Much of socio-economic stratification can be explained by the greater ability for higher-income groups to pay for more desirable locations. The intra-urban location of ethnic groups involves considering the role of involuntary (prejudice) and voluntary (sentimental association, defence avoidance, preservation, etc.) factors.

In North America, the basic pattern of location of families within urban areas is best described in concentric zones emanating outwards from a central point, most often, the CBD. This specific pattern emerges as a result of the locational decision made by individuals between access to space and accessibility to various parts of the city. High accessibility is often concurrent with high land values for central areas, thus diminished ability to pay for more units of space. Low accessibility (in outlying areas) is concurrent with the greater ability to purchase more units of space per unit of money. Families and individuals can make residential location decisions considering these factors.

Localized spatial geographies are complex. The real geography of cities affects theorized patterns where zones might be distorted along transportation surfaces or limited by topographic features. The age and suitability of the built environment also impacts residential suitability. The bid-rent mechanism is also able to reintroduce itself through gentrification processes. Further, numerous combinations of social groups interrupt theorized patterns. For instance the expected concentric

familial pattern may be interrupted by a large number of ethnic groups. Societal differentiation might also intervene leading to differences in observed patterns, for example the presence of a white flight in the United States in comparison to a different mix of ethnicity in Canada.

The location of the young adult age cohort is the result of the interaction of potentially numerous considerations. Patterns of residential settlement and urban form signal the underlying processes at work within and between cities (Hackworth, 2005). Bourne and Murdie (1972) use ecological methods – exploring the both of socio-economic and spatial patterns together – to identify a close interrelationship between social and physical space and offer a structural typology of neighbourhood types (Davies and Murdie, 1993). Walks (2001) identifies changing patterns in the settlement of the city and Hulchanski (2010) uses this signal to identify an underlying pattern of broad polarization linked to spatial patterns. Moos (2012; 2014) identifies long-run generational changes in the young adult cohort over a period of 30 years, specifically uncovering income, tenure, housing form, urban form and commuting considerations contributing to settlement patterns of young adults. Moos finds general tendencies towards centralizing patterns of settlement over time with commuting, tenure and housing form ordering housing decisions by distance from central areas.

Recent societal change has indeed exerted strong forces aimed at reorganizing the urban landscape. Underneath this change however there persists a landscape created in the Fordist-era of housing stock, of familial organization and

suburbanization. Further, many institutional constructs persist in varying degrees in cities. As put by Wyly (1999), the urban landscape is described by continuity and change.

Hackworth (2005; 2007) uses ecological methods to point to patterns suggestive of a neoliberal spatial fix. This link between economic, social and political processes and the spatial arrangement of cities is valuable in considering the differences in the residential ecology of young adult populations in cities in Canada and the United States. The belief here is that patterns identified within and between cities, hint at common forces governing the organization of cities. While a high degree of complexity is expected because of unique variation, patterns can be related to one another to identify significant underlying forces.

2.3 Socio-Spatial Polarization

Fordism marked spatial segmentation along economic, class and even racial lines but can generally be seen as providing transformational gains in income and socio-economic status to large segments of society (Florida and Jonas, 1991). The economic transition seen since, in the differences in the fortunes of workers in declining industrial sectors and those in the emerging quaternary sector (and those of the global economy), would eventually drive new stark divisions in the spatial organization of cities (Walks, 2001).

Deindustrialization would help to create a supply of surplus labour in North American cities. The collapse of the Fordist-Keynsian system would see the retreat of the welfare state, falling unionisation rates, the use of outsourcing and forms of

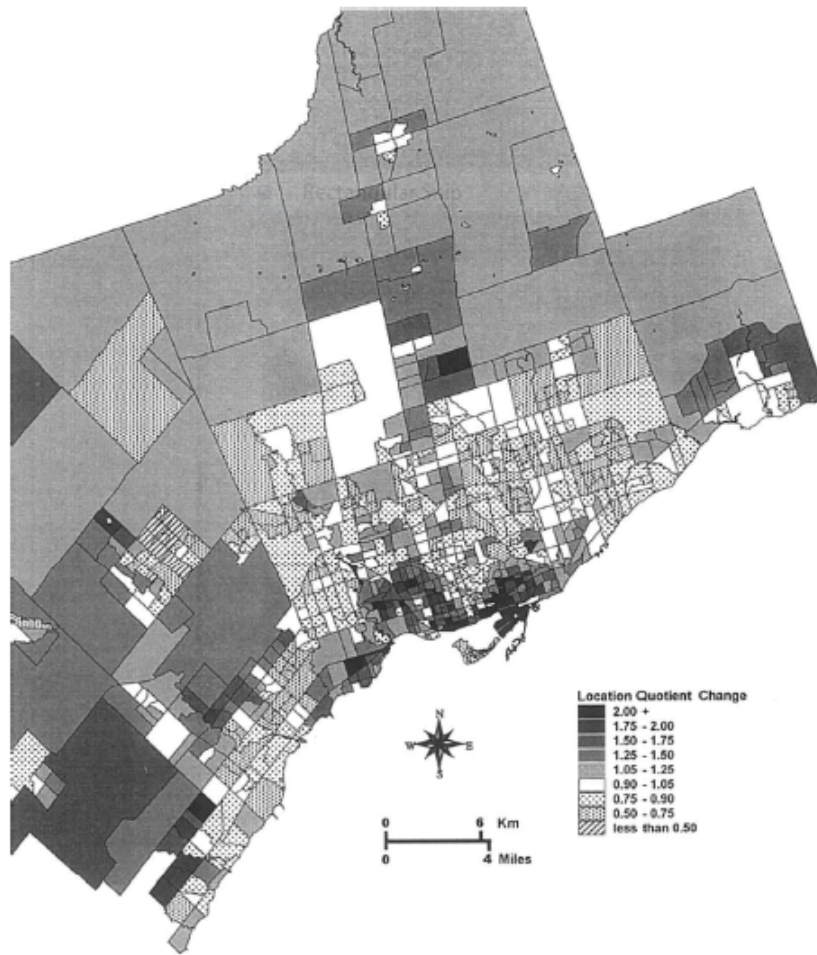
flexible labour (part-time and contract work) that would exert downward pressure on the wages of the previously affluent Fordist middle class (Walks, 2001).

Disinvestment in Fordist industry would be offset by investment in post-Fordist production, the rise of the service and quaternary sectors.

Global cities, those beneficiaries of neoliberal global business and financial flows, saw concentration in head office functions and FIRE (finance, insurance and real estate) functions. Particularly in those same cities, the labour supplied by failing industry and growing international immigration would be employed in low-wage, low-skill service sector occupations to serve the increased professional and global class (Walks, 2001). Growth in low-level services employment is particularly evident in the United States, while such growth has been more moderate in the Canadian context (Walks, 2001). Economic and occupational restructuring leads to a hollowing out of the middle of income structures, as the Fordist middle class declines in status while professional and elite occupations fare ever better. This occupational polarization provides the origin for the development of further social and spatial polarization.

The systemic process of gentrification and reinvestment in disinvested areas that characterized the neoliberal spatial fix can be seen within the same process of occupational polarization. With the decline in the fortunes of former blue-collar workers, the elites and the new professional middle-class became able to out-bid the working classes for space at all points across the city (Walks, 2001). The results of this process exhibit similar patterns to neoliberal spatial fix. The social landscape of

the city begins to be reordered by income, immigrant status and occupation over



time.

Figure 1 - Changes in location quotients for professional workers, 1971-91. (Walks, 2001)

Able to create inner city, suburban and exurban enclaves, elites and the new middle class transform patterns of spatial organization across the city. Walks (2001), describes this movement over time in Toronto (see Figure 1). As neighbourhoods gentrify, low-level service and manufacturing employees decentralise. These forms

are hypothesized to be particularly evident in global cities, where occupational polarization is expected to be stark.

In fact, as Hulchanski (2010) observes in the global city of Toronto, there have emerged the fortunes of three cities, spatially and experientially distinct. The first, a high-income group concentrated in the centre, has seen neighbourhood incomes rise at rates in excess of CMA averages. The second city, generally low income, has seen incomes fall further. These patterns are presented in Figure 2.

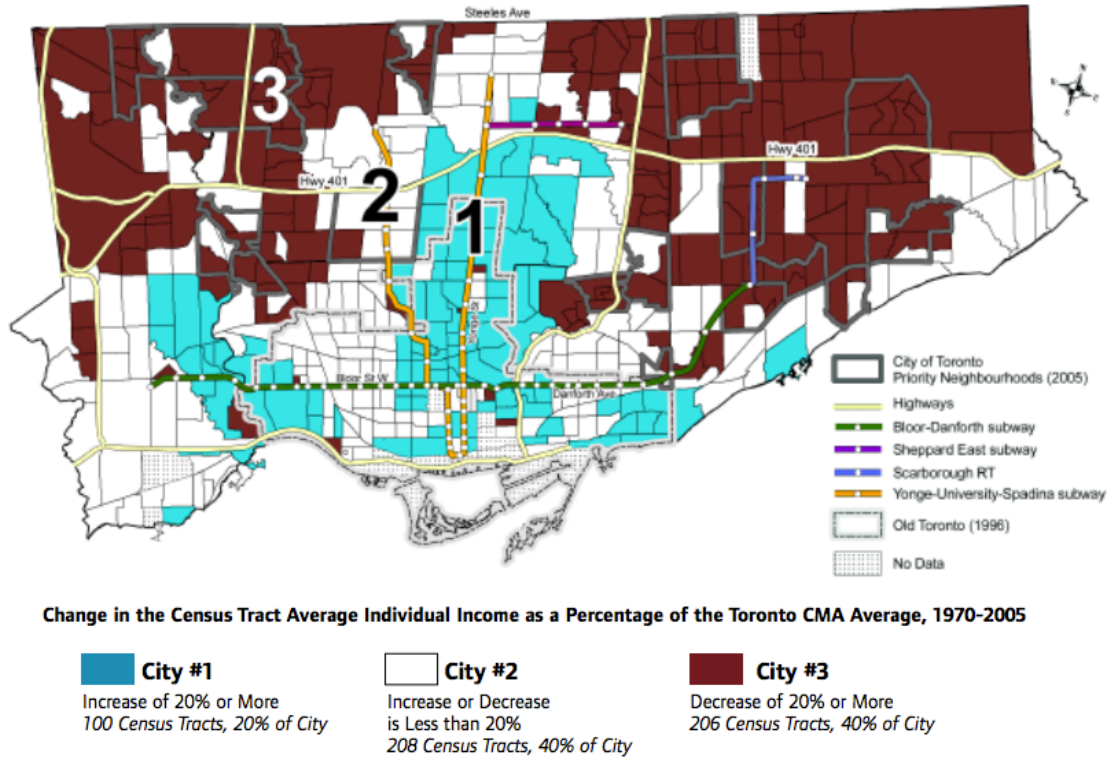


Figure 2 - Change in average individual income, City of Toronto, relative to the Toronto CMA, 1970-2005: Average individual income from all sources, 15 years and over, census tracts (Hulchanski, 2010)

Low-income patterns cluster at the north-eastern and north-western edges of the city of Toronto. The second city, where incomes have remained close to CMA

averages, has declined in extent. This middle has bifurcated, declining from 66% of all Toronto neighbourhoods in 1970 to 29% in 2005 while low income and high-income areas have grown in extent. This has meant a polarization in the spatial organization of income in the city. Hackworth (2007) describes similar patterns in his neoliberal spatial fix where the city becomes radically reorganized and split between patterns of revalorisation and devalorisation. The inner suburbs of the Toronto CMA do not simply exhibit the general devalorization described in the neoliberal spatial fix however but are transitional, showing both patterns of investment and disinvestment, income gains and income losses (Walks, 2001).

The trend towards occupational and income polarization is further reflected in immigrant settlement. The settlement of immigrants exhibits a trend towards polarization along similar lines. There is now an important distinction in the socio-economic class of immigrants. In Toronto, Walks (2010) observes lower-class immigrants settling in poorer tracts of the inner city and inner suburbs and higher-class immigrants preferring to locate in new suburbs and exurban regions. Moos (2012) notes this distinction. First after the arrival of migrants from Hong Kong following the 1997 return of the territory to Chinese rule, these immigrants arrived with established wealth and even after their arrival they continued to generate their income from sources largely outside of Canada. In contrast refugees, another sizable group of Canadian immigrants, arrive as the least affluent class, not often participating in the housing market as recent immigrants. This distinction appears again in contemplating the fortunes of young adults, the ability to participate in the post-Fordist, post-industrial economy emerges as a clear determinate of economic

success. It should here be noted that trends towards the higher cost of post-secondary education and the removal of government support or substitution of that support in favour of debt financing has erected an additional hurdle to young adults, indebting or excluding those without adequate parental support to carry such a burden.

Economic restructuring, neoliberal governance and the rise of the global city have exerted new forces of spatial organization upon cities. Successive waves of gentrification have resulted in the appearance of these social and economic patterns upon the structure of cities (see Hackworth and Smith, 2001). In many cases these patterns have arisen upon the already complex patterns that existed at the end of the Fordist-Keynsian era. A diversity and heterogeneity of forms are therefore expected in an analysis like this, consisting of a selection of major metropolitan regions across Canada and the United States. The forces of spatial polarization can be understood as inherent to the emerging neoliberal system and the internationalization of systems of production. The transition away from Fordist-industrial employment and Keynesian social support is understood as systemic (yet complex) and the challenges to labour are being felt across the developed world. In global cities the rise (in differing degrees) of professional and FIRE occupations certainly exists in stark contrast to the fortunes of others. Local governments, with reduced ability to assist through supportive programming and increased financial responsibilities, struggle to cope with these new challenges. So while resultant patterns are expected to differ, they can all be understood within the context presented in this chapter.

There is an important social justice dimension evident here when considering the mechanism of exclusion. The rising cost of admission into the post-Fordist economy and the challenge of the alternative, in perpetual low-wage employment, have created real geographies of segregation within and between cities. The restructuring required by the post-Fordist-Keynesian system has not yet emerged as a process able to be participated in by all. The neoliberal system is not balanced. The system must therefore still be in flux and awaiting a new economic-governmental compact.

2.4 Trends in the Age Composition of Canadian and US Cities

The age composition of cities and their correlated spatial dynamics has been thrown into flux since the end of the Fordist-Keynesian period. Demographic, life course, and employment patterns have all shifted, now matched against new forms of development and changing societal objectives, there have emerged a variety of lifestyles exhibiting a variety of social and ecological configurations. Not only have patterns in the residential ecology of age cohorts changed but the structure of age itself in cities has also transitioned where cohorts themselves actively seek out preferred urban amenities (Townshend and Walker, 2010; Rosenburg and Wilson, 2010).

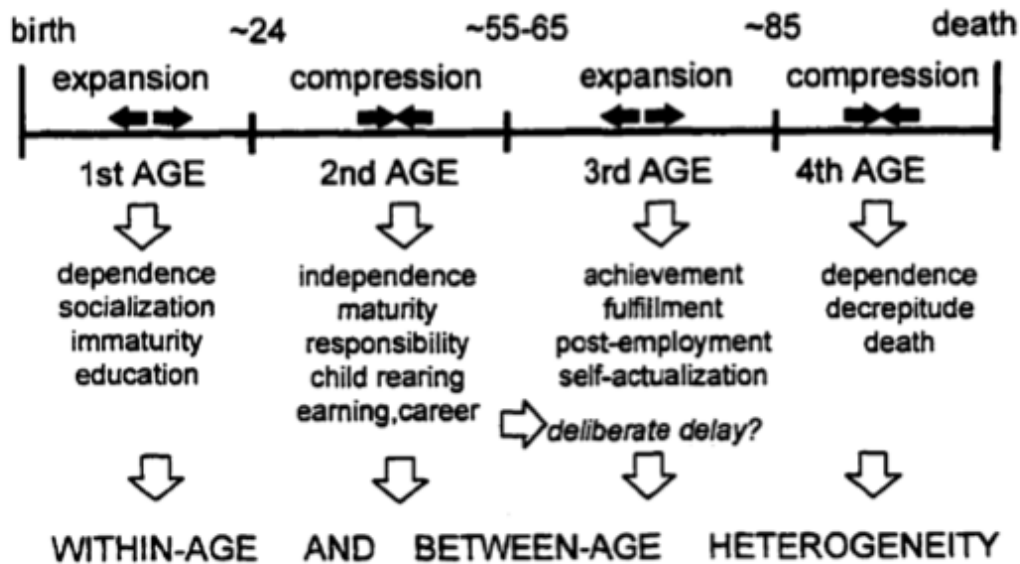
Populations in Canada and the United States are aging rapidly. Rises in median ages can be seen as the result of declining fertility rates and increases in life expectancy at all ages, but is particularly notable among those of the baby boom generation (Townshend and Walker, 2010; Shrestha and Heisler, 2011). The baby boomer cohort, those born following the end of the Second World War into the mid-1960s

has driven demographic trends throughout their life course and their presence towards the top of the population age structure is now being detected.

Immigration has also been an important factor of population growth in Canada and the United States. In 2006, immigrants accounted for nearly 20% of the Canadian population and recent immigrants (settled in the last five years) for 3.6%. In both countries, immigrants tend to settle in large metropolitan areas. In 2009 in the United States, 57% of all legal migrants settled in only ten metropolitan areas, New York, Los Angeles and Miami among the most popular destinations (Shrestha and Heisler, 2011). The settlement decisions of migrants have been important in contributing to the increased diversity of major centres. In large Canadian centres, Townshend and Walker (2010) observe net domestic migrant loss, where Canadians choose to migrate outwards to high-growth parts of the extended metropolitan area or from eastern to western centres.

Economic, demographic and societal transitions have in turn come to impact the life-course of generations as they progress through life. Recent trends are said to have led to “the extension of a youthful phase” (Chatterton and Hollands, 2002). This implies the expansion of the first age division of the life course as described by Townshend (1997; see Figure 3).

Figure 3 - Summary conceptualization of the Third Age divisions of the life course (Townshend, 1997)



Young adults of the millennial generation have been observed as now (generally) seeking further education, living longer with parents (or with greater parental support), delaying conjugal unions and delaying child rearing (Townshend, 1997; Townshend and Walker, 2010). This is an age of dependence, comparatively less responsibility, socialization and education. Occupational restructuring, labour market uncertainty and the enhanced ability of the older generation to provide care for their children can be seen as contributing to this trend. Millennials are born predominately of planned pregnancy and have fewer siblings than previous generations; parents are therefore better prepared to provide extended support to this generation (Townshend and Walker, 2010). Generally, the delay in the transition from the first to the second age has contributed to declining household sizes; couples living without children, and single-person households.

Not only do life course changes exhibit patterns of transition but also within each age, there is an expanded diversity of lifestyles. Lifestyles are distinguished by distinctive consumption patterns for goods, services and housing as well as common outlooks and attitudes. With the corporatized revalorization of the built environment in the neoliberal city, space has become a product developed and marketed to meet lifestyle goals. Enabled by reduced household size, young adults in the first and second age seeking to maximize the use value of housing and neighbourhood are driven to these developments (Moos, 2014). The process of the creation of lifestyle-oriented neighbourhoods is overlain atop the complex spatiality of continuity and change within and between cities. Housing cost and built form as well as structural changes seen in occupational polarization, and income filter down the residential decisions of young adults, often resulting in the tendency to concentrate whether in centralizing or decentralizing patterns (Moos, 2012; Moos, 2014). The resulting forms are what Moos (2014) refers to as “generationed space”, a distinctive division of space by generational status.

Generational concentration occurs both within and between cities. At the inter-metropolitan scale, Rosenberg and Wilson (2010) find tendencies towards the concentration of age groups in several Canadian cities. The researchers use an age ratio to classify cities as younger cities, older cities and cities ‘in balance’. Plane et al. (2005) note a pronounced pattern of internal migration of a young, single and highly educated population up the urban hierarchy in the United States. In their findings, metropolitan regions of 1 million or more persons were the only regions to

experience net in-migration of this young, single and educated group, with the very largest receiving the largest numbers of in-migrants between 1995 and 2006.

Young adults are generally drawn by the presence of educational and employment opportunities as well as cultural and lifestyle amenities. They are vulnerable to the marginalization brought by socio-economic disparity however. Particularly in balanced cities, disparity in social amenities offered by community organizations in favour of the larger baby boomer generation further marginalize some young adults (Rosenberg and Wilson, 2010). Cities struggle to provide support for young adults as this group too experiences internal differences in education and social support.

2.5 The Residential Ecology of Young Adults

Previous research has uncovered interesting patterns in the residential ecology of young adults in Vancouver and Montreal. Moos (2014) identifies patterns of centralization and of decentralized concentration, observing correlation in the representation of young adults in census tracts with a greater proportion of high density housing in the inner city and extending along transportation networks. Moos points to a preference for what Wyly (1999) calls the “use value” of neighbourhoods, value which is derived from urban amenities and public transit enhancements normally present in the highest density (through forces of revalorization) in the inner city. Trends unique to this generation in particular are seen as being responsible for the shift in intra-urban residential settlement dynamics, observable as concentration and centralization.

Findings from Moos (2012; 2014) identify the particular role that changes in demographics and household characteristics have had in influencing the settlement patterns of young adults. But further, Moos (2014) identifies patterns that underlie these demographic changes.

Between 1981 and 2006, Moos (2014) finds that the location of young adults has become increasingly concentrated. In Montreal, this is due to centralising tendencies associated with density. Demographic change, resulting in smaller households for the young adult cohort has led to densification in location decisions amongst the cohort. The concentration of young adults in suburban areas has diminished in Montreal, replaced by a strong centralising pattern associated with higher density forms. In the metro region, the cohort appears to locate away from higher cost housing and associated larger and detached built forms. In Montreal, Moos finds that decisions to consume multiple-dwelling forms are often motivated by income constraints amongst the cohort (Moos, 2012). This leads to densification and centralization overtime from across the metro region. Location patterns in Vancouver share the concentrating tendency. Household size appears to be an important factor in the residential organization of the cohort in Metro Vancouver. For young adults who now live in smaller sized households, location was found to be negatively associated with larger owned housing stock. Young adults consume multiple dwelling residences often choosing denser, high-rise condominium living (Moos, 2012). Also due to increasing housing costs overtime Moos observes a pattern of concentration extending outwards from the downtown along a high-density corridor served by a rapid transit line. This form drives an observable

pattern of decentralization in Vancouver albeit in a concentrated housing form and in high-density neighbourhoods.

These observed patterns are heavily influenced by demographic changes that have resulted in changing household size and characteristics. In fact, when accounting for household characteristics, Moos suggests that density and proximity to transit are new explanatory factors in young adult residential location. When accounting for changing household demography within the cohort (a decreasing household size over time), young adult location shows a positive association with distance from the CBD in both regions studied (a general decentralizing pattern). Moos (2012; 2014) find young adults to be particularly attracted to dense neighbourhoods in both Montreal and Vancouver. This, along with a clearly positive association to transit proximity in Vancouver accounts for the corridor of high-density settlement extending along a rapid transit line running into suburban Vancouver.

Interestingly, the location of young adults in one census tract was found to be related to the location of young adults in surrounding tracts. This is important because factors identified as influencing young adult location (density, amenities, walkability) as are outcomes of urban agglomerations (Moos, 2014). Furthermore, Moos' finding of the importance of density in young adult location decisions helps to describe expected patterns of young adult settlement. Hackworth (2007) finds an increase in polycentric urbanization, contributing to cubic distributions of neighbourhood density variables in conurbations across the United States. Such

geography would allow for a complex but concentrated pattern of young adult settlement across many North American cities.

3 Methods

There are several key methodological considerations to this study. These include identifying the CBD, identifying appropriate generational boundaries, and systematically measuring and classifying patterns in the distribution of young adults within the urban landscape.

The role of the researcher in this study is to provide a descriptive analysis of residential distributions of young adults in North American city regions. This study extends Moos initial investigation by presenting the residential location of young adults in major city regions across North America, leading towards the identification of forces driving the dynamics of residential location based on metropolitan characteristics.

This study begins with a literature review intended to provide an understanding of the unique development, social and economic contexts within which the young adult cohort exists. The study continues by mapping the location quotients of young adults by dissemination area/census block group within 57 metropolitan regions across North America, describing patterns by concentration, and centralization. The study concludes with geographic analysis of the findings, contextualising residential patterns within the economic and demographic dynamics of metropolitan regions.

This study uses geographic analysis to understand the distribution of the 25-34 age-cohort within metropolitan regions across North America. Like Walks (2001) and Moos (2012; 2014), location quotients are used as measures to clearly describe patterns of residential location. The primary objective of this study is to provide a

descriptive analysis of patterns varying across and between city regions. In this study, across 57 metro regions, location quotients are mapped by dissemination area/block group to illustrate the spatial organization of age. Coefficients of localisation are used to compare degrees of concentration in the location of young adults between cities.

3.1 Study Area

This study considers 57 metropolitan regions across Canada and the United States. Metropolitan regions – Census Metropolitan Areas (CMA) in Canada and Metropolitan Statistical Areas (MSA) in the United States – with a population over one million were selected based on population counts reported in the 2011 Canadian and 2010 US Census. Demographic data is analysed at the dissemination area level in Canada and the census block group level in the United States. In both Canada and the US, this geography represents the aggregation of individual neighbourhood blocks and is the smallest standard geographic area for which all census data are disseminated. US and Canadian geographies obey CMA and MSA boundaries and serve as a consistent unit to compare distance trends across metropolitan regions.

The CMA and MSA provide the metropolitan scale used in this analysis. They are comparable spatial units delineated by respective Canadian and US census authorities that delineate metropolitan areas by the functional relationship of a core region with surrounding suburbs and exurbs. The CMA/MSA geography is not confined by municipal boundaries or state/provincial boundaries. These areas are typically centred on a single city with strong economic and commuting connections

to outlying areas (US Census Bureau, 2013; Statistics Canada, 2013). In the US, the MSA is the best functional description of a metropolitan area. Other measures such as the Combined Statistical Area are often larger units based on weaker ties between the core and its region. Although these areas are the most comparable metropolitan geographies among both countries, there are slight differences in the delineation of Canadian and US statistical metropolitan areas, namely commuting thresholds and merging rules (Statistics Canada, 2013; 2010 Standards for Delineating Metropolitan and Micropolitan Statistical Areas, 2010).

3.2 The City Centre

The study measures the distance from the CBD as a means of organizing the location of residents by age.

Within a historical context in North American cities the status and function of the CBD has changed. In most large US city regions, the function and dominance of the CBD declined during the period of post-war suburbanization where inner cities experienced a hollowing out as retail and office functions diffused across a suburbanizing region. In Canadian city regions, central areas experienced less of an absolute decline but suburban centres in several Canadian metropolitan regions would gain diverse functions drawing office and retail uses from across a metro region. While neoliberal reinvestment has revived the fortunes of some downtowns, in many cases city regions have experienced polycentric urbanization. In some cities like Detroit, particular economic conditions and governmental decisions have

contributed to a weak CBD and a general diffusion of function across the metro region without creating regionally significant secondary centres.

To young adults, the CBD serves as an important central area with near equal accessibility to outlying areas. The CBD and inner areas also often represent high-density areas where residential density, density of amenities and dense housing forms are often maximized in many metro regions. Moos (2014) uses the proximity to the downtown to help identify factors influencing the residential location of young adults.

The idea of a “downtown” is a better understood feature of the North American metropolis than the specific and ephemeral CBD. The downtown of North American cities often marks an historical centre, useful in orienting urban socio-spatial patterns. Regional transport decisions have consistently been made in relation to access to a downtown as these regions often retain employment uses even while they might be devalored over time. Thus the idea of a city centre is important in the development and orientation of the North American city.

The idea of orienting socio-economic patterns in relation to the CBD originates from what is described as the Chicago School of urban geography. This school of thought suggests that by understanding processes present at a region’s core, one might better understand regional socio-spatial patterns. A school of thought known as the Los Angeles School exists in opposition to this idea. It is difficult to definitively identify the tenets of this school but it may generally be understood as either (or simultaneously) suggesting (in opposition to the Chicago School) that the

characteristics of contemporary cities arise from within neighbourhoods and across all points in space, that the periphery organizes the centre, or patterns of urbanity occur in numerous and random variations in space (Dear and Flusty, 2002). There has been criticism of this idea but perhaps the unequivocal contribution of the LA School is the suggestion that greater complexity be provided in interpreting urban dynamics. Hackworth (2005) acknowledges the high degree of complexity and variation in urban form but maintains that these socio-spatial patterns most often do not occur in random variations in space but are in fact highly ordered.

Hackworth (2007) indeed finds that some cities like Dallas elude categorization with a highly dispersed urban form that appears to be truly fragmented. Many city regions exhibit a degree of poly-centricity in form. In these cities, regional malls, suburban downtowns exurban outposts exist, causing one to consider more carefully the idea of a centrally oriented metro region and the ubiquity of model urban form.

From Hackworth's (2005) findings of complex but ordered patterns in relation to a city centre, this study identifies the CBD as a meaningful central point. This study identifies the CBD as a method of determining the degree of order spatial patterns exhibit. It is also an important feature as identified by Moos (2012).

Various measures of intensity including housing density and land value are often negatively associated with increasing distance extending away from the CBD (Murphy & Vance, 1954; Alperovich, 1982; Moos, 2014). Phenomena such as physical geography, uneven distribution of amenities, rapid transit infrastructure

and the emergence of polycentric urban forms (often from decentralising employment) affect these expected patterns (Wyly, 1999).

The CBD itself is also not immune to wider patterns of metropolitan change. CBD functions have been exposed to the forces of suburbanization and decentralization. Polycentricity and economic factors have contributed to gradual changes in the location of the CBD overtime and the diminishing of the importance of the CBD relative to other regions of the city (Alperovich, 1982). In the sample used in this study, one city, New York, is recognized as having developed two CBDs.

Numerous methods have been developed to identify the CBD. Early work by Murphy and Vance (1954) identified useful measures. The Central Business Height Index ($CBHI = \text{floor area devoted to central business uses} / \text{total ground floor area}$) is a measure of floor space devoted to central business uses relative to ground floor area and can be used to delimit the CBD. The Central Business Intensity Index ($CBII = (\text{floor area devoted to central business uses} / \text{total floor area}) \times 100$) is a measure of the intensity of central business use relative to all other uses. The CBII is a limited measure, as it cannot differentiate a one-storey big box store from a multi-storey office. The CBHI is capable of accurately identifying the peak land value intersection (PLVI) but the measure is data intensive. Murphy and Vance mention building heights as one final measure. The height of non-residential buildings can approximate the value of the uses on site but it can only be used as a rough indicator of CBD extent.

Because this study is not concerned with the precise form of the CBD, this study identifies the CBD by extending a buffer from the PLVI. One of two buffer distances is used dependant on the population of the metro region. A 1 km buffer is used in cities with populations between 1 and 2 million. A 1.5 km buffer is used to delineate the CBD in cities over 2 million in population. An exception is made in Chicago and New York. Historically, both Chicago and New York have an exceptional concentration of business activities and dense high-rise forms within downtown areas. Economic fortunes saw an early and intensive period of high-rise construction in both Chicago and New York. These functions continue within the downtowns of both cities and maintain high land values.

In Chicago a 2 km radius is used and in New York, two CBDs are delineated using a 1.5km buffer centred in midtown and another 1.5km buffer in downtown Manhattan.

The peak land value intersection is estimated based on building height. The PLVI often occurs within the CBD and is used as a proxy for identifying a central point in a metro region. The tallest non-residential building in each city is identified as being the PLVI. Building heights are drawn from the Emporis database of tallest buildings (Emporis, n.d.). The location of each building is drawn from the GeoHack database. These locations form the centroid of distance buffers.

3.3 Defining Age

The residential ecology of young adults is the result of the interaction of post-Fordist economic regimes, existing geographies and emerging societal trends. It has

been recognized that while society has long been 'generationed', these divisions between generational groups have become more pronounced due to the ability for values and norms to quickly change in light of the rapidly changing contexts that generations are raised in (Townshend, 1997; Moos, 2014). Recent studies have asserted the importance of studying age cohorts in understanding socio-spatial differentiation (Moos, 2012).

The cohort is an important construct for understanding societal change. Ryder (1965) describes coherence and continuity among each new birth cohort. Cohorts are exposed to common societal changes, experiencing changing content in formal education, changing socialisation, economic experiences and historical experiences. There is congruence in the societal experiences of cohorts. There has been a wealth of research describing distinctive changes occurring within the millennial generation; and the formative context (de-industrialisation, post-Fordism) of this generation was discussed in the literature review in Chapter 2 of this thesis.

Moos (2012) captures the experiences of this generation at the start of their housing careers. Moos (2012) suggests that for those under 25, housing decisions are likely to be tied to the parental home or to an educational institution. The young adult cohort is identified as ages 25-34.

This study uses the same age cohort definition for young adults (25-34). This classification meets the constraints of age cut-offs of both Canadian and US census data reporting.

3.4 Observing Residential Settlement

This study observes the settlement of young adults within 57 metropolitan regions in the US and Canada. Settlement patterns are described using a ratio measure known as a location quotient.

The location quotient was originally developed as a part of economic base analysis as a way of identifying the most productive local industries relative to a national scale. Wilson (1984) describes the ratio as a measure of the proportion of persons that would have to be employed locally in a given industry in order to exceed the proportion employed in that industry nationally. The measure has been criticized as being only a crude measure of a local economy and is limited in analysing nuanced urban economies with small non-manufacturing producers (Wilson, 1984).

The location quotient provides a useful measure in human ecology (Walks, 2001; Brown and Chung, 2006; Moos, 2014). In social research, particularly in studies of spatial residential dynamics and segregation, the location quotient has proven particularly valuable. The measure is simple and straightforward. Values greater than one indicate over representation, values less than one indicate underrepresentation. In social research too, the measure is also limited, as it does not provide any much information on the processes creating observed patterns. However its ability to provide high resolution in the description of spatial patterns by indicating single unit concentrations is highly valued by social researchers (Brown and Chung, 2006). It is a measure that is highly sensitive in describing the *concentration-evenness* dimension (Brown and Chung, 2006). In this study, the location quotient is used to identify single unit concentrations at the dissemination

area/block group scale in reference to the metropolitan scale. Here the measure identifies the proportion of young adults that would have to reside locally in a dissemination area or block group in order to exceed the proportion existing within the city region.

$$LQ = \frac{p_Y / p}{P_Y / P}$$

Where:

P_Y = young adult population in Dissemination Area (DA)/Block Group

p = total population in Dissemination Area/Block Group

P_Y = young adult population in CMA/MSA

P = total population in CMA/MSA

Therefore a dissemination area with a ratio value of 1 has the same proportion of young adults to general population within the DA as are in the CMA. Values over 1 signal higher than average concentrations and values less than 1 signal lower than average concentrations relative to the wider metropolitan region. This measure allows for comparisons to be made easily between cities of various sizes.

Because location quotients are calculated for geographical units, they can be mapped to display patterns of the organization of variables in space.

Walks (2001) uses location quotients to map several variables associated with social change in Toronto between 1971 and 1991. Walks intended to identify patterns signalling economic restructuring and socio-economic polarization. Walks also calculates a coefficient of localisation, a measure of the concentration of

variables within a reference scale. Walks is able to use this measure to compare concentrations across specific areas of the CMA (inner area, mature suburbs, new suburbs and exurbs) and compare these to concentrations across the CMA as a whole.

Moos (2012) uses a similar method to identify patterns in the distribution of young adults in two cities. Moos constructs ecological models, modeling the changing relationship in the distribution of young adults to correlated variables including tenure, gross rent, distance to transit, distance to downtown, household size, and household form. The numerical models developed are useful in describing a complex interrelationship of patterns, as he is able to isolate the contribution of factors from one another in the location decisions of the cohort. The geospatial analysis conducted using location quotients shows the relative concentration of young adult settlement across regions. Moos (2014) also uses the location quotient to clearly illustrate unique and significant changes in the spatial organization of young adults over time in two city regions. While ecological models were used to identify the strength and direction of individual factors influencing settlement, location quotients clearly identified important geographies of concentration, centralization and neighbourhood preference Moos (2012; 2014).

This study uses analysis of the residential location quotients of young adults and localisation measures within Census Metropolitan Areas/Metropolitan Statistical Areas. The distribution of location quotients by distance from the CBD is further

interpreted using a regression analysis known as functional form analysis (Hackworth, 2005).

The coefficient of localization (as used by Walks, 2001) is used to detect patterns similar to what Moos (2012) observes as tendencies towards density irrespective of centralizing or decentralized patterns.

The coefficient of localisation is calculated using the formula below.

$$CL_g = \sum_{i=1}^n (T_i - B_i) / 2$$

Where:

g = young adults

i = census tract

n = number of census tracts

T = the percentage share of the young adults in a census tract

B = the percentage share of the base variable (total population)

3.5 Functional Form Analysis

Functional form analysis is used by Hackworth (2005) to identify meaningful relationships between distance and socio-economic variables. Hackworth tests for linear, quadratic and cubic distributions to identify degrees of polycentric urbanization. Hackworth finds the method particularly useful in separating complex but ordered spatial patterns from those that may be random or not able to be explained by distance. This study borrows the method to help to classify young adult settlement patterns.

Buffers are created at three kilometre intervals, dividing block groups and dissemination areas by their centroid into zones. These zones report location quotients of young adults by distance from the PLVI, measuring the degree of young adult settlement by distance. These distributions are interpreted using regression analysis and classified by functional form as linear, logarithmic, quadratic or cubic distributions. Model fit is determined using R^2 values and significance is determined at the 95% interval.

3.6 Classification of Metropolitan Young Adult Settlement Patterns

A system of classification was developed to sort young adult settlement patterns.

The classification system employs location quotients, regression output and coefficients of localisation to evaluate spatial patterns by degrees of centrality and concentration.

Functional forms help to determine the form of young adult settlement as being linear, logarithmic, quadratic or cubic. These forms roughly relate to the degree of polycentricity exhibited in the spatial data. This method of classification is used to help to relate general patterns of young adult settlement within metro regions to experiences with urban planning, post-Fordist realities and the neoliberal city.

Figure 4 explains the sorting process. Levels of centralization and decentralization are determined by sorting the first-order coefficients of each functional form for all 57 metro regions. All coefficients for each metro regions are sorted by median the values. All first-order coefficients below the median value (i.e. more negative) are more centralized as their linear relationships indicate a stronger negative

relationship between young adult settlement and increasing distance from the CBD. First-order coefficients above the median in each functional form are classified as more decentralized. Regression coefficients returned for each functional form for all 57 cities are sorted using this method before model fit or significance is considered. This is done to identify a useful threshold where values on either side can be described as being distinct. Because further classification is used to identify fit and significance, there is not an even number of centralized and decentralized city regions identified.

This method is useful in meaningfully sorting distributions relative to each other but it only identifies settlement patterns as being more centralized or less centralized in relation to the other metro regions studied. Decentralized distributions classified by this study are named so as their patterns are relatively decentralized in relation to the other distributions studied.

Metro regions are sorted into functional forms using the highest r-squared value returned of the four forms evaluated (linear, logarithmic, quadratic and cubic) where confidence levels are significant to at least the 95% confidence interval. If the form for which the r-squared value is highest is not significant, then the distribution will be considered as conforming to the next form for which the r-squared value is highest and statistically significant. An r-squared value of .4 is considered a lower-limit below which the model does not adequately explain variation within the distribution.

Coefficients of localisation are sorted in a similar manner to degrees of centrality. Calculated coefficients of localisation for all metro regions are sorted by their median values with those values below the median considered less concentrated and values including and above the median considered to be more concentrated. Once linear, logarithmic and quadratic forms are identified, the classification of form is joined with that of concentration. Thus linear, logarithmic and quadratic forms are identified as being either more or less concentrated.

The strength of polycentric distributions identified in cubic forms is further evaluated using second and third order regression coefficients. Where second-order regression coefficients are higher, polycentric distributions are known to have sharper concentration in outlying nodes. Lower second-order coefficients have more moderately pronounced nodes.



Figure 4 - Classification Procedure for Age-Distance Distributions by Metro Region

As explained by Figure 5, the classification thus contains major and minor divisions.

Cities are identified as centralized or decentralized (less centralized), then by form

as quadratic or linear (etc.) and then by degree of concentration. Each of the functional forms is sorted into simplified categories referring to their analogous spatial distributions. Linear and logarithmic forms are named here as standard distributions as there generally adhere to a distance decay pattern or that of a non-polycentric city that is either oriented around a core area or dispersed. Quadratic and cubic forms are identified as polycentric, either having secondary centres (quadratic) or as being highly polycentric (cubic). All of these groupings are identified as having highly concentrated settlement patterns or less highly concentrated settlement patterns. Cubic distributions are distinguished as having stronger or weaker outlying nodes in relation to a region's inner city.

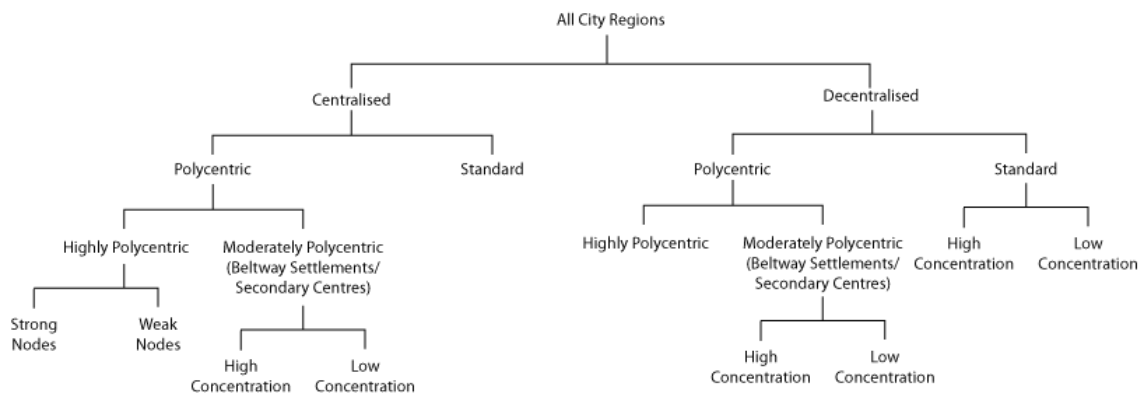


Figure 5 - Classification Hierarchy for Age-Distance Distributions by Metro Region

Age-distance distribution in metro regions with centralized settlement patterns exhibit the highest representation of young adults (as measured by location quotient) near to, or in the CBD. Simplified examples of centralized forms of age-distance distributions are presented in Figure 6 and Figure 7. The black ring represents a 10 km buffer centred on the region's CBD. In less centralized city regions, neighbourhoods with the highest levels of young adult settlement are

generally not located in the regional core. In these decentralized cities, young adults may be still locate in central areas but downtown neighbourhoods generally do not to exhibit the highest proportions of young adult settlement. As such, decentralized patterns may be generally dispersed across a region with few neighbourhoods of high young adult density or settlement may occur in polycentric patterns that are not centred on a regional CBD but instead scatter around it. Examples of decentralized forms are shown in Figure 8 and Figure 9.

Polycentric distributions generally show particular clusters of young adult settlement throughout a metro region and may be either centred or not centred as shown in Figure 6 and Figure 8. Standard distributions describe cities without substantial nodal patterns in young adult settlement. The standard distribution here is meant to describe a traditional decay model where changes to the variable increase, decrease or remains constant as the distance from the CBD is measured. These distributions are shows in Figure 7 and Figure 9.

**Centralised
Polycentric**

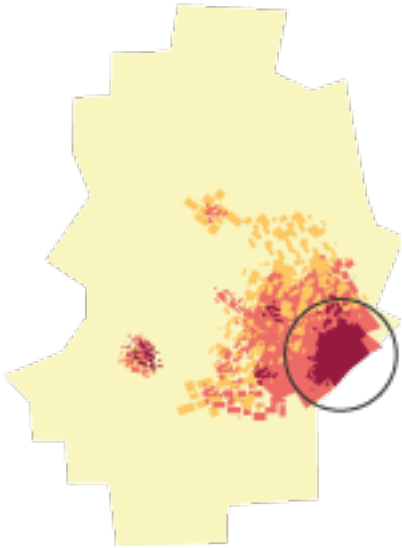


Figure 6 - Example Centralized Polycentric Age-Distance Distribution. Darker colours represent higher location quotients.

**Centralised
Standard**

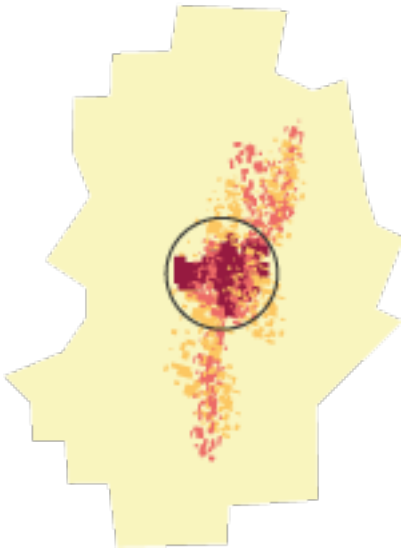


Figure 7 - Example Centralized Standard Age-Distance Distribution. Darker values represent higher location quotients.

**Decentralised
Polycentric**

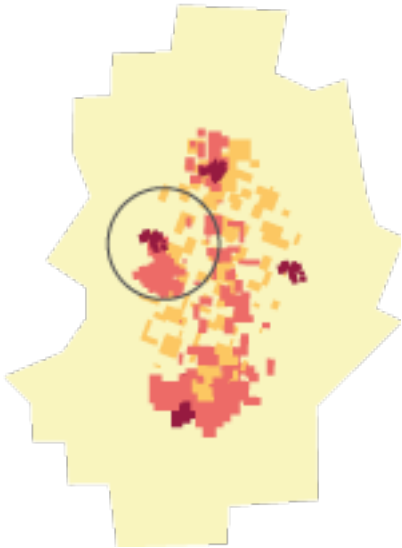
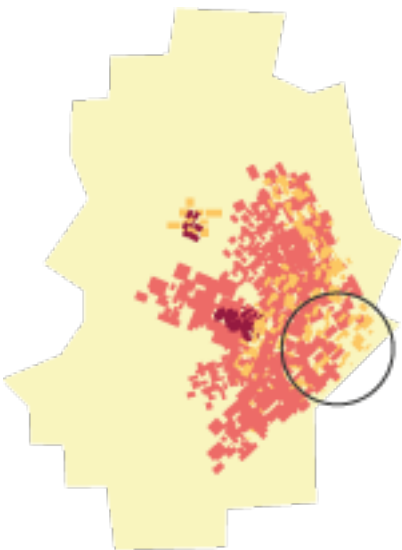


Figure 8 - Example Decentralized Polycentric Age-Distance Distribution. Darker values represent higher location quotients.



**Decentralised
Standard**

Figure 9 - Example decentralised Standard Age-Distance Distribution. Darker values represent higher location quotients.

Concentration is measured using the coefficient of localisation to describe the dispersion of the variable across the landscape. In regions of low concentration, young adult settlement tends to occur more evenly across the region as a whole. In

more concentrated regions young adult settlement tends to occur in fewer census tracts. Examples of each are provided in Figure 10 and Figure 11.

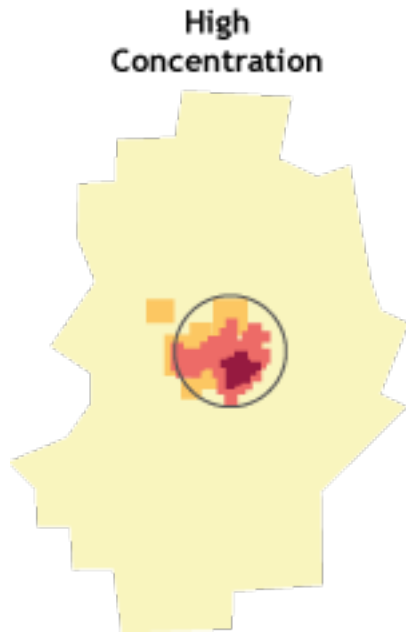


Figure 10 - Example High Concentration Age-Distance Distribution. Darker values represent higher location quotients.

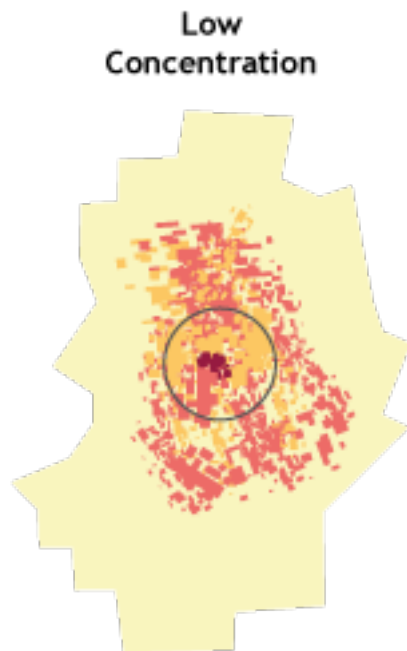


Figure 11 - Example Low Concentration Age-Distance Distribution. Darker values represent higher location quotients.

4 Case Study Cities

This study examines the residential ecology of young adults in 57 major cities (Census Metropolitan Areas and Metropolitan Statistical Areas) with populations in excess of one million persons in Canada and the United States (see Figure 12). These cities have different income, age and familial structures, different ethnic structures and geographies. A list of these cities is included below in Table 1. This chapter also explores some of the characteristics of these cities.

These 57 Canadian and US cities with populations over one million span the continent from the Pacific to Atlantic Oceans and the Gulf of Mexico. A large cluster of city regions in the study lay in the Midwestern and Southern regions of the United States.

Figure 12 - Cities with population greater than 1 million



Population Characteristics

The largest metro-delineated regions are scattered across the continent. New York City has the greatest population at 18.9 million in 2010 followed by Los Angeles (12.8 million), Chicago (9.5 million) and Dallas (6.4 million). The largest Canadian metropolitan region is Toronto which ranks 7th by CMA population here among US regions. The city of Toronto is the 3rd most populous city in this study (Statistics Canada, 2014; US. Census Bureau 5, 2010).

The smallest metropolitan areas included are Rochester (1.1 million), Salt Lake City (1.1 million) and Birmingham (1.1 million) (Census Bureau 5, 2010).

The share of young adult population as a percentage of metro population varies by nearly 5%. Salt Lake City, Austin, Calgary and Edmonton have the largest share of population aged 25-34 (16.9%, 16.9%, 16.3% and 15.9% respectively). Cities like Pittsburgh, Buffalo and Rochester had the smallest young adult populations all at 11.6%. In cities with the largest young adult populations in absolute terms (New York, Los Angeles, Chicago, Dallas, Houston, Washington and Toronto, numbers ranging from 2.7 million to 775,000) the percentage of young adults varied between 14% and 15% of population. Research has show that young adults tend to migrate upwards in the urban hierarchy towards larger and more urbanized centres (Plane et al., 2005).

Regional population dynamics in sample cities have been changing. Generally there has been population dispersion from cities in the Northeastern and Midwestern United States in favour of Southern and Western cities (Leichenko, 2001; Avent, 2011).

Historical Development of North American Cities

American cities of the Northeast including the city of Montreal in Canada have long histories, originally settled by Europeans as settlements in the 17th century. Cities like New York, Boston and Montreal have old colonial centres and have experienced growth and the gradual spatial-stratification of class among neighbourhoods (Warner and Whittmore, 2012). America grew westward into the Midwest along canals and navigable rivers. Settlements also began along the great lakes. Cities grew as centres of sprawling rural hinterland. By the 19th century, industrialization,

railways and immigration (particularly in Northeastern and Mid-Atlantic cities) contributed to population and economic growth in cities in Canada and the USA (Auch et al., 2004). Settlements on the Pacific coast grew during this time. Hispanic workers settled in western states and in California, employed in agricultural production. Southern and Midwestern regions remained predominantly rural over this time (Auch et al., 2004). Great Lakes and Northeastern US cities would remain larger and more prosperous than southern and western cities largely to the mid-1970s when deindustrialization and economic restructuring would begin to resettle populations (Leichenko, 2001; Avent, 2011). The post-slavery era in the south saw a continued reliance on agricultural production and many southern blacks moved northwards seeking better economic conditions (Auch et al., 2004).

Urbanization quickened into the 20th century as industrialization demanded labour and agricultural innovation required less of it. The end of the First World War saw the spread of investment in skyscrapers in downtowns (Auch et al., 2004). In the old colonial outposts of the northeast – Boston, New York and Philadelphia – the “broad way”, a thoroughfare once extending to the city’s edge was now completely enveloped by the city, built-out by skyscrapers extending for much of its route (Warner and Whittemore, 2012).

Following the end of the second-world war in cities across Canada and the United States, the suburban form dominated urban real-estate development (Hackworth, 2007). The suburban form spread development across Canada and the United States through a unique arrangement of investment in regional connectivity and

government support through homeownership subsidies (Hackworth, 2007). At the end of the post-war period, these cities would change again through the neoliberal spatial fix, a pattern of continued expansion and reinvestment in inner areas in many cities in Canada and the United States.

Economics and Regional Development

Cities in the United States, particularly those in the Northeast and Midwest, had experienced economic decline linked to deindustrializing forces since the 1950s (Glaeser and Ponzetto, 2007). This region (spanning the Northeast and Midwest) has been described as America's rust belt. Declining economic fortunes led to economic hardship throughout much of the region. As early as the 1970s significant economic restructuring began to occur, seeing the continued decline of manufacturing employment in American cities and the growth of new, 'idea-intensive' industries such as technology, finance and business services in select cities. The hollowing out of many American cities, through suburbanization and devalorisation of core areas began to reverse, as investment flows were reoriented in a pattern described by Hackworth (2007) as the neoliberal spatial fix. In the success and varied implementation of this new pattern of intra-urban investment, Glaeser and Ponzetto (2007) describe the differences in the economic outcomes of Detroit and Manhattan, the continued decline of one and reinvigoration of the other. Canadian cities also experienced declining manufacturing employment and suburbanization although manufacturing employment remains relatively important in some Canadian cities like Montreal and Toronto (Hutton, 2010). The

disinvestment of core areas observed in American cities was not seen to the same degree in Canada.

The experience of deindustrializing cities in the US is varied. In Cincinnati manufacturing represents one of the largest sectors of employment and total employment in the industry has been declining (Cincinnati Regional Chamber, 2013). Management and finance have become competitive sectors in the city's economy (Bureau of Labour Statistics, 2006, 2011).

The southern United States is a region seeing recent population growth. Southern cities are newer. In the south, nearly 70% of all structures were built since 1970. About 45% of all structures built in the US since 1970 are in the south. Writers like Ryan Avent and Edward Glaeser believe that restrictive building policies in major centres like Washington, New York and Seattle have increased housing and rental prices, pricing out many and that the cheaper and less restrictive cities of the south have been the recipients of this population influx (Avent, 2011; Glaeser, 2011). The rapid growth since the 1970s in building development and the relative affordability of housing in the region lend support to this argument.

Extreme boom and bust have characterized housing development in some US cities in the west. In Las Vegas and Phoenix these patterns were particularly evident. During the last housing bubble, these cities suffered both some of the most spectacular growth rates and crashes of all US cities (Dewan, 2014).

Table 1 - Study Cities, total population, population of young adults

MSA/CMA Name		Population Ages 25-34	Total Population	% Population Ages 25-34
New York-Northern New Jersey-Long Island	1	2,689,393	18,897,109	14%
Los Angeles-Long Beach-Santa Ana	1	1,889,259	12,828,837	15%
Chicago-Joliet-Naperville	1	1,364,655	9,461,105	14%
Dallas-Fort Worth-Arlington	1	951,931	6,371,773	15%
Philadelphia-Camden-Wilmington	1	771,337	5,965,343	13%
Houston-Sugar Land-Baytown	1	899,647	5,946,800	15%
Toronto	2	775,350	5,583,065	14%
Washington-Arlington-Alexandria	1	855,574	5,582,170	15%
Miami-Fort Lauderdale-Pompano Beach	1	711,640	5,564,635	13%
Atlanta-Sandy Springs-Marietta	1	761,385	5,268,860	14%
Boston-Cambridge-Quincy	1	619,747	4,552,402	14%
San Francisco-Oakland-Fremont	1	650,137	4,335,391	15%
Detroit-Warren-Livonia	1	506,250	4,296,250	12%
Riverside-San Bernardino-Ontario	1	564,520	4,224,851	13%
Phoenix-Mesa-Glendale	1	597,872	4,192,887	14%
Montreal	2	533,470	3,824,220	14%
Seattle-Tacoma-Bellevue	1	523,970	3,439,809	15%
Minneapolis-St. Paul-Bloomington	1	477,668	3,279,833	15%

San Diego-Carlsbad-San Marcos	1	470,922	3,095,313	15%
St. Louis	1	369,712	2,812,896	13%
Tampa-St. Petersburg-Clearwater	1	337,822	2,783,243	12%
Baltimore-Towson	1	362,245	2,710,489	13%
Denver-Aurora-Broomfield	1	390,192	2,543,482	15%
Pittsburgh	1	273,022	2,356,285	12%
Vancouver	2	330,075	2,313,330	14%
Portland-Vancouver-Hillsboro	1	335,570	2,226,009	15%
Sacramento--Arden-Arcade--Roseville	1	291,231	2,149,127	14%
San Antonio-New Braunfels	1	298,713	2,142,508	14%
Orlando-Kissimmee-Sanford	1	296,138	2,134,411	14%
Cincinnati-Middletown	1	274,269	2,130,151	13%
Cleveland-Elyria-Mentor	1	242,552	2,077,240	12%
Kansas City	1	285,929	2,035,334	14%
Las Vegas-Paradise	1	294,525	1,951,269	15%
San Jose-Sunnyvale-Santa Clara	1	276,497	1,836,911	15%
Columbus	1	269,563	1,836,536	15%
Charlotte-Gastonia-Rock Hill	1	254,321	1,758,038	14%

Indianapolis-Carmel	1	249,398	1,756,241	14%
Austin-Round Rock-San Marcos	1	290,552	1,716,289	17%
Virginia Beach-Norfolk-Newport News	1	235,387	1,671,683	14%
Providence-New Bedford-Fall River	1	191,633	1,600,852	12%
Nashville-Davidson--Murfreesboro--Franklin	1	234,483	1,589,934	15%
Milwaukee-Waukesha-West Allis	1	209,356	1,555,908	13%
Jacksonville	1	180,439	1,345,596	13%
Memphis	1	179,797	1,316,100	14%
Louisville/Jefferson County	1	171,491	1,283,566	13%
Richmond	1	165,268	1,258,251	13%
Oklahoma City	1	184,402	1,252,987	15%
Ottawa-Gatineau	2	166,025	1,236,320	13%
Calgary	2	199,070	1,214,835	16%
Hartford-West Hartford-East Hartford	1	142,410	1,212,381	12%
New Orleans-Metairie-Kenner	1	166,107	1,167,764	14%
Edmonton	2	185,360	1,159,875	16%
Buffalo-Niagara Falls	1	131,790	1,135,509	12%
Raleigh-Cary	1	165,547	1,130,490	15%
Birmingham-Hoover	1	155,264	1,128,047	14%

Salt Lake City	¹	190,375	1,124,197	17%
Rochester	¹	122,682	1,054,323	12%
<hr/>				
¹ 2010 US Census Data				
² 2011 Canadian Census Data				
<hr/>				

The selection criteria capture very large metro regions like New York and Los Angeles as well as smaller cities like Rochester. These cities have different economic linkages and occupy various positions of the global city hierarchy. Some preeminent centres of global finance, command and control (commonly known as Alpha cities) such as New York, Chicago and Los Angeles are included amongst the sample. Others – regional economic hubs that serve to connect their region to the global system – like Charlotte, San Jose and Baltimore are also included.

Taylor (1997) suggests that there exist hierarchical tendencies in the organization of global cities, describing differing extents of international orientation. Beaverstock et al. (1999) outline the methods by which such an order is described, dividing these cities by their functions as Alpha, Beta and Gamma cities based upon the presence of the new international division of labour and centrality based on capital flows (GaWC, 2011). Many global cities are included in this study.

Canadian cities are similar to American cities in all of their diversity and variations, Canadian cities have been exposed to the forces of change exerted across North America from the end of the Second World War to the economic shocks of the 1970s

and 1980s. Canadian cities have participated in the Fordist-Keynesian compact where relationships between government programs and economic activity saw the expansion of an affluent middle class, labour productivity growth, suburbanization and the related growth in household consumption. Deindustrialization and tendencies towards neoliberal governance have also been felt in Canadian cities and regions. The Canadian city is a distinct entity in and of itself however. In Canada many more of the remains of the Keynesian state exist in tact at all levels of government and operate alongside neoliberal objectives. Much of the infrastructure of the Keynesian system exists still from high levels of economic regulation, redistributive tax programs to extensive government land use controls (Bunting and Filion, 2010).

Variation in the extent of the continuity of the Keynesian state exists throughout Canada (really much as it does in the US, or in any city). Moos (2012) cites continued support for housing affordability in Montreal, an objective that was abandoned by the federal government and generally not adopted to the same extent by municipal governments elsewhere.

The Canadian economy is experiencing restructuring much the same as those described in de-industrializing cities, shifting to knowledge intensive, professional and global occupations (Finance, Insurance, and Real Estate or FIRE employment as well as corporate management). Calgary, Toronto, Montreal and Vancouver have all seen recent growth in the FIRE sectors with a slowing or decline in manufacturing employment (Hutton, 2010). Managerial and professional occupations have grown

at a tremendous rate also from 1971 to 2006, growing in excess of four percent at an annualized rate (Vinodrai, 2010). The associated deindustrialization has seen turbulent restructuring in cities like Hamilton, Kitchener, and Toronto, where division arise between the fortunes of the emerging workforce and those employed in declining sectors. But Canada remains a resource rich country and commodities remain an important feature of the Canadian economy. Seen uniquely in mining in Canada's Nickel-belt, and in the oil rich regions of the west and Newfoundland. Calgary's oil and gas sector has expanded rapidly recently at a rate over 50% between 2001 and 2006 (Hutton, 2010).

Calgary is a city growing rapidly due to the success of its mining and oil and gas sectors, which grew at a rate over 50% between 2001 and 2006. Growth in employment in professional, scientific and technical occupations rose at a rate just over 23% over the same period while FIRE employment rose by nearly eight percent (Hutton, 2010).

5 Findings and Analysis

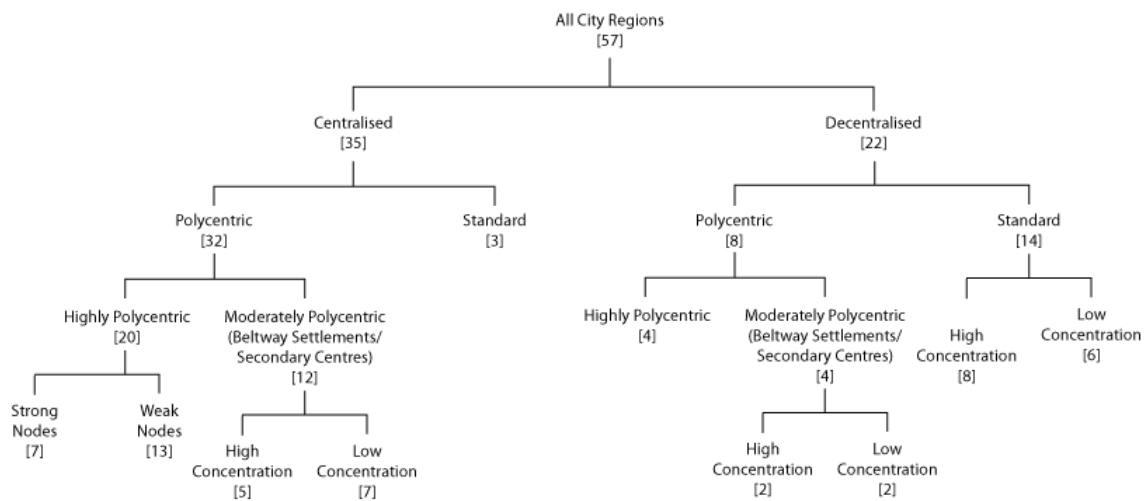
This study generally finds patterns supportive of Moos' (2012) study of the arrangement of young adults in Vancouver and Montreal. Young adults are generally found in centralized patterns but significant polycentric forms are identified. This general orientation is similar to what Moos (2012) finds in Vancouver where high housing values, a transit corridor and a polycentric urban form allow young adults to locate in a pattern extending outwards from the regional core. Indeed this study finds several such patterns in city regions. Being an investigation specifically of the settlement patterns of young adults across a greater number of city regions, this study uncovers more general patterns of variation. For instance the city regions of Montreal and Vancouver identified by Moos (2012) as having diverging patterns of centralization and decentralization are found by this study to exhibit greater similarities when measured against the 55 other sample cities.

Forms can first be described as either being centralized or decentralized with variation in the specific structure of these patterns. Figure 13 identifies the results of the classification of regional distributions of young adult settlement. The classification process is described in Chapter 3 of this thesis. Linear and logarithmic functional forms are classified as standard distributions of urban form. Quadratic forms are named as moderately polycentric and cubic forms as highly polycentric.

The study found centralized highly polycentric arrangements to be most common across the metro regions studied (20 regions). In general, polycentric spatial patterns, including quadratic and cubic forms, were most likely to occur in metro regions with a higher degree of centralization in settlement patterns. It appears that

where there is a high propensity for young adults to settle in the core of a region, they will also tend to locate in intense patterns in secondary centres and outlying nodes. Generally, in metro regions with lower concentrations of young adults in regional cores, there is a much lower occurrence of the emergence of significant outlying nodes or neighbourhoods of intense young adult settlement.

Figure 13 – Results: Classification of Age-Distance Distributions of Young Adult Settlement by Metro Region



Young adult settlement patterns in North American city regions exhibit nuanced spatial arrangements. The results indicate that the relationship between distance and settlement can vary substantially from region to region. Interesting similarities in the types of variation exist between metropolitan regions however. As Moos (2012) describes polycentric spatial distributions or strong centralizing tendencies, this study is able to identify similar processes at play. Using functional forms (linear, logarithmic, quadratic and cubic) ordered and complex patterns of dispersion and centralization are modeled (See Hackworth, 2005; Quastel et al., 2012). The totality of results of this analysis can be viewed in Appendix A.

Overall, the models show a good fit with the data. Significant functional forms were found to explain over 40% of variation in the data for all 57 city regions studied. In most cases, the best-fit model was able to explain over 70% of the variation in the data. Cities most often exhibited cubic polynomial forms, which are often associated with a relatively high degree of polycentric distributions. In twenty-four city regions a cubic equation was best able to model the data. Logarithmic forms also exhibited a good fit with the data. Linear fit and quadratic models exhibited lower r-squared values although were reasonably capable of explaining variation in many metro regions.

5.1 Linear Models

In 38 metro regions, linear models were able to explain over 50% of the variation in young adult settlement by distance. In 56 of 57 cities coefficients were significant to within at least a 95% confidence interval. Calculated constants in all cities were also found to be significant at the 95% level.

In Table 2, metro regions are sorted into quartiles based on resulting coefficients. Regression coefficients for the linear model fell between -0.028 and 1.20E-5.

Table 2 - 5 Number Summary: Distance-LQ Young Adults Linear Regression Coefficient

Linear Model Summary	
Max	1.20E-5
Q3	-0.010
Median	-0.013
Q1	-0.017
Min	-0.028

Table 3 – Metro Region Linear Regression Coefficients Sorted By Quartile (Distance-LQ Young Adults), Reporting R² Value

Q1	R ²	Q2	R ²	Q3	R ²	Q4	R ²
Atlanta	0.915	Baltimore	0.564	Austin	0.903	Birmingham	0.533
Boston	0.611	Charlotte	0.658	Cincinnati	0.569	Buffalo	0.386
Chicago	0.621	Cleveland	0.383	Indianapolis	0.484	Detroit	0.434
Dallas	0.449	Columbus	0.474	Kansas City	0.48	Jacksonville	0.585
Denver	0.617	Hartford	0.669	Memphis	0.506	Las Vegas *	0.022
Milwaukee	0.649	Houston	0.62	Miami	0.348	Los Angeles	0.721
New York	0.691	Minneapolis	0.656	Nashville	0.593	Louisville/Jefferson County	0.639
Portland	0.689	Philadelphia	0.504	New Orleans	0.573	Oklahoma City	0.642
Sacramento	0.733	Pittsburgh	0.6	Orlando	0.676	Phoenix	0.609
San Diego	0.723	St. Louis	0.638	Raleigh	0.712	Providence	0.296
San Francisco	0.552	Montreal	0.403	Richmond	0.74	Riverside	0.548
Tampa	0.784	Ottawa-Gatineau	0.512	Rochester	0.384	Salt Lake City	0.355
Washington	0.409	Toronto	0.452	San Jose	0.437	San Antonio	0.44
Calgary	0.543	Vancouver	0.498	Edmonton	0.497	Seattle	0.547
						Virginia Beach	0.514

* Not significant to at least a 95% level

In these cases the coefficient describes the strength of the relationship between young adult settlement and distance. Those cities listed under the first quartile generally exhibit a more negative relationship between distance and settlement concentrations. In these cities, the coefficient suggests that location quotients generally decline more rapidly as distance from the CDB increases.

Cities in the fourth quartile exhibit less of an association or even a positive association between settlement concentrations of young adults and distance to the CBD. These coefficients suggest less of an orientation of young adult settlement around the CBD and may hint at a generally more dispersed pattern of settlement in city regions like Las Vegas and Los Angeles or even the greater importance nodes outside of the CBD in cities like Seattle (these patterns will be further explored through other functional forms).

The low strength of the fit in many cities (indicated by the R^2 values included in Table 3) makes it problematic to draw conclusions about the shape of the relationship between variables as so much of the variation is clearly not able to be captured by a linear model in city regions like Salt Lake city, Buffalo and Rochester. Furthermore other models better explain variation in many other metro regions.

5.2 Logarithmic Models

In 10 city regions, logarithmic models were best able to describe the relationship between young adult settlement and distance. Logarithmic models also generally exhibit good fit with the data as measured by R^2 values. In 54 of 57 city regions, these models were able to explain over 50% of the variation in the dependent variable.

In 56 of 57 city regions, coefficients were found at a minimum to be significant to the 95% level and calculated constants were found to be significant to the same degree in all 57 cities. The distribution of logarithmic coefficients are presented in the 5-number summary in Table 4 and sorted by quartile in Table 5.

Coefficients fall between -0.559 and -0.069.

Table 4 -5 Number Summary: Distance-LQ Young Adults Logarithmic Regression Coefficient

Logarithmic Model Summary	
Max	-0.069
Q3	-0.197
Median	-0.275
Q1	-0.33
Min	-0.559

Table 5 - Metro Region Logarithmic Regression Coefficients Sorted By Quartile (Distance-LQ Young Adults), Reporting R² Value

Q1	R ²	Q2	R ²	Q3	R ²	Q4	R ²
Boston	0.86	Atlanta	0.912	Austin	0.858	Birmingham	0.623
Chicago	0.895	Baltimore	0.764	Buffalo	0.646	Detroit	0.578
Dallas	0.705	Charlotte	0.868	Cincinnati	0.836	Jacksonville	0.507
Denver	0.862	Cleveland	0.684	Hartford	0.663	Las Vegas *	0.03
Milwaukee	0.849	Columbus	0.641	Indianapolis	0.659	Los Angeles	0.911
New York	0.916	Houston	0.856	Kansas City	0.758	Louisville/Jefferson County	0.773
Portland	0.917	Minneapolis	0.897	Memphis	0.621	Oklahoma City	0.807
San Diego	0.93	Philadelphia	0.781	Miami	0.664	Phoenix	0.523
San Francisco	0.778	Rochester	0.699	Nashville	0.602	Providence	0.572
Seattle	0.844	Sacramento	0.879	New Orleans	0.731	Raleigh	0.746
Washington	0.719	St. Louis	0.854	Orlando	0.808	Richmond	0.707
Calgary	0.671	Tampa	0.745	Pittsburgh	0.809	Riverside	0.431
Toronto	0.758	Montreal	0.726	San Jose	0.616	Salt Lake City	0.622
Vancouver	0.743	Ottawa-Gatineau	0.771	Edmonton	0.677	San Antonio	0.293
						Virginia Beach	0.593

* Not significant to at least a 95% level

Logarithmic coefficients in all cities 57 are negative. This model is more suggestive of the orientation of the dependent variable around the core (as measured by distance to the CBD). For cities in the first quartile, as distance increases from the CBD we observe a decrease in the log of young adult residential settlement. This indicates a centrality in the organization of settlement in more detail than had been indicated using the linear model. For cities in the fourth quartile, there is generally less of an orientation around core areas although negative coefficients indicate that location quotients of young adults still fall with increasing distance from the CBD. Coefficients hint at more dispersed patterns of organization in these cities. It is interesting to note that on average, R^2 values diminish in each higher quartile group. Thus the relatively moderate coefficients of cities in the fourth quartile with low R^2 values may indicate a more random dispersion of young adults where they are not better described using other models.

5.3 Quadratic Models

Quadratic models were able to explain up to 50% of the variation of young adult settlement by distance in 56 of 57 city regions. Because it is capable of explaining most of the variation, this suggests that the model is a good fit for the data. In 48 of 57 city regions first-order coefficients were found to be significant to at least the 95% level. Second-order coefficients in 32 of 57 city regions were found to have at least the same level of significance. A five number summary of first-order quadratic model coefficients is shown in Table 6. Second-order quadratic coefficients are included in Table 8. First- and second-order coefficients are sorted for each metropolitan region by quartile in Table 7 and Table 9.

Table 6 -5 Number Summary: Distance-LQ Young Adults Quadratic Regression First-Order Coefficient

Quadratic (First-Order) Summary	
Max	0.006
Q3	-0.028
Median	-0.041
Q1	-0.057
Min	-0.108

Table 7 – Metro Region Quadratic Regression First-Order Coefficients Sorted By Quartile (Distance-LQ Young Adults), Reporting R² Value

Q1	R²	Q2	R²	Q3	R²	Q4	R²
Boston	0.913	Buffalo	0.890	Atlanta	0.940	Austin	0.927
Chicago	0.942	Charlotte	0.862	Baltimore	0.654	Birmingham *	0.559
Cleveland	0.754	Columbus	0.658	Calgary *	0.096	Detroit	0.533
Dallas	0.605	Houston	0.791	Cincinnati	0.876	Edmonton	0.574
Denver	0.814	Kansas City	0.799	Indianapolis	0.602	Hartford *	0.670
New York	0.938	Miami	0.701	Las Vegas *	0.322	Jacksonville *	0.585
Portland	0.872	Milwaukee	0.781	Los Angeles	0.895	Louisville/Jefferson County	0.746
Rochester	0.702	Minneapolis	0.938	Nashville	0.678	Memphis *	0.533
San Diego	0.926	Philadelphia	0.729	New Orleans	0.724	Phoenix *	0.626
San Francisco	0.844	Pittsburgh	0.832	Oklahoma City	0.788	Raleigh	0.781
Seattle	0.864	Providence	0.710	Orlando	0.737	Richmond	0.801
Washington	0.846	St. Louis	0.793	Sacramento	0.789	Riverside *	0.585
Montreal	0.827	Ottawa-Gatineau	0.741	Salt Lake City	0.663	San Antonio *	0.515
Toronto	0.736	Vancouver	0.641	San Jose	0.624	Tampa	0.792
						Virginia Beach	0.594

* Not significant to at least a 95% level

Polynomial functional forms indicate a degree of polynodality in a spatial distribution. The improved fit of the quadratic model over linear and logarithmic forms indicates that there may be a degree of polynodality in the spatial distributions of young adults in many of the observed city regions. The first-order coefficients indicate the slope and direction of the linear relationship of variables when fit to a quadratic function. The range of these coefficients is narrow, between -

0.11 and 0.01. Values in the first quartile generally indicate a more negative relationship where young adult residential settlement declines at a steeper rate with distance than that in the fourth quartile. In the fourth quartile, this relationship is more moderate. Several coefficients are not significant at the 95% level however, indicating that a quadratic form despite their respective R² values does not adequately describe these relationships.

Second-order polynomial coefficients describe the steepness and direction of the curve of the quadratic function.

Table 8 - 5 Number Summary: Distance-LQ Young Adults Quadratic Regression Second-Order Coefficient

Quadratic (Second-Order) Summary	
Max	0.002
Q3	0.001
Median	-0.648E-3
Q1	-0.314E-3
Min	-0.335E-3

Table 9 - Metro Region Quadratic Regression Second-Order Coefficients Sorted By Quartile (Distance-LQ Young Adults), Reporting R² Value

Q1	R ²	Q2	R ²	Q3	R ²	Q4	R ²
Atlanta *	0.940	Baltimore *	0.654	Buffalo	0.890	Boston	0.913
Austin *	0.927	Calgary *	0.576	Charlotte	0.862	Chicago	0.942
Birmingham *	0.559	Cincinnati	0.876	Columbus	0.658	Cleveland	0.754
Detroit *	0.533	Edmonton *	0.574	Houston	0.791	Dallas *	0.605
Hartford *	0.670	Indianapolis *	0.602	Kansas City	0.799	Denver	0.814
Jacksonville *	0.585	Las Vegas *	0.094	Milwaukee	0.781	Miami	0.701
Memphis *	0.533	Los Angeles	0.895	Minneapolis	0.938	Montreal	0.827
Phoenix *	0.626	Louisville/Jefferson County *	0.746	Philadelphia	0.729	New York	0.938
Raleigh *	0.781	Nashville *	0.678	Pittsburgh	0.832	Portland	0.872
Richmond *	0.801	New Orleans	0.724	Providence	0.710	Rochester	0.702
Riverside *	0.585	Oklahoma City	0.788	Salt Lake City	0.663	San Diego	0.926
San Antonio *	0.515	Orlando *	0.737	St. Louis	0.793	San Francisco	0.844
Tampa *	0.792	Sacramento *	0.789	Ottawa-Gatineau	0.741	Seattle	0.864

Virginia Beach *	0.594	San Jose	0.624	Vancouver *	0.641	Toronto	0.736
						Washington	0.846

* Not significant to at least a 95% level

Second-order quadratic coefficients were found to be significant to the 95% confidence interval in 32 of 57 city regions. These findings indicate that in metro regions where coefficients were found to be significant, there exist polycentric forms. City regions in the second quartile (Los Angeles, Oklahoma and San Jose) exhibited relatively moderate negative linear relationships indicating a more decentralized spatial arrangement. These same regions also have more moderate upward curves. Metro regions in the third and fourth quartiles of second-order coefficients also generally have stronger negative correlations between young adult settlement and distance to the CBD. Chicago, a region with a strong upward sloping curve, also exhibits a strong negative linear orientation (indicated by the first-order coefficient).

5.4 Cubic Models

Cubic models generally exhibit a high fit with the data. This is generally expected of higher-order functional forms. In 45 of 57 cities, cubic functions were best able to describe variation in the data. In 56 of 57 cases, R^2 values were calculated to be in excess of 50%.

Five number summaries of first and second order coefficients are presented in Table 10 and Table 12. In Table 11 and Table 13, coefficients are used to sort metro regions by quartile.

Table 10 - 5 Number Summary: Distance-LQ Young Adults Cubic Regression First-Order Coefficient

Cubic (First-Order) Summary	
Max	0.112
Q3	-0.035
Median	-0.077
Q1	-0.122
Min	-0.193

Table 11 - Metro Region Cubic Regression First-Order Coefficients Sorted By Quartile (Distance-LQ Young Adults), Reporting R² Value

Q1	R²	Q2	R²	Q3	R²	Q4	R²
Boston	0.962	Baltimore	0.788	Birmingham	0.759	Atlanta *	0.940
Chicago	0.996	Calgary *	0.650	Buffalo	0.900	Austin *	0.932
Cleveland	0.826	Charlotte	0.880	Cincinnati	0.918	Columbus *	0.665
Dallas	0.773	Edmonton	0.753	Hartford *	0.743	Detroit *	0.544
Denver	0.857	Houston	0.844	Indianapolis *	0.658	Jacksonville *	0.676
Miami	0.868	New York	0.961	Kansas City	0.823	Las Vegas *	0.422
Milwaukee	0.869	Ottawa-Gatineau	0.800	Louisville/Jefferson County	0.792	Los Angeles	0.899
Philadelphia	0.843	Pittsburgh	0.907	Memphis *	0.575	Nashville *	0.733
Portland	0.921	Sacramento	0.884	Minneapolis	0.947	Phoenix *	0.822
Rochester	0.946	Salt Lake City	0.778	New Orleans *	0.725	Raleigh *	0.783
Washington	0.949	San Diego	0.937	Oklahoma City *	0.797	Richmond *	0.834
Montreal	0.983	San Francisco	0.874	Orlando	0.807	Riverside *	0.585
Toronto	0.886	Seattle	0.921	Providence	0.742	San Antonio *	0.571
Vancouver	0.823	St. Louis	0.863	San Jose *	0.643	Tampa *	0.805
						Virginia Beach *	0.608

* Not significant to at least a 95% level

Table 12 - 5 Number Summary: Distance-LQ Young Adults Cubic Regression Second-Order Coefficient

Cubic (Second-Order) Summary	
Max	0.007
Q3	0.004
Median	0.002
Q1	0.765E-3
Min	-0.007

Table 13 – Metro Region Cubic Regression Second-Order Coefficients Sorted By Quartile (Distance-LQ Young Adults), Reporting R² Value

Q1	R ²	Q2	R ²	Q3	R ²	Q4	R ²
Atlanta *	0.940	Birmingham	0.759	Calgary *	0.650	Baltimore	0.788
Austin *	0.932	Buffalo *	0.900	Edmonton	0.753	Boston	0.962
Columbus *	0.665	Charlotte *	0.880	Hartford *	0.743	Chicago	0.996
Detroit *	0.544	Cincinnati	0.918	Houston	0.844	Cleveland	0.826
Jacksonville *	0.676	Kansas City *	0.823	Indianapolis *	0.658	Dallas	0.773
Las Vegas *	0.422	Los Angeles *	0.899	New York	0.961	Denver	0.857
Nashville *	0.733	Louisville/Jefferson County *	0.792	Orlando *	0.807	Miami	0.868
New Orleans *	0.725	Memphis *	0.575	Ottawa-Gatineau	0.800	Milwaukee	0.869
Phoenix	0.822	Minneapolis	0.947	Pittsburgh	0.907	Philadelphia	0.843
Raleigh *	0.783	Oklahoma City *	0.797	Sacramento	0.884	Portland	0.921
Richmond *	0.834	Providence *	0.742	Salt Lake City	0.778	Rochester	0.946
Riverside *	0.585	San Diego	0.937	San Francisco	0.874	Washington	0.949
San Antonio *	0.571	San Jose *	0.643	Seattle	0.921	Montreal	0.983
Tampa *	0.805	Virginia Beach *	0.608	St. Louis	0.863	Toronto	0.886
						Vancouver	0.823

* Not significant to at least a 95% level

Table 14 -5 Number Summary: Distance-LQ Young Adults Cubic Regression Third-Order Coefficient

Cubic (Third-Order) Summary	
Max	0.100E-3
Q3	-0.6E-5
Median	-0.29E-4
Q1	-0.47E-4
Min	-0.87E-4

Table 15 – Metro Region Cubic Regression Third-Order Coefficients Sorted By Quartile (Distance-LQ Young Adults), Reporting R² Value

Q1	R ²	Q2	R ²	Q3	R ²	Q4	R ²
Baltimore	0.788	Cleveland *	0.826	Birmingham	0.759	Atlanta *	0.940
Boston	0.962	Denver *	0.857	Buffalo *	0.900	Austin *	0.932
Calgary *	0.650	Hartford *	0.743	Charlotte *	0.880	Columbus *	0.665
Chicago	0.996	Houston *	0.844	Cincinnati	0.918	Detroit *	0.544
Dallas	0.773	Orlando *	0.807	Indianapolis *	0.658	Jacksonville *	0.676
Edmonton	0.753	Ottawa-Gatineau *	0.800	Kansas City *	0.823	Las Vegas	0.422
Miami	0.868	Pittsburgh	0.907	Louisville/Jefferson County *	0.792	Los Angeles *	0.899

Milwaukee	0.869	Portland	0.921	Memphis *	0.575	Nashville *	0.733
Montreal	0.983	Sacramento	0.884	Minneapolis *	0.947	New Orleans *	0.725
Philadelphia	0.843	Salt Lake City	0.778	New York	0.961	Phoenix	0.822
Rochester	0.946	San Francisco *	0.874	Oklahoma City *	0.797	Raleigh *	0.783
Toronto	0.886	Seattle	0.921	Providence *	0.742	Richmond *	0.834
Vancouver	0.823	St. Louis	0.863	San Diego *	0.937	Riverside *	0.585
Washington	0.949			San Jose *	0.643	San Antonio *	0.571
				Virginia Beach *	0.608	Tampa *	0.805

* Not significant to at least a 95% level

Table 15 shows that cubic forms are found to be significant in 24 of 57 metro regions. For city regions such as New York that generally also show good fit with quadratic and logarithmic forms, the high degree of significance for cubic coefficients indicates a greater degree of poly-centricity in the organization of young adult settlement. Cubic forms offer very nuanced insight into the organization of young adult settlement in city regions.

Cubic coefficients indicate that in regions like New York there is a strong negative linear relationship of the variables and moderately strong variation in their distribution (as indicated by moderately strong second and third order coefficients. New York has a strong orientation around a core area but the model suggests that there are multiple nodes situated outside of core areas.

City regions like Toronto – with first-order coefficients in the first quartile (strong negative correlation), second-order coefficients in the fourth quartile and third-order coefficients in the first quartile (high variation in the curve) – also exhibit strong orientation around a central core but the model suggests that outlying regions may have strong nodes of young adult settlement.

City regions like Phoenix have low first-order coefficients. Phoenix is one of few cities with a positive first-order coefficient. Phoenix has a very moderate positive first-order coefficient at 0.034. This signals young adult settlement increasing on average with distance from the CBD when interpreted using a cubic model. Second and third order coefficients also run contrary to observed patterns in most other cities. Overall, in regions like Phoenix, these patterns signal young adult settlement that is not oriented around the core but rather is decentralized and dispersed.

5.5 Age-Distance Distributions By Metro-Region Classified By Functional Form

Cubic	Quadratic	Logarithmic with Significant Quadratic Forms	Logarithmic	Linear
Baltimore	Buffalo	Charlotte	Detroit	Atlanta
Birmingham	Cleveland	Denver	Indianapolis	Austin
Boston	Columbus	Houston	Louisville/Jefferson County	Hartford
Chicago	Kansas City	Los Angeles	Memphis	Jacksonville
Cincinnati	Minneapolis	New Orleans	Nashville	Richmond
Dallas	Providence	Oklahoma	Orlando	Riverside
Las Vegas	San Francisco	San Diego	Raleigh	San Antonio
Miami	San Jose	Ottawa-Gatineau	Tampa	Virginia Beach
Milwaukee				Calgary
New York				
Philadelphia				
Phoenix				
Pittsburgh				
Portland				
Rochester				
Sacramento				
Salt Lake City				
Seattle				
St. Louis				
Washington				
Edmonton				
Montreal				
Toronto				
Vancouver				

Table 16 - Age-Distance Distributions By Metro-Region Classified By Functional Form

5.6 Classifying Young Adult Settlement

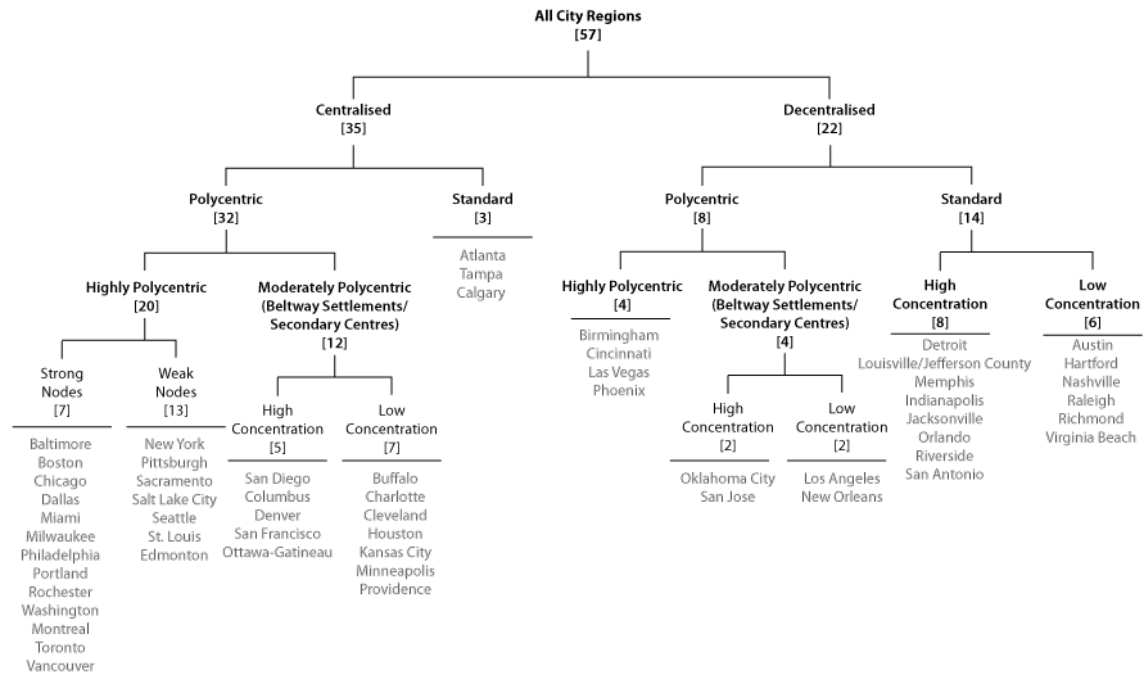


Figure 14 - Results: Metro Regions Classified By Patterns Of Young Adult Settlement

Several dominant forms of young adult settlement were observed through this study.

The variation in these forms can largely be described by centralized or less centralized spatial distributions. What was found is that polycentric spatial patterns are generally associated with centralized concentrations of young adult settlement.

In most regions, concentrations of young adult residential location only occur in multi-nodal patterns if there is also a high concentration of young adults downtown.

In relatively less centralized metro regions, patterns are more commonly associated with standard decay distributions where no neighbourhood outside of the regional core holds a strong concentration of young adult settlement.

Three centralized metro regions were found not to exhibit pronounced polycentric settlement patterns: Atlanta, Tampa and Calgary. Visually, settlement patterns in

these three city regions do exhibit some tendencies towards poly-centricity however although regression coefficients were not found to be significant for polynomial forms.

Centrality and Poly-centricity

The results point to a dominant pattern of centrality and poly-centricity in young adult settlement. Where regional spatial distributions in settlement exhibit strong concentrations in centralized neighbourhoods, outlying secondary nodes also exhibit high concentrations of young adult settlement. This finding seems to point to similar processes as identified by Moos (2012). Household characteristics, income constraints, commuting preferences, housing cost and urban form resulted in a high intensity corridor identified in Vancouver. In Montreal, Moos determines that some of the same factors created a particular concentration of settlement within the regional core. In this study, 32 city regions are found to exhibit similar patterns and it is due to similar factors. As driven by ecological forces and income constraints, young adults in their housing decisions accept the geography of residential living available to them. Thus location decisions are made within the context of an existing regional urban form. On its own, urban form can exhibit complex patterns in characteristics such as neighbourhood density, housing form and even income dynamics. The particular pattern of centrality and poly-centricity is a result of specific demographic and economic characteristics of the cohort combined with the specific urban form of the metro region.

Poly-Centricity in Urban Development

Poly-centricity is a dominant form of young adult settlement found in large metro regions like New York and Chicago and smaller regions such as Rochester and Providence. Such forms are evident regardless of the centrality of settlement. Visually, polycentric forms take on unique patterns dependant on the city region. Some metropolitan regions are composed of a single dominant city and exurban or rural settlements; others are an amalgamation of older towns. In some regions, cities have grown up in continuing competition for investment and take on uniquely decentralized patterns of poly-centricity. This type competitive growth can also create complex poly-centricity as in the binary metropolitan region of the Dallas-Fort Worth metroplex.

Young adults, with little power to reconstruct an urban landscape, consume the living space provided in the region and thus location decisions are prefaced by existing form. The concept of the neoliberal spatial fix as described by Hackworth (2007) has been useful in understanding the tendencies of capital flows within and between regions, but highly localized geographies are also at play. There exists in each city region a unique form negotiated between the city and its region, between downtown and suburbs, even between centres of settlement across the city.

Boston: A City and its region

The urbanized area of Boston bounded by the I-95 at its outer extent sits at the centre of an expansive metropolitan region stretching from southern Massachusetts at New Bedford to Rochester in southern New Hampshire.

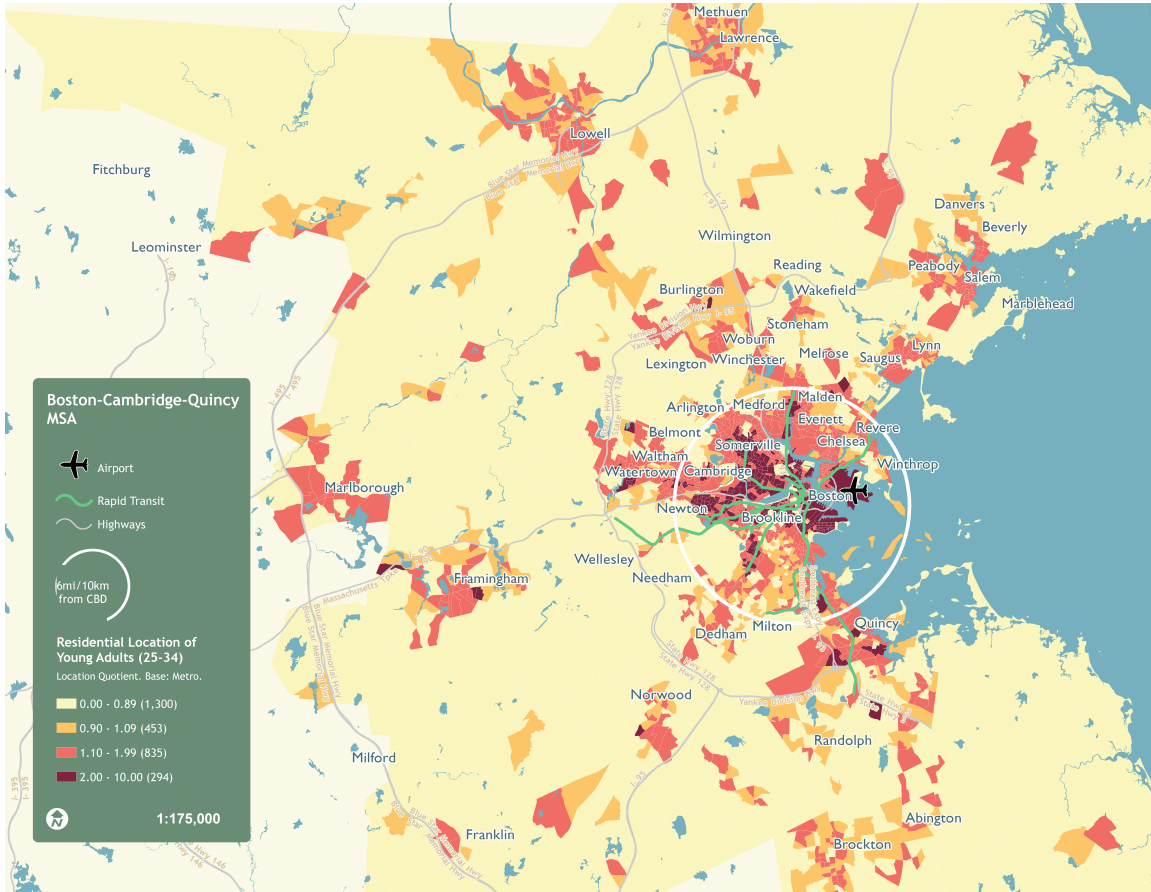


Figure 15 - Young Adult Settlement in Boston-Cambridge-Quincy MSA Mapped By Location Quotient, 2010 US Census Data.

There are many small towns surrounding the urbanized area: Wayland, Concord, Lincoln. Much of these towns in the rural reaches of metropolitan Boston show no particular concentration of young adults. Several kilometres more past the reaches of suburban Boston and these rural small towns, scattered along the I-495, are the towns of Marlborough, Lowell, Lawrence and Haverhill. Figure 15 shows these clusters in a map of the region. These exurban settlements contain clusters of young adult settlement connected by the interstate highway, otherwise isolated beyond the reach of any continuous conurbation or amalgamated built-up settlement stretching outwards from the regional core. The form of polycentric settlement

exhibited in the Boston MSA is that of a predominant core and of relatively isolated exurban settlements lying beyond any continuous reach of urbanized form.

Toronto: City vs. Suburbs

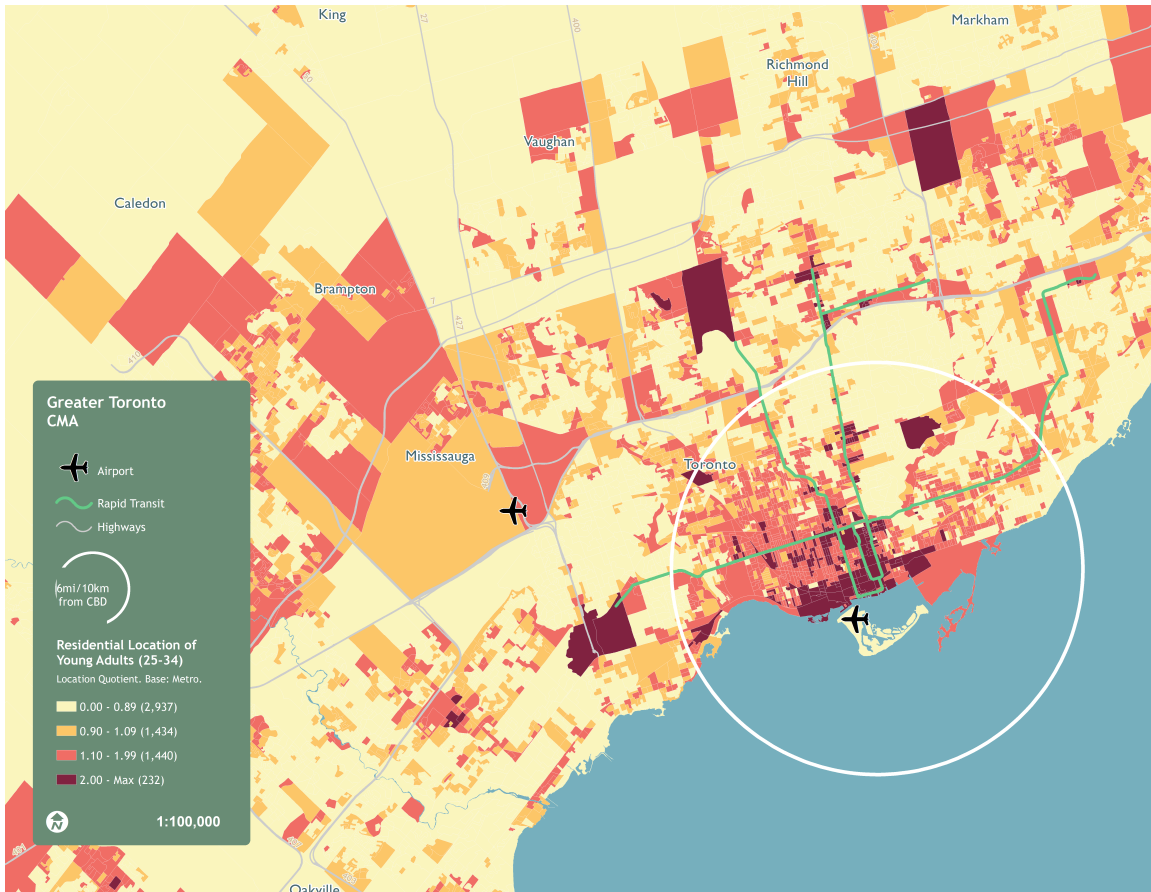


Figure 16 - Young Adult Settlement in Toronto CMA Mapped By Location Quotient, 2011 Canadian Census Data.

Similar to the case of Boston, the city of Toronto lies at the centre of an expansive region, stretching north from Lake Ontario at its most southern extent to the shores of Lake Simcoe. The metro region is Canada's largest and extends into a larger conurbation around the western shores of Lake Ontario containing a sizable portion

of the Canadian population and the majority of the population of the Province of Ontario.

Young adult settlement tends to occur in the metro core, in downtown Toronto (see Figure 16). Downtown Toronto is known for dense high rise condominium and apartment living in neighbourhoods like Liberty Village, Cityplace, Bay Street and along the Waterfront and multiple dwelling accommodation in downtown neighbourhoods like Little Italy. This settlement extends north in high concentration into the rapidly redeveloping Yonge and Eglinton neighbourhood and generally in dissipating patterns north from the downtown. Beyond the boundaries of the old city of Toronto (a battleship shape of highly concentrated settlement), there exists a clear gap beyond which neighbourhood concentrations of young adult settlement decline. In suburban Toronto, there are nodes of particularly concentrated young adult settlement in North York and Etobicoke.

Queen Street, extending east and west from Toronto's CBD marks the boundary of an extensive centre of young adult settlement. South of this boundary, from its western extent at Dufferin to its eastern extent in Leslieville, housing is predominantly high-rise to midrise in form. This region has been redeveloped as a

result of Toronto's condo and development boom.



Figure 17 - The Dividing Line: looking west from University Avenue along Queen Street. To the south is a centre of intense young adult settlement extending well into the distance. High-rise development is concentrated within this southern district.

This district is serviced by some of the city's most heavily travelled streetcar lines, which connect to subway service and the city's financial district. Parts of this district are also considered very cool. (Vogue named Queen West in Toronto the second coolest neighbourhood in the World; Remsen, 2014.) Trendy restaurants and retail are located along Queen and King Street in the Fashion District and the Design District (Queen West and King East). The district reaches the southern extent of Kensington Market, a counterculture district.

Directly north of this boundary is a region of moderately high concentration extending north of Bloor and occurring primarily west of Downtown. In this district,

row houses, duplexes and low-rise apartments are situated on side streets.



Figure 18 - Row houses and low-rise apartments on a side street north of Queen Street (view of Brock Avenue from Middleton Street).

Most common on main streets are 2- 3-storey residential over retail dwellings although some newly developed mid-rise developments are situated on main streets like College Street. The district is serviced by the Bloor-Danforth Subway Line, near the northern extent, as well as several streetcar lines (Queen, Dundas and College lines) and the Spadina LRT throughout.

Vibrant and growing suburban municipalities surround the City of Toronto. Cities like Brampton, Markham, Mississauga attract and retain young adults. Settlement

does not occur in the same concentrations as in the city of Toronto but throughout these suburban municipalities there exist overrepresentations of young adult settlement across several neighbourhoods.

The Toronto CMA is composed of a city closely interwoven with growing and vibrant suburban municipalities. The city cooperates and competes with its partners in the region; together attracting residents and employers from abroad but competing for settlement. The region has a spikey geography of land values, as one of Canada's most valued property markets with the highest number of residential towers under construction in North America and a region experiencing continued growth in single-family housing construction. The form of young adult settlement here is one of extreme concentration in the regional core while regional municipalities maintain some level of settlement concentration in neighbourhoods.

Loci of Activity: Suburban Malls, Universities and Loci of Cool

In Cleveland and Houston, there are neighbourhoods on the outskirts of the metropolitan core with high concentrations of young adult settlement. These neighbourhood centres are as follows: in Cleveland, the neighbourhoods surrounding University Circle, east of downtown (see Figure 19) and neighbourhoods surrounding West University/Rice Village south west of downtown in Houston (see Figure 20).

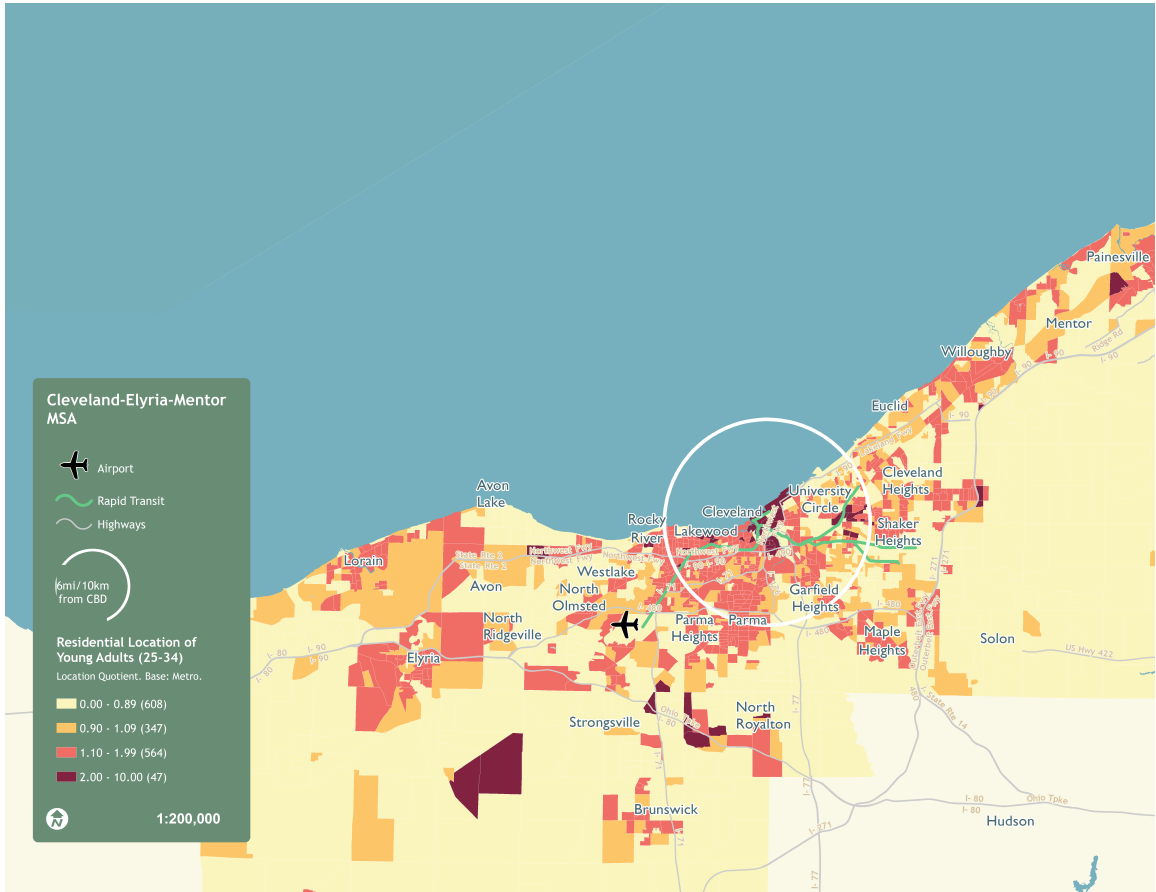


Figure 19 - Young Adult Settlement in Cleveland-Elyria-Mentor MSA Mapped By Location Quotient, 2010 US Census Data.

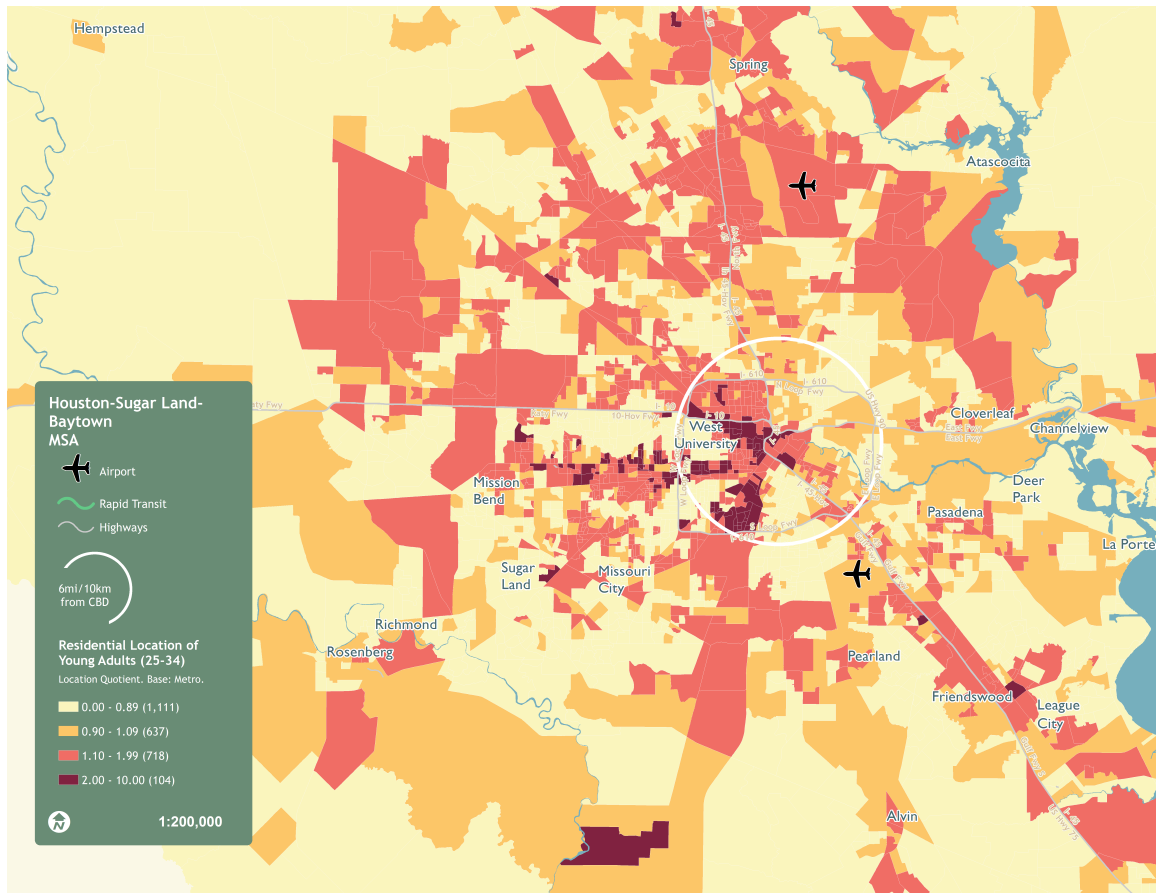


Figure 20 - Young Adult Settlement in Houston-Sugar Land-Baytown MSA Mapped By Location Quotient, 2010 US Census Data.

At the centre of these neighbourhoods are loci of young adult settlement. In both Cleveland and Houston, universities (Case Western and Rice University respectively) anchor these centres of settlement. There are anchors of other types. In Atlanta, regional malls (Howell Mill Square and the Cumberland Mall) form loci of young adult settlement, some of which are served by rapid transit. In Seattle, the Microsoft campus in Redmond forms a locus for a centre of settlement. In Baltimore, an outlying centre of young adult settlement occurs around Coppin State University, Johns Hopkins University, Mondawmin Mall and the Maryland Zoo. This neighbourhood is also served by rapid transit connecting to the downtown.

Some young adult neighbourhoods are inexplicably loci of cool. These neighbourhoods, nestled within city limits and not always at their core, are known for histories of arts and counter culture. The neighbourhoods of Fremont in Seattle, Northwest and Pearl District Portland, Williamsburg in New York, Kensington Market (Figure 21) in Toronto and Montrose in Houston are examples of these trendy forms of urban rejuvenation and centres of young adult activity. These neighbourhoods are full of the quirks, ego and charm normally associated with trendy young adult neighbourhoods: graffiti, street art and a wealth of public events.



Figure 21 - Impromptu Fire Dancing, Kensington Market, Toronto

Indeed many cities exhibit centralized settlement patterns with centres of young adult settlement oriented around loci (universities, malls, employment and

epicentres of counterculture) but these patterns exist within the context of a dominant core or between a city and competing suburban municipalities. In Detroit, this pattern occurs at a regional scale, forming a major centre of young adult settlement.

Detroit, a city region particularly impacted by deindustrialization and population decline, exhibits decentralized settlement of young adults. The city of Detroit itself exhibits very low representations of young adult settlement with moderate concentrations downtown, in the Eastern Market district to the north east of downtown and the Southwest District to the west of downtown (see Figure 22).

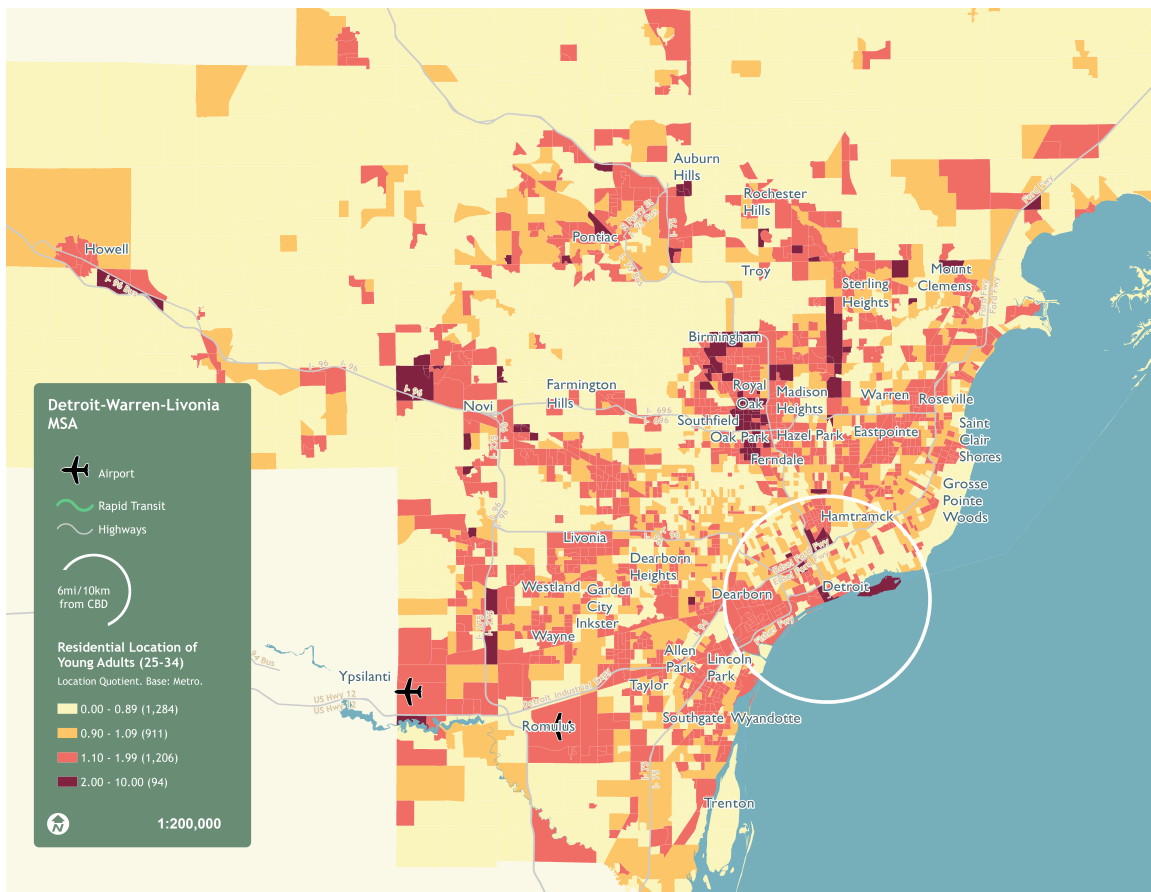


Figure 22 - Young Adult Settlement in Detroit-Warren-Livonia MSA Mapped By Location Quotient, 2010 US Census Data.

Young adults settle in high concentrations in neighbourhoods in the suburban towns of Royal Oak and Birmingham. Main street retail and a number of shopping malls are located nearby, along with the Detroit Zoo. To the east is the General Motors technical centre in another neighbourhood of concentrated settlement. Young adult settlement is not oriented around the CBD in Detroit but rather centred outside of the city around other, suburban amenity and employment centres.

In cities where it is available, rapid transit appears coincident with high proportions of young adult residence in neighbourhoods, but transit alone does not appear to dictate centres of young adult residence. Instead, it appears that in American cities, young adult centres are coincident to transit as is seen in Chicago, Cleveland, and Atlanta. In these cities, young adult settlement appears in nodes where neighbourhoods exhibiting a moderate settlement pattern surround a cluster of neighbourhoods with an exceptionally large proportion of young adults. In American cities served by rapid transit, service may bisect one of these centres but transportation infrastructure generally does not appear to shape settlement distributions.

In Canada, the orientation is different. In Calgary, Montreal, Ottawa, Toronto and Vancouver, young adult settlement appears to fall in line with the geography of rapid transit. Settlement is either high, motivated by transit provision, or it occurs in concert with the same neighbourhood investments that bring rapid transit services. In Montreal, a swath of settlement extends west across the Island of Montreal in particular concentration in areas proximate to the Orange Line of the STM subway.

In Toronto where young adult centres stretch north from the waterfront, they do so in greatest concentration in the corridor between the Yonge and University subway lines to the Bloor-Danforth line at the northern extent and the corridor continues in sparse clusters north along the Yonge subway corridor into North York. In Calgary and Vancouver, bands of moderate settlement occur stretching outwards from the CBD along the light-rail line in Calgary and the Sky Train in Vancouver (see Figure 23).

What is also interesting is the concentration of these patterns in Canadian cities. Extensive swaths of Vancouver, Calgary, Edmonton and Toronto show very low proportions of young adult settlement relative to metro levels. Young adults are not settling large segments of the urbanized areas of Vancouver, Calgary and Toronto.

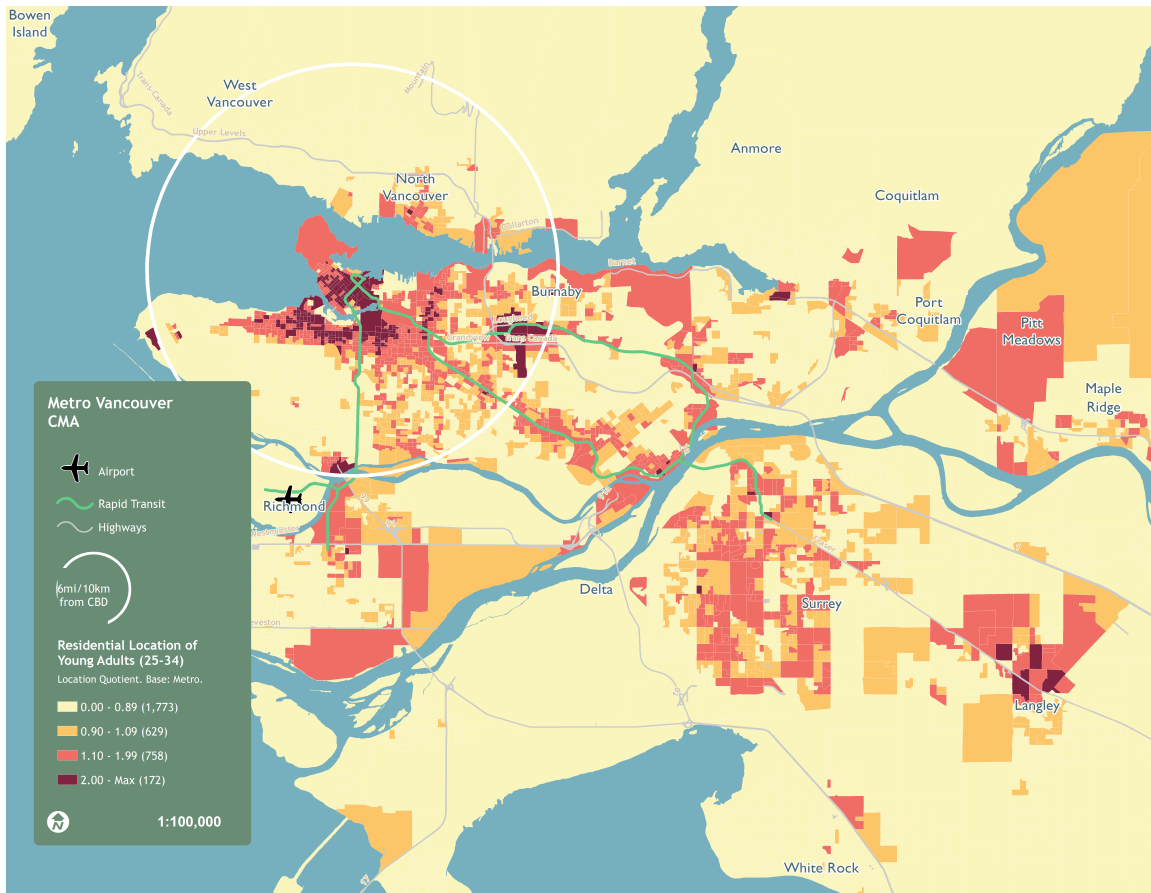


Figure 23 - Young Adult Settlement in Vancouver CMA Mapped By Location Quotient, 2011 Canadian Census Data.

While communities like Kitsilano, Mount Pleasant and Willindon Heights in Metro Vancouver are magnets for young adults, neighbourhoods like Oakridge, Western Richmond and Government Road (Burnaby) are polar opposites. This polarity generally appears to be a particular characteristic that is more prevalent among Canadian cities.

Dispersed, De-centred: Las Vegas, Phoenix

Las Vegas and Phoenix both have unique urban form. The built form of both cities is dispersed. The neoliberal geographies of disinvestment and reinvestment within these cities are similarly unique. Again, between them, patterns of young adult

settlement are similar. Here, both metros are classified as being both polycentric and decentralized.

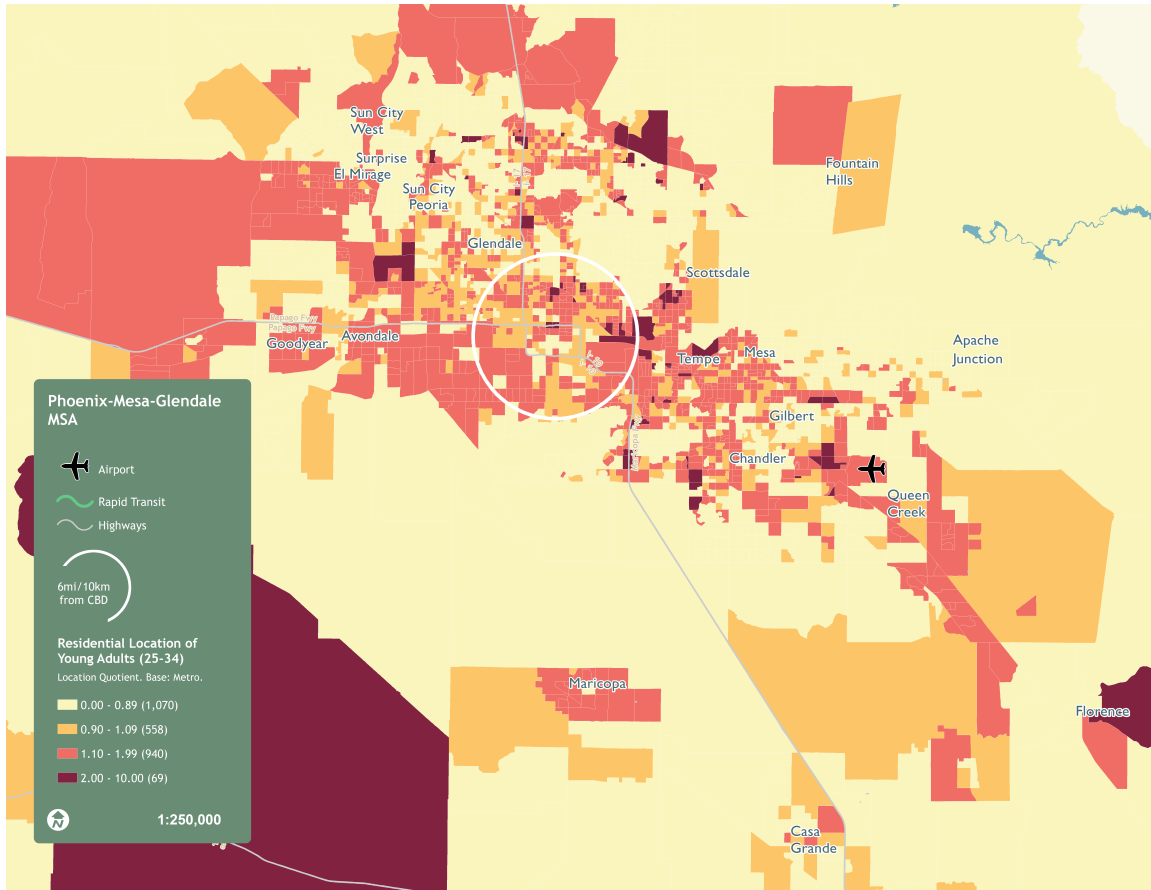


Figure 24 - Young Adult Settlement in Phoenix-Mesa-Glendale MSA Mapped By Location Quotient, 2010 US Census Data.

Young adult settlement in Phoenix appears as a swath of relatively even concentration along a Northwest-Southeast axis. Running in highest concentration along the centre of that axis, dissipating towards the fringes of the urbanized area. There is no particular concentration of settlement in the CBD. There are only small centres of high young adult settlement in Mesa and Glendale but the overall pattern is one of only loose organization regionally.

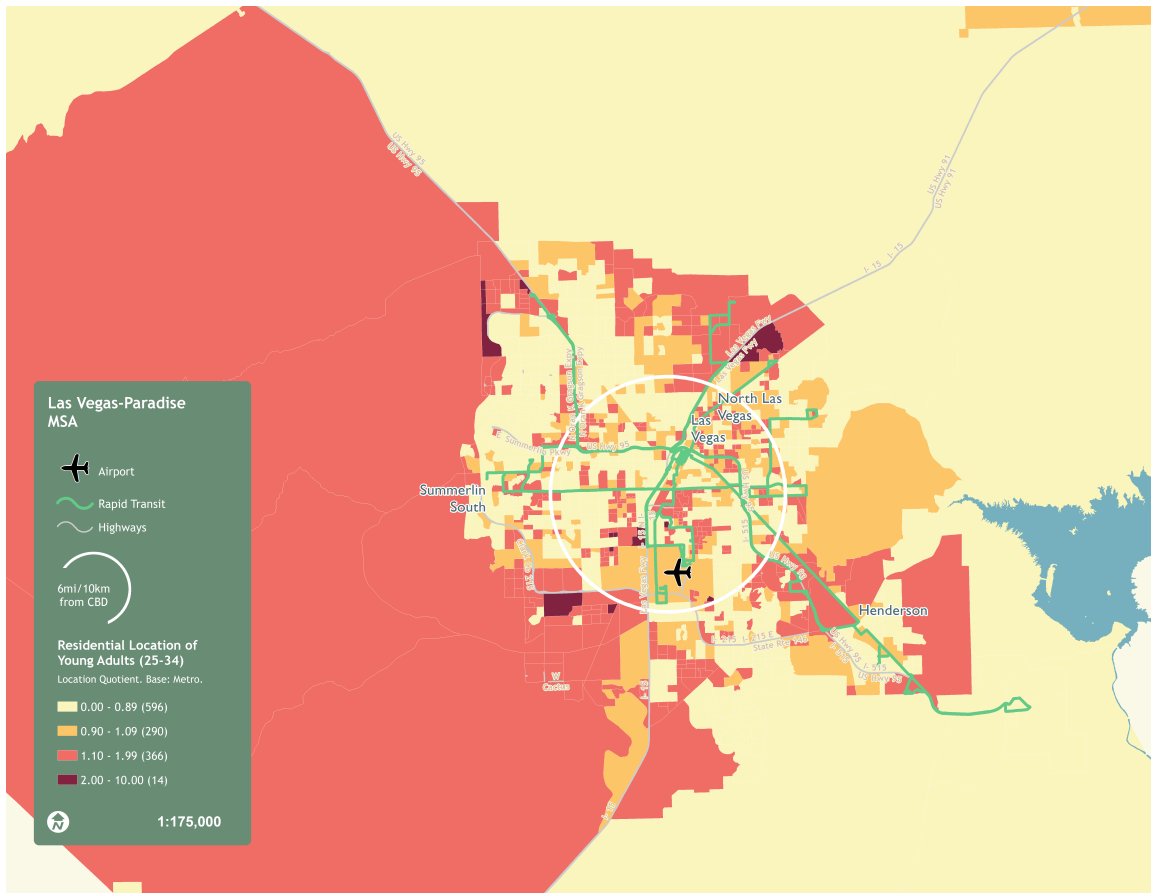


Figure 25 - Young Adult Settlement in Boston-Cambridge-Quincy MSA Mapped By Location Quotient, 2010 US Census Data.

In Las Vegas, it is difficult to identify highly settled centres of young adult residence. The settlement pattern is dispersed. Generally, settlement appears to occur in moderate intensity towards the periphery of the built-up area: in Spring Valley and in North Las Vegas. Elsewhere within the city, young adult neighbourhoods of moderate concentration are scattered amongst neighbourhoods of very low young adult settlement. Where young adult settlement occurs in moderate concentration it is serviced by a bus rapid transit line that generally bisects these neighbourhoods. Regionally, there are no suburban cities or exurban towns lying beyond the built-up area of Las Vegas with significant young adult settlement.

Los Angeles and Dallas: Neighbourhoods in Balance

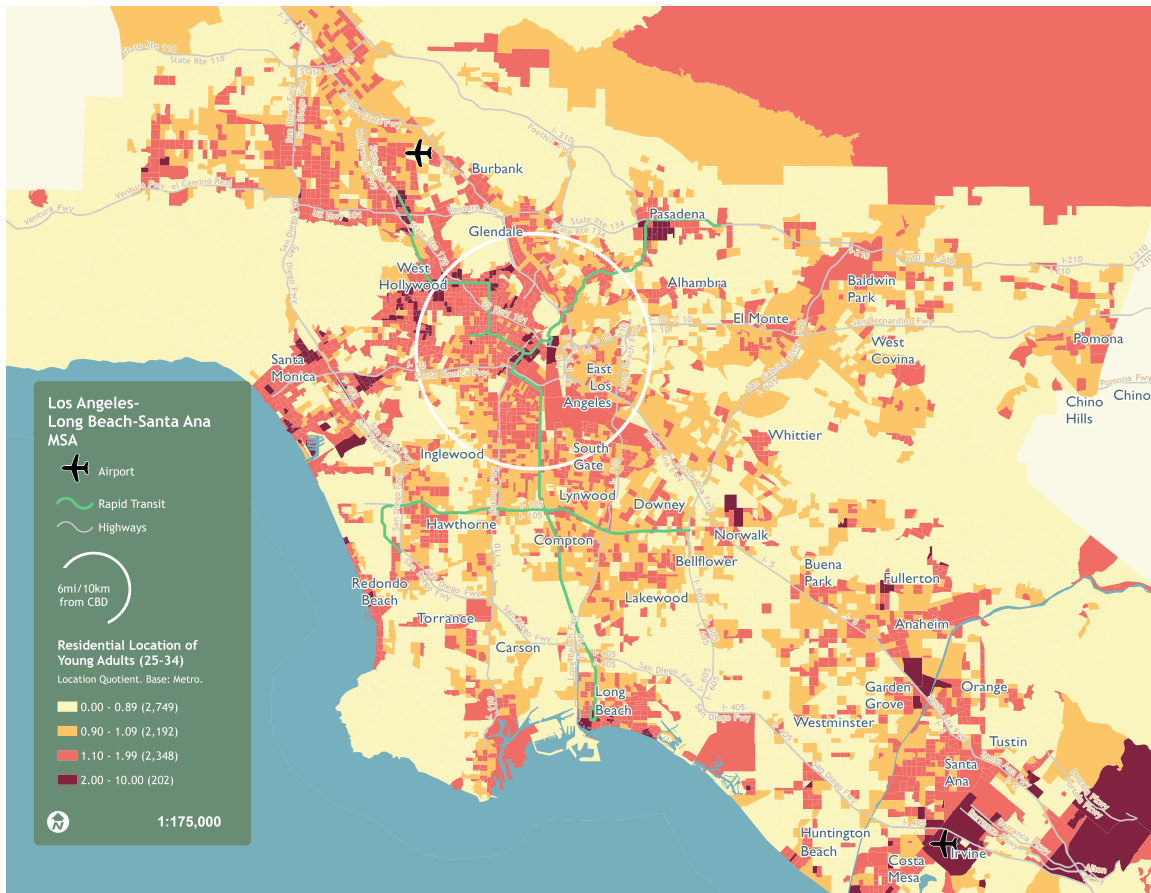


Figure 26 - Young Adult Settlement in Los Angeles-Long Beach-Santa Ana MSA Mapped By Location Quotient, 2010 US Census Data.

Los Angeles is a city of such decentred urban structure as to represent a unified criticism of the Chicago School of urban geography. Los Angeles is *the* post-modern city, an arrangement of centres with varying levels of integration between each of them organized as a sprawling metropolis from hills, through valleys, across plains to the sea. The city region grew to envelope surrounding cities and communities and exists still as an association of places. Young adult settlement patterns reflect this (see Figure 26). Settlement is polycentric. Young adult settlement is not centred, it occurs in many places and in many nodes with no particular relation to the CBD. Settlement here is different to the dispersed and decentred form of Las Vegas and Phoenix however. Young adults in Los Angeles are organized into neighbourhoods

centred on nodes of particular concentration. Downtown LA is a centre of young adult residence and the neighbourhoods surrounding to the west and south exhibit moderately high degrees of settlement. Hollywood, North Hollywood, Brentwood, Palms, Downtown Pasadena, Downtown Long Beach and Venice Beach are all neighbourhoods of high young adult settlement. The location of these centres is scattered throughout the urbanized area with locations to the south, west, north and northeast of downtown. Young adult settlement therefore has no centre but is distributed in rough balance throughout the region while neighbourhoods of moderate and very low settlement lay between. Most settlement occurs within the urbanized areas extending from Los Angeles. There is little settlement in outlying towns.

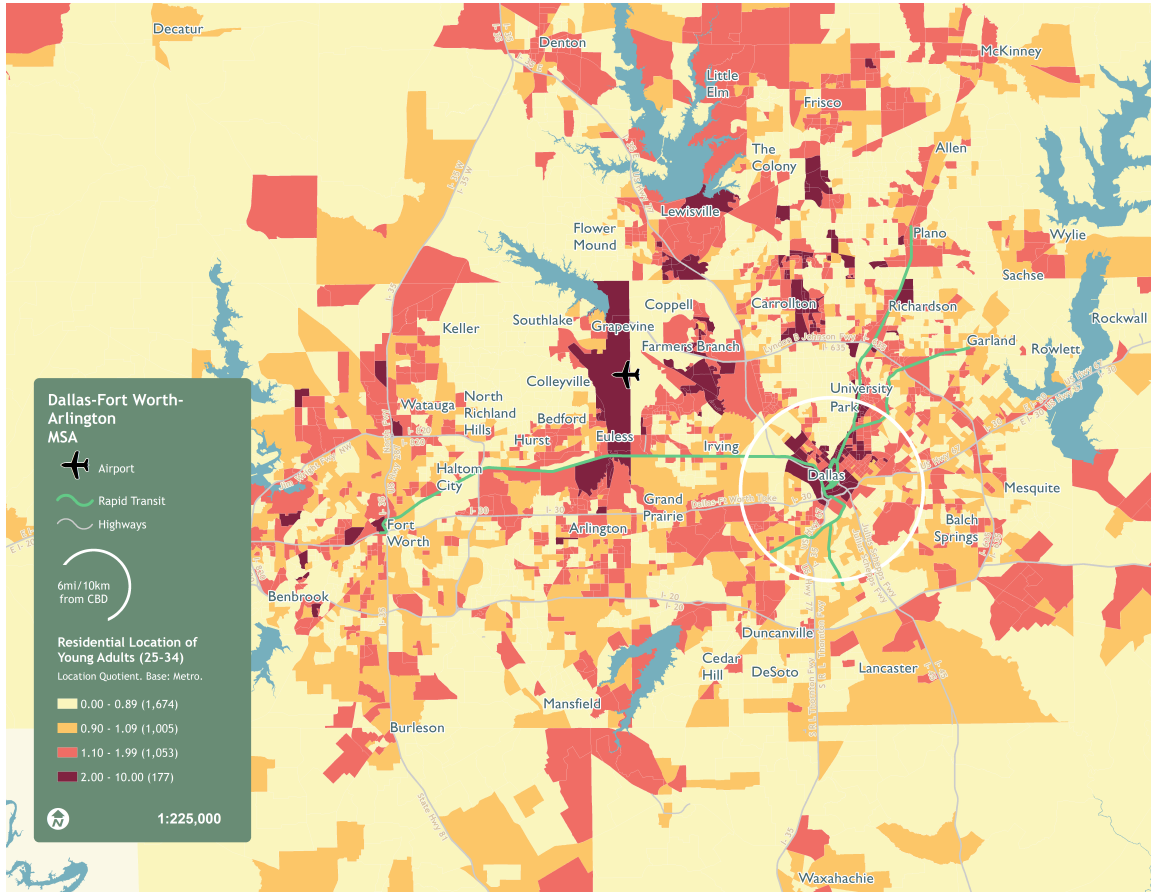


Figure 27 – Young Adult Settlement in Dallas-Fort Worth-Arlington MSA Mapped By Location Quotient, 2010 US Census Data.

Similarly, Dallas is a collection of centres. Young adult settlement in the Dallas metro region is centralized with a large share of the downtown population composed of young adults (see Figure 27). Young adult settlement extends outwards from the downtown in a linear form to the northwest along the DART rail corridor and the South Central Expressway, passing suburban malls and the Southern Methodist University. Throughout the region however, there are strong, highly organized centres of young adult settlement.

Suburbs like Las Colinas house a large proportion of young adults relative to the wider population. This neighbourhood mid-way between Dallas and Fort Worth is a significant employment centre, attracting major employers in the petroleum,

financial and technology industries. There are high concentrations in the neighbourhoods of North Arlington south of the airport. There are concentrations around Brookhaven College north of downtown Dallas, surrounding suburban malls and other major employers in the city of Plano. Within the city of Dallas proper, settlement is highly concentrated in the downtown. This is a regionally significant proportion of young adult settlement and creates a predominant centre. Just beyond the city limits, in the cities between Dallas and Fort Worth there are several nodes of young adult settlement spanning the built up area. Even outside of these nodes, young adults are scattered in moderate concentrations throughout the region. Fort Worth contains only a scattering of loosely organized concentrations. Despite clearly being identified as in their study as a centralized polycentric region, visually the region as a whole appears to exhibit a complex balance of centres, between Dallas and Fort Worth and the points between and beyond the two major centres. Dallas and Fort Worth are cities of similar populations. Between them and across their metro region they are home to 6.4 million people. The particular form of the region has created a scattered (through centralized) geography of young adult settlement.

While, Los Angeles and Dallas are cities with very different orientations of young adult residence, they exhibit a similar highly polycentric form that is balanced between centres located throughout their respective metro regions.

6 Discussion

6.1 Producing and Reproducing the Generationed City

The process of youthification, described by Moos (2014) as a process of younger adults moving into higher density neighbourhoods at the neighbourhood scale and emerging geographies of younger and older cities at the inter-urban scale, describes a key mechanism driving the emerging generationed geography of the city.

The process of youthification at the intra-urban scale is, as Moos (2014) describes, in some ways similar to the conceptualisation of gentrification as a staged model or as a process of shifting capital investment patterns. In describing generationed spaces observed through this study, youthification is best understood as a process of a complex variety of incipient stages and combinations. Also, unlike gentrification, it is difficult to link the arrival and displacement of populations to income or socio-economic indicators. The production of space is largely controlled on the supply-side by private capital while young adults simply demand and consume space and space is continually divided at a constant total cost. Indeed as highlighted by Moos, the reinvestment involved in producing youth spaces (youthification) may “impact young adults’ long term ability to accumulate equity and attain homeownership”.

The potential for generationed displacement in the process of youthification arises from young adults’ unique habits in the consumption of space. Condoization, basement suites, student apartments, flat-shares, and room shares become affordable spaces for many young adults who choose to consume dense urban spaces. These spaces, ordered by affordability, are often inadequate for other generations and may lead to a kind of displacement as areal costs increase and

spaces are reproduced in denser forms. In the downtowns of Toronto, Vancouver, New York and many other North American cities besides, redevelopment is introducing smaller living units and in many of these cities, housing prices are high. Centrality, in this context, is achieved by a necessary process of youthification. Gains to investors and developers are achieved in large part by the willingness for millennials to accept ever-smaller spaces in downtowns. The continuation of this process structures neighbourhoods by age over time.

Youth space is “generationed” as space becomes unacceptable for other cohorts and neighbourhoods become increasingly specialized. A residential arrangement known as “couch living”, a long-term variation of the popular form of non-market vacation accommodation known as couch-surfing which is growing in popularity among the young adult cohort, provides an extreme example of the extent to which youthification is generally a non-income oriented phenomenon (Gutnick, 2014).

Youth, unable to afford space, leverage social capital and consume minimal private space, choosing to share space in a friend’s lodging in order to settle in the city. This arrangement can be more than a brief transient stage although still an unstable one.

In this we can understand the preference for density as an economically motivated decision. Income set limits on housing budgets and smaller household sizes provide motivation for seeking multiple dwelling forms (condos, apartments, basement suites, flat shares). Moos (2012) identifies this as a major motivation for centralizing tendencies in Montreal. Indeed, tendencies towards centralization are widespread as this study finds. Thirty-five of fifty-seven cities studied exhibited some kind of

centralized settlement pattern and in large part centralization is aided by redevelopment. Youthification in this sense is an inevitable result of neoliberal urban and economic restructuring and demographic change.

While the preference for density may be economically mandated it is achieved only partly by economic restructuring. It is the social dimension of the cohort that to some degree enables some key settlement patterns evident in this study. In Toronto, the extent of neighbourhoods with moderately-high young adult settlement north of Queen street is a sign of these social arrangements. Low-rise, duplex and row housing predominate dwelling types in many of these neighbourhoods and single-detached housing is common on side streets in central neighbourhoods. Basement units and other multiple dwelling arrangements exist in these neighbourhoods. Young adults often choose to live with roommates or flatmates in order to occupy these housing forms in older, more affordable central neighbourhoods. Across Canada, co-op and shared ownership (co-buying) of semi-detached and single-detached housing is gaining prominence in the media, owing to the strong desire of Canadians to maximize housing dollars (Leong, 2014). In 2014, the City of Toronto adopted a motion to study opportunities for shared ownership as a strategy to address housing affordability (City of Toronto, 2014).

Here, there is also a cultural association between urban living and the young adult cohort, the significance of which should in no way be diminished by the focus here on economic and socio-political developments. Indeed, the convergence of the environmental, political, lifestyle and consumption values of the young adult cohort

are largely met in urban living. The values of the cohort lead to the types of significant life decisions not easily explained by the theory of the economically rational being. Very human objectives are sought and emotional value derived from an individual's move to the city from what data suggest was likely a suburban North American upbringing (within the same city of settlement or a city lower on the urban hierarchy). Generally young adults are social, politically and environmentally aware and reflect those values in their choice of lifestyle. Young adults generally do choose to live downtown but this centrality is not exclusive. Young adults will choose to live anywhere those objectives can be satisfied and they are indeed choosing other urban lifestyles than a downtown one.

As shown in this study, young adults will choose to locate close to employment centres or amenities or trendy neighbourhoods. This occurs whether they are in a downtown or in suburban communities like Redmond, Fremont, Brampton or Montrose. Young adults rarely settle only in the core of a metro region. Where they are able to, the cohort also concentrates in polycentric formations throughout a region. An urban lifestyle may be motivated by environmental motives, or a desire for a particular quality of life, walkability and transit accessibility but it seems that these objectives can be satisfied by a variety of urban forms.

Within the city, the geography of residence seems largely patterned by in-situ landscapes and patterns of reinvestment. Young adults are both the beneficiaries of and a major driving force behind the continued reproduction of the neoliberal spatial fix in patterns of continued urban investment. Residential ecology alone may

not entirely order the generationed city. Neoliberal forces seem to describe geographies of reinvestment. Within the generationed city, social and ecological processes are still at work in ordering the young adult cohort by socio-economic status.

6.2 Trends in Centrality: Patterns of Investment

As observed in this study, young adult settlement exhibits pronounced patterns of centrality in many cities across North America. These patterns of centralization closely resemble the geography of neighbourhood revalorisation identified by Hackworth (2007). Young adults live in the remade city. Reinvestment is important in describing young adult settlement. The production and consumption of space is central in understanding these geographies. The cohort in North America is relatively disadvantaged in comparison to previous generations at similar life-stages and they do not control capital investment flows into cities (Moos, 2013). The relative devalorisation of the inner city and targeted government investment provided the impetus for the movement of capital into inner areas. The concentration of demand for space and supportive policy provided through growth management provides strong incentive for sustained capital flows.

Growth management is an interesting consideration. Growth management policy is most often associated with a coordination of governmental effort into targeted investment in infrastructure, transit, and lifestyle amenities towards fiscal and environmental objectives. In cities with strong growth management regimes, the production of space is balanced with supportive planning and investment

frameworks. Centrality, nodal and linear forms in these cities are especially ensured by governmental objectives.

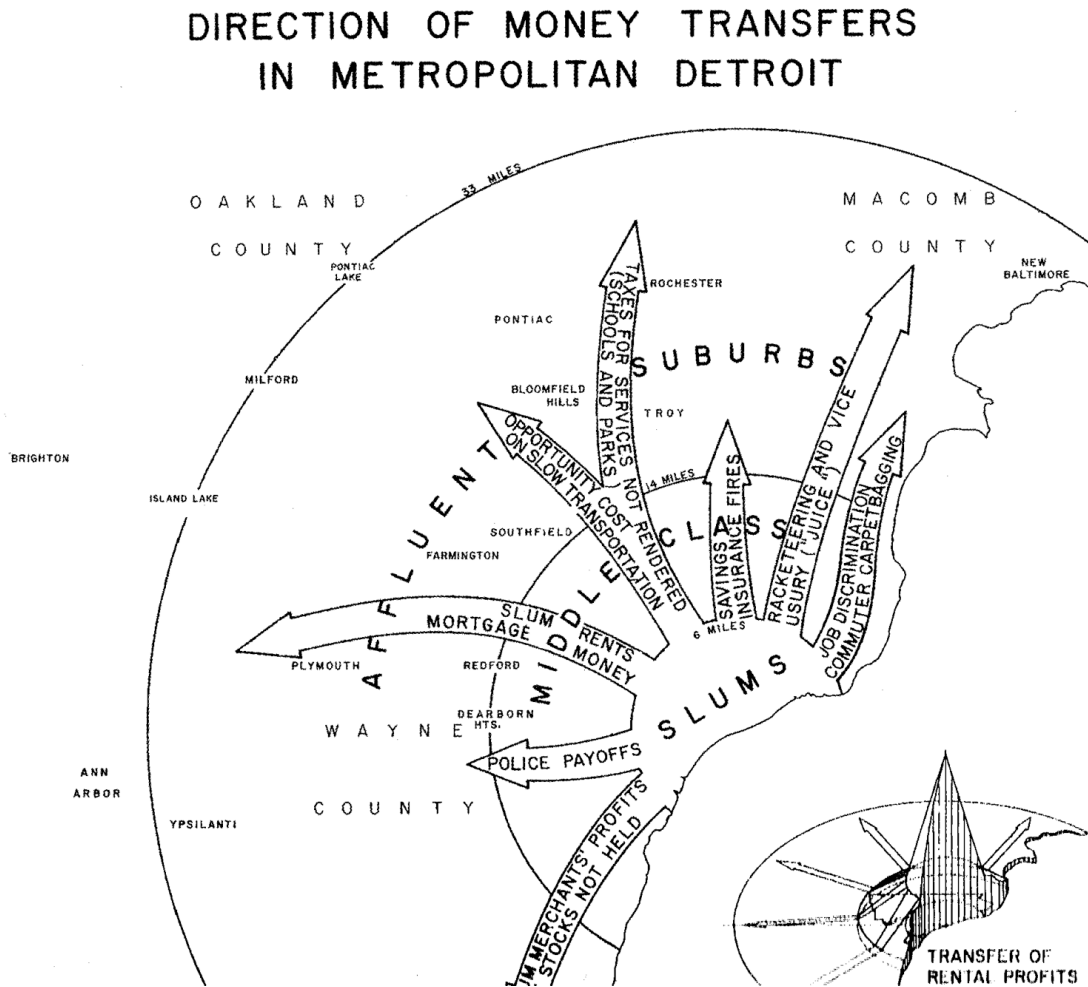
In decentralized cities both alternative investment flows and the in-situ geography of the city dictates development. In each of these cities, there are patterns are of dispersion and complex development suggested by the Los Angeles School of Urbanism (Dear and Flusty, 2002). Settlement in these cities however is balanced (as in Los Angeles), non-centred (as in Detroit) or dispersed (as in Phoenix and Las Vegas).

Historically capital has to flown outwards in established routes from central areas in cities like Detroit. In Phoenix, the city centre was underinvested. These cities exhibit a non-centred pattern resulting from the relative decline of a weak centre. In Los Angeles, the centre competes with the region and investment and redevelopment occur at many points. The types of development that occurred across Los Angeles did not require a particularly concentrated urban form and as such the city was not remade around a downtown growing outwards into its region. Without a highly concentrated pattern of investment, the process of youthification to does not occur to the same degree.

Bunge (2011) provides a qualitative diagram of capital movement in Detroit (Figure 28). While somewhat dispiriting in the naming of capital flows, the schematic is correct in direction. Capital flows out of downtown reduce opportunities for reinvestment and the production of space in the city. It results in a loss of vibrancy downtown. In Detroit, young adults settle instead in higher proportions in suburban

neighbourhoods close to employment and retail opportunities while the inner city faces sustained population losses.

Figure 28 – Direction of Money Transfers in Metropolitan Detroit (Bunge, 2011)



Hackworth (2007) confirms a strong and sustained devalorisation of core areas in Detroit. The settlement of young adults in Detroit largely occurs in a suburban ring surrounding the city, related to the direction of capital flows.

Shrinking rustbelt cities – Cleveland, Buffalo, Pittsburgh and Rochester – have adopted strategies of aggressive land management and investment. These are cities that have reintroduced vibrancy to neighbourhoods through clever policy

intervention (right-sizing and land banks among the strategies employed). These are cities with centralized young adult populations in neighbourhoods like South Side Flats in Pittsburgh, Allentown in Buffalo and Tremont in Cleveland.

In decentralized cities there may be a link to a variety of factors. Hackworth (2007) describes a complexity of forms of the neo-liberal spatial fix. There may also be cities that were not reoriented by neoliberal processes. In these decentralized cities, capital investment may exhibit a degree of dispersion or competing nodality. Cities like Austin and Los Angeles exhibit patterned settlement where young adults continue to enjoy neighbourhood amenities but are not oriented around a central CBD, and rather a patterned around a corridor or in decentralized but balanced nodes.

Alternatively, capital investment may not always produce the types of dense vibrant neighbourhoods strongly associated with young adult settlement. San Jose is a region dominated by suburban development. Within a morphology dominated by single-detached housing and in such a decentralized form, the process of youthification does not occur. San Jose is a city that has benefited from a strong and booming technology sector. The most recent wave of economic expansion was not strongly associated with a particularly dense urban form. Headquarters of large technology companies are located throughout the metropolitan region in large self-contained campuses. Downtown San Jose is not built-out, instead there are tall office blocks interspaced with sprawling parking lots. Property values are high throughout the region but there does not seem to be a particular demand for any housing form

other than single-family housing. This city was built by the new economy and as such, clear patterns of reordering and reinvestment are not obvious.

7 Conclusion

This study has identified present patterns in the residential geographies of young adults in major cities in Canada and the United States. Indeed, similar to Moos' (2012) findings, results do suggest that young adults are responsive to dense housing form, urban amenities and transit provision in both central areas and extending into suburban reaches.

Post-Fordist economic restructuring along with demographic change is involved in determining the economic and lifestyle characteristics of the young adult cohort and these changes are found to be pervasive (Townshend, 1997; Chatterton and Hollands, 2002). Young adult geographies are highly localized however and differences and similarities across major city regions are due to unique planning, and policy contexts as well as variations in the pattern of neoliberal reinvestment in the city.

In major metropolitan regions in the United States and Canada young adults live centrally. In North American metro regions, downtown represents an important centre of young adult living. This arrangement has been the result of long-shifting patterns of redevelopment and reinvestment that has brought the revitalization of downtowns across the continent. It has been the result of economic changes that have created precarious economic conditions for young adults; the rise of part-time work, contract work and slower income growth from that of a generation ago. These changes have brought about affordability challenges as property values in central areas in redeveloped cities have increased overtime. Unique demographic characteristics of the young adult cohort have also helped to shape their residential

geography and to create affordable spaces in a context of high housing costs. Living in smaller households, the cohort consumes denser housing arrangements in condominiums, apartments, and other multiple dwelling forms of housing. This form of living is pervasive and occurs widely in the cities studied: in rapidly growing cities with vibrant downtown property markets (Toronto, New York, Vancouver) and in cities where populations have declined over time but government effort has encouraged investment to remain in the core (Cleveland, Milwaukee, Pittsburgh). The Dallas-Fort Worth Metroplex, a binary metro region centred on two large cities, also exhibits a centralized pattern of young adult residence.

Young adult living also exhibits polycentric distributions. In metro regions where young adults are concentrated centrally, they also cluster in outlying suburban nodes: in trendy neighbourhoods in the inner suburbs or in newer suburban neighbourhoods anchored by employment, university or amenities. This centralized polycentric form is dominant, occurring in 32 of the 57 metro regions included in this study.

Decentralized patterns are also identified. Decentralized patterns of young adult settlement occur across a variety of urban morphologies. There are decentralized metro regions with declining populations that have seen rapid decline and disinvestment in their core while managing to maintain suburban populations (Cincinnati, Birmingham, Hartford, Detroit). Also there are urban centres in the southern and western regions of United States with dominant suburban morphology (San Jose, San Antonio, Phoenix, Las Vegas) or with highly polycentric

and dispersed urban form (Los Angeles). In decentralized metros there are fewer examples of polycentric distributions of young adults and instead distributions are dispersed across the urbanized area.

The organization of young adults in major North American cities is not random but highly patterned. The regression models used generally fit well with age-distance distributions measured in this study. Las Vegas exhibited the greatest degree of randomness in its distribution but even here the model of best fit was able to explain over 40% of all variation.

Post-Fordist labour market restructuring, demographic change and reinvestment have combined to reshape the city by age. As identified in this study, youthification occurs in spatially unique patterns. This study and previous work from Moos (2012, 2014) has shown that young adults respond to the provision of urban amenities, the availability of dense housing forms and transit. The geography of young adult residence is therefore highly localized and sensitive to local economic and policy environments. As the city is restructured we know, regulation, zoning, and infrastructure investment is able to shape the course of development. Therefore in rapidly developing cities, politicians, policy makers and planners are able to respond to the challenges facing the cohort. But equally, shrinking cities have leveraged policy, investment and political initiative to shape their own development creating and maintaining vibrant centres for future economic prosperity and quality of life.

7.1 Limitations

While literature is used to understand external factors influencing young adult settlement (neoliberal restructuring, generational change, neighbourhood ecology), a key limitation of this study is the absence of the construction of a model of young adult residential settlement: the absence of a systematic, deductive generalisation of findings. This study nonetheless represents an important contribution, furthering the understanding of young adult residential settlement and providing a basis for future study of the residential ecology of young adults in North America.

By providing a snapshot, this study is also limited in time. This study is not intended to provide a temporal analysis of settlement patterns. Indeed, a key factor influencing the present location of young adults is the past location of this cohort (Moos, 2014). The complex and diverse historical arrangement of cities in North America certainly impacts the present arrangement of young adult settlement. Contextualizing the results by considering longer-term forces at play within regions and forces specific to individual cities minimizes this limitation.

While study is limited temporally, work by Moos (2014) has shown that to some degree, even at the beginning of the process of youthification at the end of the 1970s, there had been representation of young adults in the downtowns of major Canadian city regions. What has occurred since has been a sustained concentration and centralization of young adults from across city regions. Downtown and central city neighbourhoods now have very high representation of young adults while suburban and exurban neighbourhoods have experienced pronounced decline in young adult concentration (Moos, 2014).

At the metropolitan scale, this study begins to construct an understanding of the different kinds of residential geographies of young adults, and how these vary across metropolitan areas spanning across an entire continent. Further case study research will be useful in understanding the specific forces leading to the organization within cities.

7.2 Further Research

These findings raise interesting questions of the true dynamics of young adult settlement about the factors that draw young adults to cities and the differences in available lifestyles. Is there a critical mass of young adults needed to create a youthful city? How are youthful neighbourhoods constructed socially? This study describes the ways young adults are patterned in cities. Further research should show the draws and experiences of young adults towards and between cities in Canada and the United States.

At the other end, what is the geography of the Baby Boomer city? What are the processes at work in shaping the “generationed city” for older cohorts?

The image of a “generationed city” is an interesting one. For the young, perhaps amenity rich neighbourhoods with trendy cafes and bars, bakeries and clothing shops ranging from the affluent to the newly gentrified dominate this image. It is more difficult to contemplate the divisions within the generationed city: the organization of ethnicity, and socio-economic status. If the generationed city is not a phenomenon exclusive to certain ethnicities or certain socio-economic groups, where are its divisions?

7.3 Planning Relevance

Urban planning can directly impact the production of youth spaces. It can shape the housing types developed. The geography of young adult settlement is centred on a mix of uses, on dense housing forms and on accessibility through public transit. All of these are shaped directly through planning and policy.

Generally the dominant form of young adult settlement is a favourable one, in line with contemporary planning thinking. Transit oriented developments, walkable neighbourhoods, dense housing forms will all gain favour among this generation. Affordability challenges exist but in addressing these challenges, the type of housing developed matters, neighbourhoods matter, downtowns matter and suburbs matter. Planning decisions made across metro regions must incorporate thinking about the production of space for age groups as these cohorts consume residential space in specialized ways. New housing developments targeted at young adults can take a variety of forms in various housing types and in urban and suburban locations but key lifestyle factors (access to employment and amenities) must also be considered. There are opportunities here through this generation to address challenges of sprawl, walkability, and congestion in the built form. This cohort is responsive to many smart growth initiatives.

In cities like Toronto and Vancouver where neoliberal urban restructuring brought extreme development pressures downtown, planning can shape the development of dense suburban centres and of mid-rise mixed-use developments across the metro region.

In declining cities like Cleveland and Milwaukee, city led-reinvestment in core areas and historic neighbourhoods maintained vibrant urban centres.

The successful redevelopment of many North American downtowns since the mid-1990s is a wonder of modern planning. In many Canadian and American cities, downtowns are vibrant and safe residential quarters replete with the associated health and quality of life gains one would hope to enjoy. But there are several looming concerns when considering “generationed spaces”. The ability for the current young adult cohort to trade residential space to maintain an affordable cost of living is perhaps tied to their average age. In the extension of the youthful phase, cities enjoy the consumption of all types of newly developed housing in dense downtowns. Enjoying staggering market demand, developers publicly promote the arrival of a “European sensibility” of downtown housing consumption. Instead, driven by market demand and investor capital, developers construct a wealth of easily salable, easily rentable, affordable one-bedroom condo units. Encouraged by easy debt and a too good to resist property market, young adults buy in or, for those who do not purchase, rent these same units. There are hints from the literature that the consumption of these spaces is limited by age. While young adults tend to migrate up the urban hierarchy, at ages associated with family formation and childrearing, this pattern reverses (Plane et al., 2005). Further, studies of residential mobility uncover the motivations tied to changes in the life-cycle, the birth and growth of children (Short, 1978). In light of this looming life-cycle change, the monocropped downtowns of one-bedroom condos will become fragile eco-systems

dependent on those who either can or must make the trade-off necessary to consume such spaces.

City “youthification strategies” could potentially be established to directly address the particular form of neighbourhood change introduced by the process of youthification. The city of Toronto has developed a Youth Equity strategy, identifying some of the requirements and service gaps faced by youth in the city. The strategy cuts across policy and program areas of individual departments to create a comprehensive strategy to address issues facing youth. Other North American cities should consider such efforts.

A youthification strategy would go further than a youth equity strategy. Because the process of youthification involves the displacement of resident populations, a youthification strategy should consider the needs of entire communities facing these changes. Services for youth and transit should also be prioritized in areas experiencing these changes. Further, a youthification strategy should mandate an awareness of factors contributing to youthification in all planning decisions. The strategy should identify neighbourhoods where continued redevelopment of smaller residential spaces will lead to displacement of older resident populations so that the social impact of these changes can be adequately understood.

For many cities, the real estate boom of the early 2000s has been inconvenient, occurring primarily to the benefit of investors and developers. The resulting built form in Toronto, Vancouver, New York, Calgary, and San Francisco reflects a moment in time, built from a specific economic context for a very specific market.

Planning should be aware of the impact of such changes and be able to respond quickly to arising social concerns.

Planners will face the continuing challenge of adapting built form throughout the city region to accommodate generations. Foresight is also necessary to properly harness the frenetic power of redevelopment inherent in upswings in the business cycle of neoliberal cities. Those patterns of reinvestment create and reshape space and planning must be aware of the abilities of these capital flows. Further, planning must always have the ability to shape the built form for the benefit of the many and varied populations of cities.

8 References

- 2010 Standards for Delineating Metropolitan and Micropolitan Statistical Areas; Notice of decision, 75 Fed. Reg. 37246 (June, 28, 2010)
- Alperovich, G. (1982). Density gradients and the identification of the central business district. *Urban Studies*, 19(3), 313-320.
- Andersson, F., Haltiwanger, J. C., Kutzbach, M. J., Pollakowski, H. O., & Weinberg, D. H. (2014). Job displacement and the duration of joblessness: The role of spatial mismatch (No. w20066). National Bureau of Economic Research.
- Auch, R., Taylor, J., & Acevedo, W. (2004). *Urban growth in American cities: Glimpses of US urbanization*. US Department of the Interior, US Geological Survey.
- Avent, R. (2011) *The Gated City*.
- Bain, A., (2010). Re-imagining, re-elevating, and re-placing the urban: the cultural transformation of the inner city in the twenty-first century. In T. Bunting, P. Filion & R. Walker (Eds.), *Canadian cities in transition: New directions in the twenty-first century 4th ed.* (pp. 1-468). Toronto, ON: Oxford University Press.
- Beaverstock, J. V., Smith, R. G., & Taylor, P. J. (1999). A roster of world cities. *Cities*, 16(6), 445-458.
- Bourne, I. S., & Murdie, R. A. (1972). Interrelationships of social and physical space in the city: a multivariate analysis of metropolitan Toronto*. *The Canadian Geographer/Le Géographe canadien*, 16(3), 211-229.
- Brown, L. A., & Chung, S. Y. (2006). Spatial segregation, segregation indices and the geographical perspective. *Population, space and place*, 12(2), 125-143.
- Brown, J. R., & Thompson, G. L. (2008). The relationship between transit ridership and urban decentralisation: insights from Atlanta. *Urban Studies*, 45(5-6), 1119-1139.
- Bunge, W. (2011). *Fitzgerald: Geography of a revolution* (Vol. 8). University of Georgia Press.
- Bunting, T., & Filion, P., (2010). Epochs of Canadian urban development. In T. Bunting, P. Filion & R. Walker (Eds.), *Canadian cities in transition: New directions in the twenty-first century 4th ed.* (pp. 1-468). Toronto, ON: Oxford University Press.
- Bureau of Labor Statistics, U.S. Department of Labor. (2006, 2011) Quarterly Census of Employment and Wages, [August 2014] [www.bls.gov/cew/].
- Capps, K. (2014, August 26). What does it really cost to live in San Francisco? Retrieved from City Lab website: <http://www.citylab.com/housing/2014/08/what-does-it-really-cost-to-live-in-san-francisco/379166/>

Cincinnati USA Regional Chamber. (2011). *2014 regional economic outlook*. Retrieved from <http://redicincinnati.com/uploadedFiles/Econ/Documents/EconOutlookReport2014.pdf>

City of Toronto. (2014, April 1). Opportunities for shared ownership housing to improve housing affordability for Torontonians - by councillor Ana Bailão, seconded by councillor Mary-Margaret McMahon. website: <http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2014.MM50.20>

Chatterton, P., & Hollands, R. (2002). Theorising urban playscapes: producing, regulating and consuming youthful nightlife city spaces. *Urban studies*, 39(1), 95-116.

Coffey, W. J., & Shearmur, R. G. (2002). Agglomeration and dispersion of high-order service employment in the Montreal metropolitan region, 1981-96. *Urban Studies*, 39(3), 359-378.

Davies, W.K.D. (1984). *Factorial Ecology*. Aldershot, UK: Gower.

Davies, W. K., & Murdie, R. A. (1993). Measuring the social ecology of cities. In Bourne, L. S., & Ley, D. F. (Eds.), *The changing social geography of Canadian cities*, (pp. 52-75). Montreal, QC: McGill Queen's University Press.

Dear, M. J., Flusty, S., (2002). Los angeles as post-modern urbanism. In M. J. Dear & J. D. Dishman (Eds.), *From Chicago to L.A.: Making sense of urban theory* (pp. 55-84). Thousand Oaks, CA: Sage.

Dewan, S. (2014, May 27). Home prices start easing, to the relief of experts. Retrieved from The New York Times website: <http://www.nytimes.com/2014/05/28/business/economy/home-prices-start-easing-to-the-relief-of-experts.html>

Emporis. (n.d.). Tallest buildings. website: <http://www.emporis.com/statistics/tallest-buildings>

Florida, R., & Jonas, A. (1991). US urban policy: the postwar state and capitalist regulation. *Antipode*, 23(4), 349-384.

Frey, W. H. (1979). Central city white flight: racial and nonracial causes. *American Sociological Review*, 44(3), 425-448.

Garcia-López, M. À., & Muñoz, I. (2010). Employment decentralisation: polycentricity or scatteration? The case of Barcelona. *Urban Studies*.

Glaeser, E. (2011). *Triumph of the city: How our greatest invention makes us richer, smarter, greener, healthier, and happier*. New York, NY: Penguin.

Glaeser, E. L., & Ponzetto, G. A. (2007). *Did the death of distance hurt Detroit and help New York?* (No. w13710). National Bureau of Economic Research.

Globalization and World Cities (GaWC) Research Network. (2011, September 14). The world according to GaWC 2010. Retrieved from Globalization and World Cities (GaWC) Research Network website: <http://www.lboro.com/gawc/world2010t.html>

Gutnick, D. (2014, November 1). The delicate balancing act of 21st-century couch living. Retrieved from CBC News website: <http://www.cbc.ca/news/canada/the-delicate-balancing-act-of-21st-century-couch-living-1.2820012>

Hackworth, J. (2005). Emergent urban forms, or emergent post-modernisms? A comparison of large US metropolitan areas. *Urban Geography*, 26(6), 484-519.

Hackworth, J. (2007). *The neoliberal city: Governance, ideology, and development in American urbanism*. Ithaca, NY: Cornell University Press.

Hackworth, J., & Smith, N. (2001). The changing state of gentrification. *Tijdschrift voor economische en sociale geografie*, 92(4), 464-477.

Hulchanski, J. D. (2010). *The three cities within Toronto: Income polarization among Toronto's neighbourhoods, 1970-2005*. Toronto: Cities Centre, University of Toronto.

Hutton, T. (2008). *The new economy of the inner city: restructuring, regeneration and dislocation in the twenty-first-century metropolis*. New York, NY: Routledge.

Hutton, T., (2010). Economic change in Canadian cities: locational dynamics of employment. In T. Bunting, P. Filion & R. Walker (Eds.), *Canadian cities in transition: New directions in the twenty-first century 4th ed.* (pp. 1-468). Toronto, ON: Oxford University Press.

Lebow, R. N., Mueller, J., & Wohlforth, W. C. (1995). Realism and the End of the Cold War. *International Security*, 20(2), 185-187.

Lee, S., Seo, J. G., & Webster, C. (2006). The decentralising metropolis: economic diversity and commuting in the US suburbs. *Urban Studies*, 43(13), 2525-2549.

Leichenko, R. M. (2001). Growth and change in US cities and suburbs. *Growth and Change*, 32(3), 326-354.

Leong, M. (2014, November 22). How to co-buy a home with your friend in Canada's expensive market. *National Post*. Retrieved from <http://business.financialpost.com/2014/11/22/how-to-co-buy-a-home-with-your-friend-in-canadas-expensive-market/>

Moos, M. (2012). Housing and location of young adults, then and now: consequences of urban restructuring in Montreal and Vancouver. (PhD Thesis). University of British Columbia, British Columbia.

- Moos, M. (2013). Generational Dimensions of Neoliberal and Post - Fordist Restructuring: The Changing Characteristics of Young Adults and Growing Income Inequality in Montreal and Vancouver. *International Journal of Urban and Regional Research*. doi:10.1111/1468-2427.12088
- Moos, M. (2014). *From gentrification to youthification: How inner city redevelopment and the influx of young adults are increasing the importance of age in delineating urban space*. Paper presented at the Association of Collegiate Schools of Planning Conference, Philadelphia, PA.
- Moos, M. (2014). "Generationed" space: Societal restructuring and young adults' changing residential location patterns. *The Canadian Geographer/Le Géographe canadien*, 58(1), 11-33.
- Murphy, R. E., & Vance, J. E. (1954). A comparative study of nine central business districts. *Economic Geography*, 301-336.
- Newman, K. (2004). Newark, decline and avoidance, renaissance and desire: From disinvestment to reinvestment. *The Annals of the American Academy of Political and Social Science*, 594(1), 34-48.
- The Oregonian. (2014, October 20). Things about the Portland area that planners can't change: Editorial. The Oregonian. Retrieved from <http://www.oregonlive.com/>
- Patacchini, E., & Zenou, Y. (2005). Spatial mismatch, transport mode and search decisions in England. *Journal of Urban Economics*, 58(1), 62-90.
- Plane, D. A., Henrie, C. J., & Perry, M. J. (2005). Migration up and down the urban hierarchy and across the life course. *Proceedings of the National Academy of Sciences of the United States of America*, 102(43), 15313-15318.
- Quastel, N., Moos, M., & Lynch, N. (2012). Sustainability-as-density and the return of the social: The case of Vancouver, British Columbia. *Urban Geography*, 33(7), 1055-1084.
- Remsen, N. (2014, September 5). Global street style report: Mapping out the 15 coolest neighborhoods in the world. *Vogue*. Retrieved from <http://www.vogue.com/slideshow/1080625/fifteen-coolest-street-style-neighborhoods/>
- Rosen, G., & Walks, A. (2013). Rising cities: Condominium development and the private transformation of the metropolis. *Geoforum*, 49, 160-172.
- Rosenberg, M. W., Wilson, D. H., (2010). Younger cities, older cities, and cities in the balance: Spaces and places of the younger and older population. In T. Bunting, P. Fillion & R. Walker (Eds.), *Canadian cities in transition: New directions in the twenty-first century 4th ed.* (pp. 1-468). Toronto, ON: Oxford University Press.

Ryder, N. B. (1965). The cohort as a concept in the study of social change. *American sociological review*, 843-861.

SF Made. (2013). 2013 state of local manufacturing report. Retrieved from http://www.sfmade.org/sfm/wp-content/uploads/2013_SLMReport_low_res.pdf

Short, J. R. (1978). Residential mobility. *Progress in Human Geography*, 2(3), 419-447.

Shrestha, L. B., & Heisler, E. J. (2012). The changing demographic profile of the United States. Congressional Research Service 7-5700, RL32701.

Skaburskis, A. (1988). The nature of Canadian condominium submarkets and their effect on the evolving urban spatial structure. *Urban Studies*, 25(2), 109-123.

Skaburskis, A., & Moos, M. (2008). The redistribution of residential property values in Montreal, Toronto, and Vancouver: examining neoclassical and Marxist views on changing investment patterns. *Environment and planning. A*, 40(4), 905.

Skaburskis, A., Moos, M., (2010). The economics of urban land. In T. Bunting, P. Fillion & R. Walker (Eds.), *Canadian cities in transition: New directions in the twenty-first century 4th ed.* (pp. 1-468). Toronto, ON: Oxford University Press.

Smith, N. (1979). Toward a theory of gentrification a back to the city movement by capital, not people. *Journal of the American Planning Association*, 45(4), 538-548.

Sofis, K., & Meneghetti, T. (2014, April 15). What San Francisco can teach the rest of the world about urban manufacturing. Retrieved from Citi Blog website: <http://blog.citigroup.com/2014/04/what-san-francisco-can-teach-the-rest-of-the-world-about-urban-manufacturing.shtml>

Statistics Canada1. 2012. Calgary, Alberta (Code 825) and Alberta (Code 48) (table). Census Profile. 2011 Census. Statistics Canada Catalogue no. 98-316-XWE. Ottawa. Released October 24, 2012. <http://www12.statcan.gc.ca/census-recensement/2011/dp-pd/prof/index.cfm?Lang=E> (accessed June 5, 2014).

Statistics Canada2. 2012. Edmonton, Alberta (Code 835) and Alberta (Code 48) (table). Census Profile. 2011 Census. Statistics Canada Catalogue no. 98-316-XWE. Ottawa. Released October 24, 2012. <http://www12.statcan.gc.ca/census-recensement/2011/dp-pd/prof/index.cfm?Lang=E> (accessed June 5, 2014).

Statistics Canada3. 2012. Montréal, Quebec (Code 462) and Quebec (Code 24) (table). Census Profile. 2011 Census. Statistics Canada Catalogue no. 98-316-XWE. Ottawa. Released October 24, 2012. <http://www12.statcan.gc.ca/census-recensement/2011/dp-pd/prof/index.cfm?Lang=E> (accessed June 5, 2014).

Statistics Canada4. 2012. Ottawa - Gatineau, Ontario (Code 505) and Ontario (Code 35) (table). Census Profile. 2011 Census. Statistics Canada Catalogue no. 98-316-

XWE. Ottawa. Released October 24, 2012. <http://www12.statcan.gc.ca/census-recensement/2011/dp-pd/prof/index.cfm?Lang=E> (accessed June 5, 2014).

Statistics Canada5. 2012. Toronto, Ontario (Code 535) and Ontario (Code 35) (table). Census Profile. 2011 Census. Statistics Canada Catalogue no. 98-316-XWE. Ottawa. Released October 24, 2012. <http://www12.statcan.gc.ca/census-recensement/2011/dp-pd/prof/index.cfm?Lang=E> (accessed June 5, 2014).

Statistics Canada6. 2012. Vancouver, British Columbia (Code 933) and British Columbia (Code 59) (table). Census Profile. 2011 Census. Statistics Canada Catalogue no. 98-316-XWE. Ottawa. Released October 24, 2012. <http://www12.statcan.gc.ca/census-recensement/2011/dp-pd/prof/index.cfm?Lang=E> (accessed June 5, 2014).

Statistics Canada. (2013, May 13). CMA and CA: Detailed definition. website: <http://www.statcan.gc.ca/pub/92-195-x/2011001/geo/cma-rmr/def-eng.htm>

Statistics Canada. (2014). Population and dwelling counts, for census metropolitan areas and census agglomerations, 2011 and 2006 censuses. <http://www12.statcan.gc.ca/census-recensement/2011/dp-pd/hlt-fst/pd-pl/Table-Tableau.cfm?LANG=Eng&T=201&SR=1&RPP=150&S=11&O=A>. Accessed Dec. 5, 2014.

Taylor, P. J. (1997). Hierarchical tendencies amongst world cities: a global research proposal. *Cities*, 14(6), 323-332.

Townshend, I. (1997). An urban geography of the third age (PhD Thesis). Retrieved from Collections Canada. (ISBN: 0612207757)

Townshend, I., Walker, R., (2010). Life course and lifestyle changes: Urban change through the lens of demography. In T. Bunting, P. Fillion & R. Walker (Eds.), *Canadian cities in transition: New directions in the twenty-first century 4th ed.* (pp. 468). Toronto, ON: Oxford University Press.

U.S. Census Bureau 1; American Community Survey, 2010 American Community Survey 5-Year Estimates, Table S1903; generated by Robert Walter-Joseph; using American FactFinder; <<http://factfinder2.census.gov>>; (August 2014).

U.S. Census Bureau 2; American Community Survey, 2011 American Community Survey 5-Year Estimates, Table B01003; generated by Robert Walter-Joseph; using American FactFinder; <<http://factfinder2.census.gov>>; (August 2014).

U.S. Census Bureau 3; American Community Survey, 2011 American Community Survey 5-Year Estimates, Table DP03; generated by Robert Walter-Joseph; using American FactFinder; <<http://factfinder2.census.gov>>; (August 2014).

U.S. Census Bureau 4; American Community Survey, 2011 American Community Survey 5-Year Estimates, Table DP04; generated by Robert Walter-Joseph; using American FactFinder; <<http://factfinder2.census.gov>>; (August 2014).

U.S. Census Bureau 5; 2010 Census Summary File 1; Tables P13 and QT-P1; generated by Robert Walter-Joseph; using American FactFinder; <<http://factfinder2.census.gov>>; (24 June 2014).

U.S. Census Bureau. (2013, May 6). Metropolitan and micropolitan statistical areas main. website: <http://www.census.gov/population/metro/>

Vinodrai, T. (2010). The dynamics of economic change in Canadian cities: innovation, culture, and the emergence of a knowledge-based economy. In T. Bunting, P. Filion & R. Walker (Eds.), *Canadian cities in transition: New directions in the twenty-first century 4th ed.* (pp. 1-468). Toronto, ON: Oxford University Press.

Walks, R. A. (2001). The social ecology of the post-Fordist/global city? Economic restructuring and socio-spatial polarisation in the Toronto urban region. *Urban Studies*, 38(3), 407-447.

Warner, S. B., & Whittemore, A. (2012). *American urban form: a representative history*. MIT Press.

Wilson, F. D. (1984). Urban ecology: Urbanization and systems of cities. *Annual review of sociology*, 283-307.

Wyly, E. K. (1999). Continuity and Change in the Restless Urban Landscape*. *Economic Geography*, 75(4), 309-338.

Wyly, E. K., & Hammel, D. J. (1998). Modeling the context and contingency of gentrification. *Journal of Urban Affairs*, 20(3), 303-326.

Appendix A: Model Results From Functional Form Analysis

		Atlanta	Austin	Baltimore	Birmingham
Linear	Distance	-0.02***	-0.013***	-0.015**	-0.006632**
	Constant	1.593***	1.31314335280769***	1.362085***	1.160815***
	R-Squared	0.915	0.903	0.564	0.533
Logarithmic	In(Distance)	-0.33***	-0.211***	-0.297***	-0.118802**
	Constant	2.099***	1.628***	1.874937***	1.355045***
	R-Squared	0.912	0.858	0.764	0.623
Quadratic	Distance	-0.033**	-0.021**	-0.04*	-0.012328
	Distance ²	0.000283	0.000179	0.000519	0.000122
	Constant	1.70292608414156	1.382	1.563408	1.208187
	R-Squared	0.94	0.927	0.654	0.559
Cubic	Distance	-0.032	-0.012	-0.117**	-0.054042**
	Distance ²	0.000215	-0.000314	0.004*	0.002231*
	Distance ³	0.00000094657	0.000007	-0.00005445*	-0.000029*
	Constant	1.697***	1.337288***	1.921***	1.401092***
	R-Squared	0.94	0.932	0.788	0.759
		Boston	Buffalo	Charlotte	Chicago
Linear	Distance	-0.023545**	-0.009226*	-0.017302**	-0.028092**
	Constant	1.534395***	1.196685***	1.430045***	1.741543***
	R-Squared	0.611	0.386	0.658	0.621
Logarithmic	In(Distance)	-0.462968***	-0.197949**	-0.329432***	-0.559132***
	Constant	2.343544***	1.561759***	1.993349***	2.726565***
	R-Squared	0.860	0.646	0.868	0.895
Quadratic	Distance	-0.088783***	-0.050798***	-0.055371**	-0.107798***
	Distance ²	0.001399***	0.000892***	0.000817**	0.00171***
	Constant	2.076966***	1.542435***	1.74666**	2.404444***
	R-Squared	0.913	0.89	0.862	0.942
Cubic	Distance	-0.157168***	-0.066126**	-0.08475**	-0.192881***
	Distance ²	0.004857**	0.001667	0.002302	0.006012***
	Distance ³	-0.000048**	-0.000011	-0.000021	-0.00006***
	Constant	2.393209***	1.613316***	1.882517***	2.797902***
	R-Squared	0.962	0.9	0.88	0.996

		Cincinnati	Cleveland	Columbus	Dallas
Linear	Distance	-0.010422**	-0.014576*	-0.015429**	-0.01973**
	Constant	1.275588***	1.3844***	1.322005***	1.578755***
	R-Squared	0.569	0.383	0.474	0.449
Logarithmic	In(Distance)	-0.209391***	-0.322832**	-0.297274**	-0.409487**
	Constant	1.646697***	1.990464***	1.834516***	2.319303***
	R-Squared	0.836	0.684	0.641	0.705
Quadratic	Distance	-0.040591***	-0.071129**	-0.053288**	-0.065441*
	Distance ²	0.000647**	0.001213**	0.000812*	0.000981
	Constant	1.526499**	1.85474**	1.636873*	1.958926
	R-Squared	0.876	0.754	0.658	0.605
Cubic	Distance	-0.069528**	-0.135977**	-0.033791	-0.189488**
	Distance ²	0.00211**	0.004492*	-0.000174	0.007253*
	Distance ³	-0.00002*	-0.000046	0.000014	-0.000087*
	Constant	1.660314***	2.154625***	1.546714**	2.53257***
	R-Squared	0.918	0.826	0.665	0.773
		Denver	Detroit	Hartford	Houston
Linear	Distance	-0.022717**	-0.005409*	-0.014315**	-0.014685**
	Constant	1.499251***	1.188888***	1.27411***	1.43777***
	R-Squared	0.617	0.434	0.669	0.62
Logarithmic	In(Distance)	-0.445291***	-0.103453**	-0.236317**	-0.28591***
	Constant	2.275882***	1.366347***	1.634959***	1.934183***
	R-Squared	0.862	0.578	0.663	0.856
Quadratic	Distance	-0.073421**	-0.015601*	-0.012008	-0.045113**
	Distance ²	0.001088**	0.000219	-0.00005	0.000653*
	Constant	1.920944**	1.273658	1.254918	1.690834*
	R-Squared	0.814	0.533	0.67	0.791
Cubic	Distance	-0.134603**	-0.024631	-0.060529	-0.089014**
	Distance ²	0.004181*	0.000675	0.002404	0.002873*
	Distance ³	-0.000043	-0.000006	-0.000034	-0.000031
	Constant	2.203874***	1.315414***	1.4793***	1.893851***
	R-Squared	0.857	0.544	0.743	0.844

		Indianapolis	Jacksonville	Kansas City	Las Vegas
Linear	Distance	-0.011803**	-0.00967**	-0.011162**	-0.003565
	Constant	1.287347***	1.200839***	1.313794***	1.027029***
	R-Squared	0.484	0.585	0.48	0.022
Logarithmic	In(Distance)	-0.228279**	-0.149128**	-0.232351***	-0.069083
	Constant	1.681919***	1.414104***	1.734747***	1.146604**
	R-Squared	0.659	0.507	0.758	0.03
Quadratic	Distance	-0.034816*	-0.010313	-0.047019**	-0.029139
	Distance ²	0.000494	0.000014	0.000769**	0.000549
	Constant	1.478737	1.206188	1.612006**	1.239725
	R-Squared	0.602	0.585	0.799	0.094
Cubic	Distance	-0.075974	0.028722	-0.07259*	0.112319
	Distance ²	0.002575	-0.00196	0.002062	-0.006604
	Distance ³	-0.000029	0.000028	-0.000018	0.0001*
	Constant	1.669069***	1.025675***	1.73026***	0.585564
	R-Squared	0.658	0.676	0.823	0.422
		Los Angeles	Louisville/Jefferson County	Memphis	Miami
Linear	Distance	-0.009536**	-0.00908**	-0.01132**	-0.010944*
	Constant	1.268391***	1.182112***	1.25988***	1.332344***
	R-Squared	0.721	0.639	0.506	0.348
Logarithmic	In(Distance)	-0.17762***	-0.165583***	-0.207853**	-0.250414**
	Constant	1.567407***	1.456537***	1.606138***	1.810699***
	R-Squared	0.911	0.773	0.621	0.664
Quadratic	Distance	-0.028005***	-0.023734**	-0.021703	-0.054323**
	Distance ²	0.000396**	0.000314	0.000223	0.000931**
	Constant	1.421995**	1.30399	1.346232	1.693122**
	R-Squared	0.895	0.746	0.533	0.701
Cubic	Distance	-0.035308*	-0.04893*	-0.055241	-0.132192**
	Distance ²	0.000765	0.001588	0.001919	0.004868**
	Distance ³	-0.000005	-0.000018	-0.000024	-0.000055**
	Constant	1.455766***	1.420507***	1.501328***	2.053219***
	R-Squared	0.899	0.792	0.575	0.868

		Milwaukee	Minneapolis	Nashville	New Orleans
Linear	Distance	-0.020146**	-0.016008**	-0.011856**	-0.010606**
	Constant	1.39783***	1.388835***	1.27722***	1.200029***
	R-Squared	0.649	0.656	0.593	0.573
Logarithmic	In(Distance)	-0.381882***	-0.310377***	-0.197938**	-0.198598***
	Constant	2.048791***	1.92623***	1.582511***	1.535629***
	R-Squared	0.849	0.897	0.602	0.731
Quadratic	Distance	-0.055969**	-0.057435***	-0.02952*	-0.032072**
	Distance ²	0.000768*	0.000889***	0.000379	0.00046*
	Constant	1.695761*	1.733378***	1.424128	1.378557*
	R-Squared	0.781	0.938	0.678	0.724
Cubic	Distance	-0.131944**	-0.0768**	0.007508	-0.037289
	Distance ²	0.00461*	0.001868*	-0.001493	0.000724
	Distance ³	-0.000054*	-0.000014	0.000026	-0.000004
	Constant	2.047103***	1.822929***	1.252894***	1.402682***
	R-Squared	0.869	0.947	0.733	0.725
		New York	Oklahoma City	Orlando	Philadelphia
Linear	Distance	-0.020548**	0.0000000013388**	-0.013192**	-0.015012**
	Constant	1.475891***	1.222713***	1.329969***	1.368876***
	R-Squared	0.691	0.642	0.676	0.504
Logarithmic	In(Distance)	-0.391929***	-0.18601***	-0.23895***	-0.309668***
	Constant	2.146904***	1.535316***	1.723976***	1.926824***
	R-Squared	0.916	0.807	0.808	0.781
Quadratic	Distance	-0.068912***	-0.028799**	-0.028766*	-0.054561**
	Distance ²	0.001038***	0.000403*	0.000334	0.000848*
	Constant	1.878134***	1.378983*	1.459498	1.697799*
	R-Squared	0.938	0.788	0.737	0.729
Cubic	Distance	-0.107108***	-0.040979	-0.072449*	-0.127775**
	Distance ²	0.002969**	0.001019	0.002543	0.00455**
	Distance ³	-0.000027*	-0.000009	-0.000031	-0.000052*
	Constant	2.054768***	1.435305***	1.661504***	2.036371***
	R-Squared	0.961	0.797	0.807	0.843

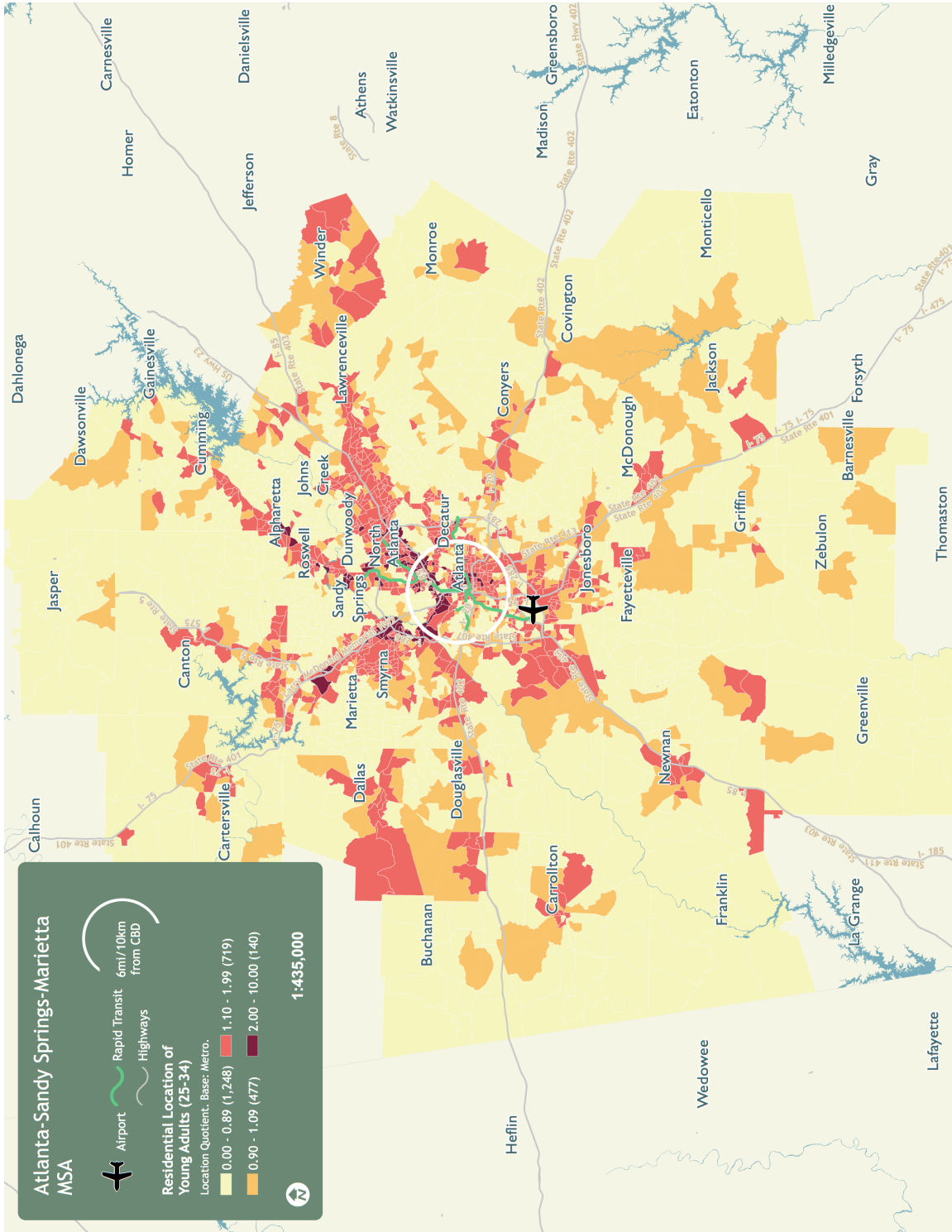
		Phoenix	Pittsburgh	Portland	Providence
Linear	Distance	-0.008258**	-0.014294**	-0.021466**	-0.007349*
	Constant	1.200293***	1.333842***	1.464092***	1.151906***
	R-Squared	0.609	0.6	0.689	0.296
Logarithmic	In(Distance)	-0.126875**	-0.275097***	-0.410535***	-0.169191**
	Constant	1.381017***	1.807755***	2.168256***	1.476133***
	R-Squared	0.523	0.809	0.917	0.572
Quadratic	Distance	-0.013749	-0.049393**	-0.065058**	-0.041552**
	Distance ²	0.000118	0.000753**	0.000935**	0.000734**
	Constant	1.245957	1.625757**	1.826638**	1.436371**
	R-Squared	0.626	0.832	0.872	0.71
Cubic	Distance	0.034288	-0.100963**	-0.124317**	-0.066579*
	Distance ²	-0.002311*	0.003361**	0.003932**	0.001999
	Distance ³	0.000034**	-0.000036*	-0.000042*	-0.000018
	Constant	1.023816***	1.864237***	2.100677	1.552105***
	R-Squared	0.822	0.907	0.921	0.742
		Raleigh	Richmond	Riverside	Rochester
Linear	Distance	-0.010669**	-0.01215***	-0.004796**	-0.013109*
	Constant	1.22479***	1.251754***	1.139023***	1.239657***
	R-Squared	0.712	0.74	0.548	0.384
Logarithmic	In(Distance)	-0.180998***	-0.196807**	-0.070535*	-0.292971**
	Constant	1.507862***	1.547082***	1.234835***	1.79237***
	R-Squared	0.746	0.707	0.431	0.699
Quadratic	Distance	-0.023744**	-0.025925**	0.000114	-0.060038**
	Distance ²	0.00028	0.000295	-0.000105	0.001007**
	Constant	1.333528	1.366312	1.098182	1.629957**
	R-Squared	0.781	0.801	0.585	0.702
Cubic	Distance	-0.02877	0.000237	0.002096	-0.167394***
	Distance ²	0.000535	-0.001027	-0.000206	0.006435***
	Distance ³	-0.000004	0.000018	0.000001	-0.000076***
	Constant	1.35677***	1.245329***	1.089016***	2.126417***
	R-Squared	0.783	0.834	0.585	0.946

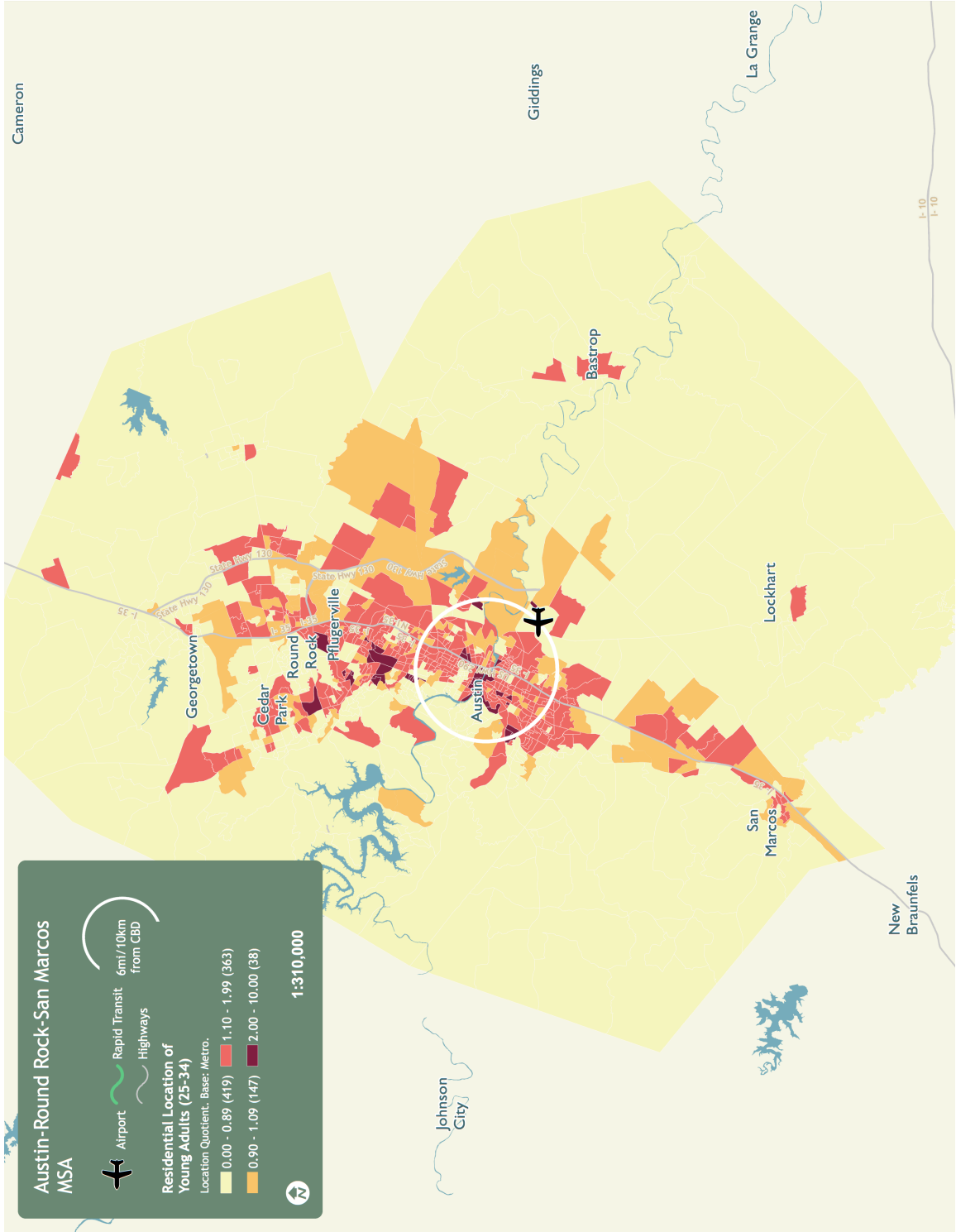
		Sacramento	Salt Lake City	Sanantonio	San Diego
Linear	Distance	-0.017983***	-0.008242*	0.00000016283**	-0.020652**
	Constant	1.4333***	1.189325***	1.180902***	1.475393***
	R-Squared	0.733	0.355	0.44	0.723
Logarithmic	In(Distance)	-0.326443***	-0.180776**	-0.129896*	-0.388315***
	Constant	1.972471***	1.526902***	1.339873***	2.133543***
	R-Squared	0.879	0.622	0.293	0.93
Quadratic	Distance	-0.037613**	-0.038452**	0.005995	-0.063784***
	Distance ²	0.000421	0.000648**	-0.000335	0.000925**
	Constant	1.596566	1.440577**	1.051179	1.834117**
	R-Squared	0.789	0.663	0.515	0.926
Cubic	Distance	-0.10402**	-0.086656**	0.041189	-0.090577**
	Distance ²	0.003779**	0.003085*	-0.002114	0.00228*
	Distance ³	-0.000047*	-0.000034*	0.000025	-0.000019
	Constant	1.903656***	1.663494***	0.88843**	1.95802***
	R-Squared	0.884	0.778	0.571	0.937
		San Francisco	San Jose	Seattle	St. Louis
Linear	Distance	-0.018603**	-0.010237*	0.000012**	-0.015677**
	Constant	1.466343***	1.160232***	1.449273***	1.418403***
	R-Squared	0.552	0.437	0.547	0.638
Logarithmic	In(Distance)	-0.366061***	-0.20156**	-0.3418***	-0.30046***
	Constant	2.106426***	1.512827***	2.06438***	0.000002***
	R-Squared	0.778	0.616	0.844	0.854
Quadratic	Distance	-0.07194**	-0.036654**	-0.066473***	-0.046077**
	Distance ²	0.001144**	0.000567*	0.00107**	0.000652*
	Constant	1.909939**	1.379943*	1.864041**	1.671238*
	R-Squared	0.844	0.624	0.864	0.793
Cubic	Distance	-0.11666**	-0.058592	-0.121501**	-0.099506**
	Distance ²	0.003405*	0.001676	0.003852**	0.003354*
	Distance ³	-0.000032	-0.000015	-0.000039*	-0.000038*
	Constant	2.116744***	1.481393***	2.118513***	1.918314***
	R-Squared	0.874	0.643	0.921	0.863

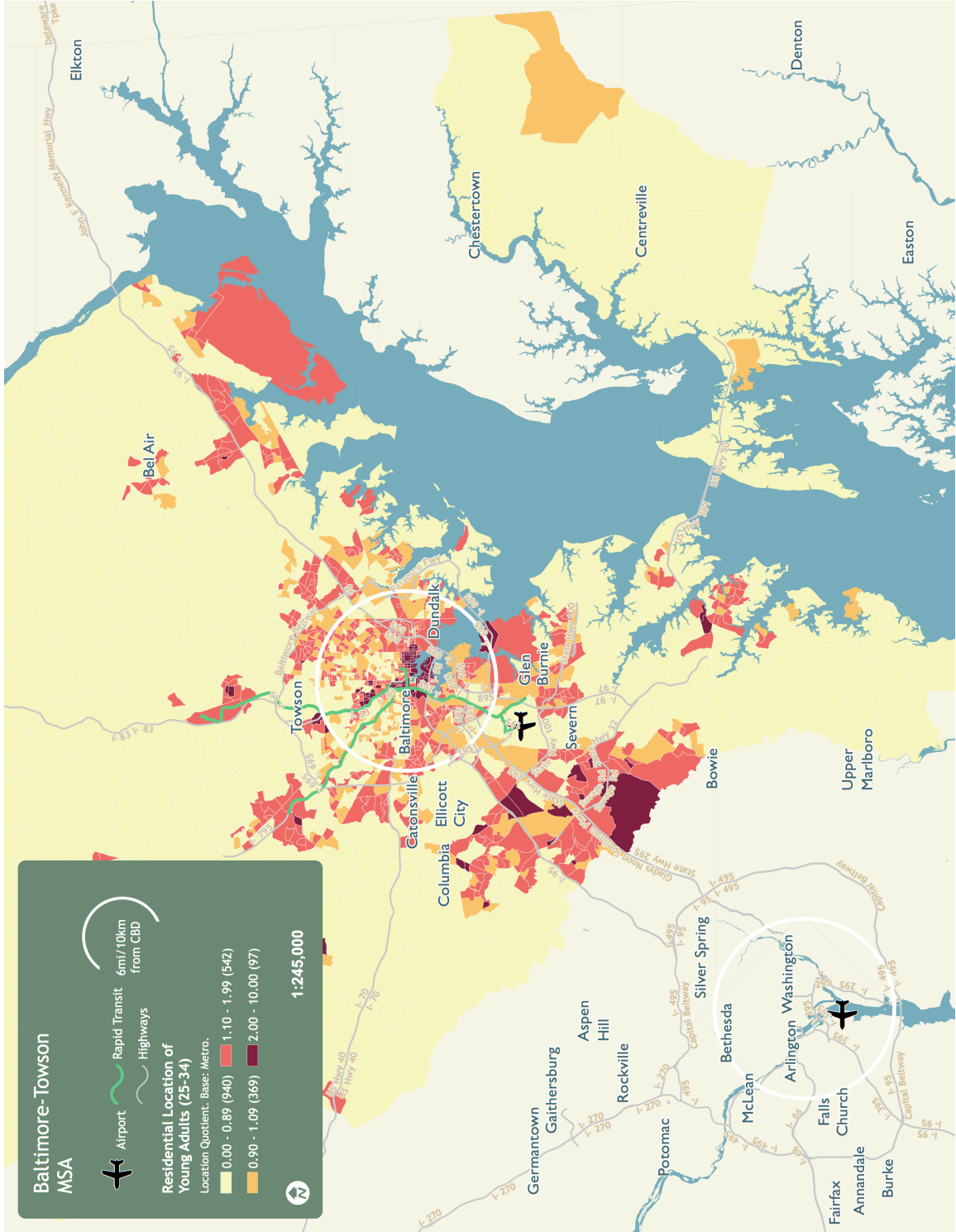
		Tampa	Virginia Beach	Washington	Calgary
Linear	Distance	-0.017561***	-0.007323**	-0.017691*	-0.017977**
	Constant	1.482574***	1.179044***	1.498873***	1.338757***
	R-Squared	0.784	0.514	0.409	0.543
Logarithmic	In(Distance)	-0.283658***	-0.130455**	-0.388908**	-0.331051**
	Constant	1.907132***	1.391397***	2.225996***	1.891429***
	R-Squared	0.745	0.593	0.719	0.671
Quadratic	Distance	-0.02446*	-0.018764*	-0.089835***	-0.035397
	Distance ²	0.000148	0.000245	0.001548**	0.000374
	Constant	1.539956	1.274196	2.098883**	1.483634
	R-Squared	0.792	0.594	0.846	0.576
Cubic	Distance	-0.000537	-0.030883	-0.181014***	-0.103498
	Distance ²	-0.001062	0.000858	0.006158**	0.003817
	Distance ³	0.000017	-0.000009	-0.000064**	-0.000048
	Constant	1.429325***	1.330238***	2.520533***	1.79856***
	R-Squared	0.805	0.608	0.949	0.65
		Edmonton	Montreal	Ottawa-Gatineau	Toronto
Linear	Distance	-0.010961**	-0.013765*	-0.013919**	-0.017115**
	Constant	1.179428***	1.278717***	1.224028***	1.426238***
	R-Squared	0.497	0.403	0.512	0.452
Logarithmic	In(Distance)	-0.211976**	-0.306074**	-0.283034***	-0.367387***
	Constant	1.545796***	1.854551***	1.729495***	2.103972***
	R-Squared	0.677	0.726	0.771	0.758
Quadratic	Distance	-0.027944*	-0.069406***	-0.050541**	-0.070637**
	Distance ²	0.000364	0.001194**	0.000786**	0.001148**
	Constant	1.320672	1.74147**	1.528604**	1.871373**
	R-Squared	0.574	0.827	0.741	0.736
Cubic	Distance	-0.095456**	-0.157419***	-0.099143**	-0.171852**
	Distance ²	0.003778*	0.005644***	0.003243*	0.006266**
	Distance ³	-0.000048*	-0.000062***	-0.000034	-0.000071**
	Constant	1.632876***	2.148477***	1.753364***	2.339434***
	R-Squared	0.753	0.983	0.8	0.886

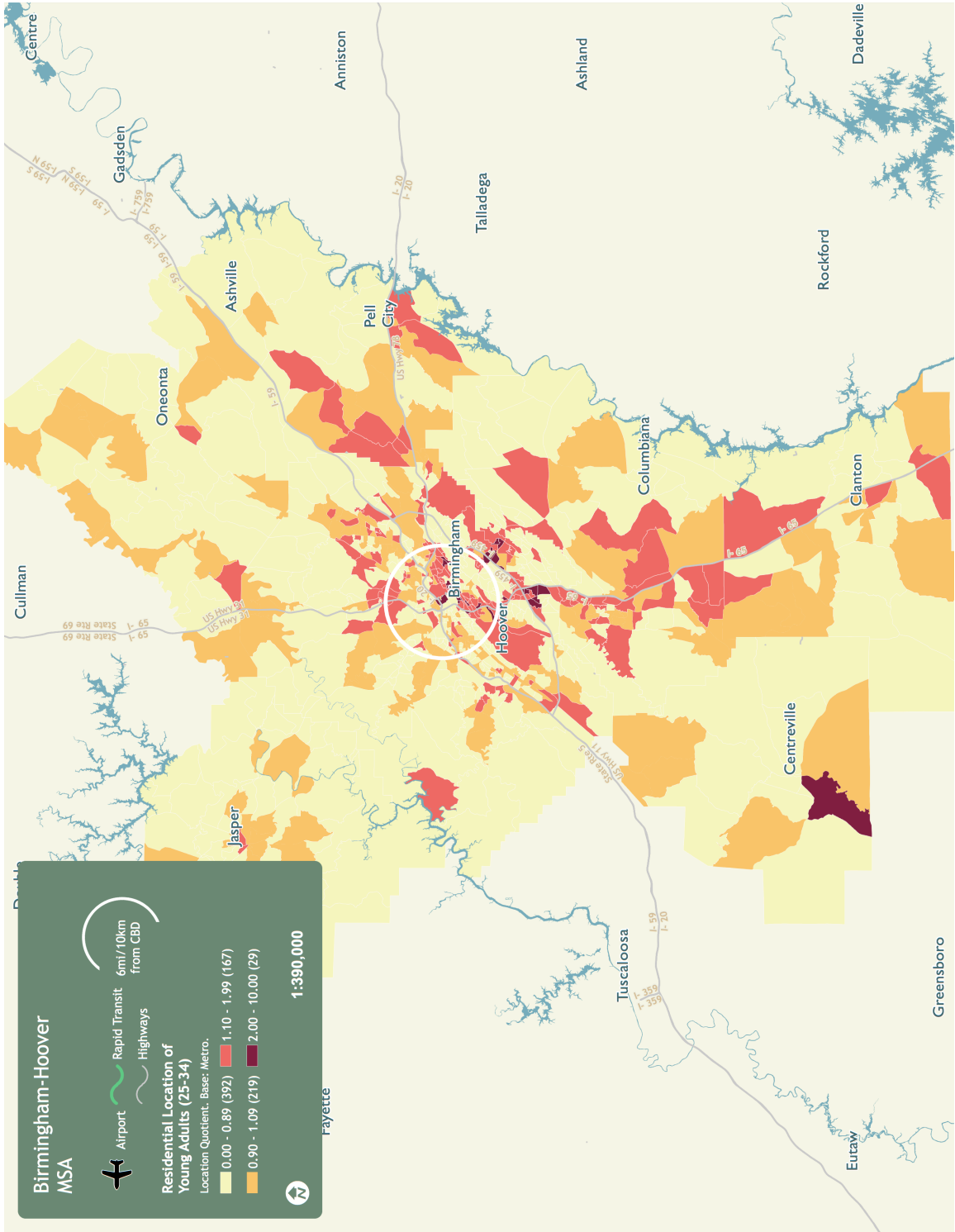
Vancouver		
Linear	Distance	-0.016594**
	Constant	1.35043***
	R-Squared	0.498
Logarithmic	In(Distance)	-0.336048***
	Constant	1.949018***
	R-Squared	0.743
Quadratic	Distance	-0.05167*
	Distance ²	0.000752
	Constant	1.642145
	R-Squared	0.641
Cubic	Distance	-0.154649**
	Distance ²	0.00596**
	Distance ³	-0.000073**
	Constant	2.118363***
	R-Squared	0.823

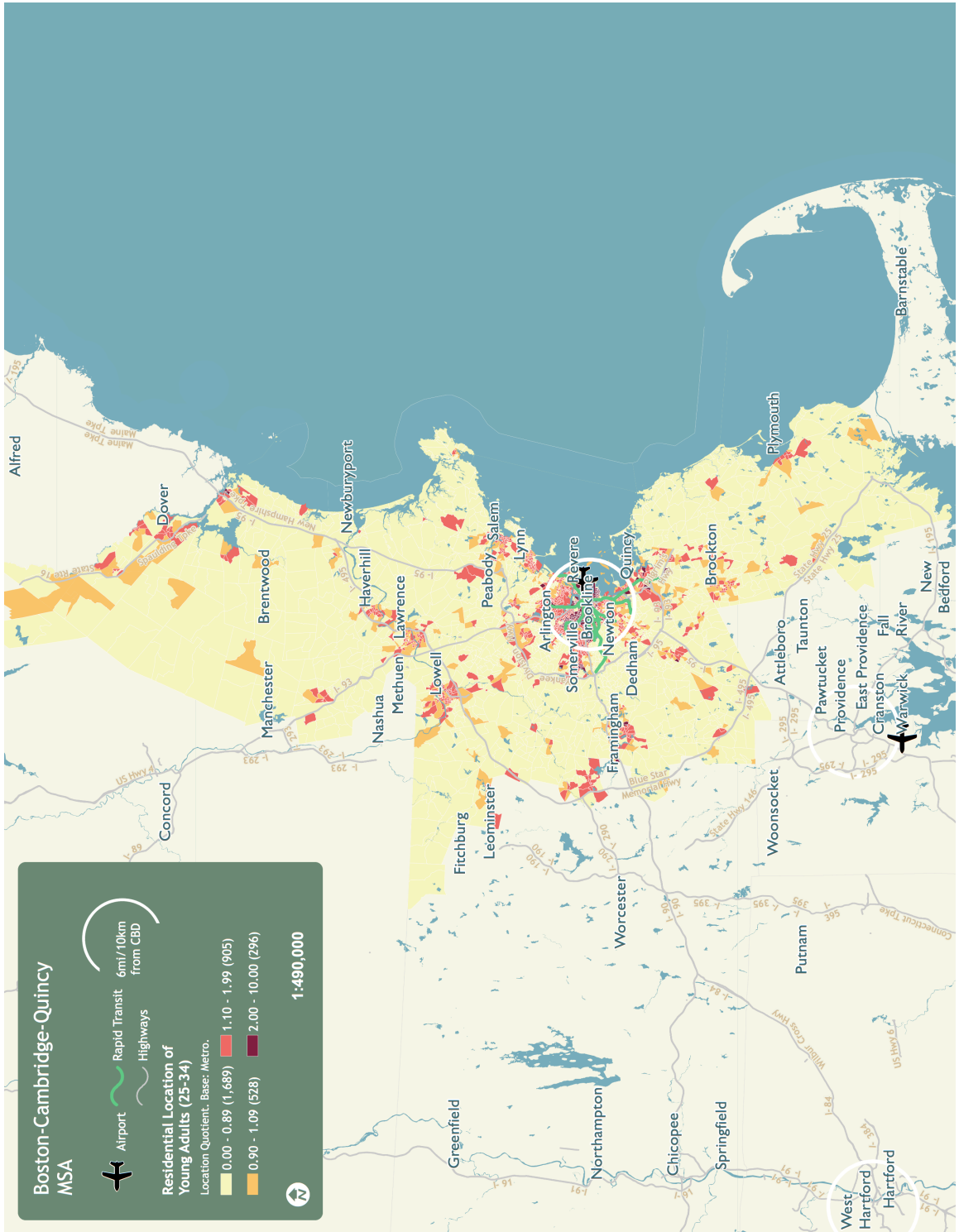
Appendix B: Spatial Organization of Young Adults in Major Metropolitan Regions in Canada and the United States

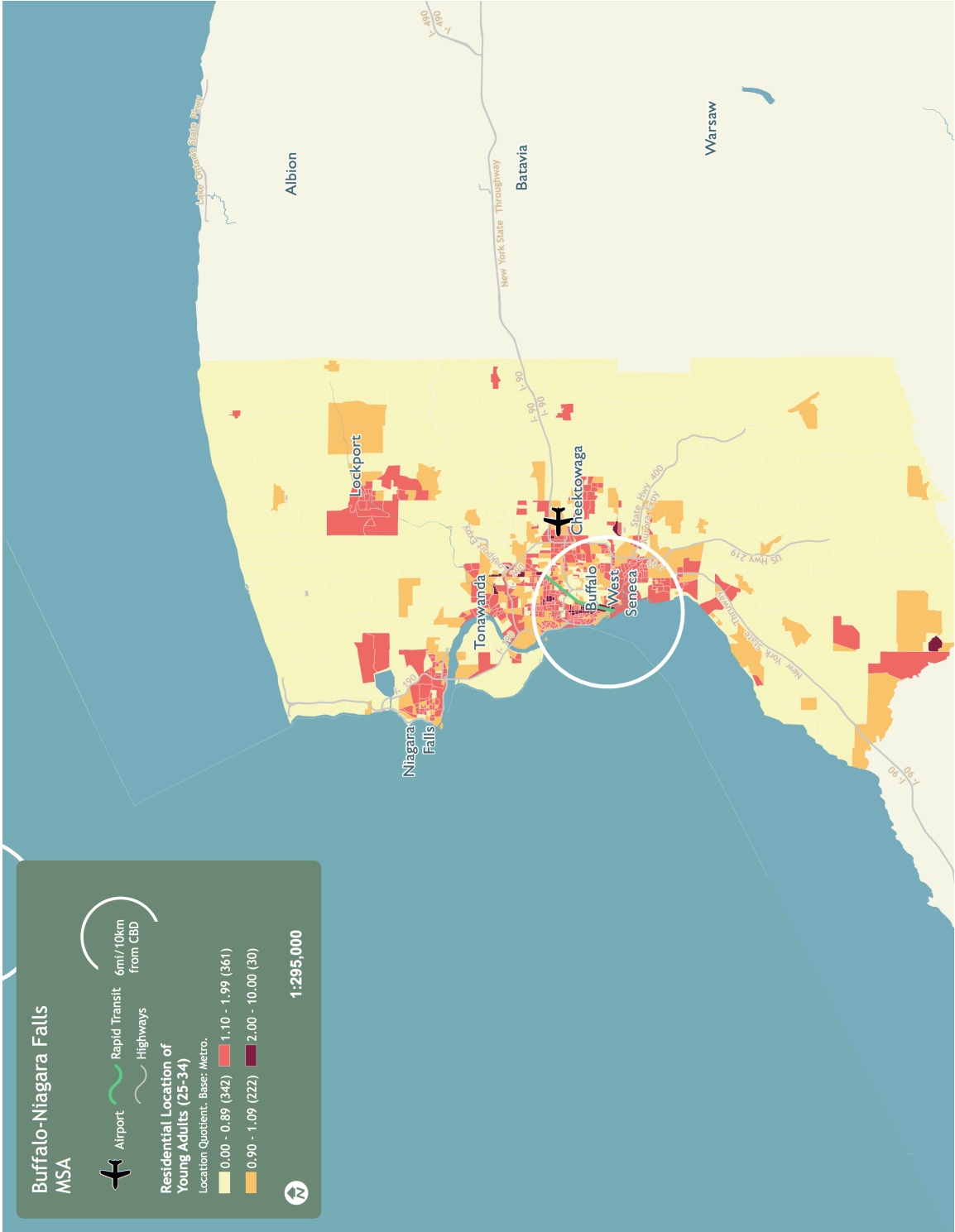


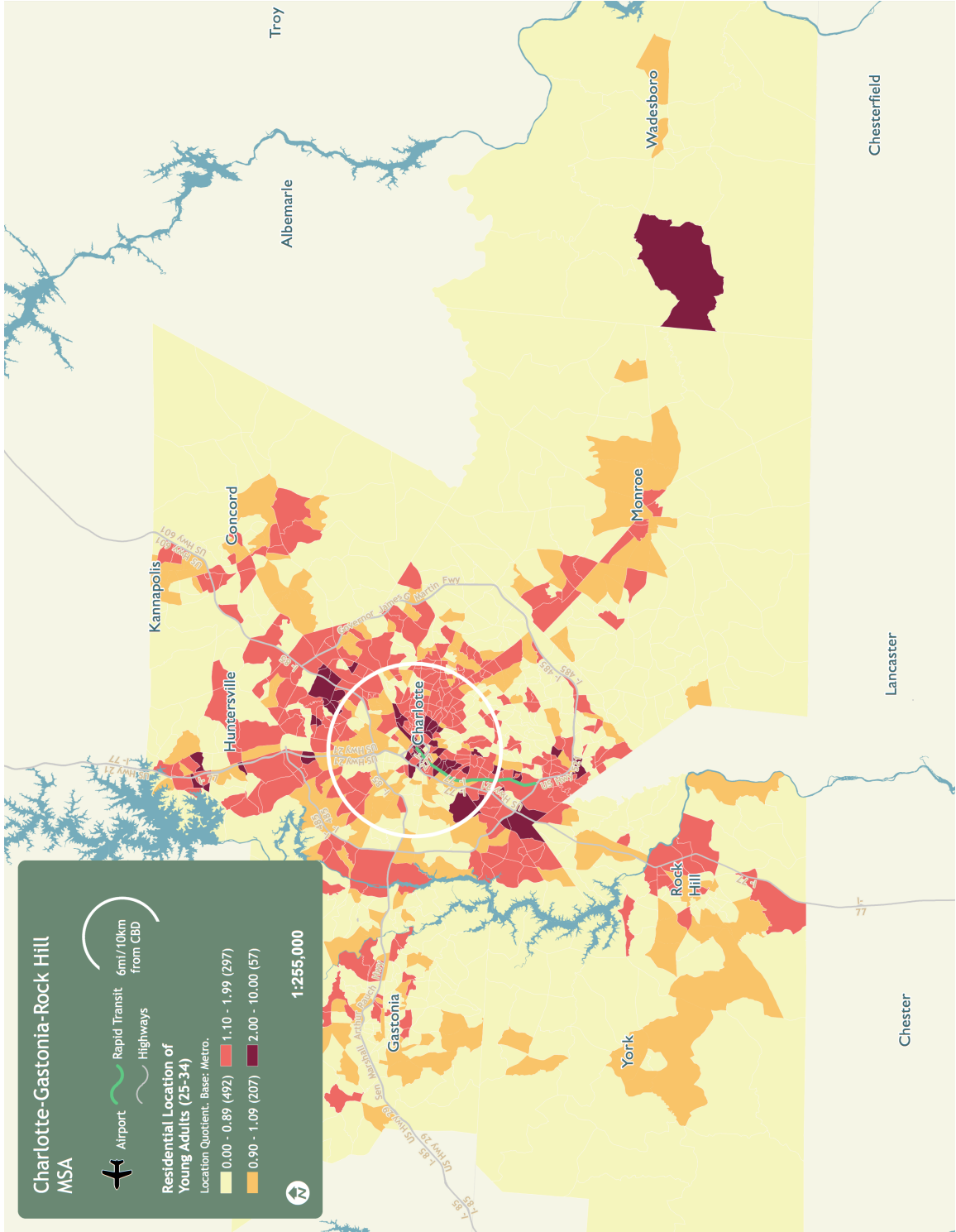


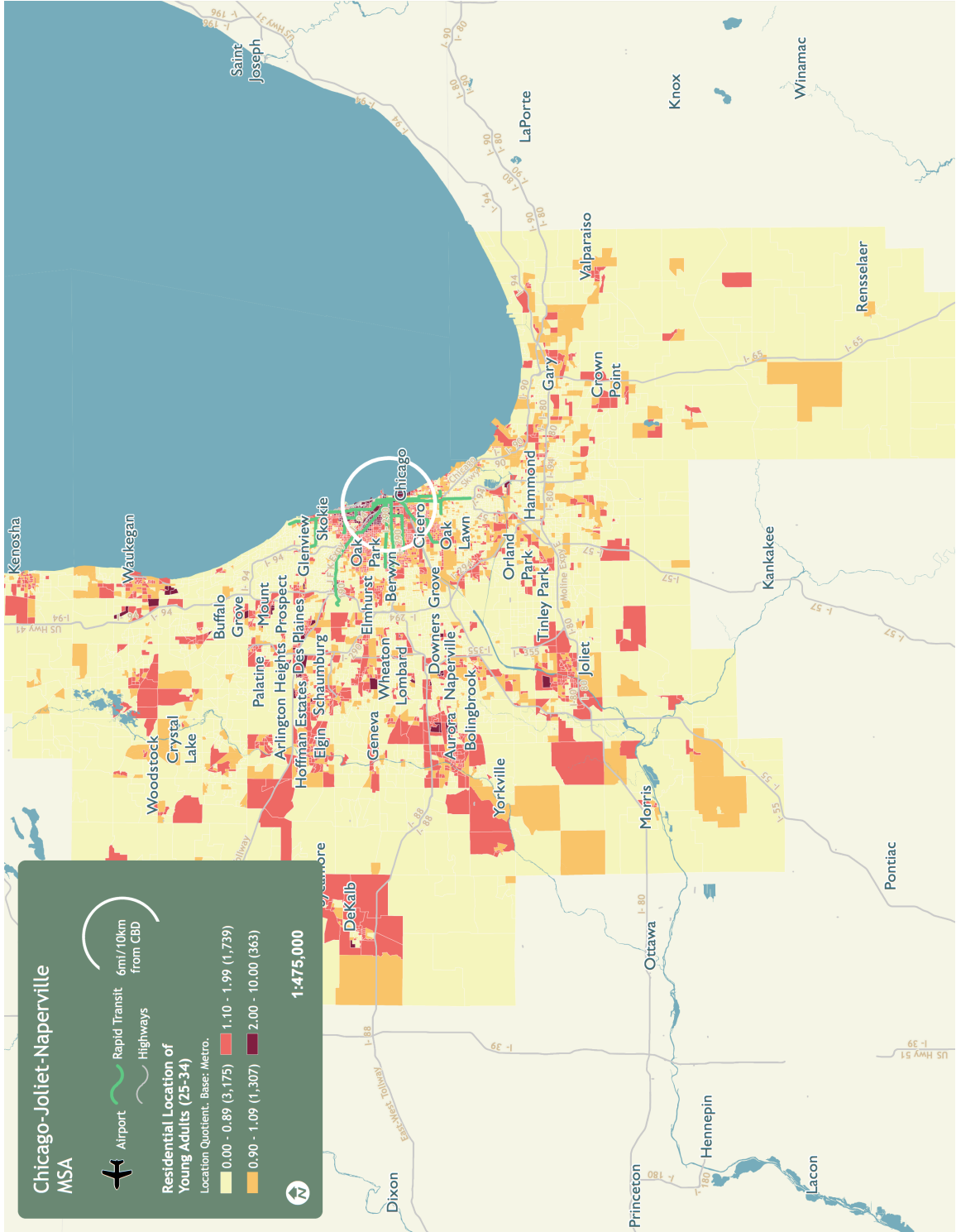


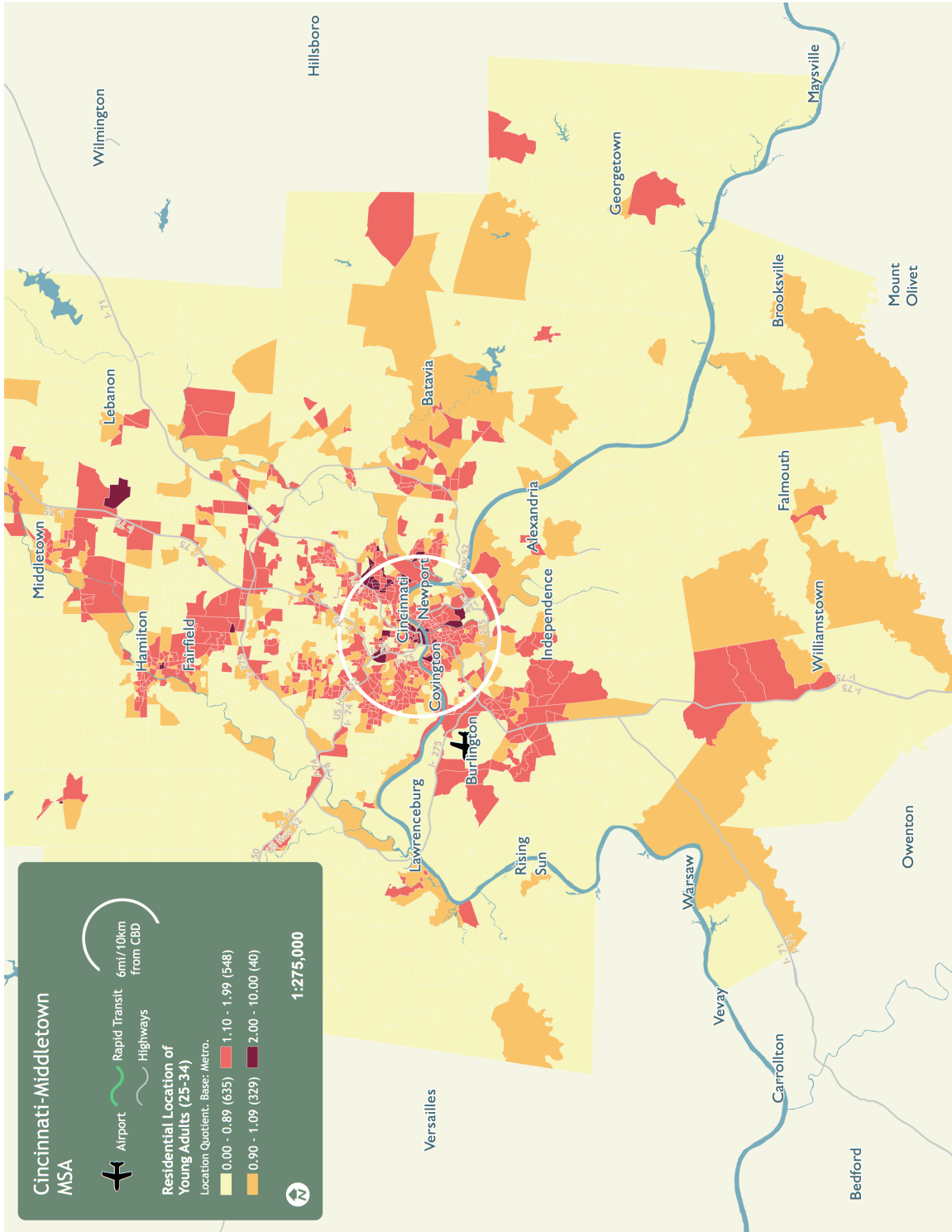


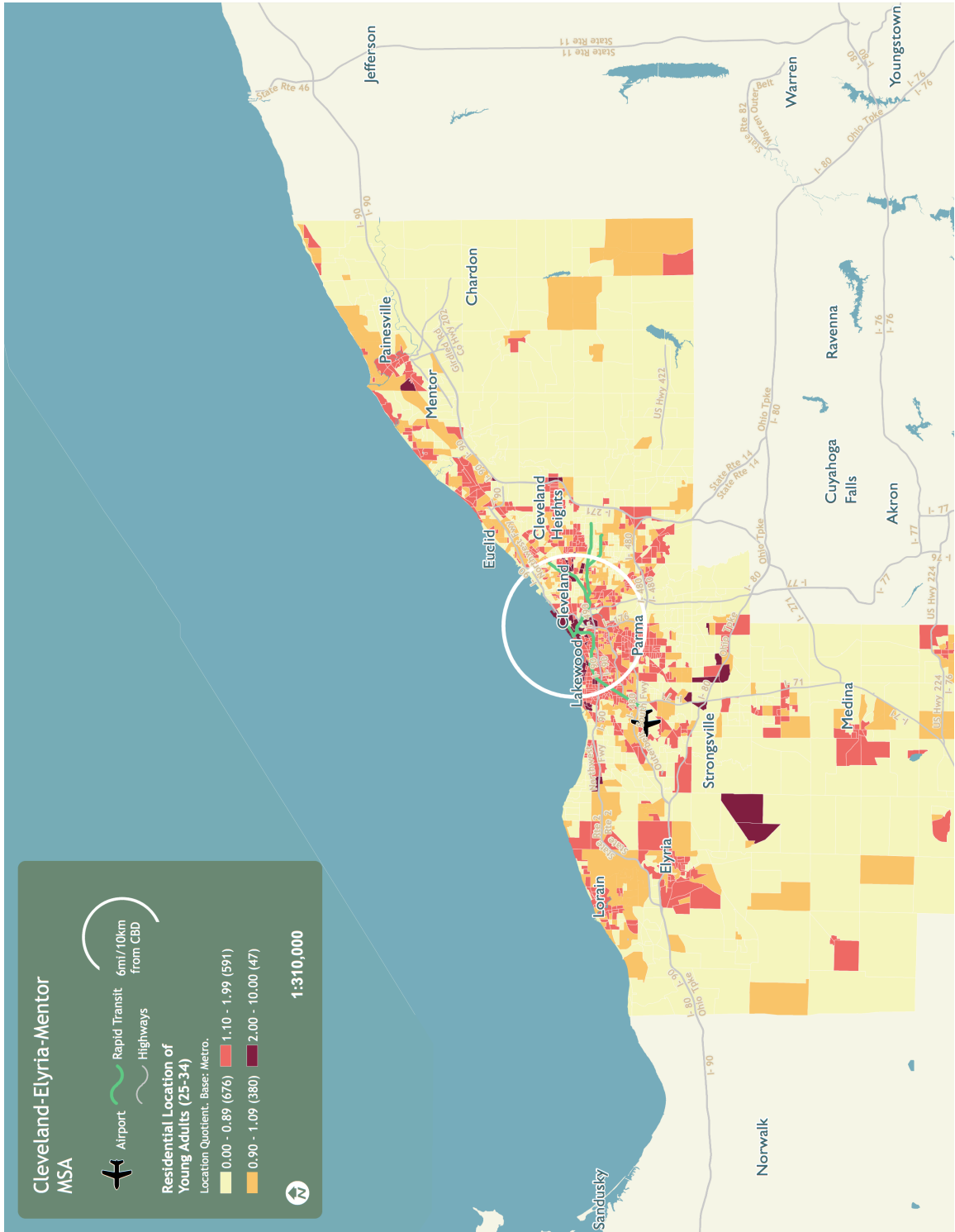


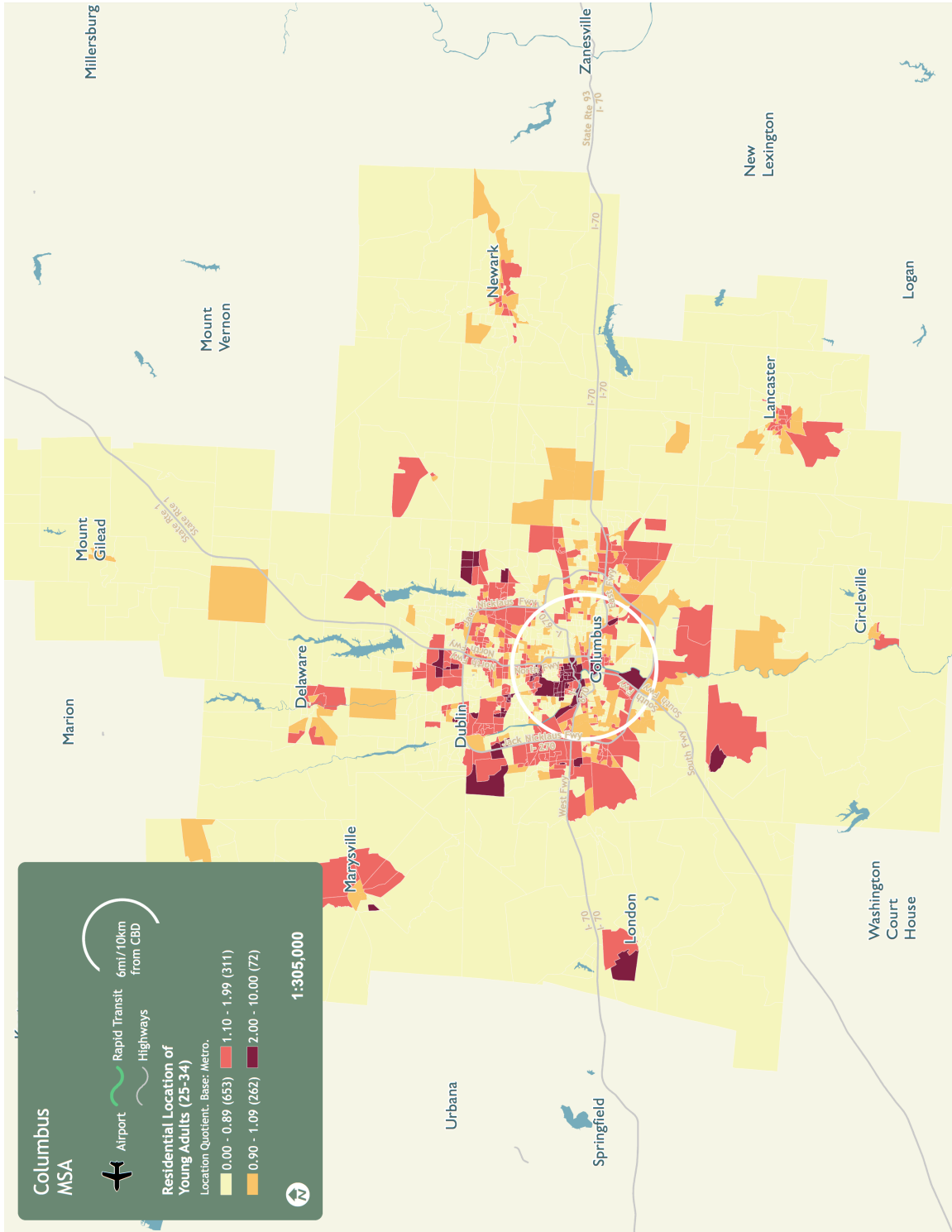


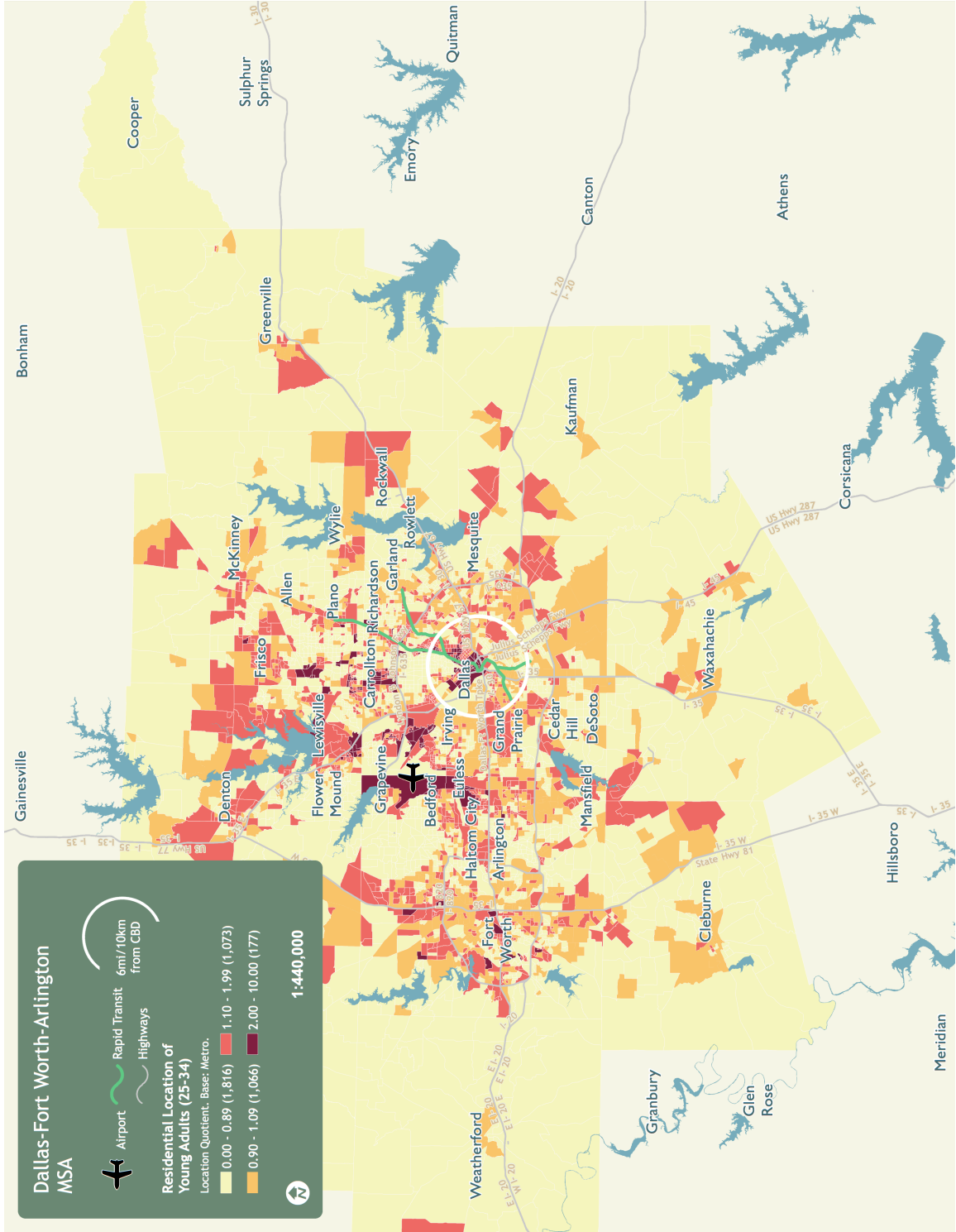


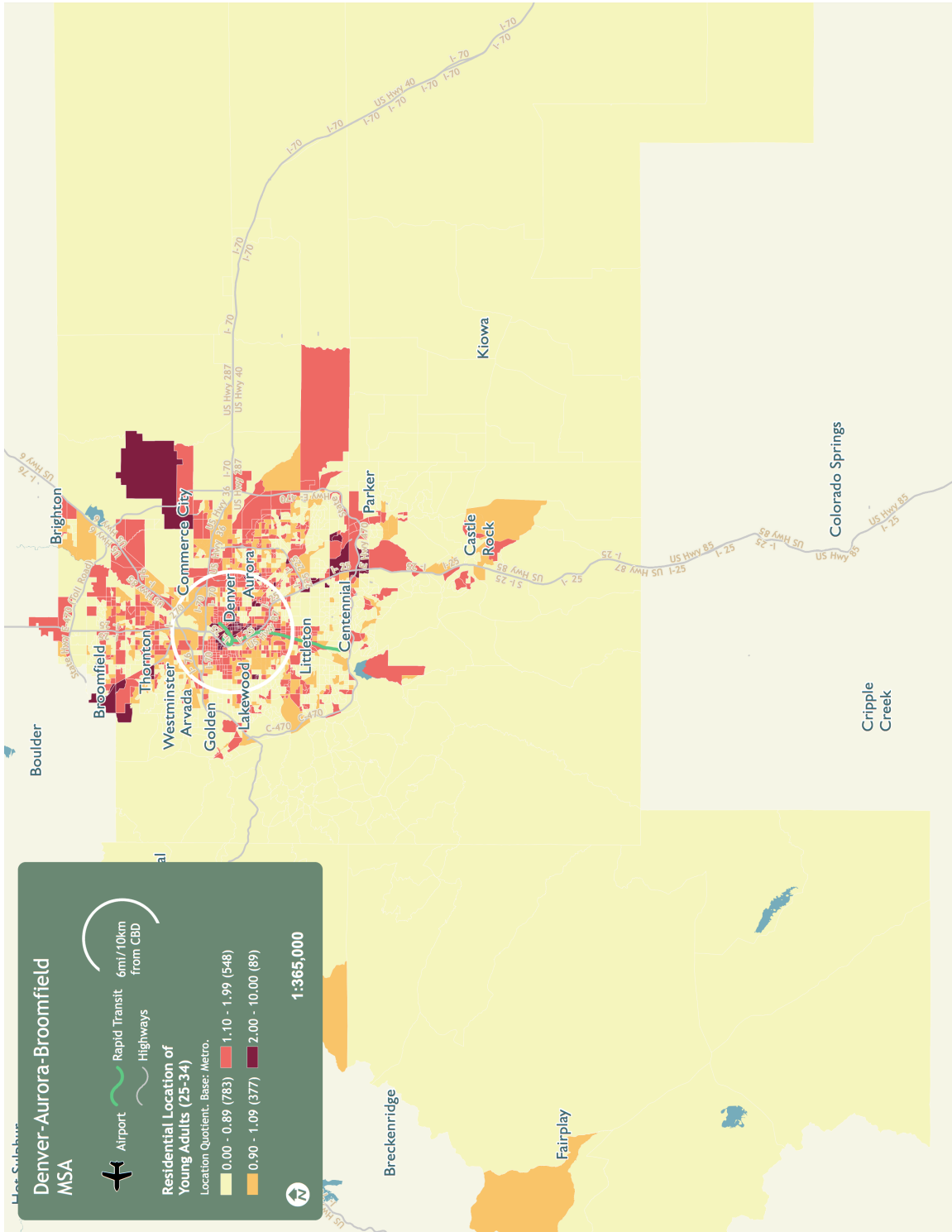












Denver-Aurora-Broomfield MSA

Airport
 Rapid Transit
 Highways

Residential Location of Young Adults (25-34)

Location Quotient. Base: Metro.

0.00 - 0.89 (783)	1.10 - 1.99 (548)
0.90 - 1.09 (377)	2.00 - 10.00 (89)

6mi/10km from CBD

1:365,000

