URBAN INTERCURRENCE:
THE STRUGGLE TO BUILD WALKABLE DOWNTOWNS IN CAR-DEPENDENT SUBURBIA

by

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Dedication

I dedicate this thesis to my wife, Lyna Kaminstky, who first encouraged me to pursue a PhD, and who never wavered in her support.

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Abstract

An increasing number of cities in Canada and the United States hope to retrofit car-dependent suburban areas into walkable, transit-oriented communities to achieve goals related to health, sustainability, and economic productivity. However, they often struggle to do so, because in car-dependent environments, wide roads and parking lots discourage walking, and because there tends to be substantial political and institutional barriers to redistributing space from cars to pedestrians. In this thesis, I ask why cities struggle to implement suburban retrofits, and what forces could facilitate change? I explain the challenge by analyzing car-dependence and walkability as two self-reinforcing, path-dependent design paradigms that exist in fundamental tension with each other. I label this tension "urban intercurrence," and draw on the literatures of American Political Development, historical institutionalism, policy feedback, and urban planning to theorize why it is difficult to transition from one paradigm to another. I categorize these tensions into three types of self-reinforcing process: institutional, political, and transport-economic (the interaction of development and transportation).

I explore these ideas in four case studies of retrofits in Canada and the United States: Surrey City Centre, BC; and the Uptown Core, Oakville, ON; Downtown Kendall, FL; and Tysons, VA. For each, I review historical documents and interview a range of actors, including developers, engineers, urban planners, politicians, and community advocates. I find evidence in support of the idea that car-dependence is self-reinforcing, and that political, institutional, and physical barriers exist for walkable design in car-dependent contexts. I also find, however, evidence of considerable progress, and I offer two additional hypotheses to explain processes of change. I propose that to initiate a retrofit, proponents can utilize contradictions that exist within car-dependence, including backlash amongst car-dependent voters against the consequences of car-dependence. To complete the process of change, however, walkable interests, institutions, and development would need to reinforce walkability on its own terms, and rely less on car-oriented institutions and voters to justify change. I bolster these claims by reviewing the history of how walkable design was first supplanted by car-dependence in the early twentieth century.

List of Abbreviations Used

AASHTO	American Association of State Highway Transportation Officials
CMHC	Canada Mortgage and Housing Corporation
FDOT	Florida Department of Transportation
FHA	Federal Housing Authority
NACTO	National Association of City Transportation Officials
SCDC	Surrey City Development Corporation
TOD	Transit-Oriented Development
VDOT	Virginia Department of Transportation
FDOT	Fairfax Department of Transportation

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Chapter 1. Introduction

Oakville's Uptown Core is torn between two possible futures. The neighbourhood is a suburban community on the edge of Oakville, Ontario, and its official plan envisions a vibrant, walkable community, with streets full of people, lined with restaurants, shops and services (Town of Oakville 2006, 215–216). Some progress is already visible on the community's south side. Developers have built compact, four-story apartment buildings with ground floor retail, bordering a tightly-packed neighbourhood of duplexes and single-family homes. However, the larger, northern half of the community suggests a different future. Here, the landscape comprises vacant fields and large parking lots, and developers have built a Walmart and other big box stores where the plan calls for downtown-style towers. As more people drive to this and other nearby big box stores, it will incentivize developers to build yet more stores with large parking lots to cater to all these customers arriving by car. The Uptown Core cannot simultaneously become a walkable neighbourhood and a landscape of big box stores. Which will prevail?

Much rides on the future of the Uptown Core and communities like it. The US Surgeon General and Canada's Public Health Officer state that community design is critical for protecting health (Centers for Disease Control 2015; Public Health Agency of Canada 2017). Only two in ten Canadians today meet minimum physical activity guidelines, and less than 3% of United States residents meet requirements for physical activity and diet, in part because a majority live in car-dependent communities, where it is not practical to walk to do useful things (Public Health Agency of Canada 2016; Loprinzi et al. 2016; Sallis et al. 2009; Lawrence Douglas Frank et al. 2007; Saelens and Handy 2008). Physical inactivity is a major risk factor for most leading preventable causes of death in Canada and the United States, including diabetes, cardiovascular disease, kidney disease, stroke, and some cancers (Warburton et al. 2010; Warburton, Nicol, and Bredin 2006; Lee et al. 2012; Booth, Roberts, and Laye 2012). Municipalities also seek to build compact, walkable communities to boost economic growth, preserve farmland, cut carbon emissions, manage traffic, and reduce infrastructure costs (Blais 2011; Leinberger and Alfonzo 2012; Eidelman 2010; Taylor 2019).

And yet, of the homes built between 2006 and 2016 in Canada, 67% are in car-dependent communities, and the United States has been following a similar pattern of growth (Gordon 2018; Heimlich and Anderson 2001, 2). Few government or municipal strategies call for building more car-dependent growth — and many do call for walkable development — yet most cities continue to build large quantities of car-dependent development (Government of Canada 2018; Government of Nova Scotia 2012; Government of Ontario 2014; Ontario Ministry of Health Promotion 2010; Public Health Agency of Canada 2017; British Columbia Ministry of Health 2015; *Places to Grow Act* 2005). There is a disconnect between official policies and outcomes (Downs 2005; Langlois 2010).

Car-dependence has been the dominant growth model for so many decades, it can be difficult to switch directions. Planning and street design standards have long been optimized for car-oriented growth (Hebbert 2005, 57; Norton 2011; Dumbaugh and Gattis 2005, 451). Banks lend more easily to typical car-dependent development types (Leinberger 2001, 11). Politically, residents often oppose density near their homes but express few complaints when homes are erected far away on the urban periphery (Trounstine 2021). The system of planning, financing, and building car-dependence is a well-oiled machine, whereas the process for delivering compact, walkable growth is often slow, facing greater bureaucratic hurdles and political controversy.

And perhaps the greatest hurdle is that if cities are to switch trajectories and build walkable neighbourhoods, they will likely need to transform existing car-dependent neighbourhoods to become walkable — as in the Uptown Core. Such “suburban retrofits” are essential for achieving goals related to health and sustainability, because the majority of urban areas in most cities today are car-dependent, leaving little room for walkable growth unless cities can convert large areas of existing suburbs into pedestrian-oriented neighbourhoods (Gordon, Hindrichs, and Willms 2018; Pucher and Lefèvre 1996). However, this is no easy task: the barriers to walkable design are greatest in such suburban contexts, where the momentum for car-oriented design is most entrenched. Many suburban retrofits today are like the Uptown Core, half-complete, caught between the prevailing development logic of wide roads and parking lots, and a hoped-for future of shopfronts and restaurants lining lively streets.

In this thesis, I ask why cities struggle to implement suburban retrofits, and what forces could facilitate change? To answer this question, I draw on the the political science literature on self-reinforcing policies and path-dependence, as they can offer insight on why it is difficult to dislodge a policy paradigm once it becomes dominant. I analyze four examples of such suburban retrofits in-depth, in the hopes of clarifying the barriers to change, and of finding strategies to overcome them. I have interviewed 48 developers, planners, engineers, politicians, and local activists to gain insight on the economic, political, and institutional forces that shape these transformations. I have also read newspaper articles, plans, staff reports, public hearings, and development proposals over a period of decades to trace how these communities became car-dependent, and the forces that have either blocked or facilitated a shift to another development paradigm.

The four retrofits I analyse represent a range of projects. Tysons, Virginia, is likely the largest suburban retrofit in the world, with a size, at 1,200 hectares, that rivals Downtown Washington D.C. The ambitious proposal calls for adding 195,000 residents and jobs by 2050, creating a major new regional downtown (Fairfax County 2017b, 21). Surrey, a suburb of Vancouver, is similarly building the downtown it never had — though at a smaller scale, 290 hectares — allowing towers 20-38 stories in height across much of its length and breadth (City of Surrey 2017a, 207). The Uptown Core is the smallest of the four, at 110 hectares, and proposes a downtown for the municipality's northern half, with buildings up to 18 stories tall (Town of Oakville 2009b, 73). Downtown Kendall — in Miami-Dade, Florida — meanwhile, was among the earliest retrofits, and helped to demonstrate that such projects are possible. It is 130 hectares and allows buildings as tall as 25 stories (Miami-Dade County 1999b). All have made major progress on compact, walkable growth in places, but none has yet to complete the transition. Each remains marked by large areas of parking lots, wide roads, or single-use buildings from its earlier life.

The present study makes a contribution to the urban planning literature on retrofits because it focuses specifically on sites where there is no single landowner — the focus of previous work on suburban retrofits (Tachieva 2010, 48; Bohl and Schwanke 2002, 132–133; Dunham-Jones and Williamson 2008, 5). This thesis instead focuses on contexts where there are a complex variety of small properties with a plurality of owners. While it is true that the most successful suburban retrofits tend to be on single, large opportunity sites — such as abandoned airfields or military bases, in the cases of Playa Vista, Los Angeles, or Baldwin

Park, Orlando — where sufficient land is available to build complete walkable communities all at once, cities cannot purchase all neighbourhoods they wish to transform, if they wish to build walkable communities at scale. There are also insufficient former airports and military bases to house everyone who may wish to lead an active lifestyle. Most urban communities have many landowners, and it is therefore important that cities learn to retrofit such places, even if it is a messier, more incremental process.

Today, the principal mechanism used by planners to shape development is zoning, which works relatively effectively in downtowns, where there is strong underlying demand. However, zoning cannot make developers want to build pedestrian-oriented buildings in a context where no one currently walks. Langlois (2010, 449) finds that, as a result, official plans are only "capable of moderately accelerating positive trends and moderately retarding negative trends." Such a weak nudge is insufficient to transform a community into a new model of design.

The present study is a political science thesis because many of the tools governments need to transform such neighbourhoods are a question of political, institutional, and economic change. I examine the political strategies used by advocates to build support for such a fundamental shift, in suburban contexts where residents often oppose density and demand abundant surface parking (Levine 2010, 82; Trounstine 2021; Ross 2015, 51–52). I study policies that changed the underlying incentives developers face, in these four retrofits, to encourage them to build pedestrian-friendly growth. And I assess the techniques necessary to shift institutional practices, to ensure that rules better reflect the needs of walkable growth, and that the practitioners are capable of implementing those new rules. What emerges is a more complete picture of how to achieve fundamental urban change.

Urban Intercurrence

At the heart of this thesis is a proposal for how to understand the tensions between car-dependence and walkability. I borrow the concept of "Interucurrence" from the field American political development, which highlights the ways in which multiple, contradictory paradigms of thought and practice can co-exist within institutions, and how their contradictions can shape policy (Orren and Skowronek 1996, 141–142; Lieberman 2002,

704). I use the phrase "urban intercurrence" to refer to the mutually-undermining co-existence of walkability and car-dependence within a given urban area. I similarly draw on historical institutionalism to describe how a paradigm, once dominant, can become path-dependent, reinforcing itself at the expense of other, competing paradigms. I then employ the research on policy feedback to explain why such a dominant paradigm does not stay dominant forever.

This thesis makes three primary claims. The first offers a model to understand the challenge cities face when attempting suburban retrofits: car-dependence reinforces itself economically, politically, and institutionally in contexts where it is dominant, blocking walkable change. I explore the ways in which local, regional, state, provincial, and national institutions can become locked-into car-oriented design once it becomes the norm. I further identify positive political feedback loops: the growth of car-dependent suburbs expands the scale of the industries that build them, and the number of residents that live in them, creating an ever-larger set of actors with a stake in defending car-oriented design from change. And I identify processes of positive economic feedback: as parking lots expand in size, more people depend on driving, increasing the incentive to erect buildings with large parking lots, and undermining the incentive to build anything else.

My second claim concerns why dominant paradigms, once dominant, need not stay dominant forever. The literature on policy feedback reveals that it is common for systems to create both self-reinforcing and self-undermining feedback (Busemeyer, Abrassart, and Nezi 2021, 145; Béland, Campbell, and Kent Weaver 2022, 35). While car-dependence creates incentives for many to defend it, it also creates consequences — such as traffic — that can inspire many to support denser, transit-oriented growth. In other cases, the mechanisms that usually reinforce car-dependence also create opportunities for change: car-oriented street design standards may encourage wider, faster roads, but in some contexts — such as local streets — they can provide justification to instead prioritize pedestrians, with slower streets, narrower lanes, and similar interventions. I refer to these contradictory feedback processes — which undermine car-dependence, reinforce walkability, or at least enable a shift towards walkability — as "inverse feedback." My second claim is that proponents can employ inverse feedback to initiate change, but that it generally only produces partial, flawed change. While car-oriented interests and institutions may support walkable design to some extent, their support, I propose, will tend to be limited.

My third claim is that to complete a shift to walkability, it is necessary, at some point, for walkability to begin to reinforce itself on its own terms, at the expense of car-dependence. That is to say: it is necessary for walkable interests to identify as such, to defend their needs, to establish separate standards, and to normalize those standards. It is also essential for walkable development to achieve a sufficient scale that it can begin to attract other, similar growth. Car-dependence may cause backlash that inspires change, but to complete change, it is essential for those who have a direct stake in walkability to complete the transformation.

I started this research with only a clear understanding of the first claim and third claim. The second claim emerged from my findings, as I struggled to come to terms with the fact that car-dependent residents are sometimes enthusiastic proponents of walkability, and that none of the four retrofits would have been possible without at least some support from car-oriented interests. The resulting model could be useful for studying processes of change in any context in which two self-reinforcing paradigms exist in tension with one another, such as that between the fossil-fuel economy to a green-energy economy, or that of autocracy and democracy.

This study draws from, and contributes to, a variety of literatures. For American Political Development, I offer a rich empirical context to study intercurrence, as well as my own empirical findings on how such tensions play out in practice. I also offer a framework for combining this field's focus on detailed historical accounts with that of comparative politics, demonstrating what can be gained in terms of generalizability by comparing four such detailed historical accounts. For the literature on policy feedback, I offer evidence in support of the notion that systems can simultaneously reinforce and undermine themselves, and I propose a model for how two such systems can interact. For historical institutionalism, I offer insights on how institutions can change despite the hold of path-dependence. And finally, for urban politics, I support the work of many thinkers who describe the resistance of car-dependence to change, but add detail to their accounts, and propose mechanisms to overcome such resistance. For urban planning, I offer further insights on the barriers to walkable growth, and how to overcome them.

Outline of Chapters

In Chapter 2, I develop the proposed model of urban intercurrence, in which car-dependence reinforces itself at the expense of walkability, and vice versa. I further review the literatures that contributes to the present thesis, and how I build on each, including American political development, historical institutionalism, policy feedback, urban politics, and comparative methods. In Chapter 3, I describe my process for selecting the four cases under examination: Downtown Kendall, Florida; Surrey City Centre, British Columbia; Tysons, Virginia; and the Uptown Core, Oakville, Ontario.

In Chapter 4, I describe the larger-scale history of the tensions between car-dependence and walkability over the last century, exploring the roles of intercurrence and policy feedback in shaping that history. While car-dependence is dominant in most Canadian and United States cities today, walkability was dominant in the 1920s. The history of how one dominant mode of design (walkability) gave way to another (car-dependence) can offer insight on how the proponents can achieve the reverse today in suburban communities. Inverse feedback played a central role in this early history. The overcrowded downtowns of that era inspired a backlash, leading many urban planners and political figures to advocate for lower-density, car-oriented models of design. Groups who benefited from car-oriented design, meanwhile, successfully articulated and reinforced their interests, in particular by shaping institutions to assign a high level of priority to cars.

In Chapters 5 through 8, I examine the history of four cases in detail: Downtown Kendall, Surrey City Centre, Tysons, and Oakville's Uptown Core. In these chapters, I explore how the events in each retrofit support or conflict with the proposed model of change. In Chapter 9, I synthesize these findings, identifying the mechanisms of car-dependent feedback that discourage change, the inverse feedback that creates openings for change, and walkable feedback that can enable more thoroughgoing change. This synthesis offers practical lessons for how to transform car-dependent areas into healthier, more sustainable communities. More broadly, it offers insights on how scholars can understand the tensions between self-reinforcing, mutually-antagonistic paradigms.

Chapter 2. Urban Intercurrence, American Political Development, and Policy Feedback

Sixty years ago, Jane Jacobs (1961) — a leading critic of urban planning practice — argued that car-dependent growth and dense urban life are in tension. "One or the other has to give," she wrote. "Depending on which pressure wins most of the victories, one of the two processes occurs: erosion of cities by automobiles, or attrition of automobiles by cities" (Jacobs 1961, 349). For Jacobs, the key distinction is between two processes of change, one rooted in feedback loops that favour driving over time, spreading the city out, while the other favours greater "city concentration," in which compact development benefits pedestrians at the expense of drivers (Jacobs 1961, 353, 349). Lewis Mumford (1963, 236) — an influential urban theorist — similarly proposed that "Diffusion and concentration are two poles of transportation." Like Jacobs, he argued that building highways and parking begets more driving, which spreads out the city, which begets more driving. The alternative, he proposed, was to, "concentrate the greatest variety of goods and people within a limited area, in order to widen the possibility of choice without making it necessary to travel." Jacobs and Mumford were perhaps the two most influential thinkers in early urban theory, and both positioned cities as facing a fundamental tension between a self-reinforcing process of car-oriented dispersion and a separate self-reinforcing process of pedestrian-oriented concentration. In a sense, they proposed a model of intercurrence before the term was coined.

This chapter builds on urban planning and urban politics literature to outline a model of "urban intercurrence," in which cities are shaped by the dynamic tension between car-dependence and walkability, both of which reinforce themselves and undermine each other. This model underlies my first and third claims: that walkable retrofits struggle in the face of self-reinforcing car-dependence, and that walkability, once it has a toe hold, can eventually reinforce itself at the expense of car-dependence. I discuss my second claim — regarding the role of "inverse feedback" — in the next chapter, where I also examine the literatures on intercurrence, path dependence, and policy feedback.

The Disappearance of Urban Intercurrence

Mysteriously, while Jacobs (1961, 349) and Mumford (1963, 236) made a convincing case for the fundamental tension between car-dependence and walkability, thinkers have not since taken up this framework, even as cities have arguably become more polarized between a sprawling car-dependent hinterland and nodes of walkable, transit-oriented growth. Scholars have since analyzed how positive feedback reinforces car-oriented development (Urry 2008; McCahill and Garrick 2012; Kitamura, Nakayama, and Yamamoto 1999; Filion 2015), how it creates barriers to walkable development (Grant 2007, 78–80; Downs 2005, 369–371), and how walkability can reinforce itself (Cervero 2005; Salat and Ollivier 2017a, 68; Nielsen 2014), but far fewer explore how these two self-reinforcing systems exist simultaneously in tension with each other. Lehe (2017, 465) does so for parking specifically, arguing that in car-oriented contexts, parking lots tend to attract more parking lots, in a self-reinforcing process, whereas walkable areas tend to disincentivize parking lots. Newman *et al.* (2016) note the distinction between walkable and car-oriented areas, but they define the two models in terms of static attributes, not the self-reinforcing forces that drive change.

Jacobs and Mumford's framework may have faded from attention in part because they conflated car-dependence with the suburbs, and walkability with the city. The trouble with this division is that suburbs can become walkable, and downtowns can become highly car-dependent — if sufficiently eroded by wide arteries and parking (Shoup 2005, 131–133). The dichotomy of city and suburb therefore obfuscates what is, I argue, a more fundamental distinction between two processes of change that can shape outcomes in any urban context. The city-suburb dichotomy also implies that urban areas can be divided into distinct, separate categories. As we will see, however, the mutually-contradictory processes that drive walkability and car-dependency can co-exist within a single city block — and within the bureaucracies that govern that block.

Urban Politics

Scholars of urban politics who study the tensions between car-oriented and walkable design have tended to focus on how car-dependence has become so dominant in Canada and the United States. They draw attention to the ways in which car-dependent residents and developers block change (Filion 2015, 638; Molotch 1976; Mattioli et al. 2020, 5–7), how

public servants defend their current way of doing business (Driscoll 2014, 319; Sorensen 2015, 28; Urry 2008, 344), and how seemingly unrelated policy decisions can shape growth, by, for example, impacting the scope for local government to manage regional development (Nivola 2007; Taylor 2014, 65–70). Some also draw attention to how the developers who build compact, walkable growth can gain political power, reinforcing an alternative model of growth (Nielsen 2014; Phelps 2012).

Perl *et al*.'s (2020) concept of "urban equivocation" is particularly relevant to the present study. They find that while major Canadian cities have rejected their early experiments in highway development in their downtowns as harmful — and have shifted towards investments in transit and walkability — cities have nonetheless "resurrected" these car-oriented policies in the suburbs, which have served as "dumping grounds [. . .] for land-use and transportation policies that had been rejected or curtailed in the inner city" (Perl, Hern, and Kenworthy 2020, 190). Perl *et al*. emphasize that pursuing both development paradigms does not "create an enduring equilibrium," but engenders growing contradictions in government investment priorities, which may become more severe in times of budget scarcity (Perl, Hern, and Kenworthy 2020, 189–190). Their focus is on how different parts of cities have pursued divergent strategies, but they also highlight that some communities, such as Surrey, B.C., have attempted to pursue both models simultaneously. They propose that future researchers examine the consequences of mixing both development models (Perl, Hern, and Kenworthy 2020, 204–205). The present study answers that challenge.

The Mechanisms of Urban Intercurrence

The processes that reinforce car-dependence and walkability can be divided into three kinds of feedback: transport-economic, institutional, and political. I propose the term "transport-economic feedback" to capture how the built environment shapes transportation choices, which then shapes the economic incentives for development, which then shape the built environment, which then further shapes transportation choices. Institutional feedback and political feedback are established concepts (Busemeyer, Abrassart, and Nezi 2021, 147; Jordan 2010, 862; Trachtman 2019, 100). Institutional feedback refers to the ways in which organizations (government or otherwise) create procedures, practices, and norms that lock-in

a development model to which they are accustomed. Political feedback captures the tendency for specific constituencies to have an interest in a prevalent model of growth, who then seek to perpetuate this model and resist alternatives. When I intend to describe the tensions between walkable and car-dependent feedback, I will use the term "intercurrence" in place of "feedback." I will, therefore, refer to transport-economic intercurrence, institutional intercurrence, and political intercurrence throughout the dissertation. This broad use of "intercurrence" represents an elaboration on how Orren and Skowronek (1996) originally used the term, which I will explore in greater depth in the next chapter.

Transport-Economic Intercurrence

The distinction between car-dependence and walkability depends on the contradictory requirements of these two urban design models, and I outline five distinctions below. These distinctions are at the core of my larger theoretic argument: that these two models exist in self-reinforcing, mutually-undermining tension with each other. A city may attempt to prioritize car-dependence and walkability simultaneously in the same place, but due to these underlying tensions, they cannot successfully prioritize both.

1. Divergent needs for movement density

Pedestrians — unlike drivers — are attracted to streets containing many other pedestrians, and are more likely to walk on streets full of other people (Gehl 2010, 23). Transit stops, shops, and services are more successful when located in places with high pedestrian traffic, and these destinations attract more pedestrians, in a self-reinforcing cycle that, over time, leads to more destinations colocating within a given area of land (Stojanovski 2020, 146; Kang 2016; Fenske 2019, 48). For pedestrians, it is particularly important for destinations to colocate in this way, because they are highly-sensitive to distance. They are most likely to walk to stores they can easily see within roughly 30 metres, and very few walk further than a mile to destinations (Ewing and Cervero 2001, 106; Schneider 2015; Stojanovski 2020, 139; El-Geneidy et al. 2014; Burke and Brown 2007).

Drivers, in contrast, are not attracted to streets full of other cars. Far fewer cars can fit through a section of street than pedestrians. According to NACTO (2016), a single 10-foot-

wide lane can accommodate 600-1,600 people in cars, 4,000 to 8,000 people riding buses, or 9,000 people on foot. When destinations are positioned closely together, and many people attempt to access them by car, this slows traffic, which erodes the benefits of destination proximity for drivers (Graham 2007; Shoup 2005, 163–165). In short, walkability depends on high concentrations of people moving within a small area whereas driving depends on low concentrations of people moving at high-speed to destinations further afield.

2. Divergent Needs for Parking and density

A parked car requires 12 times more space than pedestrians standing at a comfortable distance (Henson 2000, 27; Horn 2016, 23). A higher availability of parking improves the convenience of driving and increases auto usage, which then leads to higher demand for parking in a self-reinforcing cycle (Shoup 2005, 94,168,251; Lehe 2017, 465). Surface parking is the most convenient, lowest-cost form of parking, and it both increases the distance between destinations and undermines the quality of the public realm, two factors that discourage walking (McCahill and Garrick 2012; Shoup 2005, 161). Underground or structured parking, meanwhile, costs many times more to provide (Litman 2009, 7–8). When parking is costly, inconvenient, or unavailable, it is a powerful disincentive for driving, which encourages more people to switch to walking, transit, or other options (Voith 1998; McCahill and Garrick 2012, 161). Successful walkable development, on the other hand, tends to generate high land values, which incentivizes developers to use available space for buildings, and less for surface parking (Washington and Dourado 2018; Lehe 2017, 465). Urban intensification therefore establishes a feedback loop that consumes surface parking and discourages driving over time, whereas copious parking generates a contrary feedback loop. At its root, the tension is between what land is used for: storing vehicles to enable distant travel, or co-locating destinations to reduce the need to travel far.

3. Divergent incentives for mixed-use or single-use buildings

In compact areas, the value of homes and businesses depends on being located close to a rich variety of other destinations people can walk to, which justifies the extra expense of stacking multiple land uses inside a single building (Leinberger 2001, 10; Stojanovski 2020). It is harder to justify the extra cost and complexity of mixed-use buildings in car-dependent areas, because homes and businesses depend less on having immediate proximity to other destinations (Burchell and Listokin 2001, 18–22; Leinberger 2001, 9–10). Landlords therefore struggle to fill mixed-use buildings in car-dependent areas, developers often resist

building them, and banks are reluctant to fund them (Grant 2007, 76; Grant and Bohdanow 2008, 116; Leinberger 2001, 9–11). Financial considerations therefore militate against mixed-use development in car-dependent areas, while walkability depends on, and financially justifies, mixed-use development.

4. High-Value versus Low-Value Environment

Aesthetics have relatively little impact on where people choose to drive (Ciscal-Terry et al. 2016). If most people drive in an area, there is therefore little incentive for developers to invest in expensive exterior walls or attractive environments, which is one reason that car-dependent strip malls, big box stores, and malls tend to have cheap blank external walls and empty, unadorned parking lots (Mitchell 2007, 107). In contrast, if a building's entrances face a sidewalk, rather than a parking lot, its success depends on the street being a place where people walk, especially if the building has ground-floor retail (Leinberger 2001, 9–10). In such a context, it makes sense for developers to invest in buildings that face the street with windows, doors, and other small flourishes that contribute to creating a street that will attract street life (Gehl 2010, 76–77). If people do walk on a street in large numbers, this gives developers reason to create shops, restaurants, and other businesses along the sidewalk, which further contributes to creating a desirable, lively place to walk (Ellard 2015, 108–109, 113). Walkability depends on higher-cost, higher-value, sidewalk-oriented buildings, whereas car-dependence favours low-cost buildings lined with blank walls and parking lots (Grant 2007, 79–80).

5. Safety *for* or *from* high-speed driving

To make it safe for cars to drive fast, roads need wide lanes, gradual turns, large sight triangles, and clear shoulders (Glennon and Weaver 1972; TAC 2017a, 52; Labi et al. 2017; AASHTO 2018, 2–11). Roads may also need many lanes to maintain traffic flow. In contrast, to make pedestrians safe and comfortable, it is important to slow traffic, which is best achieved by designing streets to make it feel dangerous to drive fast (Speck 2018; Elvik 2001; Jones et al. 2005; Parolek, Parolek, and Crawford 2008). This requires roughly the opposite set of design features: narrow lanes, tight turns, restricted sight triangles, street edges full of objects (benches, trees, on-street parking), and as few lanes as possible (Speck 2018; Elvik 2001; Jones et al. 2005; Parolek, Parolek, and Crawford 2008). Car-dependent environments create pressures for governments to prioritize high-speed driving, since destinations tend to be far apart in these contexts, and

there are, in any case, few pedestrians in these places to put at risk. Walkable areas, in contrast, depend on ensuring streets are consistently safe and comfortable, or it is unlikely many people will walk (Volker and Handy 2021; Slater et al. 2016; Giles-Corti et al. 2011).

Summary

When most people in an area rely on cars, it incentivizes developers to build low-cost, single-use, low-density buildings with cheap exteriors, flanked by parking lots, which then encourage more people to drive. When many people walk, bike, or take transit in an area, it incentivizes developers to build high-density, mixed-use buildings, with pedestrian-friendly exterior facades, and doors aimed at the sidewalk, which then encourages more people to walk, bike, and take transit. The two models follow a divergent economic logic: it would be difficult for a Walmart to succeed in downtown New York, and difficult for a mixed-use tower — with doors aimed at the sidewalk — to succeed when it is surrounded by parking lots. The two models reinforce themselves and undermine each other.

Institutional Intercurrence

Perhaps the central insight in historical institutionalism is that organizational habits accrue their own momentum (Hall and Taylor 1996; Hrelja, Isaksson, and Richardson 2013; Barnett et al. 2015). This thesis will offer many examples in which seemingly neutral government institutions can become locked-into car-oriented design, turning them into one of the most formidable barriers to walkable growth.

Standards

Since the Second World War, North American cities have approved vastly more car-dependent residential and commercial developments than any other category (Gordon and Janzen 2013; Pucher and Lefèvre 1996). In the process, planners and engineers developed standards that reflected the needs of car-dependent suburbs and highways, which then, in effect, made these the only allowable models of development — in a process that I discuss in Chapter 4. Many cities adopted model zoning codes that only allowed single-use, low-density development, effectively eliminating all transport options but the car (Parolek, Parolek, and

Crawford 2008). Street engineering standards reflected the needs of highways and arterials, prohibiting many of the key features of pedestrian-priority streets, such as narrow lanes, tight turning radii, and sidewalk bump outs (Dumbaugh and King 2018; Hebbert 2005).

In 2017, the Transportation Association of Canada took a step to address this legacy by introducing new street design standards for pedestrians and cyclists. The result is an example of intercurrence: while these two chapters treat slow, pedestrian-priority standards as a priority, the other eight chapters continue to assume that the default road is an arterial or highway — where wide lanes and sloping fast turns are required — unless otherwise stated (TAC 2017). Many of the efforts to reform car-oriented standards are incomplete in this way, retaining the imprint of their path-dependent car-oriented legacy, despite the efforts of proponents to reform them.

Expert Skills and Cultural Norms

Planners and engineers also develop technical expertise appropriate for a given development model through experience, which can make it difficult for them to switch to an alternative. When developers propose walkable developments in a community that has long followed a car-oriented model, their projects often face a slower, more difficult approvals process, both because they must request variances, and because municipal staff lack the experience necessary to evaluate such projects (Filion 2015, 638; Driscoll 2014, 319). Public servants also absorb assumptions and intuitions in the context of one development model that can make alternatives seem inappropriate (Urry 2008, 344). For example, narrow lanes would be dangerous on highways, and so engineers who have spent many years building highways regularly disallow narrow lanes within dense, walkable communities, even though evidence suggests narrow lanes improve safety in this context by slowing traffic (Speck 2013, 169–170). It is, similarly, likely true that planners and engineers who have spent their careers working within walkable contexts will develop expertise and assumptions more appropriate for a downtown than a suburban power centre.

As public servants become accustomed to a model of development, they may come to prefer it over time, which can lead to conflict between departments that is effectively political in nature (Davies 2009). This conflict is sometimes rooted in a desire to continue doing things that a public servant knows how to do (Sewell 2003; Driscoll 2014). In other cases, it is rooted in specific priorities and values (Termeer 2009; Kavanagh and Richards 2001;

Moseley 2009; Bakvis and Juillet 2004; Schwartz and Rosen 2004). As we will see, various government departments and agencies often develop a cultural commitment either to car-oriented design or walkability, creating intercurrent tensions between these two paradigms of design.

Political Intercurrence

Growth models can create and empower constituencies who then have an interest in perpetuating that model of growth. Here I summarize the role of three key constituencies: developers, road builders, and residents.

Development Interests

The development industry has traditionally played a powerful role in advocating for unfettered car-dependent growth (Molotch 1976; Moore 2013; Grant 2009; Verderber 2012). The profits they earn through this pattern of development provides both the incentive to advocate for more of the same, and the financial resources to do so. Developers donate heavily to municipal political campaigns (Charmes and Keil 2015; Young and Austin 2008), where this is allowed, and tend to be highly influential in the informal networks that shape municipal policy (Stone 2007, 1989; Keating 1991). This dynamic can be offset, however, by developers that build mixed-use projects in walkable communities, who may push for pedestrian-friendly, transit-oriented growth (Nielsen 2014).

There is a growing market demand for walkable areas, driven in part by ageing boomers seeking to downsize, and a shift in generational preferences among millennials (Brookfield 2017). However, given that two thirds of new urban construction in Canada is car-dependent today, car-dependent developers likely retain more influence overall (Gordon 2018). The interests of developers within a particular land area will depend, however, not only on these larger trends, but who owns land there, and what kind of development they hope to invest in.

Road Builders

As governments built roads and highways at growing scale over the last hundred years, they expanded the industry of civil engineers and contractors that build those roads — and their unions — and these interests have then played a major role in advocating for more government spending on roads, and on maintaining standards that favour wider roads (Rose and Mohl 2012, 42–43, 77; Norton 2011, 166–167, 185–187). These interests played an important role in the overall shift from walkability to car-dependence in the 20th Century (the subject of Chapter 4), and some role in Tysons specifically (Chapter 8), but they tend to operate at a larger scale than individual retrofits, and they play a relatively small role in this thesis.

Residents

Car-dependent development tends to create its own political constituency. Residents of low-density suburbs are aware, writes Filion (2015, 637), that for them, "public transit can never be a viable substitute for the car." They therefore tend to oppose converting traffic lanes to bus lanes, or other policies that prioritize alternative modes of transportation. These political interests are amplified by an in-group, out-group dynamic, pitting outer-suburban residents against inner-urban residents (Andrew 2001, 103). Car-dependent residents may also perceive pro-transit or pro-walking policies as an attack on their identity: "a rejection of a lifestyle to which they are committed" (Filion 2015, 637). Urry (2008, 347) similarly echoes that residents can become attached to car-dependency as "a way of life." Conversely, residents who live in walkable areas, and who depend on sidewalks and transit, have the potential to become an important political force advocating for safe streets and transit investment.

Overview

I propose that cities in Canada and the United States are shaped by the dynamic tension between two incompatible models of development — car-dependence and walkability — which simultaneously reinforce themselves and undermine each other in a process of intercurrence. This process exists because of the fundamental tensions between the physical requirements of neighbourhoods built around cars, and neighbourhoods built around walking, cycling, and transit. These physical distinctions then engender path-dependence in

institutions, and self-reinforcing feedback in politics, as public servants become locked-into certain styles of analysis, regulation, and design, and politicians come under the influence of developers and voters who prefer more of the same.

Intercurrence in American Political Development

"Intercurrence" is a valuable concept for studying the tensions between car-dependence and walkability. It is, however, perhaps counterintuitive that a concept so useful for describing urban growth emerged from a field called American political development, whose chief focus of study is the history of American national politics. Here I trace how and why American political development — and its interaction with urban politics, historical institutionalism, and the literature on policy feedback — has engendered tools useful to analyzing the processes by which cities change, and more specifically, how suburban retrofits succeed or stagnate. I conclude with a discussion of how to employ comparative methods to explore these theoretical issues.

American political development scholars trace their roots to 19th century thinkers, though the name was not coined until the 1970's (Morgan et al. 2016, 169). The first scholars in the tradition were preoccupied with why America's political institutions appeared to be on a separate trajectory from other wealthy Western countries, with such oddities as the separation of powers (Orren and Skowronek 2004, 36, 45). Some were optimistic the country was on a trajectory to an ideal future, while others argued it had gone astray (Orren and Skowronek 2004, 37, 40). All had in common, however, the assumption that they could evaluate the country's political change by an objective standard of progress, never questioning whether they could "discern in history a line of development encompassing the whole of human experience" (Orren and Skowronek 2004, 37). In the 1940s and 1950s, the Modernist school of thought continued this line of thinking, positioning the United States and other countries on a linear timeline of development (Morgan et al. 2016, 168). For these early thinkers, the term "development" meant progress measured against an objective background standard of change.

While this teleological perspective has since been largely abandoned, it did generate insights on the processes of change that remain relevant. From the start, the focus on change led scholars to examine how multiple political ideas and interests pull and tug at the political system as it evolves over time. Beard (1934) traces the tensions between reformist politics and elite interests as they develop, arguing that all apparently "'new' thoughts" can be traced to earlier periods of tension. As novel conflicts emerge, activists rehash these ideas, putting them to new uses. Ideas change by way of "absorption" — incorporating the influence of new contexts and applications — and not by mere "substitution" (Beard 1934, 15). He writes that "we can think only in terms of some tradition, some heritage of ideas and interests," and so to understand current conflict, one must understand the origins of the ideas available to thinkers in a given moment, each drawn from different periods in the past (1934, 12). Greenstone (2014) similarly traces distinct traditions of liberalism and how they have developed through American history, especially during periodic moments of conflict. These competing ideas constitute a "tool-box" from which political actors draw. In the process of forging available ideas into new arguments, they further expand that tool-box (Greenstone 2014, 47).

American political development scholars have long focused on the details by which multiple political traditions exist simultaneously, and how the tensions between these traditions shape political outcomes. These scholars therefore reject the notion that historical periods can be divided into clean boxes, each with a defining paradigm (Orren and Skowronek 2004, 62). The principles and practices prominent in any historical period do not come to a sharp end at the start of a new period, and instead they live on, co-existing in tension with new ideas and practices, sometimes for many decades (Orren and Skowronek 2004, 62). American Political Development scholars had studied such frictions for over a century by the time Orren and Skowronek (1996) gave it a name: "intercurrence." Lieberman (2002, 704) argues that intercurrence can be found wherever paradigms of political thought conflict, leading to "instability and uncertainty" (Lieberman 2002, 704).

American political development Scholars have tended not to focus on urban politics, though this is beginning to change. Dilworth (2009) published a volume of essays exploring how to apply the field's insights to cities, and since then, a handful of such studies have been published on the subject. Dierwechter (2017, 51) exposes intercurrent tensions in Smart Growth between the desire to "solve social and ecological problems" while relying on tools of "neoliberal" investment, which, she argues, creates incentives in tension with solving those

problems. Lucas (2017, 351–353) provides evidence for how various trends in Canadian urban government have progressed unevenly between and within cities, including privatization, regionalization, and the establishment of arms-length bodies, creating tensions between co-existing arrangements of government. Stone and Whelen (2009) reinterpret earlier classics in urban politics in light of intercurrence.

Lucas (2017, 344–345), however, criticizes most early attempts to combine American political development with the study of cities, arguing that scholars make only "brief reference" to concepts "such as 'intercurrence' or 'complex political authority,'" and then discuss urban history with only "tenuous" reference to these concepts. He writes:

> Dilworth's (2009) agenda-setting chapter on the subject, for instance, defines "intercurrence" very broadly, spends just a single paragraph on the possible application of the concept to the urban context, and says nothing about the methods by which APD scholars have drawn on the concept of intercurrence in practice (Lucas 2017, 345).

The present study seeks to position intercurrence as foundational within a framework for studying cities, not a tenuous appendage. I propose to use these tools to fill in gaps in the urban planning literature, to enable a practical understanding of broader — often more conflictual — mechanisms for shaping urban outcomes, and how to manage them.

Ideas vs Physical Systems in Intercurrence

There is a distinction between intercurrence as I have described it here and what Orren and Skowronek (1996) put forward. Their focus is chiefly on ideas and traditions of political thought (Orren and Skowronek 2004, 9, 111–113). In contrast, the tensions I describe between walkability and car-dependence are, in part, the product not only of ideas, but of underlying physical systems.[1] While ideas play an important role in how people react to these tensions politically, these two design paradigms nonetheless function to some extent by their own logic, whatever people think about them.

[1] While some scholars have applied American Political Development to urban issues, they have tended to focus on questions of institutional governance and political power struggles, and not on the physical tensions between systems of design (See for example: Lucas 2016; C. N. Stone and Whelen 2009; Dilworth 2009, 1–15).

There are two lines of evidence for this claim. First, the internal logic of these two design paradigms often shape events *despite* people's ideas about them. In the early 20th century, Urban planners hoped subways and streetcars would reduce urban densities — as we will see in Chapter 4 — and soon discovered it achieved the opposite (Fogelson 2001, 65; Solomon 2007, 13; Zipper 2021). Today, engineers on occasion claim that one can build wide roads while also creating a desirable environment for walking (VDOT 2020c, 1–14, 1–20; City of Surrey 2017a, 116). If few people walk on these streets, it is not the consequence of political ideas, but because reality does not reflect the engineers' claims. Such tensions continue to exert themselves whether or not people believe they exist.

A second line of evidence is that thinkers have independently arrived at similar ideas when analyzing these tensions. When Jane Jacobs explained the importance of concentration and diversity for walkable areas, she was echoing the beliefs of downtown municipal engineers of the 1920s, but she does not cite or otherwise show awareness of these earlier practitioners (Norton 2011, 132–133; Jacobs 1961, 202–205). Marohn (2021, 15–30) recently argued that there is a fundamental contradiction between the goals of designing a "road" for high-speed, car-oriented areas, and a "street" for dense, walkable areas, and that cities should clarify which goal they aim to achieve in which places. In an interview, he later stated that he had not been aware he was echoing a similar idea proposed by MacKaye and Mumford (1931) ninety years earlier, who distinguished between the "highwayless road" and the "townless highway" (Speck and Marohn 2022). Roughly the same idea has also been proposed by Perl and Kenworthy (2010), who distinguish "passage roads" and "place streets," and by Jones *et al.* (2007), who distinguish "link streets" and "place streets." None of these authors cite each other, suggesting they developed the same argument independently.

In a sense, the urban planning literature provides insights on how to understand the underlying physical tensions between car-dependence and walkability, whereas American Political Development offers lessons on how actors interpret these tensions and act on them. Both physical constraints and political traditions of thought play a central role in this analysis. In the retrofits I study, the arguments that people marshal are rarely new, but can, as Beard argues (Beard 1934, 15), be traced to earlier periods of controversy. As these political battles have progressed over the last hundred years, actors slowly innovate new ways to justify their preferred design model, expanding the "tool-box" available to future proponents

(Greenstone 2014, 47). As we will see, outcomes often depend as much on how people interpret their interests, in light of various available ideas, as on their objective interests.

Change and Stability in Historical Institutionalism

Historical institutionalism introduced the concept of "path dependence" to political science, and this concept plays a crucial role in the field's understanding of why car-oriented design has become so dominant in Canada and the United States (Driscoll 2014, 319; Sorensen 2015, 28; Filion 2015, 637–638; Nivola 2007; Taylor 2014, 65–70). Today, American political development is closely associated with historical institutionalism, but this was not always the case (Lucas 2017, 344). The present study is possible, in part, because the priorities of the two fields have become more aligned.

A central focus of historical institutionalism is to understand how a policy, once established, can become difficult to change — or "locked-in" — constraining the options available to later actors (Streeck and Thelen 2005, 19; Driscoll 2014, 318). Path-dependence is useful for scholars interested in history, because it means that the historical timing and sequence of decisions are relevant to political outcomes in the present (Fioretos, Falleti, and Sheingate 2016). Path dependence may involve a variety of mechanisms. Existing institutional practices benefit those who have invested the time and resources to become proficient with those practices, which gives them a stake in the status quo (Hall 2016, 43; Sewell 2003; Driscoll 2014). Those who derive power from existing institutions are incentivized to use that power to maintain the structures that grant that power (Hall 2016, 43; Pierson 2016, 83; Mahoney, Mohamedali, and Nguyen 2016). It is often expensive and technically challenging to change well-ingrained practices, particularly when other systems throughout government have been designed to function in conjunction with those practices (Thelen 2004; Sorensen 2015, 20–21). Decision makers may develop norms and cultural values around existing practices, which can make alternatives seem unusual or undesirable (Stone and Whelan 2009; March and Olsen 1984, 734).

All these mechanisms play a role in shaping the institutions that then shape urban outcomes in the present study. In the context of cities, however, path dependence can also

refer to the physical legacy of design policies, offering an additional layer of lock-in. When today's policies leave behind infrastructure that is expensive and controversial to change — such as the street grid, or the number of lanes on each street — it constrains future decision making (Gudmundsson and Mohajeri 2013; Sorensen 2015, 21).

A major difference between American political development and historical institutionalism — traditionally at least — is how they understand change. Historical institutionalists have had such success explaining policy stability through path dependence that many criticize the field for struggling to explain change (Kay 2005, 566; Peters, Pierre, and King 2005; Streeck and Thelen 2005). Conran and Thelen (2016, 51) write that "stability [. . .] is more or less built into the very definition of the term institution." Blyth *et al.* (2016, 156) and Fioretos *et al.* (2016, 11) argue that the more path dependence explains outcomes, the less this leaves room for change, and the less this permits a role for human agency. Some have attempted to solve the problem by relegating change to brief, exceptional "critical junctures," between which stability tends to reign (Krasner 1984; Collier and Collier 1991). American political development scholars, in contrast, have generally not felt a need to reach for such exceptional explanations, because they position change as a constant process, in which institutions are riven by ongoing tensions between competing pressures and ideas (Orren and Skowronek 2004, 9).

Since the 1990s, institutional theorists have identified a variety of other tools to reintroduce processes of ongoing incremental change into path dependence. Schmidt (2008) proposes a central role for ideas: as people adopt new framings, discourses, and heuristics, they respond to constraints in new ways. Streek and Thelen (2005, 19) describe how actors can use existing structures for new purposes ("conversion"), add to them without reforming them ("layering"), or undermine them through neglect ("drift"). Others relax the assumptions of path dependence, arguing that while institutions constrain behaviour, they do not do so perfectly. Capoccia (2016, 91) observes that to the extent institutions are weak, path dependence will fail to stick to a path. Change can therefore be explained by greater attention to the details of a specific historic moment, such as the imperfect ways in which particular feedback loops function in reality (Thelen 1999, 399).

Such explanations for change moved historical institutionalism in a direction more compatible with American political development, as they focused to a greater extent on the

interplay of new ideas and imperfect, messy causal forces. The two fields did otherwise have much in common. Both look beyond the formal holders of power and explicit legal rules to analyze the ideas, habits, norms, and other mechanisms that shape what is politically possible within a given political context. Both fields also trace causal forces to their roots in history (Orren and Skowronek 2004, 78–79). A key insight of historical institutionalism is that the initial causes of a current phenomenon may no longer exist, and yet remain influential via path dependence (Collier and Collier 1991, 35–37). American political development scholars similarly trace the roots of political traditions and structures, and how this history shapes what is possible in the present moment.

In the 1970s, American Political Development abandoned the organizing principle of progress towards a fixed goal, and the language of "institutions" provided an alternative focus of study, making the field a comfortable fit within the broader "new institutionalism," alongside historical institutionalism (Orren and Skowronek 2004, 78–79). When Orren and Skowronek's (1996) contributed the concept of intercurrence, this helped further merge the fields for some thinkers, providing institutionalists language with which to describe the tensions between path dependent processes of change (See for example: Bleich 2018, 67; Gerschewski 2021, 230). The present study builds on this marriage of the two disciplines.

In keeping with historical institutionalism, I trace the sequence of how cities made decisions throughout the history of the four suburban communities I analyze, and how these choices shape the options available to decision makers today. I also, however, pay careful attention to the ways in which institutions fail to remain static over time, and how the tensions between ideas and traditions of thought can lead to incremental shifts in how institutions operate. However, I draw on one more literature to complete this picture — that of policy feedback — to understand how the larger-scale consequences of policies can either reinforce or undermine existing policies.

Policy Feedback, Path Dependence, and Terminological Clarifications

The policy feedback literature asks how the outputs of a policy can shape the policy, often by making it more entrenched (Pierson 1993, 595). It is a powerful concept for

describing the self-reinforcing processes by which car-dependence and walkability shape communities. Car-dependent growth policies have become dominant, in part, because those policies created their own political constituencies (car-dependent residents and developers), economic momentum, and institutional lock-in, as discussed above. In this section, we will discuss the various types of feedback involved in the interaction of car-dependence and walkability.

As Busemeyer *et al.* (2021, 141) underline, the subject of policy feedback suffers from some terminological confusion. Pierson (2000, 251) uses the term "positive feedback" for processes that lead to stability, but positive feedback can also refer to "self-accelerating" systems, which result in change, not stability (Busemeyer, Abrassart, and Nezi 2021, 142; Atkinson and Oleson 1996, 609). Negative feedback, meanwhile, can refer either to self-correcting stable systems or self-undermining systems (Busemeyer, Abrassart, and Nezi 2021, 141). Following Busemeyer *et al.* (2021) and Béland *et al. (2022, 35)*, I use "self-reinforcing feedback" to refer to any feedback process that leads to stable or accelerating policy, and will use "self-accelerating feedback" to refer specifically to policies that increase their own rate of expansion. I use "self-undermining feedback" to refer, naturally, to policies that undermine themselves (Busemeyer, Abrassart, and Nezi 2021, 145).

Path-dependence can also be thought of as a kind of feedback, and here there exists yet more terminological confusion. For historical institutionalists, path dependence explains stability, but, ironically, economists originally coined the term to refer to self-reinforcing processes of change away from equilibrium (Atkinson and Oleson 1996, 609). Counterintuitively, both interpretations can describe the same system, depending on one's level of analysis. Consider that over the last century, stable traffic policies have led governments to widen roads in response to rising traffic, which has led developers to build low-density homes on the periphery, which has led to yet more traffic. This process has multiplied the scale of cities, transforming how people travel, and replacing large swaths of natural landscapes with concrete and asphalt (Urry 2008, 344; Rose and Mohl 2012, 57). If one focuses on the societal outcomes of this policy, it has led to self-accelerating change: the more governments widen roads, the more travel patterns and the physical scale of cities changes. However, during this period, the policy itself has changed little, and has instead become more resistant to change (Manville 2017, 379, 387; Urry 2008, 344). It is therefore

accurate to say both that path dependence has led to self-accelerating change in terms of its societal outcomes, but also stability, in terms of the policy itself.

I use the term "path-dependence" in line with historical institutionalists to emphasize its role in stabilizing policy. I at times refer to it as "path-dependent feedback," to parallel the other kinds of feedback discussed. Path-dependent feedback can be understood as any consequence of a policy that makes that policy more resistant to change. This may include the tendency for institutions to develop tools for a particular policy, making them ill-prepared for others, or of the political groups who benefit from a policy (such as the road construction industry) to resist changes to it. Path-dependent feedback is distinct from self-accelerating feedback in that it does not lead to the growth of a system, but merely makes it resistant to change.

Mixed Systems and Intercurrence

Self-reinforcing policy feedback cannot reproduce policy perfectly, or else any paradigm, once dominant, would remain dominant in perpetuity. Walkability had a near monopoly on growth in the early 20th century, but it has lost this position, as I describe in Chapter 4. One reason is that while it did reinforce itself — creating powerful downtown interests that fought for more downtown growth — it also inspired a backlash, due to the consequences of overcrowding, in a process of "self-undermining feedback" (Busemeyer, Abrassart, and Nezi 2021, 145). Walkability is, therefore, an example of what Beland *et al.* (2022, 35) call a "mixed system": one containing both self-reinforcing and self-undermining feedback.

A "mixed system" is already a complex concept, and I will add yet more complexity before I simplify this picture into a useful theoretical framework. If walkability and car-dependence are both mixed systems, as I argue they are, then their interactions may also be mixed. In the early 20th Century, some walkable downtown business interests advocated for policies — such as minimum parking requirements and inner-city highways — that not only undermined the downtown, but accelerated the growth of the car-dependent periphery (Rose and Mohl 2012, 5; Shoup 2005, 131–136). Walkability therefore contained not only "self-

undermining feedback," but "other-reinforcing feedback," meaning it actively reinforced the success of the competing paradigm. The image that emerges is chaotic: when two paradigms compete, they reinforce themselves at the expense of each other, but also sometimes undermine themselves and reinforce the other.

Let us add one more note of chaos to this picture before we simplify. While dominant paradigms tend to resist change (path-dependence), they cannot do so perfectly. Capoccia (2016, 91, 102) and Streeck and Thelen (2005, 19) argue that institutions are managed by humans, and humans sometimes struggle to maintain policies with fidelity due to inattention, incompetence, or other weaknesses. A policy may also have some amount of built-in flexibility: car-oriented street design standards allow a certain level of pedestrian priority on some streets. These exceptions represent the incompleteness of path-dependence, allowing actors to intervene to create some level of change within a dominant policy paradigm. I refer to such exceptions as "imperfect feedback": any output of a policy paradigm that creates opportunities for change, or fails to prevent change, away from that paradigm. Together, these various forms of feedback can explain both change and stability, but in such a chaotic manner, they risk adding little to understanding.

Theoretical Framework

To simplify, we can group together all types of feedback that support a given paradigm. I use the term "self-reinforcing feedback" to capture self-accelerating feedback, other-undermining feedback, and path-dependent feedback. We can also group together all types of feedback that undermine a given paradigm. I propose the term "inverse feedback" to capture self-undermining, other-reinforcing, and imperfect feedback. I summarize these categories in Table 1.

This classification allows me to propose three general hypotheses for how mixed systems interact. First, self-reinforcing feedback must be more powerful than inverse feedback for any dominant paradigm, or else the paradigm would not remain dominant long. Canada and the United States continue to build car-dependent neighbourhoods at much larger scale than they build walkable neighbourhoods (Gordon 2018; Heimlich and Anderson 2001,

	Sub-types	Meaning	Examples	Characteristics for a dominant paradigm
Self-reinforcing feedback	**Self-accelerating feedback**	When a paradigm's outputs increase the scale or influence of the paradigm.	Car-dependent housing development creates a large constituency of voters who depend on driving, who then demand wider roads, which then encourages more car-dependent housing development.	- More powerful than inverse feedback, or else it would not be dominant. - More complete and internally consistent in its implementation. - Less reliant on individual agency: existing feedback loops can often continue without anyone's conscious intervention.
	Other-undermining feedback	When a paradigm's outputs undermine the scale or influence of a competing paradigm.	Car-dependent voters demand wider roads and more parking within walkable communities, which undermines the success of walkable places, reducing the number of walkable voters.	
	Path-dependent feedback	When a paradigm's outputs make it harder to change the paradigm.	As transportation institutions optimize their training and analysis tools for moving cars, they become less able to optimize streets for walking.	
Inverse feedback	**Self-undermining feedback**	When a paradigm's outputs undermine its own scale or influence, or inspire a backlash.	As the scale of car-dependence grows, it can create traffic, pollution, and environmental degradation that can inspire car-dependent voters to demand less car-dependent growth.	- Generally less powerful than self-reinforcing feedback. - Tends to produce only flawed, partial change in favour of the alternate paradigm. - More reliant on individual agency to take advantage of opportunities for change.
	Other-reinforcing feedback	When a paradigm's outputs increase the scale or influence of the competing paradigm.	Car-dependent voters can become proponents of dense, walkable growth if it is positioned as a solution to traffic.	
	Imperfect feedback	When a paradigm's outputs create opportunities for change, especially due to ambiguities, contradictions, flexibility, or inattention.	Car-oriented standards generally leave some flexibility for pedestrian-priority design, especially on local streets.	

Table 1. Six kinds of mixed feedback grouped under two broad categories: self-reinforcing and inverse feedback.

2). One reason, I propose, is that self-reinforcing feedback has the advantage of being consistent with itself. It is relatively easy to convince car-dependent residents that they will benefit from wider roads and more parking. It takes more time and effort to convince them that smaller roads and less parking will benefit them by reducing traffic — and it is unlikely that all will be convinced. A paradigm's own logic will tend to be more powerful within the context of that paradigm than the exceptions.

Second, inverse feedback does enable some level of change, but it tends to enable only flawed, partial change, because it depends on contradictions and inconsistencies in the dominant paradigm, rather than an internally consistent alternative. Car-oriented design standards may allow pedestrian-priority design on a few exceptional streets, but such standards continue to otherwise encourage wide, fast design for major roads, dividing local streets from each other. Inverse feedback is important because it provides an explanation for how change can begin to occur, but walkable design will likely remain incomplete so long as it depends on the support of people who drive for all their daily needs, or on standards that were first created to enable the free flow of traffic.

Third, if inverse feedback enables some level of dense, pedestrian-friendly development, this may provide a nucleus of walkability that can begin to reinforce itself on its own terms. As the population of new walkable developments grows, these residents may provide a more full-throated political defence of pedestrian-friendly design. If their advocacy is successful, it may lead to more walkable development, increasing the number of walkable residents, in the kind of self-reinforcing process that has helped to make car-dependence so dominant today. A similar process may increase the number of developers and experts who specialize in walkable design and improve the capacity of institutions to manage walkable design. To complete a paradigm shift from one development approach to another, I propose the competing paradigm must, at some point, begin to reinforce itself on its own terms, with its own political and institutional base, at the expense of the dominant paradigm. I summarize this framework in Figure 1.

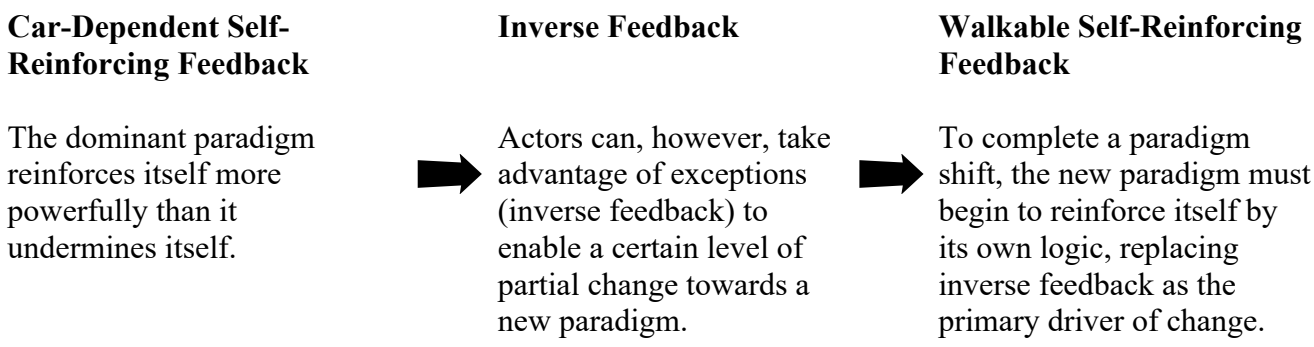

Figure 1. Summary of the proposed theoretical framework for how to shift from one dominant paradigm to another in the context of feedback and intercurrence.

This framework provides analytical tools to better understand the "tensions" involved in intercurrence, particularly in the early stages of the emergence of a competing paradigm within a given jurisdiction. Inverse feedback will tend to create considerable noise in a system as actors attempt to use the dominant paradigm against itself to allow at least some change, but this strategy may never achieve a "durable shift in authority," if actors remain focused on exceptions alone (Orren and Skowronek 2004, 120–132). However, intercurrence can, I propose, enter a new phase once the competing paradigm begins to establish its own self-reinforcing basis of authority: its own constituency of voters, companies, experts, and institutional actors, each with a vested interest in the success of that competing paradigm.

This framework is useful because it accounts simultaneously for why dominant paradigms tend to remain dominant, and for how change can nonetheless proceed. It also provides a useful framework to understand the role of human agency. Inverse feedback creates opportunities to shift course towards a new paradigm, but in most cases, this will only occur if actors intervene to take advantage of these opportunities. Heavy traffic may inspire a backlash against continued car-dependent growth amongst even car-dependent residents (Eidelman 2010, 1222), but this is unlikely to inspire them to specifically call for high-density growth, smaller streets, and less parking in a suburban community without the active intervention of proponents to explain how and why this could be a solution.

Conclusion

To study the tensions that shape cities, I propose to borrow ideas and methods from a variety of political science fields. American political development offers a way to understand the long-term political tensions between walkability and car-dependence: as the intercurrent tension between two conflicting paradigms, each with their own tool-box of arguments, developed over decades of political contestation. Historical institutionalism lends insight on how car-dependence, once dominant, became entrenched, as car-oriented norms and standards were locked-in. The policy feedback literature reveals larger scale processes by which car-dependence may reinforce itself while undermining walkability, and vice versa — while also lending insight on how exceptions to this pattern can enable change.

While the marriage of these various traditions is complex, the central argument that emerges is relatively simple. Car-dependence reinforces itself at the expense of walkability, but the exceptions to this pattern — inverse feedback — creates opportunities for actors to intervene to shift momentum. To fully achieve walkability in suburban contexts, however, will require more than exceptions: walkability will, eventually, need to itself become sufficiently dominant within its own domain that it can begin to reinforce itself at the expense of car-dependence.

Chapter 3. Case Selection and Analysis Methodology

This dissertation tackles complex phenomena and will need careful methodology. I draw on multiple literatures — especially American political development and comparative politics — to identify a strategy to analyze the tensions between car-dependence and walkability as they play out in the history of four separate cases, in distinct institutional contexts. Broadly, my hope is to leverage the kind of in-depth analysis that American political development scholars bring to a single case, while adding greater generalizability by comparing multiple cases.

As I describe in Chapter 2, this thesis offers three hypotheses:

1. Car-dependence reinforces itself via economics, politics, and institutions, making walkable retrofits difficult to achieve.[2]
2. Car-dependence also partially undermines itself, and reinforces walkability, creating opportunities for change — but the changes that result from these contradictory processes tend to only be flawed and partial.
3. To achieve a full paradigm shift to walkability, it is necessary for walkable development, interests, and institutions to reinforce themselves on their own terms, at the expense of car-dependence.

The first hypothesis characterizes the barriers to change. The second accounts for exceptions that enable proponents to initiate change. The third offers a path for how to fully transition to a walkable paradigm. Underlying all three hypotheses is the proposed model of urban intercurrence (Chapter 2), in which car-dependence and walkability reinforce themselves at the expense of each other.

The central null hypothesis for this thesis is that there is no fundamental tension between car-dependence and walkability, and that these two categories are therefore not meaningful. If a city could simply rezone a car-dependent area for walkable development, and dense, mixed-use growth followed without further intervention, it would refute the notion that car-dependence undermines walkability. If

[2] This version of the hypothesis is slightly simpler than what appeared In Chapter 2: that car-dependence reinforces itself more than it undermines itself. However, the meaning is effectively the same: on net, car-dependence reinforces itself.

engineers could design thoroughfares in a way that equally meets the needs of car-dependent drivers and local pedestrians, it would similarly contradict the idea that there are fundamental tensions between the two models.

I aim to refute this null hypothesis by exploring in-depth the tensions between car-dependence and walkability — which exist, I attempt to show, even when people do not consciously recognize them (Hypothesis 1). Where there are exceptions to these tensions, I test the idea that they enable only contradictory, partial change (Hypothesis 2). And I examine whether the continued success of walkable growth can be traced to the success of other, nearby walkable developments, on the political support of groups with an interest in that kind of development, and on experts and institutions who specialize in that kind of design (Hypothesis 3). In short, I test whether the change does represent a shift between two contradictory paradigms, and not a smooth shift between development patterns amongst an arbitrary variety of options.

This basic point — that walkability and car-dependence are in tension — should not itself be controversial, given the long history of the idea in urban thought (Mumford 1963, 236; Jacobs 1961, 349–353; Lehe 2017; Newman, Kosonen, and Kenworthy 2016). However, as we will see, governments often proceed as if there is no fundamental distinction. Studying these questions will help to underline why walkability needs categorically different policies, and why walkable growth needs greater intervention to survive when located within an otherwise car-dependent context. And, more importantly, the three hypotheses offer a model for how to navigate the paradigm shift: how to leverage the exceptions — in which car-dependent development, institutions, and interests support some level of walkable design — to establish a bridgehead, and then cultivate walkable development, institutions, and interests until they can reinforce the success of walkability.

Methodology, Comparative Politics, and Intercurrence

This thesis conducts a small-n comparative analysis of four case studies employing analytic tools from American political development. There are tensions in

combining these methodologies. Comparative methods — traditionally, at least — seek to make generalizable statements based on the formalized comparison of multiple cases, holding as many variables constant as possible. American political development focuses not on comparison but on a single case study (the United States) and rejects variables as a methodological tool (Dilworth 2020, 183; Orren and Skowronek 2004, 184). However, the confrontation of these two approaches may offer promising tools for analysis.

A central tool in comparative methodology is the "small-n most-similar cases study," in which investigators select a limited set of cases that are, to the greatest extent possible, similar in terms of all respects (control variables) except the independent and dependent variables under examination (Lijphart 1971, 690). In this way, scholars can tease out whether a given set of independent variables cause the dependent outcomes, all else held constant. Lijphart (1971) and King *et al.* (1994) position randomised control trials as the gold standard for knowledge production, followed in order of decreasing reliability by statistical methods, and finally by this qualitative comparative method. In this formal methodological hierarchy, qualitative comparative analysis is a necessary evil, essential to ask certain questions, but lower in empirical prestige (Hall 2003, 373).

Hall (2003) observes that such formal methods — focused on identifying causal links between variables — make certain ontological assumptions about the world, and are only appropriate in contexts where those assumptions hold. Formal comparative methods assume causation is largely unidirectional, so that one may distinguish dependent from independent variables. They assume that control variables outnumber the causal variables under examination, or else there will be too many potential confounds to isolate causation. They assume that variables are relatively static objects that are sufficiently similar between cases. And they assume that the causes of change are not endogenous, meaning outcomes do not result from some internal characteristic unique to one of the cases, rather than the generalizable variables it shares with other cases (Hall 2003; Dilworth 2020, 184).

There are topics that conform to these criteria, but scholars of American political development argue that their topic is not one of them. They study the rich

details by which political ideas develop and change. By foregrounding such details, few elements remain so stable as to be characterized as variables, and the differences between cases often outnumber controls (Orren and Skowronek 2004, 184; Dilworth 2020, 183). Bidirectional causation is, for them, not a confound but the focus of their research: co-existing political traditions shape each other's development, in an ongoing, mutually-causal interplay (Lieberman 2002, 698; Morgan et al. 2016, 172). Similarly, endogeneity for them is a feature not a bug (Dilworth 2020, 184). They seek to understand how the unique circumstances within a given moment, in a specific place, generates any given chain of events.

American political development scholars, however, do not reject formal methodology. Tilly (2001) proposes that scholars should focus on identifying the "mechanisms" of causation: the various processes by which political events generate outcomes. By analogy, medical researchers differentiate between studies that test causal associations (analogous to covering laws) and those that study causal mechanisms (Parkkinen et al. 2018). When medical researchers study mechanisms, they tend not to use double-blind control studies or statistical regressions, the tools for studying causal associations. Rather, they analyze specific cases in greater detail to develop a richer understanding of how and why processes in the body operate in the ways they do. The tools of mechanism studies include, "in vitro experiments, biomedical imaging, autopsy, [and] animal experiments and simulations" (Parkkinen et al. 2018, 14). Similarly, while it is appropriate for some political science studies to focus broadly on statistical regularities, it is also essential for some scholars to elucidate the detailed causal mechanisms underlying political change. American Political Development scholars have developed tools in the latter category.

Among these tools, process tracing is central. In process tracing, researchers reveal causal chains by carefully studying documents, interviewing those involved, and identifying the sequence of events (Galvin 2020, 192). For Brady *et al.* (2006), the goal is to make "causal process observations": to catch causal mechanisms in the act, providing direct evidence of their role. They offer as an example the study of the "nuclear taboo" hypothesis for why countries have not used atomic weapons in anger since WWII, direct evidence of which can be found in memos written by decision makers describing their reluctance (Brady, Collier, and Seawright 2006, 366).

Researchers may also look for a "signature" of a given mechanism, analogous to a biomarker in medicine: observations that should not occur were the mechanism not in play (Beach and Pedersen 2019, 44). "Sequence" is a third critical genre of evidence in process tracing: if x is a purported mechanism in causing y, and y occurred before x, it is strong evidence against the role of the mechanism.

For example, in Chapter 5, a mall opposed the Downtown Kendall suburban retrofit, arguing that changes would undermine car access and visibility with a "devastating impact on mall revenues" (Kalfin and Betancourt 2003, 27). This constitutes a "causal process observation" of a mechanism: the tendency of car-oriented businesses to oppose walkable plans. In this case, the mall explicitly linked their preferences to car-oriented design, providing strong evidence that this mechanism played a role in shaping outcomes.

Later, there is indirect evidence — a signature — for a second mechanism: that the success of walkable developments can reinforce itself by changing the perceived self-interest of nearby car-oriented businesses. As walkable development near the mall has become more successful, the mall's owners have replaced some parking lots with high-density towers and have inserted a street-oriented restaurant into its facade. A pamphlet for mall tenants also brags that, "6,250 new residential units are currently open or under construction within walking distance of the center" (Simon 2021, 11). The sequence of events is consistent with the proposed mechanism: the success of nearby walkable developments came first; the mall's shift in priorities came later.

Comparison is not strictly necessary for a process-tracing study. American political development scholars focus on a single case study, the United States, and reject the notion that case studies are only valuable for building hypotheses (Hall 2003, 396). Instead they propose that one can decompose a given case into hundreds of events and observations, providing a rich tapestry in which one can identify recurrent causal mechanisms (Morgan et al. 2016, 170). Comparison can, however, provide greater generalizability, helping to test whether causal mechanisms relevant in a given place are relevant elsewhere, and under what circumstances.

Mechanism studies in medicine often observe multiple patients to see whether the same mechanisms progress in a similar manner across multiple patients, and if not, why. (See for example: Bergouignan et al. 2011). Beach (2017, 1–2, 14) argues that to "generalize about causal processes," it is important "to couple process-tracing case studies with comparative methods." I therefore compare four physically-similar cases of suburban retrofits, in four separate institutional contexts, to demonstrate whether similar causal mechanisms shape retrofits even in the distinct contexts of separate regions and countries. In place of a traditional small-n most-similar cases study, I conduct a comparative mechanism study, seeking to understand whether the same mechanisms of urban transformation are found in multiple cases, and if not, to examine what may explain the differences.

I conducted semi-structured interviews, in which I asked participants a set of questions listed in Appendix C. The purpose of the script was to ensure I covered a set of all relevant topics with each participant. I did not, however, follow the script precisely, as I found it valuable to allow interviews to proceed in a natural, conversational manner. I also omitted questions when irrelevant to a person's experience or expertise.

Case Selection

To explore this hypothesis, I have identified four suburban retrofits that, to the extent possible, were similar in terms of their initial conditions: highly car-dependent commercial areas with a diversity of local land owners, and with roughly similar demographics and physical scale. The goal was not to hold these factors constant — since the study seeks to understand processes of change — but to compare multiple plans that faced similar challenges. I also selected cases in distinct institutional contexts — chosen from different states and provinces in Canada and the United States — to increase generalizability. I selected cases which had the following attributes in common:

- Suburban retrofits described in explicit, official government plans, which envision walkable future development, defined by compact, high-density, mixed-use buildings on small blocks and on pedestrian-priority streets.
- At the time that the plan was passed, the plan area constituted a car-dependent commercial area which:
    - Was dominated by car-dependent commercial or office development, in which buildings are primarily oriented towards parking lots rather than sidewalks.
    - Had few or no homes intermixed among commercial and office uses.
    - Separated any homes (if it had any) into distinct single-use residential areas.
    - Was not directly adjacent to an existing downtown or other walkable urban area.
- The retrofit is located within a growing urban region — both in terms of population and GDP — so that differences in outcomes can be explained as little as possible by exogenous economic factors.
- The retrofit is at least as large as a neighbourhood (meaning its radius is at least 400 metres, equivalent to a five minute walk from the edge to the centre), and not larger than a small collection of neighbourhoods. The goal is to study communities at the medium scale, not a small collection of blocks nor whole cities.

One risk in selecting cases is that a researcher may choose those that support a certain hypothesis, meaning that differences in outcomes may be explained by the process of selection, and not the attributes under examination (Collier and Mahoney 1996; Teune and Przeworski 1970). I sought to avoid this confound by selecting cases that were relatively similar in their starting condition, and that represented a range of progress at achieving walkability in the present moment, while I remained intentionally ignorant of the causal mechanisms that led each case to those outcomes. In this way, the cases represent a range of what is possible given certain starting conditions, and were not systematically sorted based on whether they support any given hypothesis for how urban change proceeds. I measured their progress on walkability using the following scale.

I identified potential cases by referencing books on suburban retrofits, reviewing the projects of firms who specialize in suburban retrofits, and by asking urban planning online discussion forums (Dunham-Jones 2005; Bohl and Schwanke 2002). Through this process, I identified 28 potential retrofits that were not located within, or next to, existing walkable areas. I then narrowed down cases using a process I describe below. First, however, I developed a methodology to evaluate the progress each retrofit has made on becoming walkable, so that I could better select a range of outcomes.

Walkability Evaluation Scale

Certain features of urban design consistently impact rates of walking, biking, and transit ridership (New York City 2010; Saelens and Handy 2008).[3] Scholars employ a variety of schemas to categorize these elements, but one that has gained prominence is the "6 Ds": diversity, density, distance to transit, destination access, design, and demand management (Cervero and Kockelman 1997; Garfinkel-Castro et al. 2017, 54; Ewing and Cervero 2010, 267). This schema is often used to evaluate regional transit-oriented development, and I adapt it slightly to focus on specific urban districts. First, I set aside demand management, a term referring to policy tools for reducing the total level of driving in a region. Second, I position questions of architecture and aesthetic comfort under the heading "design," and place issues of traffic safety under a separate category, identified by the antonym "danger." It is possible to build unsafe streets that feel attractive, and vice versa, and these goals arguably require distinct kinds of expertise. Third, I repurpose "destination accessibility" to refer to access to local destinations via walking — rather than regional destinations via transit — to better distinguish issues of street-network connectivity, which is also otherwise lumped together under the catch-all category of "design" (Giles-Corti et al. 2016, 2914).

[3] For simplicity, throughout this thesis, I use the words "biking" and "cycling" to refer to all types of micromobility — including skateboards, rollerblades, scooters, and e-scooters — as these tend to depend on similar types of infrastructure, including bike lanes.

Evaluation Technique

Scholars have attempted to quantify aspects of the 6 Ds into objective tools for evaluation (Ewing and Cervero 2010, 273). However, not all of these criteria are equally amenable to quantification, and considerable legitimate variation exists in how to achieve certain requirements, such as safe streets or enclosure (meaning whether a street is well-defined by buildings on all sides) (Stamatiadis et al. 2017; Rosales and Sousa 2010; Alkhresheh 2007). Moreover, these urban design qualities vary widely within sites, raising questions about which sections to measure and how to combine such measurements into a single score. I instead evaluate sites qualitatively as a whole in terms of whether the preponderance of streets and blocks meet the relevant criteria. Ewing and Handy (2009) find that trained laypeople and experts give reliably similar qualitative evaluations to sites when urban design criteria are rooted in observable facts, such as whether buildings have windows and doors on streets, rather than subjective qualities, such as whether a building is compelling or innovative. Moreover, planning scholars have increasingly recognized the need to implement design standards with judgement and flexibility to adjust to the particular needs and details of each context (Stamatiadis et al. 2017; Chupin 2011). This implies that evaluating such standards, in turn, requires judgement. I therefore evaluate whether each site meets each criteria in qualitative terms as a whole, based on a careful review of the available literature on the requirements for each aspect of the 6 D's. To make these evaluations, I use Google Street View, satellite imagery, census data, and Walk Score (described below), and transit schedules (to determine transit frequency).

Evaluating sites for a walkability grade

To reduce the role of arbitrary subjective assessment in these evaluations, I only evaluate whether these sites achieve these criteria in any basic sense, and not whether they excel at them. I give each site a score out of six, in which clearly meeting a requirement is worth 1, and in which ambiguously or unevenly meeting a requirement is worth 0.5, following this criteria:

- **Clearly meets requirements.** The site substantially meets the criteria throughout most of its area. Exceptions are minor or isolated, and should not pose barriers to most users (residents, employees, customers etc.) walking to most major destinations.

- **Ambiguous or Uneven.** It is unclear whether the site meets the criteria, but it likely meets it sufficiently well that it should not pose a decisive barrier to people walking to most major destinations. *Or*, the site would be graded as meeting the criteria in large areas, but would be graded as ambiguous or failing to meet it in other areas.
- **Fails to meet requirements.** The site clearly fails to meet the criteria to such an extent that it likely poses a barrier to people walking to major destinations.

This score is not intended to provide a predictive index of walkability, but rather only to provide an indication of the extent to which each plan has achieved its explicit goal to create a walkable environment. I grade the sites in terms of their present state.

Walkability Grading Criteria

I scored each site from 0 to 1 on each of the following six criteria:

Diversity

To support high rates of walking, communities need a diverse mix of local destinations, including retail, parks, offices, and other employment (Glazier et al. 2014; Curley 2010; Saelens and Handy 2008). As an indicator of diversity, I use WalkScore, an index that draws on street network data, including housing and business addresses, to give a score on the mix of destinations within walking distance of a given location. WalkScore has been validated as predictive of rates of walking (Duncan et al. 2011, 2013). Following WalkScore's schema, I label communities as substantially meeting criteria if they have a score above 70 out of 100, and those with 50 to 69 as minimally meeting criteria. Walk Score provides numerical values for specific addresses, not areas, and so I identify representative scores within each site's primary commercial area(s) and within major residential neighbourhoods.

Density

Residential density is highly correlated with rates of walking (Giles-Corti et al. 2016; Glazier et al. 2014; Sallis et al. 2016). Communities require a minimum threshold of 35 residents and jobs per hectare or few people will walk to destinations

(Newman and Kenworthy 2006; See also: Cervero and Dai 2014, 130). Eom and Cho (2015, 79, 81) similarly show that density is most strongly correlated with walking as density rises to 34 people per hectare. I grade projects with densities above 34 people per hectare as substantially meeting density criteria, and areas with half that number, 16 people per hectare, as minimally meeting criteria.

Distance to Transit

Transit best supports rates of walking when located within 400 metres of homes and when it arrives at high frequencies (every 15 minutes or less) (Cervero 1998; Walker 2012). Transit also has a larger impact on walking when it is located near other mixed-use destinations (Eisenberg-Guyot et al. 2019; Sallis et al. 2016; Kamruzzaman et al. 2014). The transit network should itself form a grid, allowing riders to efficiently access all major destinations at any time of day (McLeod, Scheurer, and Curtis 2017; Mees et al. 2010; Walker 2012). Street networks must also allow transit to pass through the centre of communities in a relatively straight line (Ozbil, Peponis, and Bafna 2009). Residents will walk further to reach higher-order transit, such as subways or light rail (Kuby, Barranda, and Upchurch 2004; O'Sullivan and Morrall 1996). I evaluate each site as substantially meeting this criteria if the primary commercial area(s) and the preponderance of homes fall within walking distance (400 metres or less) of transit stops, or 800m of higher-order transit, with frequencies of 15 minutes or less. I evaluate them as minimally meeting criteria if the preponderance of homes and businesses are within these distances of transit with frequencies of 30 minutes or less.

Destination Access

Residents are less likely to walk if the street network is not well-connected or if it is interrupted by large blocks, because this forces residents to walk further to reach destinations (Frank et al. 2005; Ellis et al. 2016; Stojanovski 2020). Pedestrian access tends to erode when blocks are longer than 140 metres (Sevtsuk, Kalvo, and Ekmekci 2016). Communities are evaluated as substantially meeting criteria if their blocks are shorter than 140 metres with few or no exceptions (excluding parks or natural features). They are evaluated as minimally meeting criteria if many blocks are longer than 140 metres, but not longer than 200 metres.

Street connectivity only provides access to destinations if the destinations are located close to homes (Glazier et al. 2014; Sallis et al. 2016). I separately evaluate whether a site's primary commercial areas are located centrally within, or intermixed among, the site's housing. I apply the lower of the two evaluations as the site's score for destination access.

Danger: Street Safety

Streets that feel unsafe substantially reduce rates of walking, whether due to fast traffic or inadequate pedestrian protection (Rossen et al. 2011; Borst et al. 2008; Pucher and Dijkstra 2003; Wang et al. 2016; Mindell and Karlsen 2012). Pedestrians tend to feel safest on streets with adequate sidewalks, where street crossings are short, and where the street is designed for slow speeds using narrow lanes, tight turning radii, and other traffic-calming measures (Giles-Corti et al. 2011; Park, Deakin, and Lee 2014; Parolek, Parolek, and Crawford 2008, 30). Street crossings should also be as short as possible. Where long crossings are necessary — across four-or-more lanes — it is important to insert pedestrian islands in the median, to reduce the amount of time in which pedestrians are exposed to traffic (NACTO 2016). I evaluate sites as meeting this criteria if a preponderance of streets meet safe street criteria, with a focus on primary commercial streets, and if no street divides the site that significantly violates safe-street requirements, such as a wide car-priority arterial or highway. I evaluate sites as minimally meeting this criteria if multiple streets within the site fail to meet standards of safety, without violating them so significantly as to pose a major barrier to walking.

Urban Design

While aesthetic taste is subjective, certain elements of street and building design are found to impact the likelihood that people will walk on streets, and the probability they will linger there (Gehl 2010; R. Ewing and Handy 2009; Ellard 2015; Pushkarev and Zupan 1975; Sugiyama et al. 2012). I adopt Ewing and Handy's (2009) schema for measuring design, except that I exclude "imaginability" (which is more related to wayfinding and place identity than walkability) and add greenery:

- **Enclosure.** People are more likely to spend time on streets that are bordered by a relatively-consistent edge, so that the street and the walls along it form a well-defined sense of place (Garfinkel-Castro et al. 2017, 56). Parking lots,

vacant lots, large setbacks, gaps between buildings, and excessively-wide streets undermine enclosure (Speck 2018, 198–199; R. Ewing and Handy 2009; Alkhresheh 2007).

- **Human scale.** Human scale is, roughly speaking, the distance within which humans can recognize the face of another human, or roughly 25 metres. When walls are taller and streets are wider than this distance, people tend to feel less comfortable (New York City 2010, 34; Gehl 2010, 35; Yin and Wang 2016). Human scale can be preserved, to some extent, for large buildings if their upper floors "step back" from the street, so that the wall facing the sidewalk is only 3 to 5 stories (Ewing and Clemente 2013, 9).
- **Transparency.** This metric refers to the connection between the interior of buildings and the street (Ewing and Clemente 2013; R. Ewing and Handy 2009). Humans feel more comfortable on streets where there are consistent interfaces between buildings and outdoors, such as windows, doors, balconies, or patios (Garfinkel-Castro et al. 2017, 56; Gehl 2010, 35).
- **Complexity.** Blank walls undermine human comfort on streets, an effect that has been measured biometrically by Ellard (2015) and Sussman and Ward (2019). Many architectural features can contribute to providing minimum-necessary visual complexity: doors, windows, sills, stairways, cornices, signs, ornamentation, and any changes in depth or material (New York City 2010, 34; Brown et al. 2007, 45, 47; Gjerde 2010). Complexity is also aided when buildings are narrow, and when they do not all look identical, so that pedestrians see a variety of visual stimuli as they walk (Gehl 2010, 77).
- **Greenery.** Humans are "biophilic," attracted to streets with plants and trees, and tend to walk more on streets with lots of greenery (Lu, Sarkar, and Xiao 2018; Sallis et al. 2016; Yang et al. 2019; Adkins et al. 2012, 507).

Sites are evaluated as substantially meeting urban design criteria if they consistently meet most of these requirements on most of their streets, with an emphasis on primary commercial streets. They are only evaluated as failing if they violate design requirements to sufficient extent that it is likely to pose a barrier to rates of walking, particularly within a primary commercial area.

Narrowing down cases

I identified 28 examples of plans in the United States and Canada to retrofit car-dependent areas by referencing books on the subject, consulting the work of firms known to work on retrofits, and through general online searchers (Dunham-Jones and Williamson 2008). I graded the current status of each on the 6-point walkability scale, described above. As can be seen in Figure 2, the cases identified vary from having made no progress towards walkability to having fully achieved a transition. I excluded University Station, Westwood, Massachusetts and Midtown, Oakville, Ontario from my analysis, as these sites have made no progress on walkability, and therefore would not include the mechanisms of intercurrent design I seek to study.

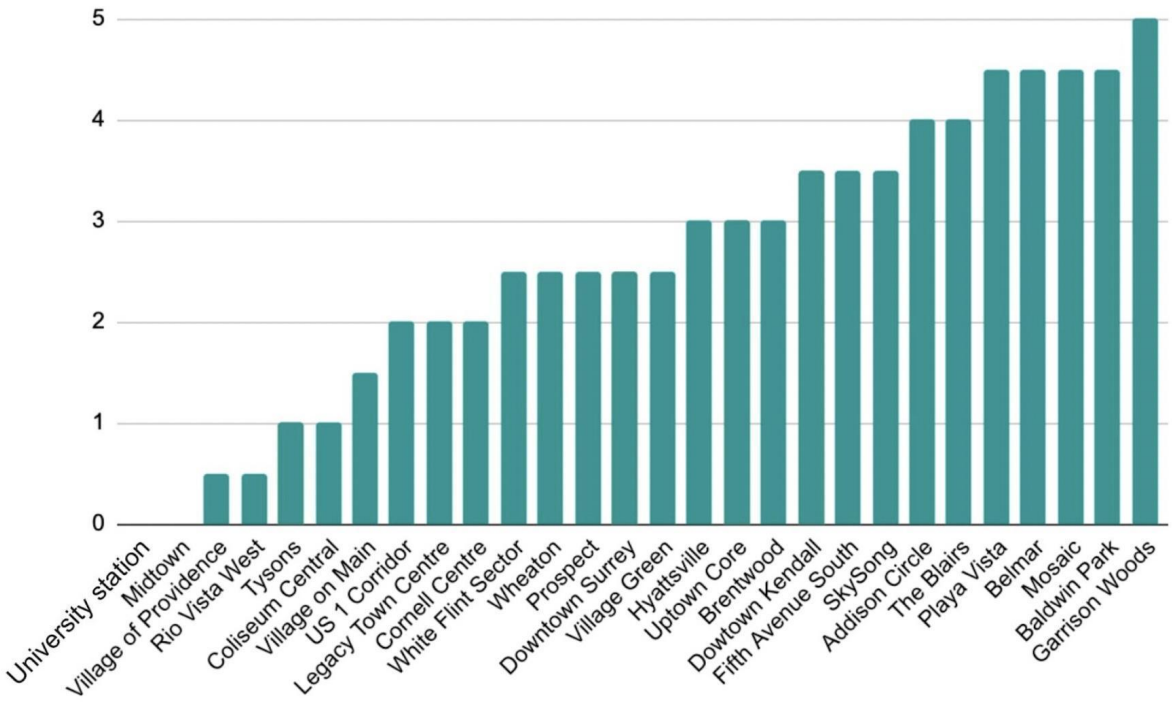

Figure 2. Walkability score for 27 retrofit sites.

This study seeks to understand retrofits in areas with multiple landowners, where demolishing the whole neighbourhood at once and rebuilding on a blank slate is not an option. I seek to understand the messy process of redevelopment when multiple landowners rebuild piece by piece, creating an inconsistent development pattern where some changes encourage walkability while others encourage car-dependence. I therefore excluded 12 cases that are composed of a single property, or

where a single developer managed the whole project, as shown in Figure 3. Note that all the most successful cases had a single owner or were redeveloped as a blank slate, as Dunham-Jones and Williamson (2008) observe. However, some of the least successful sites, including University Station and Midtown, also have a single owner. Unitary ownership appears to be a key factor in some of the most comprehensive retrofits, but it does not guarantee success.

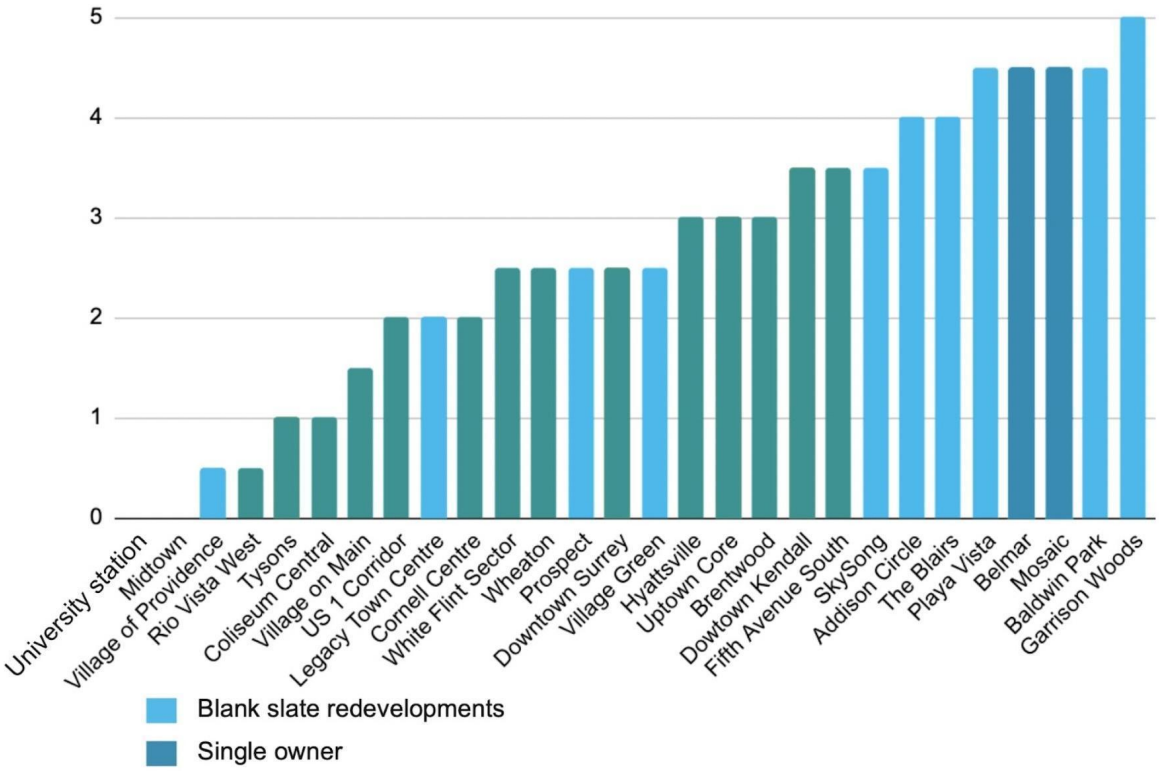

Figure 3. Exclusion criteria: blank slate redevelopments and single owners.

The remaining sites are not uniform in their retrofit progress. They are composed of many small properties with separate landowners, each with distinct preferences, goals, expertise, and access to capital. Each therefore has a mix of sub-areas that are highly car-dependent and sub-areas that are more walkable. While none of the mixed-ownership cases were successful in becoming fully walkable, many contain sub-areas that have become highly walkable, making it possible to compare examples of success and failure within the remaining cases.

One ambiguous case is the Uptown Core. Much of its land was owned by a single landowner at the time of the plan's passing, 1994, which I had not realized

when first selecting cases. In the 1960s, almost the entire area had been owned by the developer Metrontario. However, by 2006, land ownership had diversified somewhat, with the city, other developers, and residents owning large portions of the site. Retail tenants also have long-term leases on many remaining properties. A single landowner therefore has greater influence over the pace of change in the central area of the Uptown Core than in the other cases, but their influence is far short of absolute, and, as we will see, the pace of change in the area depends on complex, intercurrent economic processes.

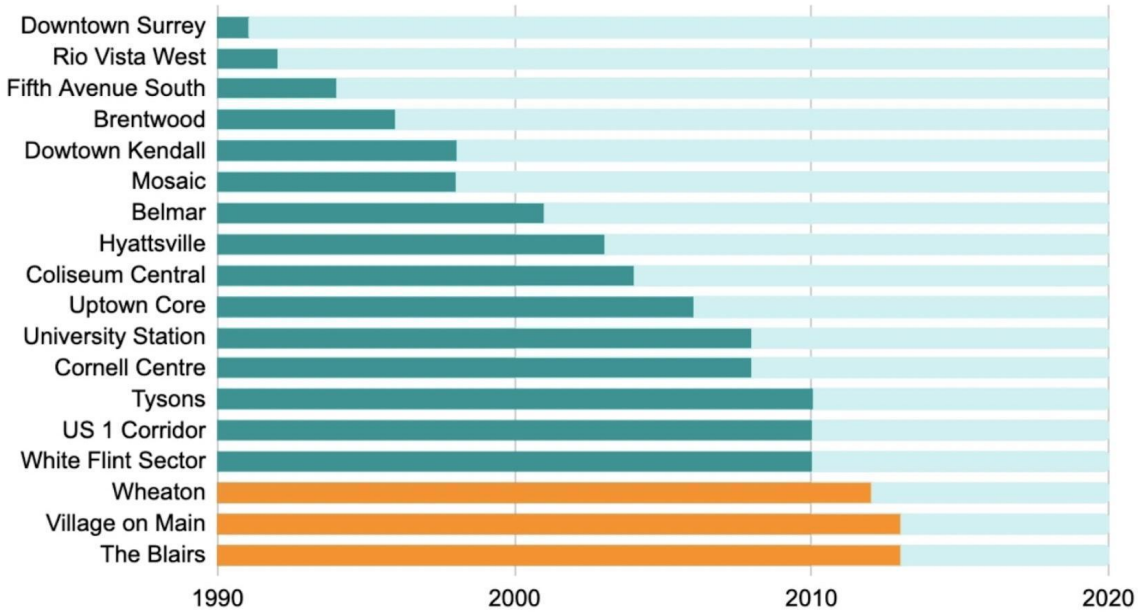

Figure 4. List of dates of each plan.

I then excluded cases whose plans were adopted since 2010, as later plans would provide insufficient time to observe substantial redevelopment (Figure 4). After excluding these cases, nine cases remain, listed in Table 2.

United States

Virginia and Washington DC
Tysons
White Flint Sector
Hyattsville
Coliseum Central

California
Rio Vista West

Florida

Canada

British Columbia
Surrey City Centre
Brentwood

Ontario
Uptown Core

Downtown Kendall

Table 2. Institutional context of remaining cases.

I next selected cases from distinct institutional contexts, to better identify whether the causal mechanisms I find in any one case is unique to a given region and its institutions, or a phenomenon generalizable to the broader Canadian and United States contexts. I selected two cases from Canada. The Uptown Core was the only option available outside of British Columbia, and provides an excellent example of a site that has a mix of both walkable and car-dependent development. Of the two British Columnian options, Surrey City Centre was a more uniformly car-dependent at the time the plan passed.

In the United States, a number of sites had relatively unclear or inadequate plans for achieving walkability, including Rio Vista West and Coliseum Central. Others were already partially urban, walkable, or transit-oriented at the time the plan was passed, including White Flynt Sector and Hyattsville. This left Tysons, Virginia, and Downtown Kendall, Florida. These two cases provide clear examples of areas that were largely car-dependent with a wide variety of land owners, promising a messy redevelopment process.

These four selected cases also represent a range of progress on achieving walkability, according to my 6-point scoring system. Tysons had a retrofit score of 1, Downtown Surrey of 2, Uptown Core of 3, and Downtown Kendall of 3.5. Moreover, each has made far greater progress in certain subareas, and far less progress in others, enabling an analysis of what explains the difference.

Overview of the Four Study Cases

Three of the cases under study have made relatively modest shifts from driving to other modes (Figure 5). In Tysons, Downtown Kendall, and The Uptown Core, 63% to 78% of residents drive to work. Surrey City Centre has made the greatest progress on this measure, with only 51% driver mode share for commuting, and the highest rate of transit use, at 26%. However, if data were available on mode

share for all trips, Surrey likely would not be such an outsider. While the community connects to downtown jobs via Skytrain, and features various job rich local institutions (including a university and City Hall), the area currently does not have a high proportion of street-front retail, and it has a relatively low Walkscore.

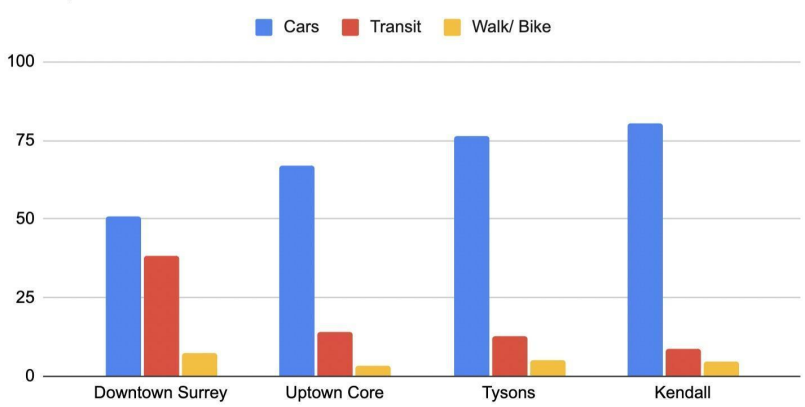

Figure 5. Transport mode share to work for the four study sites.

Descriptive Statistics

Next I explore a variety of demographic and economic factors to consider whether these four cases are distinct from each other in ways that could impact results. Table 3 lists key descriptive statistics.

	Surrey City Centre	**Uptown Core**	**Tysons**	**Downtown Kendall**	**Canada**	**United States**
Size (hectares)	270	113	447[4]	324		
Population	13,400	6,400	10,142	7,400		
Median age	38.9	39.9	40.1	37.1	40.7	38.5
Mean income	$33,700	$44,500	$74,300	$37,700	37,800	35,700
Visible minorities	52%	36.7%	44.7%	17.5%	42.9%	60%
House poor[5]	37.9%	37.7%				
Poverty			6.5%	42.3%		

Table 3. Descriptive statistics for the four study sites (U.S. Census Bureau 2019; Statistics Canada 2021; U.S. Census Bureau 2020).

[4] This is the number of hectares for the central areas slated for transit-oriented development. The entire plan area is instead roughly 1,200 hectares, and the population of this larger area is 29,000 (Fairfax County 2021b, 15).

[5] The proportion of residents who pay more than 30% of their income on rent or mortgage.

The Tysons plan area would be many times larger than the other sites, but I have focused specifically on its four "Transit-Oriented Development" areas identified in its official plans, where local government intends to achieve the majority of multimobile development. Tysons remains larger, but it is comparable in size to Surrey. The two smaller sites, Downtown Kendall and the Uptown Core, are large enough to contain at least one walkable neighbourhood, meaning a mixed-use area with a diameter of 800 metres, so that any resident could walk 5 minutes (400m) to a destination at its centre (Porta et al. 2014, 3384).

Downtown Surrey is on the high end of the population distribution among examined retrofits. This, however, is partially an artefact of the boundary line of its official plan, which includes several older residential neighbourhoods on its periphery. The majority of the study area had almost no residential population at the time the plan was passed (like the other retrofits under examination), and any population they do have now is the result of the plan's success at adding new residents.

The median ages for the four case studies are highly similar, sitting in the middle of the distribution for the cases under examination (Figure 6). However, if we break age into generational categories, Downtown Kendall has a much larger share of people over 51. This may reflect the growing demand for walkability in older populations (Sisson 2017)

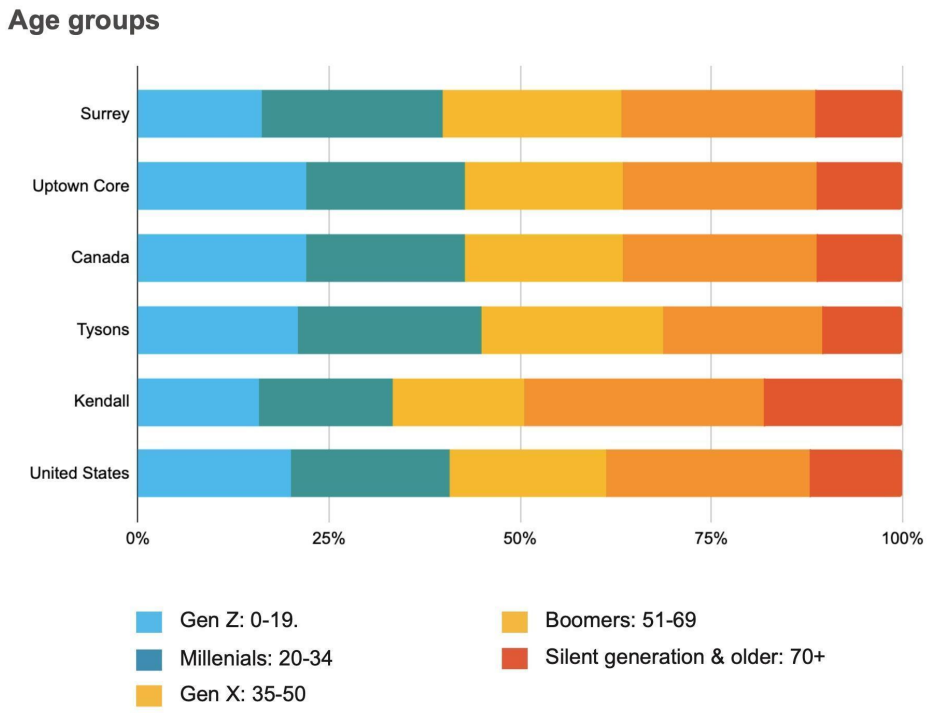

Figure 6. Age demographic proportions for the four study sites.

The four cases do vary substantially, however, in terms of the presence of visible minorities. In Surrey and Tysons, roughly half of residents are visible minorities, whereas only 36% are in the Uptown Core, and only 17% are in Kendall (U.S. Census Bureau 2019; Statistics Canada 2021). In theory, this could lead to greater tensions in the former two cases, or impact residents' comfort accepting an influx of new residents. I did not, however, encounter evidence of racial or similar tensions playing an important role in opposition to retrofits — though such intergroup animus may have existed, without being explicitly articulated in the newspaper articles and other documents I reviewed.

The Uptown Core, Downtown Kendall, and Surrey City Centre have similar median incomes and rates of poverty (Table 3). Tysons is an outlier on this issue, with higher incomes and lower rates of poverty. This affluence may encourage developers to build in Tysons, but otherwise, I do not expect this difference to substantially affect my findings.

Analysis

Process Tracing

My analysis will be modelled on process tracing. I provide detailed descriptions of a sequence of events based on historical documentation and interviews to elucidate the causes of specific outcomes (Collier 2011). To some extent, I adopt a theory-testing approach to process tracing, in which one identifies potential causal mechanisms, and tests whether the presence of these mechanisms (and necessary contextual factors) tend to produce the expected outcomes (Beach 2017, 19). I also, however, adopt a theory-building approach, in that I set out to discover new causal mechanisms, and strategies for change that I could not anticipate at the outset of the research (Trampusch and Palier 2016, 441). By combining the two approaches, I aim both to test ideas deductively that are drawn from existing literature, and identify mechanisms of change inductively that I discover in the cases.

Combining process tracing with the comparison of multiple cases enables stronger generalizable statements, particularly when each case can be disaggregated into multiple sub-cases to better test the theory (Bennett 2008, 1–2). The communities under analysis provide ample opportunity for such disaggregation because urban design outcomes are not uniform within each case. For instance, certain sections of Oakville's Uptown Core have attracted mixed-use walkable development, while other sections have attracted big-box store development, providing multiple opportunities to study the relationship between causes and effects. To be clear, however, I do not engage in the kind of formal process tracing capable of isolating specific variables and establishing firm causality (Bennett and Elman 2007, 183–185). Rather, I use process tracing as a broad model, weighing the likely significance of evidence in the context of the historical trajectory of each case.

Document Collection

In each selected case, I collect historical documentation related to the development of the district. These include master plans, other related plans or by-laws, transit plans, public consultation reports, relevant opinion pieces written in local media, and council debate transcripts. I collect documents spanning upwards of four decades, to capture how planning practice and goals have developed for the site over time. To compare outcomes, I also collect descriptive statistics for the area, including transportation mode share and WalkScore, and, where possible, how these indicators have changed over time.

Interviews

I sought to interview a broad range of sectors that influenced each retrofit, either through their own work or their advocacy efforts, including:

- Local political representatives, current and former.
- Government urban planners and engineers who have worked on the file.
- Private sector consultants who worked on the plan, or who worked on projects within the plan.
- Developers who have been consulted on the Masterplan, who have built developments there in the past, or who have proposed developments there.
- Members of resident-groups considered stakeholders for the plan.
- Representatives of other civil society and economic organizations, such as chambers of commerce, who gave input on the plan.
- Employees of other institutions who have authority over aspects of the plan, such as higher levels of government, or local special purpose bodies.

I reached out to 67 people, and 48 generously offered to do an interview, an acceptance rate of 72%. No sector systematically declined. I was, however, unable to reach transportation engineers in Miami-Dade's local government. In general, it was somewhat easier to reach interviewees who played a positive role in supporting a retrofit. Some opponents of local plans explicitly declined to conduct an interview, or have since retired or passed away, which means that in some cases, I was only able to interview one side of a controversy. In these cases, I have attempted to fill the gap

with newspaper articles from the time, and to quote these opponents in their own words.

Conclusion

Through process tracing, document analysis, and interviews, I test the hypothesis that cities in Canada and the United States are shaped by the dynamic tension between two incompatible models of development — car-dependence and walkability — which simultaneously reinforce themselves and undermine each other in a process of intercurrence. I probe these four cases for evidence that car-dependence and walkability represent two competing self-reinforcing models of growth, and whether these models reinforce themselves, in part, via institutional and political lock-in, and the role of self-reinforcing and self-undermining feedback in the process of policy change.

Chapter 4. A Century of Urban Intercurrence in North America

In 1900, the car remained a loud, impractical tool, while nearly all communities were designed either around foot traffic or, increasingly, transit (Seely 1987, 161). A century later, the majority of homes in Canada and the United States are located within car-dependent communities (Pucher and Lefèvre 1996; Gordon 2018). This chapter charts this remarkable shift, and central to this story are the ways in which growth paradigms can reinforce themselves, or conversely, how they can inspire their opposition, creating opportunities for change. The history of this shift can offer lessons on how officials can intervene today to engineer a contrary shift: to retrofit suburban communities to become walkable.

The Origins of Urban Intercurrence

The 1880s saw the invention of four technologies that would change cities forever: the car, the electric streetcar, the modern bicycle, and the steel-frame skyscraper (Sovacool 2009, 414–415; Mohajan 2019, 15; Rees 2016, 4; Ali and Moon 2022, 1). The latter three inventions had the potential to magnify traditional walkable development patterns, creating cities denser than had ever before existed. The automobile, meanwhile, had the potential to spread cities out into an all-new model of low-density growth. The decade gave birth to two contradictory potential development trajectories, creating urban intercurrence as we know it.

Until the 1920s, walkability had the advantage. All cities were walkable at that time, because no other option had yet existed. Influential economic actors tended to be located downtown — including department stores, banks, newspapers, land owners, and utilities — and they used their political clout to advocate for the needs of downtown, including for subways and streetcars (Fogelson 2001, 63). The electric companies — notably General Electric — also lobbied for the expansion of electric streetcars (Norton 2011, 159). Most transportation at the turn of the century took place by train or transit, and in Canada, roads suffered from underinvestment (Roberts, Meadowcroft, and Layzell 2020, 6). In the United States, many of the first

engineers who worked on city streets were employed by downtown chambers of commerce, and they therefore focused on the issues downtown businesses cared about: allowing the city centre to continue to grow, densify, and prosper (Norton 2011, 126, 130–133). These municipal engineers[6] therefore argued against allowing cars to consume too much street space, and focused instead on improving transit, using streets more efficiently, and clearing up sidewalks to allow more people to walk (Norton 2011, 126, 130–133).

As mass transit funnelled people downtown, and developers built skyscrapers, it enabled a level of urban density that had never before existed (Glaeser 2005). Suburbs, at that time, were also transit-oriented, compact, and mixed use: streetcar operators encouraged dense development around their stations to ensure they would have a steady flow of riders, and no one had yet used zoning to illegalize local shops and services near those stations (Ross 2015, 13–15). Transit agencies were profitable in cities such as Toronto because the development industry had built a grid of compact, mid-rise buildings, centred around transit, providing a high concentration of potential riders on transit lines (Sewell 2009, 13–14). Many of today's highest-value urban areas were built in this brief moment when the major economic and political interests in cities were focused on creating compact growth around transit (Leinberger and Rodriguez 2016, 20).

Walkability was, at that time, self-accelerating, with high-density construction making transit more successful, which enabled higher-frequency transit, which enabled denser development. And in this process, the downtown business elite, high-density developers, and the professionals worked for them were becoming more influential. Had this process continued, the majority of urban areas in Canada and the United States might today resemble the central areas of New York, Toronto, and Chicago.

[6] Norton calls this group of engineers "municipal engineers," even if they were not employed by municipalities, and I adopt this terminology (Norton 2011, 126).

Backlash

However, this early period of extreme, industrialized walkability created problems that would generate a backlash. Most cities lacked adequate housing or sanitation to manage the enormous influx of people migrating from rural areas and other countries, leading to overcrowded conditions and squalor (Weiner 1997, 10; L. Solomon 2007, 26–30). Factories often sat beside homes, choking streets with smoke and other forms of pollution (Talen 2012, 23–25). These consequences would motivate many urban leaders to attempt to curb densification, in a self-undermining process, and to encourage new forms of outward, low-density, car-oriented growth. This combination of self-undermining and other-reinforcing feedback is what I have called "inverse feedback," and it plays a crucial role in explaining the shift from walkability to car-dependence.

Ironically, while urban planners are often the chief advocates for walkability today, they were amongst its chief opponents in the 1920s. The profession was conceived as a response to the worst excesses of early industrial-age dense development (Hall 2021, 37–47). Planners in both Canada and the United States believed the problems of overcrowding were synonymous with density itself, and sought to spread cities out into lower-density neighbourhoods (Fogelson 2001, 108; Hayden 2004, 6; Solomon 2007, 24–25). They also hoped to keep noxious factories out of these neighbourhoods with strict zoning (Talen 2012, 23–25).

The dominance of walkability at this time had one downside that contributed to its decline: its consequences were vivid and known to thinkers, whereas the potential consequences of car-dependence were not. The United States held its first national conference on planning in 1909, entitled, "City Planning and the Problems of Congestion" (Ross 2015, 26). Remarkably, to modern eyes, "congestion" referred not to cars, but rather to streets overcrowded with people walking, shopping, and doing work (Fogelson 2001, 45; Seely 1987, 161). Planners aimed to solve such crowding by spreading the city out and reducing its density (Ross 2015, 26). They could not then know that they would be so successful that cities would one day struggle to attract any street life. Such a future may have been hard to imagine, given that many attendees arrived by horse carriage (Seely 1987, 161). Thinkers often foresaw the upsides of a life built around cars, but not the downsides. In his Broadacre City

proposal, Frank Lloyd Wright (1933) imagined every household having an acre of land and a car to travel. His proposal did not acknowledge the daily gridlock this would precipitate.

Planners first hoped that mass transit might spread the city out into the kind of lower-density communities they desired (Fogelson 2001, 65; Solomon 2007, 13). When they realized it instead encouraged densification, they turned against the technology. A Philidalphia Urban Planner accused subways of being more "traffic breeders than traffic absorbers" — by which he meant pedestrian traffic (Zipper 2021). One thinker similarly criticized what he called the "vicious circle of transit development and city congestion," arguing that subways encourage more people to shop and work downtown, which increases the value of land near stations, which then encourages people to build skyscrapers, which then encourages yet more people to come (Fogelson 2001, 103). He condemned this cycle in much the same terms that urbanists today criticize highway expansion and sprawl: "the problem has gone around and around in a circle, from congestion to new subway—and then again to congestion" (Fogelson 2001, 103). He saw, accurately, that walkability is self-reinforcing, and he wanted to end it.

One reason that planners supported low-density growth, at this time, was that the few single-family neighbourhoods that existed were owned by the wealthy, whereas most low-income neighbourhoods were in dense, walkable neighbourhoods, which contributed to the perception that single-family housing offered a healthier, more virtuous lifestyle (Hayden 2004, 6; Solomon 2007, 26–28). They suffered none of the dirty air, pit latrines, or prostitution that made some inner city neighbourhoods seem insalubrious (Hall 2021, 37–47; Ross 2015, 15–17). Low-density development was also associated with the traditional values of rural communities, and those who distrusted cities hoped they could spread the city out into a healthier, rural way of life (Solomon 2007, 46–48). Ideas played a crucial role in the initial shift in policy from supporting downtowns to encouraging outward, low-density growth: by associating downtowns with poverty and wealthy suburbs with virtue, government officials began an effort to remodel cities in terms of those wealthy exclaves.

Racism and classism further contributed to the shift. Early subdivisions used covenants to outlaw small homes and apartment buildings, and set minimum selling prices, in an effort to keep out lower classes (Ross 2015, 15; L. Solomon 2007, 26–30). Some zoning laws in the 1910s in the United States explicitly forbade blacks from majority white neighbourhoods (Ross 2015, 20). A 1924 court case struck down zoning rules in the city of Euclid because, the judge wrote, it transparently sought to "classify the population and to segregate them according to their income or situation in life" (Kosman 1993, 101–102). (That decision was later reversed by a higher court) (Kosman 1993, 101–102). A major motivation for early comprehensive plans was to establish a legal justification for excluding apartments and other lower-class housing types in a manner that would survive court challenges (Ross 2015, 28–30). Planners established model plans in the 1910s and 1920s to help cities across the United States to legally create exclusive neighbourhoods, and these plans were copied by many cities verbatim — including their printing errors (Lehnerer 2009, 60; Ross 2015, 30). Within a decade, similar restrictive single-use zoning spread to Canada (Ward 1999, 60–61).

Both the United States and Canada would establish housing authorities that would play a powerful role in codifying and funding the desired transformation of cities into low-density suburban growth. The United States created the Federal Housing Authority (FHA) during the depression to kickstart housing construction (Ross 2015, 41–43). The organization provided insurance for mortgages and allowed smaller down payments, enabling more people to enter the housing market, particularly after the second world war. The agency's classification scheme for granting mortgages penalized dense neighbourhoods — particularly in low-income areas. As a consequence, their funds were systematically funnelled away from downtowns and transit-oriented suburbs, and towards new low-density developments (Ross 2015, 42; Hayden 2004, 151). This classification system was then adopted by the wider financial industry, and would starve low-income walkable neighbourhoods of financing — a policy later known as "red-lining" (Ross 2015, 42–43). Without investment, residents struggled to repair buildings, build new homes, or open businesses, which made them less eligible for loans, leading to a self-reinforcing decline in many walkable areas (Ross 2015, 42–43). The FHA further set design guidelines for the communities it would fund, forcing developers to build car-oriented

cul-de-sacs and restrictive zoning rules, helping to create the typical car-dependent suburb of today (Ben-Joseph 2005, 64–74).

The Canada Mortgage and Housing Corporation (CMHC) was similarly created in 1946 to house veterans after the second world war (Solomon 2007, 50). It too favoured low-density neighbourhoods, and helped coordinate the construction of pipes and roads to spur investment in them (Solomon 2007, 54–55). One Canadian Veterans Affairs Minister explained that he wanted to encourage "real settlement," which, for him, meant "real farming" (Solomon 2007, 48). Solomon (2007, 55) argues that cities like Toronto would not have sprawled to the extent they did without the CMHC's direct intervention.

Traditional urban developers did push back against these rules, defending their right to build dense, multi-story apartment buildings (Hayden 2004, 130; Solomon 2007, 13–14). If they had succeeded, it would have been an example of walkable interests defending walkable growth, in a self-reinforcing process. However, there were economic interests who benefited from the new car-oriented growth model, and they fought to defend the new rules, in a contrary self-reinforcing process. These interests included real estate trade associations, who profited from the buying and selling of single-family lots (Hayden 2004, 130; Solomon 2007, 13–14). The construction of car-oriented neighbourhoods at large scale further established an industry of builders focused on this model of growth, creating a growing economic sector with a stake in the perpetuation of this growth model (Fogelson 2001, 108–110; Urry 2008, 344; Peiser 1990, 498). As these communities grew, they also created a population of residents who had no option but to drive — now a majority in both Canada and the United States — who have become a powerful political force pushing for car-oriented infrastructure investments and the maintenance of single-family zoning (Filion 2015, 637; Moore 2021).

An observer in the 1920s may have assumed that dense, transit-oriented development would continue to dominate cities. Downtowns had the advantage of being established economic centres where most residents worked and shopped, and their elites were politically powerful (Fogelson 2001, 63; Norton 2011, 130–133, 159). Downtowns were then becoming denser with the introduction of streetcars, in a

self-reinforcing process that strengthened their economic and political power (Zipper 2021; Fogelson 2001, 103). However, this early period of walkable growth was not well-managed, and its overcrowding, pollution, and poverty inspired opposition to this model (Fogelson 2001, 108; Hayden 2004, 6; Solomon 2007, 24–25). Planners and policy makers led a backlash, and used zoning, financial programs, and direct government investment to give new, car-oriented forms of growth the advantage (Talen 2012, 23–25). Walkability therefore undermined itself, and helped inspire the first car-oriented policy, in a kind of inverse feedback. Once car-oriented development began to take hold, however, it became self-reinforcing in its own right, and established its own constituency of developers, business elites, and residents who would set different priorities. And nowhere was this shift in self-reinforcing interests more powerful than in the design of roads.

The Transformation of Streets for People into Roads for Cars

"Congestion" began to mean *car* congestion in the 1920s, as car ownership rose (Roberts, Meadowcroft, and Layzell 2020, 7; Norton 2011, 131). At first, municipal engineers largely rejected the idea that they should widen roads, and certainly not at the expense of sidewalks or buildings (Norton 2011, 126). Engineers at the time had the intuitions of people who lived and worked in high-density downtowns — and often, whose salaries were paid by downtown business interests — and they attempted to enforce the spatial logic of these urban centres in a way that may have become self-reinforcing and path-dependent had their work continued. They understood that cities depended on large numbers of people moving efficiently through limited space, and that cars, in contrast, hogged space (Norton 2011, 130, 132–133). These engineers therefore focused on strategies to increase throughput, such as clearing sidewalks, timing signals, and eliminating on-street parking during rush hour (Norton 2011, 158). They also proposed to ban cars from streetcar tracks, which, if successful, would have created the first transit lanes (Norton 2011, 158). Few of these engineers took "seriously proposals to reconstruct the city for the sake of the automobile" (Norton 2011, 126)

Engineers expressed ideas at that time that would seem new and progressive today. One calculated that parked cars impose costs fourteen times higher than moving cars (Norton 2011, 141–142). When Shoup (2005) drew attention to similar numbers in 2005, it was considered path breaking. Many municipal engineers also rejected the idea that widening roads would reduce traffic, predicting that it would only encourage people to drive more, a process now called induced demand (Norton 2011, 156). In contrast, today's traffic studies often ignore induced demand in their projections, despite there being much more research on the phenomenon today than in the 1920s (VDOT 2020c, 2–10; Marohn 2019, 90–95; Speck 2013, 80–83).

The shift in engineering thinking towards prioritizing cars can be traced to the strategic intervention of auto companies. Car sales dropped in the mid-1920s and manufacturers blamed it on the lack of road space in cities (Norton 2011, 156). They recognized that they would struggle to expand road space for cars if they did not change how engineers understood the problem, and so in 1926, the auto industry funded a research institute at Harvard University, helping it to become the country's leading authority on traffic — while keeping quiet their role in funding it (Norton 2011, 165–166; Brown, Morris, and Taylor 2009, 163). The institute graduated large numbers of experts who would work in cities across the United States, and who would begin to implement the auto industry's version of traffic solutions (Norton 2011, 166–169). In this new paradigm, traffic was fundamentally a supply and demand problem, and the appropriate response to congestion was to expand the supply of roads (Norton 2011, 166; Ross 2015, 31–32). Soon, this model would also influence Canadian engineers (Sewell 2009, 52–53).

Auto interests achieved this shift in engineering philosophy in part by influencing which engineers were considered authorities on transportation. The municipal engineers who first worked on city streets had an interest in successful downtowns, and focused on using existing streets to bring the greatest number of people downtown (Norton 2011, 104–106, 126–127). In contrast, *civil* engineers earned their pay through building new infrastructure, and from the 1920s onwards, they drafted reports calling for new, wider, and ever-more elaborate roads (Norton 2011, 202; Rose and Mohl 2012, 44). The research institute at Harvard — funded by auto interests — helped to lend support to the authority of civil engineers as the new

traffic experts (Norton 2011, 202–204). Ninety years later, civil engineers are the undisputed authorities over road design, and they continue to release reports with much the same message: roads are clogged with congestion, and government must therefore build new, wider, and more complex roads (See for example: VDOT 2020c, 2–7—2–8; Marohn 2019, 90–95; Speck 2013, 80–83).

From the 1920s through to the 1950s, a variety of economic sectors found common cause in the goal of expanding roads. Civil engineers, auto manufacturers, oil companies, farmers, real estate interests, developers, road contractors, trucking companies, and trucking unions all coordinated to shift government policy to invest heavily in roads (Hayden 2004, 151, 155, 166; Rose and Mohl 2012, 12, 30, 36, 41–44). In the United States, these efforts culminated in the 1956 *Federal-Aid Highway Act*, in which the federal government would pay 90% of costs to build 40,000 miles of interstate highways (Lewyn 2012, 102; Rose and Mohl 2012, 85). Auto-oriented sectors recognized their common interests and were successful in lobbying government to invest in it, leading to a self-accelerating process in which the expansion of roads expanded the industries that built roads and cars, which in turn expanded the industry's budget to push government for more funding for roads (Fogelson 2001, 108; Ross 2015, 32).

In contrast, streetcar companies and downtown leaders often instead focused on competing with each other, and failed to effectively organize to protect their common interests (Fogelson 2001, 108; Ross 2015, 32). In other cases, they misunderstood their interests, and actively lobbied for policies that would undermine downtowns. In the hope of attracting suburban customers back into downtowns, downtown groups lobbied for highways directly into the heart of cities, demolishing hectares of compact development in the process (Rose and Mohl 2012, 56–57). These inner-city highways — which were built through downtowns across Canada and the United States — accelerated urban decline, encouraging people to drive to the periphery, and discouraging people from walking in the core (Jacobs 1961, 171, 350–354). Planners also began imposing parking requirements in the hope of supporting businesses, which further accelerated decline by leading many landowners to demolish buildings and to replace them with parking lots (Shoup 2005, 131–136).

Many of today's most authoritative engineering organizations began life with an explicit focus on building highways, and grew in influence as road construction grew in scale, in a process that locked-in car-oriented design as standard practice. The American Association of State Highway Officials (AASHO) was founded in 1915 to help states coordinate standards for highways, but it would later expand its mandate to include all streets, including inside downtowns, and it now writes the principal standards books for all roads in the United States (AASHTO 2020; Hebbert 2005, 55–56). The Transportation Association of Canada, which similarly writes the primary road standards for Canada, started life as the Canadian Good Roads Association in 1914 with the goal to improve Canadian regional roads (Haas and Falls 2014, 11–14). Most American state Departments of Transportation began as Highway Departments, and they first established their current authority over transportation issues while implementing the interstate highway system after 1956 (Toth 2017; Schmitt 2017; Hayden 2004, 166–167). The standards and education materials for these organizations continue to focus on highways more than other topics (AASHTO 2018; TAC 2017; Haas and Falls 2014, 16–20).

These organizations would codify a new paradigm of traffic management, using complex analytic methodologies to give scientific imprimatur to the goal of widening roads. In the 1940s, AASHO developed a cost-benefit analysis tool for new roads, which placed emphasis on the costs of traffic to drivers and their cars, but said little of the impact of wider roads for people walking or the performance of transit (Weiner 1997, 22). In the 1950s, the profession developed its first traffic studies, which calculated existing traffic and projected it to steadily rise (Weiner 1997, 26). These studies would become more elaborate over time, but they retained the built-in assumption that growing traffic is a background objective fact (rather the consequence of policy choices), and that the appropriate response is to widen roads (Weiner 1997, 21; DeRobertis et al. 2014, 32; Dumbaugh and Gattis 2005, 453–454).

AASHO published their first Capacity Manual in 1950, and they introduced "level of service" in the 1965 edition (Bhuyan and Nayak 2013, 222). Level the service measures the performance of a road in terms of whether traffic moves smoothly, and leaves aside the value of the road for pedestrians or any other street user (Bhuyan and Nayak 2013, 222; DeRobertis et al. 2014). Level of service would

become the central design parameter for roads in Canadian and American engineering standards, positioning the priorities of drivers as an objective requirement — rather than a value preference — while de-emphasizing the needs of other street users (Roess, Vandehey, and Kittelson 2010, 20; Bhuyan and Nayak 2013, 222; Weiner 1997, 14–15).

As engineers built new highways, traffic at first flowed smoothly, granting the impression that this new model of road widening could offer the smooth traffic it promised (Cox and Love 1998, 6). If traffic then clogged those roads, engineers argued they could solve it by widening them again, and this always did bring temporary relief, encouraging governments to widen roads one more time, in hopes that this would finally fix the problem (Duranton and Turner 2011). This process has generated ever-wider roads, and encouraged ever-more distant growth, which then created more traffic, in a self-accelerating process that has now continued for over seventy years, creating highways wider than 20 lanes in places. The resulting urban expansion has swallowed the gaps between some major cities, creating contiguous urban landscapes that stretch for hundreds of kilometres, such as between Boston and Washington D.C. (Florida 2010, 48–51).

Without dedicated lanes, transit became slower and less reliable as traffic rose in the 1950s, which encouraged more people to drive, which further undermined transit (Fogelson 2001, 110; Weiner 1997, 12; Ryuichi Kitamura, Mokhtarian, and Laidet 1997). This self-reinforcing decline was helped along by the concerted efforts of oil and car companies, who worked together to buy and eliminate streetcar companies — a conspiracy for which they were later fined in an antitrust case (Hayden 2004, 165). Downtown business groups continued to lobby for improved transit, but their influence was now checked by the growing power of car-oriented businesses on the urban periphery, who lobbied instead for roads (Sewell 2009, 64). As regional malls and suburban offices gutted downtowns over the coming decades — particularly in the United States — it further undermined the voice of downtown business elites (Strom 2008, 46; Fogelson 2001, 108–109). The influence of car-dependent economic interests, meanwhile, grew with the scale of this growth model.

The car-dependent paradigm reached its purest form in low-density suburbs, but the paradigm also reached into walkable downtown cores in a process that was, in a sense, the mirror image of today's suburban retrofits. Over many years, officials in Canada and the United States expanded the size of inner-city roadways and shrunk the size of sidewalks, and built highways through urban neighbourhoods (Sewell 2009, 33–34, 64; Rose and Mohl 2012, 55–64). They deprived transit agencies of funding and directed money to roads (Weiner 1997, 28). And they set high parking requirements for new construction, which led many developers to buy and demolish nearby buildings to replace them with surface parking (Shoup 2005, 131–136). As people drove more, and used active modes less, it justified yet wider roads and more parking, and lower investment in sidewalks and transit, in a self-accelerating process. From 1950, official policy in effect subjected downtowns to a kind of car-dependent retrofit, and in some cases, it was nearly successful. Today, roughly half of downtown Detroit is devoted to parking (Data Driven Detroit 2018).

Cars had an advantage that contributed to this shift: their negative externalities undermine walking, biking, and transit more than the reverse. Drivers can kill pedestrians and cyclists, but rarely the reverse. The noise, smoke, and danger generated by heavy traffic discourages people from walking, whereas heavy pedestrian traffic does not discourage driving — so long as people stay off the street (Norton 2011, 222). If transit shares lanes with cars, transit becomes less convenient than driving at every level of congestion — since it does not travel directly to one's destination (Kitamura, Mokhtarian, and Laidet 1997). As heavy traffic undermines walking, biking, and transit, it encourages more people to drive, creating worse traffic, in a self-reinforcing process.

Due to this disparity, the failure to acknowledge the tension between cars and active modes tends to favour cars. One way in which engineering standards have favoured cars — intentionally or not — is encourage the investment in *all* modes (Dade County 1969, 7, 18; Fairfax County 2017a, 72–74). If one invests in wider sidewalks, higher frequency transit, and wider, faster roads in the same place, this risks making conditions worse for walking and transit, due to the danger and disamenity of fast, heavy traffic (Norton 2011, 4, 223). In this way, engineers build

environments where few people are willing to walk or take transit, even while they can correctly claim to have invested in all modes.

The intervention of the auto industry in the engineering profession in the late 1920s was, arguably, one of the most successful examples of industrial lobbying in the history of Western capitalism. They helped to train and empower civil engineers, who had an interest in building roads, to have authority over road design and spending, and these engineers would go on to establish the standards that now define how decisions are made about roads (Norton 2011, 156, 165–166; Brown, Morris, and Taylor 2009, 163; Ross 2015, 31–32). These standards made new and wider roads the inevitable response to traffic, which encouraged car-dependent sprawl, which in turn generated traffic, in a self-reinforcing process that continues today (Ross 2015, 31–32; Rose and Mohl 2012, 40, 55; Noland 2001). The growing suburbs created a constituency of car-dependent residents and businesses who further demanded wider roads (Filion 2015, 637; Moore 2021). As Pierson (2000, 253) argues, a small change at the right moment in a self-reinforcing system can have nonlinear consequences. In this case, a well-timed investment by the auto industry transformed North America into a place where the majority of people cannot leave home without access to a car (Gordon, Hindrichs, and Willms 2018; Parker et al. 2018).

Backlash against Car-Dependence

As car-oriented design gained steam, its excesses helped to motivate a backlash, in the same manner that the excesses of industrialized walkability in an earlier era helped to motivate car-dependence. It became increasingly evident through the 1960s and 1970s that building highways through cities caused economic decline, rather than curing it (Perl, Hern, and Kenworthy 2015, 99–100; Renckens 2012, 64; Teaford 2000, 446–449). Engineering methodologies were meant to solve traffic by accommodating it with wider roads, but wider roads instead encouraged widespread car-dependent development that has clogged roads with levels of congestion that would have been considered “intolerable” to earlier drivers (Bhuyan and Nayak 2013,

220). Heavy traffic has been a major inspiration for the four retrofits I study, encouraging leaders to seek alternative methods for people to travel.

The early critics of car-oriented suburbs focused on the bland aesthetics and lifestyle of these communities, a tactic which may have backfired, galvanizing car-dependent residents to defend their lifestyle (Filion 2015, 637; Urry 2008, 347). Since then, however, research has revealed more serious consequences of car-dependent growth, in terms of pollution, climate change, social isolation, physical inactivity, rates of road injuries, poverty, and the loss of economic productivity — issues that are not so easily dismissed (Hamidi et al. 2015; Burchell et al. 1998; Blais 2011; Frank, Engelke, and Schmid 2003; Saunders 2010; Mazumdar et al. 2018; Hall 2002, 322–323; Florida and Mellander 2016). And while car-dependent residents have proven protective of their neighbourhoods, they are generally less protective of the visually uninspiring commercial areas that serve them, creating an opportunity for transformation (Dunham-Jones and Williamson 2008, 61–62).

An important voice in this reaction was that of Jane Jacobs, who first came to prominence fighting inner-city road expansions and slum clearances in New York in the 1950s and 60s (Flint 2009). Inspired by these battles, she wrote *The Death and Life of Great American Cities*, which would become the most influential book in modern planning (Campanella 2011; Flint 2009, 185). In it, she advocates for a model of urban prosperity that corresponds roughly to what many in the downtown business elite had intuitively understood decades earlier: that a city's economy depends on the concentration of homes, offices, and shops; that a street serves many purposes; and that transit and walking are far more space-efficient than driving (Jacobs 1961; Norton 2011, 132–133). Jacobs had a profound impact on the planning profession. Many of the most influential books in the field in recent decades either advocate for walkable growth or are guides for how to achieve it (Speck 2013; Jacobs 1995; Gehl 2010; Calthorpe 1993; Lynch 1984; Duany, Plater-Zyberk, and Speck 2001).

This shift has created a rift between urban planners and engineers. The two professions largely worked towards the common goal of clearing "slums" to build highways and single-use districts from the 1930s through to the early 1950s (Sewell 2009, 64; Rose and Mohl 2012, 5–13; Teaford 2000). However, while urban planners

shifted their aspirations towards a more walkable model, transportation engineers have maintained a methodology that calls for adding more and wider roads as traffic rises, enforced through a complex apparatus of standards and analysis tools (Hebbert 2005, 39, 56; Manville 2017).

Intercurrence Within Planning and Engineering

That said, the current situation is not quite as simple as a contest between planners and engineers, with one profession wholly on the side of walkability and the other on the side of car-dependence. While the intellectual leadership in the planning field has largely shifted to the goal of walkability, many of the field's day-to-day practices remain car-oriented. That most growth is car-dependent means the majority of work done by planners — in both the public and private sectors — has been to implement low-density, single-use zoning and to process car-dependent development applications (Gordon, Hindrichs, and Willms 2018; Parker et al. 2018; Filion 2015, 638). In private, it is common for planners to complain of the disconnect: the aspirations they are taught in school often have little to do with the content of their work.

In part, overcoming car-dependence is beyond the authority of planners: developers continue to propose single-family neighbourhoods, politicians continue to approve them, and once built, car-dependent residents often vehemently oppose change (Filion 2015; Moos et al. 2015, 84; Whittemore and BenDor 2019). In Talen's words, "planners are left holding the bag," enforcing rules they "care little about" (Talen 2012, 5). However, it is also true that many planners prefer to implement regulations with which they are familiar, which is often car-oriented, even when presented with opportunities to recommend more walkable styles of growth, or to limit car-dependent growth (Nussbaum and Spessot 2017). Planners experience intercurrence not only in their interaction with engineers, but within their own profession.

There also exists intercurrence within the engineering profession, as the influence of walkable ideas grows in that field. One engineer I interviewed, Rick Hall, became a "firebrand" for walkable design in the 1980s, in part because he read Jane Jacobs. At that time, he says, there were only a handful of other engineers focused on walkability, but that has begun to change (Hall, personal communication, July 14, 2021). As downtowns resurged in popularity in the 1990s, cities increasingly needed engineers capable of designing vibrant, walkable downtown streets. In 1996, a group of these engineers formed the National Association of City Transportation Officials (NACTO), which in 2013, published street design guidelines for urban centres, providing a walkable alternative to AASHTO's more car-centred standards (NACTO 2013; AASHTO 2018).

There are other signs that this new walkable paradigm is beginning to loosen the grip of car-oriented thinking within the engineering profession, resulting in internal contradictions. The 2018 edition of AASHTO's road standards recognizes, for the first time, distinct "contexts," and acknowledges that in dense, downtown urban centres, pedestrians and cyclists should be granted greater priority at the potential expense of cars (AASHTO 2018, 1–17, 1–20—1–24). However, its standards nonetheless continue to recommend 70km/h arterials within urban centres, and do not acknowledge pedestrian priority for walkable suburban areas (AASHTO 2018, 7–36, 1–17—1–22). The Transportation Association of Canada's national standards now provide two chapters on pedestrian and cyclist-priority design (TAC 2017: Chapters 5 and 6). However, the other eight chapters treat wide, fast, car-oriented roads as the default, and the document does not clarify which standards should prevail in which places (TAC 2017). The ongoing focus on highways in these organizations is reflected in the photos of collectors, mega-highways, and interchanges that adorn their standards (VDOT 2021; AASHTO 2018; TAC 2017).

The continued existence of successful walkable communities — in North America and elsewhere — challenges the premises on which modern car-oriented road standards are based. The example of successful European cities — which do not widen inner-city roads in response to traffic — draws into question the assumption that widening roads to preserve traffic flow is essential for economic efficiency (AASHTO 2018, 2–32, 2–36, 5–3; TAC 2017, 9–37). In many European cities,

residents can reach destinations in less time on average than American cities, often including by car (Wu et al. 2021, 3–6). When I asked officials, in my interviews, why they were first inspired to implement suburban retrofits, in many cases they cited their first-hand exposure to successful walkable places, either overseas, or historic town centres at home (Sixta, personal interview, March 24, 2021; Rawlinson, personal interview, Jul7 15, 2021; Hall, personal interview, July 14, 2021). Walkable contexts have therefore continued to reinforce themselves by way of example, influencing official and professional thinking, in a manner that has been diminished by the dominance of car-dependence for many decades, but which never disappeared. Slowly, it has begun to gain momentum as the number of successful walkable centres grows.

A Hundred Years of Intercurrence

Inverse feedback played an important role in explaining the paradigm shift from the compact, walkable cities of the 1920s to the auto-dominated cities of today. Overcrowded, poorly-regulated urban centres created a backlash in a kind of self-undermining feedback. Walkable interests also undermined walkability themselves due to ambiguities and misunderstandings in their own interests. Downtown groups lobbied for parking requirements and inner-city highways, in the misguided hope this would save the downtown (Rose and Mohl 2012, 56–57; Shoup 2005, 131–136). Urban planners hoped to improve downtowns by making them lower density, and by separating uses (Fogelson 2001, 108; Hayden 2004, 6; Solomon 2007, 24–25). Walkability contributed to walkability's own decline, in part with the support of those who hoped to protect downtowns.

However, while inverse feedback played a key role in weakening the dominance of walkability, car-dependent growth owes its scale to those who had an unequivocal interest in car-dependent growth. The companies and professionals who benefit from road building created policies and standards that ensured continued road building. These policies enabled the construction of car-dependent homes at enormous scale, which established a class of developers, residents, and politicians

with an interest in prioritizing cars. As the pace of growth accelerated, car-dependent sprawl expanded outwards, absorbing whole cities into vast conurbations of pavement and single-uses, in many cases visible from space (Florida 2010, 48–51). The process can be compared to the collapse of a glacial lake, where a small stream of water knocks aside small chunks of ice, releasing a larger stream, which carries away more ice, in a self-reinforcing process, until the entire lake comes through in an enormous wave.

Yet despite all this momentum, the car-dependent paradigm never eliminated its walkable alternative. Where the street pattern, historic buildings, and transit systems remained from an earlier epoch, there existed the materials by which cities could build a walkable resurgence. While Detroit lost half its downtown land area to parking, it did retain towers and an efficient street grid, upon which its downtown is now slowly rebounding (Applebome 2016). The remaining walkable towns and urban centres challenge the assumptions that underlie car-dependent standards, and help inspire another generation of professionals to achieve a different kind of growth. One advantage favouring walkability today, moreover, is that cities have largely solved many of the problems associated with earlier, industrialized walkable growth: few North American downtowns are now choked with factory smoke (thanks to zoning), lack toilets or running water (thanks to the building code), or suffer highly overcrowded conditions (thanks long-term trends in living standards, economic growth, and the mass production of housing).

And just as the flaws in an earlier period of walkable growth helped inspire the initial wave of car-dependence, the flaws of car-dependence have inspired its opposition. As the traffic, stress, and health consequences of widespread car-oriented design have become more evident, the market demand for single-family suburbs has softened, while the price of walkable neighbourhoods has risen (Boyar 2016; Leinberger and Rodriguez 2016). In fact, there are now so few dense, mixed-use urban areas that demand for them far exceeds supply, leading to a crisis of unaffordable housing in many walkable areas (Florida 2017, 67).

The proponents of walkability have made their greatest progress in historic walkable neighbourhoods that retained the historic bones of pedestrian-oriented

design. The growth in downtown sales values have outpaced suburban units for over a decade (Boyar 2016). Some of the most successful walkable retrofits are located next to downtowns, where they can leverage existing street life to attract new pedestrian-oriented of investment (Curtis, Howe, and Glass 2009; Salat and Ollivier 2017b; Vall-Casas et al. 2016; Sweeney and Hanlon 2017). The challenge is far greater deep inside the car-dependent hinterland, where governments hope to transform parking lots into downtowns, and high-speed roadways into streets — the subject of this thesis. If highways and parking requirements never quite transformed downtowns into suburban office parks, we can expect it will be difficult to transform suburban parking lots into lively urban centres.

American Political Development and a Century of Urban Intercurrence

I have, in this chapter, described a century of intercurrence, in which two contradictory growth paradigms existed side-by-side, shaping cities, institutions, and politics, each gaining momentum in different periods, but without ever securing absolute dominance. It would be difficult to understand this history without acknowledging that multiple paradigms of thought can simultaneously shape institutions, as Orren and Skowronek (1996) argued when they first put forward the concept of intercurrence.

Engineers who today argue wider roads within cities are “necessary” and “needed” draw on a model of traffic management that was first developed in the 1920s and later refined into complex formal methodologies, particularly between 1940 and 1970 (Fairfax County 2017a, 40, 59, 72–74; Rose and Mohl 2012, 40; Norton 2011, 166, 176; Bhuyan and Nayak 2013). As planners shifted their focus to advocating for walkability in the 1960s and 70s, they at first drew on Jane Jacobs and earlier thinkers, but have since incrementally expanded their “tool-box” of arguments (Beard 1934, 47). One can see this tool-box grow using Google Ngram Viewer, which tracks how often words appear in published books (Michel et al. 2011). It reveals that new words have entered the planning lexicon since the 1980s, including walkability,

smart growth, transit-oriented development, and new urbanism[7] (Figure 7). As today's thinkers craft arguments for walkability in terms of health, the environment, and wealth creation, they continue to expand this tool-box (Frumkin, Frank, and Jackson 2010; Marohn 2019; Cohen and Dong 2021).

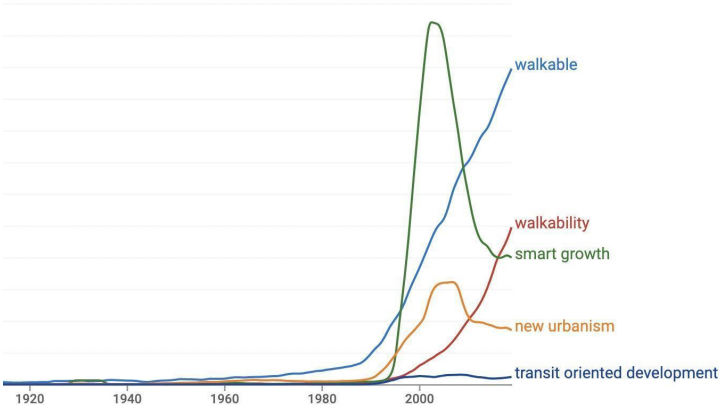

Figure 7. The occurrence of various urban planning terms in the Google Books catalogue, according to Google Ngram viewer. Source: Google NGram viewer (Michel et al. 2011).

There is a complex interaction between the intercurrence of physical urban systems and that of ideas, which we can summarize as follows. Walkability and car-dependence both create groups of people who have an interest in defending either model, while also inspiring some people to oppose them. In each case, people draw on available ideas, beliefs, arguments, and methodologies to condemn or defend each model. The physical consequences of these models inspire people to defend or repudiate one or the other, but the specific arguments they use — and the effectiveness of those arguments — is decided by political influence, institutional norms, and ideas. One cannot understand why early planners hoped to spread cities into low-density communities without understanding the history of ideas, and one cannot understand why this policy failed to eliminate traffic without understanding the physical constraints of these growth models.

[7] Smart growth is a method of regional planning that aims to direct growth away from greenfield sites while encouraging it near transit. Transit-oriented development is a related model where cities aim to encourage dense, walkable development around transit stations. New Urbanism is an approach to planning that emphasizes traditional forms of neighbourhood design, with pedestrian-friendly streets and main streets.

Conclusion

At the turn of the 20th century, dense, walkable development had the backing of powerful downtown economic elites and the professionals who worked for them. However, the economic sectors that depended on wider roads and single-family homes better organized around their collective interests, and outmanoeuvred downtowns in defining standards and the priorities for government funding. Their initial success then compounded over decades, creating an ever-larger set of builders, designers, and voters who would demand wider roads and restrictive zoning. Those who advocate for walkable growth today therefore face a daunting obstacle: the accumulated momentum of generations of professional practice, a hundred-billion-dollar road construction industry, and vast urban landscapes where people have no option but to drive (IBIS World 2021; Gordon, Hindrichs, and Willms 2018).

And yet, while car-dependence reinforces itself, it also creates consequences that can cause a backlash, and that can encourage alternative, walkable models of growth. This self-undermining feedback can become stronger as its consequences become more vivid, leading to a growing desire to build communities where residents can avoid the daily commute through ever-worsening traffic. As walkable downtowns and suburban centres grow, they too shape institutions, and they too create a constituency of builders and commuters who have a stake in expanded mixed-use growth and pedestrian-friendly infrastructure. The opportunity exists to give walkability the same self-reinforcing influence, if walkable interests can successfully reform professional education and standards, and if they can grow the set of voters and economic interests who depend on, and demand, walkable growth. To fully understand the push and tug of these two design paradigms — and how to navigate the transition from one to the other — one must understand the processes by which they accelerate themselves, undermine each other, and inspire their own backlash. We now turn to four specific examples of such efforts to establish self-reinforcing walkability within car-dependent suburbs.

Chapter 5. Downtown Kendall: Walkability in a Cradle of Highways

One morning in the mid-1990s, Paul Vrooman was reading a newspaper and he saw two words in a title he had never seen together before: “Downtown Kendall” (Vrooman, personal interview, July 6, 2021). Kendall was a suburb of Miami that followed the standard American suburban model: large swaths of single-family homes with pockets of malls, shopping centres, and the occasional tower, but never anything resembling a downtown. The words “Downtown Kendall” were written in jest, referring to a few new developments in the area, but they surprised Vrooman. It got him thinking: “If there were Fourth of July fireworks, where would it happen? Where would any kind of celebration happen?” (Vrooman, personal interview, July 6, 2021). As an employee at the local Chamber of Commerce, he wondered if he could do something to make it a reality.

By coincidence, the office of a then-rare expert on walkability, Victor Dover, was only a few blocks away. Dover warned that the project would not be easy. Opposition to development in the area was well-organised and vitriolic. The Miami-Dade region had sprawled 15 kms South and West of Kendall since it was first built in the 1960s, and thousands of residents drove through Kendall to reach Downtown Miami daily, choking the suburb’s arterials with traffic. Residents opposed any new development that would add yet more cars to their overcrowded streets (Fernandez 2003; Fordyce 2003b, [c] 2003). Dover told Vrooman that the plan would have no hope of success unless he could build a broad coalition of supportive residents, local landowners, developers, and business people (Dover, personal interview, June 1, 2021).

To Dover’s surprise, Vrooman came back six months later with the support of all these groups. And so Vrooman and Dover set about doing something that had never been attempted in Miami: to transform a suburb into a downtown (Dover, personal interview, June 1, 2021). The project would encounter resistance from the three kinds of car-dependent feedback. Economically, the plan would depend on

landowners demolishing their existing car-oriented buildings, which some would resist, because their buildings were profitable and the status quo was less risky than an unproven walkable model. Institutionally, the change would violate established street-design standards and methods for analysing growth. And politically, it would face fierce opposition from many residents and landowners who preferred the status quo.

However, the project did in many ways succeed, so much so that it inspired other, similar retrofits throughout Miami (Miami-Dade County 2019, ix). The project was possible, in part, because of inverse feedback: many car-dependent residents hoped denser, walkable development would reduce traffic, and car-oriented landowners saw the economic value in higher-density growth. Walkable development there has since begun to build on its own success in a self-reinforcing process — though so far incompletely. Elements of car-dependence continue to reinforce themselves alongside elements of walkability, in development, in institutions, and politically. It is not yet clear whether walkability will continue to reinforce itself in Downtown Kendall to become a fully-walkable downtown, or whether the community will stall in the current stalemate between walkability and car-oriented design.

Context

Downtown Kendall is a 47 acre unincorporated area within the 1.6-million-acre Miami-Dade County. Because it is unincorporated, the county provides services of local government, including planning and code enforcement. The county has a strong mayor system, in which the Mayor appoints directors to all departments, and can veto the decisions of the legislative body, the Board of County Commissioners. The Board has 13 commissioners, each elected by district, and Downtown Kendall currently falls into District 7, and borders two others. In 1996, the County delegated many zoning and land use decisions to local Community Councils, which are elected volunteer boards representing smaller sub-areas of the county. Downtown Kendall falls into the Kendall Community Council, which has six local board members and two County Commissioners (“Community Councils - Miami-Dade County” 2021).

The Downtown Kendall area has a population of roughly 7,400, as of 2020 (U.S. Census Bureau 2020).[8] Its median income is $52,000, roughly equivalent to the region's: $54,000 (U.S. Census Bureau 2020). 17% of residents are visible minorities (U.S. Census Bureau 2019). In 2019, 81% of residents drove to work, whereas 9% took transit, and 5% walked (U.S. Census Bureau 2019). (Numbers for active transportation dropped in the most-recent 2020 census due to the pandemic, at which time most people either drove or worked from home) (U.S. Census Bureau 2020). Roughly 70% of residents are renters whereas 30% are homeowners (U.S. Census Bureau 2019). 42% of residents live below the poverty line (U.S. Census Bureau 2019).

Interviews

I interviewed eight people for this chapter, including two planners with Miami-Dade County, one local politician, one civil society representative, one local real estate agent, and two planning consultants and one engineering consultant who worked on the plan. 73% of people who I reached out to agreed to speak. The Florida Department of Transportation also provided emailed responses to questions. I was unable to secure an interview with engineers at the Miami-Dade Department of public works, either because I did not hear back from people I contacted, or because I was unable to find current contact information for engineers who worked on the plan, many of whom are now retired. The Dadeland Mall — which was a major stakeholder for the plan, and later an opponent — declined an interview.

The Origins of a Car-Dependent Edge City

Downtown Kendall[9] was a product of its roads. By 1963, the location was the intersection of three highways: US1, Palmetto Expressway, and Kendall Drive. It was rich habitat for car-oriented businesses. In 1962, developers announced an enormous project at this intersection, including a mall with 4,000 parking spaces; apartment towers in parking lots, north of Snapper Creek; and car dealerships and restaurants, to

[8] I draw these statistics from the following block groups: 78.08, block group 1, 78.08, block group 2, and 77.04 block group 2.

[9] For simplicity, I refer to it as Downtown Kendall throughout, including before it was given this title.

the South of Kendall Drive (Figure 8) (Sherman 1960). In 1980, the county added a fourth highway, the Snapper Creek Expressway, bounding Downtown Kendall in highways on all sides (Miami Herald 1980, 1965). With so many highways feeding cars into this one location, the Dadeland Mall became one of the most profitable malls in the country, with average sales by the 1990s, per square foot, three times the national average (Walker 2001b).

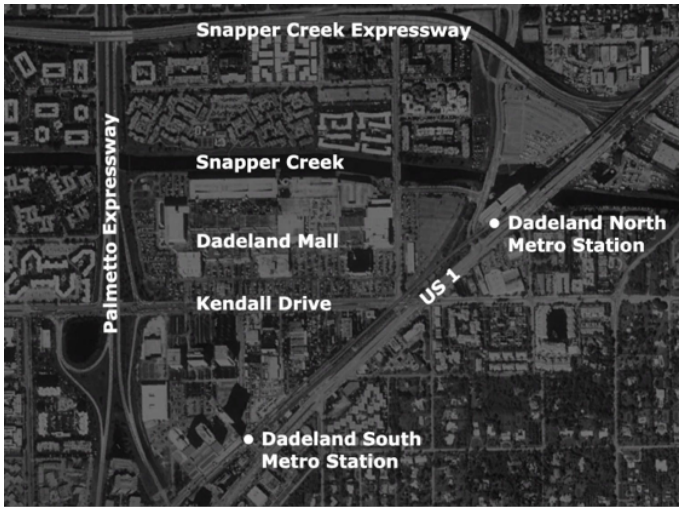

Figure 8. Satellite image of Downtown Kendall in 1994, with the names of pieces of transportation infrastructure noted. (Source: U.S. Geological Survey 1994).

The construction of Kendall Drive illustrates the quantities of money directed towards road building at this time: it was not built to meet any immediate need, but because the state had to spend its $2 million federal highway budget by June of that year (Miami Herald 1965). Newspapers dubbed it “the road to nowhere”: a highway through swamps and tomato farms carrying almost no traffic (Figure 9) (Miami Herald 1965; K. Ross 2001). Before long, however, developers did build low-density homes along the highway’s length (Douglas 2000; Faiola 1990). All this development soon saturated the highway with traffic, making it seem, according to one local journalist, both “prescient” and “notoriously short-sighted,” because the county did not otherwise prepare for growth there, and the area lacked adequate transit, commercial centres, or other basic services (Douglas 2000).

Figure 9. The Miami Herald lampoons Kendal Drive as "the road to nowhere," comparing it to other roads the paper felt were better candidates for investment (Source: Miami Herald 1965).

The intersection of these highways would become the default location for the area's commercial and office development, not because anyone had planned it to serve this role, but because every time developers proposed shops or services elsewhere, single-family residents would revolt (Faiola 1990). "It is a blow at real estate values," wrote one, when the County approved a rezoning proposal for businesses in one neighbourhood (Miami Herald 1962). "Something drastic must be done," wrote another, who called for a grand jury investigation (Miami Herald 1962). Downtown Kendall was, in contrast, a commercial area from the start. By the 1980s, Downtown Kendall had grown into what Garreau (1992) calls an "edge city": an urban area with all the land uses of a downtown — including offices, restaurants, and retail — but none of the public spaces, street life, or amenities, instead devoting most outdoor space to large parking lots and roads.

A Train in Auto-Suburbia

In 1984, the county made one last major transportation investment that was strangely out-of-place at the intersection of four highways: it built two stations for a new mass transit train line connecting directly to downtown Miami (Veciana-Suarez 1984). In this context — surrounded by parking lots, wide roads, and few homes — the stations unsurprisingly attracted few riders (Miami Herald 1986). President

Reagan quipped that the train cost so much per rider, “It would have been cheaper to buy everyone a limousine” (Miami Herald 1986).

An earlier era of American transit builders understood that transit needed density and pedestrian-oriented streets to succeed (Sewell 2009, 13–14). By 1969, however, when Miami-Dade County wrote its Transportation Master Plan, this knowledge appears to have been lost. The plan not only proposed transit next to highways, but proposed a new highway — the Snapper Creek Expressway — that would intersect with a new transit station. The plan also did not propose density, or any changes in land use, around its stations (Dade County 1969, 4–5, 7, 18). It instead treated transit and highways as roughly interchangeable tools for meeting travel demand.

As I argue in Chapter 4, the failure to acknowledge the tensions between modes tends to reinforces car-dependence, because highways discourage walking and transit more than pedestrians and riders discourage driving. The new transit stations therefore attracted little growth, with the exception of a single mixed-use office tower complex built in 1987 (Reiser 2016). The stations did, however, provide a toehold for walkability, on which the Downtown Kendall plan could later build.

Support and opposition to change

By the 1980s, the area was “choking on traffic,” and each new proposal for development faced heavy opposition becase residents feared growth would make it worse (Dover, personal interview, June 1, 2021, Vrooman, personal interview, July 6, 202). Dover says residents were right, at that time, to fear the impacts of growth on traffic. Each new project acted like its own isolated “asteroid,” separated by the empty space, “built around the idea of driving everywhere for everything.” In this context, “every new development seems like the straw that breaks the camel's back” (Dover, personal interview, June 1, 2021).

Vrooman saw an opportunity in this frustration. If he could position dense, transit-oriented development as the solution to traffic — offering new residents walking and transit as viable alternatives to driving — he could use the fear of traffic to motivate car-dependent residents to support walkable growth (Vrooman, personal interview, July 6, 2021). A local reporter would later explain: “It's hard to argue with the idea of eliminating some of the traffic and congestion that has become synonymous with the sprawling suburban chaos” (Walker 2001a). By reframing the problem, Vrooman could shift a political barrier to walkability into a justification for it, and convince at least some car-dependent residents to actively support dense development, in a kind of inverse feedback. However, many car-dependent residents would continue to believe that density causes traffic, creating a paradoxical situation in which traffic would motivate both the opponents and proponents of walkable change, as we will see (Whoriskey 1998, 25A; Figueras 2001; Rabin 1999b; Fordyce 2003a).

By the 1990s, three other consequences of car-dependence further created opportunities for walkable change — in further examples of self-undermining, inverse feedback. First, Downtown Kendall’s car-oriented visual environment was bleak, inspiring few people to defend the status quo. A local reporter described the area as “a clogged, charmless swath of congestion and inconvenience,” and writes that other communities in the county regularly say: “We don't want to be the next Kendall” (Douglas 2000). The area offered no place to gather, to celebrate, to hold a parade (Whoriskey 1998).

Second, as the area’s buildings aged and traffic rose, its office market suffered, because the uninspiring environment offered few reasons to want to work there (Faiola 1990). By 1990, the area’s offices had only 60-70% occupancy (Faiola 1990). The Burger King headquarters — once a major economic driver in the area — closed in 1987 and soon became vacant, and soon housed homeless squatters (Chasko 1995). The Dadeland Mall continued to prosper, but otherwise, the area struggled as a place to work.

Third, low-density, car-dependent growth had consumed much of the available land in the Miami-Dade region, and the city needed new ways to grow. The county

was bounded to the East by the ocean, to the West by the Florida Everglades, and to the South by the region's last remaining farmland (EPA 2012). Miami-Dade established a growth boundary in 1983 in an effort to curb the impact of car-dependent sprawl on farmland and the environment (Figure 10) (EPA 2012, 1). The region therefore needed to find places to densify, and Downtown Kendall's location next to transit made it an attractive option.

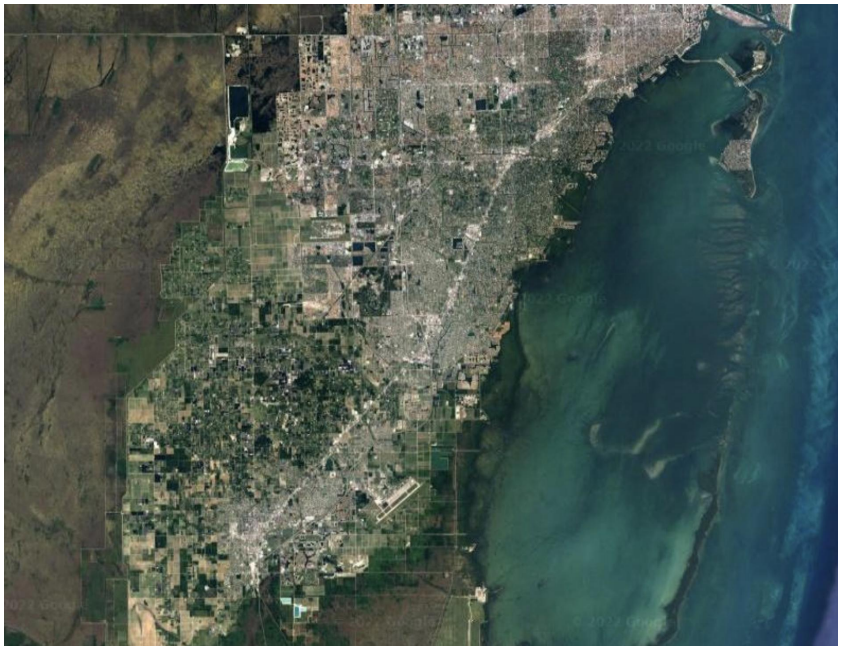

Figure 10. The impact of Miami-Dade's growth boundary is visible in this satellite image, where urban form ends and farmland and everglades begin (Source: TerraMetrics 2022).

Residential Support and Opposition

Political Intercurrence

When Vooman first proposed the idea of high-density growth at Downtown Kendall, some residents baulked. The transit stations bordered the neighbouring community of Pinecrest, and Vrooman asked their leaders if they would support density on US1 (Figure 11) (Vrooman, personal interview, July 6, 2021). Pinecrest responded to the idea by abruptly incorporating as a separate municipality in 1996, shielding itself from the authority of the Miami-Dade County planning department (Pinecrest 2006, 10). A former Pinecrest Mayor, Cindy Lerner, explained that "there was very real concern that transit-oriented development as high as 12 storeys or

more" would be allowed in her community (Lerner, personal interview, July 15, 2021). Pinecrest, she explained, "was an older neighbourhood. It was. Much of it was acre properties and estate homes, and there was absolutely no interest whatsoever in multifamily development or anything that came anywhere near 12 stories" (Lerner, personal interview, July 15, 2021).

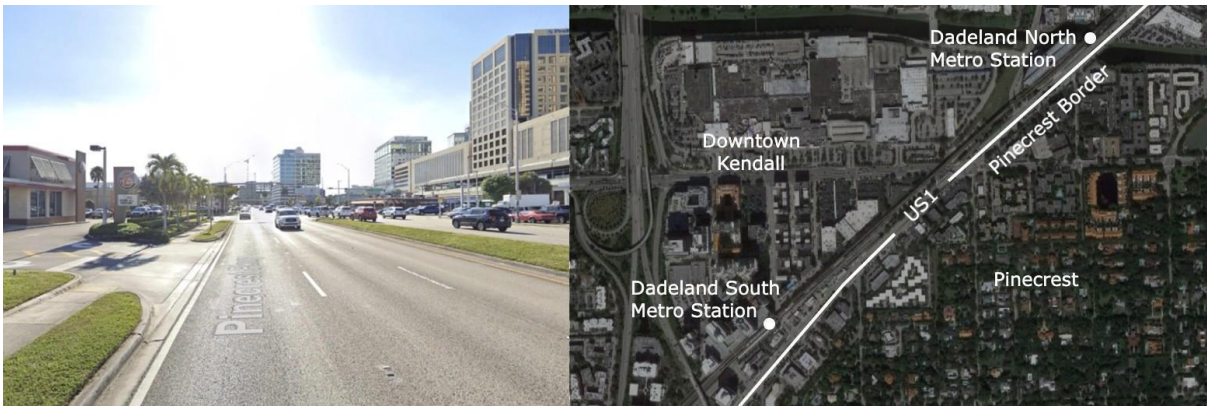

Figure 11. Left. US1 today. Pinecrest, on the left, retains the same urban form it had in 1996 when the Downtown Kendall plan was first proposed and Pinecrest incorporated as a separate municipality (Source: Google Maps Streetview Imagery, December 2021. Accessed January 2022). **Right.** Downtown Kendall and Pinecrest are separated by US1 (Source: satellite image from Maxar Technologies (2022a), with labels added).

Lerner explained that her community preferred "the country feel," which wasn't, "rural, but it just doesn't have the many characteristics that come with an urban environment" (personal interview, July 15, 2021). Residents opposed not only tall buildings, but anything too strongly associated with urbanity. During her tenure (2008 to 2016), Lerner proposed to build sidewalks in the community, and residents voiced concerns that sidewalks would "attract criminals, people from outside the neighbourhood," and that they would bring traffic, by analogy with urban centres (Lerner, personal interview, July 15, 2021). "There are people who will say they will lay down in front of a bulldozer before they will let anybody put a sidewalk in front of their yard" (Lerner, personal interview, July 15, 2021). Pinecrest residents would become some of the most vocal opponents of the new plan, resisting density not only in their community, but within Downtown Kendall (Rabin 1999b; Ross 2003).

However, the tendency of car-dependent residents to oppose density is only a tendency. In other neighbourhoods, Vrooman found many residents agreed with the idea that if growth had to happen, it was better for it to be quarantined to a well-

defined area — particularly next to transit (Vrooman, personal interview, July 6, 2021). Elizabeth Plater-Zyberk, a planner who worked on the project, reflects that:

> It was very rational of single-family residents. They usually just say, 'Let's dig our heels in. Give them an inch, they'll take a foot.' In this case, they came out and were strategic about it and said, 'We'll draw a line in the sand. But we understand, that's only going to work if there is an escape valve for growth somewhere' (Plater-Zyberk, personal interview, April 30, 2021).

This strategy — to allow density within finite areas on the condition of protecting single-family neighbourhoods — is sometimes called the "grand bargain", and has been used in an increasing number of cities (O'Neill, Gualco-Nelson, and Biber 2019, 68).

Some car-dependent residents would not only accept the plan, but would become avid supporters. Vrooman created a steering committee of residents, developers, and other local leaders to manage the project. Those residents who sat on the committee would come to feel ownership over the plan, and would go on to vocally defend it in later controversies (Gregory 2000a; Finerock 2000a, [b] 2000). The grand bargain reduced the fear that densification would spread to their own neighbourhoods, and the promise of a vibrant town centre offered a reason to support it. This messaging strategy therefore switched many car-dependent residents from opposing change and reinforcing car-dependence, to enabling change, in a kind of inverse feedback.

Institutional Opportunities for Change

Institutional Intercurrence

The 1998 movie The Truman Show depicts an idealised (though simulated) community where neighbours warmly greet each other on a friendly local main street. The movie was filmed in a real community, Seaside, Florida (Figure 12), built in the early 1980s, and the town's simulated neighbourliness exists in real life: a study suggests that Seaside has stronger social ties than most modern American suburbs (Plas and Lewis 1996). The construction of Seaside had a major impact on the urban planning profession, showing it was still possible to build beautiful, walkable

communities, and inspired a movement called New Urbanism, which seeks to re-establish traditional, walkable approaches to design as standard practice (Qi 2021). Miami-Dade County lists the town as an explicit inspiration for its own efforts to implement walkable design (Miami-Dade County 1999a, 3).

Figure 12. Seaside Florida, which was featured in the 1998 film *The Truman Show.* (Source: Image by JR P, Flickr, Creative Commons Licence).

Seaside also established the reputations of its designers, Andrés Duany and Elizabeth Plater-Zyberk, who would go on to work on walkable communities across North America, including Downtown Kendall. The pair also trained Victor Dover (Dover, personal interview, June 1, 2021). That all three lived in Miami-Dade meant that the county was unusually well-positioned to experiment with a walkable retrofit. At a time when the necessary expertise was rare, it had two of the leading firms in the topic in North America. An engineer who worked on Seaside, Rick Hall, would also write Downtown Kendall's street design codes, and would go on to become a leading advocate for walkability (Hall, personal interview, July 14, 2021). Seaside established a foothold for walkable design in Florida, inspiring more, similar projects, which in turn helped experts in walkable design gain more expertise and reputation, which facilitated further investments in walkable design, in a self-reinforcing process.

The Charrette

On one Friday evening in June, 1998, more than 150 local property owners, neighbours, business people, developers, elected officials, and county planning staff gathered in a Marriott conference room to hash out a vision for the new Downtown Kendall plan (The Miami Herald 1998). The process lasted a week, with multiple sessions through the weekend and after work (Rabin 1998b; Miami-Dade County 1998a). One reporter summed up the meeting: "[participants] took a set of ideas [. . .], tossed them in a mix, added some reality, and came up with a list of things that can be done" (Rabin 1998b).

The meeting was called a "charrette," which is a tool some planners use to overcome the status quo bias. One reason it is difficult to dislodge car-dependence — or any dominant design paradigm — is that even if stakeholders can agree on a transformation in principle, it is much harder to agree on the thousands of specific details within a plan, such as building heights, the location of streets, the width of streets, and so on (Condon 2012, 12–13). To overcome this challenge, the planning team gathered all stakeholders together for long, intensive sessions, arming them with maps and markers, and working until they can hammer out a set of ideas they can agree on.

Dover says that a key part of the process was to break people out of their assumptions. At the back of the conference room, there hung a 80-foot banner that asked: "What is the future of Downtown Kendall?" Dover says the concept remained so alien, it "broke people out of their everyday life, their experience of the way it is right now. And it allowed them to start to imagine what it could be. And it worked" (Dover, personal interview, June 1, 2021).

Stakeholders did arrive at broad agreement on most elements of the plan, including a new street grid, public spaces, and building design requirements. The design team then wrote an eight-page concept plan, written as a kind of manifesto: "Long a collection of piecemeal, auto-dominated, suburban-style developments, the area [. . .] will emerge as a cosmopolitan, urbane district and a lasting economic powerhouse" (Miami-Dade County 1998b, 1). And they illustrated the plan with European-style architecture, vividly depicted a different future (Figure 13). The

County endorsed the concept plan in September of that year, and hired the two planning firms — Dover, Kohl and Partners, and Duany, Plater-Zeberk CoDesign — to work with the county to translate the concept into legal ordinances (Miami-Dade County 1998c). The momentum for walkable design was growing.

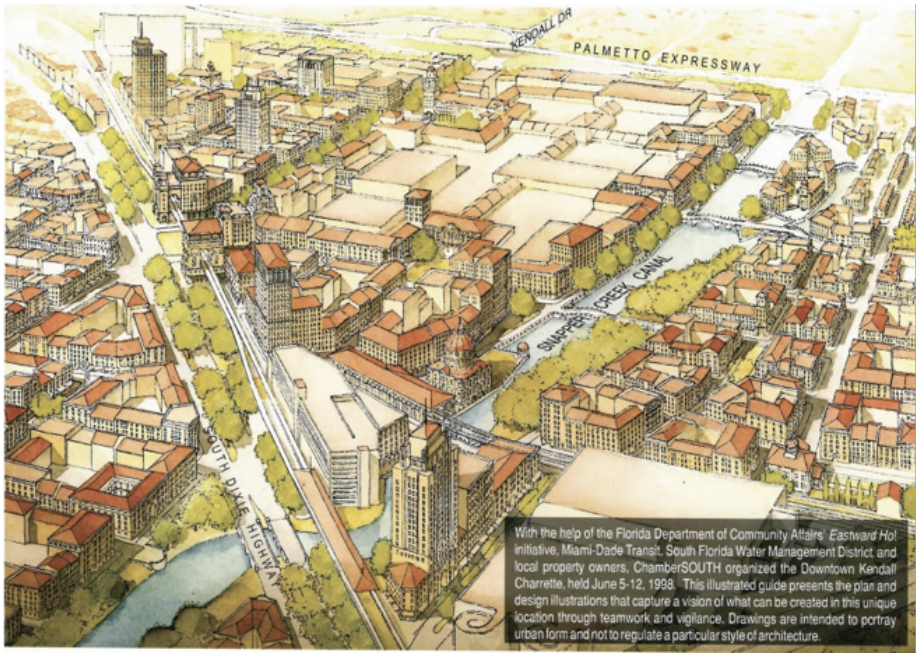

Figure 13. Concept image from the 1998 Downtown Kendall Master Plan (Miami-Dade County 1998b).

The Battle over Height

Political Intercurrence

There was one issue residents struggled to agree on in the charrette: height. Dover says he could appreciate residents' apprehension, given the poor design of buildings in the area at that time: "Who wants another one of those towers just poking out of the parking garage?" The plan was meant to address those fears, to provide "a way out of this trap" (Dover, personal interview, June 1, 2021). He hoped that by setting minimum standards for architecture, and by negotiating clear caps for heights, residents could come to support new, high-quality growth (Dover, personal interview, June 1, 2021). However, the concept plan avoided the issue of heights, noting only that it required "further study" (Miami-Dade County 1998b) (Figure 13).

As planners set out to write more detailed rules for Downtown Kendall, they found that the scenic, low-rise concept image for the plan would prove a problem (Figure 13). Planners learned they could not set height limits so low because existing rules already allowed taller buildings, and in Florida state law, landowners can take legal action if regulations eliminate property rights (Butts 2018, 4; Blanco, personal communication, May 6, 2021). County planners also worried that height restrictions would provide too little incentive for developers to rebuild. Gilberto Blanco, a Miami-Dade planner, was sympathetic with residents: "Six storey buildings are the ideal height for pedestrian-friendly communities" (Blanco, personal interview, May 6, 2021). But if the plan did not enable taller buildings, there was a risk no one would build.

Pinecrest residents were some of the strongest opponents of height, despite having separated from the county. "We [. . .] view downtown Kendall sort of like the Monroe Doctrine," said then Mayor Evelyn Greer, explaining her opposition to a proposed tall building in Downtown Kendall, in reference to a United States' policy that treats the Americas as its sphere of influence (Rabin 1999b). Paul Vrooman expressed frustration:

> They took their ball and went home, and then started trying to dictate what happened across the street. They incorporated and they seceded from that process. Well, you know, you can either participate and be a player, and share the responsibility for what happens there, and make it a better thing, or you can just, in my mind, be quiet (Vrooman, personal interview, July 6, 2021).

When Pinecrest incorporated as a city, it was no longer under the county planning department's authority, but their residents did still vote in County elections, and the community could use other tools, such as legal challenges, to make themselves heard. Pinecrest would later sue a developer for failing to consult the village sufficiently on a tower within Downtown Kendall, and succeeded, through negotiations, to have its height reduced from 390 to 315 feet (Rabin 1999b).

The threat of delays was a serious concern to the Downtown Kendall planning team, who worried the plan would lose momentum. They therefore agreed to reduce height limits on US1 — where it neighboured Pinecrest — to eight stories, despite this being the location of both transit stations (Miami-Dade County 1999b; Blanco,

personal communication, May 6, 2021). However, Pinecrest would lose much of its influence over Downtown Kendall once the plan was ratified and there was less urgency to act quickly (Blanco, personal interview, May 6, 2021). The county is now planning to increase densities around transit stations along US1 to increase ridership (Miami-Dade 2019, 84–88). A planner explains, in an interview, that some Pinecrest residents have protested, but that the County intends to proceed: "You are a municipality, this is our stuff."

Otherwise, the Downtown Kendall plan enabled towers up to 25 stories tall in areas designated "Core," 10 story towers in areas designated "Center," and 7 story buildings in areas designated "Edge" (Figure 14) (Miami-Dade County 2009, 5). (They limited heights along US1 using a street classification that set lower heights along its edge) (Miami-Dade County 2009, 17). The new ordinances were approved in 1999 (Miami-Dade County 1999b).

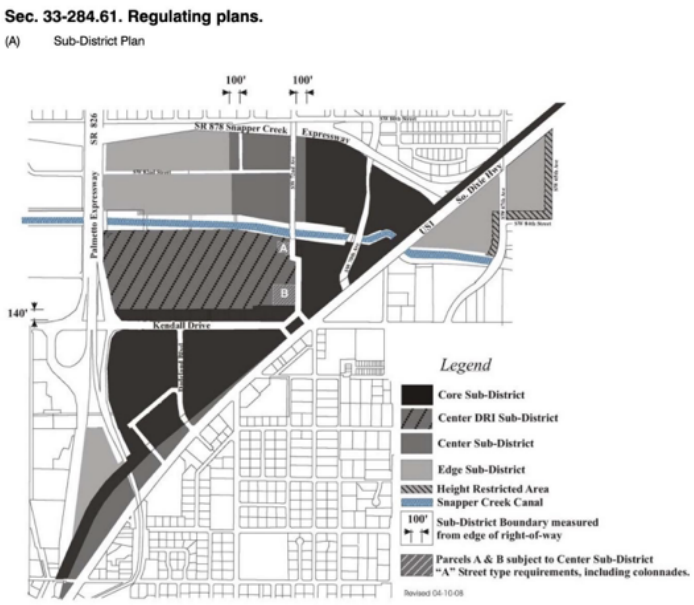

Figure 14. The land designations for Downtown Kendall as of 2009 (Source: Miami-Dade County 2009, 5).

Among the more important tools the planning team used to avoid opposition was speed. In 1998 and 1999, there is little evidence in news stories that height was a major political issue, except in Pinecrest (Rabin 1998a, [b] 1998; Whoriskey 1998; Rabin 1998c, [a] 1999). Opposition would become much louder, however, in the coming years, after the plan had already passed, as specific buildings were proposed,

and the scale of new development became clear (Fernandez 2003; Ross 2003; Williams 2003; Fordyce 2003b). Speed may be particularly effective where the supporters of walkable change are enthusiastic, while potential opponents are paying less attention.

Landowner Rebellion

Transport-Economic Intercurrence

At first, most landowners in Downtown Kendall expressed little opposition to the plan. Even the car-oriented Dadeland Mall sent representatives to steering committee meetings, and their reaction was largely positive (Finerock 2000a). Karl Woodard, the mall's general manager, told a reporter, “We are a supporter and hope to be a player in this” (Whoriskey 1998). Dover suspects the Mall was sanguine towards the plan because they doubted anything would come of it:

> They were just kind of asleep. They came to the meetings and they rolled their eyes and they acted like they really, this wasn't really going to happen, it wasn't really going to affect them. And so they just played along (Dover, personal interview, June 1, 2021).

That changed when the Miami-Dade County Commission voted unanimously to implement the new ordinance (Miami-Dade County 1999b). Suddenly, Dover recalls, the managers at the mall “woke up fast” (personal interview, June 1, 2021).

The mall’s management did not respond to a request for an interview, but there are two other factors that may have soured their support for the plan. The first was that when the mall requested extra time to finish an expansion — which had previously been approved in 1995 — it faced angry opposition from the proponents of the plan. Albert Harum-Alvarez, who sat on the Downtown Kendall steering committee, argued that the expansion was “completely out of accord with [the plan],” and would cause “a 10-year delay” and a “massive traffic impact,” citing its parking lots and lack of pedestrian-oriented investments (Gregory 2000a). He cited news reports that the mall had previously shelved the expansion plans, and argued they were only now reviving it to challenge the Downtown Kendall plan (Harum-Alvarez 2001; Matas 1996). (It is true that the mall would never implement anything like its

initial expansion proposal, though it would make other renovations) (Battaglia 1995). Council voted to approve the extension (Finerock 2000a; Gregory 2000b).

The second concern was that another, smaller nearby mall, Dadeland Station, was refused a permit to build a bathroom in their parking garage until they brought their entire building into conformity with the plan, which would have required demolishing sections of the mall to build new streets, as well as inserting new retail entrances into its external walls (Figure 15) (Miami-Dade County 1998b, 3; Walker 2001a). If such a small change could trigger requirements for such a complete redevelopment, this left both malls with little flexibility. Dover recalls that a Dadeland Mall lawyer asked a municipal planner whether changing the signs in their food court would be sufficient to trigger the plan's requirements:

> A regulator is not inclined to say, "of course, you don't have to comply"… They took a really hard line approach and said, "Yes, you must put streets through your mall. You must tear down buildings. We're not giving you a permit to do anything unless you completely conform." There was this kind of brinkmanship, like Kennedy and Khrushchev, between the regulators and the landowners. We worked so carefully to bring about a coalition. And it turned out they weren't on the same page (Dover, personal interview, June 1, 2021).

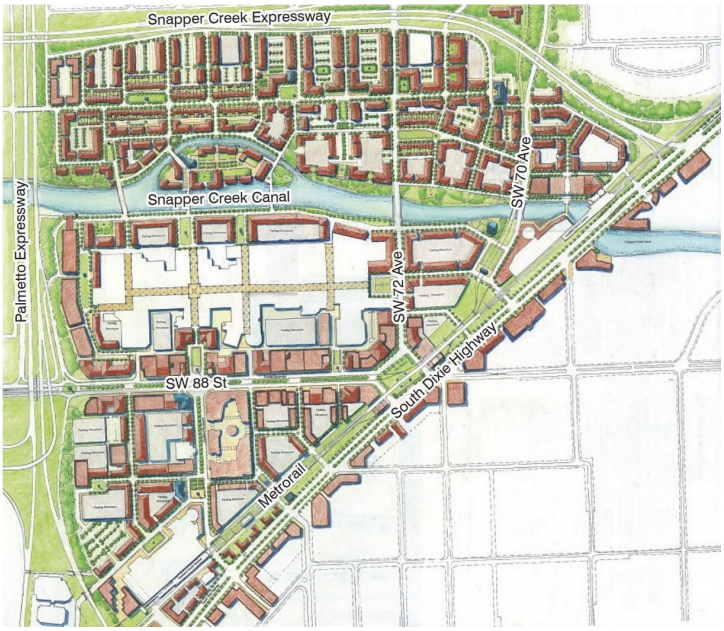

Figure 15. A concept map for the Downtown Kendall Master Plan shows streets running through the mall, centre (Source: Miami-Dade County 1998b, 3).

As Dadeland Mall's managers turned against the plan, they found other things not to like in it. The plan required that the mall build pedestrian-friendly buildings on

its existing parking lots along Kendall Drive. Dover recalls that the mall's landscape architects "just hated that idea":

> They said no, this will impede the free flowing movement of left turning cars into our mall and it will give people the impression that they have to drive through a downtown to get to our mall. [They said:] 'We like our highway… We are a drive-to experience. We are not a transit-oriented development' (Dover, personal interview, June 1, 2021).

The mall also strongly opposed the idea of narrowing Kendall Drive from six lanes to four lanes, and dedicating two of the lanes for transit (Ross 2001). The mall hired experts who argued the changes would create congestion, slowing traffic from 12 mph to 5 mph (Ross 2001). They also opposed a requirement to erect new buildings along the street on their parking lots, which "would diminish accessibility and visibility" (Ross 2001). The changes, they argued, "could have a devastating impact on mall revenues" (Ross 2001). "We remember the whole area used to be called Deadland," a mall representative argued, "And we hope it doesn't go back to being known as Deadland" (Ross 2001).

In 2000, the mall partnered with three retail companies and two nearby landowners and took the county to court to oppose the plan (Walker 2001a). They filed a claim under Florida's Property Rights Protection Act and claimed $120-200 million in damages (Miami-Dade County 2001a; Walker 2001b, [a] 2001). They created a website, purportedly run by concerned residents, called SaveDadeland.com, a tactic sometimes called "astroturfing" (DadelandSprawl 2001; Ratkiewicz et al. 2011). They also paid a resident sitting on the plan's steering committee to oppose the plan (Miami-Dade County 2001b). Vrooman discovered this when he thought the person was acting suspiciously, and looked up his name on the county's lobbyist registry, which confirmed he was working on "Dadeland Mall Zoning" (Vrooman, personal communication, July 6, 2021; Miami-Dade County 2001b). Later newspaper articles acknowledge the man's role as a lobbyist (Miami-Dade County 2001b; Figueras 2001).

The mall's opposition also revealed, however, that the plan had gained a constituency of supportive residents. A local group created a website called "Dadeland Sprawl" to defend the plan from the Dadeland Mall. Albert Harum-

Alvarez told reporters how he and others had worked with the mall "for almost two years" to create the plan, and felt the mall's sudden turnaround was "a major breach of faith": "We sat down together, we agreed to this document, and we felt like a team... I don't feel like a team anymore. I feel betrayed" (Finerock 2000b, [a] 2000).

The mall's owners and county representatives met to see if they could negotiate a solution, and the county made two major concessions. The first was to draw a new boundary around the mall and to exempt it from the plan, while still giving the mall owners the right to implement the plan at any time they choose (Figure 16). The parking lots on the south and east sides of the mall, however, were not exempt, so that if the owners ever wanted to build along the street, they would need to conform with the plan and create a street wall of mixed-use, sidewalk-oriented development (Miami-Dade County 2002, [a] 2001).

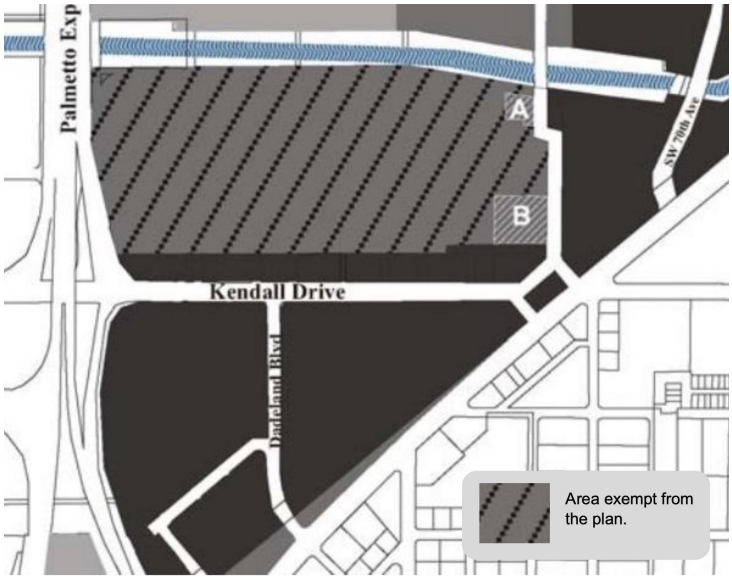

Figure 16. The diagonal lines identify the area owned by the mall that is exempt from the plan (Source: Miami-Dade County 2009, 5, with legend added).

The second concession was that Miami-Dade would wait eight years before initiating any redesign of Kendall Drive (Miami-Dade County 2002). However, the delay would last much longer, because it put the street behind the queue of all other street design projects (Dover, personal interview, June 1, 2021). The county is only now, 20 years later, conducting a study for Kendall Drive (Miami-Dade County 2017). As a result, Kendall Drive has remained — like US1 — a car-oriented barrier, rather than a walkable main street (Figure 17). Its wide, traffic-oriented nature has

reduced the incentive to build dense, pedestrian-oriented buildings along its edge. “It is literally life-threatening to cross Kendall Drive in the newly ‘walkable’ urban center,” Mary F. Williams, a nearby resident, would later complain in a letter to the local paper (Williams 2004). Another resident, Maureen Sookaloo, expressed frustration at the mall’s role in preventing the redesign of the street: “It's as if those of us who don't own cars don't exist” (Ross 2001).

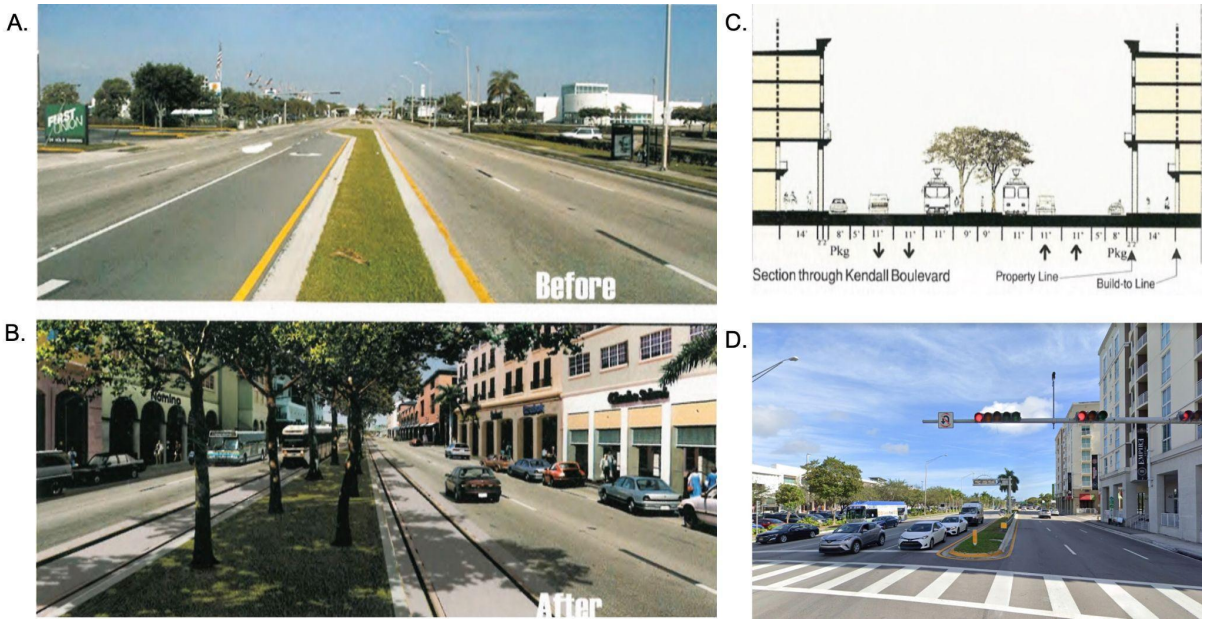

Figure 17. A. A photo of Kendall Drive from the 1998 Master Plan. **B.** A concept image for the street’s future. Original caption: “Kendall Drive is a grand boulevard with arcaded sidewalks, taller buildings built to the edge of the street, parallel on-street parking spaces, and shade trees. Transit is a part of Kendall's future.” **C.** A cross-section of the street’s proposed design. **D.** Kendall Drive today (Sources: Photos A, B, and C from Miami-Dade County (1998b, 4). Photo D from Google Streetview Imagery, December (2020).

On Black Friday, 2001, a group of residents gathered in front of the Dadeland Mall to protest the new agreement (Figueras 2001). Harum-Alvarez told reporters that leaving the mall unchanged would create “a half-mile long impediment” in the centre of the plan (Figueras 2001). “You're going to have this beautiful project on the south side of Kendall Drive with columns and trees,” he argued, “facing a parking lot to the north” (Figueras 2001). Mall spokesperson Jim McClellan was defiant: “From a planning standpoint, in a perfect world, it's a grand idea... but with all due respect to our opponents, they don't run a mall” (Figueras 2001).

Other landowners were also sceptical of the Downtown Kendall Plan. At one meeting, a representative of the Dadeland Medical Building, Ira Segal, complained that (as paraphrased in meeting minutes), “the proposed designs favored, too much, pedestrian users whereas motorists accounted for more than 90% of the traffic using the roadways,” and that “businesses will not be successful if they are dependent on pedestrian traffic” (Hall Planning & Engineering, Inc. 2003, 26). He doubted that the plan would “result in increased pedestrian activity,” because “the South Florida climate was not conducive for walking and further the local Floridians do not walk” (Hall Planning & Engineering, Inc. 2003, 26).

Another landowner rushed to apply for development permits to build a car-oriented strip mall before the new rules came into force, putting a 100 metre wide parking lot between the building and the street (Figure 18). The move was surprising to Vrooman, because the plan would have allowed that landowner to build high-density, mixed-use towers, which, if successful, would have been far more profitable (Vrooman, personal interview, July 6, 2021). He recalls that the chair of the Downtown Kendall Steering Committee — himself a developer — chided the landowner, asking: “That’s great, so what are you going to do with the other 20 stories that you're entitled to?” (Vrooman, personal interview, July 6, 2021).

Figure 18. The properties of two landowners who were sceptical of the new Downtown Kendall Plan. One, the Dadeland Medical Building, would eventually take advantage of the plan to build a 20 story building. The other rushed to have a car-oriented stripmall approved before the new plan came into force (Source: Satallite imagery from Maxar Technologies (2022a), with labels added).

However, it was not yet clear whether such towers would succeed. A reporter explained the risks: “many developers are afraid to build sidewalk shops because, with most people driving in and out of the area, there are few pedestrians to patronize such shops, at least for now” (Whoriskey 1998, 25A). Pedestrian-oriented buildings depended on streetlife materializing at some point in the future, whereas car-oriented buildings could rely on existing car traffic. Dover says that losing this parcel “was a blow” for him: “Having worked so hard on the plan to imagine a beautiful city to see a big chunk of the land just removed and broken off into its own asteroid again” (Dover, personal interview, June 1, 2021).

Once the Downtown Kendall zoning code was approved in 1999, it did soon became apparent that conditions were ripe for walkable redevelopment (Miami-Dade County 1999b; Kelly 2002). In a 14 month period, the County received applications for at least seven projects there, with 3,500 residential units and over 200,000 square feet of retail (Ross 2003; Fordyce 2003c). One condo project sold out in a single afternoon (Miami Herald 2003). There were, at that time, few urban areas in Miami-Dade that could offer a walkable lifestyle outside of Downtown Miami, and this latent unmet demand drove quick sales, even if projects could only offer the promise of future walkability, in a landscape still largely defined by parking lots. The marketing materials for the new buildings embraced the walkable lifestyle described in the plan, with one promising: “neighborhood restaurants and entertainment on foot” (Miami Herald 2006).

Just as car-dependent residents could become supporters or opponents of the plan, it was possible for landowners in the same area to become both supporters or opponents, depending on how they framed their interests. Some prioritized the protection of their current business model and emphasized the risks of change, and they fought to preserve their existing buildings and priority for cars. Others chose to switch their investment model to dense, mixed-use, pedestrian-friendly buildings because they believed it could earn them more money. In the process, their interests changed: their earnings suddenly depended much less on surface parking, and much more on creating streets where people would walk and shop. While some car-dependent interests reinforced car-dependence, others transformed themselves into walkable interests by investing in walkable development, and proceeded to reinforce

this new design model, building desirable streetscapes that would then make it easier for other nearby landowners to build their own walkable developments.

Residential Opposition Returns

Political Intercurrence

As the scale of development projects became evident, it aroused more vocal opposition from nearby residents. Many doubted high-density towers could reduce traffic: “Somehow, I can't visualize the 30,000-plus occupants of these pricey residences hopping on Metrorail or county buses,” said Marcia Finkel at a local Community Council meeting (Fernandez 2003). McHenry "Hank" Hamilton was incredulous: “You think that Miss America is not going to have a car and ride the dirty Metrorail?” (Fordyce 2003b). Residents were also concerned that transit projects for Kendall Drive and US1 were delayed, meaning there was little high-quality transit in the area except the metrorail, giving new residents insufficient alternatives to driving (Fordyce 2003b). “This is not New York or Boston,” one resident argued, “where they have good public transportation” (Fordyce 2003b). This additional transit infrastructure is only now being designed (FDOT 2021; Miami-Dade County 2021).

In 2003, County planners proposed to loosen parking requirements — allowing developers to count on-street parking towards their minimum parking requirements — sparking further opposition (Fordyce 2003c). Resident Marcia Finkel expressed doubt that new residents “are going to have one car and they're going to get on the train to go downtown. That's not a reality, and that's my concern” (Fernandez 2003). Nelson Varona similarly dismissed the proposal as, “money into the developers' pockets... Don't sit here and tell us there won't be a traffic and parking problem” (Fordyce 2003c). Planners attempted to reassure residents that if there was less parking, it would encourage Downtown Kendall residents to drive less, reducing traffic (Fernandez 2003). It is unclear how convincing they found this pitch.

Both the proponents and opponents of the plan made compelling points. It is not easy to shift mode share in a car-dependent environment: so far, more than 80% of Downtown Kendall’s residents continue to drive to work (U.S. Census Bureau 2019).

And yet, it would be difficult to reduce the impacts of urban growth on traffic unless the county provides viable alternatives to driving, and both walking and transit require density (Ewing and Cervero 2017, 2010). This means it is internally coherent for residents to position density as both the *cause* and *solution* of excessive traffic and scarce parking. These two interpretations simultaneously creatied political barriers to walkable growth and opportunities to justify it. In this case, the walkable position prevailed because the plan's generous height restrictions had already been approved in 1999 — though I was unable to confirm whether the controversial parking changes were ever implemented (Miami-Dade County 1999b).

Street Design and a Professional Cold War

Institutional Intercurrence

In the early 1980s, Rick Hall was hired to do a traffic engineering study for Seaside Florida. He had done dozens of similar studies for other developments throughout Florida and was accustomed to a car-oriented approach to road design (Hall, personal interview, July 14, 2021). Seaside did not fit that formula. The plan called for creating twelve separate intersections on a regional arterial within half-a-mile. This would be anathema to standard engineering practice, in which the purpose of an arterial is to enable unimpeded traffic flow. Hall's initial instinct was to say, "Guys, this is not the way we do things" (Hall, personal interview, July 14, 2021).

But he stopped himself. He had lived in England, France, and Germany as a teenager, and he remembered seeing small blocks with buildings lining the street, where people get around mainly by walking outside. "And when I realised that they were trying to do that brand new in Seaside from scratch, I began to get very interested" (Hall, personal interview, July 14, 2021). While he worked on the project, he was, slowly, transformed from a car-oriented technician into "a firebrand New Urbanist transportation engineer" (Hall, personal interview, July 14, 2021). He says this made him "a rare bird," because even today, there are few in the profession dedicated to this design philosophy: "Probably about three or four dozen, maybe" (Hall, personal interview, July 14, 2021).

Seventeen years later, it was Rick Hall's job to write the street design guidelines for Downtown Kendall, and he confronted the problem he had almost created for Seaside: convincing engineers to implement designs that contradict the prevailing car-oriented standards. Hall held two meetings with Public Works that year, and a report on these meetings listed 17 points of conflict (Hall Planning & Engineering, Inc. 2003, 8). Dover explains the planning team intentionally implemented land use ordinances before street design codes, because they knew this would be the hardest step (Dover, personal interview, June 1, 2021). Planning staff, he says, "were locked into a perpetual Cold War" with transportation engineers in the Public Works department (Dover, personal interview, June 1, 2021).

The disagreement between planners and engineers can be traced to the 1960s — as I discuss in Chapter 4 — when the core assumptions of the two professions sharply diverged, with planners focusing increasingly on achieving compact, mixed-use growth, and engineers focused on facilitating smooth traffic in all contexts, often with increasingly wide roads (Duany, Plater-Zyberk, and Speck 2001, 85–98). Engineers crafted sophisticated methodologies for predicting and accommodating the needs of cars, and since their expertise rested on these methodologies, they were resistant to proposals to instead design narrow, pedestrian-priority streets (Roess, Vandehey, and Kittelson 2010, 20; Bhuyan and Nayak 2013, 222; Weiner 1997, 14–15, 26; Rose and Mohl 2012, 40). Gilberto Blanco summarised the tension as follows: "Public works is there for traffic expediency. Cars have to be fast. What do these urban centres do? Exactly the opposite" (Blanco, personal interview, May 6, 2021).

A central point of disagreement between Hall and engineering staff was on how to design for safety (Hall Planning & Engineering, Inc. 2003). Modern engineering standards were first developed for highways, and they therefore focus on how to achieve safety for fast moving cars (Weiner 1997, 13–14). This requires wide lanes; gradual turns; large sight triangles; and a "clear zone" beside the roadway — an area containing no fixed objects that cars might run into (AASHTO 2018, 6–21, 9–36). These rules are sensible for highways, but in places heavily trafficked by pedestrians, research suggests that the best way to reduce injuries and fatalities is to ensure that cars drive slowly — as discussed in Chapter 2 (Kröyer 2015; Andersson and Nilsson 1997; Elvik 2001; Dumbaugh and Gattis 2005). Slowing cars, in turn, is

best achieved by ensuring it feels dangerous to drive fast, which requires a diametrically opposite set of standards: narrow lanes, sharp turns, constrained sight triangles, and objects lining the street (Elvik 2001; Jones et al. 2005; Parolek, Parolek, and Crawford 2008). Hall laments:

> Even in the cities, you've got to have 12, 15 feet of clearance on the street. They didn't realise that when they cut down these adjacent trees, and they cleared this area out, it made the [driver's] accelerator go down. And that kills pedestrians (Hall, personal interview, July 14, 2021).

In one meeting, Hall argued that existing standards "produces a suburban design" and "does not give fundamental design consideration to pedestrian traffic" (Hall Planning & Engineering, Inc. 2003, 33). A Public Works engineer defended their standards, arguing that the Florida Green Book did explicitly address pedestrian safety (Hall Planning & Engineering, Inc. 2003, 33). The 2002 Florida Greenbook (8-1) devotes a full chapter to pedestrian facilities, but its approach was based on safe high-speed driving, and proposed to protect pedestrians by clearing away visual obstructions, not by slowing cars (FDOT 2002, 8–1 to 8–7). Blanco reflects that these two conceptions of safety led to a bizarre situation, in which County engineers insisted on their standards as a "life safety issue," even while Downtown Kendall team proposed different standards specifically to achieve safety (Blanco, personal interview, May 6, 2021). Both sets of professionals could draw on long traditions of thought to support their contradictory positions, an example of intercurrence — two coexisting, but contradictory, institutional paradigms.

One point of disagreement was about whether it was appropriate to implement sharp corners to slow turning cars. Hall argued that engineers should not measure the "actual curb radius" at the corner, but rather, the "effective turning radii," measured from driving lane to driving lane, which would allow for sharper corners (Figure 19). Engineers responded that they would need to investigate this concept further, but in the end, the turning radii in Downtown Kendall correspond to the larger turns that Public Works preferred, allowing cars to turn at higher speed (Hall Planning & Engineering, Inc. 2003, 30). The proponents of walkable design have, however, since slowly eroded the dominance of the car-oriented position, and Miami-Dade's Complete Streets Guidelines now concur with Hall's approach, recommending turns

even sharper than what Hall had asked for, measured in terms of effective turning radii (Miami-Dade County 2016, 96).

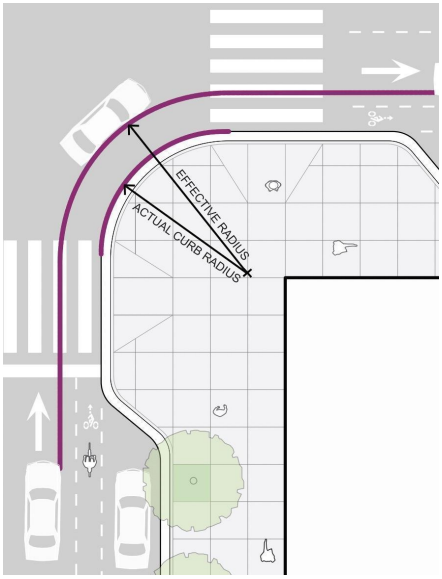

Figure 19. The 2016 Miami-Dade County Complete Streets Design Guidelines explains the difference between "actual" and "effective" turning radii, a distinction that Hall attempted (and appears to have failed) to convey to Public Works engineers in 2002 (Source: Miami-Dade County 2016, 97).

Sight triangles posed another challenge. Engineers complained that (as paraphrased in the meeting minutes) parked cars near corners "could be a safety problem and may clog-up the intersections" (Hall Planning & Engineering, Inc. 2003, 29). Sight-triangle standards would also require buildings to be setback from intersections, which would create large gaps in the street wall and undermine pedestrian comfort (Jacobs 1995, 277–281). Hall addressed the engineers' opposition at some intersections by adding traffic lights, which reduce the need for sight triangles by controlling when cars enter intersections. At other corners, he had to evoke more complex justifications, arguing that drivers would stop twice, once to ensure no pedestrian is crossing, and a second time to check for traffic (Hall Planning & Engineering, Inc. 2003, 34). Blanco says sight triangles continue to cause issues for walkable developments in Miami-Dade, often forcing them to eliminate trees near intersections or to push trees against the walls of buildings (Blanco, personal interview, May 6, 2021).

One of the greatest barriers to walkable design was the "functional classification system," by which engineers categorize streets. The classification

system was born in traditional car-dependent suburban contexts, where local streets feed into collector roads, which feed into arterials, which feed into highways (B. Ross 2015, 33–35; Marohn 2021, 16). With each step up this hierarchy, standards prioritize higher speeds, and therefore require larger gaps between intersections and driveways to ensure traffic can flow smoothly without interruption (AASHTO 2018, 1–7—1–15). Dadeland Drive is classified as a collector, and US1 and Kendall Drive are classified as arterials (Figure 20). Under then and current standards, these streets must therefore prioritise high-volume, high-speed driving, with large gaps between intersections, creating major barriers for pedestrian access (AASHTO 2018, 1–7—1–15; Sevtsuk, Kalvo, and Ekmekci 2016).

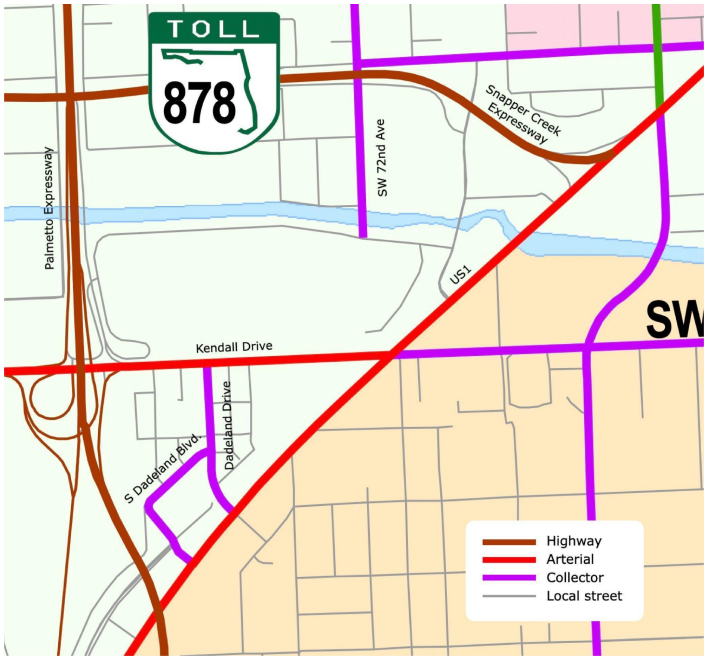

Figure 20. Functional Classification of Downtown Kendall Streets (Source FDOT 2010).

It was on these arterials and collectors that the tensions between design philosophies was most intractable. Advocates for walkable design challenge the idea that a subset of streets must allow fast driving, and argue instead that every street needs to support the goal of enabling people to reach the greatest number of destinations efficiently at slow speed, with short blocks, dense development, and narrow, pedestrian-priority streets (Levine, Grengs, and Merlin 2019, 71–85; Wu et al. 2021; Barrington-Leigh and Millard-Ball 2019). Hall reflects that engineers "are generally very reluctant" to abandon the road hierarchy, "because it would be an

admission that they have been misperforming their engineering duties for 40 years" (Hall, personal interview, July 14, 2021).

It was, moreover, difficult to convince county engineers not to prioritize traffic on these major roads because they knew the public would be angry. Dover explains:

> Residents are calling their elected officials and saying, 'when are you going to do something about traffic, it's just getting worse and worse.' And so from [the engineer's] point of view, anything you do to put friction on their Teflon smooth, well-greased roads, is causing them to get more phone calls from elected officials who are getting angry phone calls from their angry constituents. So you know the old principle: keep your boss's boss off your boss's back? Well, you know, their boss's boss is the motoring public (Dover, personal interview, June 1, 2021).

I was unable to reach an engineer who worked on the Downtown Kendall project to ask for their perspective on their motives. However, the AASHTO (2018, 2–32) Greenbook — the national engineering standards for roads — does state that traffic standards are based in part on what, "the motoring public is willing to accept."

At one meeting, a public works engineer stated categorically that, on these arterials and collectors: "any reduction in through lane capacity would be unacceptable" (Hall Planning & Engineering, Inc. 2003, 28). Originally, the planning team had hoped to reduce Kendall Drive from six lanes to four lanes (K. Ross 2001). However, Hall recognized there was little hope for the proposal, and he assured the assembled engineers that the team proposed no lane reductions (Hall Planning & Engineering, Inc. 2003, 28).

The proponents of walkability did have one advantage: the support of the area's three elected Commissioners. Vrooman recalls they "really helped to give a strong message to the higher department heads at the county that this is going to happen, work with them on it" (Vrooman, personal interview, July 6, 2021). He attributes this support to the fact that the Chamber represented local business interests, and that they had done the work to assemble a wide tent of interests, including residents (Vrooman, personal interview, July 6, 2021). Walkable political momentum therefore helped, to some degree, to overcome car-oriented path dependence.

County engineers did explore solutions to enable a redesign when they found ways to make it accord with their standards. They agreed that on-street parking eliminated the need for a clear zone, because parked cars provide a buffer that can absorb the impact of a crash (Hall Planning & Engineering, Inc. 2003, 33). They also proposed that if a redesign of Kendall Drive created a traffic bottleneck, it was possible to accommodate the overflow by widening the parallel Snapper Creek expressway to the north (Hall Planning & Engineering, Inc. 2003, 34). This solution may have made possible pedestrian-friendly changes to the street, had the Dadeland Mall not already succeeded in blocking any changes for at least eight years (Miami-Dade County 2002).

However, engineers accepted no pedestrian-friendly improvements to Dadeland Drive or South Dadeland Boulevard (Figure 21). They refused to redesignate these two roads as local streets, which restricted design options (Hall Planning & Engineering, Inc. 2003, 33). They also insisted on keeping a turning lane at the intersection of the two streets, where there is today, as a result, a dangerous slip-lane turn (Hall Planning & Engineering, Inc. 2003, 31; Jiang et al. 2020).

Figure 21. Left. Road functional classifications for Downtown Kendall (Source: FDOT 2010). **Right.** The intersection of Dadeland Drive and South Dadeland Boulevard. Engineers insisted on retaining this right-turning slip lane, which eliminates a crosswalk and makes the street less safe to cross (Source: Google Streetview, 2021).

Miami-Dade planners employed a final remarkable tactic in these negotiations: they wrote a rule in the Downtown Kendall Ordinance saying their plan overrules Public Works. Section 33-284.59 states: “Where conflicts occur with

Miami-Dade Department of Public Works Manual of Public Works, [. . .] this Article shall take precedence" (Miami-Dade County 1999b). At one meeting, a representative of the Downtown Kendall planning team explained this rule to the assembled engineers, to which the minutes note tersely: "Additional research was requested to confirm this position." I asked one planner if this rule settled matters once-and-for-all: "No, they don't care. They say, 'Oh, yeah, whatever,' and they still want the 54 foot curb radii." He told me, however, that the rule has served a purpose: "What that does is that it forces you to work together to come up with solutions."

Development Since the Plan's Implementation

Transport-Economic Intercurrence

"For those who haven't visited the Dadeland Mall area in a while," wrote a reporter in 2006, "the landscape prompts the same reaction: Jaws drop, eyes look upward — and the questions begin" (Piedra 2006). Once the new plan was approved, the pace of development quickly transformed much of the landscape (Ross 2003; Fordyce 2003). Eric Morales — a real estate agent who has bought and sold homes in the Downtown Kendall market since 1999 — told me that when he first heard about the Downtown Kendall project, "I laughed at it. This was the middle of nowhere" (Morales, personal interview, March 25, 2021). Now, he says: "Man, they're almost at 100% success. I'm competing with downtown Miami." He says it feels "like a downtown in the middle of the suburb. [. . .] I have residents in the project that haven't seen their cars in months" (Morales, personal interview, March 25, 2021). A recent Miami Herald headline read, "Here are 5 Miami neighbourhoods where rents have risen most. One will surprise you" (Rodriguez 2019). Downtown Kendall was the one to surprise you.

A key project in this transformation was Downtown Dadeland, finished in 2005. The project was on a 2.8 hectare lot, sufficient land area for seven city blocks of development. The buildings hide undeveloped parking lots on both sides, creating an enclosed main street down its centre (Figure 22). Tachieva (2010, 48) and Dunham-Jones and Williamson (2008, 5) argue that to retrofit suburbia, it is important for a single developer to assemble the entire project area, so that they can unilaterally

create a critical mass of streetlife to support walkable retail. In this case, the developer was successful in creating that critical mass with only a small fraction of the total Downtown Kendall land area, and the street is now full of businesses. The streetlife generated in this development has then likely contributed to the redevelopment of other nearby properties.

Figure 22. Downtown Dadeland. (Source: Photo by Brenda Benoît Dudley, Creative Commons Licence).

Downtown Kendall's redevelopment has largely occurred in two pockets, each near Metro stations, but other areas of the plan continue to face major hurdles. Nearly a third of Downtown Kendall's land area was excluded by the resistance of the mall (Figure 23). Large, fast roads continue to divide the centre of the community and buffer it on all sides. Other landowners have so far chosen not to take advantage of the plan yet. A county planner, Gilberto Blanco, reflects, "It's a miracle that this thing actually looks like an urban centre when it was done" (personal interview, May 6, 2021).

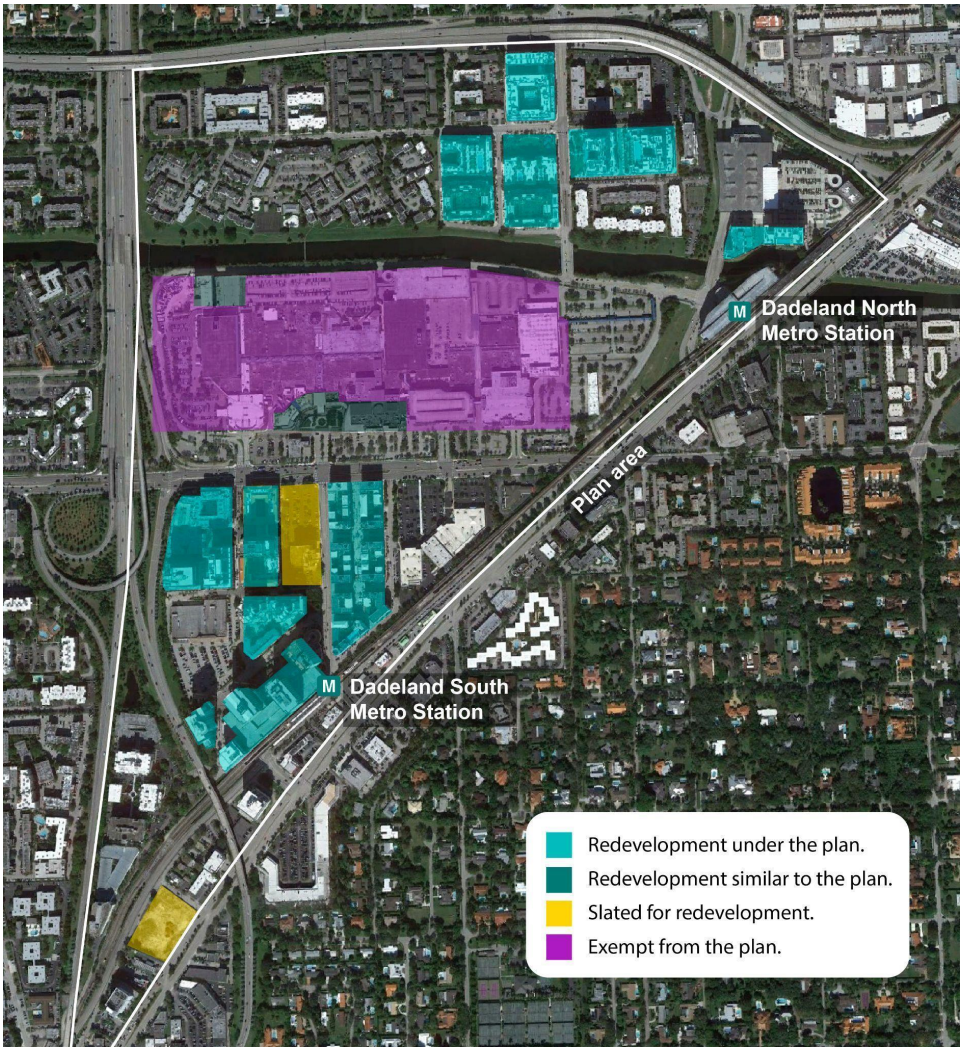

Figure 23. Properties redeveloped under the Downtown Kendall Plan (Source: Satallite imagery: Maxar Technologies (2022a), with labels, legend, and highlighted areas added).

The greatest transformation has occurred in a triangle of land between Kendall Drive, US1, and the Palmetto Expressway (Figure 24). Here, there remain only three properties that do not yet conform to the plan: the Publix Grocery Store, an office building with large parking lots, and the strip mall that was rushed through before the new plan could be approved. Morales recalls that the office building property (marked yellow in Figure 24) was slated to be redeveloped as dense, mixed-use buildings, but the project was stalled due to COVID19 (Morales, personal interview, March 25, 2021).

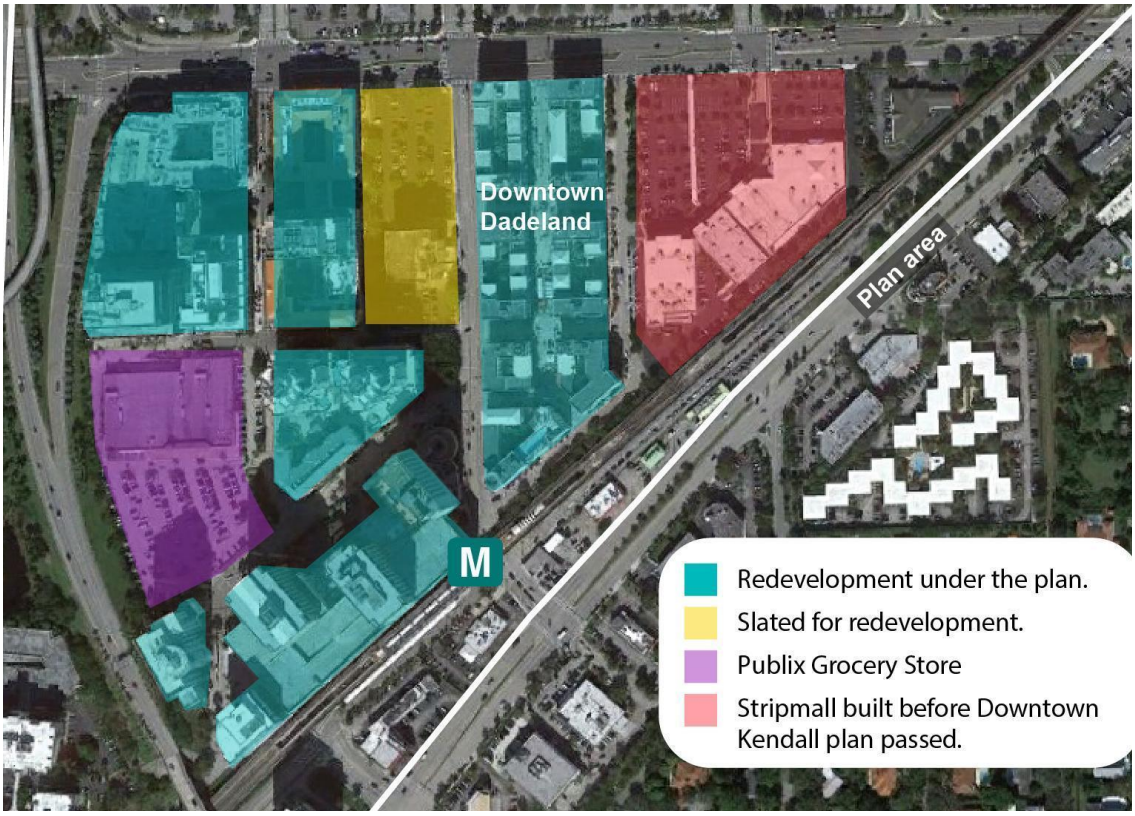

Figure 24. Close up of the Southern wedge of Downtown Kendall (Source: Satallite imagery: Maxar Technologies (2022a), with labels, legend, and highlighted areas added).

North of Snapper Creek, a number of apartment buildings were quickly demolished and rebuilt to take advantage of the plan (Figure 25). Most of the remaining sites are more difficult to redevelop, however, because many are condos. In Florida, 80% of condo owners need to agree to sell a property before a sale can proceed (Olick 2014). Condos therefore grant disproportionate power to residents who oppose change, and effectively lock-in any preexisting model of development.

Figure 25. Above. Map of the northern portion of the Downtown Kendall areas and the properties redeveloped there (Source: Satallite imagery: Maxar Technologies 2022a). **Below.** A photo of one residential street redeveloped under the plan, labelled photo 1 on the map (Source: Google Streetview 2022).

Next to the Dadeland North Metro Station, there is a new small pocket of high-density mixed-use redevelopment, sandwiched between a big box store, structured parking lots, and a wide collector road (Figure 26). It is remarkable that ground-floor retail (such as a pizzeria) can survive in such an isolated walkable structure, with only a neighbouring metrorail station to encourage foot traffic. Its narrow street, however, creates a pedestrian-friendly connection with the entrance to the neighbouring mall, which may mean that in this case, a car-oriented building type

is able to reinforce the success of a walkable development — an example of inverse feedback.

Figure 26. An isolated redeveloped property under the Downtown Kendall Plan. Photo 2 in the map in Figure 24 (Source: Google Streetview 2022).

The Dadeland Mall, meanwhile, has begun to take advantage of the Kendall Plan, despite its initial resistance. It has replaced parking on its northwest corner with two mixed-use towers, containing a hotel, movie theatre, and retail. It has also built a new public square at the southern entrance to the mall, flanked on three sides by new buildings with exterior-facing restaurants and retail (Figure 27). These are modest steps towards walkability: a parking lot still separates the mall from Kendall Drive, and the new tower only eliminates parking that few drivers could have seen from any road.

Figure 27. A map of the Dadeland Mall and surrounding areas. The mall is exempt from being redeveloped under the Downtown Kendall Plan, but it has, nonetheless, redeveloped sections in a manner roughly in conformance with the plan. The mall owners have the right to build up to 25 stories anywhere within the mall or on surrounding parking lots (Source: Satallite imagery: Maxar Technologies (2022a), with labels, legend, and highlighted areas added).

Nonetheless, it is notable that the mall chose to build these projects in a manner relatively consistent with the Downtown Kendall Plan in an area exempt from the plan's rules. The new construction has created restaurant balconies with a view of Downtown Dadeland and surrounding towers, implying that there is value in this view (Figure 28). In a pamphlet aimed at prospective commercial tenants, the mall also explicitly acknowledges the economic value of being located next to a dense, walkable community: "6,250 new residential units are currently open or under construction within walking distance" (Simon 2021, 11).

Figure 28. The view from the mall's new restaurant balcones (Source: Google Streetview 2022).

However, the mall's pamphlet also emphasises its location "at the intersection of two of Miami's most travelled roads" (Simon 2021, 11). If the mall were to build on these parking lots, it would lose its most convenient, visible parking. It remains to be seen which set of economic incentives will hold greater sway over the mall long term: the potential windfall from building a walkable downtown, or the thousands of cars who drive past the mall daily.

Even Pinecrest is now exploring zoning changes that roughly reflect the goals of the plan, which will likely include mid-rise, mixed-use, pedestrian-oriented buildings on US1 (Pinecrest Village 2022). The community was motivated to act, in part, because Miami-Dade county was threatening to impose high-density zoning through legislation near transit stations, and Pinecrest hoped to preserve its "autonomy" by proposing its own solution (Ladra 2022; Miami Herald Editorial Board 2022; Losner 2021).[10] The county proposed the legislation to address the region's traffic problems and lack of housing (Miami Herald Editorial Board 2022; Tobin 2019).

[10] In 1999, Pinecrest shielded itself against the Downtown Kendall plan in the sense that under the then existing legislation, the county's planning department would not have authority over their land. The County could have passed legislation to change this, if this had been politically viable.

Pinecrest was also, however, motivated by a study that found their retail businesses were losing customers to other commercial centres, many of which are more walkable and urban (Ladra 2022). While the economic benefits of pedestrian-oriented retail were theoretic in the 1990s, the community now has to compete with successful walkable centres. Walkable development has continued to slowly self-accelerate in Miami-Dade County. As areas like Downtown Kendall have proven successful, the justification for it has become more vivid, and a walkable approach to design has increasingly become standard practice. As a result, a community that incorporated to prevent walkable density may soon implement it.

Road Design Standards Redux

Institutional Intercurrence

The battle over Downtown Kendall's streets has an important coda. The Florida Department of Transportation is now redesigning Kendall Drive, and it is using the state's new "Context Sensitive" street standards, which were crafted, in part, by some of the same people who first attempted to redesign Kendall Drive in 2003 (FDOT Spokespeople, personal interview, August 8, 2021). Context standards classify streets in terms of the type of community they pass through, so that an arterial on the urban fringe can be designed differently than one inside the centre of a community (FDOT 2020; FDOT District Six 2017). Hall has long advocated for such standards, and in 2018, he and other advocates scored a major victory: AASHTO recognized five separate "contexts" in its national standards, called the Greenbook (AASHTO 2018, 1–15—1–22; Hall, personal communication, July 14, 2021). A protogé of Rick Hall, Dewayne Carver, is now the Florida DOT's Complete Streets Program Manager, and in 2020, his team released guidelines that establish six context categories for Florida (FDOT 2020). These categories, in turn, are explicitly based on a categorization scheme developed by DPZ, one of the planning firms who worked on Downtown Kendall (FDOT 2020, 22).

Downtown Kendall is now categorised as having an "Urban Core" context, which removes many of the barriers to pedestrian priority. Florida's new Context Classification Guide recommends tighter turning radii and shorter crossings for

pedestrians in Urban Cores (FDOT 2020, 35). The maximum speed for streets is 30 miles per hour, whereas Kendall Drive is currently 40 miles per hour (FDOT 2020, 39). The guide recommends creating greater "access," allowing shorter blocks (FDOT 2020, 26). The Florida Department of Transportation's redesign of Kendall Drive also aims to add a bus lane to the street (FDOT District Six 2017). Together, it is possible Downtown Kendall's largest interior street may become a people-centred and transit-oriented place.

However, this new context classification scheme does not eliminate the old functional classification system, in which Kendall Drive is an arterial and Dadeland Boulevard is a collector (FDOT 2020). These streets therefore retain the purpose of moving high volumes of cars long distance at high speed, while they are simultaneously classified to support a walkable context — an example of intercurrence baked into standards. The Context Classification Guide does not clarify how to settle such conflicts (FDOT 2020, 26). It appears, however, that the functional hierarchy retains stronger momentum. A spokesperson for The Florida Department of Transportation (FDOT) says, in an email, that the department does not plan to allow lane reductions or any changes that would undermine minimum traffic flow on Kendall Drive:

> Due to existing constrained right-of-way and the cost and impacts of adding additional lanes to Kendall Drive, there is limited opportunity to completely transform the Kendall Corridor from an auto-centric corridor to one that provides significant additional right-of-way to bicyclists and pedestrians. To the extent possible, a more pedestrian-friendly environment will be considered (FDOT Spokespeople, personal interview, August 8, 2021).

While through-traffic remains a minimum standard, pedestrians will be "considered," and their needs will be met "to the extent possible" (FDOT Spokespeople, personal interview, August 8, 2021). Kendall Drive may therefore become marginally more pedestrian friendly in its role as a street in the centre of a community, but will continue in its contradictory role as a thoroughfare for long-distance car travel. So far, car-dependent institutional path dependence is proving a more powerful force than efforts to institutionalize walkable design.

Analysis

In a sense, retrofitting Downtown Kendall should not have been possible. The area was bounded by highways on all sides, and characterized by asphalt and blank walls within. Single-family residents vehemently fought high-density projects, fearing traffic impacts (Dover, personal interview, June 1, 2021). Landowners were skeptical that people would ever walk its streets, and doubted buildings could succeed without parking lots (Hall Planning & Engineering, Inc. 2003, 26; Whoriskey 1998, 25A). Some landowners fought the plan, threatening to sue for $200 million (E. Walker 2001b, [a] 2001). Car-oriented design had been so dominant for so long in the state, road design standards allowed little else (Hall Planning & Engineering, Inc. 2003). Car-dependence had long become deeply ingrained, creating barriers to any other kind of growth.

And yet, to a remarkable degree, Downtown Kendall has transformed — if only in pockets. This was possible, in part, because car-dependence does not perfectly reinforce itself, and proponents took advantage of exceptions to pursue change. Dade County's 1969 Transportation Master Plan was largely a car-oriented document focused on highways, but it did at least propose a train, which the Downtown Kendall plan could later use to initiate a different kind of growth (Dade County 1969, 4–5, 7, 18). While many car-dependent residents opposed density, fearing it would make traffic worse, others became convinced that density near transit could be a solution for traffic. While car-oriented buildings encouraged more car-oriented buildings, they also created so much traffic, and such an unwelcoming environment, that over time, they began to undermine their own economic viability, leading to decline in the local office market (Faiola 1990; Chasko 1995). The Dadeland Mall is car-oriented, but it is so popular, it may have given developers confidence they could invest in high-value walkable buildings nearby (Vrooman, personal interview, July 6, 2021). Regionally, low-density car-dependent growth had consumed most available land, and left Miami-Dade with terrible traffic, inspiring a backlash that encouraged denser, walkable growth. Finally, while car-oriented engineering standards largely posed a barrier to walkable design, proponents were nonetheless able to adapt them to allow pedestrian-friendly designs on some local streets.

In these ways, the ambiguities in, and consequences of, car-dependence enabled a shift towards a different model of growth. However, while such inverse feedback can create opportunities for change, it tends to enable only flawed, partial change. Only some residents accepted the role of towers in reducing traffic, and only some landowners believed pedestrian-oriented buildings would be profitable. Other car-dependent residents and landowners continued to fight the plan. The Dadeland Mall may have helped to attract development, but its parking lots and blank walls continued to constitute a barrier to walking, isolating one half of the plan area from the other. Engineering standards may have allowed pedestrian-friendly design on some local streets, but they created major barriers to change on collectors and arterials.

Nonetheless, once inverse feedback allowed some level of walkability in Downtown Kendall, walkability could begin to reinforce itself on its own terms. The new towers compete with Miami's downtown for renters and buyers, and many residents go weeks or months without driving (Rodriguez 2019; Morales, personal communication, March 25, 2021). The success of these buildings continues to encourage more, similar pedestrian-oriented buildings. It has even inspired the Dadeland Mall to experiment with street facing, mixed-use designs, and to boast, in its marketing materials, of being within "walking distance" of Downtown Kendall (Simon 2021, 11). Institutionally, the success of Downtown Kendall inspired Miami-Dade to create eleven other, similar retrofit plans, and to establish standard regulations for them, making it easier to establish other, similar growth in the future (Miami-Dade County 2019, ix). Professionals who worked on Downtown Kendall would also go on to advocate for reforms to state standards, and these reforms are now being used to redesign Kendall Drive (FDOT 2020).

However, the absence of any form of local government for Downtown Kendall poses one barrier to walkability reinforcing itself fully. Elizabeth Plater-Zyberk reflects that:

> The best redevelopments have mayors who act like developers. Mayors who get up every morning and say, 'How am I going to make the physical place better? What do we need to do? What do we need to advance the vision?' (Plater-Zyberk, personal interview, April 30, 2021).

Googling the words “Downtown Kendall” brings up articles from the late 1990s and early 2000s. The plan has in many ways succeeded, but it lacks cohesive psychological identity and local leadership to reinvest in the gains from walkable growth, to demand more pedestrian-friendly street designs, and to overcome the other car-oriented barriers to change. If Downtown Kendall had its own government, the success of walkability could shape its institutions in a self-reinforcing process. Instead, Downtown Kendall constitutes only 0.06% of Miami-Dade’s land area. In such a vast jurisdiction — much of which is car-dependent — a single walkable retrofit may struggle to command the attention of leaders for long.

Conclusion

While car-dependence created barriers to change in Downtown Kendall, the consequences of car-dependence also motivated change. As the first walkable developments became successful, they too began to reinforce themselves, establishing a beachhead upon which other walkable developments could advance. The result is that walkable growth has made enormous but incomplete progress in transforming the area, creating pockets of thriving street life alongside sections of persistent car-dependent design. The contradictory logic of these two design paradigms will likely continue to shape this environment for the foreseeable future, in a continued state of urban intercurrence.

Chapter 6. Surrey City Centre: Overcoming Stasis

Surrey hopes to build a pedestrian-oriented downtown in an area traditionally known as Whalley, and Whalley was named after a gas station. Whalley's Home Station (Figure 29) was built on the side of the King George Highway, which connected Vancouver to the United States when the road was finished in 1937. The history of the name says much about the challenge the city faced: this area has been, since its beginning, a highly car-oriented place.

Figure 29. Whalley's Home Station, the gas station after which the community of Whalley was named. Photo taken in the early 1930s (Source: Brown 2014b).

Once the highway was built, it attracted strip malls aimed at people driving to or from Vancouver (City of Surrey 2017a, 26). Over the coming decades, Whalley would grow into a suburban city with King George Highway at its centre — and the road was not widely loved. In the 1960s and 70s, newspaper editorials denounced the "ribbon development along the [. . .] Highway," and the area's "uninspired" and "unsightly [. . .] strip development" (The Columbian 1963, [a] 1977).

In 1975, the Vancouver Regional Plan proposed a different future for Whalley: to turn it into a Regional Town Centre, much like "the downtown of a small city" (GVRD 1975, 18). However, little would materialize. In 1980, Surrey established its own downtown plan for Whalley, but this too would have little impact (District of Surrey 1980). In 1991, Surrey rewrote the plan, this time supported by a $130 million investment in three new SkyTrain mass transit stations in Whalley (District of Surrey

1991; The Vancouver Sun 1994). But again, little changed. The Vancouver region wrote three more plans in 1980, 1990, and 1996, all of which encouraged dense growth (GVRD 1980, 1990, 1996). Almost nothing happened.

Finally, in roughly 2010, something began to shift. By 2020, there were over 90 approved or active development applications for the area, and Surrey had become one of the fastest growing cities in Canada (Urban Surrey 2020; Van Santvoort 2021). This chapter charts the course of this transformation, and intercurrence is central to the story: the messy, self-contradictory transition from decades of car-dependent growth, to a new, long-sought-for model of walkable development.

The chapter begins by exploring three separate attempts to transform the community, in the 1980s, 1990s, and 2000s. It shows how political, institutional, and transport-economic feedback reinforced car-dependence, creating barriers to change for many decades, and how leaders finally overcame these challenges in the 2000s, shifting economic momentum towards self-reinforcing walkable growth. The chapter ends by assessing the lingering influence of the car-dependent paradigm in Surrey City Centre, and the area's prospects for continued walkable development.

Context

Surrey is a municipality in the region of Vancouver. Surrey manages most day-to-day aspects of city planning (such as zonings and development approvals), but a regional agency, TransLink, manages transit and highways. Metro Vancouver contains 21 municipalities. Surrey has 8 Councillors elected at-large (meaning it has no voting districts), and one elected Mayor ("Mayor & Council" 2019). Councillors in Surrey often organize themselves into officially recognized Civic Parties, which promote specific candidates for office ("Elector Organizations" 2016).

Surrey City Centre is roughly 270 hectares, which approaches the size of downtown Vancouver, 370 hectares ("City Centre Plan" 2019a). The City Centre constitutes roughly 0.9% of Surrey's total land area. Surrey is a major destination for immigration, and 55% of the area's residents are visible minorities (Teixeira 2014,

173). The area's mean income of $54,000 a year is far lower than the city as a whole, which is $73,000 (Statistics Canada 2016). Thirty eight per cent of residents face challenges with housing affordability, meaning they spend more than thirty percent of their income on rent or mortgage payments (Statistics Canada 2016). The Surrey City Centre is growing quickly: it expanded by 57% since 2001 to a population of 13,438 in 2016 (Statistics Canada 2001, 2016).[11]

Interviews and Sources

This chapter is based, in part, on twelve interviews I conducted between April 2021 and March 2022. Interviewees included four urban planners and three transportation engineers who worked for the City of Surrey between 1977 and today. I also spoke with a former mayor, the former head of the Surrey City Development Corporation; a Senior Development Manager with PCI, a development corporation; the Director of the Downtown Surrey Business Improvement District; and a local blogger who writes on development issues. 71 per cent of people I contacted for an interview agreed to conduct one. No sector was systematically reluctant to give an interview.

The 1980 Whalley Guildford Town Plan

Political and Institutional Intercurrence

In *One Hundred Years of Solitude*, Garcia Márquez (2018) describes a general who "started thirty two civil wars and lost all of them." Gerhard Sixta is an urban planner who had a similar experience in Vancouver. He first wrote a revolutionary new walkable plan for downtown Burnaby as the head of planning for that suburb of Vancouver in 1971 (District of Burnaby 1971). He left that job in frustration at the lack of progress, and was hired as the head of planning at Surrey (Sixta 2021). There, he wrote another revolutionary walkable plan, with the support of local councillors

[11] Population statistics are drawn from Statistics Canada data for the following Dissemination Districts: 59151920, 59151932, 59152204, 59151948, 59151949, 59151950, 59151951, 59151952, 59152206, 59152205, and 59152203. I also use 59151930 for 2001, and 59153386 and 59151931 for 2016, due to boundary changes (Statistics Canada 2001, 2016).

and newspapers (The Columbian 1977b, [a] 1977; Surrey Leader 1977). A few years later, he left again in frustration.

Sixta's efforts would in some ways prove prescient, recommending changes that would foreshadow Surrey's later success building walkable towers some three decades later. But his plans would flounder, in part, because he did not sufficiently recognize the political and institutional vested interests in continued car-dependence. He believed he could shift the city to a walkable development paradigm by establishing it in policy. He would discover how unofficial policy momentum can derail such plans.

The American political development thinker, Beard (1934, 12), writes that "we can think only in terms of some tradition, some heritage of ideas." For Sixta, the idea that North American suburbs could change was rooted in his experience growing up in Vienna, Austria, where he saw first-hand that a different tradition of design could work. "I had, at the back of my mind, the image of a much better environment" (Sixta 2021). He wanted to create lively communities, where, "with every step, there's something new happening along the sidewalk" (Sixta, personal interview, March 24, 2021). While car-dependence had been gaining increasing momentum in cities like Surrey since the 1950s, historic examples of walkability continued to quietly reinforce an alternative model, though with less success, inspiring practitioners like Sixta to push for change.

Sixta's hope to implement walkability was also aided by a growing frustration with the consequences of car-dependence. Newspaper editorials condemned the "pox" of "commercial sprawl" and "unsightly" "strip development" in Whalley and elsewhere (The Columbian 1977b; Odam 1979; The Surrey Leader 1982). Regionally, Vancouver's car-dependent growth was compounding traffic problems. Most jobs remained in the downtown, which meant its streets were clogged with the traffic from an entire region daily (GVRD 1975, 18). The 1975 Vancouver Regional Plan hoped to put jobs in a new downtown in Surrey, so that many of the region's commuters would drive to Surrey instead (GVRD 1975, 18). As in Downtown Kendall, the consequences of large-scale car-dependence motivated efforts to implement a different model, in a process of inverse feedback.

In 1977, Sixta — then Surrey's Chief Planner — proposed a new plan for Whalley. It would create dense, mixed-use buildings with a core area centred around transit, with lower-density neighbourhoods outside this core (District of Surrey 1980, 48–52). It sought to line streets with trees and ground-level shops and services, and to eliminate parking lots between the street and shops (Figure 30) (District of Surrey 1980, 57–61).

Figure 30. Concept image from the 1980 Whalley/ Guildford Town Plan (Source: District of Surrey 1980, 58).

However, while most retrofits today aim to redevelop strip malls and parking lots — places where there are few local residents to oppose change — Sixta proposed to the new plan in a single-family neighbourhood. Existing residents would help support businesses, and the area's small streets would enable safe walking. Sixta did not want to build a new downtown on Whalley's parking lots because they were located on the King George Highway, a heavily-trafficked, hostile environment that few would want to walk and live on (Sixta, personal interview, March 24, 2021). However, while his proposed location for the plan avoided physical barriers to walkability, it faced political barriers: the opposition of car-dependent homeowners who preferred their existing, low-density way of life (Moore 2021; Sweeney and Hanlon 2017).

Surrey had a second car-oriented commercial area bordering another highway 3 km to the East of Whalley, called Guildford (Figure 31). Sixta proposed to connect these two commercial cores with a pedestrian-friendly downtown, centred on 104

Avenue, which was then a residential street (District of Surrey 1980, 59). The avenue was, he argued, ripe for redevelopment, because many of its homes were in a state of disrepair and its land values were low (District of Surrey 1980, 11; Sixta 2021).

Figure 31. Map showing the regional context of the Whalley/ Guildford Town Plan and Vancouver's Downtown (Source: Satellite image from Landsat Copernicus (1984), with labels, highways, and highlights added).

At first, it seemed as though the plan would succeed. One local editorial headline read, "Surrey 'town' makes sense," and went on to argue that the plan was "long overdue" (The Columbian 1977b). In 1977, Council unanimously voted to support the plan in principle (Surrey Leader 1977). The 1980 draft contains concept images for three dense, mixed-use buildings that developers had already proposed (Figure 32) (District of Surrey 1980, 67–70). An Alderman told reporters that "the municipality does not see its future as a bedroom community but as 'the future major metropolitan centre south of the Fraser'" (BC Business 1978). The plan had the support of the local political elite: influential newspapers, developers, and politicians all supported what he was trying to achieve.

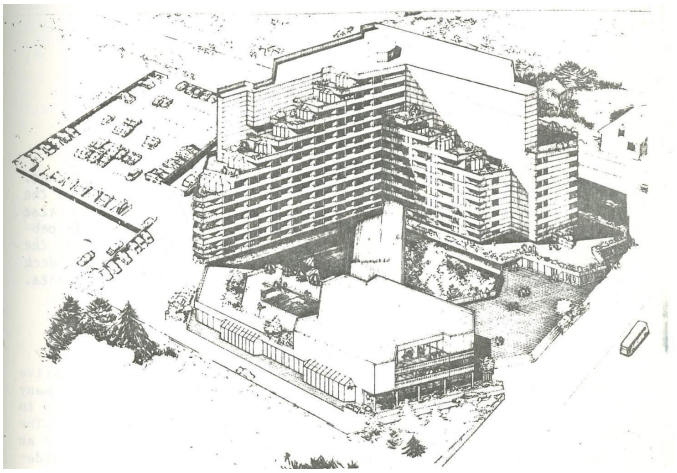

Figure 32. Mixed-use development concept that had been proposed under the Whalley/ Guildford Town Plan (Source: District of Surrey 1980, 67).

All this changed, however, when hundreds of angry residents along Avenue 104 arrived at public hearings for developments proposed under the plan (Surrey Leader 1980b). Two hundred and fifty showed up at one meeting, overflowing the Council chamber (Surrey Leader 1981b). Alderman William Fomich summarized their complaints: “They do not want apartments in their single family area” (Stan McKinnon 1981, 2). One resident wrote an op-ed decrying the plan’s goal to maximize “bodies per acre,” which would lead to the “deterioration of community fabric” with “traffic and noise pollution” (Wright 1981). The plan’s reception along 104 Avenue helps to underline why future retrofits — here and elsewhere — would aim to redevelop parking lots and not neighbourhoods: existing residents are a powerful force in opposing walkable change.

By 1981, a growing number of Council candidates campaigned in opposition to 104 Avenue development, and many won office (Surrey Leader 1981a; Sixta, personal communication, March 24, 2021). Unsurprisingly, the new Aldermen were more sympathetic to car-dependent growth. In 1981, Council held a series of five public hearings to fast-track 5,000 subdivision lots for single-family homes (Stanley McKinnon 1981; Surrey Leader 1981a). They did also support dense development in in commercial areas, so long as it was not located in neighbourhoods that could attract the ire of residents (Surrey Leader 1980c).

The plan was also undermined by the institutional momentum of car-oriented design. Sixta did not, he told me, do enough to mend disagreements with other city staff who had objections to the plan:

> I simply ignored them. I wasn't working for them, I was working for Council, and I had the confidence of Counsel. But when you do that, the people you have ignored become politicians (Sixta, personal interview, March 24, 2021).

He preferred not to state who specifically he had in mind, but opponents within the bureaucracy soon made their voices heard. In 1980, Surrey's lead Municipal Engineer, Mike Jones, brought a "lengthy report" to council expressing concern about the plan's impact on drivers (City of Surrey 1980; The Surrey Leader 1980a). Jones told Council:

> The proposed plan usurps 104 Avenue [and] ignores the consequences of not retaining [its] through traffic handling ability. [. . .] In my opinion the new town centre plan is deficient because it quite deliberately creates future transportation problems but does not specifically plan for their resolution (The Surrey Leader 1980a).

One Alderman — from the earlier cohort who had supported the plan — expressed surprise about this "last-minute" intervention (The Surrey Leader 1980a). One potential explanation for the timing of the report was that a new Mayor, Don Ross, had been elected a few months earlier. Jones and the new Mayor do appear to have been aligned in worldview: Ross would later recommend Jones to be fast-tracked for promotion to Municipal Manager (The Surrey Leader 1983).

The then head of the bureaucracy, Municipal Manager Dan Closkey, also turned against the plan. At one municipal meeting, Closkey echoed Jones' concerns about traffic, and questioned the plan's economic viability: "no significant building has taken place despite the fact that a great deal of commercial activity has taken place elsewhere in Surrey" (City of Surrey 1980; The Surrey Leader 1980a). Sixta countered that developers did make proposals, which were stopped by political opposition, not by the economic viability of the plan (Surrey Leader 1980b, [b] 1981; Stan McKinnon 1981, 2). Nonetheless, Closkey recommended that Council hire a consultant to reconsider the plan's traffic impacts and feasibility, which Council

approved, thereby putting the plan on hold (City of Surrey 1980; Stan McKinnon 1981, 1).

By late 1980, sentiment among Surrey's elite had largely turned against the plan. Local newspaper editorials shifted from praise to criticism. The Surrey Leader (1981b) disparaged the plan as an "odd looking blob on the map," which would cause traffic problems that would "cost the taxpayers of Surrey tens of millions of dollars to ameliorate." It would take decades for the plan to attract sufficient development to create a downtown, the paper editorialized: "The [. . .] concept just won't fly" (The Surrey Leader 1980b, [b] 1981). The Surrey Chamber of Commerce called for a complete re-evaluation (The Surrey Leader 1981a). The Whalley/Guildford plan was never officially repealed, but newspapers mention it less often after 1981. Sixta had lost the support of the local political elite.

In 1984, the Municipal Engineer, Mike Jones, became the City Manager, and the next year, he brought a report to Council proposing that Sixta be fired. The report was leaked to the press, and in it, Jones criticizes Sixta's "almost total lack of inter-personal skills," and lamented that he "has too often shown rudeness and arrogance to developers" (Vancouver Sun 1985). The report concludes that "the faith [. . .] of his peers [has] been lost beyond recall" (Vancouver Sun 1985). (A reporter contacted consultants, developers, and municipal planners to fact check these claims, and found a mix of support and opposition, not unusual for someone who makes controversial decisions) (The Surrey Leader 1985). Sixta told me that his opponents within staff "won on the political end, and I lost it." He summarized the plan's trajectory: "Council and the mayor got thrown out because of my plan. A brand new mayor and council appeared. And I said, well, goodbye" (Sixta, personal interview, March 24, 2021).

No one in Surrey officially labelled themselves as pro-walkability or pro-car-dependence. However, Sixta's initial progress on transforming 104 Avenue mobilized a set of opponents in the public, staff, and Council. Residents angry about the issue helped bring to power leaders who would not only kill the plan, but who would fast-track thousands of single-family homes (Stanley McKinnon 1981; Surrey Leader 1981a). And these leaders would empower staff members who would later have Sixta

fired (Vancouver Sun 1985; The Surrey Leader 1983). The consequences of car-dependence inspired a walkable alternative — in an example of inverse feedback — but the proposal to locate it on existing neighbourhoods mobilized a backlash. In the end, the self-reinforcing feedback of car-dependence proved, at that time, more powerful than whatever feedback favoured walkability.

1991 Whalley Town Plan.

Political and Institutional Intercurrence

However, those who opposed Sixta's Plan were not necessarily against dense, walkable growth, so long as it was not built on existing single-family homes and did not shrink the size of roads. Many Councillors preferred Whalley's many parking lots as a location for downtown-style development (Surrey Leader 1980a; Stanley McKinnon 1981). In 1989, British Columbia Transit announced that it would build a SkyTrain mass transit connection into Whalley, providing the impetus to rewrite the plan to focus growth within that area (The Surrey Leader 1989). Surrey therefore wrote a new plan to prepare for transit, finished in 1991 (District of Surrey 1991, 2). The new plan criticized the earlier plan, arguing that connecting Whalley and Guildford would take "a very long time, maybe more than 100 years" (See Figure 33) (District of Surrey 1991, 2). It left unstated that an opponent of the earlier plan, Mike Jones, was now in charge of the bureaucracy (Brown 2014a).

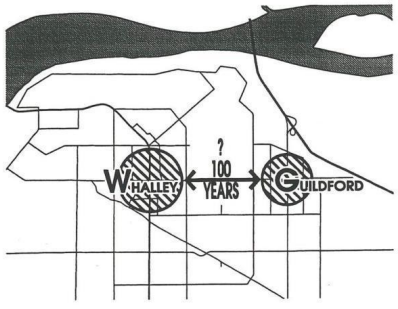

Figure 33. A diagram in the 1991 Whalley Town Centre Plan criticizing the viability of the 1980 Plan to create a downtown between Whalley and guildford (Source: District of Surrey 1991, 2).

The new plan in some ways maintained the goals of the earlier plan. It proposed dense, mixed-use growth around transit stations, and smaller blocks (District

of Surrey 1991, 6, 9). It aimed to create, “a healthy and humane built environment [. . .] where the car does not dominate the environment but is integrated with other modes of movement” (District of Surrey 1991, 6, 9). The primary differences were that it shifted the locus of growth away from existing neighbourhoods to the highway and its stripmalls (Figure 34).

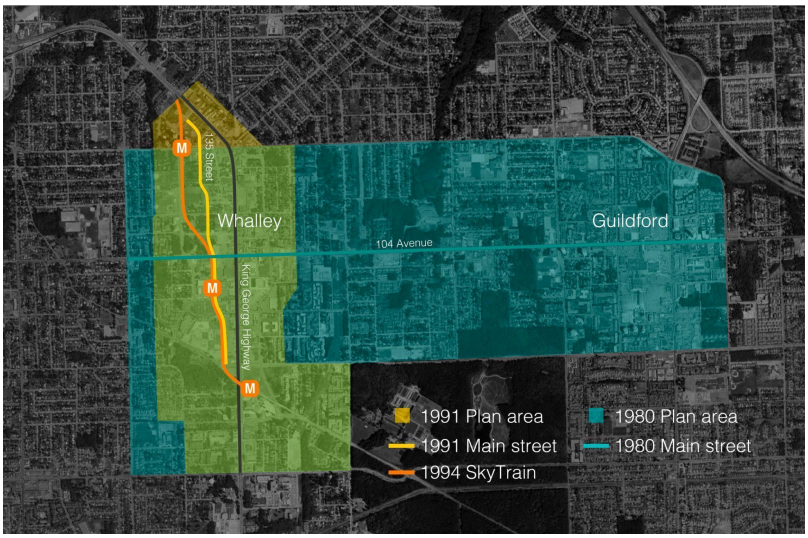

Figure 34. Diagram of the plan areas and main streets for the 1980 and 1991 North Surrey plans. (Source: satellite image from Image Landsat/ Copernicus 1998, with labels and highlights added).

Under Jones’ leadership, the plan did embrace an effort to create pedestrian-friendly places. It attempted to do this, however, while making fewer sacrifices to traffic. The plan proposed to turn King George Highway into a “street” (in places) by slowing its speed, replacing parking lots with higher-quality buildings, and emphasizing its potential “civic importance” (City of Surrey 1993, 62). However, the plan also made clear that “King George Highway will remain the primary system of vehicular arrival” (City of Surrey 1993, 64). It was six lanes wide and would remain a thoroughfare that was difficult to cross and uncomfortable to walk, which risked discouraging development along its length (Mindell and Karlsen 2012). In an example of intercurrence, the plan adopts many of the priorities of compact, walkable growth, while not addressing the large, car-oriented road through its centre, undermining those same goals.

The Chicken-and-Egg Problem

Transport-Economic Intercurrence

No one I interviewed recalled strong political opposition to the 1991 plan, and I found no evidence of major fractures within staff over the plan. This time, a greater barrier to growth was economic: while it was relatively easy to attract dense mixed-use development to a residential neighbourhoood under the previous plan, it was more difficult to attract investment to an area dominated parking lots and large roads. Surrey's SkyTrain stations opened in 1994, but only one large office building was erected in the next decade (Dickson 2006, 10). The proposed new main street — 135 Street — remained something of a back alley, lined with blank walls and service entrances (Figure 34) (District of Surrey 1991, 9).

The Surrey City Centre faced a chicken-and-an-egg problem. The square foot costs of a mixed-use tower are far greater than that of a single-story strip mall (Dickson 2006, 35). It was difficult to justify higher prices for units, however, while towers were surrounded by asphalt. The area needed new buildings to replace parking lots with a more attractive environment, but it was difficult to justify the cost of new buildings until there was an attractive environment. Similarly, it would be difficult to convince developers to design buildings with no surface parking lots, and with retail facing the sidewalk, in a context where most people drive and few people walk. It would be difficult for sidewalk-facing businesses to succeed until there is a high-enough density of mixed-use towers to attract people to sidewalks, but there was little incentive to build such towers until their ground floor businesses had a chance of succeeding. Brad Howard — the Senior Development Manager at PCI, a large development company active in the area — explains that:

> If you're going to invest millions and millions of dollars into a project, it can be difficult being the very first one in because those parking lots in those strip malls around you. Those will take time to build out and to change (Howard, personal interview, April 9, 2021).

Whalley was, in a sense, stuck in a local minimum. Mixed-use towers might be more profitable if many developers built them at once, but until then, it remained less risky to operate single-story strip malls.

This barrier can be understood as a kind of collective action problem. Olson (1965) originally coined the term to describe the difficulty of organizing groups towards a common goal, due to the incentive for individuals to act as free riders, enjoying the benefits of others' work and sacrifice, without needing to make sacrifices themselves. In walkable retrofits, landowners would all benefit if they all invested simultaneously in a higher-value, pedestrian-oriented model of design. There is no mechanism, however, to ensure they all invest, and if too few invest, the prevailing design model will remain car-oriented, and those investments risk failure. There is therefore an incentive for each to act as a free rider, allowing others to take the risk, while enjoying the uplift in their own property values if change does occur. If the incentive is for no individual landowner to pursue change, it is difficult for developers to trust that change will occur. This dynamic is a powerful mechanism for reinforcing car-dependence. In Surrey, it would stall redevelopment for almost two decades.

Attempt Three to Create a Walkable Centre

Car-Dependent Intercurrence

One morning, Surrey Mayor Dianne Watts was scheduled to attend a breakfast meeting in Vancouver, and she had to set her alarm for 4:45am to get through traffic on time (MacQueen 2009). Every day, Surrey commuters face 20km of gridlock to reach Downtown Vancouver, a problem exacerbated by the downtown's unlikely location. Whereas most downtowns are at the centre of their urban region, Vancouver is the North West extremity of Metro Vancouver (Figure 35). With mountains on one side and ocean on the other, the region could only grow in one direction. As a consequence, the region's commuters funnel into a wedge to reach downtown, creating gridlock traffic.

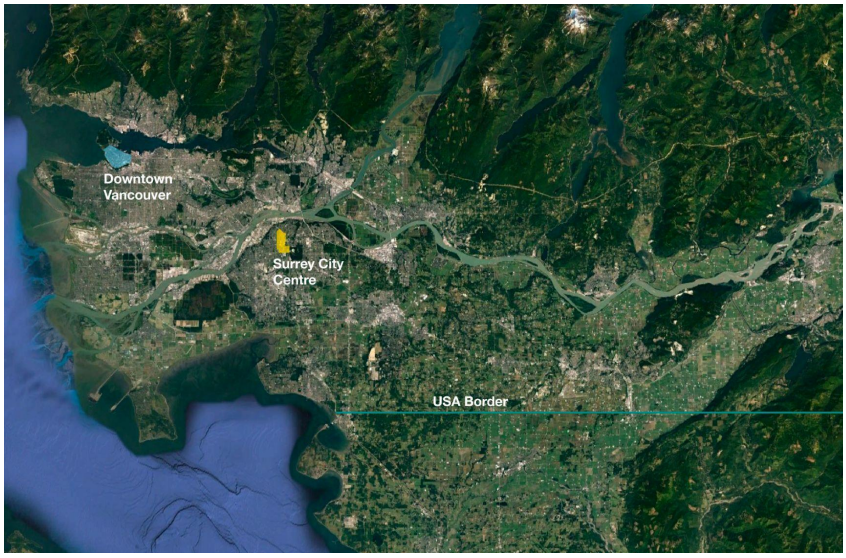

Figure 35. Surrey City Centre's location with respect to Metro Vancouver's Urban region and Downtown Vancouver (Source: satellite image from Maxar Technologies (2022c), with labels, highlights, and border added).

In the mid-nineties, Vancouver Regional planners noticed that Surrey was, in contrast, at the centre of the region, and therefore designated it to become a second major downtown (Dickson 2006, 11). Watts was determined to turn those words on paper into a reality, so that the community could enjoy a short commute to its own urban centre, rather than needing to drive through all that traffic. As in Downtown Kendall and the earlier Surrey plans, the consequences of car-dependence — heavy traffic — helped inspire walkable change, in an example of inverse feedback.

Watts was a City Councillor at Surrey from 1996 to 2005. During that time, she became frustrated that the city's growth failed to follow any intentional plan: "chaos," she called it (Watts, personal interview, March 30, 2021). Surrey was attracting over $500 million worth of construction every year in the 1990s, and over $1 billion in the early 2000s (Dickson 2006, 10; City of Surrey 2019). But, Watts laments, "Nothing was happening in the downtown core" (Watts, personal interview, March 30, 2021). In 2005, she left her long-time party and ran against then Mayor Doug McCallum as an independent, and beat him by 10,000 votes (Bula 2010).

Overcoming the Chicken-and-Egg Problem

Transport-Economic Intercurrence

Surrey City Centre needed a strategy, Watts (2021) told me, to create a "critical mass" of new high-value growth to knock it out of its low-value stasis. One opportunity was to move City Hall, which, in 1961, had been built at the intersection of two highways, "in the middle of nowhere" (Watts, personal interview, March 30, 2021) (Figure 36). She further wrangled provincial and federal funding to help build a new $36 million library, large public plaza, and other major amenities under a program she called "Build Surrey" (Surrey City Manager 2010; Tischler 2011).

Figure 36. 1962 Surrey City Hall (Source: Brown 2014c).

Critically, Surrey did not put these buildings on the cheapest, most convenient land, scattered across the plan area. Instead, the city co-located all these projects on a single block, next to the Surrey Centre SkyTrain Station, and near the one development that had been built in the last decade, an office complex containing a new campus for Simon Fraser University. The city also built a new street to create a finer grid for walking. By focusing this government investment into such a small area, the city hoped to achieve a "critical mass" of growth to shift it into a higher-value pattern of growth in this one place, where dense, mixed-use buildings could become profitable (General Manager, Planning and Development 2008, 5).

Still, investors were reluctant to place a bet on high-cost, high-reward developments that had yet to be tested in that market (Heaney, personal interview,

March 29, 2021). Surrey needed a developer with money willing to take risks. In 2007, Council took an unusual step and created the developer they wanted. The city established the Surrey City Development Corporation (SCDC), an arms-length company for which the city remained the sole shareholder, but which could raise capital, build market-oriented development projects, and partner with other development firms to help to encourage them to invest (City of Surrey 2012; Heaney, personal communication, March 29, 2021).

The SCDC's first major project was 3 Civic Plaza, a 50 story tower including hotel, condos, office and ground-floor retail (Ditmars 2012). And again, the city built the project on the same block as the new library and City Hall, further contributing to the area's critical mass (Figure 37). The SCDC partnered with a private company on the project, Century Group, to diversify risk and to help bring private investment into the area (Heaney, personal interview, March 29, 2021). The SCDC continued focusing development in that finite area, including a massive two-tower project called Centre Block, approved in 2021 (Zytaruk 2021).

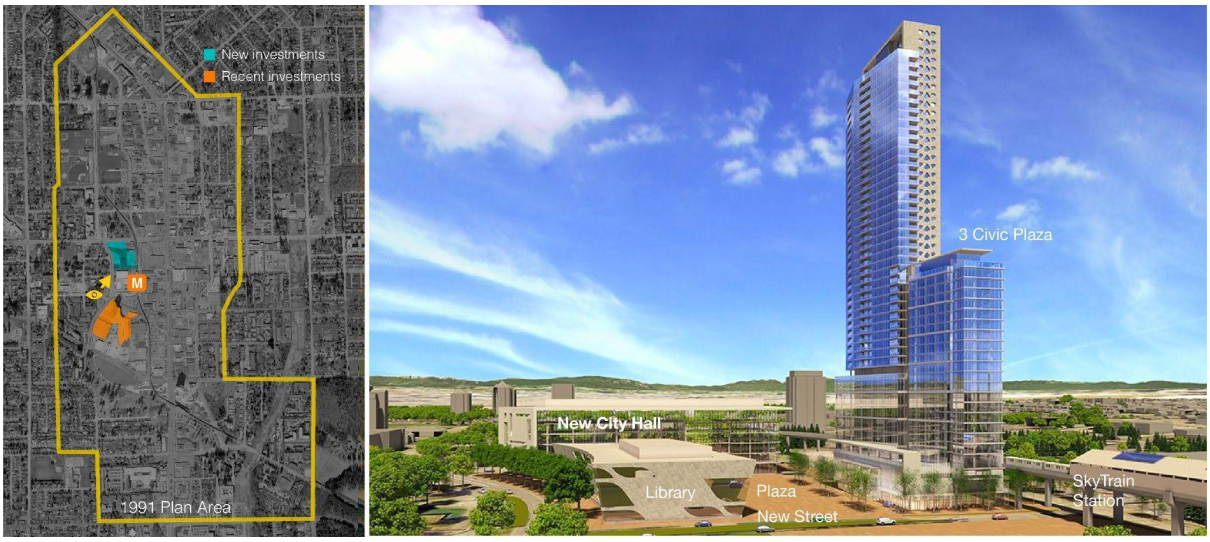

Figure 37. Major projects in Surrey City Centre under the Build Surrey Program. Recent investments included the SkyTrain and an office building containing a Simon Fraser University Campus. New investments included the new City Hall, library, plaza, street, and the office building, 3 Civic Plaza. (Source: satellite image from Landsat/ Copernicus (1998), with boundaries, labels, and highlights added. Concept photo from Surrey (2015), with labels added).

Even with these strategies in place, the plan depended on a strong economy, and in 2008, just as Watts was hoping to kickstart Whalley's revitalization, the

financial crisis struck. Surrey was only then receiving its first tentative development applications in the City Centre. Watts worried that, “if they stop, they may never start again” (Watts, personal interview, March 30, 2021). In 2009, the city therefore announced a package of short-term financial incentives to encourage development, including three years without property taxes, a one third reduction in infrastructure fees, and a 50% cut in other application fees (Lamontagne 2013, 10). Watts was, in effect, implementing a comprehensive package of strategies to overcome car-dependent lock-in, and to let a new model of growth take hold.

In 2010, development interest in Surrey City Central began to grow. By the end of the decade, it had become a flood. According to a local blogger who tracks planning proposals in the area, developers applied for 94 major projects in the area between 2010 and 2020 (Figure 38) (Urban Surrey 2020). The city has grown by 18% per year, in some years, and has now doubled Vancouver’s growth rate, with 43% of that growth in urban centres, including Surrey City Centre (City of Surrey 2020b; Robinson 2019). Brad Howard, a Senior Development Manager at PCI, reflects:

> It's like a snowball that starts rolling down the hill, and eventually you gain momentum and speed. I think we are at the point right now in the city centre where we're starting to see that snowball rolling (Howard, personal interview, April 9, 2021).

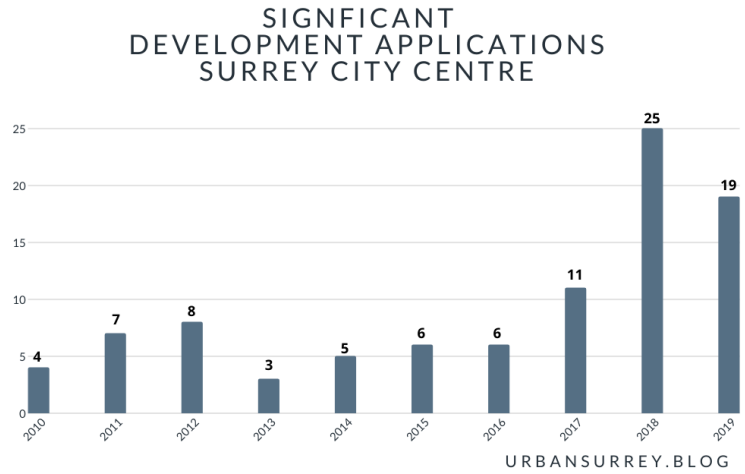

Figure 38. The number of major development applications brought to Surrey Council, ranging in size from a single four-story building to multi-tower projects up to 45 stories tall (Source: Urban Surrey 2020).

While Watts' initial strategy was to focus on creating critical mass for one finite area, the onslaught of development interest has now expanded to envelop the entire Surrey City Centre. As Figure 39 shows, developers are, in a sense, building out an entire downtown at once (UrbanSurrey 2021). (However, Hallingham, who compiled Figure 39, cautions that many landowners seeking approval today may hope to sell the development rights to another builder, and it is therefore difficult to know how quickly all these projects will be realized) (Hallingham, personal interview, March 30, 2021).

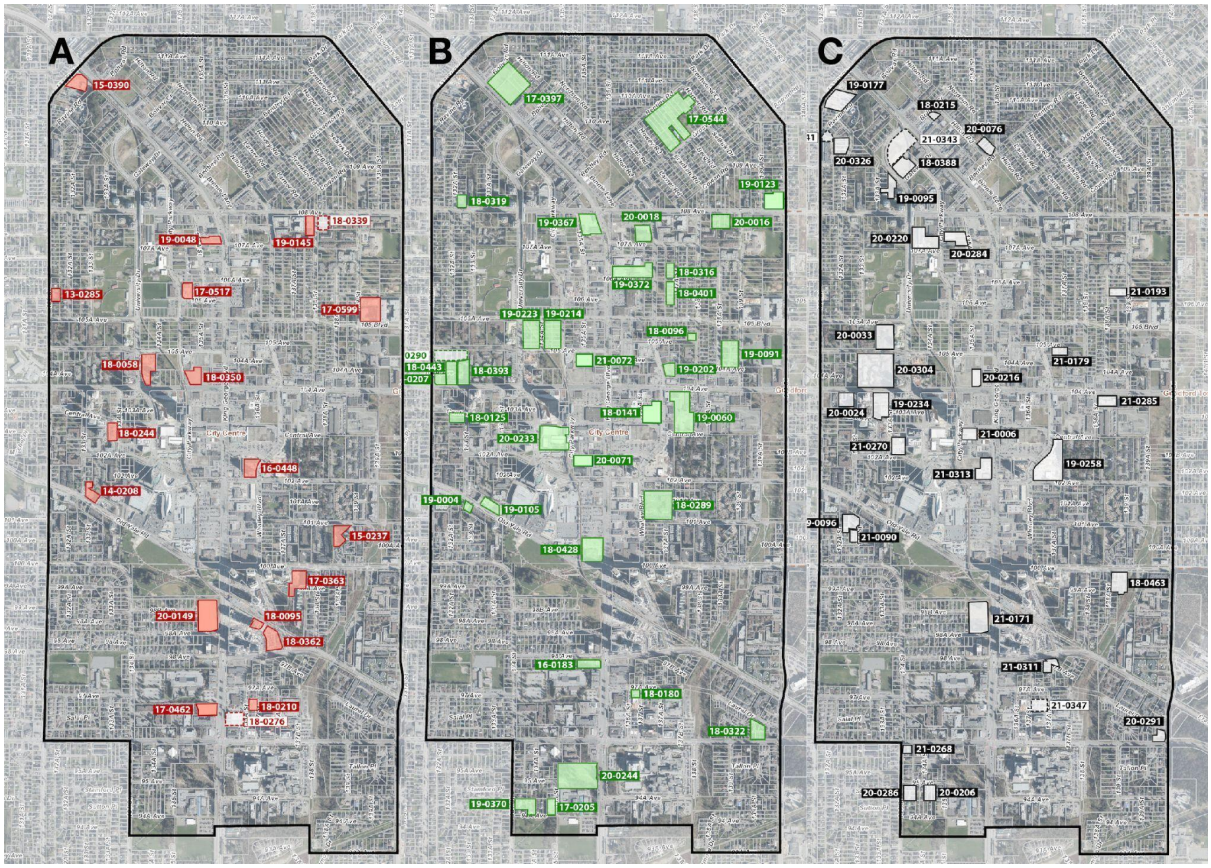

Figure 39. **A.** Projects currently under construction as of December 2021. **B.** Projects that have been approved. **C.** Projects seeking approval. (Source: UrbanSurrey 2021).

Surrey may have also benefited from larger shifts in the market. It is perhaps not a coincidence that both Surrey and Tysons would attract a flood of development applications at the same time (as we will see), and that walkable urban markets have gained value faster than car-dependent markets since the 2008 crash: both retrofits may have benefited from larger-scale market shifts towards walkable design models (Boyar 2016; Frank 2015, 5; Florida and Mellander 2016). Nonetheless, Watts' three-

pronged strategy offer lessons on how to overcome the transport-economic feedback of car-dependence: to concentrate public investment in a finite physical area to overcome the chicken-and-egg problem, to create an arm's length development authority capable of raising money and investing in private projects, and to implement short-term financial incentives to kick-start growth.

Bureaucratic Culture Change

Institutional Intercurrence

In Sixta's time, Surrey's planning and engineering departments were in conflict. A profound transformation has since taken place. Today, none of the engineers or planners I spoke to expressed any frustration with the others. Many work on the same floor in the same building (Klassen, personal interview, March 26, 2021; McLeod, personal interview, March 24, 2021; Dong, personal communication, April 1, 2021; Atkins, personal communication, April 21, 2022). Both teams push the other to make their policies more pedestrian-friendly. Some call themselves "Plangineers" (McLeod, personal interview, March 24, 2021). The change has been so fundamental, Hallingham — a local blogger on development — was surprised when I asked him about the influence of car-dependent street standards: "It just seems a little outdated at this point" (Hallingham, personal interview, March 30, 2021).

This shift can be traced, in part, to the deliberate efforts of political leaders in the region to change the car-oriented culture of the bureaucracy. In 1972, a new civic party, TEAM, won elections in Vancouver, in part propelled by their opposition to plans for inner-city highways (Mickleburgh 2013). One of their first acts in power was to fire the City Commissioner Gerald Sutton-Brown — who had spearheaded proposals for these highways — and five other managers who held similar views (Stone 2014, 397). According to Stone (2014, 397), these dismissals quickly shifted bureaucratic culture: "New and surviving planners were keen to work with the new agenda." The administration also implemented new design guidelines to institutionalize pedestrian-oriented policies (Stone 2014, 397). In all, these changes

contributed to shifting long-term professional norms in the city (Perl, Hern, and Kenworthy 2015, 108).

This shift has since influenced the wider region, including Surrey. As one Surrey planner told me: “Everyone's going to the same conferences and reading the same things” (Dong, personal interview, April 1, 2021). Mayor Watts contributed to this bureaucratic culture change in 2005 when she, like TEAM, replaced Surrey’s City Commissioner, Gerald Sutton-Brown (Spencer 2006). “He was there under the previous Mayor,” Watts told me, “that allowed all of this chaos and just ridiculous development. So I knew that he could not be a part of the vision in the future” (Watts, personal interview, March 30, 2021).

In 2008 and 2010, this new City Manager would hire managers for the transportation and planning departments — Jamie Boan and Don Luymes — who, according to multiple interviewees, both prioritized pedestrians and cyclists, and saw eye-to-eye on walkability, helping to bring the departments closer together (McLeod, personal interview, March 24, 2021; Arason, personal interview, March 9, 2022). In his first year, Boan would help usher in a new Transportation Strategic Plan, which placed pedestrians on top of a list of the “Hierarchy of Consideration,” above, “transit, bicycles, commercial traffic and trucks [and] single occupancy vehicles” (City of Surrey 2008, 43). And he hired planners into his department — previously dominated by engineers — helping to cross-pollinate the culture of the two professions (Arason, personal interview, March 9, 2022).

The current Director of Transportation Planning, Douglas McLeod, argues that bringing planners into the department lent greater authority to the issues planners care about:

> Engineering, typically, has the last call. They're the ones implementing the infrastructure and owning and maintaining it. If you put planning in a different group that has no actual authority or ownership of the end product, you're going to start to get the disconnect (McLeod, personal interview, March 24, 2021).

There is a tendency for public servants to stereotype people in other departments and to discount their advice, but it is harder to ignore dissenters in one’s own department

(Termeer 2009, 312). The physical design of their offices also helps. Multiple interviewees report that it is now far easier to collaborate — and harder to stereotype the other department — because most of them share a floor in the new City Hall (McLeod, personal interview, March 24, 2021; Arason, personal interview, March 9, 2022; Dong, personal interview, April 1, 2021).

Surrey adopted at least two strategies to blunt the car-oriented institutional path-dependence so common in traffic engineering departments: they hired new management and put urban planners directly inside the department. This, and a wider, regional shift in bureaucratic culture, appears to have led to a profound change in how the Surrey public service operates. Surrey Planner Andrew Dong recalls that by the time he joined the department, "It wasn't always planning pushing transportation engineers. It came in both directions. Transportation was sometimes pushing planning to be more progressive" (Dong, personal interview, April 1, 2021).

Limitations to Institutional Change

Institutional Intercurrence

However, while Surrey institutions have blunted car-oriented institutional path-dependence, the city has not eliminated it. The 2008 Transportation Strategic Plan continues to place emphasis on setting speed limits based on what drivers expect — which "might include raising the speed limit" — rather than on making changes to streets to ensure drivers travel slowly (City of Surrey 2008, 50). The transportation department also continues to forecast traffic demand using many of the same tools that, in other cities, justify wider roads. McLeod explains that the department attempts to moderate the impact of its traffic forecasts by assuming many people walk or take transit (McLeod, personal interview, March 24, 2021). However, the department does, nonetheless, continue to prioritize projected traffic flow. Surrey is not ready, McLeod believes, to accept congestion as a tool for encouraging other modes of transportation, as called for in Metro Vancouver's 1996 regional plan (GVRD 1996, 19, 23; McLeod, personal communication, March 24, 2021).

McLeod says that the bureaucracy takes a cautious approach to transformation, because if it attempted to move too quickly, it could cause a backlash (McLeod, personal interview, March 24, 2021). McLeod argues that for Surrey, it could be risky to try to "dive into your end state" and attempt to create a fully-walkable community with narrow streets all at once (McLeod, personal interview, March 24, 2021). If you do that, "you're just going to get this gigantic wall of resistance. And then you may actually have to take more time undoing the damage that you've done. So it's about navigating the slow change" (McLeod, personal interview, March 24, 2021).

When Surrey began updating the Surrey City Centre Plan in 2008, it also faced an institutional barrier at a national level: no engineering design standards then existed for pedestrian-priority streets. The city therefore had to invest heavily to develop its own standards (City of Surrey 2017b). The year they published the updated plan, the Transportation Association of Canada (2017) finally established such national standards. It is a testament to the hold car-dependence has had over the transportation engineering profession that no pedestrian-oriented national standards existed until two decades into the twenty-first century. The new standards may help to reduce car-oriented path-dependence in the profession, reducing the barriers to future suburban retrofits.

The tensions between traffic needs and Surrey's new walkable goals are greatest on King George Boulevard, whose six lanes and heavy traffic divide the City Centre in two — as Sixta worried. It remains deadly to cross, with 259 injuries between 2009 and 2013 at one intersection (City of Surrey 2017a, 28). The city's current plans for the highway contain the same tensions today as the 1993 plan (City of Surrey 1993, 62–64). The updated 2017 Plan proposes to create a pedestrian-friendly environment on the street while also following "arterial design standards" for this "connection to the rest of the City and the Region," which will continue to carry "35-40,000 motor vehicles a day through City Centre" (City of Surrey 2017a, 116). The city does hope to narrow lanes to create space for bike lanes and sidewalks (Figure 40) (McLeod, personal communication, March 24, 2021; City of Surrey 2017a, 116). It has no plans, however, to reduce throughput.

Figure 40. "Conceptual Sketch of Future King George Boulevard North of 102 Avenue," from the 2017 Surrey Centre Plan, showing the city's intention to create a more pedestrian friendly boulevard, while maintaining the street's through capacity at six lanes (Source: City of Surrey 2017a, 116).

Mayor Watts understood that to shift development paradigms in Surrey City Centre, it was important to overcome not only the economic barriers of engrained car-dependence, but the institutional barriers. By changing leadership at the top, reorganizing departments, and establishing new official priorities, she and others shifted the deep-set norms of car-oriented design (City of Surrey 2008, 43; McLeod, personal communication, March 24, 2021; Dong, personal communication, April 1, 2021; Watts, personal communication, March 30, 2021). And yet, there are limits to how profoundly these institutions can change, in part because voters are not ready for faster change. McLeod emphasized that the city "is not trying to create a war on cars in a community that relies on cars. [Many residents] are hyper reliant on cars in suburbs, and so waging a war on their only mode of transportation isn't going to go over well" (McLeod, personal interview, March 24, 2021). The political self-reinforcing feedback of car-dependent residents can slow institutional change towards walkability.

Political Support for Walkable Growth

Political Intercurrence

Surrey's car-dependent residents would, however, show a remarkable level of support for its nascent walkable downtown — so long as growth did not change their own neighbourhoods or affect the size of their roads. Watts enjoyed a 73% support rating in 2014, her last year in power, in large part thanks to her success attracting growth to Surrey City Centre (Sinoski and O'Neil 2014). The support for walkable development was so widespread in Surrey that, tellingly, Watts' political adversaries adopted her positions. When Watts first ran for mayor in 2005, she criticized the incumbent, Doug McCallum, for allowing business parks and residential sprawl (Luba 2005; Ward 2005). McCallum's party, in turn, criticized Watts for opposing highway widening projects and outward growth (Luba 2005). McCallum lost, and when he ran for Mayor again in 2018, he now promised to outdo Watts' legacy, redoubling efforts to achieve dense, transit-oriented "smart development" (Zytaruk 2018). He won the 2018 election campaign, in which he argued: "[in] far too many cases, new developments aren't effectively connecting their new residents to schools and transit" (Zytaruk 2019). The economic success of Surrey's walkable development had begun to reinforce itself politically, forcing one former opponent to become an enthusiastic supporter.

However, car-dependent residents show greater support for dense, walkable development if it is not in their local neighbourhood. I reviewed 39 public hearings for developments in the Surrey City Centre from 2018 (when online records became available) to 2021 (City of Surrey 2022). 45% of submissions expressed opposition, and an additional 26% identified concerns, whereas only 28% expressed support.[12]

[12] These numbers are based on the summaries of Surrey Council public hearings by the city's clerks. The clerks categorize all written input into three categories: "For", "Against", and "Concern" (City of Surrey 2022). They do not categorize spoken submissions, providing instead summaries of what each participant expressed. However, they often use language indicating one of the three categories, such as "expressed appreciation," "spoke in opposition," or "expressed concern" (City of Surrey 2022). The classifications were therefore largely based on the assessment of the clerks. Some cases, however, required some judgement. If someone offered an idea on how to improve the project, but did not otherwise speak for or against it, I coded this as "concerned." Interestingly, the prevalence of negative comments can be explained, in part, by a small group of highly-motivated individuals: remarkably, just three residents gave 41% opposing comments. One represented a local environmental group that

The projects that attracted the greatest opposition were those that impinged on established single-family neighbourhoods. The three that attracted the most negative comments — between 13 and 18 people — would replace single-family homes. In contrast, many skyscrapers located on former strip malls and parking lots attracted relatively little opposition.

However, there are exceptions to this pattern: some of the very single-family communities that had opposed dense development in the 1980 plan today show strong support for dense redevelopment inside their neighbourhoods. In 2021, Planners launched an update for the Surrey City Centre Plan that would extend its boundaries into two residential communities, including Timbre Heights, a community whose angry residents helped scuttle the 1977 plan (Surrey Leader 1981b). Surprisingly, nearly three quarters of these largely single-family residents surveyed now supported apartment buildings up to six stories tall in their community (City of Surrey 2021b, 5, 13).

This is the only example I have encountered in my research of single-family neighbourhoods welcoming redevelopment. A local realtor — who preferred to speak off the record — offered three explanations. First, these areas had developed a negative reputation for drugs and crime, and many residents would like to shift their neighbourhoods' character through redevelopment. Other interviewees echoed that the two areas had attracted a negative reputation (Klassen, personal interview, March 26, 2021; Hallingham, personal interview, March 30, 2021; Howard, personal interview, April 9, 2021). Second, land values in these areas have stagnated, and residents see redevelopment as an opportunity to reverse this trend. Third, many of the properties are now owned by investors, who support the plan because it will help secure a return on their investment.

While single-family residents often constitute a powerful political barrier to walkable change, they can come to support change if car-dependence no longer serves their interests. Just as traffic can convince some car-dependent residents to support

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opposed the excessive cutting of trees, and the other two focused on the potential traffic and parking impacts.

densification near transit, a collapse in local land values can, it appears, cause some of them to support densification even within their own communities. In this way, single-family residents can shift from being an important factor reinforcing car-dependence into a source of support for walkability, in an example of inverse feedback.

Should Transit Displace Cars or Fly Above Them?

Political Intercurrence

Perhaps the most fundamental tension between walkable and car-dependent design is the question of how to allocate street space. Watts proposed to create an at-grade tram that would displace cars from existing traffic lanes (Sinoski 2009). Her old political rival, Doug McCallum, proposed to build a SkyTrain in the air above traffic, which would cost much more, but would take less space away from cars (Reid 2018a). While dense, walkable growth is popular in Surrey, switching traffic lanes to transit lanes affects drivers more directly, triggering political feedback against change. In the end, McCallum would prevail.

Watts proposed a light rail network rather than an elevated SkyTrain in part because it was cheaper, making it more feasible to create a complete network throughout Surrey, and because it would better attract street life and business investment (Figure 41) (Watts, personal interview, March 30, 2021). “If you want to go from A to B, use SkyTrain,” Watts (2021) told me. “But if you want to animate the street, you need at-grade transit.” Her proposal was at first popular. Watts’ successor as the leader of the Surrey First party — Linda Hepner — campaigned in the 2014 election with a focus on the light rail proposal, and won by a wide margin (Sinclair 2014). The project also enjoyed the support of Surrey’s business organisations (Reid 2018b). The first two routes would have followed King George Boulevard and 104 Avenue, and a third would connect the city of Langley to the South East (Red lines in Figure 41). By 2018, all necessary approvals and funding were secured for these light rail routes from regional, provincial, and federal governments (The Vancouver Sun 2018).

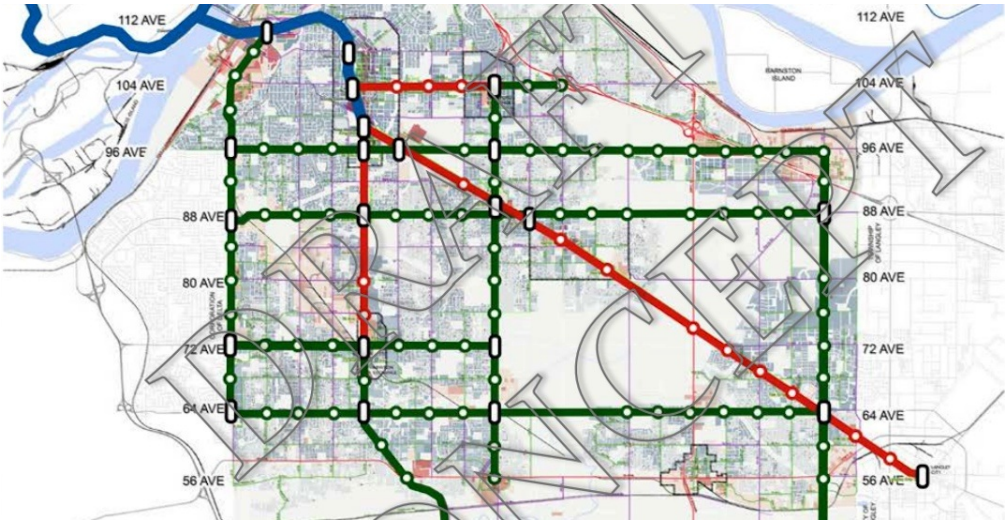

Figure 41. 2018 draft of Surrey's proposed light rail network, issued months before McCallum scrapped the project. Red lines: The proposed first phase of light rail on King George Boulevard, 104 Avenue, and the Fraser Highway to Langley. The diagonal line, on the Fraser Highway, would be replaced with a SkyTrain, and there are no current plans to build the other two lines. Green lines: long-term light rail routes. Blue lines: existing SkyTrain (Source: Chan 2018).

In 2017, however, a group called "Skytrain for Surrey" held protests calling on Surrey to replace the light rail with a SkyTrain (SkyTrain for Surrey 2021). This alerted McCallum that this could be a helpful wedge issue, and in the 2018 election, he made the SkyTrain a central campaign promise (Reid 2018a). In this car-dependent suburban community, it was attractive that a SkyTrain would take less space away from cars.

A SkyTrain is of course not inherently a car-oriented policy. Counterintuitively, however, McCallum would not be the first politician to appeal to car-dependent voters by proposing to replace light rail with grade-separated trains. Former Toronto Mayor Rob Ford — who famously promised to "end the war on cars" — scrapped plans for light rail to invest instead in subways, and his brother, Doug Ford — now Premier of Ontario — recently released a transportation plan that would extend Toronto's subways while also widening highways (Alcoba 2010; Moore, Gray, and Cook 2022). A SkyTrain can appeal to otherwise car-dependent voters because it can replace the one trip that is most difficult to make by car — commuting through traffic to work — and it can also help to alleviate rush-hour traffic by replacing some of those car trips. And it does not consume road space.

However, a SkyTrain to downtown does not meet the needs of people who rely on transit for everyday trips, such as going to daycare, visiting friends, or buying groceries. For such quotidian trips, Walker (2012, 163–180) argues, residents need a complete network of high-frequency routes that connect their entire local area. A high-speed connection to the downtown makes one kind of trip faster, but does little to enable a complete transit-oriented lifestyle throughout one's community.

The Fleetwood Business Improvement Association — which was located on the proposed SkyTrain line — lobbied to build light rail instead of a SkyTrain because, they argued, it would do more to support street life and business development. Their Executive Director, Dean Barbour, called the SkyTrain a "noisy monstrosity" that "moves people," but fails to support "livability" (Reid 2018b). The organization created two renderings to demonstrate the different visual impact of light rail and SkyTrain on the street (Figure 42) (Reid 2018b).

Figure 42. The Fleetwood Business Improvement Association created these two renderings to express the preferable visual impact of light rail on "livability" versus a SkyTrain (Source: Reid 2018b).

However, the majority of residents supported the SkyTrain (The Vancouver Sun 2018). In 2018, McCallum won with a full slate at Council, evicting Surrey First (Watts' former party) from all seats but one (Saltman 2018). The new Council voted unanimously to scrap the light rail proposal within minutes of being sworn in (Johnston 2018). The regional transit agency — TransLink — has since incorporated the SkyTrain corridor into its plans, but it continues to encourage an at-grade transit for the rest of the Surrey Network (Chan 2021; TransLink 2022, 113).

By building a single SkyTrain line, Surrey did not improve transit on King George Boulevard and 104 Avenue (TransLink 2022, 129; Chan 2018). These two routes suffer the worst passenger delays in the entire Vancouver region, measured in person hours (TransLink 2022, 129). In 2019, TransLink released a report that expresses frustration — in muted bureaucratic language — that the most financially viable solutions to this problem are not politically viable:

> Converting general travel lanes or parking lanes into bus lanes is a fast, effective and inexpensive way to improve bus service, [but] the explicit re-allocation of space from one user to another often arouses opposition (CBC News 2019).

Surrey conducted a survey on the issue, and respondents specifically oppose bus lanes there due to, "Increased congestion for private vehicles" (Surrey General Manager, Engineering 2020a, 12). Respondents preferred widening roads for cars along SkyTrain routes, which Surrey now plans to do along the route to Langley (Surrey General Manager, Engineering 2020a, 5, [b] 2020).

Car-dependent residents played a crucial role in supporting walkable growth in Surrey, but they can be imperfect allies to walkability. Due to their political influence, Surrey's recent investments in transit better reflect the needs of drivers than transit riders. Inverse feedback — the support of car-dependent actors for walkability — can play a valuable role in initiating change, but tends to provide only partial support for change. This dynamic may shift, however, in the coming years as thousands of new residents move into Surrey City Centre, and these walkable residents begin to defend their own interests. It may soon be possible for walkability to reinforce itself on its own terms.

Current State of Growth

Transport-Economic Intercurrence

One challenge Surrey faces in becoming a full-fledged downtown is its relative lack of office space. Residential units are currently more profitable than office units, in part because the Vancouver region has some of the most expensive housing in the world (Lee-Young 2022). This makes it difficult to add white collar jobs, a

critical step to make it a downtown with its own economic momentum (City of Surrey 2021c, 4). That said, developers are building some office space, often as part of mixed-use residential buildings (City of Surrey 2021a). Surrey is currently working on an update to the Surrey City Centre Plan to "encourage and grow office development in City Centre" (City of Surrey 2020a)

The reason that downtown office markets succeed is, in part, because companies benefit economically from being located near other companies (Glaeser and Gottlieb 2009; Matthew 1992). This creates another chicken-and-egg for a nascent downtown that has relatively few existing companies: developers may not want to build offices in a place where few companies are already located, but companies can only move there if developers build office space. Surrey planners propose to require developers to build some proportion of office space in new buildings (City of Surrey 2021c, 6). In this approach, residential units would effectively subsidize office space until the office market becomes self-sustaining (Howard, personal interview, April 9, 2021). However, Council recently rejected the planning department's first attempt at creating such a requirement because developers argued the requirements were too high (Zytaruk 2022). The difficulty establishing an office market is one more barrier Surrey must face to transform a single-use car-dependent retail area into a mixed-use, walkable downtown.

Summary

In the 1970s, few buildings in Whalley were more than two decades old, and yet car-dependence had already set in, and it would take half-a-century to begin to dislodge it (City of Surrey 2017a, 26). Politically, the area's single-family residents opposed the density required to turn their community into a downtown, killing the 1977 plan (Surrey Leader 1980b, [b] 1981; Stan McKinnon 1981). Institutionally, traffic standards required wide, car-oriented roads, and the city's engineers opposed pedestrian-priority changes that would sacrifice traffic flow (The Surrey Leader 1980a). Economically, the area's wide roads and large parking lots provided infertile ground for pedestrian-oriented buildings, preventing walkable redevelopment for

many years, even while zoning allowed high-density growth. Car-dependence powerfully reinforced car-dependence.

As in Downtown Kendall, however, the consequences of car-dependence inspired renewed efforts for change, in a kind of self-undermining, inverse feedback. Gridlock traffic was a central motivator. So too was the unattractive, low-value "hodge podge" of "uninspired" and "unsightly" strip malls and parking lots, which though convenient for drivers, were never widely loved (The Columbian 1977b; Odam 1979; The Surrey Leader 1982; The Columbian 1963). Remarkably, a majority of residents in two single-family neighbourhoods now even support replacing their own homes with high-density growth, likely because their property values have stagnated, and they hope a new growth model will enable a rebound (Surrey Leader 1981b).

However, while the retrofit has depended on the support of car-dependent residents, their commitment to driving means they are imperfect allies to the plan. Many residents opposed replacing traffic lanes with light-rail lines. They instead elected a Mayor who promised to implement a single, elevated train line, which would take less space away from drivers, and would not provide relief for two of the most congested transit routes in the region (TransLink 2022, 129; Chan 2018). Fear of backlash also led city officials to continue to prioritize traffic throughput on the City Centre's major roads, and to maintain their size (McLeod, personal communication, March 24, 2021; City of Surrey 2017a, 116). Inverse feedback may enable change, but imperfectly: to the extent a walkable plan depends on people who rely on driving, there is a limit on how walkable the plan can be.

Surrey offers valuable strategies for giving walkable growth a foothold, and allowing it to reinforce itself. The city invested heavily in new public buildings, and concentrated them all on a single block adjacent to transit, which strengthened investor confidence that this one part of the downtown would, at least, become a walkable place full of amenities and street life (General Manager, Planning and Development 2008, 5; Watts, personal communication, March 30, 2021). They further utilized temporary financial incentives and a public Development Corporation to facilitate investment within this area. In this way, they overcame decades of inaction,

and convinced a first set of developers to invest in major mixed-use projects. Once some began to invest, others soon followed, unleashing a "snowball" of development, turning the area into one of the fastest growing communities in the province (City of Surrey 2020b; Robinson 2019; Howard, personal communication, April 9, 2021).

Surrey has also made progress in overcoming institutional path dependence. Mayor Watts replaced the City Manager, which precipitated changes in department managers, who then changed departmental culture and priorities (Spencer 2006; Watts, personal communication, March 30, 2021). The city also introduced urban planners into the engineering department, and located the two departments on the same floor of the new City Hall, which granted planners (who tend to show stronger support for walkability) greater influence in engineering practice (McLeod, personal interview, March 24, 2021; Dong, personal interview, April 1, 2021; Arason, personal interview, March 9, 2022). Engineers and planners report they now see eye-to-eye on the importance of prioritizing pedestrians, cyclists, and transit riders (Klassen, personal interview, March 26, 2021; McLeod, personal interview, March 24, 2021; Dong, personal interview, April 1, 2021; Atkins, personal interview, April 21, 2022).

Beard (1934, 12), an American Political Development scholar, argues that as political advocates fight for a policy, they expand the "toolbox" of arguments and strategies that future advocates can draw on. Surrey has expanded the toolbox for walkable growth, showing how concerted investments in a small urban space can create a critical mass of street life — or at least, the expectation that that critical mass will come — starting a process of investment that can accelerate to a startling pace of growth. If Surrey City Centre succeeds, it may reinforce walkability elsewhere in Canada, tempting other cities to themselves transform parking lots into a downtown.

Chapter 7. Tysons: Islands of Walkability amidst Rivers of Car-Dependence

Every Sunday Morning, in 1991, Jackie Catterton would pack her two kids and drive 120 miles to Tysons Corner, Virginia, through highways and arterials, past parking lots and shopping malls, to an Oldsmobile dealership (Figure 43). There, she would walk past its bright new cars to its body shop, sit in a metal foldable seat, and join 200 other congregants to listen to Pastor Cameron Simmons preach the Word of God. This body shop was no temporary location for their church: "The Lord led us to this place," Simmons told a local newspaper (The Daily News Leader 1991).

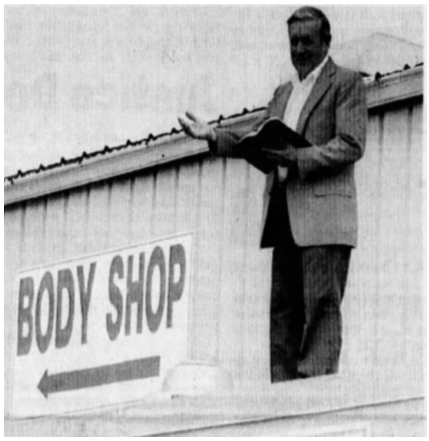

Figure 43. Pastor Cameron Simmons preaches from the roof of an auto body shop (Source: The Daily News Leader 1991).

Kunstler (1994, 96) argues that Americans "worship" the car. This has never been so close to being literally true as in Tysons Corner. The area embraced car-dependence at a remarkable scale. It was the 12th largest office market in the country, and had more retail sales than the nearest major urban centre, Washington DC (Landsberg 1991; Snyder 2011). But unlike Washington DC, Tysons Corner had few homes — only 5,700, compared to its 70,000 employees, in 1993 — and it offered no way to travel but by car (Fairfax County 1994, 91). With every morning rush hour, its population would grow manyfold, and deflate again at dusk, pushing and pulling tens of thousands of vehicles through its many crisscrossing highways and mega-arterials. It was, in a sense, the apotheosis of car-dependent design, a whole city built around

the logic of highways and parking lots, fed by a vast hinterland of single-family homes (Figure 44).

Figure 44. Tysons Corner aerial photograph, 2010. (Source: Photo by La Citta Vita, Flickr, Creative Commons Licence).

Tysons was the central inspiration for Garreau's 1991 book, *Edge City*, which explored this peculiarly American phenomenon: the downtownless downtown, an urban centre with all the functions of a downtown, but with no streets full of people, and with no option but to drive. Garreau (1992, xvi, xxii) saw a bright future for car-dependence, and he wrote the book to celebrate the economic dynamism of "Edge Cities." Just as he was writing it, however, the people who lived and worked in Tysons were becoming frustrated with its interminable traffic (Mullins 2015; The Associated Press 1991). They set about transforming it into a more traditional downtown, offering more options to get around, and a vibrant centre to call their own. It would be the largest suburban retrofit in American history, perhaps the largest in the world.

And yet, few decision makers would prove willing to wholly abandon the design methodologies that had created Tysons Corner, and drivers would push back against proposals to reduce the size of Tysons' roads. Tysons has, therefore, become a new kind of Edge City: one sitting on the edge of an urban, walkable transformation, held back by the powerful momentum of decades of car-dependence.

Context

Tysons is an unincorporated area of Fairfax County in Northern Virginia. It is a large, mostly car-dependent county, and Tysons occupies roughly 1% of its land (United States Census Bureau 2021b). It has a nine-person Board of Supervisors, each elected by district, and a Chairman elected at-large. All of Tysons falls into a single electoral district. The Board of Supervisors appoints a twelve-person Planning Commission, which makes many day-to-day planning decisions and offers recommendations to the Board (Niedzielski-Eichner, personal communication, May 18, 2021; Fairfax County 2021a). While Fairfax has authority over most issues in Tysons, the Virginia Department of Transportation (VDOT) manages its major roadways and must give approvals to changes to them — a fact that would prove consequential.

Tysons currently has a population of 29,000 (Fairfax County 2021b, 15). Its Comprehensive Plan divides Tysons into eight districts, four of which are designated for higher density transit-oriented development (Figure 45) (Fairfax County 2017b, 11). The population of these transit-oriented districts is now roughly 10,000 (U.S. Census Bureau 2020).[13] Residents there are largely wealthy: their median income is $117,000, and only 6.5% fall under the poverty line, reflecting Tysons' high property values (U.S. Census Bureau 2020; Leinberger 2018). As we will see, the economic prosperity of the area likely played a role in allowing this particular retrofit to attract growth.[14] 55% of residents are white, 29% are Asian, 9% are black, and 7% identify by other groups (U.S. Census Bureau 2020). 76% of residents drive to work (of which 6% carpool), 13% take transit, and 5% walk (U.S. Census Bureau 2020). 17% of its homes have been built since 2014, shortly after the updated Tysons Plan was enacted (U.S. Census Bureau 2020).

[13] I estimate the statistics for these four central districts using the following census dissemination areas: 4604 block 3, 4802.03, 4802.02 block 2, 4712.02 block 1, 4712.02 block 2, 4712.01 block 2. Note that their boundaries do not perfectly align with the four districts.

[14] Prosperity, however, is not a necessary condition for retrofits to succeed, as we see in Surrey City Centre, which was relatively low-income prior to the retrofit.

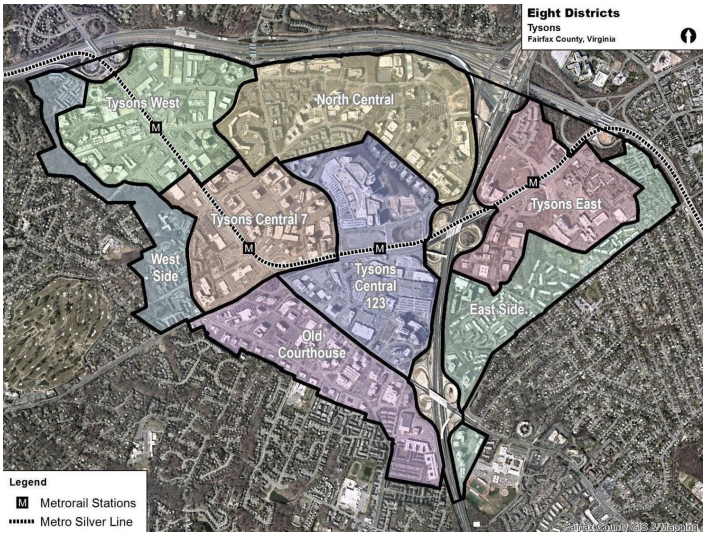

Figure 45. Tysons has 8 districts. The four central districts — Tysons West, Tysons Central 7, Tysons Central 123, and Tysons East — are designated for higher-density, transit-oriented growth. The outer districts are intended to act as buffers with surrounding communities (Source: Fairfax County 2017b, 10–11).

Interviews

For this chapter, I interviewed 16 people, including three community advocates, three elected officials, five Fairfax County urban planners, two engineers (one with Fairfax County, one with VDOT), one developer, and two employees of the Tysons Partnership, an arms-length organization created by Fairfax County to help coordinate the transformation. 80% of people who I contacted for an interview agreed to conduct one. No sector was systematically resistant to speaking.

Origins of Car-Dependence in Tysons Corner

Political and Transport-Economic Intercurrence

Few people had more impact on Tysons' early growth than John Tilghman Hazel. When he was a young boy, he saw developers frame 50-70 homes simultaneously for an early subdivision (Garreau 1992, 379). It was “a big deal,” he said, and he would spend most of his adult life fighting for that model of progress: industrial-scale housing construction made possible by highways (Garreau 1992, 379). He would get his first opportunity as a young lawyer in the late 1950s, helping the Washington DC region expropriate land to build a new highway. The highway ran through Tysons Corner, which was, until then, an intersection of rural roads. In the

process, he became an expert in land-use and property law in Northern Virginia (Mabeus and Andrews 2022). Early car-dependent development inspired Hazel, and he would become a powerful force in reinforcing this growth model.

A developer, Ted Lerner, read about that proposed highway, and he made what then seemed an unlikely investment: to build the country's largest enclosed mall, Tysons Corner Center, on what was then cow farms (Mullins 2015). To secure approvals for such a massive project, he turned to the lawyer who had just become an expert on the subject, Til Hazel (Rein 2022). The next year, another developer, Gerald Halpin, made even bigger bets on Tysons, acquiring over 100 acres of land, largely for office buildings. He too hired Hazel (InsideNoVa 2022). Over the next decade, Hazel was at the front line of court battles — most of which he won — to help these and other developers build what they wanted in Tysons Corner (Mabeus and Andrews 2022; Bacon 2022).

Tysons Corner was well-positioned for growth. It was located at the midpoint between the Pentagon and Dulles Airport, a strategic location for defence contractors (Mullins 2015). Through the 1980s and 1990s, it also attracted headquarters for Fortune 500 companies, offering both low-cost offices and easy access to policy makers in Washington DC. It would attract headquarters for Mitre, Capital One, PNC Bank, Freddie Mac, Hilton Worldwide, and more (Mullins 2015). Successful office markets tend to attract yet more offices, because they offer each other business opportunities, attract an ecosystem of services, and sustain a common talent pool, among other reasons (Glaeser and Gottlieb 2009; Matthew 1992). Tysons' car-dependent office market therefore became self-reinforcing, and by the 1990s, office rents in Tysons approached that of Washington DC (Rensbarger 1997).

Local leaders discussed the possibility of turning Tysons Corner into the region's downtown as early as the 1960s (Fairfax County 1994, 94). What was built, however, depended less on official policy, and more on what developers found expedient — with Hazel's help. Hazel fought ferociously in court, like "a bull in a China shop," according to a friend (Bacon 2022). It likely helped that he was a major donor to the Republican party, and that he would defend politicians in court when they faced corruption charges (Garreau 1992, 352, 385; Phelps 2012, 684; Rein 2022).

Using any tactics necessary, Hazel effectively removed the roadblocks on development, and the result was the simplest, most expedient way to make income off land near highways: office towers and malls surrounded by parking lots (Garreau 1992, 379–382). Tysons came to resemble a downtown economically — a centre of jobs and commerce — while lacking homes, parks, or any cultural centre. And it depended so much on the car, it had almost twice as much parking space as office space (Gardner 2008).

Garreau (1992, 7) describes Tysons as a "Dante-esque vision" that "brings a physical shiver to the spine." However, he interviewed Hazel for the book, and he wrote Hazel's version of events: "When [Hazel] looked out over the land, he saw it as starkly vacant until the brilliance of the human mind was brought to it, to find its most ingenious use... He was the bringer of civilization" (Garreau 1992, 387). The book offers a full-throated defence of car-dependence: "I marvel at how ingenious Edge Cities are, and at how successfully they manage to deliver just about anything quantifiable—like jobs and wealth" (Garreau 1992, xxii). Garreau's central theme is that, despite what planners might think, "Americans basically are pretty smart cookies who generally know what they're doing" (Garreau 1992, xiv). He praises the Edge City's "unprecedentedly low unemployment" and that they have "made a generation of real estate homeowners and speculators rich" (Garreau 1992, 8). Car-dependence reinforces itself, in part, through the advocacy of those who believe it is a superior model.

Proposals for a Retrofit Emerge

Transport-Economic Intercurrence

If Garreau had instead interviewed Gerald Halpin — one of Hazel's first clients, and the largest developer in Tysons — he may have come to different conclusions. Just as Garreau wrote Edge City, Halpin was undergoing a change in thinking. He and a group of developers saw the limits of purely car-oriented growth, and they made a proposal for a new mass transit train line through Tysons to the Dulles Airport, connecting to Washington DC's existing rail network (Levey 2017; Daily Press 1991). In a sign of their influence, the proposal was echoed in the 1994

Tysons Comprehensive Plan (Daily Press 1991; Fairfax County 1994). He would later become a leading proponent for the Tysons Comprehensive Plan (Levey 2017).

Stewart Schwartz — the Executive Director of the Coalition For Smarter Growth, which advocates for transit-oriented development, and who knew Halpin — offers a simple explanation for this shift in thinking: "Tysons was choking on its own traffic" (Schwartz, personal interview, April 5, 2022). As in Downtown Kendall and Surrey City Centre, the scale of car-dependence in Tysons created problems that inspired landowners to seek a new model of growth, in a process of inverse feedback that inspired walkable growth. Nearly everyone who worked at Tysons' hundred thousand jobs had no option but to drive (Tysons Land Use Task Force 2008a, 9). The area's heavy traffic was increasingly eroding whatever locational advantage Tysons had, and the area had few other amenities to recommend it: its parking lots and cheap buildings gave people few reasons to work there (Mullins 2015). Tysons' low-density growth model had also consumed the area's available land, leaving little room for continued growth unless developers switched to a higher-density model (Leinberger 2018). The consequences of car-dependence therefore created opportunities for change.

Fairfax County adopted a new plan for Tysons in 1994 that called for somewhat higher densities, and a style of growth that would mix that of a downtown and a suburb (Fairfax County 1994, 89). The plan describes Tysons' inadequate physical environment:

> [L]arge expanses of parking lots and some open space and the dispersion of uses — a restaurant here, and office building a fair distance away — forces people to get into their cars to travel even short distances. [. . .] Walking is difficult because there is no integrated system of sidewalks (Fairfax County 1994, 94–96).

Little came of the 1994 plan at first, likely in part because Tysons did not yet have mass transit, and in part because its policies did not allow substantial density, creating little incentive to rebuild (Fairfax County 1994, 116–117, 122). And as the plan itself noted, little would change so long as current "uses remain economically viable" (Fairfax County 1994, 95). In the 1990s, Tysons' office market remained successful

and its malls sold more than downtown Washington DC, creating little incentive to demolish existing buildings (Mullins 2015; Landsberg 1991).

The Dot Com crash in 2001 helped shift thinking. Tysons was a centre for technology companies, and when the internet sector crashed, it led to 21 million square feet of office vacancies, an increase of 550% (The Associated Press 2002; The Washington Post 2002). As office property tax revenue fell, the area's small number of homes had to carry a disproportionate burden, leading to a sudden increase in residential taxes of 16.3% (The Associated Press 2002). Meanwhile, a process of walkable self-reinforcing feedback was taking hold at a national level, encouraging a different style of growth. An increasing proportion of employees in the United States wanted to work in downtown environments with local amenities, leading walkable areas to gain value faster than their car-dependent counterparts (Boyar 2016; Frank 2015, 5; Florida and Mellander 2016). Increasingly, Tysons was losing office tenants to Washington DC (Mullins 2015).

By 1999, the state secured federal money for a new train line through Tysons (The Associated Press 1999). It was within this context — with car-dependence undermining itself, and a potential catalyst for walkable growth on the horizon — that Halpin made an unlikely decision that would change the direction of his company, and of Tysons. In 2001, he hired John Gerber, the president of an organization that was redeveloping New York's Pennsylvania Station — the busiest transit terminal in the United States, located in the densest, most walkable context in the country — to be the Executive Vice President of Halpin's development company, West Group (Gerber, personal interview, May 3, 2022). He was an unlikely executive for a suburban developer, but by 2014, Gerber ran the company. At first, the company's support for walkable policies could be construed as a kind of inverse feedback: a car-dependent interest supporting some elements of walkability. However, by hiring an expert from Downtown New York, and putting him in charge, the company effectively retrofitted itself, transforming into a walkable builder, which would reinforce walkability for many years to come.

Gerber emphasizes that Halpin did not know what changes he wanted him to bring, but "he was looking for new ideas" (Gerber, personal interview, May 3, 2022).

Gerber pitched the concept of turning Tysons into a proper downtown, with high-density, mixed-use buildings around transit. Halpin embraced the idea, and he would spend much of the rest of his career advocating for a new Comprehensive Plan (Levey 2017). The concept aligned with the proposals of the Coalition For Smarter Growth, a non-profit that had long called for transit-oriented development, and the company and this non-profit would work together towards that goal (Gerber, personal interview, May 3, 2022; Schwartz 2022, personal interview, April 5, 2022). The developer who built the greatest quantity of car-dependent growth in Tysons became instrumental in shifting paradigms to enable a whole new kind of growth.

While the buildings in Tysons were losing value in the early 2000s, the land itself retained its strategic location between the airport and the capital (Leinberger 2018). The combination made the area ripe for redevelopment. In 2004, state government finally committed to funding four mass transit stations in Tysons (Fairfax County 2017b, 4). In response, developers put forward no less than twenty proposals (Fairfax County 2017b, 4). Conditions were set for Tysons to shift dramatically from its decades of locked-in car-dependence to a radically distinct walkable model. Halpin's change of mind was beginning to physically reshape Tysons. As we will see, however, Hazel would continue to have his car-oriented vision heard in Tysons. Political intercurrence would continue in Tysons, as influential actors advanced divergent visions for the area's future.

Striking a Deal on Growth and Traffic

Political Intercurrence

When developers proposed 20 major development projects in Tysons, the County's elected Supervisors responded with trepidation, fearing political backlash (Fairfax County 2017b, 4). Already, one developer's proposal for a 40-acre, downtown-style "Mini-City" within Tysons was defeated by angry residents, who feared "massive traffic jams to an already clogged area" (Shear 2001). Fairfax County was stuck in a Catch 22: Tysons had deadlock traffic because of its car-dependent growth, yet the County struggled to implement a walkable alternative because the

public feared it would cause traffic. So long as the public associated density with traffic, Tysons was politically locked-into car-dependence.

County Supervisors therefore chose to remove themselves from this politically risky issue and set up a task force to hold consultations on a plan. The Tysons Land Use Task Force would have 36 members, including residents, developers, business people, and sustainability and transportation advocates (Tysons Land Use Task Force 2008b). By putting these diverse political factions into a room together, they could identify whether a politically viable solution could be found.

In 2008, the Task Force emerged with a proposal that, they hoped, all stakeholders could accept. The proposal would direct 95% of growth to places close to some kind of transit, helping to mollify those who feared congestion, while also pleasing environmental and transportation advocates (Tysons Land Use Task Force 2008b, v, 26). It would allow high-density towers, which would make developers happy, and would provide a financial incentive for change (Gardner 2008). The proposal also called for directing development funds to parks, trails, and an arts centre, which helped secure the support of neighbourhood groups (Tysons Land Use Task Force 2008b, 29, 31).

However, these tactics did not eliminate fears. The Task Force proposed 83,000 new residents in Tysons while also calling for “narrower” roads (Tysons Land Use Task Force 2008b, 9, 92). This alarmed nearby suburban residents, who formed a new organization, the Greater Tysons Citizen Coalition, to fight to ensure that Tysons would accommodate all new trips with its own transportation infrastructure, including with wider roads (Trompeter 2020a; Gardner 2008). A member of the group, Sally Horn, explains that in their perspective, if Tysons' population outpaced its transportation infrastructure, “you would be talking about total gridlock” (Horn, personal interview, May 19, 2021). They feared that traffic would overflow Tysons into surrounding communities, leading to “safety concerns, as people zoom through residential streets” (Horn, personal interview, May 19, 2021).

Mechanisms of Inverse Feedback

Political Intercurrence

In 2008, Fairfax County established a committee to translate the Task Force's recommendations into a politically feasible plan (Alcorn, personal interview, May 24, 2021). They adopted strategies to secure the support of car-dependent residents for walkable change, in an example of inverse feedback. Walter Alcorn, who chaired the committee, says residents largely accepted the idea that if the county had to grow, the best place to do so was next to train stations in Tysons, both because new residents would be more likely to take transit there, and if they did drive, it would be in the opposite direction of rush-hour traffic (Alcorn, personal interview, May 24, 2021). The County also promised to require new developments to create Demand Management Programs: strategies to ensure residents drive less (Fairfax County 2017b, 66–71). The Tysons Plan further promised to invest in sidewalks, bike lanes, and bus routes to reduce traffic (Fairfax County 2017b, 19, 71–77).

Remarkably, the committee even found support for placing limits on parking, under the hope that if new Tysons residents had fewer parking spots, they would drive less, creating less traffic. Planners made a similar argument in Downtown Kendall, but whereas it failed to resonate there, it was successful in Tysons (Fernandez 2003). The plan therefore sets no parking minimums for all non-residential uses near stations, and sets parking *maximums* that were lower than the previous parking *minimums* (Fairfax County 2017b, 68; Snyder 2011; Battista, personal communication, May 20, 2021). By framing parking maximums as a tool for fighting traffic, proponents gained further support of car-dependent residents for walkable policy.

And car-dependent residents found other reasons to support walkability. Many liked the idea of having an urban centre they could visit, so long as it did not create excessive traffic (Horn, personal communication, May 19, 2021; Gardner 2008). Philip Niedzielski-Eichner — former Fairfax Supervisor and current chairperson of the Fairfax County Tysons Committee — explains that "people are intrigued by having an urban area that they can go to in the middle of the generally very suburban

area" (Niedzielski-Eichner, personal interview, May 18, 2021). While knocking on doors for election campaigns, he noticed that there is "very broad support for it" (Niedzielski-Eichner, personal interview, May 18, 2021).

As in Downtown Kendall, residents were also persuaded by the "grand bargain": they would happily accept density in Tysons if it meant their own communities did not have to change (O'Neill, Gualco-Nelson, and Biber 2019, 68). Niedzielski-Eichner says that residents understood that if the County could satisfy its needs for growth in this finite area, it could "thereby protect the suburban character of the rest of the county" (Niedzielski-Eichner, personal interview, May 18, 2021). The lack of single-family residents living *within* Tysons also reduced opposition, as in Surrey City Centre and Downtown Kendall. Barbara Byron, the Director of Fairfax's Planning and Zoning Agency, notes that few people bother to come to public hearings to oppose individual developments in Tysons: "In ten years, you could count on your hands the number of people who actually testified" (Byron, personal interview, May 20, 2021).

However, while the support of car-dependent residents for Tysons was critical for it to succeed, they were imperfect allies. Suburban residents were happy to let new residents walk and take transit, but they wanted to retain their own freedom to drive through Tysons unimpeded by traffic (Gardner 2008). Some also feared that Tysons itself would struggle economically without wider roads (Horn, personal interview, May 19, 2021). For people who shop and work by driving, it is counterintuitive that a retrofit might be more successful with narrower roads. To mollify these concerns, the Tysons Plan commits to widening arterials in stages as its residential population rises (Fairfax County 2017b). This promise would, in effect, make Tysons' roads more car-dependent in proportion to the success of its walkable growth. Inverse feedback is important for initiating walkable change, but it is vulnerable to such contradictions, because the priorities of car-dependent residents are unlikely to align perfectly with fully walkable design.

Negotiating new Standards

Institutional Intercurrence

Neither the Virginia nor Fairfax Departments of Transportation (VDOT) had substantial experience managing walkable communities before the Tysons retrofit — and their standards reflected this fact. Most downtowns in Virginia are located within incorporated municipalities, which manage their own streets. This means that VDOT almost exclusively manages suburban and rural roads outside urban centres (Alcorn, personal communication, May 24, 2021; Reich 2018). Outside Tysons, Fairfax is also almost entirely composed of car-dependent development. Fairfax County Supervisor Alcorn underlines this point by noting that the County has never created a system for parking enforcement, because it had never had a street with paid on-street parking (Alcorn, personal interview, May 24, 2021). VDOT, to his knowledge, has never approved a raised crosswalk (Alcorn, personal interview, May 24, 2021). The two organizations' standards were therefore optimized for highways, parking lots, and single-family subdivisions — not walkable places.

VDOT manages Tysons' major roads, which would pose a problem for transforming Tysons into a walkable place. Virginia's Road Design Manual was responsible, in part, for delivering Tysons' car-priority streets, with their wide lanes, high-speed corners, paucity of intersections, and surfeit of turning lanes (VDOT 2021). If Tysons were to create walkable streets, it would need new standards. Fairfax County's Department of Transportation therefore set about negotiating with VDOT to create new, more walkable standards for Tysons (Biesiadny, personal interview, May 13, 2021).

The negotiations were most successful for local streets, which are not critical for moving high volumes of traffic. For such streets, the new standards allow slower speeds, more congestion, sharper turns, narrow lanes, short blocks, and on-street parking (Fairfax County and VDOT 2011; FCDOT 2011, DS–4, DS–10). An example of a street built under the new standards is Boro Plaza, which has achieved a people-friendly, downtown atmosphere — in part thanks to the Tysons Urban Design

Guidelines, which governs the design of buildings (Figure 46) (Fairfax County 2017e).

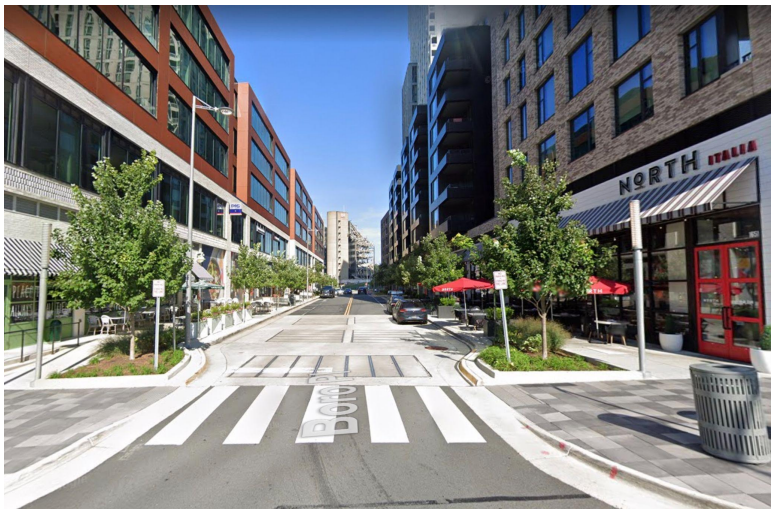

Figure 46. Boro Plaza, a new street in Tysons which follows the Tysons Urban Design Guidelines and which achieves a pedestrian-friendly environment (Fairfax County 2017e). (Source: Google Streetview 2021).

However, like car-dependent residents, VDOT would prove less willing to accept novel pedestrian-priority designs on its collectors and arterials. The new standards did not eliminate the underlying car-oriented framework for designing streets — including level-of-service, traffic studies, and the road hierarchy — but instead attempted to blunt their impacts, while allowing some level of walkable design (FCDOT 2011). The new standards therefore constituted an example of inverse feedback, using car-oriented standards — that were first developed to justify wider roads (Rose and Mohl 2012, 40; DeRobertis et al. 2014) — to instead justify walkability. As we will see, the strategy at least enabled some level of walkability, but it would also generate contradictions, limiting the shift to walkable design.

Plan Outcomes and Its Mega-Roads

The Tysons Plan was approved in 2010 and the response of developers was dramatic. Thirty six major developments have since been proposed in the Tysons area, many of which are massive in scale, resembling small downtowns in themselves (Figure 47) (Fairfax County 2022). Fifty four million square feet of development has been built, totalling $17.9 billion in investment (Fairfax County 2021b, 2; Trompeter

2020b). The area has achieved a more balanced mix of housing and jobs: there were 12 jobs for every resident in 2010, but 6 jobs for every resident today (Fairfax County 2021b, 8). Many of these developments show promise of becoming bustling, walkable places.

Figure 47. A. A map of proposed and approved development applications (Source: Fairfax County 2021b, 9)**. B.** The Mile, a 38 acre development (Source: Fairfax County 2017f). **C.** The Boro, 18 acres (Source: Washburn 2020). **D.** The ViewSpring Hill Station, 32 acres (Source: Architecture 2011).

The rising market demand for walkable development — coupled with Tysons' transit stations — have enabled a remarkable level of momentum for walkable growth. Yet there is one great barrier for walkable growth: the extreme size of Tysons' major roads. The combination of walkable growth and car-dependent arterials has resulted in a unique urban morphology: islands of walkability divided by unwalkable, car-dependent roads.

The Persistence of Vast Arterials

Political and Institutional Intercurrence

A fifteen-lane highway divides Tysons in two, and another runs along its Northern boundary. Tysons' two major avenues — Routes 7 and 123 — span eight to ten lanes, and where they meet, there is a highway-style interchange, occupying eight hectares (twenty acres) in the centre of the community. The interchanges with the actual highways are much larger. One in the centre of Tysons consumes 20 hectares (50 acres). These collectors, highways, and interchanges create substantial gaps in Tysons' urban fabric, as shown in Figure 48.

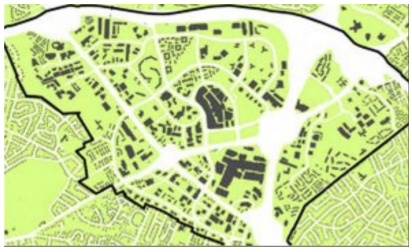

Figure 48. A 2008 diagram of Tysons' built form and the land consumed by its roads (Source: Tysons Land Use Task Force 2008b, 21).

Tysons' smaller collectors and minor avenues are larger than the widest highways in many cities, at seven to ten lanes. In many areas of Tysons, a pedestrian could not walk more than a few blocks without needing to cross a major road, as shown in Figure 49. Car-oriented design has held its grip on these major roads.

Figure 49. Photos demonstrating the large scale of major roads in Tysons. (Source: Functional Classification map from VDOT (2014), with labels added. All photos from Google Streetview (2021), except photo 4, which is by Emily Hamilton, used with permission).

The 2008 Tysons Task Force proposed to fundamentally change Routes 7 and 123:

> The auto-oriented streets of Route 7 and Route 123 will be transformed to tree-lined boulevards designed to calm traffic through the most urban parts of Tysons while still moving traffic. People will be able to walk or bike safely along Route 7 and 123 to nearby businesses (Tysons Land Use Task Force 2008a, iv).

The subsequent Comprehensive Plan endorsed this vision, and the 2011 Transportation Design Standards labels them "low-speed boulevards" (FCDOT 2011, DS–3; Fairfax County 2017b, 9). The Standards envision creating streets with a double row of trees, with "pedestrians moving to and from the Metro and work, browsing at window displays, and shopping in retail establishments" (FCDOT 2011, DS–14—15). The Urban Design Standards goes a step further, and suggests turning them into 4-lane boulevards with a median (Fairfax County 2017e, 2–7, 2–14).

The County's subsequent actions do not reflect these aspirations. The County widened Route 7 by as many as three lanes in places. At its widest, it now has eleven lanes. Advocates encouraged Fairfax County to narrow Route 123, but it kept its current eight-to-ten lane width, and widened it in one location (S. Schwartz 2022).

The County has also widened streets that intersect these roads, such as where Westpark Avenue meets Route 7 (Figure 50). One intersection, next to a metro station — at Route 123 and International Drive — was widened on two sides and lost its crosswalks. Pedestrians must now use a pedestrian bridge.

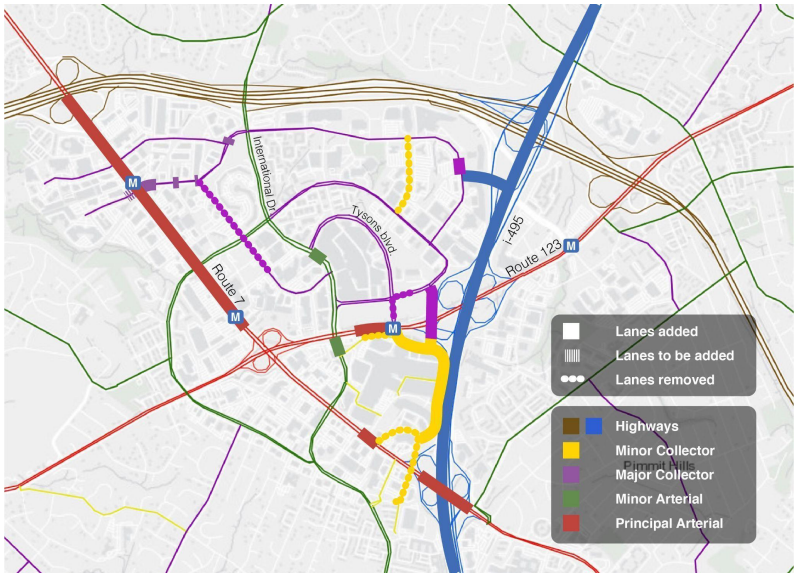

Figure 50. A map showing the changes in the sizes of major roads in Tysons since 2010. (Source: Functional Classification map from VDOT (2014) with roads changes, legend, and metro stations overlayed.)

Meanwhile, VDOT widened the I-495 highway, which passes through Tysons, from 10 to 16 lanes, and plans are currently underway to expand the highway further north (VDOT 2020a, 2–16—2–21). Fairfax County did reduce the size of some roads, but in many cases, they remain wide after losing lanes. A lane was removed from the intersection of Tysons Boulevard and Galleria Drive — next to Tysons Corner Metro station — but pedestrians must now cross eight lanes on both streets (Figure 49, #2). (Other lane reductions were more substantial: Greensboro Drive was reduced to three lanes to add a bike lane).

The County's transportation budget reflects this continued focus on cars. The 2012 Road Fund dedicated $1 billion by 2030 to widening roads, adding highway ramps, and building overpasses in Tysons (Fairfax County Planning Commission 2012, 23). In contrast, it allocated $408 million for new transit services, and only $77 million for bikes and pedestrians (Fairfax County Planning Commission 2012, 23). Toderian (2016) argues: "The Truth about a city's aspirations isn't found in its vision.

It's found in its budget." While Fairfax County (and other layers of government) did invest $2.9 billion in Tysons' metro stations, its transportation budget has since effectively reverted to focusing on the car, rather than on reinvesting in walkability around those stations (Aratani and Duggan 2014).

A similar difference in priorities can be found in the timelines for pedestrian-oriented projects. Fairfax County Supervisor Penny Gross has expressed frustration at how long it can take for the county to approve pedestrian-focused projects:

> The community gets so exasperated and so do we as board members because it seems to take so doggone long to get a simple sidewalk built. [. . .] When people ask for sidewalks or some sort of amenities because their kids are little and they're in strollers, quite often those kids are in college before we get anything on the ground (Taube 2021).

One crosswalk project has been in the works, she reports, since 1986 (Taube 2021). More recently, it took three years to implement a crosswalk at an intersection directly adjacent to Tysons Corner Station (Di Caro 2017).

Consequences of Vast Roads

Transport-Economic Intercurrence

When major roads divide a community, it dramatically undermines rates of walking, because it creates barriers between potential destinations, and undermines the ability of neighbouring buildings to reinforce each other's success, preventing residents and customers from easily walking between them (Mindell and Karlsen 2012). There are also long gaps along these roads where pedestrians cannot cross, because engineering standards recommend restricting access to avenues and collectors (AASHTO 2018, 5–13). Such gaps create what Jane Jacobs (1961, 267–269) calls "border vacuums": places where few people walk for lack of destinations to walk to, which discourages entrepreneurs from opening businesses, which then further deadens street life, creating inhospitable, sometimes dangerous, streets. A reporter recently visited Tysons and described walking there as "manageable, if not enjoyable [. . .] The sidewalk was there, mostly. But the roads were wide, and the cars were going fast." One interviewee who lives in Tysons, and who preferred not to be named, told me she

recently crossed “a two-lane street intersecting a two-lane street, and I felt like I was on vacation.”

The Silver Line — the train transit service that serves Tysons — follows Routes 7 and 123, in part because this was a convenient, low-cost route to build on (Karus 2007). As a result, its stations sit atop highway-like roads, which poses a major barrier for walkable growth. In an internal analysis, Fairfax’s transit agency estimated that the Tysons’ Metro transit attracted almost half as much ridership as their model would predict, given the number of nearby homes and jobs (Di Caro 2015). They attribute this poor performance to the lack of sidewalks and crosswalks (Di Caro 2015).

These wide thoroughfares also likely discourage development next to stations. Eight large development projects in Tysons propose buildings next to Metro stations. In normal circumstances, developers would likely begin construction with the buildings nearest stations because the land around stations is usually the highest value (Salat and Ollivier 2017b). However, research also shows that wide, heavily trafficked roads reduce the value of nearby buildings (Theebe 2004). In six of these eight development projects, nothing has yet to be built next to Metro stations, and in some cases, the first buildings are being built as far away as possible, putting greater distance between themselves and loud roads (Fairfax County 2017d, [b] 2014, 2010, 2003, [a] 2013, 2016, Exception: [b] 2013, Exception: 2007). While parts of Tysons are transforming quickly, the environment around Metro Stations therefore remains characterized by asphalt and blank walls (Figure 51). In an example of intercurrence, transit stations encourage dense development while vast roads push it away.

Figure 51. A successful transit-oriented urban street in Sweden — where commerce and street life can reinforce transit ridership and vice versa — compared to the area around Spring Hill Metro Station in Tysons, where road infrastructure poses a barrier to street life. (Sources. Left photo by Drottninggatan, Stockholm, Sweden, by Jaime Silve, Creative Commons License. Right photo by Stewart Schwartz, used with permission.)

Causes of Wide, Unwalkable Roads

Much of the remainder of this chapter will focus on the question: why do Tysons' arterials continue to prioritize cars and fail to meet the needs of pedestrians, cyclists, and transit users? As we will see, political and institutional path-dependence both play a central role.

Voters' Influence on Wide Roads

Political Intercurrence

As noted above, the 2010 Plan commits to widening Tysons' arterials in part to mollify the fears of the car-dependent residents (Fairfax County 2017b, 19, 71–77). The plan's central justification for investing in sidewalks, bike lanes, and transit is, for the same reason, to reduce congestion (Fairfax County 2017b, 19, 42, 71–77). While this rhetorical move helped to build political support for active transportation in an otherwise car-dependent county, it also weakened the argument for reducing the size of arterials. If the purpose of people walking and biking is to improve traffic flow, it would be illogical to sacrifice traffic flow to improve walking and biking. Justifying

active modes in terms of their value to cars is a clever way to induce inverse feedback — generating support from car-dependent residents for walkability — but it risks reinforcing the argument for larger roads.

Supervisor Alcorn described an internal "battle" over how to design Routes 7 and 123: "one of the questions was, should we treat 123 as a Boulevard? Or should we treat it like a river?" (Alcorn, personal interview, May 24, 2021). In the "river" approach, the County would accept the two roads as barriers that pedestrians would need to cross by bridge or other means. The County chose the river approach, in part, for political reasons: "The public is just not going to be comfortable with squeezing the traffic down into a more kind of more urban type environment" (Niedzielski-Eichner, personal interview, May 18, 2021). Stewart Schwartz, from the Coalition for Smarter Growth, told me his group fought hard to downsize Routes 7 and 123 to create a more pedestrian-friendly environment, and the only change they secured was that VDOT renamed them Low-Speed Boulevards — which he called "Orwellian" (Schwartz, personal interview, April 5, 2022). In effect, the voters who today drive these roads outweighed the hypothetical voters who would one day walk there.

While there was political fighting over widening roads in Tysons, the plan does not acknowledge any such tensions or trade-offs (Fairfax County 2017a, 70–76). Bachrach and Baratz (1962) argue that power is achieved not only by winning policy disagreements, but by shaping what issues are even discussed. That the greatest single barrier to walkability in Tysons is not mentioned in the official documents I reviewed suggests the influence of those who would prefer to prioritize cars (Fairfax County 2017a, 70–76; FCDOT 2011; Fairfax County 2013c, [b] 2011, [e] 2017). It is easier to justify a policy if one does not acknowledge its costs.

Industry's Influence on Wide Roads

Political Intercurrence

Just as Halpin began pushing for walkable development, Hazel was helping to found a new organization, The Northern Virginia Transportation Alliance, to advocate

for expanding highways, including within Tysons (Bacon 2022; Schwartz, personal communication, April 5, 2022). Since the 1960s, Virginia has built highways at a stunning scale: 1,100 miles of highway now crisscross the state (VDOT 2006, 2019). In the process, it created an ecosystem of companies that depend on highway construction, and the Transportation Alliance represents their interests (Schwartz, personal interview, April 5, 2022). The Alliance's board of directors is drawn from a mix of real estate developers, civil engineering companies, road contractors, and other organizations that benefit directly, or indirectly, from highway construction (NVTA 2015). Schwartz (2022) calls this group "The Highway Industrial Complex." The Alliance counts as victories the expansion of the two highways that pass through Tysons — the I-495 and the Dulles Highway — widening each by three-to-seven lanes between 2000 and 2015 (NVTA 2021).

While highway builders and car-oriented developers help fund The Northern Virginia Transportation Alliance, transit-oriented developers help fund the Coalition for Smarter Growth (Schwartz, personal interview, April 5, 2022). Tysons therefore provides a tidy example of Political Intercurrence, with specific organizations representing the separate economic interests of two contradictory growth paradigms. Each organization uses income from those development models to fund advocacy for the continuation of those models, in two mutually-contradictory self-reinforcing processes (NVTA 2021; Schwartz, personal interview, April 5, 2022). So far, in Tysons, the Transportation Alliance has won more battles over the size of roads.

There are, however, wrinkles in this model. While the Alliance advocates for highways, it does not actively oppose walkable development specifically. In fact, the chair of their board of Directors, Margaret Parker, lists "transit-oriented development" as one of her specialties (NVTA 2015). One reason may be that the organization does not need to oppose walkability. As noted above, the official Tysons reports I reviewed do not acknowledge the negative impacts of widening roads on transit-oriented development, which means advocates for wider roads can sidestep the issue (See for example: Fairfax County 2017b, 72–77). Adding active transportation paths and bus lanes to projects also allows road builders to claim they are contributing *to* sustainable development, without having to sacrifice space for cars, which helps them secure funding and expand their project budgets (Marohn 2021, 78–80). The U.S.

Department of Transportation (2022, 1) announced it will give a $1.05 billion loan for expanding a highway near Tysons, justified, in part, because it is a "multimodal project" featuring "pedestrian and bike paths."

And as I note in Chapter 4, the failure to acknowledge tensions between wide roads and walkability tends to favour cars, because heavy traffic discourages pedestrians more than pedestrians discourage drivers (Norton 2011, 222). Smart-growth advocates therefore need to argue for walkable development and against large roads, while car-oriented advocates enjoy the more comfortable position of arguing for both. These nuances notwithstanding, Hazel did express annoyance at all the proposed changes in Tysons. "It's the most successful edge city in America," he told a journalist. "Why do you want to keep messing with it?" (Reilly and Zapana 2012).

Institutional Commitments to Wide Roads

Institutional Intercurrence

There are also many institutional reasons that Fairfax and Virginia's institutions have remained committed to widening roads, and why they struggled to mitigate the impacts of these roads on pedestrians and cyclists. Here I list some of the most salient institutional factors.

Engineering Culture and Embedded Values

Since the 1930s, Engineers have developed a methodology for accommodating traffic with wider roads, and this methodology is built around certain values and priorities that often go unstated. For example, the Tysons Plan focuses on the "level of service" of streets, which assesses only traffic flow, and not the value of streets for pedestrians, cyclists, transit riders, residents, or businesses. In effect, level of service presupposes that traffic flow outweighs all other potential purposes of a street, though engineering documents rarely state this explicitly (DeRobertis et al. 2014; Speck 2018, 102–103). Such methodologies therefore have "embedded values," meaning they prioritize some values above others without saying so directly (Marohn 2021, 1–14; Aicp, Tumlin, and Pe 2014).

Another example is that The Tysons Plan forecasts traffic demand using the Institute of Traffic Engineering's estimates for the number of trips that certain kinds of buildings generate, and then recommends how wide roads must be to accommodate those trips (Fairfax County 2017a, 71–75). These estimates have been shown to overestimate trips, particularly in walkable areas, which then justifies wider roads (Hamidi et al. 2020; Millard-Ball and Siegman 2006). Designing roads based on traffic studies implies that government values fluid traffic more than it values safe, comfortable walking and biking, without stating this explicitly, and the methodology therefore reliably justifies wider roads (Marohn 2021, 91–93; Speck 2018, 100–101; Hamidi et al. 2020; Millard-Ball and Siegman 2006).

The Tysons Plan also uses biased language to imply that wider roads are an inherent good. The plan refers to road widenings as "improvements" that are "necessary" and "needed," without acknowledging the trade-offs between these investments and the pedestrian environment (Fairfax County 2017, 31, 40, 59). Using biased language in this way is a common strategy in transportation engineering, according to Lockwood (2017).

Intentional, Strategic Support for Wide Roads

In some cases, these "embedded values" may be unconscious, but the case of the I-495 expansion provides an example where engineers appear to orchestrate a decision-making process to lead to a pre-decided outcome. The agency started the process by consulting the public on whether the project's "purpose and need" should include "reducing congestion," which, unsurprisingly, the public endorsed (VDOT 2020c, vii). Later, when opponents objected that the project would increase greenhouse gas emissions and could undermine transit-oriented growth, the agency argued that widening the highway was required to fulfill this previously approved "purpose and need" (VDOT 2020d, 17). The project offered only one "build alternative," which opponents criticized as a "conclusions-first approach," in which only one suggestion is offered that could fulfill the stated purpose and need (VDOT 2020b, [c] 2020).

The project's analysis also selectively ignores relevant information. It does not acknowledge induced demand, in which new lanes encourage people to drive more and further. VDOT's report instead forecasts that the added lanes will improve traffic flow until 2045 (VDOT 2020c, 2–10). Research suggests, however, that new lanes usually reach previous levels of congestion within five years, due to induced demand (Hymel 2019; Noland 2001). The report argues, on the contrary, that the new lanes will lead people to drive less, reducing CO2 emissions, "due to fewer circuitous cut-through trips" (VDOT 2020b, 2).

VDOT's I-495 expansion project includes a multiuse pathway for pedestrians and cyclists, which bolster's the organizations' case that the project will "provide additional travel choices" for everyone (VDOT 2020c, 1–14, 1–20). The document evokes the path to justify the project, but does not acknowledge that few people will likely walk and bike along a highway, given the impact of pollution and noise on their comfort (Babisch 2003; Brugge, Durant, and Rioux 2007; Hitchins et al. 2000; VDOT 2020a, 1–14—1–15). VDOT argues the wider highway will benefit transit because it adds high-occupancy vehicle lanes, but the plan does not acknowledge the possibility of using existing lanes for this purpose, rather than expanding the highway (VDOT 2020c, 2–12, [b] 2020, 3). The analysis is perhaps best understood as a political document, selectively including research and considerations to favour a single preferred outcome.

Lack of Knowledge

If engineers have spent their careers designing roads for cars, they may fail to prioritize other modes simply due to ignorance of their needs. Evidence of this can be found in a 2011 study to improve access to Tysons' Metro stations (Fairfax County DOT 2011). The report focuses on whether pedestrians can reach the stations by sidewalks or other means, and leaves out the question of how to mitigate the impact of wide roads and large blank walls near stations on the pedestrian environment (Fairfax County DOT 2011). To omit this issue is to miss what is likely the greatest barrier to pedestrian activity near stations (Speck 2013, 11). The omission does not appear to be a political choice aimed at preserving wider roads, because there is much professionals could have done to improve conditions without narrowing roads. A plausible explanation is that the relevant professionals were using the word "access"

as it applies to cars. Traffic noise and aesthetics have little impact on where people choose to drive, and so if the report's authors had more experience working on car-oriented infrastructure, they may not realize the importance of such issues to walking (Ciscal-Terry et al. 2016; Gehl 2013).

Anchoring

Psychologists have identified a human bias called "anchoring": when people negotiate prices or guess numbers, they tend to start from the first number they hear, and suggest something relatively higher or lower than that, rather than selecting a number optimal for a given situation (Jacowitz and Kahneman 1995; Kahneman 1992). A similar kind of "anchoring" appears to be at play in the transition from car-dependent to walkable standards in Tysons. Officials start with their existing car-dependent standards, and they propose new ones relatively more walkable than that. They may therefore feel they have made major progress on walkability, even while infrastructure remains highly car-oriented compared to a traditional walkable centre. Anchoring can reinforce car-dependence by encouraging decision makers to make only minor adjustments to the status quo, rather than fully implementing the requirements of walkability.

An example of this phenomenon can be found in the redesign of an intersection next to Tysons Corner Station, at Galleria Drive and Tysons Boulevard. After three years of consultation and negotiation with VDOT, the County removed a turning lane and added crosswalks on two sides (Di Caro 2017). While this represents a kind of progress, the intersection remains eight-lanes wide after the changes. If decision makers anchor their expectations to the previous nine-lane status quo, an eight-lane design may seem a kind of progress. However, an eight-lane road remains a barrier for walking and transit ridership, and will likely undermine the success of the transit station (Mindell and Karlsen 2012; Anciaes et al. 2019; Park, Choi, and Lee 2015, 539). Anchoring makes an eight-lane road seem like progress, even while this is wider than nearly all the roads in the other retrofits I study.

Similarly, the county has made investments in sidewalks along some of Tysons' thoroughfares, such as along Route 123, shown in Figure 52. Some interviewees pointed to this as an example of progress (Biesiadny, personal interview,

May 13, 2021; Byron, personal interview, May 20, 2021). The result, however, is a marginal improvement on an eight-lane road and hostile environment. Anchoring can lead decision makers to believe they are implementing walkability even while their infrastructure continues to prioritize cars over pedestrians.

Figure 52. The results of a recent sidewalk improvement on Route 123. (Source: photo by Stewart Schwartz, used with permission.

The Tysons Standards recommend avenues as wide as 6 lanes (FCDOT 2011, DS–10). Again, this would constitute progress compared to Tysons' 10-lane roads, but a 6 lane road remains large, and would likely continue to constitute a barrier. Roads of this scale may seem standard practice to VDOT, which manages over a thousand miles of highways four-to-ten lanes wide (VDOT 2019).

In other cases, the Tysons Design Standards allow walkable designs, and yet are restrictive in where they allow them, treating these designs as exceptions to be adopted with care in special cases. For example, the standards allow sharper turns than would be permitted elsewhere in Virginia, which slow traffic and promote pedestrian safety (FCDOT 2011, DS–20—21). While this represents progress, the guidelines establish seven criteria to implement such corners, including that pedestrian volumes are already high and that car volumes are low (FCDOT 2011, DS–20—21). The Tysons standards were designed specifically for a walkable context, but they continue to treat car-oriented design as the default, while walkable design is something that must be justified on a case-by-case basis, with restrictive criteria. The

standards are anchored to a car-dependent status quo, while taking only small steps towards a walkable alternative.

A consequence of this anchoring bias is that officials involved can feel like "they have moved mountains" to achieve walkability — in the words of one interviewee who wished not to be named — even as they fail to achieve adequate standards of walkability. It leads to a situation where "their self perception is not the same as others." To critics whose expectations are anchored to successful walkable communities, there is a major gap between the plan and its goals. Supervisor Alcorn — who has sat on the appointed Planning Commission for the Tysons area during the planning process — comments that the "results are mixed [. . .] Even the new stuff, you still see echoes of the suburban mindset, and automobile dominant assumptions built into the transportation system" (Alcorn, personal interview, May 24, 2021). Anchoring offers an explanation for why inverse feedback tends to be incomplete: the support of car-oriented institutions for walkable growth is moderated by the sense that car-dependence is normal, while fully walkable designs are extreme.

Multilevel Governance and Inertia

While both the Fairfax and Virginia Departments of Transportation have developed a car-oriented professional culture over decades, it appears that FCDOT has made greater progress on shifting priorities, at least within Tysons. Sonya Breehey, Northern Virginia advocacy manager for the Coalition for Smarter Growth, told a reporter that, "There has been increased focus and leadership in the county on pedestrian safety, which is great. [. . .] However, VDOT continues to be a major stumbling block" (Taube 2021). Tom Biesiadny, Director of the Fairfax County DOT, acknowledged in an interview that Routes 7 and 123 were effectively relegated to "car streets," and told me that, "If we were to do it again today, we might do it differently" (Biesiadny, personal interview, May 13, 2021). If Fairfax County had complete authority over its roads, it may have made greater progress in institutionalizing new design priorities for Tysons. However, VDOT still needs to approve changes to most of the area's major roads. A lesson here is that if it is difficult to shift one path-dependent institution, it is more difficult to shift two simultaneously. Multilevel governance can therefore create additional barriers to change, reducing the likelihood that all relevant institutions will shift to support walkability simultaneously.

Institutional Barriers to Active Transportation

Institutional Path Dependence

There are other institutional barriers to designing streets and buildings to prioritize the comfort and safety of people walking and biking in Tysons, beyond the tendency to create wide roads.

Bike Lanes, Competence, and Selection Bias

The cover of the Fairfax County Bicycle Master Plan shows two middle-aged men confidently biking on a five-lane road with no protection except a thin strip of white paint, which visibly ends in the photo (Figure 53) (Fairfax County 2014a). The plan appears to have been written with these fearless cyclists in mind. It recommends painting bike lanes on uphills, but not downhills, "where bicyclists can typically travel at speeds close to motor vehicles" (Fairfax County 2014a, 28). It suggests adding share-the-road signs on thoroughfares with speeds of 35 to 50 miles per hour (56 to 80 km/h) (Fairfax County 2014a, 30). Only a small minority of proposed bike facilities for Tysons are fully separated from traffic or provide any buffer (Fairfax County 2014a, 50). The plan recommends sharrows — markings on the road that indicate a lane should be shared with cyclists — because their "impact to motor vehicle traffic will be minimal and the benefit for cyclists will be significant" (Fairfax County 2011b, ES–6). Studies have found, however, that sharrows have no impact on cyclist safety (Ferenchak and Marshall 2016). Unprotected bike lanes, meanwhile, provide an insufficient sense of comfort or safety to enable the majority of women, children, or the elderly to bike (McNeil, Monsere, and Dill 2015).

Figure 53. Left, cover of the Fairfax County Bicycle Master Plan, showing a bicycle environment that does not achieve all-ages-and-abilities standards (Source: Fairfax County 2014a). Right, Gallows road, a Tysons bike lane. (Source: Google Streetview 2021 imagery.)

In part, Fairfax's Bicycle Master Plan is evidence of the role of competence in path-dependence: the plan does not appear to have been written by active transportation specialists. Some bike lanes in Tysons — such as that shown in Figure 54 — place cyclists between multiple lanes of high-speed traffic. A market study of Tysons found that the area had made much less progress improving conditions for bikes than for pedestrians and transit, and that only 8% of its roads are suitable for biking (Libby Solomon 2021). Residents told reporters that cycling in the area feels like "flirting with death" (Jordan 2020).

Figure 54. A bike lane in Tysons on Colshire Drive, Tysons. Cyclists describe biking in Tysons as "flirting with death" (Jordan 2020). (Source: Google Streetview 2021 imagery.)

The bicycle plan was shaped, in part, by yet another kind of path-dependent process. The cyclists who gave input on the plan were those who were already biking

in Tysons, which means that potential cyclists, who were not willing to bike on such large roads, were excluded from the process. Bruce Wright is a long-time cycling advocate with the Fairfax Alliance for Better Bicycling and was a member of the Tysons Task Force (Wright, personal interview, May 3, 2021). He told me that when the Tysons plan was first written, his group was largely composed of "middle aged men in lycra," a demographic more willing to bike alongside high-speed cars. These existing cyclists supported sharrows and painted bike lanes because they were the very cyclists most willing to bike in the existing environment, and they did not feel they needed much more protection. But since that time, Wright told me, "our organization has diversified. We've had more women become leaders in the group, and they have stressed the importance of separated bike facilities" (Wright, personal interview, May 3, 2021). He believes the County's future bike lanes will better match all-ages-and-abilities standards.

Recently, Fairfax designers hoped to improve bike lanes by putting them on the other side of on-street parking, so that parked cars would protect cyclists from traffic. This approach is now standard practice among cycling experts, because, as Jan Gehl puts it, "Parked cars are used to protect cyclists [. . .], cyclists are not used to protect parked cars" (The Record 2010; NACTO 2017, 12–14). However, when Fairfax planners proposed this to VDOT, they made little progress: "It's just not in their standards, so they can't do it" (Nixon, personal interview, May 13, 2021). Another planner commented that in this case, "Everybody wanted it," but it simply was not possible under existing rigid standards (Fuller, personal interview, May 13, 2021).

Limited Application of Building Design Standards

Blank walls constitute another barrier to walking in Tysons. The Tysons Urban Design Guidelines classifies streets in terms of their pedestrian priority, and sets lower standards — allowing more blank walls — for so-called "secondary" and "tertiary" streets (Fairfax County 2017e, 2–30, 2–31). It is not unusual to set higher design standards on some streets than others, but if requirements are set too low on secondary and tertiary streets, there is a risk that pedestrians will be buffeted by traffic on one side and blank walls on the other. The Boro's A Building, for example, presents a highly-walkable facade on its southern side — which is classified as a

primary pedestrian street — but it has a blank wall on its other side, on a secondary pedestrian street, where it faces a major collector (Figure 55) (Fairfax County 2014b, 93). (The blank wall covers a structured parking lot) (Battista, personal interview, May 20, 2021).

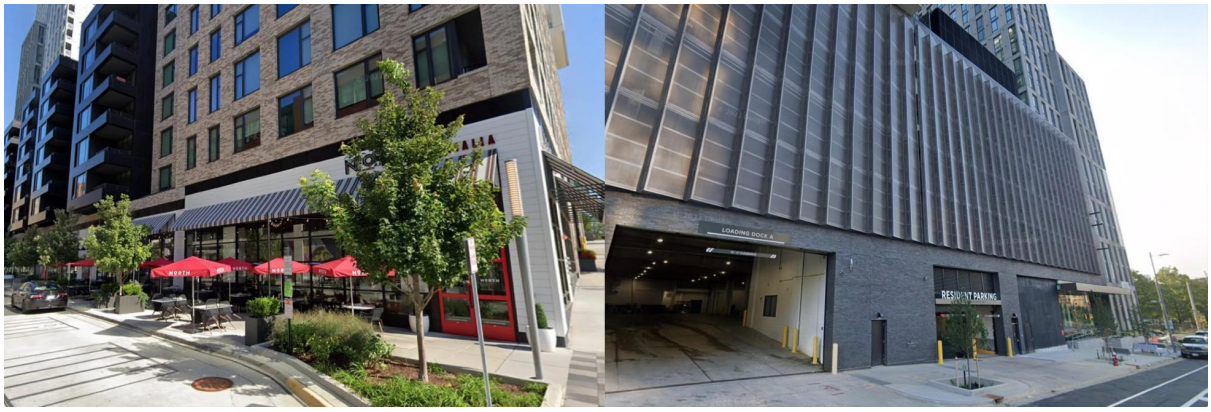

Figure 55. The Boro offers a pedestrian-friendly streetscape on one side (a primary pedestrian street), but a blank wall on the other (a tertiary pedestrian street). (Source: both images from Google Streetview 2021).

One way that car-dependence reinforces itself is by discouraging investment in high-quality pedestrian design. Few people walk on collectors, and so it may seem a waste of money to invest in designing a pedestrian-friendly streetscape there, where few will see it. There is a risk, however, in sacrificing these streets, because pedestrians can rarely rely on primary streets alone to reach destinations, and they are more likely to walk if they have access to a network of people-friendly streets that allow them to reach all potential destinations within the shortest-possible time (Penn et al. 1998, 80–81; Sevtsuk, Kalvo, and Ekmekci 2016). It is important for all streets in a walkable context to achieve some minimum level of pedestrian comfort.

Summary of Institutional Mechanisms

The Tysons Plan throws into sharp relief a multiplicity of mechanisms for self-reinforcing car-dependence because it is an extreme case: a car-dependent commercial centre in a car-dependent county in a largely car-dependent state attempting to become a walkable place. These mechanisms include: the way in which values become embedded in standards and the preferences of bureaucratic subcultures, the limited competencies of people who have worked more on one kind of design than another, the psychological tendency to anchor normalcy to current practice, the

difficulty reforming multiple levels of government simultaneously, the greater influence of car-dependent voters on higher orders of government, and the tendency of unwalkable streets to make it seem unreasonable to invest in people-friendly building facades.

Efforts to Mitigate Car-Oriented Path Dependence

Institutional Intercurrence

Despite the above shortcomings, not every decision in Tysons favours cars above active modes. The County has sacrificed traffic lanes to create bike lanes. Tysons' plans are successfully delivering high-density, walkable, downtown-style developments. This progress has been possible, in part, because both the Fairfax and Virginia Departments of Transportation have made explicit efforts to blunt car-oriented institutional path dependence.

Culture Change and Specialization

Institutional Intercurrence

Tysons consumes roughly 1% of an otherwise car-dependent county. Fairfax therefore needed a way to ensure the planners and engineers working on Tysons understood the project and could acquire the necessary skills it would demand. They therefore created a team of planners and engineers who work specifically on Tysons (Battista, personal interview, May 20, 2021; Byron, personal interview, May 20, 2021). Even if the majority of professionals in the County have little direct exposure to dense, mixed-use design, this specific group now has a decade of experience working on it. As in Surrey, the creation of a multidisciplinary team has helped to reduce the stereotypical tension between planners and engineers, enabling them to design streets that prioritize pedestrians as well as cars (Byron, personal interview, May 20, 2021).

VDOT's leadership, meanwhile, worried that their engineers would be reluctant to accept new street design standards that contradict the norms that apply elsewhere in their work (Lerner, personal interview, May 25, 2021). They adopted a fascinating strategy: they hired someone whose job it was to cajole his fellow engineers into following the new rules. Abraham Lerner has held the position of "Tyson's Corner Transportation Urban Center Liaison" for ten years (VDOT 2012). He explains, in an interview, that if an engineer fails to acknowledge the new standards, "they see Avi Lerner walking into their office and saying, 'remember, this document is called the Tysons Standards. And your comment would be very valid anywhere else, except in Tysons" (Lerner, personal interview, May 25, 2021). He says he has seen progress in the organization. For example, many engineers now accept that in Tysons, they should only add turning lanes as a last resort (Lerner, personal interview, May 25, 2021). In one case, a developer wanted to add a turning lane, and in a sign of change, VDOT joined with the County in refusing the proposal (Fuller, personal communication, May 13, 2021).

Mitigating Traffic Studies

Institutional Intercurrence

Amongst the most powerful institutional mechanisms for creating wider roads is the traffic study, and Fairfax County's Department of Transportation has made efforts to blunt their impact. Traffic studies especially posed a threat to the Tysons Plan, interviewees tell me, because VDOT is prone to adding turning lanes in response to forecasted travel demand, which increases the size of roads at precisely those points where pedestrians need to cross (Biesiadny, personal interview, May 13, 2021; Lerner, personal interview, May 25, 2021).

Fairfax County adopted two strategies to mitigate traffic studies. First, the Tysons Design Guidelines list seven alternative strategies to avoid traffic problems before resorting to turning lanes (Fairfax County 2017e, DS–6—DS–8). Alternatives include adding new streets to the grid, investing in other modes of transportation, or phasing the development to time it with other transportation investments (FCDOT 2011, DS–

6—DS–7). Interviewees tell me this system — which they call the "tiered approach" — enables the county to avoid many turning lanes that VDOT would otherwise have required (Biesiadny, personal interview, May 13, 2021; Lerner, personal interview, May 25, 2021).

Second, Fairfax engineers have adopted a new kind of traffic study — the "consolidated traffic impact study" — that assesses the potential impact of all developments proposed under the official plan as a whole, along with proposed infrastructure investments. In this way, engineers can forecast the proportion of people who will ultimately take transit, use new streets, or walk between new buildings, once these buildings reach full build-out (Fairfax County 2015). This approach helps to avoid the problem that if engineers analyze each building in isolation, it will seem that most users will drive, given the existing car-oriented environment (Biesiadny 2021; FCDOT 2010; Walker et al. 2011). The consolidated approach effectively allows engineers to instead estimate how people will travel after developments have reached a critical mass of walkability (Fairfax County 2021b, 174).

And yet, one development proposed under the rules will soon widen a street from four to five lanes, despite being directly next to a metro station (Figure 56) (Fairfax County 2011a, C–11). While Fairfax County engineers have partially redesigned traffic studies to enable denser growth, they have not eliminated their underlying car-oriented logic. Traffic studies, consolidated or not, continue to be premised on the assumption that it is necessary to match projected traffic volumes with lanes, and therefore reinforce car-dependence (DeRobertis et al. 2014).

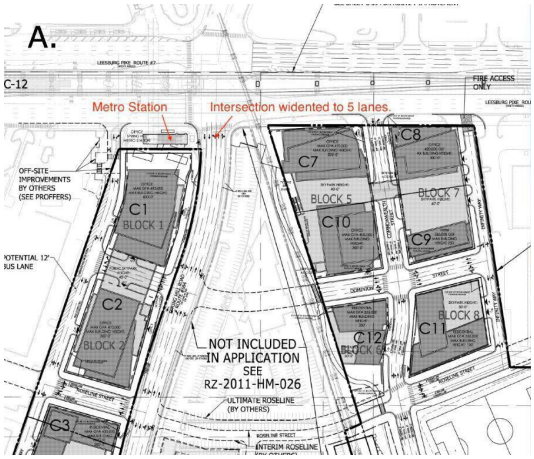

Figure 56. An Intersection that will be widened to five lanes next to Spring Hill Metro Station as part of the Dominion East Development. Red text by author. (Source: Fairfax County 2011a, C–11).

One official, who preferred not to be named, argued the county should have made a more wholesale change in the standards they use:

> If you really had the foresight, you would create mechanisms that are not part of your original suburban mechanisms. In other words, you would not only imagine a whole new place, you'd imagine a whole new kind of regulating system for that place.

If both VDOT and Fairfax County were fully committed to achieving walkable design in Tysons, they could have directly prohibited the addition of new turning lanes and stopped requiring traffic studies, rather than attempting to create complex workarounds to achieve pedestrian priority. The current approach attempts to repurpose car-oriented standards to support walkability in a kind of inverse feedback. Like other forms of inverse feedback, these repurposed standards may make it possible to initiate change, but they retain contradictions that continue to favour cars, creating barriers to implementing walkability in full.

Islands of walkability and Tysons' Future

Despite these barriers, a very different Tysons is emerging between its major roads. On Tysons' local streets — which are unimportant for regional traffic — there are fewer barriers to pedestrian-priority design from VDOT, car-dependent voters, or highway lobbyists. In these pockets, the County has implemented pedestrian-oriented standards that roughly match NACTO's recommendations, with narrow lanes, tight

corners, and sidewalk bump outs (FCDOT 2011). Building design standards require pedestrian-friendly facades, with windows, shops, and doors (Fairfax County 2017e). The Boro is the best example so-far built, but the plans for many others suggest a similar level of pedestrian-priority — such as The Mile (Figure 57).

Figure 57. A concept image of The Mile (Source: Fairfax County 2017f).

Ronit Dancis, who until recently managed the Tysons Partnership's Transportation Demand Management program, described these pockets as "islands of walkability":

> You might have a block, two blocks, or ten blocks that are very walkable. But then there is this very significant road that you would have to pass to get to the next island. And that affects how you move in your neighborhood, how you go shopping, how you walk, how you do bar crawls — how you do everything" (Dancis, personal interview, May 10, 2021).

In a sense, Tysons is an archipelago, with these islands separated by what Supervisor Alcorn calls "rivers": car-dependent roads that pedestrians can only cross with difficulty (Alcorn, personal interview, May 24, 2021).

Unlike real rivers, Tysons' major roads will drag down the value of surrounding buildings with noise, pollution, and visual disamenity (Theebe 2004). Relatively few people will cross those roads to destinations on the other side, which means that roads will inhibit the ability of buildings to reinforce each other's success (Mindell and Karlsen 2012). Tysons is an archipelago of intercurrence, with islands

reinforcing walkable growth, divided by rivers undermining walkability and reinforcing a car-dependent lifestyle.

Risks to Critical Mass in Tysons

Transport-Economic Intercurrence

It remains uncertain whether Tysons will achieve a critical mass of dense, walkable, vibrant development to make this growth paradigm self-sustaining. In Planning Commissioner Niedzielski-Eichner's estimation, Tysons "is close to critical mass," but it has not yet achieved it (Niedzielski-Eichner, personal interview, May 18, 2021). Two major risks to Tysons achieving this momentum include its wide roads and the financial burdens placed on new development.

One challenge is that Tysons must effectively achieve a critical mass separately for each of its islands of walkability. Tysons' elected representative on the Board of Supervisors, Dalia Palchik, comments that:

> There are people who are waiting for that retail, waiting for that vibrant community, waiting for places they can walk to. I think it's a challenge of such a large land area to keep growing these smaller communities within it (Palchik, personal interview, June 4, 2021).

In a sense, Tysons is not a single retrofit, but multiple retrofits, each of which can only partially reinforce each other's success because of the roads that divide them. The probability that any one island will succeed is diminished by having their lack of walkable access to each other (Mindell and Karlsen 2012).

Another barrier to critical mass is that the Tysons Plan depends heavily on developers paying large up-front costs for transportation and other infrastructure, placing a financial burden on new growth (Fairfax County 2017b, 31, 77–78). Sally Horn, who is a member of The Greater Tysons Citizens Coalition, explains that a major priority of theirs was ensuring that Tysons' growth would pay for itself: "We all coalesced around the issue of who's going to pay for the roads. [. . .] Taxpayers who live in suburban communities don't really want to pay for all the new roads" (Horn,

personal interview, May 19, 2021). Developments in Tysons therefore pay an up-front fee and a supplementary tax to cover the costs of new streets and other investments (Fairfax County 2017b, 77–78). The plan also aims to create the majority of new infrastructure by requiring developers to build it as part of construction (Fairfax County 2017b, 31).

While car-dependent residents feared Tysons would constitute a financial burden on the county's suburban communities, the opposite may be true. Tysons currently contributes 7.2% of Fairfax's total budget, while occupying roughly 1% of its land (Tysons Partnership 2021, 5). Tysons' net fiscal contribution of $141 million is greater than the county's total annual budget for Public Works (Tysons Partnership 2021, 5). As a general principle, dense, mixed-use urban centres tend to be net-positive contributors to city budgets, while car-dependent communities tend to be a net drain (Carruthers and Úlfarsson 2008, 1814; Speck 2018, 22–23; Canadian Urban Institute and the International Downtown Association 2013, 46). In Tysons, car-dependent residents were, in effect, successful in ensuring a greater share of Tysons' lucrative tax revenue would improve communities outside Tysons, and that only Tysons' special supplementary fees and taxes would be spent on Tysons itself (Fairfax County 2017b, 78). In this way, the interests of car-dependent communities reinforce the financial interests of car-dependent areas at the expense of walkable areas.

This up-front financial burden on development poses a risk for Tysons' walkable archipelago for two reasons. First, anything that adds to the costs of growth makes it more vulnerable to drops in market demand. As a proportion of annual rents, the fees, taxes, and direct costs developers must carry to build Tysons' infrastructure now roughly equals the costs they carry in New York, one of the country's most lucrative real estate markets (Leinberger 2018). If these costs slow the pace of development, this may become self-reinforcing, because it could signal to other developers that the area will not fully transition into a desirable walkable environment — undermining their willingness to invest in developments that depend on that future. Second, waiting for developers to build new streets delays the construction of the walkable street network. This could create a vicious cycle, in which the absence of walkable streets discourages street life, which could discourage investment in mixed-

use development, which could lead to a lack of investment in walkable streets. Supervisor Niedzielski-Eichner would like to see the County make a greater up-front investment, "creating the context that allows for the development community to see how its investment will be realized" (Niedzielski-Eichner, personal interview, May 18, 2021).

The Potential for Self-Reinforcing Walkability

Political and Institutional Intercurrence

To fully achieve walkability in Tysons, it would likely be necessary for walkable interests and institutions to gain influence over the area, rather than relying on the support of car-dependent residents, and attempting to repurpose car-oriented standards. If Tysons population grows to one hundred thousand — as hoped — and it becomes a downtown, it will gain more voters, and its financial value to the county will grow, increasing its relative influence within Fairfax County (Fairfax County 2017b, 21). It is possible that Tysons will sprout its own class of elite local boosters capable of shaping political decisions to favour walkable interests, as downtown economic actors have done in many cities (Strom 2008). However, it will likely remain politically difficult to meaningfully reduce the size of Tysons' roads, given that the majority of Fairfax county is car-dependent, and it has over a million residents (United States Census Bureau 2021a).

One way that Tysons' local residents could take control of its future would be to incorporate as a municipality. This would allow it to manage its own roads and establish its own standards, as other incorporated municipalities in Virginia have (VDOT 2019; Reich 2018). It would also reduce the political influence of Fairfax County's car-dependent residents. However, the former Executive Director of the Tysons Partnership, Sol Glasner, believes it is unlikely that Tysons will be allowed to incorporate, because Fairfax is too dependent on the windfall taxes it generates. "It's kind of the punchline to a joke rather than something that anybody is really pursued seriously" (Glasner, personal interview, May 24, 2021). It is also unlikely that VDOT will abandon jurisdiction over Tysons' collectors and avenues, as they perform an

important role as regional arterials. For the foreseeable future, Tysons will continue to be shaped by the contradictory priorities of walkable and car-oriented interests, in a state of permanent intercurrence.

Conclusion

Garreau's (1992) *Edge City* helped make Tysons a symbol of car dependence in its most extreme form: one of the country's leading economic centres built around highways and parking lots. Fairfax County's effort to transform it has the potential to become a symbol of something else: the largest suburban retrofit in the world. Leinberger (2018) argues that if it succeeds, it could reinforce walkability at a national level: "other edge cities will take notice and follow Tysons' lead." It risks, however, instead becoming a symbol of incomplete, self-contradictory transformation.

It is remarkable that Tysons has been as successful as it is, given that proponents have had to rely on the political support of car-dependent residents, and have needed to adapt car-oriented standards, to deliver walkable design. Proponents were successful in convincing single-family residents that high-density towers — with little parking — would reduce the traffic impacts of growth; that the new downtown would offer a wonderful place to visit; and that if they accepted growth in Tysons, their own communities would be protected from change. The county blunted the impact of traffic studies by convincing VDOT to accept worse levels of service, and by forecasting the impact of all development combined, allowing more optimistic predictions about walking and transit (FCDOT 2011, DS–4, DS–5; S. Walker et al. 2011). They did not eliminate the road hierarchy, but they did convince the Virginia Department of Transportation to allow more pedestrian-priority designs on local streets and lesser collectors (FCDOT 2011, DS–10 — DS–13). Tysons has, to a remarkable extent, relied on inverse feedback: on using car-oriented groups and standards to support walkability.

However, inverse feedback delivers only incomplete change. Contradictions remain between the preferences of car-dependent voters, the logic of car-oriented

standards, and the needs of walkable design. Car-dependent voters extracted commitments to expanding the size of Tysons' major roads — creating the area's single greatest barrier to walkability — and for paying for new infrastructure with special taxes and fees on Tysons' development, even while Tysons' lucrative tax income already effectively subsidizes car-dependent neighbourhods. The promise that Tysons was a solution for traffic may have made the plan politically feasible, but it also undermined the case for narrowing roads. The new Tysons Standards blunted the impact of traffic studies on the size of roads, but did not eliminate these impacts, and many roads were expanded, including next to transit stations. While the road hierarchy enabled pedestrian-friendly designs on local streets, it blocked pedestrian-friendly design on most collectors and arterials.

Tysons may therefore become a symbol of an incomplete transformation. If the goal of walkable retrofits is to achieve critical mass, Tysons' mammoth-sized arterials are nuclear control rods, inserted into the urban fabric to stifle this self-reinforcing transformation. I am aware of few examples where government has spent so heavily to achieve a goal while spending so heavily to undermine it: billions of dollars on subways, sidewalks, and bike lanes, and nearly a billion dollars for widening roads and onramps, and billions more on widening its highways (Fairfax County Planning Commission 2012, 23; Aratani and Duggan 2014). As Hamilton (2020, 60) argues, "some of the plan's objectives may prove mutually exclusive."

Such contradictions will likely remain until Tysons' population grows to such a point that it can become a political force in its own right, demanding its requirements on its own terms, rather than in terms of what car-dependent residents believe is desirable. And it will likely be necessary to adopt standards specifically developed to create walkable contexts — such as those written by NACTO (2013) — that do not depend on car-oriented methodologies, such as traffic studies, level of service, and the road hierarchy. Perhaps the clearest institutional step Fairfax County has taken towards enabling walkability to reinforce itself is to create a team of planners and engineers dedicated to designing Tysons, so that this team — in an otherwise car-dependent county — can become experts in the logic of walkable design. Otherwise, however, Tysons will likely remain riddled with contradictions,

demonstrating what car-oriented interests and institutions are willing to accept, not what walkability can itself achieve.

Chapter 8. The Uptown Core: Main Street at the Border of Walkability and Car-Dependence

The Uptown Core provides the most vivid example of intercurrence of the four retrofits I study. In the south, it features a compact, pedestrian-friendly community of tree-lined streets and porches. In the north, it features a Walmart, other big box stores, and abundant parking. In between, there is a main street caught between these two worlds: with wide sidewalks, but also wide traffic lanes; streets lined with pedestrian-oriented buildings, but also the view of enormous parking lots; and with sidewalk-oriented retail, which struggle to stay open due to the competition of big box stores. The history of how the community reached this impasse offers insight on how both car-dependency and walkability can reinforce themselves, and may suggest useful interventions to achieve the kind of fully walkable downtown Oakville hopes to create here.

The Uptown Core is distinct from the other three retrofits in two respects. First, city officials hoped to achieve walkable growth there when it was still a greenfield site with no buildings. Second, much of the area was at first owned by a single landowner. However, much of the site has become car-dependent, and land ownership has become more diverse. By the time Oakville approved its 2006 plan for the area, the city was attempting to retrofit a car-dependent area with many landowners, as in the other three cases. The Uptown Core demonstrates, moreover, how difficult it can be to implement walkable growth in a car-dependent context, even when this is the intention from the start.

Context

Oakville is a municipality in the region of Halton. Oakville manages most of the detailed planning in the Uptown Core, but the region sets long-range growth goals, manages services such as water, and has authority over regional roads, including Dundas and Trafalgar, two arterials on the edge of the Uptown Core. The town is governed by a mayor and seven councillors, elected by ward, plus another seven who represent the same wards in Regional Council. Elections are non-partisan.

The uptown core is 113 hectares, comprising 0.8% of Oakville's land. Residents have a mean income of $55,900 annually, compared to $76,500 for the Town of Oakville (Statistics Canada 2016).[15] 38% of Uptown Core struggle to afford housing, meaning they spend more than 30% of their income on rent or mortgage payments (Statistics Canada 2016). It is neither an exceptionally diverse nor homogenous community: 38% of residents are visible minorities (Statistics Canada 2016). 78% of residents drive to work, whereas 14% take transit, 4% walk, and 0.5% bike (Statistics Canada 2016). Its population has nearly quadrupled since 2001, from 1,676 to 6,373 (Statistics Canada 2001, 2021).

Interviews and Research Materials

The chapter is based on 18 newspaper articles and 29 primary materials, such as growth plans and staff reports, dating back to 1962. I interviewed twelve people, including three staff at two development companies, three Oakville planners, two Oakville engineers, two Oakville politicians (including the current Mayor), a planning consultant, and a community leader. 63% of people I contacted agreed to conduct an interview. No sector was systematically reluctant to conduct an interview.

The Path to Car-Dependence and Efforts to Change Course

Oakville first proposed to build the Uptown Core as a second urban centre in its 1961 Official Plan, but car-oriented thinking was so dominant at that time that its proposed policies would have created a car-dependent landscape (Town of Oakville 1961, 9). The plan hoped to undo some of the excesses of early suburban development, aiming to create a new "major urban centre" with a "well-designed" commercial heart, and "to discourage great expanses of housing in areas without community organization or identity" (Town of Oakville 1961, 9, 12, 14). The plan's policies, however, did not match this goal. The plan required businesses to have parking areas three times larger than their floor space, disallowed on-street parking,

[15] These statistics are drawn from the following census tracts: 35240786, 35240787, 35240790, 35240788, 35240789.

separated land uses into separate zones, and proposed a network of main roads six-lanes wide (Town of Oakville 1961, 12, 13, 17). The plan's only reference to walking is a requirement to build sidewalks (Town of Oakville 1961, 19). The plan's policies would lead Oakville to largely focus on building single-use, car-dependent suburbs for many years to come (Town of Oakville 2017, 20).

A developer, Metrontario, bought a large portion of what is today the Uptown Core in the mid-1960s, and at the time, it had no intention of building anything urban or walkable. The company's Chief Operations Officer, Lawrence Lubin, says the company spent most of its history building car-dependent homes:

> We did a lot of suburban subdivisions that were the same as everybody else. We had good planners, but we built to the marketplace, and the market for the 50s, 60s, 70s, 80s was "give me a 50 foot lot with a big backyard and a two-car garage and I'm In Heaven." So we did very well developing and selling relatively nondescript suburbs (Lubin, personal interview, July 13, 2021).

Lubin at first assumed they would build a standard suburban mall in the Uptown Core, "with acres of parking around it" (Lubin, personal interview, July 13, 2021).

The Uptown Core was spared this fate because the town chose not to build there for many decades, while it waited for other land to fill in (Town of Oakville 1961, 19, 25; Berridge Lewinberg Greenberg 1990, 4). By the time it finally did write a more detailed plan in the 1980s, the meaning of an urban core had begun to shift in the planning profession to reflect more traditional walkable design (Hebbert 2003, 200–201; "CNU History" 2015). The new plan proposed to create "a year round, day and night, active town centre" with a tight grid of streets, all lined with a mix of homes, offices, institutions, and commercial destinations, ranging in height from 3 to 12 stories (Figure 58) (Town of Oakville 1987, 5, 6, 7, 12).

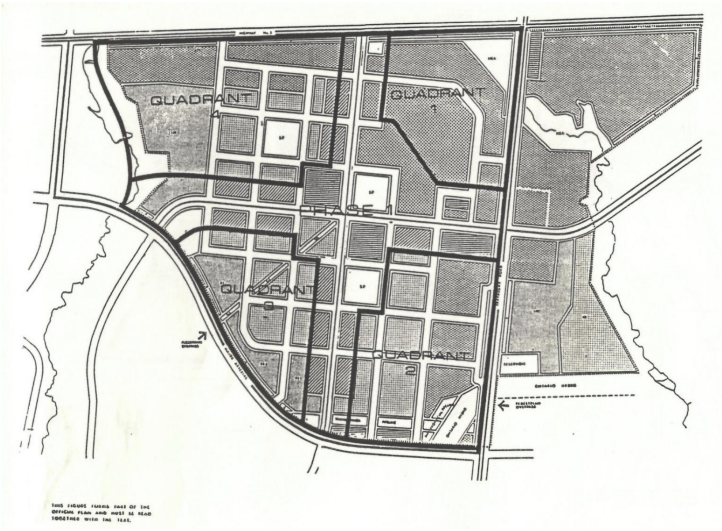

Figure 58. The proposed street layout for Oakville's 1987 Uptown Core plan (Source: Town of Oakville 1987).

Metrontario's thinking had also shifted in those intervening years. They hired a prominent architect to design a mall there, and he encouraged them to build interior streets so that, one day, it could evolve into a proper downtown — an idea that impressed Lubin (Lubin, personal interview, July 13, 2021). Seaside was built in 1981, and Lubin visited it in person because he was curious to see how this new approach to design performed. He began to wonder whether something similar was possible on their own site (Lubin, personal interview, July 13, 2021). Later, Metrontario began to question whether a regional mall was viable in that location due to a variety of regulatory and economic hurdles, but the idea of creating a proper downtown lingered (Lubin, personal interview, July 13, 2021). The town's 1987 plan pushed them further in that direction (Town of Oakville 1987).

Metrontario therefore hired a planning consultancy, Berridge Lewinberg Greenberg Ltd, who had extensive experience in urban centres, like Downtown Toronto, to create a master plan for a truly walkable place (Lubin, personal interview, July 13, 2021). Their proposal reinforced the official plan's commitment to walkability. It proposed a new radial street network to reflect the shape of exterior roads, and shifted heights and land uses, but otherwise maintained the focus on creating a pedestrian-oriented, compact, mixed-use centre (Berridge Lewinberg Greenberg 1990, 12, 34–36).

A central focus of the Berridge Lewinberg Greenberg proposal was to accommodate car-oriented businesses while minimising their impact on pedestrians. It would include a mall in the north east, but the mall would be designed with exterior-facing doors and windows "to maintain a lively retail 'main street'" (Figure 59) (Berridge Lewinberg Greenberg 1990, 33–34). One of the central focuses of the plan was to accommodate parking — "a reality that cannot be ignored, especially in a suburban environment" — without letting it dominate the environment, using on-street parking, or by hiding it inside blocks, back alleys, and parking structures (Berridge Lewinberg Greenberg 1990, 20, 22–23). "Their imagination convinced us to do things differently," Lubin recalls, because "the end result would be a better community and the marketplace was hungry for intelligent design" (Lubin, personal interview, July 13, 2021). As the culture of the planning profession shifted towards walkability, both public and private planners in Oakville began pushing for this proposed urban centre to become a traditional, urban place, aiming to mitigate the barriers that car-oriented design can pose for walkability.

Figure 59. Berridge Lewinberg Greenberg's 1990 plan for the Uptown Core, commissioned by Metrontario, the area's primary landowner. The mall would contain interior streets with exterior facing businesses to create a downtown atmosphere. (Source: Image from Berridge Lewinberg Greenberg (1990) with mall highlight and label added).

Soon, however, the economic logic of car-dependence would reassert itself. Many of the interventions that would make the proposed commercial a more walkable — such as attractive exterior facades and structured parking — would also make it more expensive. A recession struck in the early 1990s, which made such additional costs seem riskier (Berridge Lewinberg Greenberg Ltd 1995b, 1, 4). The recession also encouraged a shift in suburban retail spending from malls to big box stores, which offer lower prices (Berridge Lewinberg Greenberg Ltd 1995b, 1, 4). Metrontario therefore set about redesigning their plan around big box stores rather than a mall.

While the suburban mall is a stereotypical image of car-dependence, the tension between big box stores and walkability is more fundamental. It is possible to integrate malls into downtowns by investing in more pedestrian-friendly exteriors (West and Orr 2003). In contrast, it is more difficult for a big box store to avoid blank walls, ware-house style structures, and surface parking lots, as these are central to the business model: to minimize costs while maximizing retail space and convenient car access (Mitchell 2007, 15). Big-box-store companies also require franchisees to provide abundant quantities of parking, which, in the 1990s, often far exceeded what these stores in fact needed, creating an unattractive environment for walking (Gould 2021). Soon, Metrontario made a deal with Walmart to build there, and further signed agreements with other big box retailers that make a practice of opening near Walmarts (Lubin, personal interview, July 13, 2021).

Nonetheless, Metrontario did attempt to retain the plan's commitment to walkability while building big box stores. Berridge Lewinberg Greenberg (1995b, 5) proposed a solution in a new plan: to visually segregate the big box stores and their parking lots from the rest of the community by creating a line of buildings along a new main street, Oak Park Boulevard (Figure 60). Some of these buildings would be big box stores, but they would be required to face the main street with pedestrian-friendly windows and entrances (Berridge Lewinberg Greenberg Ltd 1995b, 5). This main street would hew to all the same New Urbanist ideals, including a consistent streetwall, small shops, doors and windows on the street, homes and offices above retail, and no surface parking (Berridge Lewinberg Greenberg Ltd 1995b, 5). The plan explicitly acknowledged that the changes were a concession to "the reality of today's

automobile-oriented society," something that would be "realistic and achievable [. . .] while maintaining the spirit and intent of the original Uptown Core Plan" (Berridge Lewinberg Greenberg Ltd 1995b, 14). As one can see in Figure 60, parking lots would play a more prominent role in the plan.

Figure 60. Berridge Lewinberg Greenberg's updated proposal for the Uptown Core plan, replacing the downtown-style and surrounding buildings with big box stores (Source: Berridge Lewinberg Greenberg Ltd 1995b, 5).

The proposal also positioned Walmart as an interim use, until market conditions would favour "additional and denser land uses" (Berridge Lewinberg Greenberg Ltd 1995b, A–99). Heinz Hecht — Oakville's principle planner for the Uptown Core at that time — explains the promise of treating big box stores as an interim use was an important reason they were willing to accept the proposal:

> The Walmart was going to be a commercial catalyst for the area. Yes, it would be drive-through initially. But the thought was that all commercial land uses have a lifecycle to them. The strategy was to put approvals through the zoning bylaw in place, in the official plan, that would allow for the re-adaptive use of these commercial buildings over time to the ultimate vision. Only time will tell whether that's going to be successful or not. But that was the initial impetus, this catalyst to create that commercial (Hecht, personal interview, May 05, 2021).

The new plan maintained a network of streets with sidewalks, in preparation for buildings being erected, one day, along their edge (Berridge Lewinberg Greenberg

Ltd 1995b, 13). The plan expressed hope these streets would bring a somewhat "urban character to the core" (Berridge Lewinberg Greenberg Ltd 1995b, 14).

The original 1961 plan for the Uptown Core was rooted in car-oriented thinking. It did, however, establish the principle that Oakville could create a new downtown, and after decades of change in urban thought, and growth in the market for walkable communities, Oakville's planners and the area's main landowner came to see eye-to-eye on the potential to build a walkable town centre. However, this proposal was fragile in the context of a suburban landscape, and soon the economic logic of car-dependence reasserted itself. In a bid to be "realistic," the developer replaced much of its walkable town centre with a Walmart, big box stores, and large parking lots, while attempting to retain whatever semblance of walkability they could (Berridge Lewinberg Greenberg Ltd 1995b, 14). The plan was the product of urban intercurrence: the competing desire to build a walkable centre within the economic context of an otherwise car-dependent suburban landscape. Parts of the Uptown Core would become walkable, as we will see, but unsurprisingly, car-dependence remained dominant throughout much of the development.

Street Design

Institutional Intercurrence

Outside the big box store area, the primary barrier the plan faced was standard street design practice. The Berridge Lewinberg Greenberg plan called for laneways behind homes so that garages would not face the street, and the street could instead be lined with pedestrian-friendly doors, windows, and porches (Berridge Lewinberg Greenberg 1990, 36). Lubin recalls that these laneways were particularly concerning to officials, who wondered how they would clear snow (personal interview, Jul 13, 2021). Oakville's engineers also proposed to make the main street a relief road for the two neighbouring arterials, Trafalgar and Dundas, which would mean it would be designed for high-volume, high-speed traffic. Lubin was incredulous: "We were trying to create a little village type of feel, and they want a Highway bypass" (personal interview, Jul 13, 2021).

Traffic studies also predicted the community would have high traffic demand, requiring wide roads throughout the community (Hecht, personal interview, May 05, 2021; Lubin, personal interview, July 13, 2021). Studies predicted high traffic, ironically, precisely because the community was dense: traffic models assume each unit produces a certain number of traffic trips, regardless of whether the community is designed to be walkable or not (Millard-Ball and Siegman 2006; Hamidi et al. 2020). The town's traffic studies effectively required wider roads in response to density, undermining the community's walkability in proportion to its success at becoming walkable.

One reason it was difficult to implement walkable street designs, Lubin reflects, is that many of the town's officials lacked exposure to this new model of walkable development: "Oakville had never experienced any kind of development like this" (Lubin, personal interview, Jul 13, 2021). For decades, the city had only built "curlicue suburban streets," and when they looked at the Uptown Core proposal, "all they saw — especially the engineers — were problems." Lubin therefore identified a surprising strategy to break the city out of its institutional commitment to car-dependence: Metrontario paid for plane tickets and took officials to see walkable communities in person.

> We organized a tour, to take a number of the planners, engineers, and Council members, along with our planners and engineers, and go down to the United States to see communities that had the kinds of designs we were hoping to build. We went to the Back Bay Area of Boston. And we'd stand on a street and everybody's 'ooing' and 'aweing' about this beautiful street. And I asked, 'what do you like about this street? What is it that makes it so special?' And they talked about the proximity of the houses to the street and the front porches. And the fact that garages were recessed, so they weren't the dominant, visible feature on the street. And how the scale of the houses related to the street. We had people pacing off the distance to the facade of the house and the width of the pavement, and how far back the garage was. It was really amazing. We also went to a development outside of Washington. And we went to the Kentlands, which was a New Urbanist development (Lubin, personal interview, Jul 13, 2021).

This vivid, first-person exposure to successful walkability helped to shift institutional thinking. The town did, in the end, accept the back alleys, on the understanding that they would receive the lowest priority for snow clearing (Lubin, personal interview,

Jul 13, 2021; Zavaros, personal interview, Jul 13, 2021). The company also convinced engineers to keep most streets narrow, at only two lanes, under the understanding that a grid would move high volumes of traffic without requiring any individual street to be high capacity. “If something got blocked,” Lubin explains, “you could always find your way out just by making a right and a left turn. We anticipated a lot of traffic, but we were providing many ways to disperse that traffic” (Lubin, personal interview, July 13, 2021).

However, engineers did require Oak Park Boulevard to be wider than originally hoped. The street has four lanes plus a turning lane at all intersections, meaning it is five-lanes wide at all places where pedestrians cross. Its lanes are 3.3 to 3.5 metres wide, whereas NACTO recommends 3 metre lanes for walkable areas (Berridge Lewinberg Greenberg Ltd 1995a, Blocks 5, 11, 19; NACTO 2013, 35). The street does have on-street parking, which helps to slow traffic (Speck 2018, 150–151). However, parking is removed during rush hour, exposing residents to greater volumes of faster cars, with less protection, during the busiest time of day (Oakville 2011, 7–25). The city treated traffic flow as a minimum requirement, while treating pedestrian comfort on the main street as something that could be compromised.

Walkable Residents Defending their Interests

Political Intercurrence

The new Uptown Core Plan was approved in 1995, and soon, Metrontario started construction, building big box stores in the north and a residential community in the south. Metrontario stuck much more closely to its original 1990 plan for the residential neighbourhoods in the south (Berridge Lewinberg Greenberg 1990; Lubin, personal communication, July 13, 2021; Zavaros, personal communication, July 13, 2021). The residential area’s streets are narrow to slow traffic, and are lined with trees on both sides. Homes face the street with porches, windows, and doors (Figure 61). Homes are narrow with small backyards, providing a level of density that can better pay for the cost of the lanes, and which also helps support nearby stores and transit.

Together, it is a pleasant environment, which, a local resident, Michelle Knoll, says encourages people to spend time on the street:

> What I know is this is a walking community. When you go outside, you will see people go by you on bikes, you will see people in the parks, you will see people walking by to another park. People say hello. It's a busy place (Knoll, personal interview, Jul 12, 2021).

Figure 61. The Uptown Core's pedestrian-friendly residential streets. Features that support walking include: its narrow street, on-street parking, trees, porches, and the absence of garages (Source: Google Streetview 2021).

Four years after the community's first residents moved in, they demonstrated a willingness to defend the walkability promised in the plan (Oakville Beaver 2001a). In 2001, Daimler Chrysler proposed to build a car dealership at the corner of the community's nascent main street, Oak Park Boulevard, and Trafalgar Road (Oakville Beaver 2001a). Residents accepted that a large chunk of the community's northern area would be devoted to big-box stores, as this was the original plan, but they objected to building such a car-oriented store at the entrance of their main street (Oakville Beaver 2001a; Knoll, personal communication, Jul 12, 2021).

The area's zoning called for hotels, office, retail, institutions, or "limited auto uses," so long as repair facilities are not visible from the street (Town of Oakville 1987). Oakville planners recommended Council to approve the dealership, arguing it was consistent with zoning, but nonetheless required the dealership to apply to

Council for an amendment, likely, in part, in response to public anger (Oakville Beaver 2001a, [b] 2001; Nelson 2001, 6–7). The staff report on the amendment acknowledges that the goals of the Uptown Core plan were to create a place that functions "similar to the existing downtown," and the eventual "elimination of permanent large areas of parking" (Nelson 2001, 5). Remarkably, however, staff considered the dealership consistent with these goals because its sales building was located on the street and because it does not interrupt the sidewalk (Nelson 2001, 5). The report acknowledges no tension between a car dealership and the plan's goals to create a pedestrian-oriented main street (Nelson 2001). The disconnect may be evidence of the lack of institutional knowledge in Oakville regarding walkability, in a town that remained largely car-dependent.

A newspaper records the emotional local reaction:

> Residents said the [proposal] flies in the face of the overall plan for the area. Most bought into the future of the Uptown Core — a bustling centre that will feature a main street of shops, restaurants, businesses and homes resembling a more urban landscape, rather than the more traditional suburban concept of malls, parking lots, subdivisions and front yard garages (Oakville Beaver 2001a).

Local resident Carl Vreuge told the paper, "We want parks not parking lots. We want quiet tree-lined streets not raceways for minivan test driving" (Oakville Beaver 2001a). Cheryl McNeil expressed frustration that the plan she had bought into was already being eroded: "We did not anticipate our trust would be betrayed scant four years after the first homeowners moved in" (Oakville Beaver 2001a).

Like Oakville planners, the local newspaper, the Oakville Beaver, saw little contradiction between a dealership and a main street. It editorialized that there was "no reason not to" approve the dealership (Oakville Beaver 2003b). The paper chastised residents: "Too often these days, planning is done on emotion rather than sound principles" (Oakville Beaver 2003b). Jason Speers, in response, attempted to convey the contradiction: "Would you approve this if it were in downtown Oakville"? (Oakville Beaver 2001b). Speers worried such car-oriented retail might become self-reinforcing, attracting other dealerships in a process that could shift the economic

momentum of the street increasingly towards car-oriented design (Oakville Beaver 2001b).

Residents gathered 320 signatures against the dealership, and when the proposal was presented at Council, they arrived wearing pins saying, “Stick to the plan” (Oakville Beaver 2001a, [b] 2001). To appease residents, the dealership proposed to build a three-story mixed-use building between the dealership and the rest of the main street (Oakville Beaver 2001b). Nonetheless, Council rejected the dealership 6 to 4 (Oakville Beaver 2001b).

This victory — though short-lived, as we will see — is an important demonstration of the potential for walkable residents to organize to defend walkability. Unusually, they organized not to oppose density, but to demand it (Oakville Beaver 2001a). The area’s councillor, Jeff Knoll, underlined this point: “We don't want flowers and fountains. Give us a stinking six-storey huge corner operation” (Oakville Beaver 2001a). Jason Speer, the president of the Uptown Core Residents Association, criticized this lack of density, arguing that it would bring too few employees to support a “coffee shop” or other businesses on the main street (Oakville Beaver 2003a). Just as car-dependent residents tend to reinforce car-dependence politically, walkable residents may reinforce walkability.

The walkable design of the community’s streets may have played a role, though indirect, in enabling this level of community mobilization. Its streets were designed to encourage residents to spend more time on porches and walking on the street, which, research suggests, supports higher levels of social capital — a measure of how well people know each other (Plas and Lewis 1996; Fennell 2014; Cabrera 2010, 226; Leyden 2003; Mazumdar et al. 2018; Teorell 2003). Residents of walkable communities also tend to volunteer more for local organizations, in part because they spend less time, on average, commuting (Wright et al. 2017, 17; Mattisson, Håkansson, and Jakobsson 2015). Social capital, in turn, enables higher levels of political mobilization (Teorell 2003; Putnam 2001). Michelle Knoll (2021)reflects that, “I do find, interestingly, that we are extremely well represented at Town activities, hearings, or any kind of community event. It's not unusual to see two or three people from the community at a public event somewhere” (Knoll, personal

interview, July 12, 2021). She says a resident needed to replace windows on his third floor and asked neighbours for help, and, she recalls, some fifty residents signed up for the work party (Knoll, personal interview, July 12, 2021).

If walkable neighbourhoods can support higher levels of social capital than car-dependent communities, this may grant them a small political advantage, reinforcing walkability. Residents also shared an unusually high level of political consensus on the issue because they self-selected to live in the community. Knoll recalls that the marketing materials sold the community as a "live, work, play" environment, and she says it impacted who moved there: "It really rang true for a lot of people. People moved here because they wanted to be a part of a community, they wanted to know their neighbours" (Knoll, personal interview, Jul 12, 2021). If residents continue to self-select based on walkable preferences in this way, the influence of walkable communities may grow as their populations grow.

However, while the community won the battle with the dealership in the political arena, they subsequently lost in administrative appeal. In Ontario at that time, developers had the recourse to appeal to a semi-judicial tribunal called the Ontario Municipal Board, which had the authority to overrule local land use decisions based on official planning policy (Moore 2021). In 2003, it found in favour of the dealership, which was built soon after (Figure 62) (Oakville Beaver 2003a). In one concession to the community, the dealership did make good on its promise to build a mixed-use building on the western half of its property. The building is six stories, with retail lining its ground floor. In a small demonstration of transport-economic intercurrence, the shops next to the dealership remain vacant, while the shops next to the main street are full of businesses.

Figure 62. The Uptown Core's Daimler Chrysler (Source: Google Streetview 2021).

The loss was demoralizing to residents. One wrote to the local paper: "My family moved from the Oak Park area once the onslaught of Official Plan Amendments began to surface, and once the original vision started to erode" (Jarviste 2003). Knoll observes that since then, most of the original residents have left, and new residents, she finds, do not self-select to prioritize walkability or community to the same extent:

> Twenty years ago, certainly I knew the names of everybody, and the names of their kids. It was a close knit community. But now, you have new people who are pissed that there's nowhere to park their car. I don't understand. You bought a home with no driveway and two parking spots (Knoll, personal interview, July 12, 2021).

Cabrera (2010, 226) finds this is a general pattern: social connectedness is strongest in the first generation of New Urbanist residents, as they are the ones most attracted to the community's original intent, but the level of connectedness erodes somewhat over time. If a walkable retrofit does not quickly become sufficiently walkable to continue attracting residents who desire walkability, it may lose the benefit of people self-selecting to prefer that kind of growth.

All that said, the Uptown Core remains unusually politically receptive to density and mixed-uses. In 2015, the town initiated a review of the Uptown Core's growth plan, which allows much greater density throughout the northern and eastern portions of the community. Carly Dodds, the lead planner on the file, says that so far, few people have attended public meetings, which is "like a vote of support. If

[residents] are sort of happy with how things are going, they don't tend to make a point to come out" (Dodds, personal interview, April 16, 2021). One could expect a different reaction if this were a single-family neighbourhood (Moore 2021; Sweeney and Hanlon 2017). It appears that those who buy homes and rent in the Uptown Core continue to oppose density less than many single-family communities.

The Struggle for a Main Street

Institutional and Transport-Economic Intercurrence

While the residential neighbourhood feels highly walkable, much less progress has been made on turning Oak Park Boulevard into a walkable main street. The majority of its proposed mixed-use buildings were never built (Figure 63). A pub and convenience store went out of business there after the first year, and it was difficult to replace them, because, Lubin explains: "It's very easy to get the first tenant into retail. It's very, very difficult to get the second tenant in when the first one has gone bankrupt" (Lubin, personal interview, Jul 13, 2021). A new pub has since reopened, but many of the other shops have been replaced with dentist offices and real estate agents, which are able to pay higher rent, but which generate less street life and vibrancy than traditional main street shops and services. In contrast, there are currently 46 businesses in the big box retail area, with no vacancies (Zavaros, personal interview, July 13, 2021).

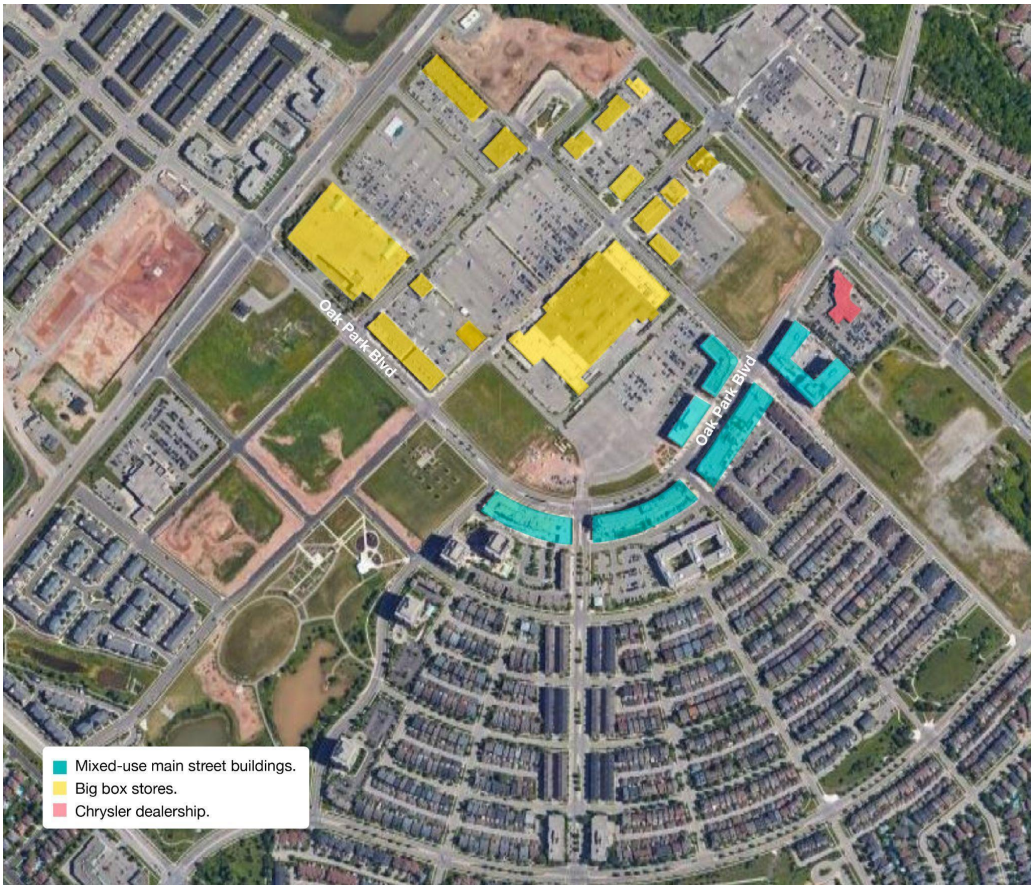

Figure 63. Since the plan has passed, the development of big box stores has outpaced the development of mixed-use buildings on the main street (Source: satellite imagery from Maxar Technologies (2022b), with highlights and legend added).

Residents, politicians, and landowners have all expressed disappointment with the main street. Oakville's Mayor Burton laments:

> The original plan was this European-style utopia. And nothing even close to it was delivered. Instead of a village atmosphere with craftsmen operating street level shops and living above them, you got Walmart, and acres and acres of parking lot. That was the promise. And that was the result (Burton, personal communication, Jul 12, 2021).

One Metrontario employee acknowledges that the street remains excessively "sterile." Michelle Knoll, a resident, complains that other residents refer to the community as the "armpit of Oakville," because of its view of parking and blank walls.

There is a mix of economic and institutional reasons why this walkable street has struggled while its car-dependent neighbours have flourished. One reason is that the plan allows relatively little density to entice development. The street imposes the

costs of mixed-use buildings, but only allows four stories of height, enabling relatively few units to cover those costs (Rabianski et al. 2009, 211). The company has therefore erected buildings at a slow, careful pace: “We were trying to do it when the time's right,” Zavaros explains, “but we're not going to lose our shirts on it either” (personal interview, July 13, 2021).

Gabe Charles, the Director of Planning at Oakville, acknowledges that they may have allowed too little height the street to incentivize growth:

> We were very cautious to make sure that we maintain that main street feel. And so that meant keeping the heights a little bit lower. Looking back, we didn't do it well enough, because we ended up with very long delays, which really don't lend itself to a really great pedestrian environment (Charles, personal interview, May 5, 2021).

The current review of the Uptown Core may provide an opportunity to increase height limits to speed up development on the main street and elsewhere in the Uptown Core — depending on public feedback (Hecht, personal interview, May 05, 2021).

The slow pace of development may have ironically increased the risk that these buildings would fail. The Berridge Lewinberg Greenberg (1995b, 5) plan depended on the idea that a line of buildings would block the view of parking from the main street. However, Metrontario has so far built buildings on a single block on that side of the street, and parking therefore continues to discourage street life. Once it became clear that the mixed-use buildings were struggling to attract retail, this further discouraged the company from building these buildings, and they have since built few of them. By leaving the street exposed to a car-dependent landscape, the company effectively allowed car-dependence to reinforce itself at the expense of walkability.

Car-dependent retail is also often able to outcompete walkable retail on prices. Big box stores keep prices down, in part, by investing little in their exterior environments, providing only basic blank walls and parking lots (Salkin 2004-2005, 52). In contrast, it costs considerably more to build pedestrian-friendly, mixed-use buildings, requiring higher rents for commercial spaces, and therefore, higher prices (Rabianski et al. 2009, 211). The single-use nature of the big box area also hurts

sidewalk-oriented retail because it contains no homes, which means half of the main street's potential catchment area contains no pedestrian customers.

While the Walmart outcompetes walkable retail, it reinforces the success of car-oriented retail. Joseph Cimer — the Senior Development Director for SmartCentres, a company that now owns much of the big box area — explains how big box stores support each other:

> Everything feeds off itself. So Walmart being the major player, the major tenant, it draws people, who might think, 'I need a haircut. So I'm gonna go First Choice across the way.' So that's how our shopping centres work and have always worked (Cimer, personal interview, August 4, 2022).

Eight new big box buildings have been erected in the last decade, while main street retail continues to struggle (Zavaros, personal interview, July 13, 2021). Mayor Burton argues that it never made sense to conceive of a Walmart as an interim use: "The lesson is that land use planners are really good at spinning fantasies. They use words that the public has begun to decode. 'Transition,' for example, can be much longer than your lifetime." So far, car-oriented retail has acted not as a stepping stone to walkability, but instead as a catalyst for more car-oriented growth. The town's Planning Director, Gabe Charles, acknowledges there is a risk in giving such big box stores "a toehold," because they can "become permanently temporary" (Charles, personal interview, May 5, 2021).

Oakville's car-oriented street design standards further undermined street life. Lubin recalls that someone on city staff complained to him that the main street has not become what was promised, and he responded, "we never got the main street we were promised":

> You have done nothing that we wanted to enhance the feel of the main street. You want the cars travelling as fast as possible. There's restricted [on-street] parking. The street is wider. The trees are few and far between. There's nothing that you've done to enhance it as a main street of a village (Lubin personal interview, July 13, 2021).

The town designed the street — its width, turning lanes, and lane widths — primarily in terms of its role as a thoroughfare, rather than its role as a main street.

The big box stores enjoy the advantage of being car-oriented businesses in a car-oriented environment, with abundant parking and access to two major arterials. In contrast, the main street is compromised by the continued dominance of parking lots, with wide lanes on a large road. The town and developers were willing to build big box stores and their parking lots at full scale with few compromises, in part because such projects matched their standard practices. In contrast, all parties approached building a walkable main street with caution and ambivalence, only providing partial priority to pedestrians and erecting fewer buildings than would be necessary to create a viable ecosystem of walkable homes and businesses. Car-oriented big box stores therefore thrive while the main street struggles.

The Exception: Walmart Encouraging Walking

Transport-Economic Intercurrence

Broadly, I find car-oriented retail undermines walkability. However, there is an exception to this pattern, offering an example of inverse feedback, in which car-oriented retail can, to some extent, contribute to walkability: many local residents walk to the big box stores. While their parking lots offer a poor environment for walking, they are located within a fifteen-minute walk of almost every home in the community, providing a level of convenience that may outweigh, to some extent, their visual disamenity. Local resident Michelle Knoll describes the role of the big box stores in the community in a largely positive manner:

> People walk to the Dairy Queen and hang out there. There's a fish and chips store there, and a breakfast restaurant, both with patios there so people meet their neighbours there. You got a mum with young kids and she can put them in the stroller and walk up to Walmart or Loblaws and get your diapers or your groceries. There's a Bulk Barn up there as well, and a little restaurant, Julia's. So, for us, it's part of the walkability, even if it's not maybe in the purest form of New Urbanism (Knoll, personal interview, Jul 12, 2021) .

Knoll resents that people say the community has “failed” and that “it's not really a New Urbanist community because there's a Walmart there.” She responds, “Okay, we walk to the Walmart, we walk to the Dairy Queen, we walk to the cafe.” This exception is possible, Knoll empasizes, in part because planners insisted on a

complete network of usable sidewalks throughout the big-box area (Knoll, personal interview, Jul 12, 2021).

None of this is to say that big box stores will support walkability long term. Less than 8% of people walk or bike to work in the Uptown Core, and 0% do in some areas (Statistics Canada 2016). While some people are willing to walk to shops through large, expansive parking lots, research suggests that many more would walk if stores were available on pedestrian-friendly streets (Dadpour, Pakzad, and Khankeh 2016, 8; Arvidsson et al. 2012; Ewing and Handy 2009). If the town hopes to make walking and transit primary means of travel, these parking lots will one day need to be replaced with mixed-use buildings and people-friendly streets.

However, this inverse feedback — the role of big box stores in encouraging some level of walking — could play an important role in enabling the shift to walkable growth. Nearly everyone walking to these stores must pass through Oak Park Boulevard, providing some level of pedestrian traffic for the street. If officials can give people more reason to linger there, this could help establish a customer base, thereby using the big box stores to support walkable retail. Such exceptions provide an opportunity for agents to intervene to shift the advantage from car-dependence to walkability. However, actors have so far done little to capitalize on this opportunity in the Uptown Core, and the net impact of the big box stores is currently likely negative.

Efforts to Initiate Walkable Growth

Institutional and Transport-Economic Intercurrence

In 2005, Oakville faced a renewed impetus to retrofit this big-box store shopping area into a fully walkable downtown. New provincial legislation would restrict outward growth and require greater densification (*Places to Grow Act* 2005). If Oakville wanted to avoid adding density to its vast suburbs — a political non-starter — it needed to find places to accommodate substantial growth, and the Uptown Core was a promising candidate.

For much of the late 20th century, the Toronto region sprawled at an accelerating pace, creating one of North America's largest conurbations (Florida 2010, 48–51). The majority of this growth was car-dependent, leading to consequences that would, by the late 1990s, inspire a self-undermining feedback against car-dependence: gridlock traffic, lost farmland, damaged natural landscapes, and ballooning infrastructure costs (White 2007, 40–42; Blais 2011; Eidelman 2010, 1222). In the 2003 provincial election, advocates successfully translated these grievances into a leading campaign issue, and Progress Conservative Party candidate Mike Harris promised new legislation to direct more growth to dense, transit-oriented centres (Eidelman 2010, 1223). Remarkably, the proposal aimed, in part, at securing the support of the province's car-dependent suburban residents, many of whom had absorbed the argument that if they wanted to avoid gridlock traffic, it was essential to ensure that more people moving to the region not rely entirely on driving (Eidelman 2010, 1222). The consequences of car-dependence generated inverse feedback, creating support for walkable growth among car-dependent residents.

Harris won, and in 2006, he passed the Places to Grow Plan, which required municipalities to accommodate 40% of growth within existing built up urban areas (Province of Ontario 2006, 14). Mayor Burton explains the choice to respond by further densifying the Uptown Core:

> We are required to do what the province commands willy nilly. We accept our orders, but we try to execute them in a way that increases livability rather than diminishing it. So, we embarked on a strategic vision, embracing mixed use, intensive nodes and corridors, but leaving alone stable established neighbourhoods (Burton, personal interview, July 12, 2021).

Oakville's new plan called for 5,000 to 8,000 residents and 400,000 square metres of office, retail, and other commercial space (Town of Oakville 2009b, 19). The town's plan also sought to remove the contradictions in the Uptown Core, aiming to eliminate all "large areas of surface parking," replacing them with mid-rise mixed-use buildings (Town of Oakville 2009b, 19). In 2009, the town refined the plan, increasing growth targets to 16,600 residents and 3,000 jobs (Town of Oakville 2009a, e–17). The updated plans aimed to fully transform the Uptown Core into a new downtown (Figure 64).

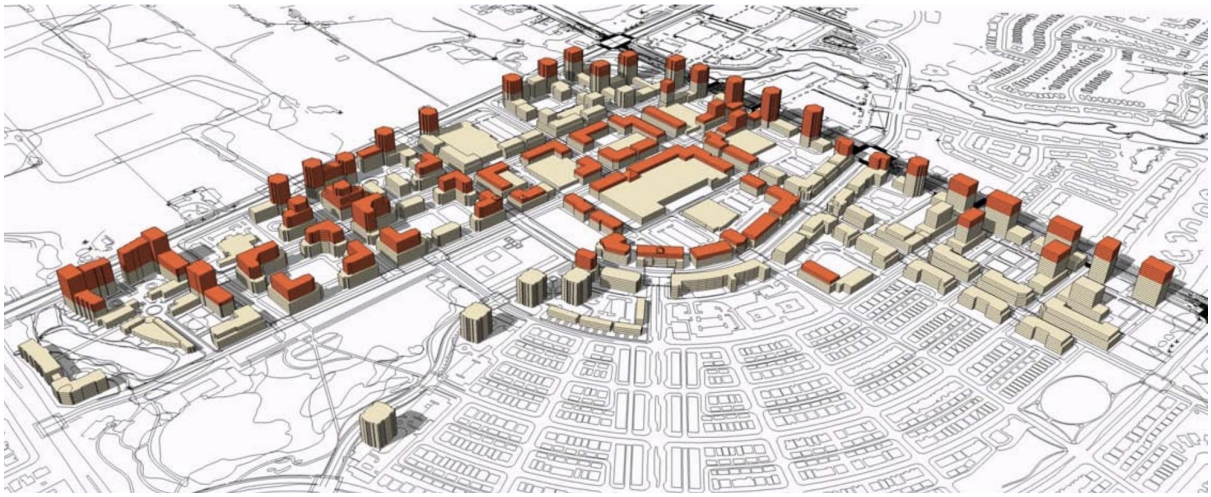

Figure 64. An illustration of the level of density allowed under the 2009 plan (Source: Town of Oakville 2009b, 73).

However, while these plans allow much taller buildings, development has remained relatively slow. 350 stacked townhouses have been built in the North West corner, designed with narrow, walkable internal streets. On Oak Park Boulevard, construction started on two four-story, mixed-use buildings in 2013 and 2017. Two major tower projects — including 5 towers in total — have also been proposed on the edges of the plan, but these were not proposed until 2019 and 2021 (InHalton 2019; Landau 2021). Walkable development has not evaporated, but neither did it substantially accelerate after Oakville allowed taller buildings.

Oakville therefore faces a similar problem as Surrey in the 1990s, in which the economic logic of the car-dependent landscape prevents walkable redevelopment, despite the city allowing substantial density. The community faced the same chicken-and-egg problem: mixed-use buildings would only succeed if they could provide a desirable outdoor environment to justify their higher costs, and if there was sufficient streetlife to support street-level retail, but these things would not exist until developers had built many new buildings. In Surrey, government intervention was therefore necessary to kickstart growth.

However, in interviews, Oakville officials expressed skepticism towards the role of the town in intervening. The lead planner for the Uptown Core, Carly Dodds, explains that “from a land-use planning perspective, all that we can do is enable [development] through our policies.” She argues that “attracting specific development

or businesses is more for the economic development department" (Dodds, personal interview, April 16, 2021). Mayor Burton concurs: "We already have the permissions in place. [Developers] have the right to transition into high density. So I don't need a magic wand to fix Uptown. I just need the landowners to clue in" (Burton, personal interview, Jul 12, 2021).

There is a strong norm in Ontario — and in Oakville specifically — that "development pays for itself," which precludes many of the financial incentives, such as tax breaks, the city might use to incentivize development (Tomalty and Skaburskis 2003, 146; Charles, personal communication, May 5, 2021). Officials may also be reluctant to intervene because in most cases, they do not need to: Ontario is one of the fastest growing areas in North America, which means that cities often can set rules and wait for growth without further intervention (Feinstein 2020). However, such an approach may be insufficient in a context where prevailing incentives discourage walkable growth.

The disconnect between rules and incentives is illustrated by a requirement, in the 1995 plan, for all buildings on the main street to direct windows and doors to the street (Planning Services Department 1995, 5). Some big box retailers sit on the main street (in its northern section), and while they have technically complied with this requirement, none have fulfilled its spirit. The windows facing the main street are blank and opaque, and the doors are locked. In some cases, retailers have located changing rooms or pipes on the main-street side of the building, blocking the doorways (Knoll, personal interview, Jul 12, 2021). In contrast, the windows and doors facing the parking lots on the other side are adorned with welcoming window displays (Figure 65). "We kind of threw in the towel," Planning Director Gabe Charles explains, "knowing that in time, those [buildings] will transition to a higher and better use. But it wasn't for lack of trying and beating your head against the wall to convince them to do something different" (Charles, personal interview, May 5, 2021).

Figure 65. These big box stores are required by planning policy to direct doors and windows to the main street, but these are currently blank and locked, likely because few people currently walk the street (left). In contrast, the buildings direct welcoming doors and window displays to the parking lots (right) (Source: both images from Google Streetview 2021).

Oakville planners are now considering zoning to encourage livelier types of retail on the main street, restricting the quantity of other types of commercial uses they consider insufficiently vibrant, such as the dentist offices and real estate agents that are today located in many of its commercial units (Simeoni 2018, 10; Zavaros, personal communication, July 13, 2021). However, if such a rule discourages development, it may counterproductively make it harder for retail to succeed. Zavaros, at Metrontario, argues it would be more constructive for the town to allow more flexibility and focus on creating the conditions in which the street could attract cafes, markets, and other types of vibrant retail (Zavaros, personal interview, July 13, 2021).

Oakville is making infrastructure investments in the Uptown Core, which, in the other retrofits examined, have played an important role in incentivizing growth. However, if officials do not consciously frame these investments as strategies to initiate growth, they risk failing to maximize their impact on this goal. In 2008, Oakville built a bus terminal in the Uptown Core, offering an opportunity to encourage nearby street life and walkable development (Burlington Post 2008). The terminal was originally proposed at the corner of Oak Park Blvd and Taunton Road, which would have positioned it in the centre of the main street, helping it to attract pedestrians and development to the street (Town of Oakville 2009b, 16). However, the town would instead build the terminal 400 metres north of the main street, creating a major gap.

The design of the terminal also does not maximize its potential benefits for walkability. It is a bus loop with stops at its centre (Figure 66), which means that a ring of fast-moving buses and unsightly asphalt separates riders from potential destinations ("City Centre Plan" 2019b, 122). Surrey had the same kind of "suburban style bus loop" in its centre, and its recent official plan argues that this "configuration isolates activity away from adjacent streets and creates a physical barrier between land uses" ("City Centre Plan" 2019b, 122). Surrey is redesigning its bus loop as a normal city block lined with transit stops around its edges and pedestrian routes through its centre, with the goal of better supporting walkable growth (City of Surrey 2017a, 122). In contrast, the design of the Uptown Core terminal suggests that the city viewed it primarily as a facility for moving transit riders, rather than a tool for catalyzing development.

Figure 66. The Uptown Core's bus terminal is low-cost and utilitarian, and does not appear to have been designed with the goal of creating a walkable environment (Source: Google Streetview 2021).

Investments in street design can also catalyze rates of walking (Sadik-Khan and Solomonow 2017). The current planning review for the Uptown Core will consider "opportunities for enhanced streetscapes along key streets," and "opportunities to enhance 'place-making' opportunities" (Simeoni 2018, 9–10). Such interventions can be powerful: people are, unsurprisingly, more likely to spend time in places where they enjoy being (Gehl 2010). However, Oakville's plans do not mention the need to intervene in the short-term to alleviate the current car-oriented deficiencies in the area's visual environment. Rather, the review focuses only on establishing long-term policies for new buildings and streets (Simeoni 2018, 4, 9).

Nonetheless, some of the town's investments do appear to be having an impact on growth. In 2019, Cortel Group started work on the Oak and Co. development — a major 750 unit, four-tower project with retail on the ground floor — directly adjacent to the transit terminal (Cortel Group 2019; BuzzBuzzHome 2022). In its marketing material, Corel Group (2022) promotes the tower's proximity to transit: "less than a minute walk from the Uptown Core Bus Terminal." They also brag that they are close to Highways 407 and 403, but — in a sign that walkability may be gaining in market momentum — they bolded the text about the terminal, and not about the highways (Cortel Group 2022).

City officials hope other upcoming transit investments will further help attract walkable growth in the Uptown Core (Dodds, personal interview, April 16, 2021; Hecht, personal interview, May 5, 2021; Charles, personal interview, May 5, 2021). The regional transit authority, Metrolinx, plans to implement Bus Rapid Transit lanes on both Dundas and Trafalgar, and these projects are in the advanced planning stages (Aecom 2015, 80; Metrolinx 2018, 55, 69, 2022). Recently, SmartCentres — which owns the big box stores — announced a major mixed-use, 585-unit development proposal on a piece of vacant land on one of these transit corridors, at the corner of Trafalgar and Oak Park, called SmartCentres Oakville North (Figure 67) (Landau 2021). Joseph Cimer, their Senior Development Director, explains that the company sees bus rapid transit as crucial for justifying further dense development in the area, and that the hopes this development project will, for its part, help justify bus rapid transit (Cimer, personal interview, August 4, 2022). The press release for the development explicitly promotes its role in the "urbanization of Oak Park Boulevard to achieve the goals of walkability" (Landau 2021).

Figure 67. SmartCentres Oakville North, a high-density, mixed-use development at the corner of Oak Park and Trafalgar, reflecting the incentives of the main street and the future bus lane, rather than the car-oriented arterial and the car-dealership across the road (Source: Landau 2021).

Shift in the Market towards Walkability

Transport-Economic Intercurrence

SmartCentre Oakville North is a major departure from the company's *modus operandi*: the company has, for most of its history, built car-oriented commercial centres. Cimer explains there were two major forces driving this shift in the company's focus. The first is that online retail has taken business away from discount big-box stores, which encouraged them to look for new business models: "We weren't building new Walmarts, that's for sure" (Cimer, personal interview, August 4, 2022). The company has experimented with self-storage and seniors homes over the last decade, and are now slowly testing the market for mixed-use rental construction, a major new phase in the company's history (Cimer, personal interview, August 4, 2022). As the market for car-oriented retail has become saturated, and as the market for walkable housing continues to grow — and continues to outpace supply — there may be a growing incentive for traditionally car-oriented builders to experiment with walkability (Moos and Prayitno 2018; Litman 2020, 10). Just as the self-reinforcing

success of car-dependent development shifted the focus of walkable developers to a new model a half-century ago, the self-reinforcing success of walkability may shift some of them back.

Cimer explains that one reason they were willing to build Oakville North now is that the price of homes in southern Ontario have risen at an extraordinary pace in the last decade, making projects in even such an imperfect context seem viable (Cimer, personal interview, August 4, 2022). SmartCentres also found it reassuring, Cimer explains, that other high-density projects along Trafalgar Road have recently been built and succeeded. With each such project, developers like SmartCentres are less reluctant to invest in something similar, in a self-reinforcing process that could accelerate growth in the Uptown Core over time.

However, the company did not feel the plan's existing rules allowed the kind of building they were willing to build. They applied for an amendment to allow narrow 28 and 29 story towers, rather than the shorter, thicker building the plan allowed, because they believed such towers are more cost-effective and desirable in the Ontario market (Town of Oakville 2009b, 73). Cimer explains the amendment has faced political opposition, because there remains strong opposition from single-family residents to towers in Oakville: "One comment I keep on hearing over and over again [is that] people didn't move out to the suburbs to live in the city of Toronto, to live in a high density tower kind of community" (Cimer, personal interview, August 4, 2022).

While it is possible for single-family residents to see their interests in high densities, as demonstrated by their support for the Places to Grow Plan, the impulse remains to oppose towers or any development out-of-keeping with their chosen way of life (Filion 2015, 637; Urry 2008, 347). Politically, car-dependence continues to reinforce itself at the expense of walkability. Also, while there is long-standing political pressure from the local Uptown Core community to create the main street they were promised, this has not yet translated into active political support for this development, or to allow more density generally. Whether car-dependent residents reinforce car-dependence, or walkable residents reinforce walkability, depends on how they frame their interests, and currently, it would appear the car-dependent

opposition to density has greater momentum than walkable support for growth. Oakville may yet, however, approve the development, given other factors reinforcing walkability, such as the Places to Grow Plan and the need to develop along the Bus Rapid Transit corridor.

There were fewer barriers to SmartCentres building on the Oakville North site than there will be elsewhere in the Uptown Core. The property had less "hard concrete and asphalt" than the big box properties in the area, and is closer to existing main street buildings, making it easier to design an attractive environment where people may like to live (Cimer, personal interview, August 4, 2022). As a vacant parcel, the company also did not need to manage existing tenants there. Cimer explains it is difficult to put "big box and medium box" stores into the base of mixed-use buildings, which means Walmart, Dollarama, and similar stores will likely remain unchanged for the foreseeable future (Cimer, personal interview, August 4, 2022). The company must also honour contractual agreements with its big-box tenants, which create another institutional barrier to walkable change. These agreements often include minimum parking ratios and sightlines to their front door, blocking any construction on their parking lots (Charles, personal interview, May 5, 2021; Cimer, personal interview, August 4, 2022).

SmartCentres does, however, believe smaller-format stores would agree to locate in the first floor of mixed-use buildings (Cimer, personal interview, August 4, 2022). If the Oakville North project succeeds, and bus rapid transit is built, it is therefore possible that the company will begin to convert parts of its smaller car-oriented commercial properties into high-density, mixed-use towers. The Uptown Core may yet begin to transform into a more walkable environment.

To support the area's transition into a second downtown, Oakville planners have also asked SmartCentres to consider building offices. However, while there is likely a market for high-density homes in the area, there is much less demand for offices (Cimer, personal interview, August 4, 2022). Metrontario has built one mixed-use office building in the Uptown Core and has struggled to attract tenants (Charles, personal interview, May 5, 2021). As we saw in Surrey, establishing a local office market requires overcoming a second chicken-and-egg problem: companies are

attracted to office markets with an existing ecosystem of other companies, and it is therefore difficult to establish demand for an office market until many offices are already built and occupied (Glaeser and Gottlieb 2009; Matthew 1992). It is unclear how to overcome this barrier.

The Impact of Wide Roads

Institutional and Political Intercurrence

One final barrier to walkability in the Uptown Core is the ongoing demand for wide roads. Trafalgar Road will soon be widened at Oak Park Boulevard from five to eight lanes, in part to accommodate the new bus rapid transit lanes (AECOM Canada Ltd 2015, 12). The design for the Dundas bus lanes are not yet complete, but if this too leads to road widening, it could isolate Uptown Core residents from high-density projects currently being built north of Dundas (Metrolinx 2022). Jill Stephens, Oakville's Director of Transportation and Engineering, explains that, "one of the challenges we have there's we don't control either those roads" (Stephen, personal interview, July 23, 2021). The Halton Region manages both, and its transportation department tends to prioritize traffic flow to a greater extent, likely in part because the region contains a larger proportion of rural council districts than Oakville itself (Stephen, personal interview, July 23, 2021; Charles, personal interview, May 5, 2021).

Oakville's planning director, Gabe Charles, says his department has sometimes questioned the region's commitment to maintaining level of service at the expense of other goals: "We've said to them [the region], so what, what's the big deal? So somebody has to wait two or three cycles to get through a light" — but the region maintained its policies (Charles, personal interview, May 5, 2021). As in Miami-Dade and Tysons, the existence of multiple levels of government with authority over roads can create additional barriers to walkable design: if it is difficult to shift the culture of one institution, it is all-the-more difficult to shift that of multiple levels, particularly when one of those levels is more beholden to rural and car-dependent voters.

On local streets in Oakville, Councillors have increasingly accepted greater congestion, because while they hear from residents demanding less traffic, they also hear from the residents living on those streets asking for slower speeds — in another example of inverse feedback, where the consequences of car-dependence encourages pedestrian-friendly designs (Stephen, personal interview, July 23, 2021). Stephens also believes the Council has come to understand that "we're at the point where we can't build our way out of congestion anymore" (Stephen, personal interview, July 23, 2021). The department now incorporates future transit projects into traffic studies, reducing forecasted traffic, which reduces requirements for wider roads (Stephen, personal interview, July 23, 2021). In most cases, the town does not plan to widen roads beyond what they have, and engineers hopes to address congestion through such solutions as directing new growth to transit stations (Stephen, personal interview, July 23, 2021).

However, Philip Kelly, Oakville's Manager of Design and Construction, emphasizes that while the current Council "has come to accept some congestion," there are limits on how much they are willing to enable, "because that could be a form of [political] suicide" (Kelly, personal interview, July 23, 2021). In some cases, engineers have come to accept a lower level of service as "tolerable," but the public continues to deem it "intolerable," limiting what street designs are politically viable (Kelly, personal interview, July 23, 2021). While these institutional and political changes reduce the risk that the Uptown Core's internal streets will be widened further, it may remain infeasible to reduce the size of Oak Park Boulevard to a more human scale. The hold of car-first thinking on the design of roads has weakened, but avoiding congestion remains a central political and institutional priority, limiting the extent to which the Uptown Core can prioritize pedestrians.

Conclusion

The Uptown Core demonstrates the ability of car-dependence to reinforce itself, despite a decades-long goal to create a new downtown. The initial 1962 plan proposed the Uptown Core as an urban centre, but the dominance of car-oriented thinking meant its policies were entirely incompatible with this goal. In the 1990s,

car-oriented thinking remained dominant in engineering, and officials required the Uptown Core's main street to accommodate inflated traffic forecasts at the expense of pedestrian comfort. The economic logic of the suburban context also led the area's primary developer, Metrontario, to abandon plans to create a downtown style mall, and to instead build big box stores. While the plan retained the main street, the neighbouring big box stores have made it difficult for businesses there to succeed, undermining the pedestrian landscape with parking lots, and outcompeting mixed-use retail buildings on price. Meanwhile, Metrontario's risk aversion, and Oakville's reluctance to allow tall buildings, have led the main street to grow at a slow pace, creating a short main street with relatively little vibrancy.

And yet, while car-dependence reinforced itself at the expense of walkability, it also, in narrower ways, created inverse feedback that supported walkability, creating opportunities for proponents to shift trajectory. The scale of car-dependent growth in southern Ontario had created sufficient backlash to justify some of the most progressive smart growth legislation in North America, which then motivated Oakville to enable more density in the Uptown Core (Eidelman 2010, 1222). While car-dependent residents demanded large, fast roads where they drove, they also demanded slower traffic speeds on their own streets, providing a political justification for allowing slower, narrower local streets (Stephen, personal interview, July 23, 2021). The Uptown Core's car-oriented stores are located close enough to homes that they did encourage some level of walking, despite the disamenity of their parking lots (Knoll, personal interview, Jul 12, 2021).

Each of these examples of inverse feedback are, however, flawed and limited, creating only imperfect support for walkability. Car-dependent residents often support density in the abstract, while forthrightly opposing towers they can see (Downs 2005, 371). It remains politically perilous for Oakville councillors to support new towers in the Uptown Core (Lea 2022). Big box stores may offer destinations to walk to, but their parking lots and blank walls simultaneously discourage walking.

The Uptown Core also, however, offers some of the clearest examples of walkability reinforcing itself. Successful walkable neighbourhoods elsewhere helped inspire Metrontario to invest in this growth model. Later, Metrontario flew municipal

staff and Councillors to see such examples in person, which made pedestrian-priority designs seem feasible, such as narrower streets and laneways. The residents of the community's pedestrian-oriented homes organized to defend their main street against a proposed car dealership, in part because they had bought their homes based on the promise of living in a walkable community. While developers have been slow to build mixed-use buildings, two new tower projects are now proposed or being built, and the marketing materials for both emphasize the promise of walkable living and access to transit (Landau 2021; Cortel Group 2022).

On Oak Park Boulevard, the contradictory influences of these two self-reinforcing systems meet. There is an opportunity to give walkability an advantage in this conflict, if actors recognize the self-reinforcing incentives at play, and intervene intentionally to reduce the advantages of car-dependence and amplify the advantages of walkability. The big box store parking lots would have less impact on the main street if they were visually blocked, either with new buildings, greenery, or any other temporary intervention. Metrontario may be able to reduce the risk that its buildings will fail, counterintuitively, if it took a bigger risk and built more buildings faster, to block the view of parking and to create a critical mass of street life. The municipality could also make such investments less risky by allowing taller buildings.

In general, municipal officials could better initiate walkable growth if they recognized their role in initiating it. While the existing plan does allow relatively high density development in places, zoning could facilitate development by ensuring it allows the kind of buildings developers want to build, which, in the case of SmartCentres, means taller, thinner towers (Cimer, personal interview, August 4, 2022). Public investments, such as transit, could better instigate walkable growth if designed and located to enhance the visual quality of streets and to encourage streetlife. The bus terminal, in contrast, is utilitarian and located far from the main street. While the prevailing norm in Oakville is that development should pay for itself, some kind of temporary financial incentive could help developers to overcome their reluctance to build. Gabe Charles, Oakville's Director of Planning, would like to see Oakville find some way to "incent the right form of development, as opposed to giving them a discount for their development" (Charles, personal interview, May 5, 2021).

Local resident Michelle Knoll says that she and other residents have a vision for the main street: “to do a light parade for Christmas,” with lights hanging from stringers across the street. Unfortunately, she laments, right now, “It is too small” (Knoll, personal interview, Jul 12, 2021). The desire is already there for the main street to act as the cultural heart of the community, if only a few more buildings were added to make it a place where one could shop, socialize, and hold events. If that main street can achieve a critical mass of street life, it remains possible that the area will transform, and developers will begin to take advantage of the opportunity to build new high-density, walkable buildings. As its population grows, the Uptown core has the potential to reinforce itself politically, with residents mobilizing to defend the vision of a main street — as they have already done in the past. If walkability can begin to reinforce itself on its own terms within The Uptown Core, it may yet become a new downtown for Oakville. However, if the city does not intervene intentionally to mitigate the self-reinforcing influence of car-dependence, this transformation risks moving slowly, or stalling completely.

Chapter 9. Car-Dependence, Inverse Feedback, and Self-Reinforcing Walkable Change

Tachieva (2010, 48), Bohl (2002, 132–133), and Dunham-Jones and Williamson (2008, 5) argue against the kind of messy, incremental suburban retrofit I describe in this thesis. They argue it is better for a single developer to own enough land to build a full-scale walkable community at once, establishing a critical mass of dense housing, pedestrian-friendly streets, and high-quality public spaces, all within walking distance of local shops and services. They propose, in this way, to eliminate the contradictions inherent in building pedestrian-friendly homes within otherwise car-oriented environments.

To some extent, my findings support their position. Surrey City Centre and Tysons saw little development for over a decade after their first walkable plans were passed. Much of the Uptown Core's proposed downtown has become a big box store destination. Roughly half of the Downtown Kendall plan area has seen little change. All continue to have large patches of wide roads, blank walls, and parking lots. One could avoid these failings and contradictions if one could fully redevelop a community as one single project.

It is, however, rarely feasible for government to assemble all the land in a community to rebuild it as a single project. It is important for cities to learn how to implement incremental retrofits, because cities cannot achieve their most urgent goals by retrofitting those few exceptional sites where government owns a former airport, military base, or other large piece of land, and can redevelop it all at once. If cities are to reduce vehicle-miles travelled per person, cut carbon emissions, and promote healthy transportation, cities will need to redesign a large proportion of urban areas to become walkable (Gordon and Janzen 2013; Pucher and Lefèvre 1996, 175). Cities therefore need to better understand urban intercurrence and how to navigate it, so that, if they choose to, they can convert existing car-dependent landscapes into walkable growth without needing to acquire it all first.

The four retrofits do offer reasons to be optimistic that it is possible to incrementally retrofit communities, even if the process is messy and takes longer. Downtown Kendall, Surrey City Centre, and Tysons are all leading growth areas in their regional markets (Urban Surrey 2020; Van Santvoort 2021; Fairfax County 2021b; Rodriguez 2019). Developers have begun to build mixed-use towers in the Uptown Core again. All four cases contain areas that are convenient, high-value, and walkable. Each retrofit carries examples of both success and failures, providing a useful testing ground for ideas about how to enable change.

In this final chapter, I explore these processes of transformation in terms of my three hypotheses, which are, in short: that car-dependence reinforces itself at the expense of walkability, that inverse feedback creates opportunities for change, and that it is essential for walkability to begin to reinforce itself to complete the process of change. I devote a section to each hypothesis, and within each section, I outline my findings in terms of three types of feedback: political, institutional, and transport-economic. I offer a framework to better understand the chaotic nature of this process of change, and ideas on how to complete the process to achieve a more complete transformation.

Self-Reinforcing Car-Dependence

My first hypothesis is that suburban retrofits struggle because car-dependence reinforces itself economically, politically, and institutionally, blocking walkable change. I found substantial support for this idea, suggesting that there does exist a fundamental tension between car-dependence and walkability.

Transport-Economic Path-Dependence

When governments allow downtown-style towers in an area currently occupied by low-cost stripmalls and parking lots, one might assume developers would quickly take the opportunity to invest in high-density, high-value buildings. The

Mayor of Oakville, Rob Burton, thinks so, and he blames developers for not taking advantage of the Uptown Core's permissive zoning: "[Developers] have the right to transition into high density. So I don't need a magic wand to fix Uptown. I just need the landowners to clue in" (Burton, personal interview, Jul 12, 2021). However, relatively few landowners have acted on this opportunity in the Uptown Core in the last fifteen years, and almost none did in Surrey and Tysons in the 1990s. In Downtown Kendall, a developer rushed to build stripmalls before the new plan would come into place, contenting himself with a one-story building where 25 stories would have been allowed (Whoriskey 1998, 25A; Vrooman, personal communication, July 6, 2021; Miami-Dade County 2009).

Why? One reason is that when most people drive, developers are incentivized to cater to people driving. A reporter in Downtown Kendall summarized the issue: "many developers are afraid to build sidewalk shops because, with most people driving in and out of the area, there are few pedestrians to patronize such shops, at least for now" (Whoriskey 1998, 25A). Zoning for the four retrofits requires towers to line the sidewalk with ground-floor retail — in place of parking lots — in a context where sidewalks were empty and parking lots were busy.

The skepticism towards pedestrian-friendly buildings can be self-reinforcing, because if developers build projects that prioritize drivers, it tends to further undermine conditions for walking. One Downtown Kendall developer, who was skeptical about people ever walking in that area, rushed to have a new stripmall approved before the plan was passed, which then blanketed the eastern flank of the retrofit with asphalt (Dover, personal interview, June 1, 2021). Big box stores in the Uptown Core were required to direct welcoming windows and doors to the neighbouring main street, but they instead locked their doors and covered their windows along the street, leaving a blank, uninviting environment for pedestrians (Town of Oakville 2009b, 24; Knoll, personal communication, Jul 12, 2021; Planning Services Department 1995, 5). The design of these buildings encourages people to drive, and the buildings prioritize drivers because most people drive, in a self-reinforcing process.

It is also difficult to justify the costs of pedestrian-friendly, mixed-use buildings in a car-oriented environment. It costs more to design mixed-use buildings with attractive facades, street-level windows, multiple entrances, and underground parking (Leinberger 2001, 11). To make such a building profitable, tenants must either be willing to pay higher costs, accept smaller units, or both (Leinberger 2001, 11). Few people will pay more per square foot, however, if a building is surrounded by the "hostile environment" of parking lots and large roads (Cimer, personal interview, August 4, 2022).

There is little incentive for developers to invest in a high-value external environment to attract drivers, moreover, because aesthetics bear little on where people drive (Ciscal-Terry et al. 2016). It is difficult, in any case, to make parking lots attractive. Developers therefore face an incentive in car-dependent contexts to build low-cost, low-value buildings. Most of the big box stores, stripmalls, and malls in the four cases were therefore designed as warehouse-style structures with blank walls and flat, empty parking lots. Office towers in Tysons and Downtown Kendal were simple, single-use buildings with little elaboration, seated in parking lots. Such buildings do little to increase land values, but they also cost little. They create an undesirable environment, which keeps land values low, and low land values then make it cost-effective to create large buildings that offer voluminous space for retail, offices, or apartments. These car-dependent areas were, in a sense, in a low-land-value equilibrium, in which they invest little in creating a desirable environment, and use the low land values to build cheap, spacious buildings.

The challenge that confronts developers in walkable retrofits is, therefore, to transition from a low-value equilibrium to a high-value equilibrium. (Or, more accurately, to transition to a high-value "disequilibrium" of rising prices and reinvestment, typical of a downtown environment) (Florida 2010, 30). This is a difficult collective action problem, because no single new building will transform the landscape from one of blank walls and parking lots to desirable streets where people will pay a premium per square foot. And as I underline in Chapter 6, the incentive for each landowner is to act as a free rider, allowing other developers to take the risk of investing in higher-value design, without having to take the risk oneself (See: Olson 1965 on collective action problems). The success of retrofit plans therefore depend on

developers having reason to believe other developers will also invest in higher-value buildings. The safest response is to not invest, and to continue collecting rents on the existing car-dependent business model.

Institutional Path-Dependence

Car-oriented institutional standards

It is all the more difficult to convince developers to invest in a walkable retrofit if government regulations and professional standards create roads that are dangerous and unpleasant for pedestrians. In all four retrofits, institutional path-dependence played a major role in discouraging pedestrian-priority design.

Street Design Standards

From the 1930s to the 1970s, civil engineers assembled what Rose and Mohl (2012, 40) call a "complicated apparatus" of "ingenious" analysis techniques that reliably justify building larger roads. The origins of this apparatus can be traced to the 1920s, when pro-car economic interests manoeuvred to give civil engineers authority over transportation design (Norton 2011, 202). Civil engineers had an interest in justifying wider roads, because they are the ones who would then design and build these roads. Since the 1910s, the profession advocated for large, elaborate road infrastructure in cities, and they continue to today (Norton 2011, 202; Mattioli et al. 2020, 7; Marohn 2021, 132–139). Once the profession had authority over road design, it started the long process of establishing decision-making tools and standards that would define streets in terms of their value to drivers, while providing minimum accommodation to other road users (Norton 2011, 165–166; Brown, Morris, and Taylor 2009, 163).

The road hierarchy is, in particular, a powerful force for institutionalizing car priority, because if the defined purpose of collectors and arterials is to move cars, it is difficult to argue that it should instead prioritize other goals (Marshall 2004, 5; Marohn 2021, 10–13). As a consequence, five-to-ten lane arterials and collectors pose barriers for walking all four retrofits, and in Tysons and Downtown Kendall, some of

these roads were widened, had turning lanes added, or had crosswalks removed, after these retrofit plans were passed. These roads divide homes from potential destinations, undermine street life, and put the success of pedestrian-oriented buildings at risk (Mindell and Karlsen 2012; Anciaes, Jones, and Mindell 2016; Park, Choi, and Lee 2015, 539).

Two additional institutional tools proved particularly powerful in justifying wide roads in all four retrofits. Level-of-service standards set minimum requirements for traffic flow on streets for drivers, but do not weigh the requirements of streets for other users (DeRobertis et al. 2014, 32; Dumbaugh and Gattis 2005, 453). Traffic studies then forecast rising traffic levels, and require either wider roads or density restrictions to maintain level of service (Manville 2017; Speck 2013, 81–85). The two analysis tools reliably justify wider roads by defining success in terms of cars, positioning wider roads as the solution, and by assuming traffic will rise (Rose and Mohl 2012, 40, 43; Manville 2017, 378; Mattioli et al. 2020, 7; Marohn 2021, 10–13).

These standards had major consequences for the retrofits. Oakville designed The Uptown Core's central pedestrian main street to be five-lanes wide in rush hour so it could meet forecasted level-of-service requirements (Oakville 2011, 7–25; Hecht, personal communication, May 05, 2021; Lubin, personal communication, July 13, 2021). Planners did work with engineers to make the street as narrow as possible, but they did not challenge the underlying assumption that traffic flow should be non-negotiable on a main street, and that pedestrian comfort, street life, and business vitality are a secondary priority (Hecht, personal interview, May 05, 2021). Tysons' plans recommended transforming its large arterials into smaller, human-scale, tree-lined "low-speed boulevards" (FCDOT 2011, DS–3, DS–14—15; Fairfax County 2017b, 9). Instead, officials widened them into highway-like thoroughfares, including next to transit stations (Fairfax County 2017b, 31, 60–61).

Embedded Values

Engineering standards are powerful, in part, because they present their requirements as objective, rather than as value choices — a pattern which theorists call "embedded values" (Marohn 2021, 1–14; Aicp, Tumlin, and Pe 2014). The Tysons Plan refers to road widenings as "improvements" that are "necessary" and

"needed," and does not acknowledge that these decisions prioritize some road users above others (Fairfax County 2017a, 31, 40, 59). It is in the interests of a dominant institutional paradigm to treat its priorities as objective in this way, because it implies that decision makers have no choice but to accept them.

In contrast, those who wish to implement new walkable standards must make their values explicit so they may justify exceptions to the prevailing norm. The Tysons Plan asks the reader to "imagine seeing people at sidewalk cafes, walking or jogging down tree-lined boulevards, enjoying public art and outdoor performances, and playing in the parks" (Fairfax County 2017b, 6). Nowhere does it ask the reader to imagine convenient driving or heavily trafficked roads, but the plan's budget devotes more to this outcome than to creating walkable streets (Fairfax County Planning Commission 2012, 23). Downtown Kendall's plan similarly attempts to inspire the reader to support new designs: "Main Streets with wide sidewalks, elegant squares, a rich mix of urban architecture, and tree-lined streets" (Miami-Dade County 1998b, 1). Florida's Greenbook blocked many of these new designs without providing any such visionary goal, except to "meet reasonable expectations of the users" (FDOT 2002, 1–5; Hall Planning & Engineering, Inc. 2003, 33–34). It is an indication of the dominance of car-oriented design that it is often treated as necessary with little explicit justification.

Experience and Competence

The walkable retrofits each represent less than 2% of the land area of the jurisdiction of their local governments. Local government staff, therefore, tend to have far more experience managing car-oriented design, and often approach walkable design with assumptions and priorities that better reflect the needs of cars than pedestrians. The Tysons Metrorail Station Access Management Study fails to mention the impact of highway-like arterials on people's willingness to walk, despite this likely being the greatest barrier to access (Fairfax County DOT 2011). It instead focuses on the presence or absence of crosswalks and sidewalks, which, though important, misses the impacts of noise, traffic, crossing distance, and an asphalt landscape on people's willingness to walk (Fairfax County DOT 2011; Speck 2013, 11; Ewing and Handy 2009; Gehl 2010; Park, Deakin, and Lee 2014). Similarly, the authors for the I-495 highway expansion report argue that a multiuse path along a

sixteen-lane highway will provide a useful connection for people walking and biking near Tysons, disregarding the impact of highway traffic on whether people will choose to walk or bike there (VDOT 2020c, 1–14, 1–20).

At a planning meeting for the Downtown Kendall plan, Miami-Dade engineers argued their standards address the needs of pedestrians (FDOT 2002, 8–1—8–7; Hall Planning & Engineering, Inc. 2003, 33). The Florida standards, at that time, did have a section explicitly focused on pedestrians, but as in Tysons, the standards only addressed whether or not pedestrian infrastructure is technically provided, and not on how to create a desirable environment where people will want to walk (FDOT 2002, 8–1—8–7). The standards made no mention of slowing traffic through design, minimizing crossing distances, or creating a visually attractive context — all key elements for increasing rates of walking (Anciaes et al. 2019; Dumbaugh and Gattis 2005). Rick Hall — an engineer on the Downtown Kendall plan — says of contemporary engineers, “They don’t know what they don’t know” (Hall, personal interview, July 14, 2021).

Current engineering standards tend not to prepare practitioners for the idea that there are urban environments to which their expertise may not be applicable. They instead position their principles as valid in all contexts, so long as practitioners make adjustments for context (AASHTO 2018, 1–20—22, 1–32; TAC 2017, 2–22, 2–46—48). There is, therefore, a tendency to approach walkable design as if their existing standards offer an appropriate framework for designing for pedestrians, even if these standards were first written to prioritize cars (Bhuyan and Nayak 2013, 222, 230; Weiner 1997, 19, 21; DeRobertis et al. 2014, 31). This mismatch is a powerful force for locking in car priority, because if standards do not acknowledge their negative impact on pedestrians, practitioners risk sacrificing those conditions without realizing they are doing so.

There is a literature on how municipalities can overcome such knowledge transfer challenges (Jansen et al. 2012; Hope 2016). All four governments hired consultants with the necessary areas of expertise. However, if the public servants who hire consultants themselves lack the necessary experience, they may ask the wrong questions — as was likely the case of the Tysons Access Study — or be uninterested

in the answers — as in Miami-Dade's engineering department (Fairfax County DOT 2011; Hall Planning & Engineering, Inc. 2003, 30–33). The most powerful mechanism for knowledge transfer appeared to be to hire staff and managers with direct experience in walkable design. Surrey's institutional transformation was accelerated by appointing managers for two departments, transportation and planning, who had a background in walkable design. West Group — a private developer who had built much of Tyson's car-dependent buildings — hired a new executive in 2001, John Gerber, who previously worked on the reconstruction of New York's World Trade Center, and who went on to lead the company in shifting focus to mixed-use, transit-oriented design. PCI in Surrey, and MetrOntario and SmartCentres in the Uptown Core, all made similar transformations.

Multi-institutional Inertia and multi-level governance.

Car-oriented design has been institutionalized not only at the local level, but at the regional, state/ provincial, and federal levels, creating additional barriers to local government switching to a more walkable paradigm. In Tysons, the Virginia Department of Transportation (VDOT) has proven more resistant to change than the local Fairfax County Department of Transportation (Taube 2021; Biesiadny, personal communication, May 13, 2021). VDOT's standards, in turn, are based on AASHTO's national standards, and it will likely remain difficult to reform state standards without first reforming national standards (AASHTO 2018; VDOT 2021).

Both VDOT and AASHTO have deep roots in car-oriented design: AASHTO was established to coordinate highway construction, and state Departments of Transportation first grew in influence while implementing the interstate highway network (Toth 2017; Schmitt 2017; Hayden 2004, 166–167; AASHTO 2020). The Transportation Association of Canada, which sets Canada's road design standards, was similarly founded for highway design (City of Surrey 2017b; Haas and Falls 2014, 10). When Surrey's engineers set about drafting new standards for their streets, no national standards yet existed for walkable centres (McLeod, personal interview, March 24, 2021).[16]

[16] The Transportation Association of Canada published a chapter on pedestrian-oriented design in their national road-design standards in 2017 (TAC 2017 Chapter 6)

Car-dependent rural and suburban voters also have disproportionate influence over these higher levels of government, both because they constitute a larger share of the electorate, and because lower density areas tend to have more electoral seats per person, giving them more disproportionate political influence (Rodden 2019). The Uptown Core is bordered by two major roads that are both managed by Halton, the regional government. Local officials have found it difficult to persuade Halton officials to redesign these roads to better prioritize pedestrians because the region tends to be stricter on level-of-service requirements — likely, in part, due to its more rural, car-dependent voter base (Charles, personal interview, May 5, 2021; Kelly, personal interview, July 23, 2021). Until such regional and national standards are changed, local retrofits must proceed by way of exception, negotiation, and compromise, while car-oriented designs can proceed as normal practice.

Self-Reinforcing Car-Dependent Politics

Broadly, my findings support the notion that people who benefit from car-oriented design defend car-oriented design. Perhaps the clearest example is the role of drivers in fighting any proposal to limit or shrink the size of roads (which reinforced the institutional barriers to shrinking roads I mention above). When the Tysons Task Force proposed to narrow some roads, it provoked an angry backlash from surrounding car-dependent communities, making some politicians question their support for the plan (Trompeter 2020a; Gardner 2008; Tysons Land Use Task Force 2008b, 9, 92). The Tysons plan would, in the end, drop most references to narrowing roads, and would instead commit to widening them (Fairfax County 2017b, 19, 31). Surrey's Mayor proposed to replace car lanes with transit lanes on three roads, leading to an angry backlash (Chan 2018; Sinoski 2009). This Mayor then lost the next election, replaced by a rival that promised to retain existing car lanes, and to build elevated transit instead, which was more expensive and created fewer transit lines (Reid 2018a; Johnston 2018). Surrey will soon widen a road under the new elevated train (General Manager, Engineering 2020).

Other advocates for wider roads include the companies that design and build them, and the developers who depend on roads for their car-dependent projects (Rose and Mohl 2012, 12, 30; Norton 2011, 189; Marohn 2021, 139–140). This lobby has grown in tandem with the scale of road building and sprawl development in the United States, and it is now highly influential, capable of shaping national spending priorities (Kelly and Schaff 2022). The role of this lobby was clearest in Tysons. The developer Til Hazel made his fortune winning legal battles for highways and car-dependent development (Garreau 1992, 379–382; Rein 2022). Later, he would become a major benefactor of the Northern Virginia Transportation Alliance, which represents road builders and developers, and which advocates for highways (Bacon 2022; Schwartz, personal communication, April 5, 2022; NVTA 2021). The organization successfully campaigned to have two highways in Tysons widened, one to 16 lanes (Bacon 2022; Schwartz, personal communication, April 5, 2022; NVTA 2015).

Car-dependent voters also tend to oppose density out of fear it will cause traffic. Traffic was one of the most common reasons given by Surrey residents opposed to high-density buildings at public hearings (City of Surrey 2022). Some Miami-Dade residents also opposed Downtown Kendall towers for this reason, and successfully secured height reductions (Rabin 1999b; Gregory 2000a; Fordyce 2003a).

Opposition to density is often rooted not solely in interests, but also in identity. When governments propose to allow more density inside existing single-family communities, it faces fierce opposition, likely in part because people see this as an attack on their way of life (Levine 2010, 82; Ellickson 2020-2021). Sixta's proposal to build mixed-use towers in single-family neighbourhoods in Surrey led to a rebellion that scuttled his 1977 plan, which led to him eventually losing his job (McKinnon 1981, 2; Vancouver Sun 1985). Oakville residents oppose tall buildings even if not located in their communities, because, according to one developer, they associate towers with a different lifestyle: "One comment I keep on hearing over and over again [is that] people didn't move out to the suburbs to live in the city of Toronto" (Cimer, personal interview, August 4, 2022). The residents of Pinecrest — an incorporated suburban community located next to Downtown Kendall — opposed

not only towers, but also sidewalks in their community, fearing a change to their way of life (Lerner, personal interview, July 15, 2021).

Car-oriented businesses also sometimes oppose high-density, mixed-use zoning if this would disrupt their business model. Landowners in Downtown Kendall threatened to sue the county for $120-200 million because the plan called for building new streets through existing malls and replacing parking lots with buildings (Walker 2001a; K. Ross 2001; E. Walker 2001b). They also opposed redesigning Kendall Drive to replace traffic lanes with parking lanes and transit (Ross 2001). The mall claimed the new street design "could have a devastating impact on mall revenues" by slowing traffic (Ross 2001). In response, the County agreed to exempt the mall from the plan, and to not redesign the road for eight years (Miami-Dade County 2002). Twenty years later, the road is only now being redesigned. Some businesses in Surrey also expressed quiet concern that walkability would hurt their existing business model (Model, personal interview, April 6, 2022). However, I found few other examples of such opposition, likely because walkable plans tend to increase development rights.

The issue of parking proved less controversial than expected. Parking tends to be a major source of controversy in existing downtowns, where drivers demand easier, more abundant parking (Shoup 2005, 153–160). In Downtown Kendall, neighbouring residents did react angrily when planners proposed to loosen parking requirements (Fordyce 2003c; Fernandez 2003). Otherwise, however, I encountered few complaints on the issue. One reason is likely that there remains copious surface parking in all four retrofits. Controversy on this issue may intensify as these retrofits reach full buildout and surface parking becomes less abundant.

Summary

Overall, my findings support the notion that car-dependence reinforces itself, and undermines walkability, via powerful self-reinforcing economic, institutional, and political forces. These findings help to explain why cities struggle to build walkable communities despite official policy goals, and why there exists a persistent mismatch between the demand for walkable housing and supply (Lawrence Douglas Frank et al. 2007, 1912; Litman 2020, 17–19, 23). It is insufficient to merely zone car-dependent environments for walkability and to wait for developers to build it, because the lack of

street life, the hostile environment, and the size of roads all militate against the success of pedestrian-oriented buildings. Such barriers encourage people to drive, which then encourages businesses, institutions, and politicians to respond to the needs of drivers, making it harder to fix the barriers to walking, in a process that reinforces itself.

Inverse Feedback and Enabling Change

And yet, the four retrofits are far from a litany of failure. It has been possible for political actors to intervene to support walkable transitions, in part, because car-dependence is a "mixed" system, meaning that while it is self-reinforcing, it is also, in other ways, self-undermining (Béland, Campbell, and Kent Weaver 2022, 35). The consequences of widespread car-dependence can generate backlash, and the ambiguities in car-oriented interests can encourage a subset of people to push for change. In some cases, car-dependence can also be "other-reinforcing," meaning that some car-dependent outcomes *support* walkability, though usually only to a limited extent. Big box stores in the Uptown Core encourage some local residents to walk (Knoll, personal interview, Jul 12, 2021). Also, while car-dependence resists change via path-dependent feedback, it does so imperfectly. Car-dependent residents tend to prefer high parking requirements — a barrier to walkable growth — but as we have seen, they can sometimes be convinced that lower parking requirements will benefit them by reducing traffic. I have called such opportunities for change "imperfect feedback."

I have grouped these exceptions to self-reinforcing feedback under the broader term "inverse feedback." Such exceptions help to explain why even powerful self-reinforcing feedback mechanisms do not inevitably strengthen a dominant paradigm in perpetuity. If feedback mechanisms include flexibility, imprecision, and some degree of self-undermining outcomes, it leaves room for human agency: for actors to intervene to shift the trajectory of policy. However, while inverse feedback can help initiate change, it cannot alone facilitate a transition into a fully walkable place. A big box store may encourage some people to walk, but big box stores alone cannot create a vibrant main street. Instead, I propose that inverse feedback provides only modest

opportunities for actors to shift the status quo. In this section, I review the evidence for my second hypothesis: car-dependence may itself create opportunities for actors to intervene to shift momentum towards walkability, but such inverse feedback alone is insufficient to complete the transition.

Transport-Economic Inverse Feedback

Car-dependent office markets — such as Tysons and Downtown Kendall, prior to being retrofitted — are prone to suffering from rising traffic, as workers have few other ways to travel. Traffic can undermine their core economic advantage: the convenience of driving. Car-dependent commercial environments also tend to be physically unattractive — for reasons outlined above — which can pose a risk to the long-term success of car-oriented office markets. Both Tysons and Downtown Kendall faced stagnation as their first generation of buildings aged and congestion worsened, helping to inspire support from developers for a walkable overhaul of the environment (The Associated Press 2002; The Washington Post 2002; Faiola 1990). Low-density growth can also quickly consume all available land, leading developers to seek a denser growth model if they want to continue building. The consequences of mature car-dependence therefore inspire developers to invest in a denser, more walkable growth model. This self-undermining feedback provides an economic justification for proponents to pursue walkable redevelopment.

To some limited extent, car-dependent buildings may also encourage some level of walking, and may help attract walkable growth — though this is the exception rather than the rule. Car-oriented malls and big box stores impose large parking lots and blank walls, but they can nonetheless create a destination to walk to, if homes are located close to them. A resident of the Uptown Core reports that community members regularly walk to Walmart and other big box stores, in part because stores are within a fifteen minute walk of all the neighbourhood's homes (Knoll, personal interview, Jul 12, 2021). Similarly, in Downtown Kendall, the prestigious Dadeland Mall may have helped give developers confidence that residents would pay a premium to live in the area, thereby supporting investment in walkable mixed-use

buildings (Vrooman, personal interview, July 6, 2021). These car-dependent businesses have therefore supported walkable growth to at least some limited extent. Of course, big box stores and car-oriented malls are unlikely to support walkability as much as pedestrian-oriented, mixed-use buildings would. Nonetheless, these exceptions matter, because they can enable proponents to establish some pedestrian activity, long before these communities create an ideal pedestrian context.

While car-dependent development tends to incentivize more car-dependent development, landowners nonetheless also face an incentive to invest in high-density, mixed-use buildings, because if such buildings can succeed, they are worth more (Leinberger 2001). Parking lots and large roads may discourage mixed-use, pedestrian-oriented buildings, but if government allows sufficient height, it increases the incentive for developers to place the bet that such developments will be profitable. Car-dependence may therefore discourage walkable growth for many years, but once developers have reason to believe that denser buildings are feasible, development applications can arrive quickly, as eventually happened in Tysons, Surrey City Centre, and Downtown Kendall.

Governments used a variety of strategies in the four retrofits to convince developers that it is worth taking the risk to invest in higher-density, mixed-use growth in an otherwise car-dependent context. The most common is to make a major investment in transit. Transit helps to bring pedestrians to streets, and offers an important amenity to justify the costs of mixed-use buildings (Cervero 1998, 6–8). In Tysons, once it was clear that government would build an elevated train, developers put forward 20 proposals for major high-density projects (Fairfax County 2017b, 4; Crotty 2001). However, transit investments alone were insufficient to initiate redevelopment in either Downtown Kendall or Surrey City Centre for more than a decade. In Tysons, demand for densification was already high, due to its strategic location between Washington DC, the Dulles Airport, and the Pentagon, meaning less government intervention may have been necessary to encourage developers to take advantage of higher-density zoning (Leinberger 2018).

In 2006, Surrey began a more comprehensive strategy to encourage car-dependent landowners to place a bet on walkable growth. The city built a City Hall,

library, public plaza, and a new street, all next to an existing transit station, bus terminal, and university (Surrey City Manager 2010; Tischler 2011). By focusing investments in a finite area that already had pedestrian-friendly assets, they helped to convey the idea that at least this one area could support higher-value, mixed-use, pedestrian-friendly development. The city went further, creating temporary tax breaks with a hard deadline in 2013, encouraging developers to invest in the short term before the incentives expired (Lamontagne 2013, 10; Meiszner 2021). And the city created an arm's length development authority to partner with private developers to encourage projects within strategic locations, facilitating the construction of multiple mixed-use towers, including five adjacent to this central transit station (Ditmars 2012). This combined approach was sufficient to attract a handful of walkable developments, which, as we will see, were sufficient to attract more walkable developments, in a process that soon became self-reinforcing.

In contrast, Downtown Kendall required much less prodding to initiate growth: the new plan attracted six major projects, despite government making little new investments in the area (Ross 2003; Fordyce 2003c). One explanation is that the existing transit line, and other nearby destinations, already provided sufficient incentive for growth, and development was only constrained by the area's zoning. It also may have helped, however, that developers were themselves directly involved in crafting the plan (Rabin 1998b). If multiple landowners must invest simultaneously to make walkable developments profitable, it is likely helpful to give them a reason to sit in a room together and discuss what they intend to build. In Tysons as well, developers were actively involved in the planning process, which may have contributed to the rush of development applications once the plan passed (Tysons Land Use Task Force 2008b; Gardner 2008; Trompeter 2020b).

Landowners face contradictory incentives to maintain their car-dependent business model or take a risk on a new, higher-value, walkable business model. This mixed, imperfect feedback provides an opportunity for governments to intervene to strengthen the incentives for developers to place a bet on walkability. Without intervention, the incentives to maintain the car-dependent status quo tend to be stronger, which is why it is so difficult for retrofits to succeed. But car-dependent self-

reinforcing feedback is not monolithic, and governments do have agency to strengthen incentives for change.

Political Inverse Feedback

Widespread car-dependence can inspire a backlash, because it can lead to consequences that affect car-dependent residents themselves, in a kind of self-undermining feedback. Gridlock congestion was a major motivator for retrofitting Downtown Kendall, Surrey City Centre, and Tysons, because — proponents argued — new residents would generate less traffic if they lived within walking distance of work, shops, and transit (Mullins 2015; Leinberger 2018; E. Walker 2001a; MacQueen 2009). One newspaper reporter commented on the Downtown Kendall plan: “It's hard to argue with the idea of eliminating some of the traffic and congestion that has become synonymous with [. . .] sprawling suburban chaos” (Walker 2001a).

In Ontario in the early 2000s, increasing numbers of suburban residents demanded provincial action to prevent millions of new residents from moving into car-dependent houses on the urban periphery, fearing this would further clog their already gridlocked roads (Eidelman 2010, 1222). The resulting 2006 provincial plan required cities to direct 40% of growth to high-density, transit-oriented centres, helping to motivate a new plan for the Uptown Core, which would allow much more density (Town of Oakville 2009b; Burton, personal communication, Jul 12, 2021; Province of Ontario 2006, 14). Of course, residents can also perceive density as a *cause* of traffic, inspiring much of the opposition to towers in Downtown Kendall, Surrey, and (initially) Tysons (Shear 2001; Gardner 2008; City of Surrey 2022; Rabin 1999b; Fordyce 2003a). Traffic therefore creates a mix of self-reinforcing and self-undermining policy feedback, often leading to support for wider roads, but sometimes inspiring support for dense, walkable growth — and sometimes both (Perl, Hern, and Kenworthy 2020, 204–205). This ambiguity leaves latitude for human agency in deciding outcomes: political actors can frame density either as the cause of, or solution to, traffic.

Similarly, in Tysons, planners framed parking restrictions as a tool for reducing traffic because it would discourage new residents from driving (Fairfax County 2017b, 68; Snyder 2011; Battista, personal communication, May 20, 2021). Miami-Dade County planners attempted a similar argument for Downtown Kendall, though it was less well received (Fernandez 2003; Fordyce 2003b). It remains to be seen whether residents near Tysons will continue to accept restrictive parking as developers build on top of parking lots, and cheap, convenient parking becomes less abundant.

Some car-dependent residents come to support walkable growth thanks to the "grand bargain," in which they accept densification within a finite area in exchange for ensuring their own communities do not change. Elizabeth Plater-Zyberk recalls this was important for the Downtown Kendall plan: single-family residents told her they would "draw a line in the sand," blocking growth in their own communities, "But we understand, that's only going to work if there is an escape valve for growth somewhere" (Plater-Zyberk, personal interview, April 30, 2021). However, while the grand bargain has enabled some car-dependent residents to support walkable retrofits, it does not remove all barriers. Retrofits would likely be more successful if nearby low-density communities also densified. It would be easier to promote walkable growth if retrofits could occur within existing neighbourhoods — with their parks, sidewalks, and homes — than amongst parking lots, arterials, and strip malls (Dunham-Jones and Williamson 2008, 4–5). To avoid the political backlash from car-dependent residents, the grand bargain relegates retrofits to some of the least walkable, most car-oriented environments.

Many car-dependent residents not only tolerate walkable retrofits, but actively support them — so long as retrofits stay within bounds — depending on how these residents interpret their interests. Many recognize the benefit in having access to an amenity-rich urban centre. The revitalization of Surrey City Centre was so politically popular that it helped earn the city's Mayor, Diane Watts, a 73% approval rating, in a suburban city that is highly car-dependent (Sinoski and O'Neil 2014). Some suburban residents near Downtown Kendall would become vocal, long-term defenders of the plan, particularly those who sat on its steering committee (Figueras 2001; Walker 2001b; Finerock 2000b). Suburban community groups near Tysons did oppose the

plan at first — worrying it would create too much traffic — but once they secured a commitment to wider roads, they defended the plan, expressing concerns, for example, about the impact of above-ground parking garages on walkability (Trompeter 2020a; Gardner 2008; Horn, personal communication, May 19, 2021; Horn 2020, 4). These car-dependent residents therefore became, to some extent, defenders of walkable development, in an example of inverse feedback.

In exceptional cases, car-dependent residents may even support denser development within their *own* communities, if land values have stagnated. Nearly three quarters of residents in two single-family neighbourhoods in Surrey approved of zoning changes that would allow six-story, mixed-use buildings inside their communities (City of Surrey 2021b, 5, 13). One of these communities, Timbre Heights, had played a central role in opposing an earlier walkable plan in the early 1980s (Surrey Leader 1981b). According to a local real estate agent, who preferred to remain anonymous, the reason for this shift in preferences is that property values had stagnated, leading homeowners to seek a new growth model to attract buyers. It can be difficult for suburban land values to recover if they drop sufficiently, because once low-income residents move in, the lack of local jobs tends to reinforce poverty (Kneebone and Garr 2010; Froud et al. 2002). The desperation created by such faltering car-dependent economic conditions can engender support for change in a self-undermining feedback process.

These exceptions notwithstanding, it remains common for car-dependent residents to oppose densification near their community, even if within finite areas (Trounstine 2021, 300). The above examples show, however, that while car-dependent residents tend to defend car-dependence and oppose densification, this feedback mechanism is not deterministic. Residents face ambiguous, mixed incentives, and proponents can encourage residents to interpret their interests in a way that supports walkability. Such unclear, imperfect feedback leaves room for human agency.

While car-dependent residents can become supporters of walkability, however, they are a flawed ally. A majority of car-dependent residents in Surrey support the retrofit, but they also rejected a plan to replace car lanes with three light-rail lines, in

favour of a single SkyTrain line that would not take space away from cars (Johnston 2018; Surrey General Manager, Engineering 2020a, 12). The two routes that were left unchanged experience some of the worst traffic delays per passenger in the Vancouver region (TransLink 2022, 129). The SkyTrain offers a form of transit that serves the needs of drivers — allowing them to replace the one trip hardest to make by car, through rush-hour traffic to downtown — but does not provide the kind of local, interconnected transit network necessary to support a walkable lifestyle (Walker 2012, 163–180).

The Tysons plan also enjoys widespread support amongst car-dependent residents, in part, because it was pitched as a solution to traffic. This made the plan politically feasible, but undermined the case for reducing the size of roads: if the plan's purpose is to reduce traffic, removing car lanes would contradict its purpose. The Greater Tysons Citizen Association — a group representing largely car-dependent neighbourhoods — supported walkability in Tysons, but also advocated for wide roads there, in part because they believed fluid traffic was essential to its economic success (Horn, personal interview, May 19, 2021). For people who see the city "through the windshield of [their] car," it is intuitive to assume that large roads are essential for economic growth, even as they undermine the economic prospects of walkable growth (Filion 2015, 637; Jacobs 1961, 257).

Institutional Inverse Feedback

To some extent, it is possible to justify pedestrian-oriented street designs within the remit of modern car-oriented engineering standards. While many current standards were developed to justify wider roads for cars, they do claim to serve all road users (Rose and Mohl 2012, 40, 43; Mattioli et al. 2020, 7; DeRobertis et al. 2014, 31). While the Functional Hierarchy prioritizes cars on arterials and collectors, it allocates greater priority to pedestrians on local streets (AASHTO 2018, 5–13). These standards therefore provide openings for reformers to justify pedestrian-oriented design on some streets, in a kind of imperfect feedback. There are, however, limits to what such efforts can achieve without first reforming the underlying logic of

these standards. If local streets are divided from each other by large roads, they can do little to foster walkability.

In some cases, practitioners can make small adjustments to car-oriented standards to weaken their impacts on walkability. In Tysons, local government attempted to blunt the tendency of traffic studies to require larger roads. Officials established a new kind of "Consolidated Traffic Study," which emphasizes the combined effect of proposed development projects on rates of walking, biking, and transit, thereby reducing projected traffic numbers (Fairfax County 2015). They also negotiated with VDOT to lower the level-of-service requirements for the area (FCDOT 2011, DS–4—5). However, while these new tools reduced the scale of road widening, officials nonetheless widened many roads, including next to transit stations — many to a size larger than most highways.

Surrey too is attempting to weaken the impact of traffic studies by making favourable assumptions about how much people will walk, bike, or take transit (McLeod, personal interview, March 24, 2021). It is not yet clear whether Surrey can consistently design streets to prioritize pedestrians as traffic in the area rises, and the tension between the needs of drivers and pedestrians increases. Car-oriented standards offer some flexibility to implement walkable design up to a point, but the prevailing tendency remains to prioritize cars over other modes.

Modern car-oriented standards are baked into the legal responsibilities, software tools, and education of today's civic engineers, which means they are difficult to eliminate. One strategy to overcome this problem is to add new standards without removing the old ones, an approach that Streek and Thelen (2005, 19) call "layering." Layering provides a tool to weaken the dominance of existing standards, but it can lead to contradictions. Florida has recently adopted a new "context" classification scheme for streets, which tends to give greater priority to pedestrians and dense economic development (FDOT 2020, 8). However, Florida did not eliminate the Functional Hierarchy, which defines the role of streets in terms of moving traffic. Kendall Drive, in Downtown Kendall, is therefore classified both as an "arterial," meaning it should prioritize cars, and an "Urban Core" context, meaning it should prioritize pedestrians and transit (FDOT 2020, 22). Such ambiguity creates

opportunities to implement walkable design to some limited extent, but is often resolved in favour of cars (Hebbert 2005, 55; DeRobertis et al. 2014, 33). The Florida Department of Transportation explained, in an emailed interview, that they would not "transform the Kendall [Drive] from an auto-centric corridor," because they are constrained by space and the need to maintain level-of-service (FDOT Spokespeople, personal interview, August 8, 2021).

The Transportation Association of Canada has, similarly, written a chapter for pedestrian contexts, which reduces barriers to future retrofits by stating that pedestrian-priority is, at least, an acceptable option (TAC 2017, 6–1). However, other, older chapters in the same standards continue to prioritize cars: while the chapter on pedestrians recommends short blocks, the chapter on intersections recommends long blocks to enhance traffic flow (TAC 2017, 6–40, 9–27). The new pedestrian-priority chapter enables new types of design, but other chapters continue to encourage the dominance of car-oriented design.

Local governments can also bypass dominant standards, to some extent, by writing new standards for specific communities. The Virginia Department of Transportation approved Fairfax County's new standards for Tysons, which was a major policy coup for walkability (Fairfax County and VDOT 2011). However, the new standards did not eliminate the road hierarchy, level-of-service, or the need for traffic studies, but rather gave relatively more priority to pedestrians within this pre-existing framework. The new standards were not a fundamental departure from existing standards. They also set restrictive criteria for where pedestrian-priority designs can be built, treating them as exceptions to be approached with caution, rather than as normal practice (FCDOT 2011, DS–20—21). While the new standards discourage engineers from widening roads at intersections to add turning lanes, they do not end the practice, and the county continues to add turning lanes at some intersections (FCDOT 2011, DS–5—6; Fairfax County 2011a, C–11). Such new standards provide an opportunity to give greater priority to walkability, but they are still written and approved by engineers, who are constrained by the culture, history, and norms of a profession that has focused on prioritizing cars for almost a century.

Practitioners often do not take full advantage of opportunities to bypass car-oriented standards, in part, because for many of them, car-dependent practices seem normal, while walkable practices seem abnormal. In Chapter 7, I borrow the psychological concept "anchoring" to refer to the tendency of decision makers to assess the reasonableness of actions in terms of what they are used to. Miami County's engineers were willing to grant somewhat greater priority to pedestrians on Kendall Drive within the remit of existing standards (Hall Planning & Engineering, Inc. 2003, 34). Engineers responded with incredulity, however, to the notion that Kendall Drive should have fewer, narrower lanes; a transit lane; on-street parking; more intersections; and buildings lining the street, which would block sight-triangles (Hall Planning & Engineering, Inc. 2003, 28; Ross 2001). For practitioners anchored to car-oriented norms, it would seem extreme to undermine a major arterial with so many intersections and so little capacity. For someone anchored to traditional walkable downtowns, in contrast, it may seem equally extreme to divide a community with an eight-lane road. While inverse feedback may enable some level of change away from car-dependence, anchoring tends to limit the ambition of those changes.

Self-Reinforcing Walkability

The ambiguities in car-dependent interests and standards create opportunities to promote change, but in most cases, they fail to deliver decisive change precisely because they are ambiguous. To the extent walkability depends on the support of people who drive for every trip, businesses that cater to those drivers, and practitioners who believe they must support all car trips, walkable retrofits are unlikely to become fully walkable. For retrofits to complete the transition, walkable interests and institutions will likely first need to begin to reinforce themselves by their own logic. In this section, I review the evidence for my third hypothesis: to achieve a full transition to walkability, it is necessary for walkable development, interests, and institutions to reinforce themselves at the expense of car-dependence.

Self-Reinforcing Walkable Development

Once walkable development has a toehold, it can begin to grow in a self-reinforcing process, transforming cheap buildings and parking lots into compact, high-value development. In Downtown Kendall, this process turned one area into one of the leading real estate markets in Miami (Rodriguez 2019; Morales, personal communication, March 25, 2021). Its first dense, mixed-use developments made it possible for sidewalk-facing businesses to succeed, and those businesses then increased the value of dense development, encouraging landowners to replace parking lots with mixed-use growth, in a self-reinforcing process that continues today (Morales, personal interview, March 25, 2021). These high-density homes and businesses have, moreover, helped to bring customers to transit, which has helped to justify major upcoming investments in transit, which will likely, in turn, encourage more compact development (FDOT 2021; Miami-Dade 2019). Once established, walkable density supports streetlife, retail, and transit, which all then supports walkable density.

Walkable development can also begin to reinforce itself before it establishes street life. In Surrey, once it became clear that some developers were building high-value, mixed-use projects, this gave other developers confidence that there would be sufficient walkable development for such projects to succeed, leading to more investment, which in turn increased the confidence for other developers. One developer described this self-reinforcing process as a "snowball" (Howard, personal interview, April 9, 2021). Surrey has ended its temporary financial incentives and has dissolved its Development Authority, but both tools had the desired impact, attracting multiple development proposals in the period directly following the 2008 financial crisis, when development was least likely to come (Urban Surrey 2020). The number of proposed projects increased each year between 2010 and 2020, until Surrey City Centre became one of the fastest growing areas of British Columbia (City of Surrey 2020b; Robinson 2019).

Walkable growth can better reinforce itself if it is visually segregated from surrounding car-dependent development. Downtown Dadeland — a development in Downtown Kendall — created a single pedestrian-priority street down its centre, lined by sidewalk-oriented buildings on both sides, which, critically, block the view of the parking lots and large roads beyond (Kelly 2002). In this way, the development has

created an uninterrupted walkable context on this one street, despite being surrounded by parking lots and wide roads on nearly all sides. Boro Plaza will soon achieve a similar effect in Tysons, once its surrounding buildings — currently under construction — are complete (Fairfax County 2014b). This strategy effectively minimizes the car-dependent feedback that would otherwise undermine these developments, and maximizes the local impact of walkable feedback.

In contrast, developers in the Uptown Core have built few buildings on one side of its main street, leaving much of it exposed to the parking lots that lay beyond. Car-dependent development therefore continues to visually dominate the street, undermining street life in a process that reinforces car-dependence. The street's businesses have struggled to stay open (Lubin, personal interview, July 13, 2021). To sustain self-reinforcing walkable growth, it is important to create incentives for multiple developers to invest simultaneously, so that their investments can attract others, and then to shield these nascent walkable contexts visually from their car-dependent surroundings. Once walkable growth reaches a scale where street life supports businesses and transit, and vice versa, this growth model can begin to reinforce itself by its own economic logic.

Self-Reinforcing Walkable Politics

In Chapter 2, I hypothesised that walkable residents will defend walkability, just as car-dependent residents defend car-dependence. I find some limited support for this idea. In The Uptown Core, residents rallied to oppose a proposed car-dealership because it contradicted the vision they had been sold of a walkable community (Oakville Beaver 2001a, [b] 2001). The community was able to muster sufficient political support to convince Oakville Town Council to reject the dealership (Oakville Beaver 2001b). However, a quasi-judicial tribunal, the Ontario Municipal Board, would later overturn the decision (Oakville Beaver 2001b, [a] 2003). Residents were nonetheless successful in mitigating the impact of the dealership by convincing its owners to build a mixed-use building that would match the plan and partially block the view of parking (Oakville Beaver 2001b).

Residents shared political preferences on this issue, in part, because homebuyers self-selected to live in a walkable community (Knoll, personal interview, Jul 12, 2021). If the populations of the other three retrofits self-select in this way, they may also develop capacity to mobilize and defend walkable interests. However, I did not encounter other examples where the residents of walkable communities organized to defend walkability.

In Tysons, the developers of mixed-use, transit-oriented developments help fund an organization, the Coalition for Smarter Growth, to advocate for the interests of walkability (Schwartz, personal interview, April 5, 2022). The organization pushes for increasing transit funding, ending highway expansion, and narrowing roads to a more human scale (Amsa and Cort 2021; Schwartz, personal communication, April 5, 2022). The Coalition has seen major successes in Tysons, including the plan itself, which they championed (Schwartz, personal interview, April 5, 2022). However, the organization has enjoyed few victories on the issue of road widening specifically, where the interest of road builders aligns with the preferences of car-oriented developers, residents, and government civil engineers.

Overall, the potential of walkable interests to organize to protect their interests remains largely latent in the four retrofits. This may be, in part, because walkable feedback too is mixed: the interests of walkable residents and businesses, like car-dependent residents and businesses, can be framed in multiple ways. Many residents of walkable communities also drive, and they too may oppose reducing space for cars on roads to favour other modes. Surveys suggest that business owners on walkable streets tend to overestimate how many customers arrive by car and underestimate how many arrive by walking, biking, or transit, undermining their support for prioritizing active modes (Popovich and Handy 2014, 48).

The opportunity remains for proponents to articulate the unique political interests of walkable centres, and to organize local residents, landowners, and businesses to defend these interests. These retrofits may otherwise not be able to complete their transition into fully walkable places: if the people who have an interest in these retrofits do not actively push for human-scale roads, slowing traffic, shifting car lanes to transit lanes, and securing government investment, it is unlikely anyone

else will push for these in any sustained fashion. The success of walkable retrofits depends, in part, on whether their residents, landowners, and business owners believe they have an interest in that outcome, and act on it.

Self-Reinforcing Walkable Institutions

To consistently implement walkable standards, the experts who specialize in walkability will likely need to write standards optimized for this goal, and that are not rooted in the car-oriented standards of the last hundred years. As noted above, Surrey and Tysons wrote new street standards for the City Centre to better prioritize pedestrians, but neither represented clean departures from traditional car-oriented standards (City of Surrey 2017b; Fairfax County and VDOT 2011). Officials who specialize in walkable design have created a new standards organization, NACTO, giving local governments an alternative to AASHTO or TAC standards, but none of the four retrofits adopted these standards (NACTO 2016, 2013, 2017, 2021, 6).[17]

Governments can also choose to abolish specific standards that favour car-dependence. In 1996, Metro Vancouver (in which Surrey is located) eliminated level-of-service as a goal for car travel, preserving it only for goods movement (GVRD 1996, 19, 23). However, Surrey itself did not adopt this policy (McLeod, personal interview, March 24, 2021). None of the four retrofits have eliminated level-of-service, traffic studies, or the road hierarchy.

Just as institutions can become locked-into car-dependent standards, it is possible to lock-in walkable design. As a growing number of professionals gain experience working on walkable retrofits and downtowns, this may make it easier for governments to implement walkability at the expense of car-dependence. The planners and engineers who worked on Seaside Florida in the early 1980s would gain influence thanks to the project's success, and went on to create the Downtown Kendall plan and other similar projects throughout North America (Lambert 2016).

[17] NACTO was started by United States transportation officials in 1996, but it soon widened its mandate to accept Canadian and Mexican professionals and cities as members.

Similarly, while anchoring favours car-dependence today — defining what practitioners consider normal — it can equally favour walkability in the future. Pedestrian-oriented design has become so normalized in Surrey that one commentator, Stephen Hallingham, was surprised to hear that in other jurisdictions, car-oriented standards remain so dominant: "It just seems a little outdated at this point" (Hallingham, personal interview, March 30, 2021). Norton (2011, 126) notes that in the 1920s, few engineers took "seriously proposals to reconstruct the city for the sake of the automobile," because the idea lay so far outside the realm of what they knew and understood. While car-dependence defines normality for many practitioners today, if walkable development continues to grow, it may come to define what an increasing proportion of planners and engineers assume is normal practice.[18]

One method for re-anchoring practitioners' sense of normal is to expose them to walkable places. When I asked proponents what inspired them to prefer walkability, many cited personal experience with European cities or historic North American main streets (Sixta, personal interview, March 24, 2021; Rawlinson, personal interview, July 15, 2021; Hall, personal interview, July 14, 2021). Developers in the Uptown Core flew local officials to walkable communities in Boston and elsewhere to give them first-hand exposure to the kind of design they were hoping to achieve, helping to re-anchor their assumptions to the vivid example of successful, desirable streets that would not have met the town's existing standards (Lubin, personal interview, July 13, 2021). In this way, successful walkable developments have begun to reinforce walkability by shifting what practitioners perceive as normal.

While it is difficult to transform the norms and expertise of an entire organization, one can, instead, establish a sub-group specifically tasked with walkable design. Fairfax County created a group of planners and engineers who work solely on Tysons, so that this group, at least, can develop subject-matter expertise and the appropriate norms for pedestrian-priority design as they work on walkable projects, in a self-reinforcing manner (Battista, personal interview, May 20, 2021; Byron,

[18] Other long range trends may also encourage this shift in priorities, including climate change and rates of physical inactivity and obesity, both of which are caused, in part, by excessive reliance on cars (Ewing and Hamidi 2014, 10; Abraham et al. 2012).

personal interview, May 20, 2021). Thanks to the work of this team, in part, many of the local streets in new developments in Tysons feature slow pedestrian-priority streets and sidewalk-oriented buildings (See for example: Fairfax County 2014b, [c] 2017). Their impact is less evident on Tysons' collectors and arterials, where VDOT has greater authority, but within developments, they deliver highly walkable designs.

An abrupt strategy to shift institutional culture is to fire those who led the old culture. In the 1970s, a newly-elected government in Vancouver ended the city's focus on expanding highways by firing many of the city's top bureaucrats, and replacing them with people willing to prioritize other modes (Stone 2014, 397). This move helped shift the city's long term institutional culture, and likely contributed to making walkable, transit-oriented design unusually well-institutionalized in the region (Dong, personal interview, April 1, 2021). Former Surrey Mayor Watts similarly fired Surrey's City Manager, replacing him with someone more committed to her vision for a walkable City Centre (Spencer 2006; Watts, personal communication, March 30, 2021). The new City Manager soon replaced the managers of the planning and transportation departments with people who prioritized walkability, and they led a major shift in the norms in these departments in favour of pedestrian-priority design (City of Surrey 2008, 43; Arason, personal communication, March 9, 2022).

Firing managers is powerful because it establishes a strong incentive for other managers to shift priorities. It also offers an opportunity to hire people who already have the competencies, priorities, and norms appropriate for walkable design, obviating the need to re-educate those who may have deep-set commitments to car-oriented design. Walkability has a better chance of reinforcing itself in institutions if people's jobs depend on implementing it.

One can intentionally reinforce walkability by giving officials who support it greater power and influence within institutions. The Virginia Department of Transportation hired someone whose job it was to monitor the department's work on Tysons and to ensure it is consistent with the walkable intent of the plan (VDOT 2012; Lerner, personal communication, May 25, 2021). This employee, Abraham Lerner, recalls many instances where he intervened to change departmental recommendations, reminding employees that different standards and practices apply

in Tysons than in the rest of the state (VDOT 2012; Lerner, personal communication, May 25, 2021). Surrey helped to shift the priorities of their engineers by adding planners to their engineering department, and by locating the planning and engineering departments on the same floor of a building, enabling planners (who today tend to be more supportive of walkability) to have more impact on engineering culture (McLeod, personal interview, March 24, 2021; Arason, personal interview, March 9, 2022).

Mechanisms

In a classic paper, Pierson (1993) enumerates a list of mechanisms that can lead policies to reinforce themselves. Many of these mechanisms can be found in the feedback loops discussed above. Béland *et al.* (2022) have since written an expanded list, and have further added feedback mechanisms that are self-undermining, rather than self-reinforcing. I have identified the mechanisms that are most relevant to the present study and listed them in Appendix B. I have also added mechanisms — or drawn mechanisms from elsewhere — in cases where I felt a type of feedback was missing from these lists. The table in Appendix B further describes how each mechanism functions in practice, both for self-reinforcing car-dependence and self-reinforcing walkability. The table further includes a column for inverse feedback, which describes those cases where a mechanism fails to reinforce car-dependence, or creates opportunities for change.

I have identified which mechanisms appear in which of the four retrofits in Appendix B, and certain patterns emerge. Many of the feedback mechanisms that reinforce car-dependence were abundant, including:

- **Protective constituencies**. The tendency of car commuters who benefit from wide roads to defend those roads and to oppose density (fearing it will cause more traffic).
- **Increasing Returns.** Relatedly, long-term government investments in widening roads have allowed car-dependent communities to expand, increasing the number of their voters, giving greater power to those who depend on those roads.

- **Cues for identity**. One reason suburban residents often oppose density is that they perceive it as an attack on their chosen way of life.
- **Administrative capacities**. Government departments continue to use car-oriented analysis tools for analyzing growth and road design changes, because it would be expensive to acquire and integrate new tools.
- **Norms**. Transportation engineers often view traffic flow as an essential goal, and prioritize this goal above other, competing goals.
- **Embedded values.** Seemingly objective road design standards effectively prioritize the value of moving traffic quickly over pedestrian safety and comfort.
- **Menu contraction**. Some ideas — such as narrowing roads — are seen as so politically infeasible that they cease to be a topic of debate.
- **Multi-level government lock-in**. I coined this term to refer to policies that are difficult to change — such as car-oriented road design standards — because they have been institutionalized in multiple levels of government, and would require reform at all levels.
- **Building-transport feedback.** This mechanism refers to the tendency of car-oriented buildings to encourage customers and residents to drive, which then encourages developers to build car-oriented buildings.
- **Land-value feedback**. Similarly, it is risky for developers to invest in high-value, mixed-use buildings in a low-value environment characterized by parking lots and blank walls.

The mechanisms of inverse feedback also tended to be relatively consistent across the case studies, suggesting that proponents tend to draw on similar opportunities. Common mechanisms included:

- **Scale impacts.** As car-dependence grows in scale, its impacts on traffic grows, which can create a backlash that can motivate change.
- **Cues for identity.** While car-dependent residents tend to identify strongly with their housing and transportation choices, they tend not to identify with their commercial centres. This reduces opposition to change in commercial areas.

- **Category structure.** While road design classifications tend to reinforce car-dependence, the category of "local streets" can justify some level of pedestrian priority.
- **Embedded Values.** While the structure of standards may favour cars above other modes, they do contain provisions for other modes, and pedestrian-friendly designs are often implemented on their merits.
- **Multi-Level government lock-in.** Local governments are able to do a great deal without the permission of higher levels of government, particularly on streets that they own and manage, and in regulating buildings.
- **Aesthetics and land-value feedback.** If local government allows sufficiently tall buildings, it can overcome the reluctance of developers to invest in high-value buildings in a low-value environment.

I found, in contrast, only a handful of mechanisms that reinforce walkability consistently across the studies. These include tool-box elaboration (proponents for walkability have honed their arguments over years of implementing retrofits), learning effects (in which institutions become more competent at implementing walkable design as their exposure to increases), and land-value feedback (in which mixed-use developments attract more investment in mixed-use developments).

Other mechanisms appear only in isolated cases. I had expected "self-reinforcing influence" to play a larger role: that the car-oriented industries that grew wealthy over the last century would use their resources to oppose change. However, I only found examples of the road builders opposing change in Tysons, and of businesses opposing change in Downtown Kendall. (A likely explanation is that they can pursue their car-oriented business model elsewhere, or change business models locally.) Some examples of inverse feedback were also exceptional. Only in Surrey did car-dependent residents ask for their own car-dependent communities to become walkable, and only in Tysons did residents accept parking restrictions as a solution to traffic (both examples of protective constituencies failing to act as protective constituencies). Only in the Uptown Core and Downtown Kendall did car-oriented businesses contribute, somewhat, to rates of walking or mixed-use investment (inverse examples of building-transport feedback and land-value feedback).

Most examples of self-reinforcing walkability are isolates, which underlines that walkability has only inconsistently begun to reinforce itself in the four retrofits. Only in the Uptown Core did walkable residents form a protective constituency, and only in Tysons do we see mixed-use developers reinvest their profits in defending their political interests (self-reinforcing influence). Only in Surrey has walkable design become a dominant value in local and regional institutions (norms). Only in Tysons and Downtown Kendall has a specific team been established to work on walkable projects (learning effects). Only Surrey and Tysons attempted to establish distinct street design standards for walkable areas (category structure). One explanation for this tendency for idiosyncrasy is that suburban retrofits remain a relatively new phenomenon. It is possible that as they become better established, they will begin to exhibit a more consistent set of self-reinforcing mechanisms.

The column for inverse feedback in Appendix B contains many more entries than the column for self-reinforcing walkability, which highlights an important finding: so far, the four retrofits have tended to make progress due to weaknesses in car-dependence, rather than the strength of walkability. Broadly speaking, proponents implemented walkability not by appealing to walkable residents, nor by creating standards optimized for walkability, but by placating car-dependent residents, and by bending car-oriented design standards. Walkable retrofits therefore continue to exist at an early, self-contradictory stage, without a strong political constituency and institutional basis to defend themselves on their own terms.

Contribution to Political Science

The inverse feedback column to Table 4 is a major contribution of this thesis to political science literature. It provides a useful addition to the "holy grail" of institutionalist research: to simultaneously explain stability and change (Blyth, Helgadóttir, and Kring 2016, 148). In most mechanisms that reinforce car-dependence, there lurks ambiguities and contradictions that give actors agency to intervene strategically to enable change. For example, while car-dependent residents *generally* demand wide roads as a solution to traffic — which reinforces car-

dependence — it is possible to convince them that walkable, transit-oriented development is a better solution to traffic.

This analysis offers two predictions about stability and change. First, self-reinforcing feedback tends to be stronger than inverse feedback, or else car-dependence would quickly unravel. It takes little time and energy to convince people who depend on driving that there should be more and wider roads. In contrast, it takes resourcefulness to convince them that density would reduce the number of people driving. Second, while inverse feedback can enable change, it tends to enable only partial, flawed, self-contradictory change, as it is the child of ambiguities and contradictions, not of coherent policy. A complete paradigm shift would require another step: for walkability to reinforce itself on its own terms, at the expense of car-dependence. Before walkability can itself become dominant, the interest groups, professionals, and economic actors who have an undivided interest in walkability would need to organize to better articulate their interests, and defend them.

Inverse feedback is compatible with other explanations that scholars have given for how institutions change. Blyth *et al.* (2016, 148), Orren (1995, 99), and Schmidt (2008) emphasize the role of ideas, discourse, and framing in enabling change. These factors play a central role in explaining why some car-dependent interests defend car-dependence, while others shift how they interpret their interests, and support walkability (Blyth, Helgadóttir, and Kring 2016, 148; Orren 1995, 99; Schmidt 2008). There is potential for future research to tease out the specific arguments, framings, or ideas that best enable shifts in perspective, and that, therefore, weaken self-reinforcing feedback and encourage change.

The concept of imperfect feedback — a subcategory of inverse feedback — also aligns well with scholars who explain change in terms of entropy. Capoccia (2016, 91, 102) emphasizes that institutions are often too weak to fully reinforce themselves. Streeck and Thelen (2005, 19) similarly argue that institutions "drift" — shifting purpose or losing effectiveness — unless they are vigilantly maintained. Each of these authors argue that such imperfections create opportunities for human agency: for people to intervene in messy systems to shift policy direction (Capoccia 2016, 91, 102; Streeck and Thelen 2005, 19). The present analysis contributes to this body of

work by locating these imperfections within specific feedback mechanisms: to argue that the same mechanisms can simultaneously reinforce the dominant paradigm while creating opportunities for change, due to inconsistencies, mixed incentives, and questions of interpretation.

American Political Development

I have built on American political development to propose an approach for combining intercurrence with insights from historical institutionalism and policy feedback, in which two competing paradigms coexist as self-reinforcing, mutually-undermining, systems. This approach to intercurrence is distinct from its initial usage, in which it referred primarily to the tension between systems of ideas — such as legal schools of thought — rather than questions of self-reinforcing policy feedback (Orren and Skowronek 1996, 114). I have strayed even further from the realm of ideas to focus on two physical systems of urban design, and on the tensions that exist between them in physical reality, independent of ideas about them. Nonetheless, the basic focus of American political development — on "durable shifts of authority" from one paradigm to another — remains a central focus of this thesis (Orren and Skowronek 2004, 120–132). I have shown that concepts from this literature can be applied productively to questions of urban design. Studying feedback can, moreover, contribute to the American political development literature by explaining how paradigms of ideas remain influential over time.

An important feedback loop in Table 4 was drawn from the American Political Development literature: the elaboration of a "tool-box" of arguments for a paradigm, which becomes more sophisticated over time as proponents work to justify it (Greenstone 2014, 47; Orren and Skowronek 2004, 75). Current road design standards provide a case study in how, after decades of careful elaboration, proponents have found ways to describe car-oriented design in a manner that seems objective and inevitable (Bhuyan and Nayak 2013, 130–132; Rose and Mohl 2012, 40–43; Norton 2011, 156, 166–169; AASHTO 2018). However, the proponents of walkability have also slowly expanded their counter-arguments, emphasizing the value of walkability in terms of quality of life (Duany, Plater-Zyberk, and Speck 2001), social connections

(Leyden 2003), street life (Jacobs 1961; Gehl 2010), health (Frank, Engelke, and Schmid 2003), the environment (Calthorpe 2013), safety (Dumbaugh and Gattis 2005; Speck 2018), and economic productivity (Marohn 2019; Glaeser 2011). On balance, the retrofits I studied faced greater political headwinds in the 1980s and early 1990s as compared to efforts after the 2000s, likely in part because proponents had by then expanded their tool-box of arguments and evidence to justify their position. In Ontario, proponents expertly marshalled arguments about traffic, the environment, and the economy to convince car-dependent residents that walkable growth was in their interest, which led to smart growth legislation that supported the densification of the Uptown Core (Eidelman 2010, 1222).

"Inverse feedback" provides a theoretic tool to better understand the chaotic process of change inherent to intercurrence (Ashbee 2015, 23). Table 4 suggests that actors can often exploit the mechanisms that otherwise reinforce a dominant paradigm to partially implement or justify an alternate paradigm. This can lead to messy outcomes because when proponents rely on contradictions to make change, it tends to beget contradictions. Car-oriented design standards may allow pedestrian-priority design on local streets, but this concession limits pedestrian priority to a small number of streets, divided from each other by arterials. The more proponents succeed in creating excellent walkable streets in this way, the greater the contradiction with surrounding arterials. I also offer a tentative theoretic explanation for how one may eliminate such contradictions and achieve a "durable shift in authority" (Orren and Skowronek 2004, 120–132). One must eventually rely less on inverse feedback, and shift focus to the new paradigm reinforcing itself on its own terms.

These insights may be useful for any political-economic context in which two paradigms compete for dominance, such as the shift from the fossil-fuel economy to a low-carbon paradigm. A similar central strategy may apply: amplify inverse feedback to create openings for change, and then maximize positive feedback to solidify the alternative paradigm. Such a fundamental shift appears to be possible, because car-dependence displaced the dominance of walkability in the early 20th century, and walkability is starting to achieve the contrary in these four retrofits. This thesis provides a map for navigating intercurrence from one dominant paradigm to another.

Contribution to Urban Planning

The theoretic model proposed in this thesis offers city officials practical insights for how to manage suburban retrofits. If officials fail to recognize the underlying tensions between car-dependence and walkability, they risk attempting to implement new zoning to allow dense, walkable growth without first creating the conditions under which developers would invest in such growth. Walkable plans may therefore have little impact on growth for many years, as in the Uptown Core today or Surrey in the 1990s. The failure to distinguish these growth models also puts officials at risk of making contradictory investments, as in Tysons, where government spent billions on transit lines while also widening roads next to them (Fairfax County Planning Commission 2012; Aratani and Duggan 2014). Or, government may continue using standards that were written to prioritize cars in places where government hopes to give priority to pedestrians, as in all four retrofits (though less so in Surrey). To competently switch from one paradigm to another, it is important that officials recognize that these paradigms contradict each other, and to intervene strategically to minimize the self-reinforcing feedback of one paradigm, utilize inverse feedback to initiate change, and then maximize self-reinforcing feedback for the new paradigm.

Proponents for walkability have one major economic advantage: car-dependent landowners can potentially earn more if they invest in dense, walkable development, *if it succeeds*. However, maintaining the status quo is less risky, and without intervention, incentives favouring the status quo appear to be stronger: see, for example, the slow growth of Tysons and Surrey before government intervened to incentivize dense development. The basic task officials face, therefore, is to strengthen the incentives for change. They can allow more density, eliminate parking requirements, concentrate all public investments into one finite area near transit, gather developers to coordinate their plans, create a development authority to partner on projects in strategic places, and offer tax breaks with a short deadline to spur immediate investment. Once walkable investment has started, officials can intervene to maximize the positive impact of walkable growth on future walkable growth, and minimize the impact of surrounding car-oriented development, by working with

developers to position buildings strategically to block the view of highways and parking lots, and to create streets that are pedestrian-friendly on all sides, as in Downtown Dadeland. Governments can also invest in streets and public spaces around transit stations to maximize the positive impact of transit on street life, as in Surrey.

Institutionally, officials can make use of the flexibility of current car-oriented standards to enable pedestrian-priority design on some streets, and to justify high-density growth without widening roads. If officials cannot fully eliminate car-oriented standards, they can also layer new standards on top of old ones, as in Florida's Context standards, which are layered atop the preexisting road hierarchy standards (FDOT 2020). The flexibility in car-oriented practice can enable some change, but such fixes create a patchwork of mutually contradictory standards. To complete the transition, it will likely be necessary to create new standards that are fully optimized for walkability, and that do not import such car-oriented requirements as level-of-service. NACTO (2013) has begun to design such standards, but none of the four retrofits used them.

Institutions also need to develop skills, norms, and procedures compatible with walkable design. One way to do so is to establish teams that work only on walkable areas, so that these practitioners can develop the capacities appropriate for walkable design. Officials can also strategically position urban planners on the same teams as engineers, or in adjacent offices, because, today, urban planners tend to have a stronger commitment to walkability. People in positions of power can also hire and fire managers as needed to ensure they have the appropriate priorities to implement walkable design, as in Surrey.

Politically, proponents can utilize the tools of inverse feedback to gain the support of some car-dependent interests. They can emphasize the benefits of transit-oriented growth for reducing traffic, promise to protect car-dependent neighbourhoods from densification, and provide routes for driving that bypass the retrofit, in exchange for narrowing specific roads and adding more density within specific areas. Ultimately, however, walkability cannot fully succeed if its policies depend primarily on the support of car-dependent interests. Officials should therefore do what they can

to encourage the residents, businesses, and developers of new walkable communities to articulate and defend their latent political interests.

To transition from one paradigm to another, I have shown one can start by using the dominant paradigm against itself: using its exceptions, ambiguities, and self-undermining features to provide a foothold for an alternative paradigm. The process resembles fighting fire with fire. However, in the long term, it will likely be more productive to fight fire with water. Walkability will struggle to thrive if it remains a novelty, surviving in an otherwise asphalt landscape, allowed only by exception to car-oriented rules, and dependent on the political support of car-dependent residents. Eventually, walkability must become dominant within its own domain, with an environment, rules, and a political base of its own.

Chapter 10. Conclusion

In the mid 2010s, Oakville's Mayor Rob Burton took me on a tour of the Uptown Core. He described the beautiful, European-style main street that was supposed to be there, and lamented that most of it — with the exception of two blocks of mixed-use buildings — was left vacant, or had been turned into parking lots and big box stores. I was confused. I had been taught in my training as an urban planner that the primary tools for creating change in cities are plans and zoning. Oakville had created plans and zoning for the Uptown Core, but little had changed. Developers could earn much more from high-density, mixed-use buildings than they could from what currently stood there. Why were they not building them?

I therefore set out to understand the barriers car-dependence creates for walkable growth. Developers were generous in explaining their reasoning. As I summarized in chapter 9, car-dependent developers are effectively stuck in a low-value equilibrium, or a kind of collective action problem (Olson 1965). Single-use, warehouse style structures may earn less than mixed-use towers, but they also cost less to build. It is difficult to convince tenants to pay a premium for the higher costs of mixed-use buildings if they are surrounded by parking lots, large roads, and blank walls (Leinberger 2001, 11; Cimer, personal communication, August 4, 2022). The challenge of building higher-density, mixed-use buildings is therefore to give developers reason to believe that other developers will also soon invest, so that collectively, their new buildings can transform the environment into one that tenants will pay for (Howard, personal communication, April 9, 2021). However, the incentive for any individual developer is to act as a free rider on other developers' investments, which will increase the area's land values without one needing to invest oneself.

It is similarly risky to be the first developer to invest in pedestrian-oriented buildings amongst asphalt and concrete, as one might find oneself with empty retail spaces pointed at empty sidewalks. Few people will walk in an area until there is a concentration of sidewalk-oriented businesses there, but entrepreneurs have little reason to open such businesses, and developers have little reason to build those retail

spaces, until people already walk there (Grant 2007, 80; De Nadai et al. 2016, 420–421; Ewing and Cervero 2010, 273–275). Existing car-oriented land uses may be less profitable than high-density, mixed-use towers, but they are also less risky, relying only on the transport mode already dominant in an area, and not the speculation that people might start walking in the future (Howard, personal communication, April 9, 2021). It should not be surprising that walkable plans had only a minor impact on growth in the Tysons, Surrey, or the Uptown Core in the 1990s. These plans allowed walkable growth in an environment where few incentives existed to build walkable growth.

Car-dependence has also created political and institutional barriers to change. The last century of car-dependent growth has created large constituencies of residents and businesses with a stake in the status quo. In Surrey and Tysons, angry voters scuttled multiple proposals to redesign roads to reduce space for cars and increase space for other modes (Trompeter 2020a; Gardner 2008; Stan McKinnon 1981; Johnston 2018). Instead, many roads have been, or will soon be, expanded in Tysons, Surrey, and the Uptown Core next to rapid transit (Fairfax County 2017b, 72–77; General Manager, Engineering 2020, 5; AECOM Canada Ltd 2015). Many car-dependent residents opposed density in the four retrofits because they assumed that more homes and jobs could only mean more traffic — an assumption that would be accurate in a car-dependent environment (Graham 2007, 114; Sweet 2011). In Downtown Kendall, a coalition of malls and other landowners launched a campaign to stop the new plan, fearing it would force them to build on top of their parking lots, and to eventually cut the mall up into smaller, walkable blocks (Miami-Dade County 1998b, 3; Walker 2001a). In Tysons, a group founded by car-oriented developers and highway builders were successful in lobbying to maintain or expand the size of major roads (NVTA 2021).

Institutions have been profoundly shaped by the needs and logic of car-dependent design, making it difficult to build anything else. Road design standards were first crafted by organizations that specialized in highways, and by researchers funded by car companies, and these standards define the value of a road in terms of its ability to move cars (Norton 2011, 165–166; Brown, Morris, and Taylor 2009, 163; Rose and Mohl 2012, 40). In Downtown Kendall, Oakville, and Tysons, these

standards posed a barrier to reducing turning speeds, shrinking lanes, eliminating lanes, and more (Hall Planning & Engineering, Inc. 2003, 32–35; City of Surrey 2017a, 116; Fairfax County 2017b, 19, 42, 71–77). Surrey and Tysons wrote all-new standards to allow more pedestrian-oriented designs, but both jurisdictions continue to use car-oriented design concepts — such as level-of-service — and in Tysons, the standards continue to treat pedestrian-friendly design as an exception to be approached with caution (FCDOT 2011, DS–20—21; City of Surrey 2017b).

Explaining Change

Despite all these barriers, considerable progress has been made in the four retrofits I studied, and in others (Williamson and Dunham-Jones 2021, 112, 131, 144, 187, 192, 203, 211, 239). Initially, I assumed that walkable change could be explained primarily by the strategic interventions of walkable interests. If they could gain a toehold for walkable growth, I hypothesized walkability could begin to reinforce itself by its own economic, political, and institutional logic. This hypothesis — which is now listed as my third hypothesis in Chapter 3 — was to some extent supported by the evidence. The proponents of the four walkable retrofits were, in most cases, inspired by their own personal experience with walkable communities, which suggests that walkability continues to reinforce itself at the level of ideas. The pace of walkable retrofits appears to be expanding, likely, in part, because at least some early retrofits have succeeded, and homes sell at a premium in those that have (Williamson and Dunham-Jones 2021, viii–ix; Li et al. 2014; Cortright 2009).[19] If more are built, and more succeed, the incentive to build them will continue to grow.

However, to my surprise, car-oriented interests also played a central role in change — arguably a larger role than walkable interests, in some cases. Some car-dependent voters believed they would benefit from restricted parking, narrower streets, and high densities — so long as these policies were implemented only within

[19] The most successful are blank-slate retrofits, built as a single project on a large piece of land, such as Playa Vista, Los Angeles and Baldwin Park, Orlando. Otherwise, "success" is a relative term. I have highlighted deficiencies in all four retrofits, but they have all attracted high-value mixed-use buildings, and Downtown Kendall competes with downtown Miami for prices (Rodriguez 2019; Morales, personal interview, March 25, 2021).

the well-defined boundary of walkable communities — because these changes could reduce traffic; create attractive destinations; promote an area's economic growth; and/or provide an escape valve for housing growth, allowing their own community to stay the same. I found only a few isolated examples of walkable residents organizing to defend their interests — in the Uptown Core and Tysons — but car-dependent residents were highly vocal in all four retrofits, shaping what was politically feasible.

In all four retrofits, previously car-oriented developers became major proponents of the new plans, in part because the new zoning would multiply their development rights (Vrooman, personal interview, July 6, 2021; Lubin personal interview, July 13, 2021; Howard, personal interview, April 9, 2021; Gerber, personal interview, May 3, 2022). There were also exceptions to the tendency of car-oriented buildings to discourage walkability: some car-oriented big box stores and malls attracted people on foot, or helped encourage investment in mixed-use buildings (Vrooman, personal interview, July 6, 2021; Knoll, personal interview, Jul 12, 2021). The institutions that adapted street design standards for these plans, meanwhile, were also generally the same that manage highways and arterials. While these institutions did create barriers to walkability, they also allowed new, narrower street designs in certain places, and other similar reforms (FCDOT 2011, DS–20—21; City of Surrey 2017b).

I coined the term "inverse feedback" to capture these exceptions, where the dominant paradigm partially undermines itself, reinforces the competing paradigm, or otherwise creates opportunities for change. A major cause of inverse feedback in recent decades is the extreme scale of car-dependent growth and its consequences (Gordon 2018; Heimlich and Anderson 2001, 2). Development patterns in Canada and the United States have rendered the majority of citizens wholly dependent on driving, creating a level of traffic that would have been considered intolerable in the 1960s (Bhuyan and Nayak 2013, 220). Sprawl eliminated much of Ontario's farmland by the 1990s, motivating many suburban voters to demand that new growth happen inside existing communities, in places like the Uptown Core (White 2007, 40–42; Eidelman 2010, 1222). In Tysons and Downtown Kendall, low-density growth had consumed all available land, inspiring developers and planners to seek a denser growth model to allow for the construction of more homes and office space (Miami Herald Editorial

Board 2022; Tobin 2019; Leinberger 2018). As the scale of these problems grew, so too did inverse feedback.

However, change caused by car-dependent interests is not identical to change caused by walkable interests. Car-dependent interests are much more likely to accept some kinds of reform than others, enabling only imperfect, incomplete change. Many suburban residents supported density near transit, but I found no examples of them expressing direct support for narrower roads. In institutions, there was a tendency to accept small, incremental changes from the status quo, but not a fundamental shift in philosophy. Fairfax County may have adopted an alternative to traffic studies to reduce the need to widen roads in Tysons, but nonetheless budgeted a billion dollars for widening and adding roads, including next to transit stations (Fairfax County Planning Commission 2012, 23; Fairfax County 2015). Surrey, Downtown Kendall, and the Uptown Core all saw progress on pedestrian-friendly design on local streets, but their arterials and collectors continue to prioritize cars.

I have therefore proposed a three-part framework for explaining the role of inverse feedback in change. First, car-dependence does tend to reinforce itself more than it undermines itself, which explains why it has been dominant now for a century, and why it remains difficult to successfully implement walkable growth in suburban contexts (Grant 2007, 80; Langlois 2010). But, second, car-dependence generates contradictions, ambiguities, and downsides — that is, inverse feedback — particularly when it grows to a scale that consumes all nearby land. Some car-oriented interests and institutions can therefore come to support change, but when they do, they tend to support only partial, incomplete change. To complete the process of transformation, I propose that — third — it would be necessary to organize those residents, developers, and industries that benefit directly from walkability to advocate for their unique needs in full, and to establish institutions and design standards that specialize specifically in this model of growth. In this way, as walkable development expands in scale, it can begin to defend its interests, and become standard practice, in a manner less prone to contradictions.

The four retrofits provide strong evidence for the first two hypotheses, but only a few suggestive examples for the third. Walkable residents did organize to

defend their interests in the Uptown Core, and local government did establish separate teams in Tysons and Downtown Kendall to implement walkable plans (Battista, personal interview, May 20, 2021; Byron, personal interview, May 20, 2021; Rawlinson, personal interview, July 7, 2021). Otherwise, however, my evidence for this third step is largely drawn from history, in the example of how car-dependence first overcame walkability, which was, a century ago, the dominant paradigm. At that time, car-oriented interests — civil engineers, auto manufacturers, oil companies, developers, trucking companies, and others — were more successful than their walkable counterparts in articulating their common interests, advocating for them, and having them institutionalized (Fogelson 2001, 108; Ross 2015, 32). If car-dependent interests could initiate this kind of self-reinforcing process, something similar could be possible for walkable interests today.

Intercurrence, Inverse Feedback, and Political Theory

A core insight of American Political Development is that no single paradigm ever fully dominates a society, and that it is the friction between them that explains political struggles and their outcomes (Orren and Skowronek 2004, 14–17, 113, 1996, 141). This is a useful concept for the study of cities, and retrofits specifically. It would be difficult to explain the reluctance of developers to build high-density buildings in car-dependent areas unless one first acknowledges that car-dependent and walkable buildings require different design paradigms. The failure to acknowledge such tensions itself is a political choice with consequences. The American Association of Highway and Transportation Engineers argue that their standards are equally relevant in all urban areas (AASHTO 2018, 1–17 to 1–22). Their standards were first written for highways, and as a consequence, they tend to give cars priority even within the densest urban cores (AASHTO 2018, 7–34 to 7–36, 7–40).

The concept of intercurrence illuminates the tensions inherent in retrofits, and retrofits contribute to our understanding of intercurrence. Retrofits highlight the crucial role of policy feedback in explaining how paradigms entrench themselves. A century ago, planners worried that transit, skyscrapers, foot traffic, and street-level businesses all reinforced each other, creating ever-denser urban cores where it was

increasingly difficult to drive (Fogelson 2001, 103; Zipper 2021; Ross 2015, 26; Perl and Kenworthy 2010, 1). Today, planners worry about a near-opposite set of mechanisms, in which highways enable low-density growth, causing traffic, which then requires more highways, leading to increasingly spread out, low-density, car-oriented cities, where it becomes impractical to walk, bike, or take transit. Both self-reinforcing processes are accompanied by political and institutional feedback mechanisms, expanding the set of interests who can defend either model of growth, and locking in a set of design practices as standard (Urry 2008, 344; Driscoll 2014, 319; Lehe 2017, 464). It would be difficult to fully understand the intercurrent tensions between these two paradigms without understanding the self-reinforcing feedback mechanisms that create them.

I propose the term "urban intercurrence" to capture the powerful tensions between car-dependence and walkability. This powerful, dynamic process simultaneously concentrates cities in some places while spreading them outwards into a thinly developed, expanding periphery. The concept brings clarity to what it means to implement a "suburban retrofit." Existing literature on retrofits sometimes mix efforts to implement walkability with other goals, such as implementing grey water systems and solar panels, or even being "anti-corporate" (Williamson and Dunham-Jones 2021, 101, 113, 116, 124, 157). "Urban intercurrence" focuses attention on a specific, difficult task: to shift from the self-reinforcing feedback mechanisms of car-dependence to that of walkability.

The concept of "inverse feedback," meanwhile, contributes insight for both to the literature on intercurrence and policy feedback. Inverse feedback can be summarized by three features: that self-reinforcing systems tend to contain contradictions, that these create opportunities for change, and that the resulting change tends to be imperfect and incomplete. The concept helps to explain why self-reinforcing paradigms do not remain dominant forever, without implying that they should collapse instantly under their contradictions. Instead, inverse feedback explains the availability of certain levers that proponents can pull on to initiate a process of change — but only to initiate it. Such levers cannot complete the process of change because they involve, by definition, groups and institutions that are tied to the dominant status quo, and who are therefore unlikely to endorse a full scale

transformation. Contradictions may enable change, but they also lead to further contradictions, not a coherent, self-consistent alternative.

Lieberman (2002, 698) has written that intercurrence explains change in terms of "friction, irregularities, and discontinuities" between competing paradigms. "Inverse feedback" introduces another source of friction: that co-existing paradigms contradict not only each other, but themselves. The resulting model of change would risk being too complex, were it not necessary. As I emphasize above, the progress of the four retrofits occurred at least as much due to the support of car-oriented interests as walkable interests. These mixed incentives help to explain some of the glaring contradictions in the four retrofits: why governments designed a main street as an arterial bypass in Oakville, eliminated a crosswalk next to transit in Downtown Kendall, or removed lanes from one intersection in Tysons while also removing the pedestrian islands (Hall Planning & Engineering, Inc. 2003, 30; Di Caro 2017; Lubin, personal interview, July 13, 2021). These decisions are the product not only of the competition between proponents of walkable and car-oriented design, but of the inconsistent interests, habits, and beliefs of car-oriented groups themselves, and their sometimes open-minded, but ultimately flawed, attempts to implement a paradigm that is foreign to them. Inverse feedback offers insight, in this way, not only on how change can begin, but on the nature of change.

A potential topic for future research is whether this model of change applies more broadly: whether inverse feedback plays a role in initiating, but not completing, transformation in other examples of intercurrence. Would it be relevant to contexts less tied to the logic of physical infrastructure, such as changes in legal thinking or ideological paradigms? It would also be valuable to examine whether the patterns of change I observe hold more broadly for other examples of suburban retrofits, particularly in other countries and political contexts. It would also be valuable to explore whether similar insights apply not only to the suburbs, but to efforts to revitalize historic downtowns and rural town centres. The present study focused only on retrofits that have made at least some progress, and it would be useful to examine whether similar forces explain why some retrofits lead to little or no change. If any retrofits fully succeed in the future — creating an environment with few remaining

signs of a car-dependent past — it would be especially valuable to examine whether the three-step process of change I have proposed can explain that success.

The Future

This thesis has positioned the tensions between car dependence and walkability as pathological. Wide roads divide walkable communities. Walkable areas, meanwhile, create obstacles for those who need to drive long distance fast. At their extremes, both walkability and car-dependence can undermine themselves. In the 1920s, an extreme kind of high-density walkable growth led to overcrowding and concentrated poverty (Weiner 1997, 10; Solomon 2007, 26–30). The scale of car-dependence today, meanwhile, erodes the utility of cars by causing excessive traffic (Bhuyan and Nayak 2013, 220).

Must such contradictions continue indefinitely? Will cities vacillate between two extreme paradigms that undermine each other and themselves? Perhaps not. Already, cities have learned to implement building codes and social policies that avoid the sanitation problems and overcrowding faced by dense cities in the 1920s. Marohn (2021, 15–30) suggests it should also be possible to design car-dependent areas to prevent some of its downsides. If one limits housing near regional roads and highways, one can reduce the extreme traffic on them. Relatedly, if one can limit growth in car-oriented areas to economic activities that need to be car-dependent — such as logistics, manufacturing, and ports — this would preserve road space for these industries that need to drive. Such policies would also encourage housing density in places that most benefit from it: walkable communities.

One could, meanwhile, eliminate much of the pathological tension between car-dependence and walkability if governments officially categorized urban areas for one design paradigm or the other, and established separate institutions for designing each. In this way, one could develop separate street design standards for walkable and car-dependent areas, removing the need to mix the contradictory logic of both. In walkable areas, one could simply remove such standards as the functional hierarchy, traffic studies, and level of service, which undermined pedestrian priority in all four

retrofits. One could also train separate experts in the two paradigms, allowing them to develop the distinct skills, habits, and practices appropriate for either.

The pathologies of urban intercurrence are therefore perhaps not inevitable, but they are likely to continue for many decades, or centuries, to come. The majority of homes in Canada and the United States are car-dependent, and roads will continue to be filled with traffic caused by land uses that could be walkable. It is likely not financially or politically feasible to convert all these communities into walkable places for the foreseeable future. There will therefore also continue to exist tensions between those who need to drive for all trips, and those who want some urban areas to be pleasant pedestrian-centred environments.

However, it should at least be possible to reduce the level of contradiction within walkable communities. NACTO (2013) has begun to establish distinct standards for walkable areas, though they have not yet clarified where these standards should apply. Politically, as the size of retrofits grows, so too will the number of voters and business interests who depend on their success, which may better empower them to shape streets and other public investments in their own interests. One could also amplify their power by allowing walkable communities to form their own local governments.

The plausibility of these outcomes varies in the four retrofits. Tysons did establish a distinct team to work on walkable areas, but they also imported car-oriented concepts, and on major roads, they continue to labour under the authority of a car-oriented state Department of Transportation (Taube 2021; Battista, personal interview, May 20, 2021; Byron, personal interview, May 20, 2021). Politically, there is little indication that governments would allow the four retrofits to split off to form their own municipalities, or otherwise govern themselves. These communities will therefore continue to exist in jurisdictions where the majority of voters are car-dependent, and will depend on their ambivalent support.

To study suburban retrofits is to study contradictions. The contradictions between car-oriented and walkable interests create barriers to implementing walkability in full. The opportunities to make progress on retrofits itself depends on

contradictions within car-dependence. It is therefore unsurprising that the four retrofits contain incongruencies, and have only made partial progress. To my knowledge, the only retrofits that have achieved such a change relatively free of contradictions are those that were built as a single project on a large piece of land, with no existing residents or businesses, such as Playa Vista, Los Angeles, or Baldwin Park, Orlando. Retrofits need not be riven by contradiction in perpetuity, however, if separate standards and institutions are established for them, and if local interests gain greater power over the design of their own community.

Appendix A. List of Interviewees.

This list includes only those interviewees who agreed to be quoted on the record, and who I quoted in the body of the text. All interviews were conducted by myself.

Downtown Kendall.

Name	**Official title**	**Role in retrofit**	**Interview date**
Blanco, Gilbert	Supervisor, Area Planning Implementation, Miami-Dade	A county planner who worked on the retrofit.	May 6, 2021
Dover, Victor	Founding Principal, Dover, Kohl & Partners	Urban planning consultant, employed by Chamber South to work on the retrofit. Also a major proponent for the project.	June 1, 2021
Florida Department of Transportation	Florida Department of Transportation Spokespeople (emailed interview)	Establish state-wide street design standards, and manage and design collectors and arterials within Downtown Kendall.	August 8, 2021
Hall, Rick	Principal Engineer, Rick Hall & Associates Consulting Engineers	An engineering consultant employed by Chamber South to work on the retrofit.	July 14, 2021
Lerner, Cindy	Former Mayor of Pinecrest, a municipality neighbouring the retrofit.	Pinecrest opposed the retrofit.	July 15, 2021
Morales, Eric	Real Estate Agent	Facilitates sales within Downtown Kendall, and provided insight on the market.	March 25, 2021
Plater-Zyberk, Elizabeth	Founding Partner, DPZ CoDesign	Urban planning consultant employed by Chamber South to work on the retrofit.	April 30, 2021
Rawlinson, Lee	Retired Director, Planning Division, Miami-Dade County	A county planner who worked on the retrofit.	July 7, 2021

Name	Official title	Role in retrofit	Interview date
Vrooman, Paul	Former employee, Chamber South, Miami-Dade Chamber of Commerce, Florida	Primary proponent for the retrofit.	July 6, 2021

Surrey City Centre

Name	Official title	Role in retrofit	Interview date
Arason, Jeff	Director, Strategic Initiatives & Corporate Reporting at City of Surrey	Has worked in the engineering department and was involved in implementing many aspects of the Surrey City Centre Plan.	March 9, 2022
Atkins, Christopher	Acting Current Planning Manager, North Surrey at City of Surrey.	Has worked on the Surrey City Centre Plan.	April 21, 2022
Dong, Andrew	Community Planner, Planning & Development Department, City of Surrey	Primary contact for current efforts to update the Surrey City Centre Plan.	April 1, 2021
Heaney, Michael	Former CEO of Surrey City Development Corporation	Partnered with private developers on development projects consistent with the Surrey Surrey City Centre Plan.	March 29, 2021
Howard, Brad	Director Developments, PCI Developments	Employee of a development company with major projects in Surrey City Centre.	April 9, 2021
Klassen, Patrick	Community Planning Manager, Planning & Development Department, City of Surrey	Has worked on the Surrey City Centre Plan.	March 26, 2021
MacLeod, Douglas	Transportation Planning Manager, City of Surrey	Works on transportation issues in the Surrey City Centre Plan.	March 24, 2021

Name	Official title	Role in retrofit	Interview date
Model, Elizabeth	CEO, Downtown Surrey Business Improvement District	Represents businesses in the Surrey City Centre Plan area and has been a major advocate for the plan.	April 6, 2022
Sixta, Gerhard	Former Chief Planner, Surrey	Led and implemented an early retrofit plan for Surrey.	March 24, 2021
Watts, Dianne	Former Mayor, Surrey	Championed the Build Surrey Program, which helped to accelerate the Surrey City Centre Plan.	March 30, 2021

Tysons

Name	Official title	Role in retrofit	Interview date
Alcorn, Walter	Supervisor, Hunter Mill District, on the elected Fairfax County Board of Supervisors; former Fairfax County Planning Commissioner; and former member of the Tysons Task Force	As a member of the Tysons Task Force, he worked with interest groups and government departments to craft a version of the plan that was politically and institutionally viable.	May 24, 2021
Battista, Suzianne	Chief, Urban Centers Section, Fairfax County	Urban planner who has worked on some of the development files in Tysons.	May 20, 2021
Biesiadny, Tom	Director, Fairfax County Department of Transportation	Oversees engineering and street design for Tysons.	May 13, 2021
Byron, Barbara	The Director of Fairfax's Planning and Zoning Agency	County urban planner who oversees the Tysons Comprehensive Plan.	May 20, 2021
Dancis, Ronit	Former Director, Transportation Management Association, Tysons Partnership Inc.	Oversaw efforts to ensure new developments in Tysons met their demand management goals (i.e., to reduce car trips).	May 10, 2021

Name	Official title	Role in retrofit	Interview date
Fuller, Gregory	Section Chief for Site Analysis, Fairfax County Department of Transportation	An urban planner who oversees planning work in Tysons for the Department of Transportation.	May 13, 2021
Gerber, John	CEO, West Group.	He leads a development firm that is a major land owner in Tysons. He played a central role in putting forward proposals for dense, walkable development in the early 2000s.	May 3, 2022
Glasner, Sol	Retired President & CEO, Tysons Partnership.	Led efforts to coordinate government, developers, industry, and community groups to implement the Tysons Comprehensive Plan.	May 26, 2021
Horn, Sally	President of the McLean Citizens Association and member of the Greater Tysons Citizen Coalition	Provided input on the Tysons Plan as a member of these two groups, which represent suburban communities neighbouring Tysons.	May 19, 2021
Lerner, Abraham	Tysons Corner Transportation Urban Center Liaison, Virginia Department of Transportation	Coordinates with county engineers, developers, and his colleagues to implement transportation design decisions consistent with the Tysons plan.	May 25, 2021
Niedzielski-Eichner, Phillip	Fairfax County Planning Commissioner	Manages the Tysons Comprehensive Plan with other commissioners.	March 24, 2021
Nixon, Brittany	Transportation Planner III - Site Analysis Section, Fairfax County Department of Transportation	Urban planner who works on development projects in Tysons.	May 13, 2021
Palchik, Dalia	Supervisor, Providence District, on the elected Fairfax County Board of Supervisors	Current county elected representative for the Providence District, which covers most of the Tysons area.	June 4, 2021

Name	Official title	Role in retrofit	Interview date
Schwart, Stewart	Executive Director of the Coalition For Smarter Growth	Director of a non-government group that gave input on the original Tysons Plan and that advocates for walkable, transit-oriented design in Tysons.	April 5, 2022
Wright, Bruce	Board member, Fairfax Alliance for Better Bicycling, and former chairman, Fairfax Advocates for Better Bicycling	Participated on the Tysons Task Force and gave input on cycling infrastructure for the plan.	May 3, 2021

Uptown Core

Name	Official title	Role in retrofit	Interview date
Burton, Rob	Mayor, Oakville	Has encouraged growth in the Uptown Core as a way to address the province's growth requirements for municipalities.	July 12, 2021
Charles, Gabe	Director of Planning, Town of Oakville	Managed planning on the file as the town's Director of Planning.	May 5, 2021
Cimer, Joseph	Director, Development, SmartCentres	Works for a development company that is a major landowner in the Uptown Core. He has worked on recent mixed-use development proposals there.	August 4, 2022
Dodds, Carly	Planner at Town of Oakville	Current lead planner on updates to the Uptown Core plan.	April 16, 2021
Hecht, Heinz	Retired Manager Current Planning, Town of Oakville	Worked on the Uptown Core file in the 1990s.	May 5, 2021

Name	Official title	Role in retrofit	Interview date
Kelly, Philip	Manager, Design & Construction, Transportation and Engineering, Town of Oakville	An engineer with the Town of Oakville who oversees a division that conducts street design projects in the Uptown Core.	July 23, 2021
Knoll, Michelle	Executive Director, Oak Park Neighbourhood Centre	Was an early resident of the Uptown Core, and was involved in efforts to stop a car dealership in the community.	July 12, 2021
Lubin, Lawrence	Chief Operations Officer, Metrontario Group	Works for a development company that is a major landowner in the Uptown Core. He has played an instrumental role in development proposals for the Uptown Core since the 1970s.	July 13, 2021
Stephen, Jill	Director, Transportation and Engineering, Town of Oakville	An engineer with the Town of Oakville who oversees a department that conducts street design projects in the Uptown Core.	July 23, 2021
Zavaros, Scott	Director of Land Development, Metrontario Group	Works for a development company that is a major landowner in the Uptown Core. He has worked on the Uptown Core since the 1990s, and used to be a resident.	July 13, 2021

Appendix B. Mechanisms Table

Table 4. A list of the mechanisms by which car-dependence and walkability can reinforce themselves. The middle column, "inverse Feedback," identifies reasons why these mechanisms do not necessarily reinforce car-dependence, but leave flexibility for actors to advance walkability instead, helping to explain change. This column focuses only on examples of inverse feedback *from* car-dependence *towards* walkability, as this is the topic of the present study. I note the chapters where I find evidence for each mechanism using the following symbols: Chapter 4. History: ● Chapter 5. Downtown Kendall: ● Chapter 6. Surrey: ● Chapter 7. Tysons: ● Chapter 8. Uptown Core: ●

	Self-Reinforcing Car-Dependence	**Inverse Feedback**	**Self-Reinforcing Walkability**
Spoils & Consequences. These feedback processes involve those groups who benefit from a policy, or perceive themselves to benefit.			
Protective Constituency (Pierson 1996) Related: Spoils, Concentrated Benefits (Pierson 1993, 599; Béland, Campbell, and Kent Weaver 2022, 54). The beneficiaries of a policy are incentivized to defend it.	**Political Feedback** - Engineering groups, who benefit from highway funding, tend to defend highway-building budgets and projects. ● - Car-oriented businesses sometimes fight street design changes that would reduce car access. ● - Car-dependent residents often oppose proposals for high-density development out of fear it will cause traffic ●●●● - Car-dependent residents often fight proposals to reduce the speed or size of roads they use. ●●●	**Political Feedback** - Some car-dependent residents perceive themselves to have an interest in having access to a nearby walkable town centre, and advocate for a suburban retrofit (as long as their own communities stay unchanged). ●●● - Car-dependent residents may support parking restrictions within a walkable area if it is presented as a solution to traffic. ● - Car-dependent residents may come to support a denser development if their housing prices stagnate. ● - Many suburban residents are willing to accept the "Grand Bargain," in which they accept density within a finite area, so long as their own communities do not change. ●●● - People asking for slower speeds on local streets sometimes provide a political counterweight to people asking for higher-speed roads. ●	**Political Feedback** - If a walkable retrofit successfully attracts residents seeking a walkable lifestyle, these residents may defend that lifestyle against such incursions as a car dealership. ●

	Self-Reinforcing Car-Dependence	Inverse Feedback	Self-Reinforcing Walkability
Increasing Returns: Self-Reinforcing Influence (Pierson 1993, 607–608) The groups who benefit from a growth paradigm grow in size and influence as the scale of the paradigm grows, which then empowers them to defend and redouble that paradigm.	**Political Feedback** - The size of highway budgets in Canada and the United States since the 1950s has created large industries in engineering, asphalt, and construction, and these groups use their size and budgets to lobby for expanded highway funding 🟡🔴. - The development industry that builds car-dependent communities has become large and influential, and it advocates for lax growth policies that allow them to build more 🟡🔴. - Government investments in large roads have effectively subsidized the construction of car-dependent communities, and the residents of these communities have become a powerful political constituency for further road widening 🟡🔵🟢🔴🟣.	**Political Feedback** - The industries that build roads can generally expand their projects by building additional infrastructure for transit and other modes. These groups therefore increasingly support investments in transit, cycling, and pedestrian infrastructure, so long as these proposals do not shrink the size of roads or road budgets 🔴. - Developers usually do not oppose denser zoning for their own land, if it gives them more options, unless new rules will require them to demolish their existing car-oriented buildings 🔵🟢🔴🟣. - Some car-dependent residents believe it is in their interests to limit car-dependent growth to maintain free-flowing traffic for themselves 🔵🟣.	**Political Feedback** - As transit-oriented development has grown in scale in Tysons, the developers who build these high-density buildings have funded an organization to advocate for transit investment and dense zoning, and to oppose highway construction and wide roads 🔴.

	Self-Reinforcing Car-Dependence	Inverse Feedback	Self-Reinforcing Walkability
Scale Impacts (New) The scale of a growth paradigm can itself become self-reinforcing, if it becomes so dominant that it eliminates the vestiges of the alternative paradigm.	**Institutional Feedback** - If a jurisdiction contains no walkable growth, this risks eliminating the institutional capacity to implement alternatives 🟢🔴.	**Political Feedback** - As car-dependence grows in scale, its impacts on air quality, CO2 emissions, and the degradation of natural environments can inspire a political backlash 🔵🟢🟣. - Widespread car-dependence can lead to high levels of traffic, which can inspire a backlash, leading some people to demand alternative models of growth that, they hope, will create less traffic 🔵🟢🔴🟣. **Transport-Economic Feedback** - Low-density growth quickly consumes available land, limiting the space available for continued car-dependent growth. This can lead developers to seek denser growth models 🔵🔴🟣. - Rising traffic can undermine the economic competitiveness of car-oriented office environments, as these areas tend to offer few amenities other than convenient driving. The failure of this economic model can lead some landowners to push for a new, denser model with more amenities and transport options 🔵🔴.	
Tool-Box Elaboration (Greenstone 2014, 47; Orren and Skowronek 2004, 75) As actors advocate for a policy, they articulate arguments for it that future actors can draw on, leading to an accumulation of ideas that help to justify it.	**Political and Institutional Feedback** - The proponents of car-oriented design have elaborated a framework for justifying wider roads and outward growth that can make the decision to widen roads seem inevitable in reports and standards 🟡🔵🟢🔴🟣.		**Political and Institutional Feedback** - In recent decades, advocates for walkable growth have expanded the justifications for this approach to design, focusing on traffic, the environment, health, and the economy 🟡🔵🟢🔴🟣.

	Self-Reinforcing Car-Dependence	Inverse Feedback	Self-Reinforcing Walkability
Cues for identity (Pierson 1993, 619–620) If policies have an impact on people's sense of identity, they may defend those policies to defend their identity.	**Political Feedback** - Some residents in single-family communities oppose tall buildings not only because of its practical impacts, but because they perceive it as an attack on their chosen way of life 🔵🟢🟣.	**Political Feedback** - Residents rarely identify car-oriented commercial environments as the psychological centre of their community, because they tend to be visually undesirable. These environments therefore often have few defenders, and their unattractiveness can motivate some residents to demand change 🔵🟢🔴🟣. - Many residents do not perceive tall buildings outside their own neighbourhood as an attack on their identity 🔵🟢🔴.	

	Self-Reinforcing Car-Dependence	Inverse Feedback	Self-Reinforcing Walkability
Over-Adaptation Institutions adapt to existing policies, which can make them less able to implement other policies. These feedback processes are analogous to when animal species become highly adapted to one ecological niche, making them less able to adapt to other niches.			
Learning Effects (Pierson 1993, 607) When a policy paradigm becomes dominant, actors will tend to become proficient at working within this paradigm, while losing the skills necessary for alternatives.	**Institutional Feedback** - In jurisdictions with few walkable places, public servants may lack the skills necessary to implement walkability 🟢🔴. **Transport-Economic Feedback** - If most developers in an area have focused on car-dependent projects, they may lack the skills and confidence to implement walkable developments 🟢.	**Institutional and Transport-Economic Feedback** - Governments and developers can hire employees or consultants with expertise in walkable developments 🔵🟢🔴🟣.	**Institutional Feedback** - As jurisdictions gain more direct experience with walkable developments, they gain the necessary skills to implement more 🔵🟢🔴🟣. - Some jurisdictions accelerate learning by creating specific teams that focus on walkable developments 🔵🔴. **Transport-Economic Feedback** - As developers build more walkable projects, they become more comfortable making investments in this growth model 🔵🟢🔴🟣.
Administrative Capacities (Pierson 1993, 604–605) When a policy paradigm becomes dominant, institutions establish systems for implementing that paradigm, which are often inadequate for implementing other paradigms.	**Institutional Feedback** - Governments continue to use car-oriented measurement tools (such as level of service) in walkable places because adopting new tools would require them to collect new kinds of data and create new decision-making processes 🔵🟢🔴🟣. - Engineering departments use sophisticated software tools for measuring and projecting traffic impacts. Officials tend to give greater weight to the impact of decisions on traffic than on other modes because they are better equipped to evaluate traffic impacts 🔵🟢🔴🟣.	**Institutional Feedback** - While level-of-service and traffic studies tend to justify wider roads and limits on density, it is possible to moderate these conclusions by increasing the level of congestion deemed acceptable, or setting optimistic assumptions about future rates of walking, biking, and transit ridership 🟢🔴. - If institutions are reluctant to eliminate well-established car-oriented standards, it is sometimes possible to add new pedestrian-oriented standards alongside existing ones, a strategy called "Layering" (Streeck and Thelen 2005, 19). Some jurisdictions have created "context" classification schemes, which can give greater priority to pedestrians 🔵🔴.	**Institutional Feedback** - Professionals who specialise in walkable contexts may establish standards optimized for these contexts, and train an increasing number of professionals in them. NACTO was formed by urban transportation officials for this purpose, though none of the four cases have adopted NACTO standards. 🟡

	Self-Reinforcing Car-Dependence	Inverse Feedback	Self-Reinforcing Walkability
Category Structure (New) When a policy paradigm becomes dominant, organizations tend to adopt terms and categories that reflect that paradigm, making it more difficult to implement, understand, or discuss other paradigms.	**Institutional Feedback** - The functional hierarchy classifies streets using terms such as "collectors" and "arterials," which imply that the purpose of streets is fundamentally to move traffic, which constitutes a barrier to the prioritization of other modes. The Functional Hierarchy is in tension with the goal of creating a walkable grid, which requires all streets to prioritize pedestrian safety and comfort 🔵🟢🔴🟣.	**Institutional Feedback** - The Functional Hierarchy implies that local streets — the ones lowest on the traffic hierarchy — should prioritize pedestrians. This classification can provide an opportunity to implement pedestrian-priority designs, though at a limited scale 🔵🟢🔴🟣.	**Institutional Feedback** - Local governments may establish new street-design standards to support walkable retrofits. 🟢🔴

	Self-Reinforcing Car-Dependence	Inverse Feedback	Self-Reinforcing Walkability
Lock-in A number of mechanisms make it difficult for institutions to change quickly to another paradigm, even if many people involved want to.			
Anchoring (Related to: Bounded rationality, incrementalism) (Pierson 1993, 611–612) Actors tend to judge the reasonableness of actions in terms of their distance from current practice, rather than what would be optimal for a given context. This shapes what options are considered reasonable, and what are beyond consideration.	**Institutional Feedback** - Professionals accustomed to car-oriented design may perceive small changes towards walkability as major concessions, even if they fall far short of walkability, such as the elimination of a single lane from a nine-lane road. This dynamic can limit the ambition of walkable changes ●●. - Public servants may accept walkable standards for some streets, but may limit where these standards apply, treating them as exceptional tools to be used with caution, rather than as a consistent practice ●.	**Institutional Feedback** - While anchoring may limit the ambition of walkable changes, it does not prevent walkable changes ●●●●.	**Institutional Feedback** - As pedestrian-oriented design becomes common practice in a region (such as Vancouver), it can begin to define what professionals perceive as normal ●.

	Self-Reinforcing Car-Dependence	Inverse Feedback	Self-Reinforcing Walkability
Status-Quo Bias (New) Actors tend to face fewer risks if they follow standard practice versus attempting something new, even if standard practice causes greater harm.	**Political Feedback** - Politicians face greater risk of being blamed for traffic if they approve dense developments or narrow roadways than if they maintain the status quo 🔵🟢🔴🟣. **Institutional Feedback** - Engineers face fewer legal and professional risks if they implement existing car-oriented street design standards, even if evidence exists (as it does) that existing standards lead to more injuries and deaths than alternative pedestrian-priority standards 🔵🔴🟣.	**Political Feedback** - If traffic becomes sufficiently frustrating, residents may deem the status quo unacceptable and demand change. Some politicians successfully position transit investments, density, walkable street design, and parking restrictions as solutions to traffic 🔵🟢🔴🟣. **Institutional Feedback** - Engineers enjoy some latitude in how they implement existing standards, allowing them to build marginally more pedestrian-friendly standards without substantial professional risk 🔵🟢🔴🟣.	**Institutional Feedback** - When jurisdictions adopt walkable standards, they reduce the risk engineers face in implementing them 🟢🔴.

	Self-Reinforcing Car-Dependence	Inverse Feedback	Self-Reinforcing Walkability
Norms (Béland, Campbell, and Kent Weaver 2022, 17–18) Once a paradigm becomes dominant, its underlying logic can begin to seem like common sense, and people begin to evaluate proposals in terms of the norms, values, and logic of that paradigm.	**Political Feedback** - Car-dependent residents have come to expect political leaders to deliver free-flowing traffic and ample parking. These norms create political barriers to building walkable contexts, which require narrow streets and limited parking 🔵🟢🔴🟣. **Institutional Feedback** - Transportation engineers tend to view traffic flow as an essential goal, and defend this goal against those who want to redesign streets to prioritize other goals 🔵🟢🔴🟣. - Transportation engineers tend to share a strong cultural commitment to achieving safety for fast driving, which can make slower-speed designs (such as narrow lanes) seem unacceptable 🔵🟢🔴🟣.	**Institutional Feedback** - While experts appeal to safety when justifying wide lanes and fast roads, reformers can also appeal to safety to justify narrower, slower street designs 🔵🟢🔴🟣. - Pedestrian, cycling, and transit infrastructure can be justified as tools for improving traffic flow and speed, by reducing the proportion of people who drive 🔵🟢🔴🟣. - While institutions influence the norms and values of their employees, they do not do so perfectly, leaving latitude for some to push for internal change 🔵🟢🔴🟣.	**Institutional Feedback** - If people who prioritize walkability are hired into positions of leadership, they can shift cultural norms by hiring people who also prioritize walkability 🟢. - If an administration fires people who oppose walkability, it creates a strong incentive to shift cultural norms 🟢.
Embedded values (Marohn 2021, 1–14). Actors sometimes write rules and standards in seemingly neutral language, but which implicitly reflects the values and priorities of the dominant paradigm, making it difficult to implement alternate policies.	**Institutional Feedback** - Level of service, the Functional Hierarchy, and current safety standards implicitly prioritize car-oriented goals above others, making it difficult to justify walkable infrastructure. These standards often do not consider the value of proximity (rather than speed), the capacity of streets in terms of people (rather than vehicles), and the performance of streets in terms of local economic development (rather than transportation) 🔵🟢🔴🟣.	**Institutional Feedback** - It is sometimes possible to justify walkable designs by adding pedestrian-oriented goals to one's analysis, such as increasing transit ridership. Usually, however, these goals do not replace car-oriented goals, but exist alongside them 🔵🟢🔴🟣. - Walkable infrastructure may be treated as an option (rather than a requirement), but nonetheless, it is often implemented on its merits 🔵🟢🔴🟣.	

	Self-Reinforcing Car-Dependence	Inverse Feedback	Self-Reinforcing Walkability
	- In all four retrofits, proposals to expand car infrastructure tend to be treated as requirements, whereas proposals to improve infrastructure for walking, biking, or transit are treated as options 🔵🟢🔴🟣.		
Menu contraction (Béland, Campbell, and Kent Weaver 2022, 53). Related: the second face of power (Bachrach and Baratz 1962). If sufficiently powerful interests depend on some aspect of a paradigm, there may be little evidence of the option being discussed, because actors feel there is little hope of implementing it.	**Political Feedback** - Some proposals may be so clearly opposed by landowners that they are not raised, such as the idea of dividing large malls into smaller walkable blocks (in Tysons) 🔴. - Shrinking the size of large roads might be so clearly unpopular that the proponents of retrofits do not mention it, or stop mentioning it 🔵🟢🔴🟣. **Institutional Feedback** - In the 1920s, engineers debated many ideas for fighting traffic. However, from the 1950s to 1980s, few options for fighting traffic were considered for the four retrofits except widening roads 🟡.	**Institutional Feedback** - Decades of road widening projects have not eliminated traffic, creating an opportunity for proponents to argue for alternative solutions 🔵🟢🔴🟣.	

	Self-Reinforcing Car-Dependence	**Inverse Feedback**	**Self-Reinforcing Walkability**
Selection Bias The people who choose to live or work in the context of a given paradigm are likely biased in favour of what currently exists.	**Political Feedback** - Suburban residents may prioritize cars, in part, because they self-selected for a car-oriented environment. 🔵🟢🔴🟣 **Institutional Feedback** - If local government consults existing cyclists in a car-dependent environment, they will tend to only hear from those willing to bike in a car-dependent environment, excluding all those who need safer infrastructure 🔴. - If a government department mostly manages highways and large roads, it will likely attract people who prefer working on such car-oriented projects 🔴.		**Political Feedback** - Residents may self-select to live in walkable retrofits, if the advertising for these developments offer a walkable lifestyle. They are therefore more likely to share a political commitment to defending walkability 🟣.

Multi-Level Government Lock-In New, related to Coordination Effects (Pierson 1993, 607) Feedback processes affect different levels of government differently, and some may face stronger incentives to maintain the status quo, and weaker incentives for change.	**Political Feedback** - Higher levels of government tend to have a greater proportion of car-dependent rural and exurban areas. Voters in low-density areas also have disproportionate influence because they tend to have fewer voters per elected official. Higher levels of government therefore often resist changes that would affect drivers, such as redesigning arterials that pass through retrofits 🔵🟢🔴🟣. **Institutional Feedback** - State Departments of Transportation first gained influence in the United States implementing highways. The same is true of national transportation standards bodies in Canada and the United States. This history means that the car-oriented design paradigm is particularly entrenched in these organizations, and they posed a barrier to change in all four retrofits 🟡.	**Political Feedback** - Local governments are able to implement many policies without the participation of higher levels of government. 🔵🟢🔴🟣	

	Self-Reinforcing Car-Dependence	Inverse Feedback	Self-Reinforcing Walkability
Urban Intercurrence Some feedback mechanisms are specific to the tensions between car-dependence and walkability.			
Building-Transport Feedback New, related to Coordination Effects (Pierson 1993, 607) Car-dependent development tends to reinforce rates of driving, which incentivizes development that caters to driving, undermining other modes of transport.	**Transport-Economic Feedback** - If most people drive in an area, and few people walk, developers are incentivized to build large parking lots in front of buildings. Developers are disincentivized from investing in buildings that prioritize pedestrians in such a context — with entrances aimed directly onto the sidewalk — because such buildings risk failing unless other developers build similar buildings at sufficient scale to make walking a major mode of transportation. ●●●● - Maintaining an existing car-oriented business model is generally a lower-risk strategy than betting that an area will transform sufficiently to support sidewalk-oriented business models. Developers often prefer the status quo, even if offered high-density development rights. ●●●●	**Transport-Economic Feedback** - While car-oriented big-box stores and malls tend to encourage driving and discourage walking, they sometimes also encourage some residents to walk if located sufficiently close to homes or transit. If they are sufficiently desirable stores, they can increase the value of nearby developments to some limited extent, helping to make walkable developments more viable — though much less so than buildings designed to cater to pedestrians. ●● **Transport-Economic Feedback** - While many car-dependent land owners do not take advantage of high-density zoning — due to the risk that the area will remain too car-oriented for such buildings to become successful — others may be willing to take the risk, or to sell to those who will. ●●●●	**Transport-Economic Feedback** - If developers work directly on crafting a new walkable plan for an area, their participation may signal to each other that they will invest, building confidence and therefore increasing the likelihood that they will in fact invest. ●● - If developers and government invest in sidewalk-oriented buildings at sufficient scale, it can give developers confidence that people will soon walk the area's sidewalks, which can encourage more developers to invest in sidewalk-oriented buildings, in a self-reinforcing process based on the anticipation of street life. ●● - If sufficient people walk on existing sidewalks, it further incentivizes developers to invest in sidewalk-oriented buildings. These buildings then attract more people to sidewalks, in a self-reinforcing process based on actual street life. ●

	Self-Reinforcing Car-Dependence	Inverse Feedback	Self-Reinforcing Walkability
Aesthetics and land-value feedback. (New, related to Coordination Effects) (Pierson 1993, 607) Car-dependent business models tend to depend on providing large amounts of space at low-cost in low-value buildings. It can be difficult, in this context, to transition to a walkable business model, which depends on offering smaller spaces at higher cost (per square foot) in higher-value buildings.	**Transport-Economic Feedback** - Aesthetics bear little on where people drive, and parking lots make it difficult, in any case, to make properties aesthetically attractive. Car-dependent developers therefore rarely invest in creating attractive commercial properties, and instead design cheap, single-use, often single-story buildings with blank walls and simple parking lots. Such environments discourage people from walking. ●●●● - It is difficult for higher-value, mixed-use buildings to succeed unless the exterior environment is sufficiently attractive and there is a concentration of valuable nearby destinations. No single building can create an attractive environment or a concentration of destinations, which discourages walkable investment in car-dependent environments. ●●●●	**Transport-Economic Feedback** - If local government allows developers to build sufficiently tall buildings, the profits from such towers can compensate for the costs of pedestrian-friendly exteriors and mixed-use design, and help compensate for the risks of changing business models. ●●●● - If land values rise for any reason unrelated to an area's current physical state — such as the regional scarcity of homes, or an area's strategic position in a region — developers may be able to command sufficiently high prices to justify higher-cost walkable designs before the area is itself visually desirable or convenient for walking. ●●	**Transport-Economic Feedback** - Once developers begin investing in an area in large numbers, this gives other developers confidence that land values will rise, which encourages yet more developers to invest ●●●. - If existing mixed-use buildings create visually desirable streets and a cluster of convenient destinations, it increases the amount developers can charge per square foot, which attracts more nearby mixed-use development, in a self-reinforcing process ●●. - High land costs incentivizes developers to use their land for buildings, not for parking lots. The concentration of buildings encourages walking, while the absence of parking discourages driving, in a process that reinforces walkability over time ●. - Developers can amplify the self-reinforcing impact of walkable buildings, and diminish the feedback of car-oriented buildings, by positioning walkable buildings to block the view of car-oriented parking lots and blank walls ●.

	Self-Reinforcing Car-Dependence	Inverse Feedback	Self-Reinforcing Walkability
Fixed Costs, Branching Effects (Sorensen 2015, 21; Pierson 1993, 607–609) When a community was built under one growth model, it is expensive to rebuild infrastructure and buildings to reflect a new model.	**Institutional Feedback** - Governments can rarely afford to transform an area's infrastructure wholesale to become fully walkable. The legacy of car-oriented infrastructure therefore tends to continue influencing transportation behaviour long after shifts in official policy. 🔵🟢🔴🟣 **Transport-Economic Feedback** - It is unlikely that all landowners in an area will develop all their properties simultaneously to become walkable. The legacy of car-dependent growth therefore continues to influence transportation behaviour long after zoning changes. 🔵🟢🔴🟣		

Appendix C: Interview Guide

The following interview guide provides an outline of the questions I asked participants (when relevant). I did not follow this template precisely. It acted, instead, as a checklist of topics to cover, to ensure I addressed all important issues with each participant.

Question 1: Warm Up

Everyone except local politicians

- Please describe your role in your organization, and the focus of your [group, team, department, or company].

Local Politicians

- Please describe your role as an elected official, as you see it, and your primary goals overall.

Question 2: Relation to Plan

Government Staff: engineers, urban designers, urban planners, development officers.

- What was/is your role in creating or implementing the plan?

Developers or their staff

- I'd like to understand your company's involvement in shaping, implementing, or working under the plan, and your personal role in those activities.
    - In what ways did your company give input on the plan when it was being developed?
    - Could you describe the developments you've proposed or considered proposing under the plan, and your role in those proposals?

Development industry consultants

- I'd like to understand your company's involvement in shaping, implementing, or working under the plan, and your personal role in those activities.
    - In what ways did your company give input on the plan when it was being developed?
    - Could you describe the developments you've proposed or considered proposing under the plan, and your role in those proposals?

Local Politicians

- [If they were elected when the plan was being developed]. To what extent were you involved in the development of this plan?
- In what ways are you involved in efforts to implement this plan, make adjustments to it, or shepherding developments under it?

Community groups

- I'd like to understand your group's involvement in shaping, implementing, or proposing changes to the plan, and your personal role in those activities.
    - In what ways did you give input on the plan when it was being developed?
    - Have you been active since the plan passed in implementing any aspect of the plan, proposing changes to it, or anything similar?

Question 3: Paradigm Shift

Everyone

- To what extent, if at all, does this plan represent a major shift in how planning is done in your city, and this area of the city specifically?
- If so:
    - Please characterize, in your own words, the key changes that define this shift.

Question 4: Evaluation of Progress

Everyone

- In a broad sense, how successful do you believe the plan has been in achieving its goals? And in your own view, at a high level, what do you think accounts for this outcome?
- In what ways do you, or your department/organization, support, or have concerns about this plan?

Question 5: Institutional path dependence: regulations.

Even when successful, it can be difficult to make changes in how cities conduct community design. I would like to ask you a few questions about some of those potential challenges.

Government Staff: engineers, urban designers, urban planners, development officers.

- Are there any pre-existing rules, policies, or regulations that have conflicted with the intent of this plan, and make it more difficult to implement?
- If so, in your view, were any of these older rules developed with different ideas or assumptions in mind that would help to explain why they're in tension with the new plan? What kind of distinct ideas or assumptions may be relevant?

Developers or their staff

- Are there any pre-existing rules, policies, or regulations that make it more difficult to build projects under this plan?
- If so, in your view, were any of these older rules developed with different ideas or assumptions in mind that would help to explain why they're in tension with the new plan? What kind of distinct ideas or assumptions may be relevant?

Development industry consultants

- Are there any pre-existing rules, policies, or regulations that make it more difficult to implement the new plan, or to build development projects under it?
- If so, in your view, were any of these older rules developed with different ideas or assumptions in mind that would help to explain why they're in tension with the new plan? What kind of distinct ideas or assumptions may be relevant?

Local Politicians

- Are there any pre-existing rules, policies, or regulations that conflict with the intent of this plan, and make it more difficult to implement?
- If so, in your view, were any of these older rules developed with different ideas or assumptions in mind that would help to explain why they're in tension with the new plan? What kind of distinct ideas or assumptions may be relevant?

Community groups

- Are you aware of any pre-existing rules, policies, or regulations that conflict with the intent of this plan, and make it more difficult to implement?

- If so, in your view, were any of these older rules developed with different ideas or assumptions in mind that would help to explain why they're in tension with the new plan? What kind of distinct ideas or assumptions may be relevant?

Question 6: Institutional path dependence - ideas & distinctions between parts of government

In this question, I'm going to ask about potential sources of disagreement between parts of government. Please note that my goal is to identify differences in philosophy or assumptions, and not to highlight personal disagreements. I am happy to anonymize answers to this question, or any question you request. If so, I will not name your department/ organization, or any identifying information, in reference to any answer that you give.

Government Staff: engineers, urban designers, urban planners, development officers.

- In your view, how aligned are various departments on implementing this plan? Were there any differences in perspectives or ways of thinking that pose challenges? Or do departments have similar ways of thinking?
- In your view, how aligned is your institution with other relevant agencies or levels of government, outside of your organization, on implementing this plan? How easy or difficult has it been to coordinate with other parts of government on this plan, and why do you think that is?
- [If they agree with the premise that the plan constitutes a paradigm shift]. If there have been any differences, do you think they are related to this plan doing things in a new way?

Developers or their staff, and development industry consultants

- Caution text: In your view, how aligned are various government departments on implementing this plan? Are there any differences in perspectives or ways of thinking that pose challenges to creating development projects under the plan? Or do departments have similar ways of thinking?
    - Have you had to work with multiple agencies or levels of government to implement projects under this plan? If so, how aligned do you feel they are on implementing this plan? If there is any mismatch, has this created any difficulty?
    - [If they agree with the premise that the plan constitutes a paradigm shift]. If there have been any differences, do you think they are related to this plan doing things in a new way?

Local Politicians

- In your view, how aligned are various departments on implementing this plan? Were there any differences in perspectives or ways of thinking that pose challenges for implementing the plan? Or do departments have similar ways of thinking?
- In your view, how aligned are various agencies or levels of government on implementing this plan? Have there been any differences in perspectives or ways of thinking that pose challenges for implementing the plan, or do various parts of government have similar ways of thinking?
- [If they agree with the premise that the plan constitutes a paradigm shift]. If there have been any differences, do you think they are related to this plan doing things in a new way?

Community groups

- In your view, how aligned are various departments or parts of government on implementing this plan? Were there any differences in perspectives or ways of thinking that pose challenges for implementing the plan? Or do they have similar ways of thinking?
- [If they agree with the premise that the plan constitutes a paradigm shift]. If there have been any differences, do you think they are related to this plan doing things in a new way?

Question 7: Physical, development path dependence

Government Staff: engineers, urban designers, urban planners, development officers. And: Development industry consultants

- Has the development industry shown interest in building projects that follow this plan? Why do you think this is?
- [If they agree with the premise that the plan constitutes a paradigm shift]. Do you think there would be more development interest if the plan followed the area's older model of planning? Why or why not?
- Have developers proposed variances or amendments to the plan to try and build developments that would better match the previous paradigm?

Developers or their staff

- Caution text. Does the new plan increase or decrease your company's interest in proposing developments in the area?
    - [If they agree with the premise that the plan constitutes a paradigm shift]. Do you think there would be more development interest if the plan followed the area's older model of planning? Why or why not?
    - Have you proposed variances or amendments to the plan, or other regulations, to implement projects in the area? If so, broadly speaking, what was the motivation?

Local Politicians

- Has the development industry shown interest in building projects that follow this plan? Why or why do you think this is?
- [If they agree with the premise that the plan constitutes a paradigm shift]. Do you think there would be more development interest following the old paradigm than the new one? Why or why not?
- Have they requested changes to the plan, or related regulations, to build different kinds of projects?

Community groups

- Overall, does your organization support the kinds of developments that have been built under the plan? Why or why not?
- [If they agree with the premise that the plan constitutes a paradigm shift]. Do you feel projects are more aligned with the new paradigm or the old one? Would you prefer if developers built projects aligned with the new paradigm or the old one?

Question 8: Political path dependence

Everyone

- In your view, which actors, in and outside of government, played the biggest part in shaping, passing, and implementing this plan?
- Have any actors been influential in opposing the plan, or shifting its direction? If so, please explain.

Question 9: Wrap up.

- Those are all my questions. Are there any other thoughts, observations, or ideas you would like me to consider?

Revisiting consent.

- Are there any changes you would like to make to what you feel comfortable being quoted on, or not quoted on, or any answers for which you would like to be de-identified?

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