There Goes the Neighbourhood:
The Social Role, Real and Perceived, of Two New Light Rail Lines in North America

by

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ABSTRACT

New light rail projects are a common feature of North American cities; however, it is not always clear which communities are benefiting, or are perceived to be benefiting, from these investments in transport infrastructure. Extensive bodies of literature have examined the impact of light rail lines on social equity, as well as perceptions of light rail as a mode, but not necessarily in conjunction with one another. This thesis integrates these two concepts to conduct a comparative study of two new light rail projects: the Réseau express métropolitain (REM) in Montreal, Canada and the Purple Line in Maryland, United States. Using a combination of quantitative and qualitative methods, I conclude that the social role of the Purple Line is far more equitable than that of the REM, in both real and perceived terms.

Keywords: light rail, transport equity, perceptions of transit, Réseau express métropolitain, Purple Line

CHAPTER 1: INTRODUCTION

Rail transit systems lie at the heart of contemporary cities, providing mobility to residents and shaping understandings of the surrounding urban fabric. Whenever a city inaugurates a new rail line, it is typically a cause for celebration. Elected officials are able to cut a ribbon on a big project, the media marvels over the gleaming stations, and the public gets the impression that their lives have been improved in some way, even if most are not regular riders (Richmond, 2005; Taylor & Morris, 2015). Though the years of design and construction leading up to opening day are commonly marked by political contention, public discourses usually focus on project financing, design choices, and construction impacts (Martens et al., 2012). Opposition may also be expressed on environmental grounds, or through a stated desire to preserve the 'character' of a certain neighbourhood (Weitz, 2008).

Within a democratic system, these are all valid issues for members of the public to raise, but another issue is too often left inadequately addressed: for whom the new transit infrastructure is being built in the first place (Grengs, 2005). As these projects represent substantial public investments, and governments are theoretically meant to benefit their citizens in a fair manner, this is equally important to consider (Litman, 2002; Coggins & Pieterse, 2015). Therefore, the aim of this thesis is to explore the social role, both actual and perceived, of new light rail lines being built in North America. In other words, which communities are served by these projects, and which are not? Furthermore, how is the role of these projects understood in those communities?

Of course, there are many new light rail lines under construction across the continent, and I cannot possibly cover all of them. As a result, I have chosen to focus on two case studies which I believe offer an ideal opportunity to examine the societal forces that affect similar projects, while retaining a realistic scope. These are the Réseau express métropolitain (REM) in and around Montreal, Quebec, and the Purple Line in the Maryland suburbs of Washington, DC (the Maryland capital region). In addition to my own familiarity with both regions, Canada and the United States exhibit a shared culture of automobile dependency and relatively low transit ridership (Newman & Kenworthy, 1999; Miron, 2003) that often produces stark socio-economic divides around transport policy debates and planning priorities, as well as around popular perceptions of transit (Ross, 1985; Golub et al., 2013). As new rail projects tend to figure prominently in the social imaginations of

their cities' residents, and to be contested along identifiable socio-political lines (Hensher et al., 2015), my narrower scale is unlikely to reduce the salience of the dynamics I wish to examine. Ultimately, this thesis answers these two research questions:

1. Which communities do the REM and Purple Line serve?
2. Which communities do stakeholders perceive the REM and Purple Line to serve?

To answer these questions, I will employ a combination of quantitative and qualitative research methods. My quantitative method is an analysis of census socio-economic data from the neighbourhoods surrounding the future REM and Purple Line stations. Through a statistical comparison to data from neighbourhoods with existing rail transit service, I will be able to answer question one. My qualitative method involves semi-structured interviews with key informants, who either have expert knowledge or who represent communities of interest along the route of each project. Analyzing the answers of these individuals will allow me to offer an answer to question two.

This thesis is structured as follows: In chapter two, I review relevant conceptual and practical literature on transport equity and perceptions of public transit, providing a theoretical basis for my research. In chapter three, I introduce the two cases of Montreal and Maryland in greater detail and explain why I selected them, in part by comparing and contrasting aspects of the REM and Purple Line projects. In chapter four, I justify my choice of research methods and outline how I implemented them, in addition to discussing my positionality as a researcher. In chapters five and six, I present my findings from my statistical analysis and interviews, respectively, in order to formally answer my two research questions. Finally, in chapter seven, I give some concluding thoughts on these results, note the limitations of my research, and offer suggestions for future inquiry.

CHAPTER 2: LITERATURE REVIEW

The two bodies of literature I review in this chapter focus on transport equity and perceptions of public transit, with an emphasis on previous studies of light rail lines. These respectively connect to my two research questions on the social role and perceptions of the new rail projects I am investigating. Research on equity explicitly interrogates which people and communities are being served by transport infrastructure, in line with my first question of whom the Purple Line and REM are serving. Meanwhile, the literature on perceptions of light rail connects to my second question of whom people believe the new lines serve, in the sense that how people perceive a transit line partly reflects its assumed ridership base. Therefore, an understanding of the existing knowledge in these fields is important not only to ground my own research in the transport geography discipline and justify my choice of topic, but also to inform my methodological design and approach to analysis of my findings.

2.1. Transport equity

Transport equity is the idea that the costs and benefits of investments in transport systems should be fairly distributed among the population (Litman, 2002; Rock et al., 2014; Gössling, 2016). This idea has found acceptance due to growing recognition that there is a basic human right to mobility, as it is "central to accessing the objects of socio-economic rights and is also often an integral component to exercising various civil and political rights" (Coggins & Pieterse, 2015, p. 296). However, there is disagreement as to what constitutes a fair distribution of costs and benefits. Therefore, after establishing why equity matters through an overview of some of the philosophical underpinnings of the concept, I discuss different measures of equity and case studies of equity in practice, focusing on light rail lines.

2.1.1. Basis for equity

The roots of modern research on transport equity in the West lie in the work of 20th-century philosophers like Henri Lefebvre and John Rawls. Lefebvre (1968) famously introduced the 'right to the city.' This right "is not merely a right of access to what already exists, but a right to change it" (Harvey, 2003, p. 939). That is, the right to the city is not just a right to equitable provision of social goods like transport, but the right of ordinary residents to control urban development as they see fit (Marcuse, 2009; Balzarini & Shlay, 2016). Lefebvre, a committed Marxist, wrote at a time

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when Western cities were particularly threatened by deindustrialization, suburbanization, and social unrest (Burgel et al., 1987). Consequently, he articulated "a cry and a demand [for]…a transformed and renewed right to urban life" (Lefebvre, 1968/1996, p. 158). While this sweeping vision can seem dated today, it remains relevant in the context of the ongoing gentrification of global cities. As wealth returns to the same city centres that were experiencing steady disinvestment fifty years ago, fresh concerns about the right to the city have arisen, including around mobility (Coggins & Pieterse, 2015; Balzarini & Shlay, 2016). Simply put, without equitable transport, not all residents are afforded Lefebvre's right to take part in the changing of their cities. Therefore, our understanding of the right to the city "should reflect notions of accessibility and mobility within a spatial framework" (Coggins & Pieterse, 2015, p. 296). Authors such as Fainstein (2011) and Purcell (2014) emphasize the importance of the local democracy or participatory planning framework, and of incorporating diverse perspectives into the transport planning process.

In contrast to Lefebvre's worldview, wherein the capitalist systems that control urban life are entirely subverted to serve some conception of the common good, Rawls (1971) argues for more classically liberal 'principles of justice.' These principles permit the continuation of inequalities—provided that all may access the top positions in the hierarchy under meritocratic conditions—in order to incentivize humans to perform socially beneficial functions (Steinberger, 1982). Therefore, Rawls holds that social goods should be distributed such that they "are to the greatest benefit of the least advantaged" (p. 83), but not to the point of harming the rights of the more advantaged. Rawls has attracted his fair share of derision for his admittedly optimistic belief in a level playing field (Reiff, 2012), but he succeeds where Lefebvre fails in providing a framework for furthering equitable outcomes within the reality of current governance structures, which are not exactly amenable to revolutionary idealism.

Like most Marxists, Lefebvre has also been critiqued for his class reductionism; that is, the assumption that all working-class people share the same interests in urban space, when this is often not the case, especially when it comes to race in the North American context (Balzarini & Shlay, 2016). Due to the inevitability of governments having to allocate limited resources—such as funding for public transit—Rawls's principles of justice provide a needed refinement to Lefebvre's

right to the city. At the same time, the right to the city sharply illuminates the shortcomings of Rawls's imagined meritocracy and challenges us to think about the larger power dynamics shaping our cities (Purcell, 2014). Combined, both concepts are important to understanding two further themes I will now discuss: how equity is measured, and how it is or is not implemented when it comes to new light rail projects.

2.1.2. Measures of equity

The first theme in the literature that I have identified for further exploration is how equity has been measured. Without a fair yardstick to evaluate by, it is impossible to determine the extent to which a particular transport system or plan, such as a new rail line, is equitable. However, there is no single best measurement tool, as a multitude of available indicators can be used, including service frequency, geographic coverage, fare structure, and so forth (Litman, 2003). Additionally, there are different types of equity to consider. One popular typology is that of horizontal and vertical equity. Horizontal equity simply means equal opportunity in the distribution of transport access among groups of people who pay similar amounts in taxes, while a vertical equity approach entails making decisions based on underlying social stratifications in order to promote more equal accessibility outcomes (Khisty, 1996).

Earlier research on transport equity usually gravitated toward horizontal measures, looking purely at the spatial distribution of transport infrastructure or employment accessibility across a region (Truelove, 1993; Nash, 2001). While there remain benefits to these approaches—namely, ease of quantification (Delbosc & Currie, 2011; Welch & Sabyasachee, 2013)—with regard to public transit projects, I have already addressed the general consensus that their politics are inseparable from those of class and race. In fact, the notion of vertical equity is supported not only by Lefebvre, but also to an extent by Rawls—recall his formulation of giving the greatest benefit to the least advantaged, which can also be called 'maximin,' or maximizing the minimum level of access enjoyed by any one community (Khisty, 1996). Martens et al. (2012) support this goal but propose adding a constraint on the maximum range or gap between the highest and lowest levels of accessibility, in order to more readily adapt to changes at the top end of the distribution. They refer to this as the 'maximax' criterion. Foth et al. (2013) sum up that an equitable distribution of public

transit "first maintains a decent level of benefits for socially disadvantaged groups, then maximizes the average for all and narrows the range" (p. 3).

Whether or not they employ this criterion, in deciding between competing scenarios, Nash (2001) discusses how planners also often look for Pareto improvements, or changes that result in net gains for some areas without causing a net loss to others. These gains and losses are frequently measured by synthesizing demographic data with transport network maps, and looking for patterns in who has access to transport infrastructure over time (Karner & Golub, 2019)—see, for instance, work by Wu & Hine (2003), Fan et al. (2012), or Foth et al. (2013). Examining these correlations has become particularly important due to the previously mentioned wave of gentrification occurring across North American cities, which Kahn (2007) and Rayle (2015), among others, have associated with transit-oriented development. Hess (2018) specifically linked new light rail projects to processes of neighbourhood change and displacement of lower-income residents to lower-density suburbs, consequently leaving some of the people who rely on transit the most in areas with the least access. Given these concerns, Thomopoulos et al. (2009) suggest a framework for measuring equity via interviews with key stakeholders from impacted populations to gauge their perceptions of a new infrastructure project's equity.

Fundamentally, the dynamic I have outlined of competition for scarce resources between different transport constituencies overlies a philosophical debate about whom and what transit should be for: reducing car usage by affluent 'choice' riders with automobiles, or providing essential mobility—the right to access the city—to very young, old, poor, or disabled 'captive' riders who do not drive (Garrett & Taylor, 1999; Grengs, 2005). Though the word captive is increasingly disfavoured because it wrongly implies that the needs of transit-dependent people can be safely ignored (Higashide et al., 2016), the paradigm still has its uses to explain how all of the foregoing theory is—or often, is not—implemented by planners.

2.1.3. Equity in practice: light rail

Accordingly, the third prominent theme in the transport equity literature that I reviewed centered upon studies of transport equity in practice, especially around light rail lines. Walker (2008) operationalizes the choice-versus-captive rider concept by assigning them respectively to two

opposing goals which, he says, planners must choose between. The ridership goal maximizes the number of people using transit for efficiency reasons and so seeks to attract choice riders with direct, frequent service along dense corridors. Conversely, the coverage goal maximizes the number of people who have access to transit for equity reasons or serves taxpayers in all parts of a jurisdiction, even if that means lower overall ridership because routes are less direct and frequent. While these goals are inherently in conflict given a fixed budget, Walker argues that there is no one right answer to this zero-sum proposition. Instead, he calls for a set breakdown to be determined via participatory planning, and for greater transparency in transport plans so that everyone can grasp the binary tradeoffs at work (Ibid.)

Plan analysis, then, is a common methodology used in the equity-in-practice literature. In general, these investigations have turned up mixed or disappointing results, indicating that equity is much easier said than done. While most plans do mention equity as an ideal, specifics are often lacking and priority is usually accorded to other goals, such as reducing congestion, fostering economic development, or reducing greenhouse gas emissions (Manaugh et al., 2015; Lee et al., 2017; Linovski et al., 2018). As could be expected, this means outcomes are worse for lower-income communities of colour, which tend to lack the political clout of their affluent White counterparts (Kain, 1992; Garrett & Taylor, 1999; Preston & McLafferty, 2016). The relative disenfranchisement of people for whom equity is most pressing as a transport goal—combined with the competing theoretical concepts and measuring tools I have outlined—evidently makes it easier for the entire equity framework to fall by the wayside.

This is especially apparent when it comes to new light rail projects, which have broadly been built with economic or environmental justifications in mind, and with less attention paid to social equity impacts (Garrett & Taylor, 1999; Manville & Levine, 2018). Light rail as a mode has been directly identified in the literature with attempts to attract a wealthier clientele to transit as compared to buses (Taylor & Morris, 2015), which suffer from poor image and low social status (Weitz, 2008; Fitt, 2018). Hensher (1999) attributes the light rail trend to a common desire among many elected officials to have a prestigious 'legacy project' for which they can claim political credit, and a shiny new train offers a *je ne sais quoi* that a new bus does not. Considering that rail trips are already disproportionately subsidized in North American cities to the detriment of bus trips (Giuliano,

2005), the practice of equity in every city that has built light rail over the past 40 years could conceivably be questioned. After all, following Walker's logic, every dollar directed toward a ridership-oriented rail line is a dollar taken away from providing lifeline access to the most needy citizens.

A popular case study that embodies the above dynamics is that of the Los Angeles Bus Riders' Union (BRU), a coalition of groups representing low-income bus riders of colour who successfully sued Los Angeles transit officials in 1994 to stop them from raising fares and reducing bus service in order to dedicate more funding to rail construction (Grengs, 2002). The BRU alleged that their civil rights were being violated because rail riders were disproportionately White, and already took up 70 percent of the transit capital budget despite making up only six percent of passengers (Ibid.) A federal judge agreed and ordered authorities to cancel the fare hike, buy more buses, and actively consider equity impacts in their decision-making process (Ibid.) They complied, but still disputed the BRU's claims, saying that Whites were only over-represented by a few percentage points among rail passengers, and voters had themselves set the 70 percent allocation (Stanger, 1999). After the judge's consent decree expired in 2006, transport planning priorities in Los Angeles reverted to being officially race-neutral. However, Golub et al. (2013) critique the notion of race-neutrality, arguing that it invariably perpetuates existing inequities that were explicitly racist in their construction, such as the historical redlining of Black neighbourhoods. In this way, there can be technocratic "racism without racists" (p. 722).

To be clear, I by no means intend to argue here that light rail is inherently racist. Rather, I consider this ongoing debate in the transport equity literature relevant to my first research question of whom the REM and Purple Line serve. As for my second research question concerning whom people believe the projects serve, I continue this chapter with a review of relevant literature on perceptions of public transit.

2.2. Perceptions of public transit

Research on perceptions of public transit tends to fall under the realm of social psychology. Applying this field to the study of transit involves modeling how perceptions of transit are formed by certain stimuli, and to what extent personal characteristics intervene between those perceptions

and resulting attitudes and behaviour (Van Acker et al., 2010). There is a fair amount of literature on this emotive aspect of transit, in part because transport systems are highly visible and integral parts of the metropolitan landscape as a whole. However, much of this research has touched on the more immediate effects of transit perceptions, like the impact of perceived transit amenities on short-term travel behaviour (Bamberg et al., 2007; Van Acker et al., 2010), leaving somewhat of a gap in the literature when it comes to perceptions of the larger place of public transit and transit riders in our society. Although this niche is small, it is directly relevant to my thesis, and there is enough to go on that I will examine it here. Fundamentally, perceptions of transit begin with its 'imageability,' so I begin there and then note how this quality manifests itself in differing public perceptions of transit modes, such as light rail, and from there goes on to impact perceptions of transit riders.

2.2.1. Imageability of transit

Through its prominent role as a connector of urban spaces, transport infrastructure is very imageable. The idea of 'imageability' comes from the work of Lynch (1960), who defined it as "that quality in a physical object which gives it a high probability of evoking a strong image in any given observer" (p. 9). Through interviewing residents of three US cities, Lynch theorized that people perceive their cities through five key elements: districts, edges, nodes, landmarks, and paths. The two most obviously linked to transit systems are nodes (stations) and paths (lines); however, smaller details of the transit experience, down to the seating upholstery and door chimes, also contribute to the development of a certain mental vignette of what it means to ride transit (Higgins & Kanaroglou, 2016).

More consequentially, images of the surrounding city are also informed by transit. Public transit, and the people who ride it, mediate perceptions of proximity, safety, and familiarity within the city (Bamberg et al., 2007; McCray & Brais, 2007). They suggest that one new job or home is better than another because the former is closer to a transit stop, or that a certain neighbourhood is to be avoided after dark in part because of its transit situation. Among others, Mondschein et al. (2013) refer to the sum of these perceptions, or personalized knowledge, as cognitive maps. Using these maps, people form opinions on the place of transit and its riders in their cities, which are expressed when, for instance, they decide whether to drive or take a bus, or whether to vote to fund a subway

expansion (Van Acker et al., 2010; Hensher et al., 2015). An example of how malleable these opinions can be is found in the survey which Brown and Werner (2010) conducted among residents of a Salt Lake City neighbourhood, before and after a new light rail line was built through the area, about their perceptions of how it had changed the area. After the line was built, they found that residents of the neighbourhood, a diverse lower-income district, reported a positive image of the rail line and thought its connective presence had improved the local sense of community. Earlier images of the train as a harbinger of gentrification were supplanted when such processes failed to immediately materialize (Ibid.)

2.2.2. Differences between modes

Public debate over new rail projects regularly includes discourses around different transit modes, most commonly with buses as a proposed alternative. Before continuing, it should be noted that there has been criticism of the propensity for 'technology-first' thinking in the transit planning process, on the premise that the actual transport needs of a corridor should dictate the mode used to serve it, rather than an overriding desire to implement a certain mode somewhere, regardless of its suitability (Walker, 2011). This is a fair critique in principle, but I have nonetheless chosen to focus on differences between modes because, as perhaps the most tangible aspects of the transit ecosystem to the riding public, they are highly relevant to public perceptions of transit.

In general, the literature on buses has confirmed that common stereotypes about buses in North America are indeed widespread: they are dirty, slow, unreliable, unsafe, and associated with government handouts to the poor (Weitz, 2008; Cain et al., 2009). Fitt (2018) draws on the concept of 'habitus,' or the way habits are reinforced by continued socialization or exposure to a certain stimulus, to explain the durability of negative images of the bus as a low-status mode. On the other hand, rail is widely seen as clean, fast, reliable, safe, and associated with middle-class patrons and a globalized image (Taylor & Morris, 2015; Higgins & Kanaroglou, 2016). Richmond (2005) writes of the 'mythology' of light rail. From researching the case of Los Angeles, he found that policymakers were far more enamoured of rail as opposed to buses simply because of the sleeker aesthetic of an imagined train 'whooshing' past traffic, while buses were stuck lurching through it. Others had become convinced that rail was the right mode for the city because they had seen it

work well on visits to Europe, neglecting to consider that European cities were far more dense than Los Angeles and lacked the pervasive car culture of North America (Ibid.)

These attitudes can persist among occasional transit riders even if some bus services, such as bus rapid transit (BRT), can in fact end up being faster and more pleasant to ride than rail lines running in mixed traffic (Cain et al., 2009; Walker, 2011). Hensher et al. (2015) studied perceptions of new light rail proposals in Australia versus perceptions of alternative BRT proposals. Respondents grasped the pros and cons of both light rail and BRT, but only regular riders showed a preference for BRT. Overall, to the majority of the population who are not regular transit users, trains are simply 'sexier' than buses (Richmond, 2005).

2.2.3. Perceptions of transit riders

It is only natural, then, that perceptions of trains as superior to buses can translate into perceptions of train riders as superior to bus riders. An ideal case study to explore this phenomenon of perceptions of transit riders may be found in Atlanta. The southern city is easily the most notorious North American example of the influence that perceptions of the transit constituency, and the politics of racism and classism, can have on transit planning and popular perceptions of whom and what transit is meant to serve.

The Metropolitan Atlanta Rapid Transit Authority (MARTA) was founded in the 1960s to build a comprehensive transit system for the region, but today remains underbuilt and underfunded, with an overwhelmingly Black ridership base, in part because White suburban voters have repeatedly rejected funding MARTA expansion into their jurisdictions (Bullard et al., 2004; Henderson, 2006). Suburban fears that public transit would facilitate increased crime were such obviously coded expressions of racism against Black riders that the transit system's own leaders publicly condemned such sentiments (Schmidt, 1987). (Studies by Billings et al. (2011) of Charlotte and Gallison (2016) of Vancouver have refuted any systemic link between transit and crime as a myth.)

There is historical evidence that early MARTA leaders even rejected building out a more comprehensive bus network in favour of pursuing construction of a rail system that would carry with it a greater cachet and attract White riders (Bullard et al., 2004). Initial plans for the rail

network prioritized a commuter-type line coming from the mostly White northern suburbs to downtown, neglecting southern Black neighbourhoods. Eventually, service to those areas was built after outcry from Black community leaders, but the result was that suburban counties refused to allow the system to cross their borders (Ibid.) Transit in Atlanta has never seriously recovered its image due to these controversies. Ross (1985) surveyed White and Black residents about their perceptions of MARTA, and found that Black residents had significantly more negative feelings about the system than White respondents. She attributed this to the fact that few Whites actually rode the trains, and so thought of them as benign goods, in the way Richmond (2005) theorizes. Conversely, Black respondents were more frequent riders and so did not hesitate to express their unhappiness with the system's poor regional connectivity and segregated patronage. Ross also cited possible social desirability bias among White respondents, who may not have wanted to express their true feelings about transit to her because she herself is Black.

2.3. Implications

There is an overwhelming agreement that transport equity—specifically vertical equity—matters greatly in the urban studies context (Khisty, 1996; Litman, 2003). Which communities are served, and which are left behind, has clear implications for the promotion of social mobility and inclusive economic growth (Coggins & Pieterse, 2015). While the lack of a standard way to measure vertical equity has hindered research into its implementation, there is a general acceptance of Rawlsian redistributive principles (Martens et al., 2012; Foth et al., 2013). Common methods for assessing the application of these principles incorporate demographic data to explore correlations between transport infrastructure and socio-economic indicators, and to track neighbourhood change over time as a result of new transport projects (Rayle, 2015; Karner & Golub, 2019). Others have taken more qualitative, perceptions-based approaches and advocated for greater community consultation (Walker, 2008; Thomopoulos et al., 2009).

The preponderance of the evidence also shows that the equity impacts of light rail lines in particular matter due to the salience of class- and race-based power dynamics around them (Grengs, 2005; Hess, 2018). Despite less extensive literature on perceptions of public transit, it is clear that light rail has a much more positive image than buses (Richmond, 2005; Higgins & Kanaroglou, 2016)

in part due to class- and race-based perceptions of their riders, which in turn drive broader attitudes about the role of transit in society.

All of these conclusions have bearing on my research design, which I will elaborate further in chapter 4 on methodology. Broadly, the literature on transport equity clearly lays the groundwork for why I have chosen to conduct an analysis based upon socio-economic data; and the literature on perceptions of transit supports my decision to conduct qualitative interviews. I do not mean to overstate the novelty of my approach, but I nonetheless find the currently available literature linking the issues of transport equity and perceptions of public transit to be seriously lacking, and have undertaken this research in the hope that it may prove a worthy contribution to the field.

CHAPTER 3: CONTEXT

I have previously stated that I chose to study the REM and the Purple Line because I am most familiar with those two projects and locations, and because of the shared transportation paradigm of Canadian and American cities. However, it is worth contextualizing these choices further through an overview of some of the other similarities and differences between the two projects. In this chapter, I will give detailed overviews of Montreal and the Réseau express métropolitain, as well as the Maryland suburbs of Washington, DC (the Maryland capital region) and the Purple Line.

First, Table 3.1 below summarizes the population, area, and population density of the two study areas. Reflecting the fact that the Montreal region includes a large central city, while the Maryland capital region is mostly suburban, the former is nearly twice as populous and dense as the latter, though both regions are remarkably similar in area.

Table 3.1. Population, area, and population density of study areas

Indicator	Montreal Region	Maryland Capital Region
Population (2016)	3,572,175	1,885,669
Area (sq km)	2,356.66	2,156.06
Population density (per sq km)	1,515.78	874.59

(Source: Statistics Canada, US Census Bureau)

Second, although both the REM and Purple Line have most often been billed as 'light rail,' this is an ambiguous term applied to a variety of North American rail lines built since the late 1970s (TRB, 2000; Johnson, 2009). Light rail lines are broadly characterized by the use of shorter and lighter-weight trains, overhead catenary power, and existing rights-of-way. All of these features serve to reduce construction costs as compared to more traditional 'heavy rail' subways, which have made them quite popular among politicians, planners, and the public (Ibid.) Nevertheless, the result of this terminological flexibility is that the REM and Purple Line, while classified together, exhibit significant variances that in some respects make them closer to other categories of rail transit, which I will detail below.

Lastly, both case studies also allow for class- and race-based dynamics to be explored via exemplar neighbourhoods whose residents have expressed concerns over the new rail projects being built in their areas. The REM and Purple Line each run directly through affluent streetcar suburbs—respectively, the Town of Mount Royal (TMR) and Chevy Chase—where local opponents have cited environmental or aesthetic issues, while these opponents' critics have raised the spectre of racism or classism (Shaver, 2008; Di Cintio, 2011). Conversely, the Purple Line also traverses Langley Park, a low-income Latino immigrant community where it is associated with worries about gentrification (Lung-Amam et al., 2019), whereas one of Montreal's most identifiably low-income immigrant communities, Montréal-Nord, is located far from the REM. The continued lack of plans for rapid transit to the area is a perpetual gripe for the borough's residents (Thomas, 2010).

3.1. The Réseau express métropolitain

The Réseau express métropolitain is a light rail transit system being built in and around Montreal, Quebec, Canada. First announced in 2016, with construction beginning in 2018, the REM is scheduled to enter service in three phases between 2021 and 2023. As seen in Map 3.1 below, the initial segment will run from Brossard on the south shore of the St. Lawrence River to Gare Centrale (Central Station) in downtown Montreal, via the new Samuel de Champlain Bridge. The route then continues through the century-old Mont Royal Tunnel, replacing the Deux-Montagnes commuter rail line. At Bois-Franc, the network splits into three branches, to be inaugurated in 2022 and 2023: one diverging south to serve Trudeau International Airport in Dorval; one continuing northwest along the existing commuter rail alignment to Deux-Montagnes; and one following Autoroute 40 through the West Island suburbs, along an elevated viaduct, to L'Anse-à-l'Orme. The REM will connect with the existing Montreal Métro at three stations: Gare Centrale, McGill, and Édouard-Montpetit.

The REM's 67 kilometres of track and 26 stations will be fully grade-separated from surface traffic, while its vehicles will operate automatically at rapid transit frequencies of between two and twelve minutes. This upgraded flavour of light rail has sometimes been termed 'light metro' (Mandri-Perrott, 2010). In its layout, the REM closely resembles many European regional rail systems, in that it is made up of lower-frequency suburban commuter branches that converge in a central tunnel to provide high-frequency subway service in the urban core. However, such

networks are uncommon in North America, with the notable exception of Philadelphia (Johnson, 2009).
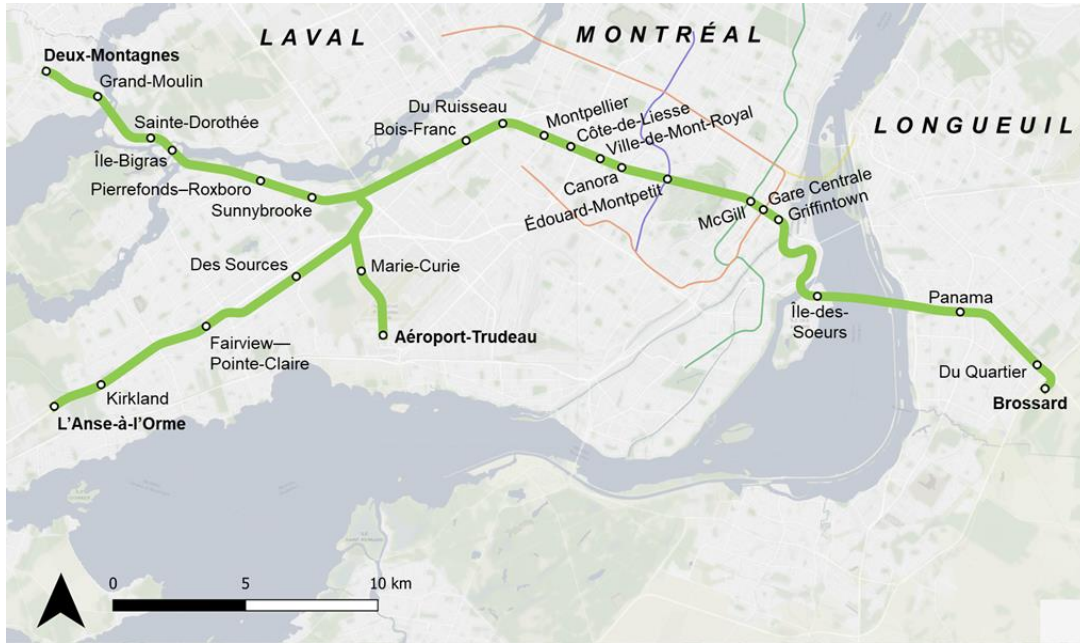

Map 3.1. The Réseau express métropolitain and existing Montreal Métro
(Source: CDPQ Infra)

However, perhaps the most notable aspect of the REM is that, unlike all other public transit in the Montreal region, it is not directly under the planning purview of the Autorité régionale de transport métropolitain (ARTM), nor will it be operated by the Société de transport de Montréal (STM), which are both fully public bodies. Instead, it is the first infrastructure project in Quebec being spearheaded privately by CDPQ Infra, a subsidiary of the provincial government's pension fund, the Caisse de dépôt et placement du Québec. Given that substantial sums of federal, provincial, and local funding are still involved, the Caisse claims that the REM is a 'public-public partnership' which will achieve private-sector efficiencies while remaining under public ownership, but critics have said that the REM will still be functionally privatized, as the government is contractually prohibited from exercising substantial control over the project (Noakes, 2018). In particular, the REM will monopolize the extremely valuable Mont Royal Tunnel, while non-compete clauses restrict the STM and ARTM from offering services that could detract from the REM's ridership (Ibid.) A certain synergy between the REM's station locations and the Caisse's existing real estate holdings has also been alleged (Gyulai, 2019).

3.2. The Purple Line

The Purple Line is a light rail transit system being built in Montgomery and Prince George's Counties, Maryland, in the United States. These two suburban counties comprise the northeastern suburbs of Washington, DC, and together are called the Maryland capital region. My research only looks at this portion of the Washington metropolitan area because the Purple Line is a project of Maryland alone, and therefore under no circumstances would hypothetical alternative routes enter the District of Columbia or Virginia, which are separate planning jurisdictions.

First conceived in the 1990s, the Purple Line has evolved through a number of iterations, including as a simple trolley along a disused freight rail branch between Bethesda and Silver Spring in Montgomery County, and later as a 'bi-county transitway' extending eastward into Prince George's County, possibly as a BRT route. The present Purple Line, which broke ground in 2017, with service set to begin between 2022 and 2024, extends for 26 kilometres from Bethesda in Montgomery County to New Carrollton in Prince George's County, stopping at 21 stations along the way, as seen in Map 3.2 below. The line notably connects four branches of the existing DC Metro at Silver Spring, College Park, and the two termini. This circumferential routing, in contrast to the radial DC Metro system, is often touted as a major benefit of the Purple Line, because it will allow users to traverse the suburban area without having to go through downtown Washington.
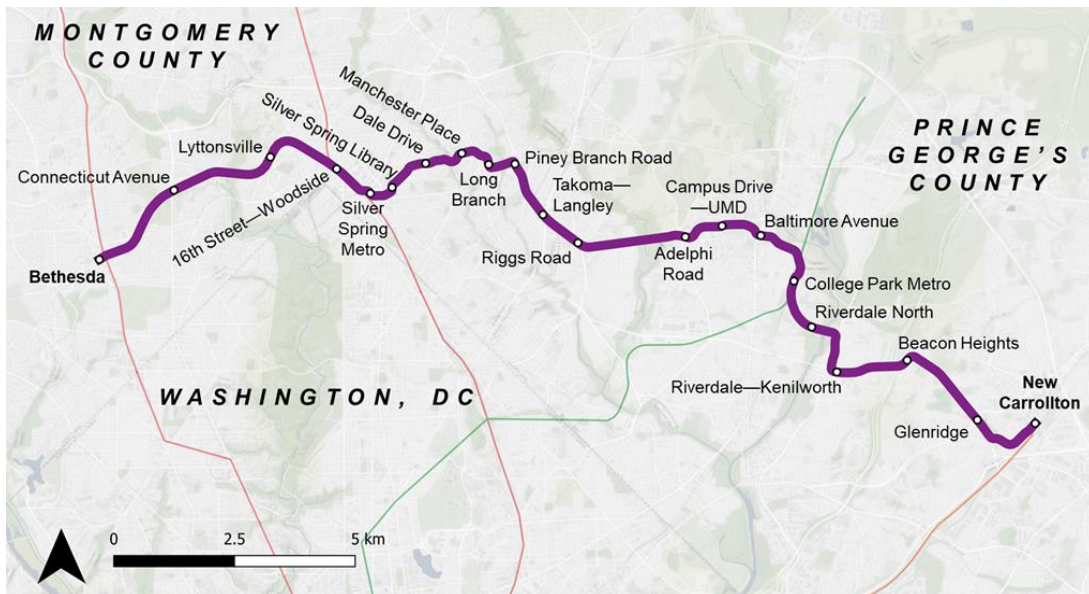
Map 3.2. The Purple Line and existing DC Metro
(Source: MTA Maryland)

With manual operation, planned headways of eight to sixteen minutes, and lack of dedicated right-of-way east of Silver Spring, the Purple Line is distinct from the REM's light metro design, instead more closely resembling the slower streetcar or tram lines running in mixed traffic that have proliferated across US cities in the past decade. The Purple Line is also being built through a more standard public-private partnership scheme, allowing a consortium of private engineering firms and contractors, called Purple Line Transit Partners (PLTP), to build the line and operate it for 30 years on behalf of the state-owned Maryland Transit Administration (MTA Maryland). After recouping its investment, the consortium will convey full ownership of the line to the state; as a result, like its Canadian counterpart, PLTP has also rejected claims that the Purple Line is privatized infrastructure (Benz & Kay, 2016).

CHAPTER 4: METHODOLOGY

In this chapter, I outline my research methodology. First, I detail and justify the choices I made in order to conduct my quantitative analysis—including selecting variables from census data, performing operations in GIS software to model that data, and finally, conducting tests of statistical significance—to answer my first research question. Next, I discuss why and how I conducted semi-structured interviews with key informants, and coded the responses I received to answer my second research question. Finally, in accordance with the norms of ethical research, I give a statement of my own positionality, and how I believe it has affected my performance in this study.

4.1. Quantitative analysis

To answer that first research question regarding which communities the REM and Purple Line are going to be serving, I designed a quantitative approach that compares census socio-economic indicators for the Montreal and Maryland capital regions to the exact routing and stop locations of the two projects, versus existing metro systems in both locations. This allows for before-and-after comparisons between the average socio-economic conditions around the present and future rapid transit networks (Manaugh and El-Geneidy, 2012). The extent and direction of any changes will answer the research question; if average socio-economic indicators around transit rise after the new lines are added to the map, then I will be able to conclude that the project is skewed in favour of more affluent residents, and vice-versa. In this section, I list the variables I chose and justify their inclusion in an aggregate socio-economic index, as well as the operations I performed in GIS software to compile all of the data and produce the measurements I needed to carry out my final statistical analysis of the equitability of both projects.

4.1.1. Variable selection

The six socio-economic indicators I used are shown below in Table 4.1, with appropriate references. By including a wide array of data on income, poverty, housing, education, commuting, and ethnic background, I was able to form a comprehensive picture of the socio-economic conditions in any given location in both areas studied.

Table 4.1. Selection of socio-economic variables

Indicator	References
Median household income	Hess (2005) Manaugh & El-Geneidy (2012)
Poverty rate	Hess (2005) Foth et al. (2013)
Renter-occupied housing rate	Hess (2005)
Percent over 25 with a Bachelor's degree	Sanchez et al. (2004)
Rate of active commutes (walking, bicycling, or riding public transit)	Sanchez et al. (2004) Manaugh & El-Geneidy (2012)
Non-White population	Kain (1992) Sanchez et al. (2004)

The data for the Maryland capital region were downloaded at the census tract level from the American Fact Finder tool on the official website of the US Census Bureau. The Statistics Canada data for the Montreal region were also collected at the tract level from the CHASS Data Centre web interface operated by the University of Toronto. All of the data were used 'as-is' on the assumption that they were the most accurate representations available of the population in each census tract.

A challenge posed by working with census data from two different countries and their statistical agencies is that there are some variations in the formatting of the data and the methodology used to collect similar variables, such as differing definitions of the poverty line, as well as the fact that Hispanic origins are treated separately on the US Census. Therefore, in counting the non-White populations for Montreal, I combined Statistics Canada's 'visible minority' and Indigenous ancestry categories, while for the Maryland capital region, I used the US Census Bureau's counts of all races aside from White, plus Hispanic Whites.

It is also worth noting that while the use of journey-to-work data to quantify mode share is widespread, this likely undercounts transit usage, because people who do not work outside the home—largely students, seniors, single parents, and people with disabilities—are

disproportionately likely to rely on transit. Furthermore, those who do commute still make many other trips to shop or socialize, for which they may use transit even if they drive to work (Hertz, 2015).

4.1.2. GIS model

To begin my GIS model, I drew shapefiles of the REM and Purple Line based on official plans and maps available on the project websites, using lines to represent the routes and points for each station. As station locations were somewhat approximate when I completed this process, this may introduce a very minor source of error in the results. I also downloaded shapefiles from Statistics Canada and the US Census Bureau of the census tracts of the Montreal census metropolitan area and the Maryland portion of the Washington, DC metropolitan statistical area, respectively. Census tracts are generally the smallest geographic areas for which complete census data are available from both countries, and function as good approximations of neighbourhoods or parts of neighbourhoods.

A major source of error I then sought to eliminate was the presence of census tracts that would be unlikely to be served by rail transit even in a situation of perfect social equity, due to low population density. Estimates of the minimum population density needed to support light rail vary widely (Burda & Haines, 2011; Cervero & Guerra, 2011); therefore, I utilized shapefiles provided by Statistics Canada and the US Census Bureau that delineated the contours of the Montreal population centre and the Washington, DC urban area, respectively. Both of these shapefiles represent official definitions of the continuous built-up area, or urban agglomeration, inside of which rail service is likely plausible. Therefore, I performed a clip operation to remove census tracts, and parts thereof, which fell outside these shapefiles. Finally, I performed join operations to add the appropriate census data to the census tracts' attribute tables.

My next step was to create circular buffers around each existing metro station and each proposed light rail station, representing the approximate area served by each station. In Montreal, I included all 68 existing Montreal Métro stations in my buffer analysis, while in Maryland, I included 29 DC Metro stations—all 24 fully within the state, plus an additional five located either partly or entirely inside the DC border but which nevertheless serve substantial numbers of Maryland riders.

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I chose a buffer distance of 800 metres (about one-half mile) based on a standard distance for walking to rapid transit found in the literature (O'Sullivan & Morall, 1996; Ker & Ginn, 2003). Obviously, one pitfall with this method is that in reality, there are no hard cutoffs beyond which no one will walk to a transit stop, while everyone inside will do so. Furthermore, circular buffers inherently include areas that are beyond 800 metres of walking distance on the road network, as shown in Figure 4.1 below of Manchester Place station on the Purple Line, where only the roads outlined in red are within 800 metres of walking distance from the station. Since this discrepancy somewhat mitigates the fact that transit-dependent populations like the ones I am considering in my research often have to walk further than 800 metres to transit (TRB, 2013), I remain confident in using the ubiquitous circular buffers as proxies for service areas.
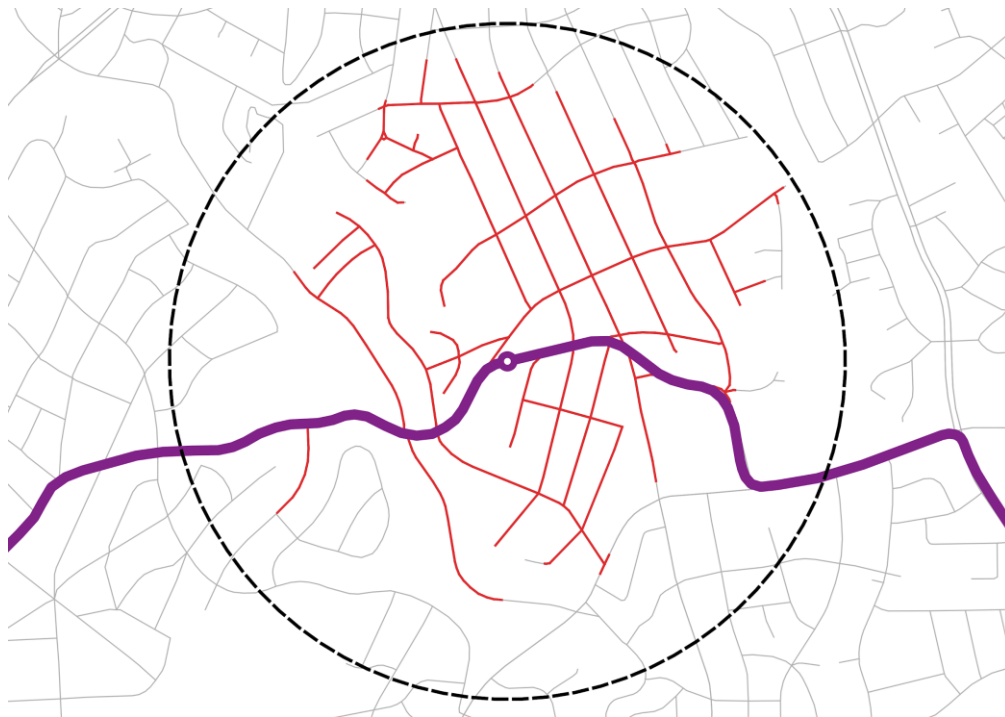
Figure 4.1. Sample 800-metre buffer and road network around a light rail station
(Source: MTA Maryland, US Census Bureau)

Finally, in order to calculate socio-economic indicators at the level of each REM and Purple Line station, I used the Voronoi (or Thiessen) polygons of the point layer containing the stations. These tessellated polygons represent the area, in Euclidean space, closest to any particular station. By clipping the buffered census tracts to these polygons, I was able to separate them into sections for each station.

4.1.3. Statistical tests

With all of the buffers calculated, my GIS model was complete, and I was therefore able to extract summary statistics for each of my chosen variables, including the sample mean and standard deviation, as well as station-level data, which I will discuss later. Combined, these two scales of analysis—macro and micro—permitted me to arrive at more nuanced conclusions.

On the macro level, because most census tracts did not fall fully within the buffers around rail stations, I used weighted averages based on the percentage of each tract within the buffer region to compute the mean for each indicator. I did this first for tracts partially or fully within the buffer of an existing metro station, then separately for tracts within the buffers of Purple Line and REM stations, *excluding* any areas that overlapped with the existing buffers, to avoid compromising the independence of each sample. Thus, as shown in Figure 4.2 below, my comparisons were between areas with existing rail service (the orange census tracts), and areas which were slated to receive new rail service (the green census tracts).
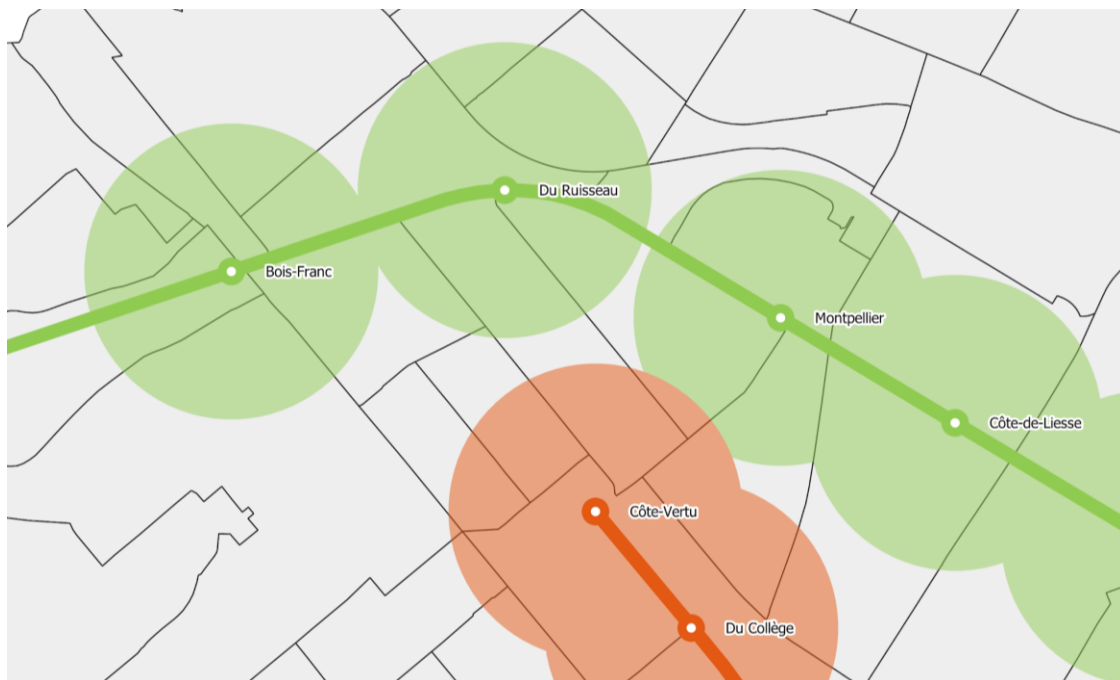

Figure 4.2. Illustrative example of the buffer analysis model
(Source: CDPQ Infra, ARTM, Statistics Canada)

These sets of summary statistics respectively allowed me to perform a series of two-tailed Welch's unequal variance t-tests for significance at the $\alpha<0.05$ level, producing quantitative answers to my first research question at the macro level. The Welch's t-test was most appropriate because it permits for significant differences in sample size (n), which were present in my analysis because the census tracts around existing metro stations were in both cases more numerous than the tracts around the new light rail stations. In interpreting the results of each test, I took a p-value below 0.05 to mean that the new rail project in question was producing a statistically significant variation in the mean socio-economic indicators of census tracts near rail transit. The direction of these variations then allowed me to conclude whom the project is serving or benefiting the most.

For the micro-level station analysis, I looked at only the new REM and Purple Line stations, thus including areas that were within the buffer of existing metro stations. As before, to calculate the mean of each socio-economic indicator for each station's assigned buffer, I used a weighted average based on the percentage of each census tract that was within the buffer area. The raw data for each station are found in Appendix A. However, to better contextualize these figures, I then calculated the average z-scores of each variable for each station, showing how many standard deviations removed the area around each station was, on average, from the study area at large. Positive z-scores indicated a higher socio-economic status area, and vice versa.

4.2. Key informant interviews

In order to provide greater depth to my research, I set out to conduct semi-structured interviews with key informants in the locations of both case studies. Such interviews are able to produce qualitative observations that can both validate and challenge previous statistical findings and assumptions (Dunn, 2016). Furthermore, as a form of primary data collection where I was fully in charge of the questions asked, the observations, quotes, and anecdotes generated were more likely to be highly relevant to my exact areas of interest. This sort of richness would not be possible had I restricted myself to quantitative data from secondary sources.

I deliberately chose the semi-structured interview format because of the flexibility it provides. Asking a set of guiding questions provided enough consistency between interviews that comparisons could be made, while simultaneously allowing each informant to dictate much of the

conversation's direction in ways that were themselves informative in terms of what ideas they chose to focus on most (Dunn, 2016). Notably, Richmond (2005) conducted semi-structured key informant interviews when researching perceptions of light rail systems. My interview guide, containing the broad questions I asked each respondent, is found in Appendix B.

Choosing to interview key informants has both benefits and drawbacks. One advantage is that they are likely to be most familiar with the interview topic and to be able to speak at greater length or in greater detail about it (Gilchrist, 1992). It is also more feasible to arrange interviews with people who have been visible in the public sphere, such as by being quoted in the news media or having their names and email addresses listed on official websites. On the other hand, key informants can also serve as gatekeepers, and while ideally their opinions should offer good reflections of the broader constituencies each represents, this may not always be the case (Maginn, 2007). Given my relatively small sample size, it would be best to describe each interview as somewhat of a vignette.

After receiving an ethical certificate from the McGill Research Ethics Board, I contacted 16 potential informants, of whom eight agreed to be interviewed. Initial contact was made by email, while interviews took place in person when possible and by phone when not. Informants included local officials who have supported and opposed the two new rail projects, leaders of activist groups which have worked with communities impacted by the projects, and local experts in transit planning and equity issues. Together, these three groups offered a wide range of perspectives.

For each interview, I obtained informed consent for their participation and recorded what they said so I could later transcribe and code each interview for analysis. The smaller sample size allowed me to accomplish these tasks in a reasonable amount of time on my own. Because of the semi-structured approach I took to conducting these interviews, there were enough repeated themes in respondents' answers that I was able to code them into categories, such as 'differentiate community identity from regional needs' or 'opinion on characteristics of transit riders.' These codes, which I developed by combining a predetermined codebook with my own perceptions of which themes were most prominent, later made it much easier to engage in a substantive analysis of themes from the interviews to help answer my second research question.

4.3. Positionality

In research methods, positionality refers to how "facets of the self—institutional privilege, for example, as well as aspects of social identity—are articulated as 'positions' in a multidimensional geography of power relations" (Rose, 1997, p. 308). In other words, researchers are not 'neutral' observers of geographic phenomena, but rather active participants in the social production of geographic knowledge, and positionality refers to the set of personal attributes which influence this participation. It then follows that researchers must be reflexive of their own positions and be cognizant of the ways in which it can influence their findings (Ibid.) For example, informants' responses in interviews are liable to differ based on their perception of the interviewer.

In my case, in addition to being male, I am also identifiable as White, which in the context of interviewing White informants, particularly in person, may have led me to be perceived more sympathetically or as being more trustworthy. Conversely, with non-White informants, I may have been perceived as more of an outsider. In those interviews over the phone where participants did not see me, this was probably less of a relevant factor. Furthermore, as a university student from a middle-class background, with informants from more affluent communities I felt as if I was 'researching up,' while with informants from lower-income communities I was 'researching down' (Marx & Treharne, 2018). In most of the interviews I felt generally at ease; but those with more palpable power imbalances between the informant and me were more uncomfortable, and I was more careful in my choice of words out of a desire to avoid accidentally alienating myself from the informant.

About this phenomenon, Maginn (2007) writes that researchers often have to make small alterations to the language they use with different respondents in order to negotiate access and build rapport. In my contact with respondents, I noticed myself doing the same thing in the hopes of increasing the chances someone would agree to an interview. For example, with respondents who I knew were less supportive of the rail line in question, I would say I was interested in hearing their thoughts about the project's 'community impact' rather than its 'social equity impact,' so I would not be seen as intending to vilify them. With respondents from Maryland, I would emphasize that I had grown up in the area to try and dispel any doubts that could be raised by my having a Canadian email address.

I will also note here that Valentine (2002), among others, has critiqued the insider-outsider binary as too simplistic. Instead, she encourages researchers to be more broadly reflexive about how their positionality impacts on their research, without pigeonholing themselves or informants into boxes of race, class, or gender. I have nonetheless chosen to focus on my insider-outsider identities because they are the easiest means whereby a picture of my positionality may be constructed, but I was aware throughout the research process of other ways in which I had to be vigilant about my position. In my conclusion, I reflect further on how that position may have influenced my overall interpretation of my findings.

CHAPTER 5: QUANTITATIVE EQUITY ANALYSIS

In this chapter, I will discuss the results of my quantitative analysis in order to answer my first research question: which communities do the REM and Purple Line serve? To give a sense of the prevailing socio-economic conditions in each study region, Table 5.1 below presents the weighted means for each of my indicator variables. It is worth noting that the Montreal region, again because it includes a large central city, exhibits lower incomes, higher poverty, and more renters than the Maryland capital region, as well as a higher rate of active commutes and more people with university degrees, which are functions of higher educational attainment and lower car ownership in Canada. When it comes to ethnic background, though, the Maryland capital region is much more diverse, with almost seven in ten residents identifying as something other than non-Hispanic White.

Table 5.1. Socio-economic summary statistics of study areas

Indicator	Montreal Region	Maryland Capital Region
Median household income	$67,595 (CAD)	$100,687 (USD)
Poverty rate	16.03%	8.44%
Renter-occupied housing rate	43.46%	34.35%
Percent over 25 with a Bachelor's degree	33.91%	22.73%
Rate of active commutes	32.96%	17.99%
Non-White population	25.49%	69.79%

(Source: Statistics Canada, US Census Bureau)

5.1. Montreal region

The values of the socio-economic indicators for Montreal, shown in Table 5.2 below, indicate that the census tracts receiving new access to rail transit via the REM exhibit statistically significant differences from the census tracts served by the existing Montreal Métro system. Compared to the parts of the study area already served by the Métro, those served by the REM have 48.72 percent higher median incomes and 8.78 percent lower poverty rates, indicating generally higher socio-economic status. A 29.21 percent decrease in the proportion of properties occupied by renters, and 27.47 percent drop in rates of active commuting, further suggest that the REM disproportionately

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serves middle-class homeowners living in lower-density, auto-dependent suburban neighbourhoods. All of these characteristics are correlated across North American metropolitan areas (Newman & Kenworthy, 1999; Miron, 2003).

Table 5.2. Change in socio-economic indicators for Montreal region tracts within 800 metres of rail transit, weighted by area within buffer; *p*-values significant at *α*<0.05 are bolded

Indicator	STM Métro (*n*= 297)	REM (*n*= 72)	Difference	*p*-value
Median household income (CAD)	$50,715	$75,426	+$24,711 (+48.72%)	**<0.001**
Poverty rate	25.84%	17.06%	-8.78%	**<0.001**
Renter-occupied housing rate	69.10%	39.89%	-29.21%	**<0.001**
Percent over 25 with a Bachelor's degree	50.07%	45.40%	-4.67%	**0.032**
Rate of active commutes	63.72%	36.25%	-27.47%	**<0.001**
Non-White population	28.25%	37.22%	+8.97%	**<0.001**

(Source: Statistics Canada)

The 4.67 percent decrease in educational attainment near REM stations admittedly does not lend further support to these conclusions, although the level is still well above the regional average, and this could be the result of the fact that the level near existing Métro stations is influenced by the fact that it already serves the areas around the region's four largest universities: McGill, Concordia, Université de Montréal, and UQAM. Meanwhile, the 8.97 percent increase in non-White populations around REM stations can be seen to capture the relative ethnic diversity of western Montreal's middle-class suburbs, which are underserved by the Métro relative to more homogeneously White and working-class neighbourhoods to the east, such as Hochelaga-Maisonneuve. Furthermore, ethnicity is a weaker predictor of affluence in Canada than in the US, partly due to more highly skilled immigration to Canada (Peñaloza and Burnett, 2017).

Broken down by station (see Table 5.3 and Map 5.1 below), the averaged *z*-scores comparing the socio-economic status of the surrounding areas to the Montreal region overall show a clear skew

toward the top of the distribution. Indeed, 17 of the 26 REM stations (65.38 percent) have positive averages, meaning they serve areas with higher socio-economic status than the overall metropolitan area. The greatest concentration of affluence can be found around Kirkland and L'Anse-à-l'Orme stations in the West Island, which are, on average, a full 1.21 standard deviations above the regional means for their respective indicators. The Ville-de-Mont-Royal station in TMR also scores highly. Aside from downtown, the most distinct low socio-economic status residential area served by the REM is a small cluster between Montpellier and Bois-Franc stations in the Ville-Saint-Laurent borough. Particularly poor neighbourhoods further to the east, like Montréal-Nord, are left out, despite lacking Métro service.

Table 5.3. Averaged *z*-scores of REM stations' indicators

Station	*z*-score	Station	*z*-score
Brossard	0.36	Bois-Franc	-0.61
Du Quartier	0.24	Marie-Curie	0.84
Panama	-0.26	Aéroport-Trudeau	0.29
Île-des-Soeurs	0.42	Des Sources	0.23
Griffintown	0.22	Fairview–Pointe-Claire	0.42
Gare Centrale	-0.61	Kirkland	1.21
McGill	-1.09	L'Anse-à-l'Orme	1.21
Édouard-Montpetit	0.41	Sunnybrooke	-0.11
Canora	-0.11	Pierrefonds–Roxboro	0.21
Ville-de-Mont-Royal	0.86	Île-Bigras	1.11
Côte-de-Liesse	-0.15	Sainte-Dorothée	1.09
Montpellier	-0.87	Grand-Moulin	0.07
Du Ruisseau	-0.48	Deux-Montagnes	0.40

(Source: Statistics Canada)

Map 5.1. The REM, with stations sized proportionate to their averaged *z*-scores
(Source: Statistics Canada, CDPQ Infra)

Overall, the picture of the REM's equitability from a quantitative standpoint is that it serves a population that is decidedly higher in socio-economic status than the population served by current rail transit infrastructure, albeit one that remains relatively ethnically diverse. Of course, outside factors also contributed to the choices made in planning the REM's route, such as the availability of the existing right-of-way to Deux-Montagnes, but the arguably most affluent branch—the one through the West Island to L'Anse-à-l'Orme—is being built on greenfield and was selected for service wholly by the Caisse de dépôt et placement. This raises questions about what exactly led the Caisse to plan this branch as opposed to one that, for example, went east along the existing rail alignment towards Montréal-Nord, a higher-need area that remains starkly disconnected from the regional transport infrastructure.

5.2. Maryland capital region

The values of the socio-economic indicators for the Maryland national capital region, shown in Table 5.4 below, indicate that the census tracts receiving new access to rail transit via the Purple Line exhibit some statistically significant differences from the census tracts served by the existing DC Metro system. Compared to the parts of the study area served by the Metro, those served by

the Purple Line have a 4.61 percent higher poverty rate and a 4.79 percent lower rate of educational attainment, indicating generally lower socio-economic status. The apparent 10.18 percent decrease in median household income near Purple Line stations also points toward this conclusion, although the drop was not so large as to be statistically significant. A nominal decrease in the proportion of properties occupied by renters is also so slight as to be statistically irrelevant.

Table 5.4. Change in socio-economic indicators for Maryland capital region tracts within 800 metres of rail transit, weighted by area within buffer; p-values significant at $\alpha<0.05$ are bolded

Indicator	DC Metro (*n*= 114)	Purple Line (*n*= 50)	Difference	*p*-value
Median household income (USD)	$83,637	$75,120	-$8,517 (-10.18%)	0.337
Poverty rate	10.04%	14.65%	+4.61%	**0.007**
Renter-occupied housing rate	58.31%	57.28%	-1.03%	0.821
Percent over 25 with a Bachelor's degree	22.66%	17.87%	-4.79%	**0.002**
Rate of active commutes	33.54%	26.35%	-7.19%	**<0.001**
Non-White population	64.84%	73.50%	+8.66%	0.072

(Source: US Census Bureau)

Rates of active commuting decrease somewhat (by 7.19 percent), but not as much as in Montreal (which saw a 27.47 percent drop), suggesting that in relative terms, areas not served by rail transit in the Maryland capital region are more dependent on bus service than equivalent parts of Montreal. Finally, the prevalence of non-White populations around Purple Line stations appears 8.66 percent higher than around Metro stations, a difference that nears but does not quite clear the threshold for statistical significance, thus giving only anecdotal backing to the notion that the Purple Line fairly serves racialized communities.

At the station level (see Table 5.5 and Map 5.2 below), the averaged *z*-scores comparing the socio-economic status of the areas surrounding Purple Line stations to the Maryland capital region overall show a clear skew toward the bottom of the distribution. A whopping 19 of the 21 stations

(90.48 percent) have negative average scores, meaning they serve areas with predominantly lower socio-economic status than the metropolitan area as a whole. The only exceptions are Connecticut Avenue in affluent Chevy Chase and Dale Drive in a middle-class part of Silver Spring, which are respectively 1.03 and 0.21 standard deviations above the regional means, on average. The most distinct low socio-economic status area of all those served by the Purple Line is the cluster around Campus Drive–UMD and Baltimore Avenue stations in College Park, but much like in downtown Montreal with its high student population, these results can be said to be outliers due to the presence of the University of Maryland. Setting this aside, then, other notable areas of need served by the Purple Line are Langley Park, with its majority Latino immigrant population, and Riverdale, which has a plurality Black population.

Table 5.5. Averaged *z*-scores of Purple Line stations' indicators

Station	*z*-score	Station	*z*-score
Bethesda	-0.13	Riggs Road	-1.16
Connecticut Avenue	1.03	Adelphi Road	-0.75
Lyttonsville	-0.22	Campus Drive–UMD	-2.09
16th Street–Woodside	-0.48	Baltimore Avenue	-1.86
Silver Spring Metro	-1.01	College Park Metro	-0.33
Silver Spring Library	-0.34	Riverdale North	-0.11
Dale Drive	0.21	Riverdale–Kenilworth	-0.82
Manchester Place	-0.42	Beacon Heights	-0.62
Long Branch	-0.76	Glenridge	-0.63
Piney Branch Road	-1.11	New Carrollton	-0.60
Takoma–Langley	-1.07		

(Source: US Census Bureau)
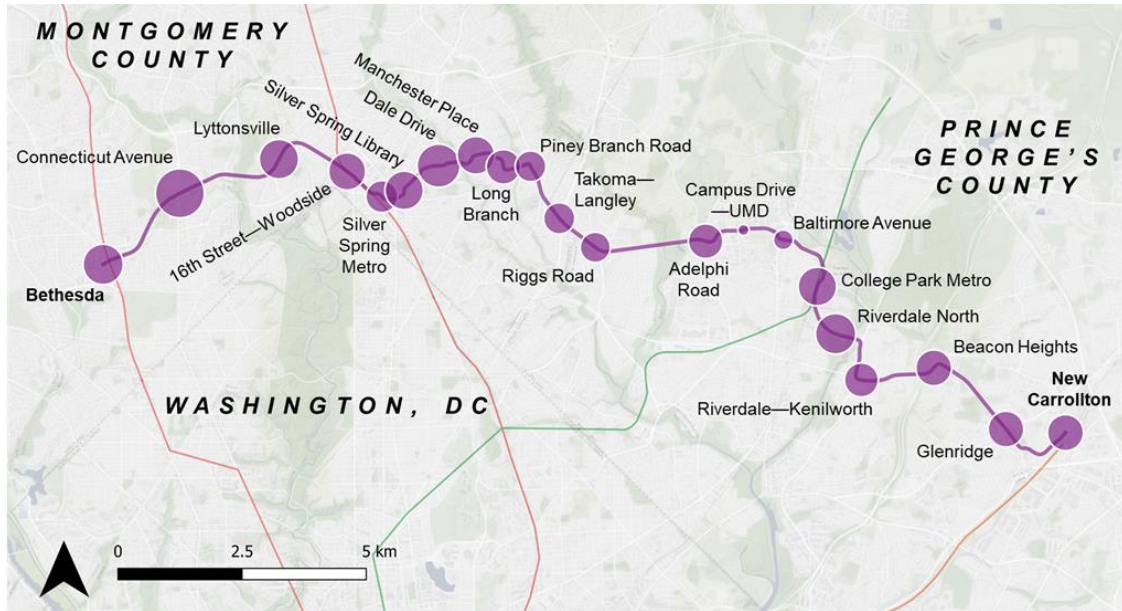
Map 5.2. The Purple Line, with stations sized proportionate to their averaged *z*-scores
(Source: US Census Bureau, MTA Maryland)

Overall, the picture of the Purple Line's equitability from a quantitative standpoint is that it serves a predominantly less affluent population than that served by existing rail transit infrastructure, but there are also some isolated pockets of affluence along the line, creating a measure of socio-economic integration across the study area. Much like the REM, other factors were at work in the planning of the Purple Line's route, such as the longstanding desire for rail service along the old freight spur between Bethesda and Silver Spring, but the route east of Silver Spring was decided upon more independently by planners. Evidently, they have done a better job adding rail transit service to areas of greater need, like Langley Park, than their counterparts in Montreal.

CHAPTER 6: EXAMINING PERCEPTIONS OF EQUITY

In this chapter, I will analyze the eight key informant interviews I conducted, transcribed, and coded in order to answer my second research question: which communities are the REM and Purple Line perceived to serve? For each case study, I will offer general possibilities. Because of the relatively small sample size, I will reiterate that my analysis is not to be taken as definitive in scope, but rather as a description of recurring themes and their bearing upon perceptions of equity.

6.1. Montreal region

I interviewed three informants from the Montreal region (names are pseudonyms):

- Roman, a local transport professional and writer;
- Camille, a member of a citizens' group that has criticized the REM; and
- Dana, a resident of the West Island.

In these interviews, I identified a few repeating themes relevant to answering my second research question. First, I noted a pattern that public imaginations and discussion tend to revolve more around logistical or environmental matters, as opposed to the more academic question of service equity. For example, Dana initially expressed the most skepticism about the fact that the REM's West Island stations are located in industrial areas far from residential neighbourhoods, meaning they are liable to worsen traffic congestion on the narrow streets around them after opening. However, after I mentioned the word 'fairness,' she added that she did not even own a car and said, "I perceive it as a system designed for people who have cars…am I going to have the same opportunity as the people who can drive to the REM to access it?" (personal communication, Mar. 16, 2020). In a similar vein, Camille began the interview by talking about research she had found on the potential negative influence of the REM on greenhouse gas emissions, but when prompted to consider its relationship to social equity, she perceived "an inequality of where the investment is going…with a lot of money being spent on behalf of people in the West Island who don't use very much public transportation, as opposed to people to the east who do" (personal communication, Mar. 12, 2020).

Ultimately, a consensus emerged that the REM was indeed problematic from an equity standpoint, in part because of the routing which neglected the entire eastern half of the Island of Montreal,

which on balance is a lower socio-economic status area. In part because of this consensus, perceptions of presumed REM riders did not feature heavily in any of my Montreal region interviews, because it was understood who would be riding the trains. Although I was only able to conduct three interviews due to time and language constraints, I do not imagine that I would have found otherwise had I spoken to substantially more people, because of how widespread criticism of the REM has been in public discourse. There were no obvious groups of citizens or communities openly heralding the system's arrival that I was able to identify. At best, Dana characterized the "silent majority" of citizens as being relatively apathetic about the REM, due to its seeming political inevitability (personal communication, Mar. 16, 2020).

Thus, in an attempt to counter the prevailing narrative, I asked each informant to address basic points in favour of the project. For instance, I proposed that since the Blue Line of the Montreal Métro is already being extended eastward, and a BRT line is being implemented along Boulevard Pie-IX, it might be acceptable for the REM to primarily serve the West Island. Roman agreed that this made sense in theory, but pointed out that the Blue Line extension had been promised for decades without ever coming to fruition, while the REM is already well on its way to completion, demonstrating that it has access to much more political and financial capital (personal communication, Jan. 29, 2020). He also noted that qualitatively, he perceived BRT to be simply not as comfortable or reliable as light rail, demonstrating the 'mythology' of light rail's superiority identified by Richmond (2005). Dana was equally unconvinced that the Blue Line would ever be finished, in part due to the quantity of resources being diverted to the REM. She speculated that, "If they had chosen a more flexible system [for the West Island] such as trams or just somewhat improved bus service, maybe there would be more money for the Blue Line" (personal communication, Mar. 16, 2020). This parallels the argument made by Hensher (1999) that decision-makers are often attracted to 'shiny objects' like new trains, even if it can be more cost-effective to invest in less glamorous things, such as better bus service.

The second theme I identified in the Montreal region interviews was that all of the informants devoted considerable attention to the highly privatized nature of the REM, and perceived equity issues arising therefrom. The gist of these issues is that the involvement of the Caisse de dépôt et placement in all aspects of the system's planning, construction, operation, and governance poses

major apparent conflicts of interest. In other words, despite the involvement of large amounts of public financing, it is not always clear that the REM will benefit the public rather than just the Caisse itself.

One previously mentioned exemplary conflict is the alleged connection between the REM's station locations and the Caisse's existing real estate through its subsidiary Ivanhoé Cambridge, which is a major player in the Canadian commercial property market. Roman pointed out that it seems problematic for the Caisse to be potentially directing tax dollars toward improving the value of its own private holdings (personal communication, Jan. 29, 2020). Camille and Dana also emphasized the size of the public subsidy for the REM. In the *Montreal Gazette*, one retired architect opined, "Hardly any notice has been taken of these property development and legal changes to allow what is being marketed to the public as: 'Hey, look, new electric trains!'" (Fish, 2017). Of course, though the resulting stations can still be useful to the public, the actual transport utility of some stops has been questioned by experts. The one at Côte-de-Liesse, for instance, serves a low-density industrial park with almost no residences or stores within 800 metres of walking distance, yet plenty of warehouses in which the Caisse owns a stake (Gyulai, 2019). Though the line itself does not go out of its way to serve Côte-de-Liesse—the future stop is along an existing right-of-way the Caisse is theoretically justified in repurposing—at the very least, the situation typifies a general approach to doing business at the Caisse that does not explicitly prioritize public benefit.

Additional privatization-related issues raised were that the REM will monopolize access to the Mont Royal Tunnel—a valuable piece of public infrastructure over which the government will no longer be able to exercise control—and restrict other public transit offerings through non-compete clauses (Noakes, 2018). The resulting perception held by all three informants was that these arrangements are unacceptable from a public policy perspective, and greatly undermine any claim the REM might otherwise make to be a valuable, let alone equitable, infrastructure project. Dana was the most critical, saying that while she had "no doubt the trains will be pleasant to ride on," there was nothing redeeming in the project from a social acceptability or equity standpoint, and that politicians and the public had been "hoodwinked" (personal communication, Mar. 16, 2020). For his part, Roman cautioned that he would not go so far as to characterize the Caisse as nefarious, and he did not dispute that the REM would open up new mobility options for the Montreal region.

Instead, he spoke of "missed opportunities" and ascribed the REM's equity woes to a more benign combination of "fiscal, engineering, and political expediency" (personal communication, Jan. 29, 2020). Essentially, involving the Caisse allowed the government to lower its upfront capital costs in a climate of budget austerity; reusing existing rights-of-way like the Deux-Montagnes line and A-40 corridor reduced engineering complexity; and serving the affluent West Island suburbs was the most politically popular approach to take. Roman argued that while each of these concerning elements is justifiable in isolation, taken together, they create a perception of unfairness to many communities, which will be left paying for a system that does not meet their needs.

Building on the idea of official indifference, Camille thought that the city of Montreal did not particularly want the REM, "but they saw the writing on the wall…[and] didn't want to go up against the Caisse because it's so powerful" (personal communication, Mar. 12, 2020). By this, she implied that the decision to build the REM was taken by a few influential actors without adequate or meaningful consultations with local authorities, planning experts, or citizens. Roman and Dana, too, touched upon this third theme that I coded for. Both mentioned a heavily critical report issued by the provincial Bureau d'audiences publiques sur l'environnement (BAPE), which called the viability of the entire project into question, but which was ultimately ignored. In the end, Camille conceded that her group could not stop the REM, and she hoped the new train line would at least be able to remove cars from the roads, but insisted that they would not stop criticizing the "way in which the public were strong-armed" (personal communication, Mar. 12, 2020). Dana concluded, "Transit can be done well, but it needs to be properly planned and cost-effective…[and] I think it's kind of a human rights thing" that the REM has not necessarily met those standards (personal communication, Mar. 16, 2020).

Therefore, I conclude that the most widespread perception of the REM is that it does not equitably serve communities in the Montreal region, and if it is perceived to serve any interests in particular, it is the economic interests of its developer, the Caisse de dépôt et placement, as well as the political interests of provincial decision-makers. These perceptions are not widely expressed in public discourse, but nonetheless become readily evident when community stakeholders are asked to share their opinions, something which the Caisse has not generally done. This is not to demonize the Caisse or write off any of the potential positive aspects of the REM, but it is to underline the

degree to which the project, in its current configuration, is perceived to be socially problematic due to its semi-privatization and overall preference for design expediency.

6.2. Maryland capital region

I interviewed five informants from the Maryland capital region (names are pseudonyms):

- Colin, a planner who has written about local transport issues;
- Abigail, a resident of Chevy Chase;
- Sergio, a manager at an immigrant services organization;
- Jeff, a local government staffer; and
- Eric, an associate at a nonprofit development firm.

From these interviews, I noted a number of recurring themes relevant to answering my second research question. As in Montreal, there is not substantial public discourse about service equity. Jeff drew a distinction between the 'retail discussions' his office has with constituents worried about construction impacts, and the less frequent 'institutional discussions' about equity it has with nonprofit groups (personal communication, Feb. 13, 2020). However, even these nonprofits can be occupied with day-to-day problems. Sergio felt that his group had come to fill a mediator role between Langley Park community members and project officials, whose own outreach efforts he characterized as well-intentioned but ultimately insufficient due to state budget cuts (personal communication, Jan. 21, 2020). Abigail similarly noted that while some in her community had initially opposed the Purple Line on principle, with construction now underway, issues like noise and blocked sidewalks have come to the fore (personal communication, Dec. 23, 2019). These experiences collectively suggest a widespread sense of inevitability among the communities near the line, similar to the prevailing sense in Montreal. In other words, with the state committed to building the Purple Line no matter what, all ordinary citizens can do is seek to mitigate its perceived downsides. Thus, there is no point in worrying about more abstract notions of fairness. This notion mirrors, albeit less intensely, the sentiments of futility I identified in Montreal.

This does not mean that the Purple Line is inequitable or that it provides no value to Langley Park, Chevy Chase, or any of the other communities along its route; the quantitative results from the previous chapter say otherwise. Rather, it means that equity has been treated incidentally by a

broad array of stakeholders, and to the extent formal consideration was given in order to comply with federal civil rights law, community input would not have altered a political process set on moving forward with construction. This finding mirrors that of others who have investigated transport equity in practice, and found that while it is generally considered ideal, different goals like economic development are often prioritized (Garrett & Taylor, 1999; Linovski et al., 2018). Colin stated that he was "not sure how relevant equity was" to the Purple Line's planners (personal communication, Dec. 20, 2019), while Eric concluded, "If the Purple Line is equitable, it will be by accident" (personal communication, Feb. 14, 2020).

This context has implications for the second theme I identified in the Maryland capital region interviews, which is that all of the informants, when prompted to consider equity, did perceive the Purple Line to be serving a diverse group of communities, if not necessarily by design. Despite his reservations about official motives, Colin nonetheless characterized the Purple Line as "super equitable" because it serves historically neglected areas like Langley Park and Riverdale (personal communication, Dec. 20, 2019). A specific selling point of the project that seems to loom large in collective perceptions is its east–west trajectory, because it bridges the previously discussed regional socio-economic divide. Some of this has to do more with the availability of certain rights-of-way outside of any equity analysis, but the basic idea of a circumferential rail line remains one premised upon serving low socio-economic status communities.

Abigail said that even though Chevy Chase residents would probably continue to drive to their destinations or walk to the nearby Bethesda metro station, many were still progressive-minded enough to appreciate that the Purple Line was serving poorer populations to the east (personal communication, Dec. 23, 2019). As for those opponents, she said they could be seen as selfish for other reasons, but rejected the idea that they were motivated by racist or classist sentiment toward the Purple Line's presumed ridership base of lower-income people and immigrants, as in Atlanta. Colin was not quite as sure, given some of the "creative distractions" town residents had litigated over in opposition to the line's construction, but he still complimented those Chevy Chase residents who were supportive (personal communication, Dec. 20, 2019). Meanwhile, in Langley Park, Sergio remarked that his group's constituents are ultimately supportive of the Purple Line "because it does go east to west and it takes you to Bethesda, which is an economic hub, so there are more

job opportunities there" (personal communication, Jan. 21, 2020). This notion of linking low-income populations to employment centres elsewhere recalls the spatial mismatch hypothesis of Kain (1992).

Jeff in particular spoke in great detail about the possibilities for east–west integration offered by the Purple Line, because of the power of rail as a mode to alter the mental maps of residents. This of course draws on work by Lynch (1960) on imageability and by Mondschein et al. (2013) on mental mapping, whereby transit infrastructure is able to greatly shape perceptions of the urban areas surrounding it. In the case of the Purple Line, Jeff expressed optimism that the line would not only ease physical travel between Montgomery and Prince George's Counties, but also lower the cognitive barriers between residents of the two jurisdictions, because only rail "gives people enough confidence to plan where they live and work around it" (personal communication, Feb. 13, 2020). In this response, Jeff also reproduced the 'mythology' of light rail theorized by Richmond (2005). The promise of greater regional integration is particularly potentially lucrative for Prince George's County, which has a majority-Black population and, according to Colin, has traditionally not done as well as wealthier Montgomery County in attracting investment to the areas around its existing rail transit stations (personal communication, Dec. 20, 2019).

The third and most important theme I coded for when it came to perceptions of the Purple Line's equity impact was its role as a vector for gentrification in the less affluent neighbourhoods east of Silver Spring. With the geography of the route itself seen in a broadly positive light, its potential ancillary impact on the housing market seems to be the more pressing equity issue (Lung-Amam et al., 2019). As one Langley Park resident put it, "I want to take the Purple Line to jobs in Bethesda. That will be so convenient. But how does that help me if I can't afford living here?" (Lazo, 2017). This theme is hardly unique, given the extensive body of research linking light rail to processes of neighbourhood change (Kahn, 2007; Rayle, 2015; Hess, 2018). However, I observed varying degrees of concern from different stakeholders, with some expressing more urgency than others.

Jeff was the least apprehensive, pointing out that many communities in Prince George's have changed little since receiving metro service in the 1980 and 1990s, while Montgomery has

implemented an inclusionary zoning policy which requires developers to make 12.5 percent of new housing units 'moderately priced,' or available at below market rate (personal communication, Feb. 13, 2020). Colin, on the other hand, said the fear of displacement was "very real" (personal communication, Dec. 20, 2019), while Eric cautioned that the Purple Line is "not equitable as currently configured…because inadequate steps have been taken from a legal standpoint to prevent displacement" (personal communication, Feb. 14, 2020). He recommended increasing the moderately-priced dwelling unit requirement to 20 percent, and doing something to assist immigrant-owned small businesses that were already facing stiff rent increases. Specific mention was made of a compromise that had been reached by Montgomery for the area around Long Branch station, whereby commercial strips would be upzoned, in keeping with the county's 'smart growth' policy of encouraging denser development near rail stations, but the residential areas would be left alone. Eric indicated that while this could allow people to benefit fairly from the new transit access, they will still end up worse off if their sources of livelihood are forced out of business, and at this point their best hope was for ridership to be so ultimately underwhelming that gentrification would simply fail to take root (personal communication, Feb. 14, 2020).

Sergio echoed that his group's main worry now is the potential for displacement to occur in Langley Park as a result of the Purple Line raising nearby land values. He characterized the community's stock of older garden apartments as one of the last sources of plentiful affordable housing in the inner Washington suburbs, and speculated that without government intervention, corporate developers would seek to replace the apartments with more lucrative properties (personal communication, Jan. 21, 2020). Currently, Prince George's has not adopted any of the same inclusionary zoning practices as Montgomery, due to a feeling among elected officials that there is no need (Smith, 2018). Sergio additionally brought up the role immigrant-owned small businesses play in the local economy. For their part, owners have gone public with their doubts; in interviews with a reporter, two agreed that "the Purple Line will be good for the area," but asked, "What good is the…project if [we] can't stick around to reap the benefits?" (Simons, 2020). Nevertheless, a state proposal to compensate small businesses for losses incurred by Purple Line construction did not make it into law (Peck, 2020).

Therefore, I conclude that to the extent the Purple Line is perceived by to be equitable by dint of its east–west trajectory through communities rich and poor, these perceptions are often undercut by a further sense that the line is above all serving the state's economic growth goals, as well as the interests of the property developers who stand to benefit most from the public investment in light rail. These perceptions are likely held by many members of the general public, but they are not typically expressed in such explicit terms, nor are they anyone's top priority due to the line's aura of political unstoppability, combined with the cuts made to outreach programs. The Purple Line is by no means a bad light rail project; truly, it offers transformative opportunities for the communities it serves. At the same time, stakeholders in those communities feel like more could be done to include their perspectives.

CHAPTER 7: CONCLUSION

In this thesis, I have explored the social role, both actual and perceived, of new light rail lines being built in North America. In other words, which communities are served by these projects, and which are not? Furthermore, how is the role of these projects understood in those communities? To accomplish this task, I focused on two case studies—the Réseau express métropolitain and the Purple Line—and asked these two research questions:

1. Which communities do the REM and Purple Line serve?

2. Which communities do stakeholders perceive the REM and Purple Line to serve?

To answer these questions, I first reviewed relevant literature and further contextualized the two case studies, before employing a combination of quantitative and qualitative research methods, analyzing census socio-economic data and interviewing key informants from the communities impacted by each project.

When it comes to the social role of the REM, I found that it serves communities that are decidedly higher in socio-economic status than the population served by current rail transit infrastructure in the Montreal region. In this vein, the project is generally perceived by community stakeholders to serve the city's affluent western suburbs instead of more transit-dependent areas to the east. Furthermore, its semi-privatized nature has created perceptions that the role of the REM is to benefit larger economic and political interests in the province, which are not amenable to expert or citizen input.

As for the social role of the Purple Line, I found that it serves communities that are predominantly less affluent than those served by existing rail transit infrastructure. In a similar fashion, it is perceived to more fairly integrate poorer eastern suburbs with wealthier pockets to the west. To the extent that the equity impact of the project is in doubt, it is due to concerns that the state is seeking to build the line for economic purposes, and has not done enough to engage marginalized communities along the route, or to implement measures to protect them from potential gentrification.

This thesis presents an in-depth consideration of two projects, through two methodologies, and two overarching frames of reference: transport equity, and perceptions of transport modes and riders. This of course has not been an exhaustive study of all the phenomena which are relevant to new light rail lines in the North American context. Therefore, I believe there is still ample room for further exploration and discovery in this field, particularly due to some of the limitations of my own approach. The most consequential limitation I experienced was in terms of the relatively small number of interviews I was able to conduct. Given the diversity of perspectives I was able to obtain in the Maryland capital region, and the unanimity I found in the Montreal region, I do not think this limitation is fatal to my present conclusions, but more raw input would certainly not hurt a future study, because my selection of key informants was biased by who I knew would be knowledgeable and who was willing or even able to speak to me at all. For instance, I could not explore the REM's relationship to community-level class dynamics as much as I would have liked because no potential informants I contacted in the Town of Mount Royal were willing to participate, and I could not locate anyone in Montréal-Nord able to be interviewed in English.

All in all, I found completing this thesis to be a worthy intellectual challenge, and I believe that irrespective of the ways in which I know I could have improved the final product, the results still speak for themselves. The Purple Line and REM are two new light rail lines being built simultaneously in two major North American metropolitan areas, yet only the former appears to be meeting the basic social service and fairness goals of ideal public transport infrastructure. By contrast, in both reality and in public perception, the social role of the latter can be said to be on a very different and far less equitable track.

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APPENDIX A: SOCIO-ECONOMIC DATA FOR REM AND PURPLE LINE STATIONS

Key to variables

Med. Inc.—Median household income (USD/CAD)

Poverty—Poverty rate

Renters—Renter-occupied housing rate

25+ B.A.—Percent over 25 with a Bachelor's degree

Act. Com.—Rate of active commutes

Non-White—Non-White population

Purple Line

Station	Med. Inc.	Poverty	Renters	25+ B.A.	Act. Com.	Non-White
Bethesda	$111,033	7.72%	64.81%	29.97%	41.74%	29.66%
Connecticut Avenue	$181,214	3.71%	21.81%	33.12%	18.35%	21.75%
Lyttonsville	$98,136	9.43%	52.15%	25.75%	28.96%	62.10%
16th Street–Woodside	$78,310	10.96%	74.53%	33.55%	40.66%	55.67%
Silver Spring Metro	$69,672	11.79%	92.70%	27.60%	53.87%	58.19%
Silver Spring Library	$73,171	7.84%	69.37%	29.85%	35.99%	50.39%
Dale Drive	$103,135	4.62%	40.84%	29.37%	28.08%	42.01%
Manchester Place	$80,874	13.97%	50.60%	22.26%	25.25%	63.92%
Long Branch	$65,721	15.14%	69.86%	20.53%	28.06%	70.56%
Piney Branch Road	$61,175	19.13%	58.48%	11.24%	28.39%	87.41%
Takoma–Langley	$67,765	16.13%	73.79%	10.04%	25.19%	86.45%
Riggs Road	$61,522	18.61%	65.43%	8.76%	24.28%	94.36%
Adelphi Road	$78,514	17.76%	60.82%	21.98%	31.16%	70.99%
Campus Drive–UMD	$46,299	58.40%	71.39%	29.14%	56.80%	38.42%
Baltimore Avenue	$34,672	50.81%	74.29%	26.27%	45.39%	45.63%
College Park Metro	$91,630	22.64%	33.12%	26.75%	29.45%	41.04%
Riverdale North	$95,632	16.42%	29.83%	25.06%	24.01%	47.87%
Riverdale–Kenilworth	$57,408	15.43%	54.63%	12.09%	17.92%	89.39%
Beacon Heights	$65,066	11.00%	41.74%	11.71%	17.96%	92.81%
Glenridge	$63,440	9.11%	43.02%	10.28%	18.90%	93.06%
New Carrollton	$60,630	6.51%	55.77%	13.85%	19.69%	93.68%

Réseau express métropolitain

Station	Med. Inc.	Poverty	Renters	25+ B.A.	Act. Com.	Non-White
Brossard	$84,318	9.60%	15.60%	49.96%	27.24%	46.90%
Du Quartier	$78,407	8.77%	17.43%	47.02%	29.11%	51.30%
Panama	$63,266	17.17%	35.47%	29.71%	36.27%	45.47%
Île-des-Soeurs	$82,388	15.33%	37.98%	64.24%	30.81%	27.22%
Griffintown	$79,780	14.25%	43.31%	69.34%	59.78%	26.95%
Gare Centrale	$48,272	35.77%	56.67%	71.75%	66.94%	44.48%
McGill	$32,460	46.14%	77.90%	74.28%	76.94%	46.84%
Édouard-Montpetit	$92,860	18.20%	53.21%	75.32%	50.01%	16.57%
Canora	$72,278	22.27%	57.65%	60.21%	46.47%	34.62%
Ville-de-Mont-Royal	$117,551	11.37%	33.54%	72.28%	29.39%	23.05%
Côte-de-Liesse	$78,923	18.44%	39.13%	42.29%	38.22%	49.99%
Montpellier	$48,691	30.91%	66.96%	39.69%	44.26%	58.23%
Du Ruisseau	$54,510	22.72%	51.57%	35.40%	35.86%	48.28%
Bois-Franc	$55,662	23.22%	50.49%	35.36%	39.33%	59.10%
Marie-Curie	$109,683	8.07%	15.45%	65.56%	20.78%	37.19%
Aéroport-Trudeau	$73,620	8.12%	20.17%	30.88%	21.91%	33.34%
Des Sources	$77,499	9.02%	24.54%	37.22%	22.51%	42.82%
Fairview–Pointe-Claire	$83,014	9.62%	30.65%	46.25%	23.92%	29.60%
Kirkland	$134,056	5.50%	6.28%	54.90%	13.74%	20.09%
L'Anse-à-l'Orme	$124,206	6.45%	7.17%	60.81%	20.49%	13.18%
Sunnybrooke	$70,166	14.39%	30.13%	33.62%	28.80%	51.19%
Pierrefonds–Roxboro	$74,708	10.76%	22.02%	37.59%	28.86%	37.69%
Île-Bigras	$115,800	3.00%	7.60%	60.65%	38.39%	9.29%
Sainte-Dorothée	$123,849	5.47%	9.27%	50.60%	25.62%	11.50%
Grand-Moulin	$58,251	15.48%	37.48%	22.42%	31.20%	8.62%
Deux-Montagnes	$77,463	8.34%	25.19%	26.19%	30.04%	10.53%

APPENDIX B: SEMI-STRUCTURED INTERVIEW GUIDE

- What is your expertise or connection to the REM/Purple Line?
- What are your general thoughts about the project?
- How would you differentiate your community from the rest of the region?
- Which communities does the line serve?
- Do you feel like this project is socially equitable?
- Do you think others in your community feel similarly or differently?
- What do you think has shaped your opinions on this project?
- Is there anything else you would like to add?