

**COMMUTERS AND COMMUNITIES: THE SOCIAL AND ECONOMIC
IMPACTS OF LABOUR MOBILITY ON SOURCE COMMUNITIES**

by

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ABSTRACT

During the past two decades, great emphasis has been put on social and cultural patterns of movement within the social sciences, leading to the establishment of what has been called the ‘mobilities turn’. One type of mobility is known as Employment-Related Geographical Mobility (E-RGM), which involves situations where workers consistently cross municipal, provincial, and/or national boundaries to get to their place of employment and back to their place of residence. The purpose of this Masters research is to study the social and economic impacts of E-RGM on source communities. The particular focus is on workers employed at Vale’s nickel processing facility in Long Harbour, Newfoundland and Labrador who commute there from various communities across the province and beyond, and how these workers spend their time and money in their source communities. Results of this research indicate that while many Vale processing workers have less time to participate in community activities since starting their employment, certain work schedules and commute arrangements allow more time for workers to engage in their communities. Further, many workers involved with extended daily commutes are more inclined to purchase goods and services locally than to travel to nearby urban centres. Overall, the way a worker engages with their community depends on a variety of circumstances, including their particular commute and work arrangement.

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CHAPTER 1

INTRODUCTION

During the past two decades, great emphasis has been put on the social and cultural patterns of movement within the social sciences, leading to the establishment of what has been called the ‘mobilities turn’. This includes observing increased levels, new forms, and different patterns of mobility among people, ideas, and knowledge (Hannam et al., 2006; Sheller and Urry, 2006; Cresswell, 2011a). One type of mobility is Employment-Related Geographical Mobility (E-RGM), which involves situations where workers consistently cross municipal, provincial, or national boundaries to get to their place of employment and back to their place of residence. This spectrum can range from short, daily commutes to nearby communities, to more extended absences involving international travel (Haugen, 2005; Temple et al., 2011).

Researchers have examined how E-RGM affects livelihoods and the quality of life in communities and regions that host mobile workers (see, for example, Storey, 2010; Ferguson, 2011; Walsh, 2012). There has, however, been relatively little research on how E-RGM (also referred to in this thesis as labour mobility) affects source communities – areas where people commute from – especially within rural regions, as documented by those that study Long Distance Commuting (LDC) (see, for example, Haslam McKenzie & Hoath, 2014; Milbourne and Kitchen, 2014). Scholars studying daily commuting also agree that this particular area of focus has been subject to limited study in the past (see also Bissell, 2015; Carson and Carson, 2014). Community consultations and research in rural regions of Newfoundland and Labrador (NL), including the Avalon Isthmus where

this research is focused, have further identified that the implications of E-RGM for source communities are poorly understood (Vodden, 2015; Porter and Vodden, 2012). More specifically, as Hall (2014) and Esteves (2008) argue, we know little about how mobile workers spend their time (e.g. volunteering, participating in community events and other forms of community engagement) and their money in their source communities (e.g. buying goods, services or property) – which are two important ways residents participate in and contribute to their places of residence. Finally, much of the existing literature about the impacts on communities of labour mobility associated with large scale industrial projects (e.g. Fort McMurray, Alberta, see, for example, Storey, 2010; Ferguson, 2011) has focused on the construction phase, a temporary form of employment, while more research is needed to understand how E-RGM affects communities during the operations phase, which provides more long-term, permanent employment.

The purpose of this research is to study the impacts of E-RGM on source communities, with a focus on workers employed at Vale’s nickel processing facility in Long Harbour-Mount Arlington Heights (hereafter referenced as Long Harbour), NL. This research uses questionnaires and semi-structured interviews to answer three primary questions:

1. What factors influence a worker’s decision to stay in their source communities and commute rather than relocate closer to their worksite?
2. How do mobile workers spend their time in their source communities?
3. How do mobile workers financially contribute to the local economy of their source communities?

Answers to these questions provide detail on how labour mobility impacts source communities in the particular context of the operations phase of a potentially long-term industrial project.

Travelling for work is not a new phenomenon, especially in rural Newfoundland and Labrador (MacDonald, Sinclair, and Walsh, 2012; Skeard, 2014; Hall, 2014). In recent years, mobile work arrangements have become increasingly used in NL, ranging across many different sectors, including mining and mineral processing, forestry, healthcare, business and entertainment. This includes E-RGM in megaproject-related construction activities in Bull Arm and Long Harbour on the Avalon Isthmus, as well as in other locations such as Muskrat Falls. While travelling for work is not new, implications of labour mobility for source communities are only starting to be recognized (Storey, 2010). This research will contribute to a growing understanding of the impacts of E-RGM on source communities.

The remainder of this thesis is divided into seven additional chapters. Chapter 2 evaluates the existing literature on E-RGM and the related social and economic community impacts, and further explains the gap in literature this research attempts to fill. Chapter 3 discusses the approaches taken in this research and expands on the research design, methods, and analysis. In Chapter 4, a description of the case study is provided. Chapter 5 focuses on the factors that influence workers to commute rather than relocate closer to the worksite. Next, Chapter 6 describes how Vale plant workers spend their time in their source communities, while Chapter 7 discusses the spending patterns of Vale plant workers and how they financially contribute to their source communities. Lastly,

Chapter 8 explores the overall implications for source communities, as well as themes for future research initiatives.

CHAPTER 2

LITERATURE REVIEW

This chapter explores the literature on E-RGM in recent decades, including the affects of E-RGM for source communities, and why more research is needed on the implications of labour mobility for source communities. In order to fully understand the impacts and significance of E-RGM, it is important to first understand the mobilities turn and why it is relevant to this study. Following this, a discussion of E-RGM and daily commuting is presented, while outlining a variety of considerations when deciding to commute. Lastly, the social and economic implications of E-RGM relevant to this study are identified, providing relevant insight for the Newfoundland and Labrador context.

2.1 The Mobilities Turn

During the 1960s and 1970s discussions of mobility primarily occurred within the spatial science literature. For example, scholars such as White and Senior (1983) suggested that with the exception of recreational travel (on cruises or trains for example), people used transportation as a means to an end. In this instance, mobility was seen as a cost – something that should be mitigated if at all possible. Further, movement was simply a result of needing to go from point A to point B and evaluated based on the quickest and most cost effective route to move between these points (Abler et al., 1971). This way of thinking about movement failed to consider the social and cultural context, and how movement is experienced.

This started to change in the late 1970s when feminist spatial science geographers observed that men and women have strikingly different experiences in their journey to and from work, and that these movements were considerably more than just getting from A to B. Put simply, a line between two points on a map is significantly different once gender is considered, as women are more likely to do grocery shopping, deal with childcare as well as contribute to other familial matters en route (Hanson and Pratt, 1995; Law, 1999). This body of work began to consider that there was more to travel routes than ‘empty movement,’ and that socio-economic relations should be considered in transport-related settings.

Greater interest in mobility studies during this period was also linked to the rise of mobility across the world. More infrastructure was established to facilitate and address the increase of mobile human activity, such as the development of faster, larger airplanes and airports as well as improved road networks for daily commuters (Harvey, 1989). With this increase in mobility, there was also an increase in the number of commuters on the road, causing greater congestion and increased journey to work times (Levinson and Kumar, 1994).

Throughout the 1990s and 2000s interest in different forms of mobility in relation to developments in social and cultural theory became apparent throughout various disciplines in the social science and humanities (Van Den Abbeele, 1992; Kaplan, 1996; Clifford, 1997; Urry, 2000). Over the last decade, this shift in focus has been labelled the ‘mobilities turn’ (Sheller, 2011; Urry, 2012), which has a variety of interpretations depending on the context. Two key themes within this wide body of research that are

relevant for this particular study include: the link between mobility and place and how mobility is experienced.

Place is an important aspect for understanding mobility because mobility is not simply travelling from one location to another, but also travelling through, and within, places (Cresswell, 2011b). Massey's (1991) thoughts on a 'global sense of place' help explain how place meanings and mobility are interconnected. Of relevance are not only place attachments within source communities, but also people's "attachments and connections with place of residence and of work and all places in-between" (Massey, 1991: 62; see also Adey, 2006; Hannam et al., 2006; Jean, 2016). Massey argues that mobility and attachment are entrenched together as a duality and they should not be separated when studied. Likewise, Clifford's (1997) discussion of roots and routes to understand how people live in and through places by being both home and away helps explain the variety of ways individuals are embedded in place and time. Bertotti et al. (2012) have also suggested the more attached you are to your community, the more likely you are to engage with your community. This is examined in this study by exploring workers' intentions to remain (or not) in their source communities after beginning work at the nickel processing facility in Long Harbour.

The mobilities turn has also enhanced our understanding of how mobilities are practiced. The act of mobility does not just occur, but is actively experienced. These experiences can come through a variety of forms ranging from pleasure and joy to pain and punishment. For example, a person flying first class from Beijing to Los Angeles has a different experience from an individual who travels to the United States via the same route, but in economy class (Cresswell, 2011b). On a local scale, people travelling to

Vale's plant may take the same route to work, but have different experiences – even in the same vehicle – depending on if they are the driver or a passenger.

The mobilities turn is, therefore, important for this particular research because it provides a lens through which to better understand mobility. As discussed in Chapter One, the goal of this research is to move beyond a simple account of the routes people take to work or the lines on a map to understand what influences people to commute the way they do, the feelings people have towards their commute, and the implications of this mobile activity for their source communities.

2.2 The E-RGM Spectrum

E-RGM involves situations where workers consistently cross municipal, provincial, and/or national boundaries to get to their place of employment and back to their place of residence. This spectrum can range from short, daily commutes to nearby communities, to more extended absences involving international travel (Haugen, 2005; Temple et al., 2011). Vale plant workers are involved in a number of different mobility scenarios, including: daily commutes which range from less than 15 minutes one way; journeys consisting of distances greater than 50km and commutes lasting over one hour each way; workers travelling across the province and temporarily residing near the worksite; and others commuting to the province for weeks at a time. There are also several different schedules that can influence the commute, which range from a Monday to Friday workweek to more compressed roster-based work schedules. These schedules are described further in Chapter 4. The following section is a discussion of the E-RGM spectrum and related literature, with descriptions of arrangements along the spectrum that

include Long Distance Commuting (LDC), Drive-In/Drive-Out (DIDO) and daily commuting. Each of these types of arrangements is discussed further below.

2.2.1 Long Distance Commuting

There is a significant body of literature that documents extended work commutes, multi-day absences from home, and the evolution of LDC. Storey and Shrimpton (1986) define LDC as employment which often takes place in an isolated host region, located at a great distance from a workers' source community; where food and accommodations are provided at the worksite, and where workers are involved in a roster-based schedule, in which they spend a fixed number of consecutive days on the work site, followed by a number of specified days at home. Rosters may differ depending on the type of work and the geographic location of the worksite, as well as corporate factors and worker preferences. The rosters can be symmetrical (e.g. two weeks on/two weeks off) or asymmetrical (e.g. two weeks on/one week off), short (e.g. four days on/four days off; eight day roster) or long (three weeks on/three weeks off; six week roster) (Storey, 2008; Hoath and Haslam McKenzie, 2013). Typically, in a roster system where the worker is near or on the worksite for multiple days, the employer pays for transportation to and from the worksite as well as provides other basic amenities such as accommodations, recreation, and basic medical services (Ryser et al., 2015).

Other scholars have defined LDC as situations where a worksite is located at least 200 kilometres (km) away from a workers source community (Öhman and Lindgren, 2003) while recent articles have suggested that LDC can also include extended daily commutes (Vodden and Hall, 2016; Barber, 2016). The underlying themes across all of

these definitions are that distance and time are important factors when discussing the E-RGM spectrum.

The E-RGM spectrum includes multiple forms of mobility, including those who travel to and from work by plane (FIFO), train, boat or automobile. DIDO work arrangements, for example, include both LDC and shorter daily commutes. Perkins (2012) defines DIDO similarly to Storey and Shrimpton's (1986) definition of LDC – which includes a remote work location, accommodations and food paid for by the company, and a rostered-based work schedule – but as a particular type of LDC where a worker uses an automobile as their mode of travel. More recently, however, there have been different interpretations of how DIDO is understood, such as Rolfe and Kinnear (2013) suggesting that workers do not need to be involved with LDC to be considered in the DIDO workforce, and that they can commute to their worksite within their local area or a nearby region. Automobile travel is the mode used most by workers in this study.

2.2.2 Daily Commuting

Daily commuting is the term used to identify the type of mobility that is the focus of this research. Shorter distances between source communities and the place of work allow for daily commuting arrangements, where people can travel to and from their employment within the same day. Particularly, this thesis will look at the differences between workers that have extended daily commutes and workers that have shorter commutes (defined in this thesis as less than 50 km). The differences and rationale for these two groups is described in the following section.

Daily commuting can involve many different modes of transportation, such as automobile commuting, public transit, walking, cycling, or even ferries (Heinen, Van Wee, and Maat, 2010; Kraemer et al, 2015). According to a 2011 study, 74% of Canadians who commute to work drive a private vehicle; 83% of these people drive alone and 17% carpool (Statistics Canada, 2013a). The percentage of individuals who carpool to work increases significantly within Atlantic Canada, however, with the highest rates across the country being in Halifax, Nova Scotia (23.5% of all workers), St. John's, NL (23.2%), Moncton, New Brunswick (22.7%) and Saint John, New Brunswick (22.5%). This carpool culture within the Atlantic region is also reflected in the Long Harbour case where a significant percentage of plant employees carpool to the worksite, a subject that is explored more thoroughly in Chapter 4.

On a national scale, the average commute time in Canada is 25.4 minutes, with the most common timeframe (33% of Canadians) being between 15 and 29 minutes to travel to work in 2010 (Statistics Canada, 2010; Statistics Canada, 2013a). When comparing Census Metropolitan Areas (CMA) in Canada, 2010 data suggests that Toronto (32.8 minutes) and Oshawa (31.8 minutes) both have average commutes that last over a half hour one way, while smaller, less densely populated, CMAs such as Saguenay (16.9 minutes), Thunder Bay (17.1 minutes) and Moncton (17.2 minutes), have shorter average commute times. In the St. John's CMA, the average daily commute time is 17.9 minutes, with 46.8% of residents commuting 15-29 minutes to work (Statistics Canada, 2013a). The St. John's CMA ranks 30 out of 33 among Canadian CMAs in terms of average daily commute, with Toronto, ranked first, having the longest.

When considering the NL context, Freshwater (2008) found that residents in rural Newfoundland commute between 5 and 135 kilometres daily. However, over 90% of the population commute less than 50km to work one way, and that “virtually no workers commute over 100km” (Freshwater et al., 2011: 13). An exception to this are workers involved in NL’s industrial sector, particularly those working in projects on the Avalon Isthmus, including Vale’s Long Harbour project as well as those at the nearby Bull Arm site near Sunnyside, Trinity Bay (Hall, 2016; Barber, 2016). Considering the standards across Canada, as well as the particular NL context, journeys to work over 50km are considered here to represent an extended daily commute. The 50km threshold also aligns with Vale’s definition, which uses a 50km radius to report statistics on their workforce (Stevens, 2014) and is also used elsewhere, such as hiring requirements in union contracts (CLRA, 2011) and recipients for industrial benefit agreements across the province (Keating and Synard, 2016). For the purposes of this study, those that commute more than 50km and those that commute less than 50km will be separated, with analysis comparing the two groups provided in Chapters 4-7.

The combination of an extended daily commute and a compressed work schedule can further extend the length of a workday. Therefore, it is also important to consider compressed work schedules, which involve increasing the length of the workday while decreasing the number of actual days worked in a week, when examining the experiences and activities of commuting workers (Paley, Herbert, and Tepas, 1994; Amendola et al., 2011). This review of literature helps guide and frame the analysis presented in Chapters 4-7, which sought to determine whether long workdays in combination with the time

spent commuting and can result in 12-15 hour workdays but provides more days off, allow more or less time for workers to engage in community-related activities.

Many people who are involved in extended daily commutes also work occupations that involve long work shifts. This has primarily been seen in the health care sector, with nurses, doctors, surgeons, and veterinarians (Kirkcaldy, Trimpop, & Cooper, 1997; Simpson & Severson, 2000), but also outside the health field, such as construction workers, bus and truck drivers, miners, and firefighters (Meijman, 1997). A 2005 study has shown that an increase of overtime and extended working hours not only poses a risk of occupational injuries while on the job, but can also be detrimental to a person's health off shift due to tiredness (Dembe et al., 2005).

There have been a number of Canadian studies that have focused on the long-term implications of compressed work schedules for workers while off shift (see, for example, Harris et al., 2015; Paley, Herbert, and Tepas, 1994; Haley and Miller, 2015). Previous results have shown that workers' job satisfaction, health and well being is improved after 5 months of working in rotating work schedules (Paley, Herbert and Tepas, 1994). Research also suggests individuals involved with compressed work schedules typically sleep longer than those involved in traditional work schedules when accounting for both work days and days off (Paley, Herbert, and Tepas, 1994; Haley and Miller, 2015). An important aspect to note from these studies is that a compressed work schedule can impact a person off shift (increasing their sleeping time for example), which may in turn affect their involvement in their source communities. As such, the combination of the work schedule of a mobile worker in addition to their commute is important to consider for this research.

2.3 Drivers of Daily Commuting

Daily commuting literature has focused on a variety of different themes, which include: mode and infrastructure characteristics (e.g. mode alternatives, infrastructure quality) commute characteristics (e.g. length, time, congestion levels) impacts on workers and families (e.g. stress and fatigue, social relations) (Lyons and Chatterjee, 2008; Perry and Rowe, 2015). This literature has also identified several factors that workers consider when participating in extended daily commuting, such as labour market opportunities, housing market conditions, social factors (e.g. family/community connections), and financial compensation. These factors, which are identified in Table 1, relate to characteristics of both the job/workplace, conditions in the host region or community, and less documented, conditions in the source community (Levinson, 1998; Herkes et al., 2013; Morgan, 2013; Bloze and Skak, 2015; Westin, 2016; Storey, 2016). Three types of factors documented in the literature as drivers of daily commuting are particularly relevant for this thesis and are discussed in more depth below to determine if and how these factors affect a worker's decision to commute or relocate closer to the worksite: economic aspects associated with E-RGM (e.g. compensation); facilities, amenities and attachments to place; and the nature of the commute.

Table 1. *Factors influencing a workers decision to commute or relocate.*

Workplace Attributes	Conditions of Host Community
<i>Compensation (wages and benefits)</i>	<i>Job opportunities for spouse</i>
<i>Nature of commute</i>	<i>Medical facilities</i>
<i>Nature of work</i>	<i>Education facilities</i>
<i>Work schedule</i>	<i>Recreation facilities</i>
<i>Size of project</i>	<i>Price of house/living conditions</i>
<i>Duration of employment</i>	<i>Social/family connections</i>

2.3.1 Economic Considerations

Commuters must decide whether the rewards of a job (financial or otherwise) and/or the satisfaction or other benefits they receive from living in their source community are worth the stress and cost of the commute. For example, many megaprojects pay higher wages than local opportunities, but typically require the worker to commute beyond their home community (Windle and Rolfe, 2013; Atkinson and Hargreaves, 2014). While salary is an important factor, several scholars in both the LDC and daily commuting literatures agree that housing affordability in the host region is also an important consideration when deciding whether to commute or relocate (Cevero, 1996; Haas and Osland, 2014). Housing costs in both source and host communities may influence a person's likelihood of commuting a greater distance for employment rather than relocating.

The financial cost of the commute is another important consideration for workers in their decision of whether to commute or relocate. Several studies have suggested that the cost of commuting is on the rise. Notably, this is related to how people have longer distance commutes, as more affordable housing is generally located further away from urban centres (MVHT, 2015). With an average commute of approximately 17km in Canada, most commuters are spending an average of \$7,540 a year to travel to and from work (Prevost, 2015). Many people employed at the Long Harbour facility are in fact commuting well over 50km to the worksite one way, resulting in a greater commute cost well above the national average. Further, changes in fuel prices can increase the cost of the commute, which fluctuates in many jurisdictions on a weekly basis (Freshwater et al., 2014). It has also been documented that those who commute an extended period of time

without financial compensation and other benefits of their job are reported to be less satisfied with their arrangement than non-commuters (Fults, 2010; Stutzer and Frey, 2008).

2.3.2 Facilities, Amenities, and Attachments to Place

Another driver of mobility is the attachment to place workers may have to their communities. Here, the conceptualization of place includes three primary features: a distinct geographic location, or the “where”; the physical characteristics of the place, or the “what”; and the meaning and value of the place, or the “why” (Trentelman, 2009).

Research has shown that the meaning and value – or attachment – to place a person holds can be attributed to a variety of factors; ranging from attachments to the individual’s home or to the surrounding environment, or to a person’s involvement in their community. Normally, a connection that exists between a place and the people who inhabit it becomes greater over time – a case that is especially true for individuals that were born and raised within the community (Taylor, 2005). The longer a person lives within a place, the more familiar he or she becomes with the area, allowing more memories to be made (Taylor, 2005). In addition, Stephens (2002) has suggested that the memories and identities a person holds within a place can create a sense of meaning and belonging with their community. The attachment and belonging to place that people hold can be one reason why people prefer to commute for work rather than relocate to a different community closer to the worksite, one of several reasons documented in both the LDC (e.g. Sandow and Westin, 2010) and daily commute (e.g. Morgan, 2013) literature.

There are several factors that contribute to place attachment with people that are involved in longer commutes (Barcus and Brunn, 2009). Research has documented that people place importance on amenities and location-specific capital, including place familiarity, or social networks, such as family and friends, when deciding whether to move from one location to another (Fletcher, 2009). As suggested in Table 1 (p.14), many host communities are too small to support urban services such as recreational, educational or medical facilities, limiting the potential for individual and family needs to be met. Hence, a person may choose to commute to allow his or her family to live in a community that provides such amenities (Herkes et al., 2013; Storey, 2016).

Place attachment is a deeply complex idea that involves a person's emotions, the historical context he or she holds with a community, the physicality of the land, and the social relationships he or she has within the community. A recent study has found that NL residents have the highest sense of belonging to their province when compared to all other Canadian jurisdictions (Statistics Canada, 2015a) and the third highest somewhat or very strong sense of belonging to their local community (77%) behind only the Northwest Territories (80%) and Nunavut (85%), respectively (Statistics Canada, 2016b). Yet, it has been documented in the daily commuting literature that people who are engaged with extended commutes tend to become less attached to their communities over time (Besser and Ryan, 2000). Due to the intricacies of place and place attachment and the relevance it has to NL, this theme is further explored in this research, as it can be a significant reason why people choose to commute.

In addition, Brown and Raymond (2007, 107) suggest that, in certain scenarios, "the concept of 'home' or 'place' extends beyond one's place of residence" (2007, 107).

While this may be the case, researchers have found that it can be difficult for mobile workers to consider their work community ‘home’ (Van der Klis and Karsten, 2009). As such, the level of attachment Vale plant workers have to their host community is also evaluated in this thesis to reaffirm or contradict what has been documented in previous literature.

2.3.3 Nature of the Commute

A significant aspect of the daily commute literature is based on the impact weather has on the length of time commuting and how weather affects the health and safety of the commuter and their commuting decisions. Perrin, Martin and Hansen (2001) conducted a study on how commute times are extended based on certain types of inclement weather on a high-speed highway during the winter months. Their findings are summarized in Table 2.

Table 2. *The increased length of time of a commute due to inclement weather as a percentage (Perrin, Martin and Hansen, 2001).*

Road Conditions	Commute Time Increase
<i>Dry</i>	0%
<i>Wet</i>	0%
<i>Wet and Snowing</i>	13%
<i>Wet and Slushy</i>	22%
<i>Slushy in Wheel Paths</i>	30%
<i>Snowy and Sticking</i>	35%
<i>Snowing and Packed</i>	42%

Not surprisingly, the more adverse the weather conditions, the longer the commute. Weather can create hazardous driving conditions for individuals and increase

the rate of congestion during inclement weather, further delaying the journey to or from work (Gilliam and Withill, 1992). When considering the health and safety risks involved with the commute during periods of harsh weather, approximately 24% of motor vehicle accidents that occur annually take place during snowy, slushy, or icy pavement conditions, with 15% happening during snowfalls or sleet. When accidents do occur they extend the length of the commute even further (FHWA, 2016). A 2009 study indicates that longer journeys to work (over 15 miles one way) are 15 times safer to take in a bus than a private vehicle, although a private vehicle is usually faster and more cost efficient depending on the length of the commute and whether carpooling is involved (Harto, 2009).

There are few data available regarding how weather impacts automobile collisions on the Trans Canada Highway (TCH) in NL, the highway used by most Vale workers to commute to work. Trends have been documented, however, that vehicle accidents are on the rise, particularly within the Avalon Isthmus (Porter and Vodden, 2012; CBC, 2016). Considering the significant delays weather can have on the daily commute, the increase number of vehicle accidents in recent years, as well as the lack of data regarding weather and the commute specific to Vale workers, it is useful to examine this area in this study and whether it influences a worker's decision to relocate closer to the worksite.

In addition (and in some cases related) to inclement weather, stress associated with extended daily commuting can negatively impact the physical and psychological health of mobile workers. This may affect their decision making on whether or not they choose to commute or relocate closer to the worksite. Research has documented that commuters experience more negative stress than non-commuters and that this stress

increases with age (Gottholmseder et al., 2009; Rüger and Ruppenthal, 2010). Longer commutes are also associated with higher blood pressure, obesity, sleep apnea and fatigue (Hansson et al., 2011; Hoehner et al., 2012). With the potential negative health implications involved with extended daily commuting, workers have a number of choices, to commute, relocate or quit their job. Whether or not these potential effects impact a Vale plant worker's willingness to commute or relocate closer to the worksite is evaluated more thoroughly in Chapter 5.

2.4 Impacts of E-RGM in Source Communities

E-RGM can affect workers, their families and communities in a variety of ways. This includes disturbances to community cohesion, disruptions of family lifestyles, and physical and mental health implications for individuals. Some of these impacts, such as health and family impacts, have been well documented (Henry et al., 2013; Carrington, Hogg, and McIntosh, 2011; Joyce et al., 2013). Others, such as how E-RGM affects source communities, are less well understood.

Community impacts of E-RGM can refer to the many social, economic, cultural, physical, environmental, and occasionally political circumstances that occur and how these circumstances affect the development of a community (Douglas, forthcoming). These resulting circumstances of E-RGM can range from a shift in gender roles (McEvoy et al., 2012), to education levels of children in mobile worker families (Asselin, 2014). Particularly relevant to for this research, scholars (Esteves, 2008; Hall, 2014) have indicated that there has been little information on how mobile workers participate in their source communities during their time home, providing further justification for this study.

Moreover, it has been identified that there is limited literature on how mobile workers spend their income and how this impacts their source communities (Hoath and Haslam McKenzie, 2014). A review of existing literature on both the social and economic impacts of mobility on source communities will be discussed in the following section.

2.4.1 Social Impacts of E-RGM on Source Communities

Understanding how employment mobility impacts the amount of time an individual spends participating in their community is particularly important and relevant for this study (Markey et al., 2015; Porter, 2016). Spending time with community residents, friends, and/or family – through volunteering, entertainment, community events, and leisure activities – helps develop a sense of belonging in communities (Sandow and Westin, 2010), which in turn, may directly contribute to and help create a greater propensity for community development (Sivan and Ruskin, 2000; Bertotti et al., 2012). Creating personal memories with friends and family within an area can also help create place attachment within a community or region, positively contributing to community cohesion (Stephens, 2002). While there has been little published in this area, researchers have indicated that people involved with E-RGM, both daily commuters and those that spend longer periods away, spend less time engaging in their community through activities such as volunteerism, church, and participating in organized sports in their source communities (Besser and Ryan, 2000; Francis, 2012; Ryser et al., 2015; Markey et al., 2015). Several other studies have suggested that the more hours an individual works per week, the less likely they are to participate in extra-curricular

activities, and that limited remaining spare time is typically spent with family and maintaining the household (Ezzedeen and Zikic, 2015; Hilbrecht and Lero, 2014).

E-RGM can also change an individual's and their family's social status and mobility within a community. With increased daily commutes, longer work shifts and reduced time participating in the community, as well as additional discretionary income, mobility is seen as a potential area of tension in many communities (Sibbel, 2010; Walsh, 2012). While distinct "have" and "have-not" groups within communities have been documented in LDC arrangements in the past, these tensions exist often, creating derogatory and judgmental attitudes surrounding families involved with E-RGM (Hoath and Haslam McKenzie, 2013). Further, the "have" expectation may be exaggerated, as community members can have unsubstantiated ideas on the disposable income E-RGM workers have, and what they might be expected to spend in their communities can be inflated as a result (Hamalainen and Bockerman, 2004; Vodden et al., 2017). This can make it increasingly difficult for mobile workers and their families to foster community relationships and participate in community activities (Sibbel & Kaczmarek, 2005). Understanding what previous literature has discussed regarding the social implications of mobility for source communities helped direct the data analysis of this thesis research presented in Chapter 6.

2.4.2 Economic Impacts of E-RGM on Source Communities

One of the most common benefits that E-RGM provides is that it allows workers to continue to reside in their permanent place of residence (Milbourne and Kitchen, 2014; Martensson, 2015). In many cases, engaging in mobile work allows people to access

employment that would otherwise be unavailable in their home communities. The financial gain often tied to labour mobility has helped many families also feel more financially stable in their local communities (Temple et al., 2011; Walsh, 2012).

Other benefits, discussed both in the LDC (ARIWG, 2007; Haslam McKenzie and Hoath, 2014) and daily commuting (Dupor, 2015) literature, include economic spinoffs received by source communities from labour mobility, such as increased spending by workers and their families through local businesses. Wages paid to these workers, which enable them to contribute to their local economies through local spending, such as the development of new residential infrastructure. Indirect multiplier effects from these expenditures of mobile workers have further contributed to local economic development in source communities, such as increased revenue from local businesses hiring new staff (Haslam McKenzie and Hoath, 2014; Storey, 2010; Dupor, 2015).

Economic spinoffs from mobility can also be seen in some cases through the development of new businesses in local areas. Innovation and entrepreneurship are critical to local economic development and sustainability within regions (Rainnie, 2004; Vodden, Carter, and White, 2013) where entrepreneurship results in diversification (Clark, 2010). While it is clear how entrepreneurship stimulates local economic development, the extent to which mobile workers engage in formalized business endeavours is less well understood (Fornahl, Zellner, and Audretsch, 2005).

When discussing economic impacts on source communities, charitable contributions to community and non-profit organizations must also be considered. Many charitable and non-profit organizations have mandates to enrich the social, cultural and economic livelihoods of communities, thus contributing to community development

(Gibson and Annis, 2009). When considering monetary donations to charities registered with the Canada Revenue Agency (CRA) NL has had the highest percentage of their population aged 15 and older making charitable contributions when compared to all other Canadian jurisdictions since 2007; 92% of NL's population made a charitable donation in 2010, with 87% of the population donating to a charity in 2013. In comparison, 84% and 82% of Canadians donated in 2010 and 2013, respectively (Barrett and Gibson, 2013; Turcotte, 2015). While there has been little literature to document how mobility impacts a person's charitable giving, it has been suggested that with increased income, there is a greater propensity for people to donate (Clerkin et al., 2013; Forbes and Zampelli, 2013; Turcotte, 2015). Given NL's history of charitable giving in addition to the propensity for people with high incomes to donate, charitable giving is an important aspect to consider when measuring the economic impacts of E-RGM on communities.

Scholars have also documented that there are challenges in source communities where some residents are receiving higher wages from E-RGM employment. Local business owners, predominantly in rural and remote communities, tend to have the notion that mobile workers are able to afford higher prices, and the cost of local goods and/or services they receive may be inflated as a result (Haslam McKenzie & Hoath, 2014). This can result in further tension between mobile and non-mobile workers within communities (Sibbel & Kaczmarek, 2005; Sibbel, 2010; Walsh, 2012). The economic spinoffs from mobility within source communities can also depend on the size of the community and the goods and services provided by local businesses. Researchers have indicated that economic multiplier effects associated with E-RGM can be weak in rural and remote regions, as much of the consumer spending occurs in urban centres (Maude and Hugo,

1992; Perry and Rowe, 2015). Moreover, with increased disposable income, many mobile workers prefer to live in more urban areas, which can result in outmigration, particularly of younger workers, from rural to urban areas (Walsh, 2012).

2.5 Summary

The mobilities turn has marked a new period for mobility research, which encourages researchers to understand ways mobility and place are linked and how mobility is experienced. The increase in mobility can impact communities in a variety of ways – from changes in civic involvement to increased local spending in source communities. Although research on labour mobility continues to be published, impacts of E-RGM on source communities have seldom been documented. Specifically, the social and economic impacts in source communities, such as how workers spend their time and money while home, needs to be addressed. As such, this Masters research, using Vale plant workers as the basis for a case study, can help increase our understanding of how mobile workers spend their time and money in their source communities.

CHAPTER 3

APPROACH TO RESEARCH

Prior to conducting this research, the appropriate use of methodology was carefully considered. This includes developing an appropriate research design and data collection methods, such as questionnaires, semi-structured interviews, participant observation, and document review. An overview of the research process as well as a discussion of qualitative and quantitative data collection techniques is also provided in the following chapter.

3.1 Research Design and Methods

A mixed-methods approach for obtaining data was used for this study. Cresswell (2015: 2) has indicated mixed-methods can be defined as, “an approach to research in the social, behavioural, and health sciences in which the investigator gathers both quantitative (closed-ended) and qualitative (open-ended) data, integrates the two, and then draws interpretations based on the combined strengths of both sets of data to understand research problems.” The collection and analysis of quantitative questionnaire data prior to conducting interviews helped to determine key research gaps within the questionnaire data that could be addressed through qualitative research. Using both quantitative and qualitative data also enhanced the validity of the research, as utilizing both types of analysis provided the opportunity to reaffirm the research findings (Abusabha and Woelfel, 2003). In some cases, it was also useful to see the contrast in data that were obtained from quantitative research versus qualitative research. This is noted as a benefit

of using a mixed-methods approach when dealing with human subjects in socio-economic research, as suggested by Othmar (2009).

Using a mixed-methods approach, specifically triangulation (utilizing and comparing data gathered through an employee questionnaire, semi-structured interviews, participant observation, and document review), provides strengths from different sets of data to understand research problems. As Downward and Mearman (2007: 77) suggest, triangulation “can provide the basis upon which different insights upon the same phenomenon can be sensibly combined and thus has the potential to unite aspects of different traditions of economic and social thought.” Triangulation provides credibility in qualitative analysis, while considered as an alternative to reliability and validity that formulates within quantitative analysis (Bogdan and Biklen, 2006). Others have suggested that it “gives a more detailed and balanced picture of the situation” (Altricher et al., 2008: 117) and that it is a highly recognized method “of cross-checking data from multiple sources to search for regularities in the research data” (O’Donoghue and Punch, 2003: 78), thus providing more accurate results and certainty in data collection (Audrey, 2013). As such, drawing data from four separate sources helps strengthen the validity and credibility of this research.

3.1.1 Employee Questionnaire

Distributing an employee questionnaire to the nickel processing facility in Long Harbour provided an opportunity to attempt to obtain data from all individuals working at the NL nickel processing facility. Vaske (2011) discusses the advantages and disadvantages of using questionnaires. Conducting surveys can provide adequate

representational data of a specific population or group of people and provides opportunities for quantitative analysis within the social sciences. However, the cost of printing and distributing questionnaires can be a hindrance for many research budgets.

Questionnaires were distributed to Processing Plant Technicians (PPT), Processing Plant Coaches (PPC) and administrative staff that work for Vale in Long Harbour (these positions are described further in the chapter that follows). After consideration of various options for distributing the survey and discussions with Vale, Vale distributed the questionnaires on site to the PPTs, PPCS, and administrators. This method was chosen because mailing the survey to workers was not feasible because the mailing addresses for workers were not available, while attempting to access workers at a physical location outside the worksite was considered unsafe as potential participants would be in moving vehicles, and likely to result in a lower response rate. Scholars (Connelly, Brown, and Decker, 2003; Lozar et al., 2008) have also indicated that there has been a decline in response rates from mail out surveys over the years, although Hardigan, Succar, and Fleisher (2012) suggest that mail out surveys receive the highest response rate over other delivery methods, such as online surveys (26% versus 11%, respectively).

The questionnaire packages, which were distributed in July 2015, included an information sheet about the project, brief biographies of the researcher (and supervisors), the questionnaire, a follow-up sheet requesting an in-depth interview, and a postage-paid envelope so that the completed questionnaire could be mailed back to Memorial University. The questionnaire was designed to identify the source communities of the workers, gather background information on the workforce and to collect some initial data

on their engagement in their source communities as the basis for further, more detailed, follow-up interviews. The questionnaire had three themes: commuting and work, time spent during non-working hours, and spending patterns. Questions included whether a Vale plant worker would consider moving closer to the plant to reduce commute time and if they volunteer or spend money in certain geographic areas. A copy of this questionnaire can be seen in Appendix A. From July 2015 to August 2015, Vale supervisors provided weekly verbal reminders to workers in their respective units. A reminder postcard was also developed, which was distributed by Vale in October 2015. Reminder postcards are a best practice suggested by Vaske (2008) and Dillman, Smyth, and Christian, (2009) among others.

Prior to the questionnaire distribution, Vale identified that 400 questionnaires would cover the entire staff at the processing facility. Of the 400 questionnaires that were distributed, 131 completed questionnaires were mailed back, providing a completion rate of approximately 33%. I was later informed that there were in fact 258 PPT/PPC and 171 permanent operations staff, totalling 429 staff as of July 2015. When considering the actual number of staff, the returned questionnaires were in fact from approximately 31% of the workforce. As noted above, in their study Hardigan, Succar, and Fleisher (2012) suggest that mail out surveys received an average response rate of 26%. By this standard, a 33% response rate is viewed as a better than average return rate for this research.

3.1.2 Semi-Structured Interviews

Questionnaire respondents were asked to identify whether they were willing to participate in a follow up, semi-structured interview. Semi-structured interviews are more

open and flexible than questionnaires, which provide an opportunity to discuss key themes in more depth (Schoenberger, 1991; Mullings, 1999; Sabot, 1999). 21 people participated in follow up interviews, which explored how their mobile work arrangement impacts their community involvement and spending patterns. Analysis from the questionnaire findings helped direct the interview questions to areas that needed to be further explored. An interview guide was developed for PPTs/PPCs and administrators to inquire about their commute and their involvement in their source communities. A separate interview guide was prepared for workers in management roles to ask about recruitment strategies and labour market issues. A copy of these interview guides can be seen in Appendix B.

Three of the interviews took place in September 2015 at Memorial University, with the remaining 18 interviews taking place from November 2015 to February 2016 in private boardrooms at the plant in Long Harbour. Questionnaire respondents were given the choice of completing a follow up interview either on site or off site. This provided an opportunity for people to be interviewed in a setting where they felt comfortable and free to discuss items of interest, as well as providing some flexibility regarding the time of the follow-up meeting. The duration of interviews ranged from 17 to 61 minutes. Pseudonyms are used for research participants throughout this thesis to help protect the anonymity of each participant.

3.1.3 Participant Observation

Unstructured participant observation was also utilized throughout this research. Dahlke, Hall, and Phinney (2015: 1117) states unstructured participant observation

“occurs along a continuum of researcher participation study – from primarily observing and active listening to complete immersion in the group.” In this case participant observation included five round trips between St. John’s and Long Harbour. These journeys occurred in various types of weather, including sun, rain, snow, and fog. This provided an opportunity to learn what Vale plant workers experience during their commute and some of the difficulties they face throughout their travels (Timeseena, 2009).

3.1.4 Document Review

Document review was also used in conducting this research. This research is part of a national project, which examines the nature of E-RGM in Canada, and how it affects workers, families, and communities. As such, project resources such as meetings and reports were used to help frame the research methodology. Specifically, a previous study conducted by Hall (2014) examined the implications of E-RGM on two host communities: Long Harbour, NL, and Sudbury, Ontario. Findings from this study provided significant contributions to the direction of this research. A number of corporate reports were also utilized for this research. This includes articles regarding the establishment of Long Harbour’s nickel processing facility as well as national and international documents regarding corporate restructuring. These materials were particularly helpful when formulating the research instruments and the research process.

3.2 Research Process

This research is part of Phase II for the Nickel Processing Component in the *On the Move Partnership: Employment-Related Geographical Mobility in the Canadian Context* project. This 7-year project (which started in 2012) is funded by the Social Sciences and Humanities Research Council of Canada (SSHRC), the Canada Foundation for Innovation, and the Research and Development Corporation NL, with the goal of investigating the implications of E-RGM on workers, workplaces, families, and host and source communities. More than 45 researchers from 17 disciplines and 24 universities across Canada and abroad, as well as over 30 community partners are studying E-RGM in a variety of sectors, including but not limited to: construction, ferry services, fisheries, mining, nickel processing, oil and gas, and trucking. Further information on this project can be obtained from the project website at www.onthemovepartnership.ca.

Phase I of the Nickel Processing Component of this project began in the fall of 2013. This research primarily focused on identifying the nature and extent of E-RGM in the nickel processing sector as well as the implications for host communities, drawing on Vale's operations in Long Harbour, NL, and Sudbury, Ontario, for a comparative analysis. In December 2014, the Nickel Processing Component hosted a community engagement session in Long Harbour, which was attended by community members, stakeholders from the provincial government, and company officials. This was the start of an informal relationship between Vale NL officials and the Nickel Processing Component research team, which subsequently led to a meeting in January 2015 to discuss Phase II of this research, which was carried out during the summer and fall of 2015, and winter of 2016.

Ethics clearance for this research was granted by the Interdisciplinary Committee on Ethics in Human Research (ICHER) at Memorial University on May 11, 2015 (ICHER #20160061-AR) and renewed on May 9, 2016. In June 2015, the questionnaire design was finalized and the appropriate package materials were printed. Questionnaire data collection was completed in July 2015. Follow-up interviews with questionnaire respondents took place from September 2015 to February 2016. Throughout this research, my primary residence was in St. John's and I would commute out to Long Harbour for field research and back on the same day.

3.3 Data Analysis

There are many benefits to incorporating quantitative methods into a research project. Typically, quantitative analysis gains its objectivity through enumeration, aggregation, and causation (Reichardt and Rallis, 1994). It allows data to be measured and, through a research design, can determine the cause and effect of phenomenon. Quantitative research is seen as having reduced subjectivity over qualitative research (Reichardt and Rallis, 1994). Particularly, using descriptive statistics is important when analyzing socio-economic data. While some scientific research may remain the same despite geographic location, socio-economic data differ between cultures, countries, and time periods (Othmar, 2009; Gartner, 1985). Questionnaire data were entered into Microsoft Excel where the data were summarized using descriptive statistics. This included measuring the frequency of variables and determining the mean response rates. This allowed relevant material to be sorted and documented appropriately, a practice recommended by others (Morgenstern, 1963; Whitehead, 1978; Thiem, 2014). This

included determining the similarities and differences of perspectives from respondents with longer commutes versus shorter commutes (less than 50 km), those that work rotating shift schedules and day shifts, as well as based on the type of position they worked.

Othmar (2009) has argued that socio-economic statistical data is only useful when paired with the appropriate qualitative data. As such, qualitative analysis was also an important aspect of this study. Mistry (2012: 521) suggests qualitative analysis should “attempt to capture data from the point of view of participants; ...gaining a ‘holistic’ overview of the context under study; and ...[understanding the] meaning gained through words or pictures in a descriptive way, rather than specified outcomes or products.” To do this, content analysis was completed on the interview transcripts. Content analysis is “any technique for making inferences by objectively and systematically identifying specified characteristics of messages” (Holsti, 1969: 14; see also Stemler, 2001). Put simply, the researcher must identify a set of themes to accurately categorize and subcategorize their data (Howitt and Cramer, 2007). Further, Howitt and Cramer (2007) suggest that it is crucial that researchers are thoroughly familiar with the data and that coding and analysis should be left to the researcher alone.

Using the appropriate labels (or codes) throughout content analysis to answer the research questions is a common technique in social sciences and humanities research. There were ten codes used throughout this analysis: community; commute; family; government; labour market; money matters; safety; sense of place; time spent home; and Vale. These codes were selected before the research began, based on the research

questions, the literature review and anecdotal information regarding the worksite. How these codes were used when categorizing the data can be seen in Table 3.

Table 3. *Description of content themes used during analysis.*

Code	Labeled Content
Community	Community of residence, communities they pass by or where they spend time and money, or the word community in another situation
Commute	The actual commute, feelings towards the commute, how the commute can be improved
Family	How family is impacted by the commute, whether family affects the decision to commute rather than relocate
Government	How workers believe the government can help their commute.
Labour Market	In discussions with managers; company responses to the local labour market and mobile workforce
Money Matters	Financial expenditures, overall income, and costs of the commute
Safety	Safety concerns regarding the commute and best practices
Sense of Place	Emotional ties an individual has with their community of residence, whether this is a factor that influences the commute
Time Spent Home	How a worker spends time off work and if this contributes to community development in their source community
Vale	Positive or negative perspectives, corporate rules or policies related to mobile workforces

After the data was coded, all the data and categories were carefully examined to determine their relevance and if any themes could be merged together to define one overall concept. The process of searching for patterns then took place, determining the similarities and differences of perspectives from respondents with longer commutes versus shorter commutes, those that work rotating shift schedules and day shifts, as well as the type of position they worked.

3.4 Summary

Having an appropriate research design is foundational for social science research. In this chapter, I first spoke to how using a mixed-method approach increases the credibility and validity of the data obtained and enables further interpretations to be made. With the inclusion of quantitative and qualitative research methods in my research, several methods of analysis have been taken to draw comparisons from each dataset and make conclusions on the research questions. With the context of the data collection methods described, an outline of the research process was provided. The inclusion of both quantitative analysis by way of the questionnaires, and qualitative analysis through the review of the interviews, helps strengthen the credibility of the research findings. From here, it is important to provide further context of the case study prior to discussing the findings and implications of this research.

CHAPTER 4

CASE STUDY AND CONTEXT

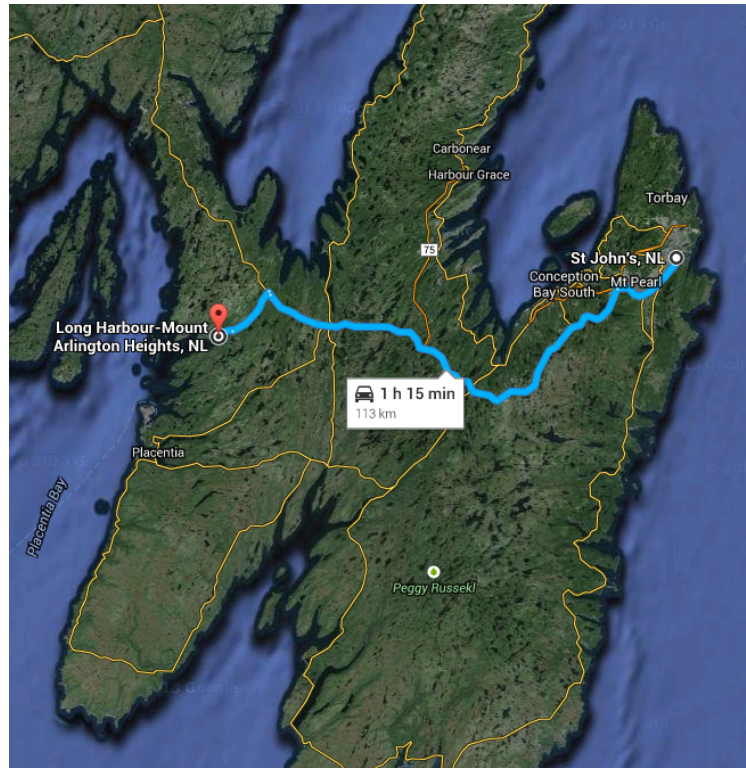


Figure 1. *Distance between Long Harbour and St. John's, NL. Retrieved from Google Maps.*

This chapter provides necessary background information regarding the community of Long Harbour-Mount Arlington Heights, the Vale nickel processing facility, the source communities and demographic information of the Vale plant workers, as well as the type of work schedule and positions these employees are involved in. Here, the different source communities Vale plant workers commute from are discussed, as well as research findings on commute time, distance, and methods. This information positions the research

findings that follow within the context in which this research occurred and provides the foundation to answer the research questions of this thesis.

4.1 Long Harbour

Long Harbour is located on the Avalon Peninsula in the eastern part of the Island of Newfoundland. It is approximately 11 km from the Trans Canada Highway and, as Figure 1 indicates, 113 km from St. John's, the capital city and the most populated community in the province. Long Harbour was settled between 1810 and 1812 and at its peak during the 1970s had a population close to 700 (Legge, 1983; Hall, 2014). However, as of 2006, the population of the community had fallen to 211. By 2011, this number had increased to 298, which has occurred since the establishment of the Vale owned nickel processing facility (Statistics Canada, 2013b). In 2016, the population decreased once again, to 185 (Statistics Canada, 2017).

Long Harbour is located in the Avalon Isthmus region in proximity to a number of other major developments. These include the oil refinery located in Come by Chance, the transshipment port in Arnold's Cove, and the current construction of the GBS for the Hebron offshore oil project at Bull Arm, near Sunnyside. In total these projects currently employ thousands of people in a variety of capacities within the industrial sector. Prior to the establishment of these new industrial projects beginning in 2005, about 40% of the region's labour force had been employed primarily in seasonal positions in the fishery, agriculture, fish processing, tourism, and the sales and service sector (Lysenko and Vodden, 2011). Although the new industrial projects in Long Harbour and Bull Arm have contributed to local employment, it is often suggested that there is a mismatch between

the skills required for these positions and the skills available within the local labour market (McQuaid, 2006; Devins and Hogarth, 2005; Lysenko and Vodden, 2011). This is, in part, why there is a great deal of labour mobility associated with the Vale site and other projects within the region.

Long Harbour's economy has endured many periods of growth and decline. From 1880 to 1940, its economy was dependent on the cod fishery. Citizens would trade their goods with merchants from nearby towns for groceries and fishing supplies (Legge, 1983). By the 1960s the significance of the cod fishery had begun to decline, partly due to the community being selected as a new site for the Electric Reduction Company of Canada Industries Limited's (ERCO) phosphorous plant. This location was chosen as a result of then-Premier Joseph Smallwood's strategic planning to attract foreign businesses to NL by promising cheap hydroelectricity and ice-free routes from North America to Europe. Construction of the ERCO plant began in 1966 and was completed in 1968, employing up to 1,300 people during peak construction periods (Hall, 2014) and approximately 400 people, predominantly male, throughout operations – 92% of whom were Newfoundlanders, and 80% of whom came from the nearby communities on the Avalon Isthmus, including Long Harbour, Dunville, and Norman's Cove (Legge, 1983). Since the 1970s, Long Harbour's economy has experienced many challenges, ranging from a decline in the market value for phosphorous, to the declining prominence of the fishery in Placentia Bay. By 1989, ERCO announced it would be shutting down the Long Harbour phosphorous plant, resulting in the loss of 290 jobs and approximately \$4 million in annual revenue (Martin, 2006).

The closure of the phosphorous plant in Long Harbour left a critical void in the community's local economy. In an effort to mitigate the negative economic implications resulting from the abandonment of ERCO operations, the Long Harbour Development Corporation (LHDC) was established in 1991 with a mandate to promote the economic prosperity of the town (LHDC, 2015). Later that year, then-Fisheries Minister John Crosbie and Minister responsible for the Atlantic Canadian Opportunities Agency (ACOA) as well as officials from the North American Resource Recovery (NARR) company outlined details of a proposed facility that would convert waste into energy at an incinerator located in Long Harbour. The plan would entail NARR shipping garbage from the Eastern Seaboard of the United States to the Long Harbour facility there to burn 3,500 tonnes of waste daily, which would generate enough electricity to service over 10,000 homes in the region (Stacey, 1992). Construction of the incinerator would cost approximately \$350 million and would have been fully operational by 1995, creating between 100-150 full-time jobs and another 50 in the transportation sector, with other employment opportunities available during the construction phase. The proposed project received widespread backlash from the public, citing environmental and health concerns, and was ultimately rejected by the NL House of Assembly (Stacey, 1992; Jackson, 1993).

4.2 Vale and the Nickel Processing Facility

In 2006 Vale NL (then Voisey's Bay Nickel Company) selected the former ERCO site in Long Harbour to develop a nickel processing facility as part of the Voisey's Bay Development Agreement (VBNC, 2006). Under the NL *Mineral Act*, Vale – a Brazilian-based global mining company – was required to develop a demonstration plant prior to

constructing a full production facility (RSNL, 2014). Argentia was selected for the research and development program, which lasted from 2005 to 2008, and initially as the location for the subsequent production facility. However, during the demonstration phase Vale decided to move the production plant to Long Harbour because of the direct access to the harbour and the dock, which provided accessibility for storing excess mineral waste elsewhere (VBNC, 2006; VBNC, 2007). Construction of the commercial nickel processing facility began in Long Harbour in April 2009, employing upwards to 6,000 workers at its peak (Hall, 2014). Construction on subsequent phases has continued up to and throughout 2016. Initial operations began in 2015, with full production expected in 2017. As of July 1, 2015, there were 429 people employed in operations at the facility with a total of 475 expected at capacity. While there are still construction workers on site, this study is focused on workers within operations.

4.3 Respondent Profile

Among the 131 questionnaire respondents, there was a range of characteristics including age, gender, marital status, and number of dependents, which may impact the decision-making process when deciding to commute or relocate to the worksite. Tables 4 to 7 summarize these characteristics.

Table 4. *Demographic information of questionnaire respondents, aged 18-29.*

<i>Gender</i>	<i>Marital Status</i>	<i>Number of dependents</i>	<i>Total Respondents (N=52)</i>	<i>Respondents that commute more than 50km (N=43)</i>	<i>Respondents that commute less than 50km (N=9)</i>
Male	Single	0 dependents	10	9	1
	Married/ Common Law	0 dependents	4	4	0
		1 dependent	4	3	1
		2 dependents	1	0	1
			19	16	3
Female	Single	0 dependents	5	5	0
	Married/ Common Law	0 dependents	4	3	1
			9	8	1
No response	Single	0 dependents	12	8	4
	Married/ Common Law	0 dependents	8	7	1
		1 dependent	2	2	0
		2 dependents	1	1	0
		4+ dependents	1	1	0
			24	19	5

When considering all respondents, 40% were between 18-29. The majority of these 18-29 year old workers commute over 50km one way (83% in comparison to 17% that commute under 50km). Another 37% of employees indicated that they were within the 30-44 age range. Of these workers 86% commute over 50km vs. 14% who drive shorter distances. Further, 20% of Vale plant workers are aged 45-59, with most of these older workers commuting less than 50km (62% in comparison to 38% that commute over 50km). Only 3% of respondents indicated they were over 60 years of age, with 50% of those that commute over 50km and 50% of those that commute under 50km, respectively. Most

workers commute over 50km to the worksite, with a greater tendency for younger individuals (44 and younger) to commute over 50km. Lack of amenities, facilities, and services near the worksite is a significant factor, as will be identified in Chapter 5.

Table 5. *Demographic information of questionnaire respondents, aged 30-44.*

<i>Gender</i>	<i>Marital Status</i>	<i>Number of dependents</i>	<i>Total Respondents (N=49)</i>	<i>Respondents that commute more than 50km (N=42)</i>	<i>Respondents that commute less than 50km (N=7)</i>
Male	Married/ Common Law	0 dependents	4	4	0
		1 dependent	4	4	0
		2 dependents	6	5	1
		3 dependents	1	1	0
			15	14	1
Female	Divorced/ Separated	0 dependents	1	1	0
	Married/ Common Law	0 dependents	5	4	1
		1 dependent	2	2	0
		2 dependents	2	2	0
			10	9	1
No response	Single	0 dependents	4	4	0
	Divorced/ Separated	0 dependents	2	1	1
		2 dependents	1	1	0
	Married/ Common Law	0 dependents	5	4	1
		1 dependent	1	1	0
		2 dependents	8	6	2
		3 dependents	3	2	1
			24	19	5

Table 6. *Demographic information of questionnaire respondents, aged 45-59.*

<i>Gender</i>	<i>Marital Status</i>	<i>Number of dependents</i>	<i>Total Respondents (N=26)</i>	<i>Respondents that commute more than 50km (N=18)</i>	<i>Respondents that commute less than 50km (N=8)</i>
Male	Single	1 dependent	1	0	1
	Married/Common Law	0 dependents	4	3	1
		1 dependent	1	1	0
		2 dependents	4	3	1
		3 dependents	1	1	0
	Divorced/Separated	2 dependents	1	1	0
			12	9	3
Female	Married/Common Law	0 dependents	1	1	0
		1 dependent	1	0	1
		3 dependents	1	0	1
			3	1	2
No response	Married/Common Law	0 dependents	3	2	1
		1 dependent	4	3	1
		2 dependents	1	0	1
		3 dependents	1	1	0
		4+ dependents	1	1	0
	Divorced/Separated	0 dependents	1	1	0
			11	8	3

Only 53% of total respondents specified their gender. Of these respondents, 84% were male and 16% female. Of those that commute over 50km, 69% were males and 31% were female. By comparison, of those that commute under 50km 73% of respondents who indicated their gender were male and 27% were female. Of male respondents 84% travel more than 50km and 16% travel less than 50km. Of female respondents 86% travel

more than 50km and 14% travel less than 50km. Males and females have a similar willingness to travel over 50km, with females only slightly more likely to travel more than 50km. This is in contrast to the literature that indicates that women are more likely to travel shorter commutes, yet tend to have more stops on their journeys to and from work (Hanson and Pratt, 1995; Law, 1999).

Table 7. *Demographic information of questionnaire respondents, aged 60 and over.*

<i>Gender</i>	<i>Marital Status</i>	<i>Number of dependents</i>	<i>Total Respondents (N=4)</i>	<i>Respondents that commute more than 50km (N=2)</i>	<i>Respondents that commute less than 50km (N=2)</i>
Male	Married/ Common Law	0 dependents	3	2	1
		1 dependent	1	0	1
			4	2	2

When asked about marital status, 71% of questionnaire respondents indicated that they are either married or living common-law, 24% noted they were single, and 5% indicated they were divorced or separated. Of those that commute over 50km to the worksite, 70% indicated they were married/common-law, 25% were single, and 5% were either divorced or separated. These numbers are similar to those that commute under 50km, where 73% of respondents suggested they were married or living common-law, 23% were single, and 4% are divorced/separated. Thus, the percentages of respondents that are either married, single, or divorced are relatively similar among respondents that commute over and under 50km, suggesting that marital status is not a major factor in the commuting decisions of Vale plant workers.

Questionnaire respondents also noted the size of their families, with 42% having one or more dependents, in comparison to the 58% of Vale plant workers who do not have any dependents. When analyzed by commute distance, the numbers slightly differ, with 40% of respondents that travel over 50km to the worksite having dependents in comparison to 50% of those that travel under 50km with dependents. Further, 60% of those without dependents travel over 50km to the worksite, whereas 76% of those that indicated they have dependents travel over 50km to the worksite. While there are other factors to consider, this difference may suggest that having dependents impacts Vale plant workers' commute-related decisions, with those having dependents being more likely to travel further to the work site. This finding aligns with qualitative findings identified in Chapter 5, where people with children typically travel over 50km to the worksite so their families can access education, competitive recreation programs, as well as other amenities. This will be discussed further in the following chapter.

As discussed in Chapter 2, literature suggests that certain demographic characteristics may influence a worker's preference to commute or relocate closer to the worksite. People with certain demographic characteristics typically favour longer (or shorter) commutes. For example, literature has suggested that people with families typically prefer to reside closer to urban centres, where their families can avail of recreational, educational, or medical facilities (Herkes et al., 2013; Storey, 2016). In contrast, it has been documented that young, single males are more open to engage in FIFO work arrangements (Storey and Shrimpton, 1986). This research indicates that younger individuals are more inclined to reside in or near urban centres and travel over 50km to the Vale worksite, reaffirming what the literature has suggested in the past. This

is likely due to accessibility of various amenities, as indicated in Chapter 5. In contrast, gender and marital status do not appear to play a significant role when deciding to commute or relocate closer to the worksite. Overall, when analyzing respondents by demographic information in this study, however, there does not appear to be significant differences between those that commute more or less than 50km. As such, the analysis in the remainder of the thesis focuses on length of commute, place of residence, and work schedule.

4.4 Source Communities

A map of the source communities of Vale plant workers is provided below (Figure 2). This includes the source communities of all 429 Vale nickel processing plant employees as of July 1, 2015 and represents data provided to the researcher by the company in April 2016. The St. John's CMA, located within the Avalon Peninsula, is the region from which 222 people or 52% of the workforce commute to the Long Harbour worksite (in comparison to 75, or 58% of questionnaire respondents). This region consists of 13 municipalities: St. John's, Mount Pearl, Paradise, Conception Bay South, Portugal Cove-St. Philips, Petty Harbour-Maddox Cove, Torbay, Logy Bay-Middle Cove-Out Cove, Bauline, Pouch Cove, Flatrock, Bay Bulls, and Witless Bay.

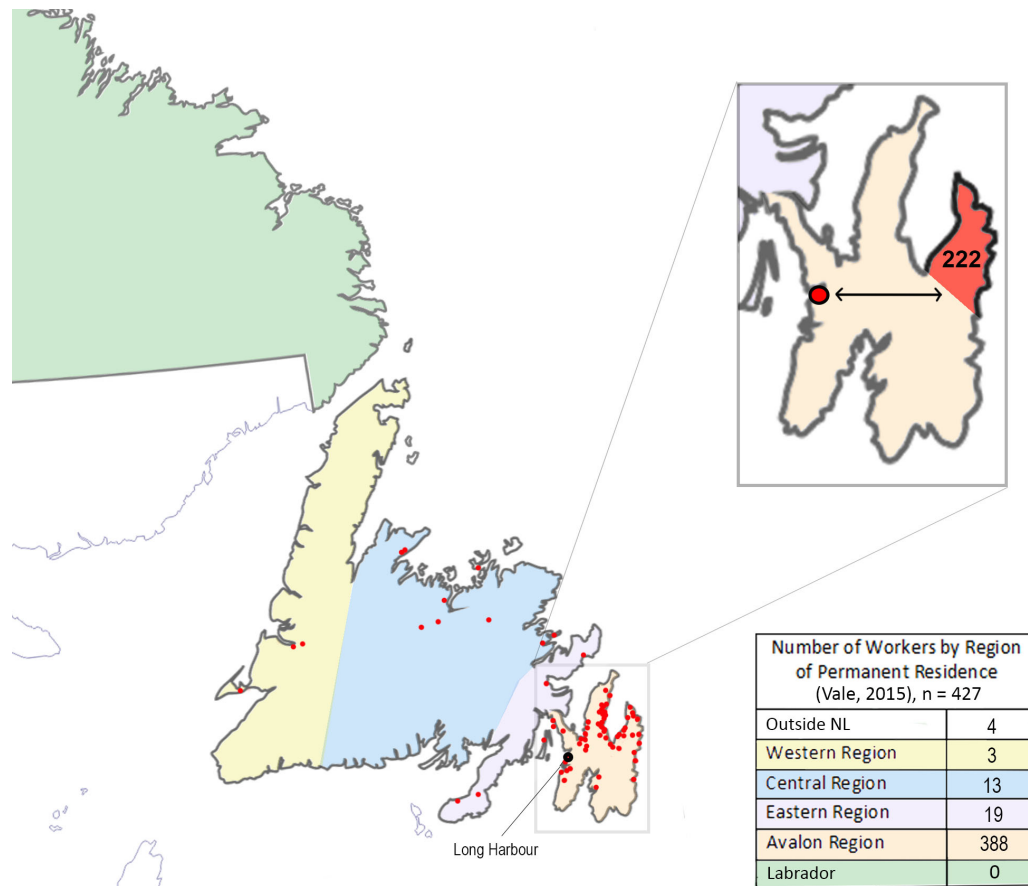


Figure 2. *The permanent place of residence of nickel processing employees as of July 1, 2015. Map developed by Leanna Butters (from Vodden et al. 2016).*

Table 8 indicates the source communities of workers as identified by the questionnaire data. It should be noted that the community names in this table reflect the exact responses that were given in the questionnaires. Some of these community names differ from the municipality in which they are located. For example, Airport Heights and Goulds are districts within the City of St. John's; Foxtrap, Kelligrews, and Upper Gullies are districts within the Town of Conception Bay South; and Dunville and Freshwater are districts within the Town of Placentia. When considering the numbers in these areas, it

brings the total to 33 people living in the City of St. John's, 19 in the Town of Conception Bay South, and 10 in the Town of Placentia. St. John's is therefore the source community for the greatest number of respondents. Other communities where ten or more Vale plant workers reside include Conception Bay South, Paradise, and Placentia. While the plant is located in Long Harbour, only 4 (3%) of questionnaire respondents reported living in the municipality itself.

Of the 131 questionnaire respondents, four indicated that they have a secondary residence they use for work and commuting purposes. The source communities of these individuals include St. John's (113km from Long Harbour), Campbelton (317km from Long Harbour), Summerford (333km from Long Harbour), and Grand Falls-Windsor (341km from Long Harbour), all but one of which are located outside what may be considered a feasible daily commute. During their work rotation, these workers stayed in Norman's Cove, Chapel Arm, Clarke's Beach, and Whitbourne, respectively. Although data presented by Vale suggests that four workers permanently reside outside the province, none of these individuals responded to this study.

Table 8. *Source communities of questionnaire respondents.*

<i>Community</i>	<i>Total Respondents (N=131)</i>	<i>Second Residence for Work</i>
Avondale	1 (Less than 1%)	
Bay Roberts	6 (5%)	
Blaketown	2 (2%)	
Bryants Cove	1 (Less than 1%)	
Campbelton	1 (Less than 1%)	Chapel Arm
Carbonear	2 (2%)	
Conception Bay South	14 (11%)	
Foxtrap	1 (less than 1%)	
Kelligrews	3 (2%)	
Upper Gullies	1 (less than 1%)	
Chance Cove	1 (Less than 1%)	
Clareville	4 (3%)	
Clarke's Beach	1 (Less than 1%)	
Conception Harbour	1 (Less than 1%)	
Dildo	3 (2%)	
Grand Falls-Windsor	1 (Less than 1%)	Whitbourne
Harbour Grace Riverhead	1 (Less than 1%)	
Holyrood	2 (2%)	
Long Harbour	4 (3%)	
Makinsons	2 (2%)	
Mount Pearl	8 (6%)	
New Harbour	2 (2%)	
Norman's Cove	2 (2%)	
North River	2 (2%)	
Old Shop	1 (Less than 1%)	
Paradise	12 (9%)	
Placentia	7 (5%)	
Dunville	2 (2%)	
Freshwater	1 (less than 1%)	
Point Verde	1 (Less than 1%)	
Portugal Cove-St. Philips	1 (Less than 1%)	
South River	1 (Less than 1%)	
St. John's	30 (23%)	1, Norman's Cove
Airport Heights	1 (less than 1%)	
Goulds	2 (2%)	
Summerford	1 (Less than 1%)	Clarke's Beach
Torbay	3 (2%)	
Whitbourne	1 (Less than 1%)	
Whiteway	1 (Less than 1%)	

4.5 Distance, Commute Time, and Modes of Transportation

The distance and length of time it takes to get to the worksite from a worker's source community, in addition to work schedule are important considerations when determining how E-RGM affects source communities. From the questionnaire data, as indicated in Table 9, the majority of respondents (80%) travel over 50km one way to get to the worksite.

Table 9. *Distance travelled to the nickel processing facility, one way.¹*

<i>Distance of Commute</i>	<i>Total Respondents (N=131)</i>
Over 50km	105 (80%)
Under 50km	26 (20%)

Further, Table 10 shows how long it took the respondents to commute to the worksite one way. Over half of the respondents (54%) indicated that their commute lasts at least one hour each way, and only 5% of respondents specified that their drive to work is less than 15 minutes.

Table 10. *Length of commute to the nickel processing facility, one way.*

<i>Length of Commute</i>	<i>Total Respondents (N=131)</i>
Less than 15 minutes	7 (5%)
Between 15 and 29 minutes	9 (7%)
Between 30 and 44 minutes	17 (13%)
Between 45 and 59 minutes	27 (21%)
Between 60 and 74 minutes	61 (46%)
Between 75 and 89 minutes	7 (6%)
90 minutes or greater	3 (2%)

¹ Nobody commuted exactly 50km. There was always a clear difference.

Questionnaire respondents were asked how they usually commute to their worksite. When considering those that commute over 50km to the worksite, 76% of these respondents typically carpool, whereas respondents that commute less than 50km are more likely to drive themselves, with 69% of people specifying this option. The questionnaire also asked respondents if they were dropped off, however, nobody selected this response, nor did they indicate that they used other modes of transportation. Table 11 shows how respondents commute to work.

Table 11. *Method of commute to the nickel processing facility.*

<i>Method of Commute</i>	<i>Total Respondents (N=131)</i>	<i>Respondents that commute more than 50km (N=105)</i>	<i>Respondents that commute less than 50km (N=26)</i>
Carpool/Rideshare	87 (66%)	80 (76%)	7 (27%)
Drive alone	35 (27%)	17 (16%)	18 (69%)
Both	9 (7%)	8 (8%)	1 (4%)

There is a great difference in the number of people that carpool when comparing those who travel more than 50km for work with those who travel under 50km for work. Interviewees that reside within 50km to the worksite indicated that the commute does not bother them and that it is a similar length if they were to live and work in St. John's (AL20151109) whereas others who commute over 50km to the worksite greatly value their carpool (DR20151222). Previous literature has documented that of the 74% of individuals who live in Canada that commute to work by a private vehicle, 17% of those carpool (Statistics Canada, 2013). When considering the Atlantic provinces, however, the rates significantly increase, with St. John's being the second highest carpool rate across the country at 23.2% (Statistics Canada, 2013a). The high rates of carpooling in

NL are consistent with the questionnaire findings of the carpool culture within the province, particularly for with those who travel more than 50km to get to work.

Interviewees talked positively about the carpool and have indicated that it makes the commute safer and more bearable. Being in a 4 or 5-person carpool only requires an individual to drive once a week or once every couple of weeks, depending on the work schedule. When asked about the commute, one interviewee stated:

I only have to drive every fourth day or every fourth shift and as long as the weather is good I don't mind it. And the way that we do it is that the person in the passenger's seat is required to stay awake with the driver and have conversations with him to make sure he doesn't get sleepy or anything and the two people in the backseat basically, they just relax or nod off or join in the conversation or whatever. But for the most part the people in the backseat are off the hook to have a nap if they want to (DR20151222).

The company has encouraged people to carpool and has allowed workers to send emails through the company's email master list to arrange a carpool system (DR20151222). They also recommend at least one passenger remain awake at all times on the journey to and from work to ensure the driver remains alert. Further, one worker indicated that in 2015, Vale paid for a cab ride home for workers whose carpool driver left the worksite early due to illness.

Other ways to improve the experience commuting for workers, such as a financial incentives, were decided against by Vale management due to the belief that the money would be pocketed and not actually used towards transportation services (AND20151109; DS20151109). As one interviewee specified:

Maybe there's a contract negotiation and people may say we need more money for travel. And money to travel is fine, money is money. Most people probably say they could use more of it. But money doesn't get you back in 3 hours, there's still that. So there's certain things I suppose, financially. Will they supply a vehicle? No. Well will it make it better? Well, it will make a piece of it better. I'll

spend less on fuel. But it wouldn't make it better for the time, for the snow, for the danger there [...] one of the first things I did when I was offered a job here was I bought a place close because as far as, I don't know what to call it, just overall genuine satisfaction can be lost sometimes when you got to drive 3 hours a day (AL20151109).

Management at the nickel processing facility are continuing to review options on how they can make the commute safer for their workers (DR20152311).

While interviewees suggested carpooling makes the commute more bearable, it also has its challenges. Many plant employees, particularly those in management positions, explained that the carpool is annoying at times when they are in the middle of something, but know they are unable to finish it off because their carpool is waiting. There are also problems when someone is in a carpool and there is an issue at home or an appointment they need to attend to and they are unable to do so (AL20151109; AND20151109).

When considering all respondents, they were split on whether or not they would prefer a different mode of transportation to get to the worksite than one they already use. However, when considering the length of the commute, a higher percentage of those that travel more than 50km one way to the worksite would prefer an alternative method than those that commute less than 50km. A range of options were discussed, with a bus being the most cited alternate option (a preferred option for one-third of respondents who commute over 50 km to work). Other options are listed in Table 12.

Table 12. *Would you prefer a different option of getting to work than the one you currently use?*

<i>Yes or No</i>	<i>Option Preferred</i>	<i>Total Respondents (N=131)</i>	<i>Respondents that commute more than 50km (N=105)</i>	<i>Respondents that commute less than 50km (N=26)</i>
Yes		65 (50%)	60 (57%)	5 (19%)
	Bus	39 (30%)	35 (33%)	4 (15%)
	Bus provided by Vale	9 (7%)	9 (9%)	0
	Other	9 (7%)	9 (9%)	0
	Carpool	4 (3%)	3 (3%)	1 (4%)
	One that is cheaper	3 (3%)	3 (3%)	0
	Work truck	1 (less than 1%)	1 (less than 1%)	0
	Live closer	1 (less than 1%)	1 (less than 1%)	0
No		66 (50%)	45 (43%)	21 (81%)
	Travel allowance	1 (less than 1%)	1 (less than 1%)	0

Providing a company bus for workers continues to be debated at the facility. People have been vocal about their desire to have appropriate transportation to the worksite. However, past experience has suggested that when the opportunity came to actually take the bus, most people declined. According to several interviewees, in 2014, several PPTs worked towards arranging a bus from St. John's to the worksite. While initially interested, when workers learned the price associated with the transportation, they declined, and discussions around a company bus were temporarily put aside. Vale management officials have stated that taking ownership of the logistics of a company bus is too much for them to arrange given the planning process: where are the pick up points? Which communities does the bus service? What times will the bus be there? Who is going to pay for it? Considering the number of different communities Vale plant workers live in

it was decided that a company bus to transport staff would not be feasible for the company to manage.

Beginning in the fall of 2015, a private bus shuttle was advertised to workers, offering a round trip to the worksite from St. John's, Witless Bay, and Avondale. A sign for this service was present at the Long Harbour highway turnoff as well as on brochures in a gas station in Whitbourne (see Figure 3). None of the people interviewed were aware of anyone that had used this service, which may be related in part to the timing of the interviews. As of May 2016, the bus shuttle continues to operate daily round trips to the plant for a fee of \$30.00, tax included. The bus provider did not indicate how many people take the shuttle on a regular basis, only that it fluctuates with each trip. Most interviewees indicated that depending on the price of gas the cost of their commute would range from \$25.00 to \$35.00 on fuel per trip. Those in a carpool may only need to spend this amount once a week. Respondents indicated it was difficult to measure the wear and tear of the commute on their vehicle, except that they needed an extra spare tire for their highway driving.

Corporate Concierge

Going to LONG HARBOUR?

PARK & RIDE SAFELY
NIGHT SHIFT & DAY SHIFT

Free Parking
(on approved lots)

Snow Clearing 24/7

Avoid:

- Highway Hazards!
- Driver Fatigue
- Moose
- Traffic

***\$25.00**
tax incl.
Round trip

Main Locations:

Kozy Kitchen -
Topsail Road

Beclin Road -
Off Topsail Road

Other in town/
out of town
locations being
considered

*some restrictions may apply.

Get your ride
Get your rest

738-8971
DAILY SHUTTLES

Corporate Accounts Welcome

Figure 3. *Advertisement of a private shuttle for nickel processing employees.*

A 2009 study has suggested that longer journeys to work (those lasting over 15 miles one way) are 15 times safer to take by bus than a private vehicle. Yet many commuters, when possible, take a private vehicle as it is usually faster and cheaper depending on the distance to the worksite and whether there is a carpool in place (Harto, 2009). While Vale plant workers discussed the merits a bus shuttle would have for health

and safety, ultimately commuting by themselves or carpool is considered more cost effective and, given the option to bus to the worksite, most interview respondents stated they would continue with their current commute method.

4.6 Work Schedule and Positions

As a 24-hour operation, plant operations require the presence of some workers at the plant every hour of the day, every day of the year. To meet these needs Vale operates three work schedules and respondents were asked which of these they currently worked: an 8-hour Monday to Friday dayshift; a 12-hour rotational day shift; and a 12-hour rotational day and night shift. Figure 4 displays the number of respondents involved with each work schedule.

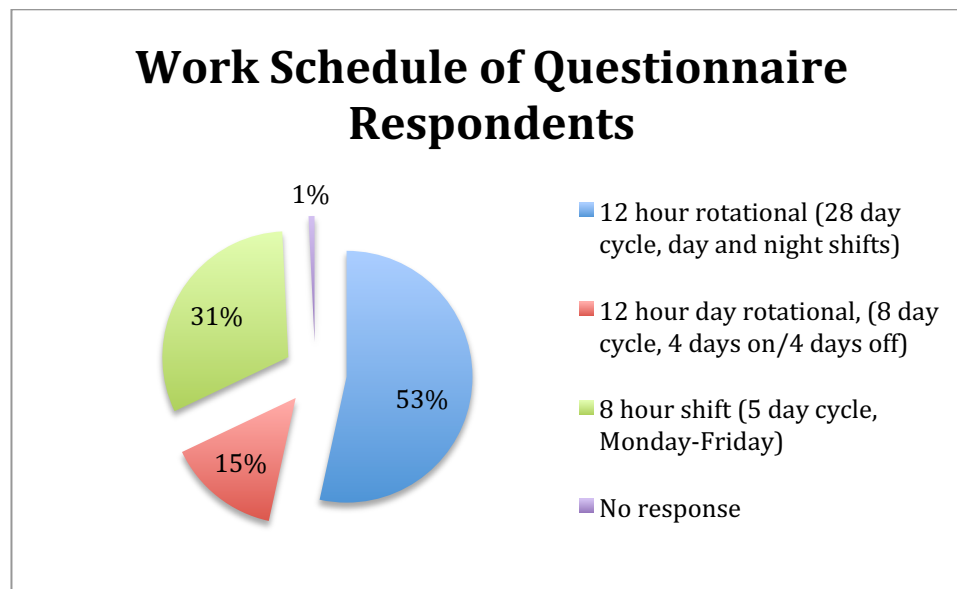


Figure 4. *Work schedules of questionnaire respondents.*

When establishing the nickel processing facility, Vale NL implemented a High Performance Work System (HPWS) for all operations at the plant. This system puts the

highest priority on the PPTs, and that every decision made is to make the PPTs more effective and efficient (DS20151109).

We designed the organization around the processing plant technicians; we have about 300 of them. So that's the base workforce [...] What we determined is, what we think the most effective way for our place is hire people that want to be business partners and are inclined that way, give them the empowerment, give them the authority to make decisions and then support them and you break down a lot of barriers that traditional organizations will have in silos (DS20151109).

As part of this empowerment, the company enabled the PPTs to develop their own work schedule, which is a 28-day cycle: 4 days off, 3 day shifts, 3 night shifts, 4 days off, 4 days shifts, 6 days off, and 4 night shifts. Day shifts are from 7am-7pm, and night shifts from 7pm-7am. Interviewees also discussed that, as a 24-hour operation, people always need to be working. As a result, individuals working the 12-hour rotational day and night shift typically arrive at the worksite 30-40 minutes prior to their scheduled shift to go through the "change house;" an area PPTs go to at the beginning and end of their shift to discuss what has occurred since their last shift, and provide time for the changeover in staff. Duties of the PPTs include operations work, maintenance work, improvement work, and administrative work – a multi-faceted activity approach that is part of the HPWS.

Over half (53%) of the 131 questionnaire respondents indicated that they work the 12-hour rotational day and night shift. PPTs and PPCs, who supervise teams of 5-8 PPTs, are the positions that work this particular schedule. PPTs and PPCs represent the largest segment (60%) of the workforce employed by Vale at the Long Harbour plant.

31% of the questionnaire respondents work an 8-hour Monday to Friday dayshift schedule, which typically begins between 7-7:30am and ends between 3:30-4:30pm, depending on the worker's preference and how long they take for lunch. People who

work this schedule include managers and other office staff, as well as some PPCs. Managers employed with Vale are responsible for areas such as engineering, research and development, human resources, and facilities management. PPCs working this particular dayshift are responsible for providing additional support to 3 teams of PPTs in the event that the supervising PPC is required to deal with a situation.

Only 15% of workers specified that they work a rotational 12-hour day shift (7am-7pm). Those that work this shift consist of the PPTs and PPCs. This shift involves working at the harbour and consists of activities which are only required during the daytime. The work rotation for these shifts is 4 days on, 4 days off.

Of the 429 people employed at the plant through the duration of this study, 60% work a rotating shift scheduling, which consists of the PPTs 12-hour day and night and 12-hour day shifts. In comparison, 68% of questionnaire respondents work a rotating shift schedule. The remaining 40% of operations work the Monday to Friday day shift, compared to 31% of questionnaire respondents. Thus, rotating shifts are slightly overrepresented within the findings that follow. There is, however, no clear pattern in the distance travelled to work by type of shift.

4.7 Summary

This chapter provides a brief economic history of Long Harbour, the context of the Vale operation, and the location of the employee source communities. The establishment of the Vale plant saw new practices in terms of recruiting and scheduling to staff the operation appropriately. As such, Vale plant workers may be involved with either a rotational day shift, a rotational day and night shift, or a Monday to Friday

weekday shift. The majority of these workers commute from particularly within the Avalon Peninsula to Long Harbour on a daily basis. Findings indicate that 52% of respondents permanently reside in the St. John's CMA, with 80% travelling over 50km one-way to the worksite. Further, over half (53%) of respondents work a 12-hour rotating day and night shift on a 28-day cycle. The factors that influence where Vale plant employees live, how they invest their time as well as financially invest in their source communities will be examined in Chapters 5-7.

CHAPTER 5

ROUTES AND ROOTS:

FACTORS THAT DRIVE EMPLOYMENT MOBILITY

The purpose of this research is to study the impacts of E-RGM on source communities, with a focus on the case of nickel processing workers employed at Vale's facility in Long Harbour, NL. In particular, this research is focused on the factors that drive their decision to commute or relocate, as well as how or whether Vale plant workers participate in their home communities through use of their time and finances. The nickel processing facility in Long Harbour is dependent on a mobile workforce: As indicated in the previous chapter, 97% of questionnaire respondents live outside of Long Harbour, and 80% travel over 50km one way to get to the worksite. Most workers have made the decision to stay in their source communities and travel a considerable distance to and from the workplace, rather than relocate closer to the worksite. This chapter focuses on the first research question and outlines the factors that influence Vale plant workers to commute rather than relocate closer to the worksite. It should be noted that the average duration of employment at the nickel processing facility at the time of this study was 20 months. Many respondents are still relatively new to the commute, which may have affected their responses since literature suggests length of time on the job can influence commuting decisions (Harris et al., 2015; Paley, Herbert and Tepas, 1994).

5.1 Factors Influencing the Commute

As observed elsewhere (see Chapter 2), there are a variety of important factors that influence Vale workers' decision to commute. These include amenities and services near the worksite, attachment to their community, as well as the nature of the commute. Research findings on these factors are discussed in the following section, with the economic and social impacts of this decision for source communities discussed more thoroughly in Chapters 6 and 7.

Vale plant workers were asked if they have moved since they started working at the facility. The question was asked to investigate whether the commute was an influence if people had changed their community of residence since starting employment at the plant. As Table 13 shows, 98 (75%) respondents indicated that they had not changed their primary community of residence since starting their work at the plant.

Table 13. *Has your community of primary residence changed since starting work at the nickel processing facility?*

<i>Community of Primary Residence...</i>	<i>Total Respondents (N=131)</i>
Stayed the same	98 (75%)
Stayed the same with a rental property closer to the worksite	4 (3%)
Closer to the worksite	21 (16%)
Further away from the worksite	8 (6%)

Four (3%) respondents specified they had not moved out of their primary community of residence, but had a rental property closer to the facility for work purposes. 21 (16%) individuals surveyed stated that they had moved closer to the facility since starting at the plant, and the remaining 8 (6%) had moved further away from the worksite.

Three interviewees stated that they had moved prior to starting their position for the purposes of their work. One person moved from Thompson, Manitoba, to St. John's whereas the other two moved from Labrador City to Kelligrews and Mount Pearl. All three individuals are employed in management positions (ED20150914; JM20151109; PK20151109).

5.1.1 Economic Considerations

There are several economic considerations Vale plant workers take into account when deciding to commute or relocate closer to the worksite. One of the most notable factors within literature is the potentially higher wage earned elsewhere over local opportunities. Table 14 indicates whether the salary at the nickel processing facility played a role in their decision making process.

Table 14. *How important was the wage when deciding to work at the nickel processing facility?*

<i>Level of Importance</i>	<i>Total Respondents (N=131)</i>	<i>Respondents that commute more than 50km (N=105)</i>	<i>Respondents that commute less than 50km (N=26)</i>
Very unimportant	11 (8%)	9 (9%)	2 (8%)
Somewhat unimportant	13 (10%)	9 (9%)	4 (15%)
Neutral	34 (26%)	27 (26%)	7 (27%)
Somewhat important	30 (23%)	27 (26%)	3 (12%)
Very important	38 (29%)	31 (30%)	7 (27%)
No response	5 (4%)	2 (2%)	3 (12%)

The majority of respondents (29%) indicated that the potential wage earned at the nickel processing facility was a very important factor when deciding whether or not to work at the site. This was similar across those that commute over 50km (30%) and under

50km (27%). As documented in Chapter 2, this aligns with previous literature, as people are more willing to commute when the wage is higher than that offered by other local opportunities (Windle and Rolfe, 2013; Atkinson and Hargreaves, 2014).

Potential employment opportunities for a spouse are another economic factor Vale plant workers consider when deciding whether to commute or relocate closer to the worksite, specifically for those identified as married or common law in Table 4. As suggested in Table 12 below, 31% of total questionnaire respondents stated that job opportunities for their spouse impacts their decision on whether to commute or relocate closer to the worksite. These rates are higher among those with longer commutes (33%) than those with shorter commutes (19%). This was also the case during the interviews, where workers who commute more than 50km suggested that their family life and the employment opportunities for their spouse combined with amenities were significant reasons as to why they commute. These reasons are applicable for the 42% who identified as having a family in Chapter 4.

Well no, my wife, she works in town. And we have a really good situation where we're 5 minutes away from nanny and poppy and 10 minutes away from grandma and grandpa. We've got babysitters and yeah, we're happy where we are. (Relocating) That's probably not in the cards for us (AND20151109).

For me, no. I'd either had to travel to here or St. John's and we're kind of in the middle. And it's good to have that hour in the morning to get ready for it and unwind in the evenings. So I wouldn't want to live any closer, no (AW20151222).

No, I can't think of anything that would make me move closer. I enjoy being in town, my family enjoys being in town. My significant other works in town, I mean I guess we could split the misery. Yeah, no I don't think there's much. Barring a free house would make me move out there, even then I don't think I would go for a free house. I'm a city kind of guy, I can't move back out (BH20150831).

My wife works in town so the closer we move to Long Harbour the longer she would have to commute. I also have a daughter that is going to post secondary school in St. John's and same thing for her (DR20151222).

A few Vale plant workers indicated that they chose to relocate closer to the nickel processing facility because of their family situation. For example, James commuted to the worksite for his Monday to Friday dayshift from St. John's for just one month before he and his family purchased property in Blaketown, located approximately 35 kilometres outside of Long Harbour. This worked conveniently for them, as his partner obtained employment as a teacher in Whitbourne, a community adjacent to Blaketown. With both partners working in the area, it was easier to relocate their family closer to the worksite. This case is the exception, where in most scenarios, one person will have to commute. Given the distance and the "risk" involved in the journey, workers suggested that they would rather be on the road instead of their family having to travel to urban areas to access services or work: "If we were to move closer she would have to go into town to work so it adds risk to her, so I'll take one for the team, I'll just absorb all that risk and cost so they can have all that" (JM201051109). Whatever the situation, Vale plant workers in this study have indicated that the job opportunities for their spouse is a significant factor when deciding to commute or relocate closer to the worksite.

5.1.2 Facilities, Amenities, and Attachments to Place

Facilities, amenities, and attachments to place were among the most important considerations in for a worker when decision whether or not to commute or relocate closer to the worksite. Questionnaire respondents were asked what amenities or services

would make them consider moving closer to the facility if they were available in communities near the worksite. Entertainment opportunities, grocery stores, and shopping malls/centres are the top three amenities questionnaire respondents indicated would be needed in order for them to consider moving closer to the worksite. Table 15 summarizes their responses.

Table 15. *Amenities and services needed near worksite to influence relocation*

<i>Amenity</i>	<i>Total Respondents (N=131)</i>	<i>Respondents that commute more than 50km (N=105)</i>	<i>Respondents that commute less than 50km (N=26)</i>
Entertainment	64 (49%)	55 (52%)	9 (35%)
Grocery stores	60 (46%)	51 (49%)	9 (35%)
Shopping Malls/Centres	51 (39%)	44 (42%)	7 (27%)
Nothing	43 (33%)	34 (32%)	9 (35%)
Job opportunities for partner	40 (31%)	35 (33%)	5 (19%)
Housing	38 (29%)	35 (33%)	3 (12%)
Education facilities	32 (24%)	29 (28%)	3 (12%)
Competitive Recreation Programs	31 (24%)	28 (27%)	3 (12%)
Gas prices	24 (18%)	20 (19%)	4 (15%)
Daycare	21 (16%)	16 (15%)	5 (19%)
No response	4 (3%)	1 (less than 1%)	3 (12%)
Other: Live in Long Harbour	3 (2%)	0	3 (12%)
Other: Medical facilities	3 (2%)	3 (3%)	0
Other: Family	2 (2%)	2 (2%)	0
Other: Car dealerships	1 (less than 1%)	1 (less than 1%)	0
Other: Music program	1 (less than 1%)	1 (less than 1%)	0
Other: Cost/quality of living	1 (less than 1%)	1 (less than 1%)	0
Other: Shorter commute	1 (less than 1%)	1 (less than 1%)	0

Those that commute greater than 50km put greater emphasis on entertainment services (52% vs. 35% for those who commute less than 50km), grocery stores (49% vs. 35%) and shopping malls and centres (42% vs. 27%) over respondents that commute less

than 50km. These numbers differ when comparing responses by type of shift, with rotational shift workers favouring entertainment (52% vs. 39% for those that work a Monday to Friday work week), grocery stores (48% vs. 39%), and shopping malls/centres (42% vs. 37%). Several interviewees explained that living in the metro region provides more accessibility to a diverse range of entertainment and other opportunities, such as fine dining restaurants, coffee shops, and other non-work activities that you would not have access to when living near the work site at Long Harbour (PK20151109).

Approximately one third of all respondents indicated that nothing would entice them to relocate closer to the worksite. This was the response for a slightly higher percentage of workers who commute less than 50km in comparison to workers who live 50km or more from the site (35% vs. 32%). Further, a greater number of people who work a Monday to Friday dayshift over rotational shift workers suggested nothing would make them consider relocating (37% vs. 31%). Several interviewees discussed that the communities where they reside (Blaketown and Whitbourne, both of which are located within 50km of the processing facility) are close enough to their worksite and that because they are “within the (50km) circle” (JH20151222) they were not considering relocating closer to the worksite.

This research has discussed a number of factors that affect the decision-making process of Vale plant workers on whether they commute from their source community or relocate closer to the worksite. To what extent, however, are these factors related to a worker’s place attachment with their source community? As discussed above, previous research has suggested that Newfoundlanders and Labradorians have the highest sense of belonging to their province in any jurisdiction in Canada (Statistics Canada, 2015b) and

the third highest sense of belonging to their local community (77%) (Statistics Canada, 2016b). This raises the question of what role a worker's attachment to their home community plays when deciding to commute or relocate, and how their sense of place and belonging to their community shapes their involvement in that community.

Vale plant workers were also asked how strong their sense of belonging was to the community where they permanently reside, the results from which can be seen in Table 16. When considering those that commute over 50km one way, 58% of respondents indicated that their sense of belonging to their source community is neutral, with only 19% and 4% of respondents claiming it was somewhat strong and very strong, respectively (low relative to Statistics Canada figures for the province as a whole). When looking at those who commute less than 50km, however, the responses differ. With 19% claiming to have a neutral sense of belonging to their home community, over 75% of respondents suggested that they have either a somewhat strong or a very strong attachment to their permanent place of residence (similar to the provincial figure of 77%). This suggests that out of these respondents, Vale plant workers that commute longer distances have less of an attachment to their source communities over those that commute shorter distances. This is particularly interesting to note, as attachments to place and local capital have been suggested as a factor as to why workers commute. Yet, in this study workers with shorter commutes have significantly stronger attachments to place than those with longer commutes. While the workers may not see themselves as attached to place, the discussion above indicates that they have preferences, if not attachments, linked to the amenities that their source community provides.

Table 16. *How would you describe your sense of belonging to the community where you primarily reside?*

<i>Level of Belonging</i>	<i>Total Respondents (N=131)</i>	<i>Respondents that commute more than 50km (N=105)</i>	<i>Respondents that commute less than 50km (N=26)</i>
Very weak	10 (8%)	10 (10%)	0
Somewhat weak	10 (8%)	9 (9%)	1 (4%)
Neutral	66 (50%)	61 (58%)	5 (19%)
Somewhat strong	30 (23%)	20 (19%)	10 (38%)
Very strong	14 (11%)	4 (4%)	10 (38%)
No response	1 (less than 1%)	1 (less than 1%)	0

As discussed in Chapter 2, it has been noted that a person's feelings of place may not only be tied to one specific community, but that they may have ties to multiple areas (Brown and Raymond, 2007; Van der Klis and Karsten, 2009). This suggests that workers may feel attachments to both their source and work communities. Further discussion in Chapter 2 indicates that people will have a higher level of attachment to their permanent place of residence over their work community (Taylor, 2005). However, to what extent is that the case among Vale workers?

Table 17 outlines the level of attachment questionnaire respondents have with the community of Long Harbour. In contrast to the neutral to strong attachments of most workers to the communities where they primarily reside, the majority of workers exhibit a very weak sense of belonging to the community of Long Harbour. It is interesting to note, however, that four respondents that commute over 50km (two permanently reside in St. John's, one in Conception Bay South, and one in Holyrood) indicated that they have either a somewhat strong or very strong sense of belonging to the community. None of

these respondents were available to be interviewed, providing no data to suggest why these individuals have a strong sense of belong to Long Harbour.

Table 17. *How would you describe your sense of belonging to the community of Long Harbour?*

<i>Level of Belonging</i>	<i>Total Respondents (N=131)</i>	<i>Respondents that commute more than 50km (N=105)</i>	<i>Respondents that commute less than 50km (N=26)</i>
Very weak	73 (56%)	59 (56%)	14 (54%)
Somewhat weak	21 (16%)	18 (17%)	3 (12%)
Neutral	28 (21%)	24 (23%)	4 (15%)
Somewhat strong	3 (2%)	2 (2%)	1 (4%)
Very strong	6 (5%)	2 (2%)	4 (15%)

As discussed above, questionnaire respondents (as indicated in Tables 4 and 12) and several interviewees indicated that employment opportunities for their partner are important when deciding whether to relocate closer to the worksite. Here, they value their source community as it provides opportunities for their family. Previous literature has also documented the role a family unit plays in place attachment; the family and social relationships that occur within particular places significantly increases the level of attachment people hold to their specific areas (Sandow and Westin, 2010). This is the case with those employed at the Long Harbour facility, as their family and social connections to place influence their decision to continue to commute.

When asked about sense of belonging to their source communities, interviewees spoke little about whether they had an attachment to their community, and if this was a factor as to why they commute. However, throughout the interviews, they did indicate the value they place on certain aspects and amenities within their source communities, which

ranged from education facilities for their children, specific fast food chains and shopping centres, to the social network they have developed within their area. Fletcher (2009) has documented the role amenities and local-specific capital has on the level of attachment people have with their communities. Although none of the interviewees explicitly indicated that their attachment to their community affected their decision to commute these factors are, in fact, aspects that tie particular individuals to places.

5.1.3 Nature of the Commute

Respondents also noted that travel-related issues related to the commute are a significant factor in the decision of some respondents to relocate closer to the worksite. One interviewee discussed, for example, that in previous positions he commuted long distances, which he found particularly difficult in periods of extreme weather. As such, a month after he started his position with Vale in Long Harbour, he bought property in Blaketown – a community located 35km from the worksite (AL20151109). Table 18 outlines various factors that can delay the journey to work, which in turn affect the decision-making process of some workers.

Responses were similar among those with longer and shorter commutes with regard to factors that delay or prevent respondents from getting to work. Over 80% of questionnaire respondents in both categories indicated that weather has delayed or prevented them from getting to the worksite in the past, with 71% of people stating it has been an issue at least twice in the past year. Road and traffic conditions were the second most cited factor that delayed or prevented Vale plant workers from getting to the worksite, with 35% of those who commute greater than 50km and 38% of those who

commute less than 50km suggesting it has been a challenge in the past. Family and transportation-related problems were other issues identified that prevent or delay respondents from getting to work. 8% of respondents did not provide an answer.

Table 18. *Factors that delay or prevent questionnaire respondents from getting to the worksite.*

<i>Factors</i>	<i>Total Respondents (N=131)</i>	<i>Respondents that commute more than 50km (N=105)</i>	<i>Respondents that commute less than 50km (N=26)</i>
Weather	109 (83%)	88 (84%)	21 (81%)
Road and traffic conditions	47 (36%)	37 (35%)	10 (38%)
Family issues	19 (15%)	14 (13%)	5 (19%)
Transportation issues	12 (9%)	9 (9%)	3 (12%)
No response	11 (8%)	10 (10%)	1 (4%)

Interviewees also specified that weather and road conditions were the biggest factors that delayed them from getting to work on time. When bad weather is in the forecast, arrangements are often made ahead of time to assess the situation and change the commute accordingly. This can add several more hours onto their workday, as Jane specifies:

You have to deal with it. If that means getting up at 2am to shovel your driveway because you have to leave by 4 so you can get there for 7, I've done that. (BP20150831).

This is just one example of the actions people take during adverse circumstances to ensure that they make it to work.

Others mentioned that roadwork and construction has delayed them from getting to work on time. The provincial government typically sends out an advisory several days in advance that the work is taking place, however, at other times they do not. Work on the

roads can add between 30-60 minutes onto the commute, one way (STE20151109; LES20151109; DR20152311).

The increased travel time respondents take on their journey to work matches what scholars have documented in the past regarding commute time and inclement weather. As discussed in Chapter 2, according to Perrin, Martin and Hansen's (2001) study which took place on a high-speed highway, depending on how severe the weather and road conditions become, the length of the commute can increase anywhere from 13-42%. Interviewees in this study discussed their commute can last an additional 30 minutes during periods of heavy snow in the winter, which increases their commute time by 40-45%.

It should be noted that there is no formalized penalty for being late for work for Vale employees. Typically, in the event of extreme weather, many people are late for shift instead of just one person or a group in a carpool. However, there is an expectation that while the weather at the start of a shift may make it unsafe to drive, workers must attempt to make it to the worksite once it clears up. In the event people are late for their shift change, workers are required to stay on shift until new staff relieves them of their duties, which can range from minutes to several hours (BP20150831).

Interviewees also discussed how the stress of the commute influences their willingness to relocate closer to the worksite. As one interviewee stated:

It is very, very draining. I found it very draining compared to my first 19 years with the company. It wanes on you, it really does. I actually drove myself here for the first few months I was here and I just couldn't do it anymore, I kind of got a little crazy. Yeah, it's tough. I'd move closer but I don't want my family to drive to St. John's every day (JM20151109).

Here, the stress of the journey to and from the worksite is another factor that influences whether an individual commutes to work or considers relocating. It is important to consider whether the level of stress differs when comparing people who drive alone to work against those who carpool to work, those that drive more or less than 50km one way, and those who work differing shifts. Questionnaire respondents ranked their level of stress associated with the commute on a scale from 1 to 5, with 1 being not stressful and 5 being very stressful. Table 19 provides the results. To reduce duplication, the 9 individuals who indicated that they drove alone and carpooled to work an equal amount were not considered. Thus, 122 responses are reflected in this analysis.

Those that live within 50km of the worksite experience significantly less stress than those who commute over 50km. 52% of questionnaire respondents that commute less than 50km rated the stress of their commute a 1 in comparison to 16% of those that are engaged in longer commutes. On the other hand, 15% of those who commute 50km or more rate their stress level as a 4 or 5, compared to only 4% of those who commute less than 50km. This data also documents that those with longer and stressful commutes are more likely to travel to work via carpool rather than driving alone. There are a higher percentage of respondents with a stress level of 3 or higher that are engaged in a carpool over driving themselves to work alone. Overall, there are clear differences in the level of stress between those that commute greater or less than 50km, and those that are in a carpool or drive alone.

Table 19. *How stressful questionnaire respondents find their commute.*

<i>Level of stress</i>	<i>Method of Transportation</i>	<i>Number of People (N=122)</i>	<i>Respondents that commute more than 50km (N=97)</i>	<i>Respondents that commute less than 50km (N=25)</i>
(Low) 1	Drive alone	11 (9%)	1 (1%)	10 (40%)
	Carpool/Rideshare	18 (15%)	15 (15%)	3 (12%)
2	Drive alone	15 (12%)	9 (9%)	6 (24%)
	Carpool/Rideshare	32 (26%)	30 (31%)	2 (8%)
3	Drive alone	6 (5%)	5 (5%)	1 (4%)
	Carpool/Rideshare	24 (20%)	22 (23%)	2 (8%)
4	Drive alone	3 (2%)	3 (3%)	0
	Carpool/Rideshare	11 (9%)	10 (10%)	1 (4%)
(High) 5	Drive alone	0	0	0
	Carpool/Rideshare	2 (2%)	2 (2%)	0

Several studies have documented how stressful people find compressed work schedules combined with extended daily commutes, as discussed in Chapter 2. There are risks associated with driving after long shifts, such as fatigue interfering with a person's ability to drive safely (Dembe et al., 2005). However, other research has shown that 5 months after working compressed work schedules, people begin to get accustomed to the rotation and their job satisfaction increases (Harris et al., 2015; Paley, Herbet and Tepas, 1994). Questionnaire results suggest there is little difference on how stressful Vale plant workers find the commute when comparing those that work a Monday to Friday work week against rotational shift workers. As one Vale employee who commutes over 50km to the worksite discussed, "I'm kind of getting used to it now. I've never commuted to work before or worked shift work, so it was something different at the beginning and it kind of became a bit of an issue for awhile there and whether I would stay here, but then I kind of got used to it. I don't mind it now" (TM20152315). The nature of the commute –

considering inclement weather, delays, and distance – in combination with a compressed work schedule can extend the workday to 14 to 15 hours. However, there is little evidence this data provides that the shift is a major consideration for workers.

5.2 Summary

There are multiple factors a person takes into account when deciding to commute to or relocate closer to the worksite. The amenities and services available in or near their permanent place of residence, specifically entertainment, grocery stores, and shopping malls/centres, play an important role in the decision-making process for many workers. The attachment a person has to their source community differs depending on their commute, with a tendency for those who commute over 50km to have a reduced sense of belonging to their local community. Whether labour mobility associated with the Vale plant impacts workers' community engagement in their source communities is the subject of the following chapter.

CHAPTER 6

SOCIAL DEVELOPMENT AND SOURCE COMMUNITIES: HOW MOBILE WORKERS SPEND TIME IN THEIR PERMANENT PLACE OF RESIDENCE

Volunteerism is important for communities as it brings people together, often from all walks of life, to work on a common project or objective. It increases social trust, reciprocity and sense of belonging in communities, contributing to the social cohesion and social capital of a given area. By the same token, being active and participating in community events and activities, and utilizing community services such as recreation and entertainment contributes to social development within communities (Barrett and Gibson, 2013; Turcotte, 2015). Other scholars have noted that time spent engaging in activities with other community residents helps develop a sense of belonging in communities (Sandow and Westin, 2010) which, in turn, helps create a greater propensity for community and social development (Bertotti et al., 2012). Research suggests that increased mobility, however, typically leaves less time for these extracurricular activities (Ezzedeen and Zikic, 2015; Hilbrecht and Lero, 2014).

This section addresses question two of this research: how mobile workers invest their time in their source communities. The chapter discusses how Vale plant workers actively participate in their community by looking at how they spend time in the following areas: volunteering; community events; entertainment; sports/recreation and exercise/fitness; and time with friends and family. The questionnaire asked respondents if they spend more, less, or the same amount of time in these areas since starting their

employment at the plant. The amount of time Vale plant workers spend in these activities, whether it has changed since starting their employment, and whether their work schedule and commute affects these aspects of their community involvement will be discussed.

6.1 Time Spent Volunteering

Only 28% of total questionnaire respondents had volunteered in their local communities in the past six months. When analyzed separately, only 22% of Vale plant workers with longer commutes are active volunteers in comparison to 54% of employees with shorter commutes. With the national volunteer rate at 44% and the NL at 46% (Turcotte, 2015) it is interesting to note that these workers that participate in extended daily commutes are well below the national and provincial averages, while those that travel shorter distances are actually above both the national and provincial averages. As noted in Table 20, Vale plant workers who travel more than 50km are less engaged in volunteerism. This indicates that their commute may be affecting their ability to positively engage in community development initiatives within their source communities.

The most notable pattern from the questionnaire data in Table 21 is that most respondents either spend the same amount of time volunteering since being employed at the plant, or indicated that the question was not applicable, which may indicate that they did not volunteer at all. Further, 68% of those who indicated that they spent the same amount of time volunteering before and after starting at the nickel processing plant did not volunteer in the past six months. While no change was the most common response and many respondents do not volunteer, 26% of respondents spend less time volunteering in their community since beginning their employment at Vale.

Table 20. *Have you volunteered in your local area in the past six months?*

<i>Response</i>	<i>Activity</i>	<i>Total Respondents (N=131)</i>	<i>Respondents that commute more than 50km (N=105)</i>	<i>Respondents that commute less than 50km (N=26)</i>
Yes		37 (28%)	23 (22%)	14 (54%)
	Recreation	23 (18%)	13 (12%)	10 (38%)
	Church	9 (7%)	3 (3%)	6 (23%)
	School programs	6 (5%)	5 (5%)	1 (4%)
	Fire department	6 (5%)	3 (3%)	3 (12%)
	Lions/Service Club	2 (2%)	0	2 (8%)
	Municipal politics	2 (2%)	1 (less than 1%)	1 (4%)
	Canadian Blood Services	1 (less than 1%)	1 (less than 1%)	0
	Special Events Committee	1 (less than 1%)	1 (less than 1%)	0
	Bowl for Kids	1 (less than 1%)	1 (less than 1%)	0
	First Lego League	1 (less than 1%)	1 (less than 1%)	0
	Psoriasis Society of NL	1 (less than 1%)	1 (less than 1%)	0
	Fundraisers	1 (less than 1%)	1 (less than 1%)	0
	Scouts	1 (less than 1%)	1 (less than 1%)	0
	SPCA	1 (less than 1%)	1 (less than 1%)	0
	Musician	1 (less than 1%)	1 (less than 1%)	0
No		94 (72%)	82 (78%)	12 (46%)

When examining whether the length of the commute impacts a Vale plant worker's volunteerism, 54% of those who commute less than 50km suggested the amount they volunteer stayed the same since starting work at the plant, compared to 31% of respondents that commute over 50km. Vale respondents that are involved in longer commutes (more than 50km) were more likely to spend less time volunteering (29%)

since they began their jobs than those that commute less than 50km (15%). Only two respondents indicated that because of their work schedule and their commute, they had more time to participate in volunteer work, both of whom commute less than 50km to the worksite.

Table 21. *Do you spend less, the same, or more time volunteering since you have started working at the nickel processing facility?*

<i>Amount of Time</i>	<i>Total Respondents (N=131)</i>	<i>Respondents that commute more than 50km (N=105)</i>	<i>Respondents that commute less than 50km (N=26)</i>
Less time	34 (26%)	30 (29%)	4 (15%)
Same time	47 (36%)	33 (31%)	14 (54%)
More time	2 (2%)	0	2 (8%)
Not applicable	44 (34%)	40 (38%)	4 (15%)
No response	4 (3%)	2 (2%)	2 (8%)

Survey respondents were also asked why they have more, less, or the same amount of time to engage in volunteering. The most frequent response from those who spend less time volunteering was that the reduced time was due to a combination of their work schedule and the length of their commute. With 12 hour workdays and a commute lasting over one hour each way, many workers do not have the time to participate in extra curricular activities that typically fall within the evenings. Others indicated that the long workday and commute is too tiring for them to be active in the evenings. The little time they did have was typically spent with their immediate family and dealing with issues in their household. These factors are also consistent with what many interviewees suggested, where due to the commute, the work schedule, and the rotation they are too tired to engage in volunteer activities (AR20160225; DR20151222). These reasons are similar

across workers who commute both more and less than 50km to the worksite. Several of those that indicated there has been no change in their volunteer rate specified they were not engaged in volunteerism prior to starting their employment at the Vale plant (DS20151109; BP20150831). Further, while this research did not specifically ask about respondents' mobility history, some workers reported that they now have more time for certain community activities as they had previously worked offshore or farther away from their source community. As such, mobility/work history may warrant further research as a factor in time spent on activities such as volunteerism and community events.

6.2 Time Spent Participating in Community Events

The majority (73%) of total questionnaire respondents had actively engaged in various types of community events and activities in the communities where they permanently reside, while 27% of people did not provide a response to the question. Community participation rates were 81% for respondents that commute less than 50km to work. For those that commute over 50km, however, this rate falls to 70%. The types of activities in which people spend time are listed in Table 22.

Recreation is the activity most workers surveyed participated in regardless of the length of their commute. Other activities included community festivals, holiday parades and festivities, and fundraisers. It is interesting to note that people who commute less than 50km are more engaged with churches than those that are involved with longer commutes. This can be related to several potential factors. Historically, churches have played a significant role within rural communities, where community residents often attend services on a weekly basis, participate in church fundraisers, and engage in other

activities or events they host (Francis and Robbins, 2012). This is also similar to other community activities, such as fundraisers, which typically show higher levels of engagement in more rural areas (Diaz-Puente et al., 2009) and among workers that commute less than 50km in this case. In contrast, more urban centres provide opportunities for involvement in more diverse range of activities. This may be one reason why respondents that commute less than 50km are more engaged (as a percentage) with local activities such as church and fundraisers than those that commute over 50km (Diaz-Puente et al., 2009).

Table 22. *Types of local activities questionnaire respondents participate in.*

<i>Activity</i>	<i>Total Respondents (N=131)</i>	<i>Respondents that commute more than 50km (N=105)</i>	<i>Respondents that commute less than 50km (N=26)</i>
Recreation	68 (52%)	52 (50%)	16 (52%)
Community Festivals	50 (38%)	38 (36%)	12 (45%)
Holiday Parades and Festivities	43 (33%)	31 (30%)	12 (46%)
Fundraisers	27 (21%)	17 (16%)	10 (38%)
Church	20 (15%)	12 (11%)	8 (31%)
Bingo	2 (2%)	1 (less than 1%)	1 (4%)
Red Cross	1 (less than 1%)	1 (less than 1%)	0
Social Events	1 (less than 1%)	1 (less than 1%)	0
Hobbies	1 (less than 1%)	1 (less than 1%)	0
Outdoors	1 (less than 1%)	1 (less than 1%)	0
Tourism	1 (less than 1%)	1 (less than 1%)	0
No response	36 (27%)	31 (30%)	5 (19%)

In relation to time spent participating in community events, the patterns are similar to the amount of time people spend volunteering. As Table 23 indicates, the highest percentage of respondents noted they spend the same amount of time participating in community events since before and after starting work at the plant. The rates are

slightly higher when considering those that commute less than 50km for work, with closer to half (46%) of respondents spending the same amount of time engaged in their communities since starting their employment with Vale in Long Harbour. A higher percentage of respondents that commute over 50km to the worksite spend less time engaged in their source communities than those with shorter commutes.

Table 23. *Do you spend less, the same, or more time participating in community events since you have started working at the nickel processing facility?*

<i>Amount of Time</i>	<i>Total Respondents (N=131)</i>	<i>Respondents that commute more than 50km (N=105)</i>	<i>Respondents that commute less than 50km (N=26)</i>
Less time	38 (29%)	33 (31%)	5 (19%)
Same time	54 (41%)	42 (40%)	12 (46%)
More time	7 (5%)	4 (4%)	3 (12%)
Not applicable	29 (22%)	25 (24%)	4 (15%)
No response	3 (2%)	1 (less than 1%)	2 (8%)

The reasons workers provided for why they have less time to participate in community events are similar to why they spend less time volunteering. With the work schedule and commute time, several workers explained they simply do not have the time to participate. When comparing time by shift, 34% of respondents that work the weekday shift have less time for community events, compared to 26% of those who have rotating shift schedules. Interviewees also indicated that the commute and the work schedule, which can include the weekend for rotational shift workers, make it difficult to participate in various community events (AR20160225; TM20152315). This is particularly interesting to note, as a higher percentage of those that work weekday shifts suggested they have less time for community events even though they have the weekends off. In

contrast, rotational shift workers may work weekends but have longer blocks of time available.

The way residents engage with their communities, whether it is through volunteering or participating in community events, can positively impact the social development of a community (Islam and Morgan, 2012; Bertotti et al., 2012). In contrast, as discussed in Chapter 2, reduced resident engagement can negatively impact a community (Hicks, 2011; Ravensbergen and Vanderplaat, 2010). These data suggest that respondents who commute over 50km to the worksite one way are less engaged with their communities than those who travel shorter distances, thereby potentially impacting their source communities in a negative way. Many of those that commute less than 50km are positively engaging in their communities – in some cases, more than the average Canadian. It should be noted that those commuting over 50km typically live in more populated communities. As such, the impact of less engagement by Vale workers in these communities may not be as significant as more or less engagement in smaller source communities.

6.3 Time Spent on Entertainment

Entertainment is important for development in communities for several reasons. In many cases, spending on entertainment in source communities helps local businesses and provides economic spinoffs within the region (Storey, 2010). Participating in entertainment with others in the community also makes personal memories within the area, which helps create place attachment in the region, positively contributing to community cohesion (Stephens, 2002). Entertainment can also strengthen mental health

as it reduces the stress people experience in life for a period of time (Osman, Dong, and Saddik, 2016).

When considering time spent volunteering and engagement in community events, most respondents specified that they spent the same amount of time in these activities before and after starting work at the plant. When analyzing entertainment, however, more respondents indicated they have additional time for entertainment (ranges from 12-19%) over increased time for volunteering (0-8%) or participating in community events (4-12%). The majority of respondents have the same or less time for entertainment since beginning work at Vale. Table 24 shows how starting employment at the facility in Long Harbour has changed Vale plant workers' time spent on entertainment.

Table 24. *Do you spend less, the same, or more time on entertainment since you have started working at the nickel processing facility?*

<i>Amount of Time</i>	<i>Total Respondents (N=131)</i>	<i>Respondents that commute more than 50km (N=105)</i>	<i>Respondents that commute less than 50km (N=26)</i>
Less time	45 (34%)	37 (35%)	8 (31%)
Same time	58 (44%)	48 (46%)	10 (38%)
More time	18 (14%)	13 (12%)	5 (19%)
Not applicable	7 (5%)	5 (5%)	2 (8%)
No response	3 (2%)	2 (2%)	1 (4%)

In this case, it is interesting to consider why some people have more time to spend on entertainment since working at the plant. Respondents indicated that with the rotating work schedule, they now have more days off than they had in previous positions, allowing them to spend more time on these activities; 78% of people that identified that they had more time for entertainment are involved with a 12 hour rotating schedule, with

the remaining 22% working the Monday to Friday day shift. Others specified that they now earn more, thus increasing the amount they can spend on entertainment than they did previously. This is true for both those that commute less than and more than 50km to the worksite. Those that spend less time on entertainment provided similar explanations as to why they spend less time on volunteering and participating in community events; primarily that the work schedule and commute time interferes with their ability to spend time on entertainment. In this example, the work schedule is seen as a reason as to why people have both more time and less time for entertainment. When considering these respondents, there is an apparent pattern that those working a 12 hour rotating shift schedule have more time for entertainment than people involved with the Monday to Friday dayshift work schedule.

6.4 Time Spent on Sports, Recreation, Exercise, and Fitness

Other leisure activities include spending time on sports, recreation, exercise, and fitness. Sivan and Ruskin (2000: 2) suggest that “leisure is a highly valued component of community development and an awareness of its advantages and benefits is essential.” Particularly, physical leisure provides an opportunity to bring together people of all races, genders and ethnicities to enhance the quality of life within a community (ibid). Recognizing this, it is important to pay attention to whether time spent on sports, recreation, exercise and fitness has changed since Vale plant workers started work at the plant.

When considering time spent in sports and recreation, many respondents that commute over 50km stated that they spend less time participating in sports and recreation

since starting their employment (49%), as indicated in Table 25. The situation differs when focusing on the group that commutes less than 50km, with only 23% indicating they have less time for sports and recreation, and 50% claiming they spend the same amount of time in these activities. Again, there appears to be a pattern where respondents that commute less than 50km typically have more time for these activities than their counterparts. Only a few suggested they have more time to spend in sports and recreation since starting work at the plant.

Table 25. *Do you spend less, the same, or more time on sports and recreation since you have started working at the nickel processing facility?*

<i>Amount of Time</i>	<i>Total Respondents (N=131)</i>	<i>Respondents that commute more than 50km (N=105)</i>	<i>Respondents that commute less than 50km (N=26)</i>
Less time	57 (44%)	51 (49%)	6 (23%)
Same time	52 (40%)	39 (37%)	13 (50%)
More time	12 (9%)	9 (9%)	3 (12%)
Not applicable	7 (5%)	5 (5%)	2 (8%)
No response	3 (2%)	1 (less than 1%)	2 (8%)

Time spent on exercise and fitness yields similar results as time spent on sports and recreation. As shown in Table 26, over half (54%) of respondents that commute over 50km spend less time on exercise and fitness than they did prior to starting work with Vale in Long Harbour. Conversely, only 23% of those with shorter commutes spend less time in these areas, with half the respondents suggesting they spend the same amount of time exercising. Only a small percentage of respondents (8-15%) stated they spend more time on exercise and fitness since starting work with Vale in Long Harbour.

Table 26. *Do you spend less, the same, or more time on exercise and fitness since you have started working at the nickel processing facility?*

<i>Amount of Time</i>	<i>Total Respondents (N=131)</i>	<i>Respondents that commute more than 50km (N=105)</i>	<i>Respondents that commute less than 50km (N=26)</i>
Less time	63 (48%)	57 (54%)	6 (23%)
Same time	50 (38%)	37 (35%)	13 (50%)
More time	12 (9%)	8 (8%)	4 (15%)
Not applicable	4 (3%)	2 (2%)	2 (8%)
No response	2 (2%)	1 (less than 1%)	1 (4%)

The reasons why respondents have less time to spend participating in sports and recreation are consistent with why respondents have less time to participate in fitness and exercise. The long days at work in addition to the length of the commute leaves less time in the evenings to engage in such activities. Further, respondents noted that their work schedule and commute often coincides with their sporting events, resulting in them missing the game or event. Many respondents also identified that the limited spare time they do have is typically spent with their family, leaving sports and recreation less of a priority. Tiredness is also a factor as respondents suggested they were simply too tired to engage in physically exhausting activities. Those that indicated they have more time for sports, recreation, exercise and fitness stated it was because they have more time off. Most of these respondents work the 12-hour rotating shift schedule.

Findings from the interviews also suggest that the commute time and work schedule play a significant role in the amount of time one can engage in their community through sports and other activities. James, for example, lives in Blaketown, where he makes the 35km journey to work from Monday to Friday to be at the plant from 7:30am.

He usually finishes his shift at 4pm, where he is home for the evening by 4:30pm. Every Wednesday night, James plays basketball, and during the summer he and his partner are a part of the local softball league. He volunteers with his child's recreational activities and is a leader in a Sunday school program. He and his family participates in community bonfires and other events every chance they get (AL20151109).

In contrast, Lincoln and his family have been living in living in the Town of Paradise for the past 35 years, which is approximately 108km from Long Harbour. Prior to working as a PPT, Lincoln was an active community member and took part in various events and recreation tournaments. Since starting employment at the facility over a year ago, he hasn't been able to keep up with his extra-curricular activities. He stated that the reason for this is due to his 12-hour work days and the extended commute required (AR20160225). Several other interviewees (AND20151109; TM20151123) reiterated this common scenario.

Time spent engaged in sports and other recreational activities with other community residents provide many social benefits to a community (Misener and Schulenkorf, 2016). This research demonstrates that many workers with extended work days in addition to the commute, particularly workers that commute over 50km, do not have time for leisure activities. Given the documented benefits of these activities to the social life of communities, this pattern may be negatively affecting the vitality of source communities, as well as other negative effects on the physical and mental health of workers (Henry et al., 2013; Carrington, Hogg, and McIntosh, 2011; Joyce et al., 2013).

6.5 Time Spent Time with Friends and Family

There are notable differences when comparing time spent with friends and family with the other activities of workers in their home communities that have been discussed above. Tables 27 and 28 show that the percentage of respondents having less time, the same time, or more time are relatively similar when considering time spent with friends and family. Over one-fifth (21% and 27% respectively) of individuals that work at the plant actually have more time for friends and family since beginning their employment. When comparing those that commute greater than 50km with people involved in shorter commutes, the results in terms of changes in the time they spend with friends is similar. The most common response for those with both longer and shorter commutes is that they have less time for friends since beginning work at Vale. When focusing on family, however, for the first time the data show that a high percentage of a specific group has more time for a particular activity; 46% of Vale plant workers with shorter commutes indicated that they have more time with their family since starting their position in Long Harbour, compared to 27% that spend the same amount of time and 19% of respondents with less time. While 22% of respondents with longer commutes did suggest they have more time for family (a higher percent than any other activity analyzed), the majority continue to have less (39%) or spend the same amount of time (32%) with their family since starting at the plant. Once again those with a shorter commute are more engaged in their community, in this case through time spent with friends and family.

Table 27. *Do you spend less, the same, or more time with friends since you have started working at the nickel processing facility?*

<i>Amount of Time</i>	<i>Total Respondents (N=131)</i>	<i>Respondents that commute more than 50km (N=105)</i>	<i>Respondents that commute less than 50km (N=26)</i>
Less time	58 (44%)	49 (47%)	9 (35%)
Same time	41 (31%)	33 (31%)	8 (31%)
More time	28 (21%)	22 (21%)	6 (23%)
Not applicable	1 (less than 1%)	0	1 (4%)
No response	3 (2%)	1 (less than 1%)	2 (8%)

Table 28. *Do you spend less, the same, or more time with family since you have started working at the nickel processing facility?*

<i>Amount of Time</i>	<i>Total Respondents (N=131)</i>	<i>Respondents that commute more than 50km (N=105)</i>	<i>Respondents that commute less than 50km (N=26)</i>
Less time	51 (39%)	46 (44%)	5 (19%)
Same time	42 (32%)	35 (33%)	7 (27%)
More time	35 (27%)	23 (22%)	12 (46%)
Not applicable	2 (2%)	1 (less than 1%)	1 (4%)
No response	1 (less than 1%)	0	1 (4%)

Given the differences between this type of activity and others, it is important to understand why respondents have more time to spend with friends and family than other activities discussed. Some workers noted that prior to taking this position, they worked offshore or out of town. Now that they work at the plant, they spend more time at home in than was previously the case. In addition, the work schedule provides people with multiple days off in a row. This allows more time for people to travel out of town and visit their friends and family that live away. In this case, the work schedule is seen as a benefit as it allows time for workers to connect with friends and family, specifically those

with the rotating shift schedule. Those that work a rotating shift schedule have more time for friends (26% vs. 12%) and family (32% vs. 15%) than respondents that work the Monday to Friday dayshift. By the same token, many respondents indicated that they now have less time with friends and family than they previously did. For those in this situation this is due, in part, to the work schedule and length of commute. Others have suggested that they moved closer to the worksite since starting their position, which has often uprooted them from a community where their friends and family live.

These examples show that workers with shorter commutes consistently have more time to participate in community activities. Although this is a logical outcome, the extent Vale plant workers with shorter commutes have time to spend with their family compared to those with greater commutes is particularly interesting to note. Spending time with family allows people to have a place in their family unit and be a part of key milestone events, which may often be missed by workers with longer commutes (Henry et al., 2013) as well as help the mental health of an individual (Henry et al., 2013). While Vale plant workers that commute over 50km tend to spend less time with family and friends since starting their employment, many of those that commute less than 50km have more time to spend in these activities.

6.6 Other Notable Findings

There are other notable findings that have emerged from the questionnaire findings related to time spent in source communities. Of the 3% of questionnaire respondents who live in Long Harbour, none indicated that they spend less time in any of the mentioned activities. Some noted they spend the same amount of time in each of the

activities, whereas others have more time in several areas. These particular workers lived in Long Harbour prior to the establishment of the plant. Their commute time may now be shorter than it was previously, depending on where they used to work, giving them more time to participate in extra-curricular activities and spend time with friends and family.

The interviewees discussed that, overall, they have less time to participate in volunteering, community events, and other community related activities. As such, determining whether questionnaire respondents consistently specified the same answer for all activities, or just certain activities, is warranted. Further analysis suggests that 21% of respondents listed the same answer across all activities, revealing that overall they consistently spend less, the same, or more time in their community since starting their employment at the Vale plant. The breakdown for this group is as follows: 10% of respondents spend less time in every activity listed; 8% of respondents spend the same amount of time in these activities; and 1% (one) of respondents was represented in each of the remaining more time/not applicable/no response categories. When looking at the group of people that, overall, spend less time engaging in activities in their source communities, while the shift they work differs (either the Monday to Friday dayshift or a 12 hour rotational shift), in most cases their commute is greater than 50km one way. This is a consistent pattern throughout the findings that those who spend less time engaged in their communities since beginning work at Vale are involved in longer commutes.

6.7 Summary

Research has documented that being active in community events, services and programs leads to increased sense of belonging, community cohesion, and social

development (Turcotte, 2015). This chapter has discussed whether the commute of Vale plant employees has had any ramifications for time spent engaging in community life. Overall, there are patterns that suggest certain work rotations and commute lengths (i.e., over 50km) can reduce the amount of time individuals spend participating in community activities, such as volunteerism, community events, entertainment, sports and recreation. While spare time is often spent with friends and family, many Vale plant workers who commute less than 50km are able to remain engaged in these activities. This is less likely to be the case for those who commute more than 50km each way to their jobs.

CHAPTER 7

MONEY MATTERS: MOBILE WORK AND LOCAL ECONOMIC DEVELOPMENT IN SOURCE COMMUNITIES

Questionnaire respondents permanently reside in 39 different communities. Considering these numbers, the potential financial benefits for source communities from E-RGM (and labour mobility associated with the Vale facility particularly) are geographically widespread, with spending also occurring in surrounding communities. Several interviewees explained that they are earning more than double the salary they could earn locally (BP20150831; AW20151222). As such they are likely to have more disposable income and can potentially contribute to their local economy through the purchase of goods and services or property.

This chapter answers the third and final question of this research by addressing how Vale plant workers contribute to the local economy in their source communities. In doing so, data will be presented on the communities where workers make their purchases, whether Vale plant employees' spending patterns have changed since starting employment at the nickel processing facility, and if their charitable donations have fluctuated since starting work at the Long Harbour plant, with consideration given to how these spending patterns impact source communities.

7.1 Spending Patterns

Questionnaire respondents were asked the name of the community where they purchase items such as gas, groceries, and clothing, as well as expenditures on higher cost

items such as vehicles and property. Table 29 indicates the communities where respondents purchase gas, the item purchased in the greatest number of different communities.

Table 29. *Communities where questionnaire respondents purchase gas.*

<i>Community</i>	<i>Total Respondents (N=131)</i>	<i>Respondents that commute more than 50km (N=105)</i>	<i>Respondents that commute less than 50km (N=26)</i>
St. John's	46 (35%)	40 (38%)	6 (23%)
CBS	18 (14%)	18 (17%)	0
Whitbourne	17 (13%)	12 (11%)	5 (19%)
Placentia	11 (8%)	0	11 (42%)
Paradise	8 (6%)	8 (8%)	0
Bay Roberts	8 (6%)	8 (8%)	0
Mount Pearl	7 (5%)	7 (7%)	0
Holyrood	5 (4%)	5 (5%)	0
Clareville	4 (3%)	4 (4%)	0
No response	4 (3%)	3 (3%)	1 (4%)
Chapel Arm	3 (2%)	1 (less than 1%)	2 (8%)
New Harbour	3 (2%)	0	3 (12%)
Norman's Cove	2 (2%)	1 (less than 1%)	1 (4%)
Carbonear	2 (2%)	2 (2%)	0
Blaketown	2 (2%)	0	2 (8%)
Clarke's Beach	2 (2%)	2 (2%)	0
Goulds	2 (2%)	2 (2%)	0
Green's Harbour	1 (less than 1%)	1 (less than 1%)	0
Harbour Grace	1 (less than 1%)	1 (less than 1%)	0
South River	1 (less than 1%)	1 (less than 1%)	0
Summerford	1 (less than 1%)	1 (less than 1%)	0
Eastport	1 (less than 1%)	1 (less than 1%)	0
Stephenville	1 (less than 1%)	1 (less than 1%)	0
Salmonier Line	1 (less than 1%)	1 (less than 1%)	0

Of the 131 total responses, 18% of individuals indicated that the location where they buy goods and services has changed since starting work at the plant. This is fairly consistent among those that commute greater than 50km (19%) and less than 50km (15%). Most (88%) of the 18% whose purchasing location had changed specified it was related to having moved into a different community since starting their employment. Most of these respondents have moved out of St. John's and the metro area to a community closer to the worksite, and now spend less time shopping in the St. John's area as a result. Others indicated that they have less time for shopping in general and did not want to travel long distances or for extended periods of time to buy something that could be bought in the community where they reside. Fatigue is also a factor, with some workers claiming they are too tired after a workday and do not want to deal with shopping related matters. These reasons were common among workers with both short and long commutes.

When comparing where people live with where they purchase their gas, 69% of total respondents noted that they purchase gas in the community where they permanently reside. Further, 35% of total respondents purchase their gas in St. John's. These rates slightly differ among those with longer (38%) and shorter (23%) commutes. In comparison, 23% of respondents identified their source community as St. John's. Based on the survey information, respondents travel to St. John's for gas, as well as to purchase other goods and services.

Placentia is another community where Vale plant workers purchase gas, particularly those that commute less than 50km to get to the worksite, with 42% of this particular group spending in this community. Yet, only 27% of those that commute less

than 50km indicated Placentia as their permanent place of residence, indicating that the community is another area where Vale plant workers travel to purchase gas. This is likely due, in part, to their being a lack of gas stations in other nearby communities (thus purchasing gas locally is not an option for them). Similarly, 14% purchase gas in Conception Bay South, yet only 11% of respondents indicated that Conception Bay South was their home community.

Several interviewees suggested that they decide to fuel their vehicle at a location that is convenient, such as Whitbourne, even if the price is higher. This is particularly useful when they are driving by a station to and from work (BP20150831; AND20151109). Whitbourne is 31km away from Long Harbour and is a common spot for many travellers to stop when journeying on the highway. Since the mid 2000s, a number of new services have been established in Whitbourne. Aside from gas stations, there are a number of coffee shops and restaurants as well as a small motel, with a new multi-phase business expansion being planned since the start of the Long Harbour project (NLOWE, 2015). As such, 13% of respondents noted that they get their fuel at this highway stop, while only one respondent indicated that they live permanently in Whitbourne and one rents accommodations there for work purposes, as presented in Table 5. Although gas is a bit more expensive in Whitbourne in comparison to prices in St. John's, respondents felt getting gas at this location was convenient, especially early in the mornings. Many carpools also stop at this location to buy coffee and tobacco on their route to work, and buy gas at the same time.

While the amount spent on gas fluctuates depending on the price of gas, the cost to fill up a vehicle ranged from \$20.00 every two weeks, to \$40.00 on one round trip,

depending on the make of the vehicle and the length of the commute. For those who commute an hour or more one way, gas typically costs between \$25.00 to \$35.00 per round trip, which usually occurs every three to four days if they are in a carpool. When considering that 69% (91) of workers purchase \$30.00 of gas eight times a month in their source communities related to their commute, they are spending approximately \$240.00 worth of gas individually, and \$21,840 combined per month in the communities identified in Table 26. If a person is not involved in a carpool and works the Monday to Friday day shift, they complete 20 or more round trips to the worksite. When considering those that commute over one hour each way at a cost of \$30.00 per round trip, up to \$600.00 a month is spent on fuel.

Table 30. *Communities where questionnaire respondents purchase groceries.*

<i>Community</i>	<i>Total Respondents (N=131)</i>	<i>Respondents that commute more than 50km (N=105)</i>	<i>Respondents that commute less than 50km (N=26)</i>
St. John's	62 (47%)	52 (52%)	10 (38%)
CBS	20 (15%)	20 (19%)	0
Mount Pearl	15 (11%)	15 (14%)	0
Bay Roberts	13 (10%)	11 (10%)	2 (8%)
Placentia	11 (8%)	0	11 (42%)
Whitbourne	8 (6%)	3 (3%)	5 (19%)
Paradise	7 (5%)	7 (7%)	0
Carbonear	5 (4%)	5 (5%)	0
Clarenville	5 (4%)	5 (5%)	0
No response	3 (2%)	3 (3%)	0
Dildo	1 (less than 1%)	0	1 (4%)
Gander	1 (less than 1%)	1 (less than 1%)	0
Summerford	1 (less than 1%)	1 (less than 1%)	0
Grand Falls Windsor	1 (less than 1%)	1 (less than 1%)	0
Long Pond	1 (less than 1%)	1 (less than 1%)	0
Eastport	1 (less than 1%)	1 (less than 1%)	0
Salmonier Line	1 (less than 1%)	1 (less than 1%)	0

The distribution of communities where people purchase groceries is similar to the areas where people purchase gas. Questionnaire respondents buy groceries in a variety of communities, as indicated in Table 30. While the majority of workers surveyed purchase groceries in St. John's, they also purchase items in smaller communities such as Placentia and Whitbourne – particularly those with shorter commutes. In this particular case, 65% of questionnaire respondents purchase groceries in their source communities.

Aside from gas and groceries, there is a common pattern of purchasing other items in St. John's: while only 23% of respondents live in St. John's, 83% indicated that they buy clothes in St. John's, and 87% of total respondents purchase household items in St. John's. This can be attributed to there being minimal opportunities to purchase the desired clothing or household items in some more remote and rural communities. As one interviewee indicated, "obviously we do go out (shop) to town just because that's where everything is" (BP20150831).

Interviewees also suggested that the long workdays and commute time affects their willingness to travel greater distances for goods and services. If there is an opportunity to purchase locally instead of travelling to a nearby urban area, they will more often than not purchase locally even if it is slightly more expensive. In some cases, however, those living in rural areas are required to travel to more populated areas to access the goods and services provided in those communities:

People ask me how's Blaketown, I always give them the windshield wiper analogy: fine, until you need to drive 30 minutes to get one [...] You certainly need to be a bit more planned and structured around your purchasing sequences. You're 50 minutes away from St. John's. Every time you need something you don't just go out and buy it, you plan and structure it a bit more around groceries or hardware supplies (AL20151109).

Interviewees discussed that they are fully aware rural communities do not have the same availability of products and services as urban centres. As such, they plan their shopping trips more carefully to ensure they purchase all the items they need in a more efficient manner when shopping in urban centres (AW20151222; AL20151109). This is further emphasized when considering their work schedule and commute, as there is a desire to reduce extra time driving if at all possible.

7.2 Large Purchases Since Starting Employment at the Plant

There are a number of large purchases respondents have made since starting their employment at the plant. These include purchasing, building or renovating a home or cabin, purchasing an automobile, motorhome, or recreational vehicle, purchasing electronics, appliances, or tools. The following section provides an analysis of these expenditures and the communities where they took place.

Of 131 respondents, 37% of them had purchased or built a home since starting work at Vale's Long Harbour facility. In addition, 25% of those who responded had renovated their homes since starting at the plant. The questionnaire also asked if respondents spent their income purchasing or renovating a cabin: Two respondents had purchased or built a cabin, which are located in Placentia and Whitbourne, and 2% of those surveyed (2 individuals) had renovated their cabins. The difference in these spending patterns by length of commute is identified in Table 31. Table 32 indicates in which communities questionnaire respondents had purchased or built their new homes.

Table 31. *Purchasing, building or renovating a home or cabin since starting employment at the nickel processing facility.*

	<i>Total Respondents (N=131)</i>	<i>Respondents that commute more than 50km (N=105)</i>	<i>Respondents that commute less than 50km (N=26)</i>
<i>Purchase/Build a Home</i>	49 (37%)	38 (36%)	11 (42%)
<i>Renovate Home</i>	33 (25%)	26 (25%)	7 (27%)
<i>Purchase/Build a Cabin</i>	2 (2%)	1 (less than 1%)	1 (4%)
<i>Renovate Cabin</i>	2 (2%)	1 (less than 1%)	1 (4%)

Table 32. *Communities where questionnaire respondents had purchased or built a home since starting employment at the nickel processing facility.*

<i>Community</i>	<i>Total Respondents (N=131)</i>
Paradise	6 (5%)
Conception Bay South	6 (5%)
St. John's	2 (2%)
Mount Pearl	2 (2%)
Clareville	2 (2%)
Bay Roberts	2 (2%)
Blaketown	2 (2%)
Long Harbour	2 (2%)
Avondale	1 (less than 1%)
South River	1 (less than 1%)
Chance Cove	1 (less than 1%)
Dildo	1 (less than 1%)
Freshwater	1 (less than 1%)
Goulds	1 (less than 1%)
Harbour Grace	1 (less than 1%)
Keilligrews	1 (less than 1%)
Makinsons	1 (less than 1%)
North River	1 (less than 1%)
Placentia	1 (less than 1%)
Point Verde	1 (less than 1%)
Whiteway	1 (less than 1%)

Paradise and Conception Bay South are the two communities where the largest percentages of respondents have purchased property since starting work at the plant. Of these 12 people, the data show a mix of individuals who have moved closer to the plant (i.e. from St. John's to Conception Bay South), people who have moved farther away from the plant (i.e. from Cupids to Paradise), and workers who have remained in Paradise and Conception Bay South. Those who built or purchased property in proximity to Vale's facility, such as those who reside in Avondale, Blaketown, and Long Harbour, already lived in these communities prior to their recent investment in property.

When considering trends of respondents that have purchased, built, or renovated a home or cabin since starting employment at Vale in Long Harbour, there are similarities between those with longer commutes and shorter commutes. The percentage of respondents that have renovated their home since starting their employment is nearly the same between Vale plant workers with commutes over 50km and under 50km (25% vs. 27%), with a similar trend in new purchases or builds as well (36% vs. 42%). However, in both cases those commuting less than 50km were slightly more likely to have invested in their homes (whether through renovations, building new or purchasing). Overall, 53% of respondents have purchased, built, or renovated a home or cabin since starting their employment. When analyzed separately, 50% of those with a commute lasting over 50km and 65% of Vale plant workers that commute less than 50km spent money in this way. Here, nearly two thirds of Vale plant workers with shorter commutes have spent money on their homes, compared to only half of those with longer commutes.

Source communities benefit from the development of new property or property purchases as they gain municipal taxes from each household, as well as other beneficial

factors that come with an increase in population (Poot, 2008). While 37% of total respondents have purchased or built a new home since starting work at the plant, these homes are distributed in primarily in separate communities, particularly the Avalon region. Although communities benefit from new residential housing through property taxes, the small number of geographically dispersed homes built by Vale plant workers are likely to have made only a minimal contribution to municipalities' net revenues.

Table 33. *Communities where questionnaire respondents purchased vehicles since starting employment at the nickel processing facility.*

<i>Community</i>	<i>Total Respondents (N=131)</i>	<i>Respondents that commute more than 50km (N=105)</i>	<i>Respondents that commute less than 50km (N=26)</i>
St. John's	46 (35%)	36 (34%)	10 (38%)
Gander	3 (2%)	2 (2%)	1 (4%)
Mount Pearl	2 (2%)	2 (3%)	0
Carbonear	2 (2%)	1 (less than 1%)	1 (4%)
Bay Roberts	1 (less than 1%)	0	1 (4%)
Clareville	1 (less than 1%)	1 (less than 1%)	0
Portugal Cove	1 (less than 1%)	1 (less than 1%)	0
Halifax	1 (less than 1%)	1 (less than 1%)	0
Montreal	1 (less than 1%)	1 (less than 1%)	0
Toronto	1 (less than 1%)	1 (less than 1%)	0

Automobiles are another high value item Vale plant employees have purchased, with 60% of total respondents buying a vehicle since starting their position at the plant. This is similar for workers that have shorter (65%) and longer (59%) commutes. In 2009, the last year Statistics Canada recorded these data, the average price of a new car was \$25,664, with trucks and SUVs costing slightly more (Statistics Canada, 2016a). Considering 60% (79) of total respondents purchased vehicles valued at an average

conservatively of \$25,664, over two million (\$2,027,456) has been spent on vehicles by questionnaire respondents. The communities where these vehicles were purchased are identified in Table 33. In most cases, respondents purchased their vehicle in St. John's, regardless of where they reside.

The interviewees reaffirmed the questionnaire findings on spending patterns. A number of those interviewed specify that they had bought a new vehicle since commuting for longer periods of time for safety reasons. Given the weather and the road conditions, many people feel safer in a larger vehicle, which may also result in increased cost for gas:

I bought myself a new vehicle since I've started work here. I bought a F150 Ford pickup [...] I was driving a little small Mazda and I just wasn't feeling safe (TOM20152315).

Further, 18% of respondents purchased a recreational vehicle since being employed with Vale in Long Harbour while 2% of workers purchased a motorhome. Although asked, no interviewee indicated they have purchased a recreational vehicle since starting employment at the Vale facility in Long Harbour.

Lastly, only 2% of respondents (2 individuals) engaged in or business related initiatives since starting their position at the plant. Respondents gave little information regarding their business investments within the questionnaire. One interviewee did indicate that prior to starting a position with Vale in Long Harbour, he had a family-run business in Central Newfoundland. This continues to be in operation today (GR20151222).

The community where workers purchase items depends on several factors. As noted above, the size of the source community and the level of services available will influence whether an individual buys goods and services in their source community or in

an urban centre (for those who live in rural areas/small towns). In many cases some items are only available for purchase in urban areas, requiring people to spend more of their income in areas that provide those goods or services. In the case of gas and groceries, there are opportunities for people to purchase these items in smaller communities. In terms of car dealerships, however, these goods are typically provided in larger urban communities, such as St. John's, Mount Pearl, Gander and Clarenville. Depending on the type of vehicle, some respondents made purchases outside of the province in cities such as Toronto and Montreal and drive or ship them back to their home community.

Other interviewees specified their spending patterns depend on their living arrangement, whether their partner also works and (in this case at least) their personal attitudes towards money:

We probably have a similar spending pattern as most people with the income and education in the community. We have a four-wheeler and a ride-on lawn mower, we have those certain things. A little bit of entertainment, we enjoy the fine dining in St. John's, so that happens from time to time [...] similar patterns of most people I suppose (AL20151109).

The wife doesn't really work much so we're pretty much capped out at what I'm making. We could use more. I piss a lot of my money away (JH20151222).

Interviewees also discussed how much they spend on the maintenance of their vehicle. While interviewees stated that determining the wear and tear inflicted on their automobiles related to their commute was difficult, they did indicate that when purchasing a new vehicle, they typically purchased the extended warranty and coverage. In addition, those interviewed stated that their tires wear down faster since starting their commute out to Vale's site in Long Harbour. Many have two spare tires in their vehicles at all times, with one interviewee claiming he went through five tires in 2015. It was

suggested that a large part of the wear and tear on the tires is from the gravel road leading into the nickel processing facility. A portion of this road has since been paved (JM20151109; DR20152311). Respondents were not explicit as to where they get their vehicles serviced or the communities where they purchase their tires. However, many indicated they bought an extended warranty at a car dealership with the purchase of their new vehicle, which, as Table 30 suggests, are located in primarily urban centres.

Scholars have identified the various benefits source communities receive that are associated with E-RGM. One of the common benefits for source communities is retaining mobile workers, who are unable to find work which is as well paid within their home community (Milbourne and Kitchen, 2014; Martensson, 2015; Haslam McKenzie and Hoath, 2014). As a result, source communities receive economic spinoffs related to labour mobility even if they are driving to a nearby community on a daily basis (Dupor, 2015). For this particular case, however, it is difficult to determine the extent that Vale plant workers contribute to local economic development in their source communities. When considering the amount of money Vale plant workers that carpool spend on gas in their source communities, for example, the total amount is estimated at \$21,840 monthly. However, when examining the amount Vale plant workers have spent on vehicles – which are typically located in urban centres outside the source communities – the amount is over \$2,000,000, significantly higher than an recurring expense (gas) which can take place in rural areas. Further, the total number of Vale plant workers is quite small (429), and considering the geographically dispersed locations of their source communities, any economic impacts they might have are diluted at the local level.

Interviewees clearly stated that they do not wish to drive any more than they need to. As such, many of those living in rural communities indicated they are more willing to shop locally instead of travel to stores in St. John's (AL20151109). However, many goods and services available in rural areas are smaller purchases, with significant expenditures taking place in nearby urban areas. Rural communities are able to capitalize on the spending patterns of Vale plant workers only to a certain extent. To that end, further research is needed to determine how source communities specifically benefit from local expenditures in this particular context.

7.3 Charitable Giving

Contributions to community and non-profit organizations enrich the social, cultural, and economic livelihood of communities. Across NL, thousands of residents are engaged in charitable giving. Based on those who gave a monetary donation to a charity registered with the Canada Revenue Agency (rather than informal donations to community organizations, etc.), NL, since 2007, has had the highest percentage of the population aged 15 and older contributing to charitable giving of all provinces and territories in Canada, with 92% of the population making a charitable donation in 2010, and 87% of the population making a charitable donation in 2013. In comparison, the national rates were 84% in 2010 and 82% in 2013 (Barrett and Gibson, 2013; Turcotte, 2015). Scholars have also suggested that with an increased income, there is greater propensity for people to donate (Clerkin, et al., 2013; Turcotte, 2015). In the case of this research, the majority of interviewees indicated they receive a higher income now than in previous positions, making charitable giving an appropriate area to study.

Charitable giving was included in the questionnaire to determine if it had changed since the respondent had started working at the plant. The results are presented in Table 34. Nearly two thirds of respondents indicated that their giving has remained the same since starting employment at the plant. Here, those with shorter commutes are slightly higher with 77% compared with those that commute over 50km one way at 62%. The next highest response was Not Applicable, with 23% of total questionnaire respondents selecting this answer. The prevalence of this response was much higher among those with longer commutes (28%) than shorter commutes (4%). It is likely that this group of people do not engage in charitable giving.

Table 34. *Have your community donations increased, stayed the same, or decreased since starting employment at the nickel processing facility?*

<i>Status</i>	<i>Total Respondents (N=131)</i>	<i>Respondents that commute more than 50km (N=105)</i>	<i>Respondents that commute less than 50km (N=26)</i>
Increased	13 (10%)	9 (9%)	4 (15%)
Stayed the same	85 (65%)	65 (62%)	20 (77%)
Decreased	1 (less than 1%)	1 (less than 1%)	0
Not applicable	30 (23%)	29 (28%)	1 (4%)
No response	2 (2%)	1 (less than 1%)	1 (4%)

Most interviewees suggested that they have a higher income in their current position than they had in their previous position. The benefits package and vacation days were also noted as a positive while working with Vale. However, with an increased income, only 10% of total questionnaire respondents indicated that the amount they donate had increased since starting their position at the plant. The one respondent who started donating less since starting at the worksite suggested it was related to their long

workday and commute and, therefore, they no longer have time to do so. Scholars (Markey et al., 2015) have documented that charitable giving rates may be lower for mobile workers, especially when dealing with multiple households. Despite the increase in income and greater propensity to donate, charitable giving rates have remained relatively stable. Given the small percentage of those that now donate more to registered charities, it is unlikely these organizations experience a significant benefit from plant workers being employed by the Vale facility.

7.4 Summary

The ways that an individual financially contributes to their source community depends on a variety of factors. The amount of income they receive, the availability of goods and services in their community, their proximity to an urban centre, family size, stage in their lifecycle and many other factors all affect a worker's purchasing decisions. When possible, many workers prefer to stay in their communities and purchase locally to reduce time on the road, which can provide potential economic spinoffs in the region. Purchasing a house and investing in property can also contribute to local economic development in a worker's permanent place of residence. Vehicle purchases by Vale workers have contributed to local economic development, primarily in St. John's. Yet, with the small concentration of workers residing in specific communities, it is difficult to suggest that certain communities are experiencing significant local economic development based on a Vale plant worker's residency. The eighth and final chapter will discuss the implications and meaning of this research for communities and workers moving forward, and the relevance of this work to the academic community.

CHAPTER 8

CONCLUSIONS

8.1 Overview of Research

The purpose of this research was to study the impacts of E-RGM on source communities by focusing on the example of workers employed at Vale's nickel processing facility in Long Harbour, Newfoundland and Labrador. Up to this point, much of the existing literature surrounding the implications of labour mobility for source communities has focused on the construction phase of major industrial projects, with limited research on employment mobility during the operations phase. Particularly, there has been minimal research on this topic as it pertains to rural areas and in Canada. This research helps fill this gap by addressing three primary questions: i) what factors influence a worker's decision to stay in their source communities and commute rather than relocate closer to their worksite?; ii) how do mobile workers contribute to their source communities through their time?; and iii) how do mobile workers financially contribute to the local economy in their source communities?

Overall, most questionnaire respondents have remained living in the same community of residence since they have started working at the nickel processing facility. This allows them to continue utilizing the social networks they have within their community, paying for goods, services, and taxes in their municipality or surrounding area, and/or sustaining attachments to their home community. The longer a person lives within a community, the more likely they are to become attached to 'place' (Stephens, 2002; Taylor, 2006) and contribute to community development (Clerkin et al., 2013).

Many (34%) respondents also stated they have a somewhat strong or very strong attachment to their source communities which, as literature suggests, can increase their willingness to engage in their community should they have the time to do so (Bertotti et al., 2012). Respondents also indicated reasons why they choose to stay living in their source communities and commute, which include access to entertainment (49%), grocery stores (46%) and shopping malls or centres (39%). Employment opportunities for a spouse in the host region were another recurring reason why interviewees continue their commuting arrangements. With 75% of respondents residing in the same community since starting their employment at the Vale plant, this provides the potential for them to remain engaged in their source communities should they choose to do so.

However, a combination of the commute time and work schedules leaves many Vale plant workers with less time to engage in community activities than they once were involved with. 53% of questionnaire respondents work a 12 hour rotational shift, which includes day, night, and weekend shifts. In combination with a commute that is over 50km one way for many, this results in a 14-15 hour work day. This affects a worker's ability to remain engaged in their community due to a variety of factors. It has been identified that the long work days and commutes are tiring, with many workers giving up extra-curricular activities due to fatigue. With workdays extending into the evenings in addition to weekend shifts, workers often miss the opportunity to engage in activities such as recreation, volunteerism, and community and social events. There is a pattern that the remaining spare time they do have after work is not spent in formalized activities, but with their families.

It is important to note, however, that the way a person engages with their community depends on context. This research has shown that the length of the commute and the type of work schedule can impact a worker's involvement in their community. Vale plant workers with shorter commutes are more likely to be involved in their community over those with longer commutes, for example. In fact, many questionnaire respondents residing within 50km to the worksite actually have more time in certain areas now than they did prior to starting their employment at the plant such as establishing and/or maintaining relationships with other community residents and particularly with family. Similarly, a Monday to Friday dayshift allows more time for community involvement, whereas the rotational 12 hour shift has provided others with more time to be engaged in activities in their communities.

Since starting work at the facility, 18% of respondents have changed their spending patterns, in part related to their commute and often because they have moved. Further, 53% of questionnaire respondents have built, purchased, or renovated their home or cabin since starting their employment with Vale in Long Harbour. In addition, a number of Vale plant workers are now using new vehicles on the journey to the worksite, purchased primarily in St. John's and surrounding communities. Other communities and local businesses are benefitting from a portion of workers relocating closer to the facility and purchasing goods in their source communities.

Yet, to what extent do Vale plant workers specifically assist in providing local economic benefits? Questionnaire respondents are distributed across 39 different source communities, with most communities hosting only one or two workers. Recurring expenditures such as gas are putting just over \$20,000 in all (primarily source)

communities per month (with approximately \$240 per worker per month) compared to over two million dollars being spent on vehicles alone in predominantly urban contexts. Even with the increased tendency to purchase local goods and services to cut down travel time, the economic benefits received by communities in areas with a low percentage of workers is minimal. Even in communities that host a higher number of Vale plant workers such as St. John's, Conception Bay South, and Paradise, the impacts of their individual spending is diluted at the local level due to the large populations of these urban centres.

8.1.1 E-RGM and Mobile Workers

While this research did not directly address the question of how E-RGM impacts workers, the findings did provide some insights on this topic. There is a clear pattern that respondents involved with longer commutes have less time to engage in their source communities. Previous literature has suggested that extended periods of time in this lifestyle can have detrimental impacts to health (Harris et al., 2015). Interviewees have suggested that they are tired and occasionally stressed due to their commute, which may ultimately contribute to detrimental health impacts. From a corporate level, there is little flexibility for a worker to change the amount of time they work or the particular shift they are involved in. The work schedule was initially developed by workers, for workers, and will be operated on that basis for the foreseeable future. An alternative to reduce their extended workday, then, would be to reduce the length of the commute. Yet, as this research has documented, many respondents hold a strong attachment to their source

communities (and to the amenities and services urban centres provide), justifying the reason as to why they began commuting in the first place.

8.1.2 E-RGM and Community Impacts

This research has documented the social and economic community impacts of employment mobility, particularly as it pertains to source communities. E-RGM provides an opportunity for community residents to remain living in their community of choice and earn an income that may not always be available within their local area. As this research has shown, however, a combination of the commute and work schedule often makes it difficult for people to be as engaged in their community as they once were. In the past, these types of work arrangements have created difficulties for voluntary organizations recruiting volunteers, and for organizations such as volunteer fire departments to remain in operation (CBC, 2015). This research supports previous research and media reports that LDC can negatively affect volunteerism as well as time spent on other community and recreational activities. It is notable that many mobile workers employed at Vale now have more time, however, to spend with family.

If workers are willing to remain involved, communities and local organizations can cater their services and/or required volunteer commitments to adjust to an individual's work schedule (Markey et al., 2015). A fitness centre was recently established in Conception Bay South, for example, and is providing a service where they will freeze a person's account that is involved with E-RGM arrangements that require a worker to live out of the community for a period of time, so they only need to pay for their membership while they are home (Platinum Pro Fitness, 2016). This allows people

with complex work schedules to continue working on their fitness and remain engaged in their communities. This may be difficult for some businesses and organizations to do, depending on the different work patterns community members are involved with. Yet, if the lack of volunteers is an issue for some organizations, it may be worth attempting to accommodate those involved with shift work and rotational schedules, such as the Long Harbour Vale plant workers.

Several respondents have also suggested they are more likely to purchase their goods and services locally rather than travel to a nearby urban centre. In many cases, rural communities have limited capacity to provide services that can be accessed in urban communities. However, groceries, gas, and household items are recurring expenditures, allowing workers to continually spend in their source communities. Further, the services they do offer could be provided to allow Vale plant workers time to shop while they are not working. Interviewees have suggested that in many of their communities, the grocery store closes at 5pm, denying them access to be able to purchase groceries after work (DS20151123). Although it may be difficult for local businesses to justify remaining open just for a few people, it may also attract others from neighbouring communities to access a service that is not offered in their area.

8.2 Theoretical Developments in Examining E-RGM and Community Intersections

This research is positioned within the mobilities turn, which provides a new lens for conceptualizing mobility research. The mobilities turn recognizes “the importance of the systematic movements of people for work and family life, for leisure and pleasure, and for politics and protest” (Sheller and Urry, 2006: 208). Findings from this research

suggest that various social and economic aspects of mobility impact source communities. Considering the phenomenon of E-RGM impacting communities, how then is community development impacted by E-RGM? To address this, I put forward for future consideration the Community Mobilities Framework (CMF) to capture the relationship between E-RGM and community development, which can be seen in Figure 5. There is much known about each individual concept – within each circle – however, less is known about the connection between the two and how labour mobility impacts community development.

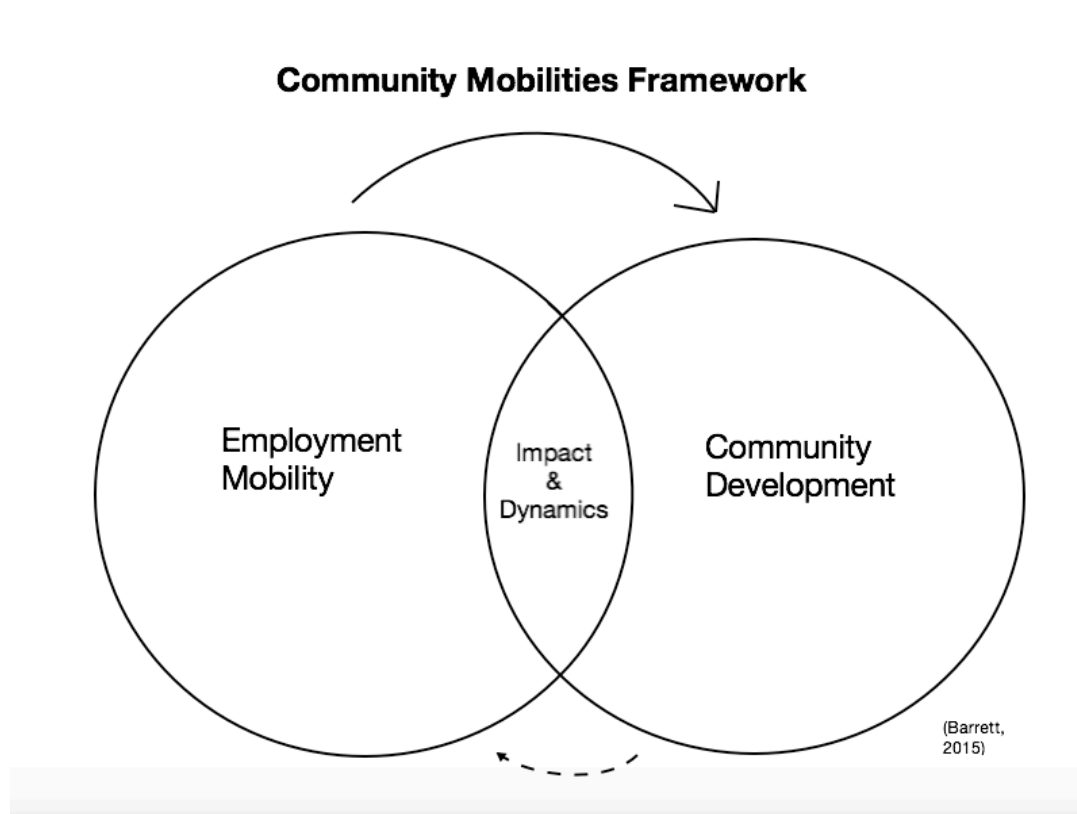


Figure 5. *The Community Mobilities Framework.*

There are several reasons why this framework is useful for this type of research moving forward. There are many ways to understand and interpret mobility, including different forms of E-RGM: FIFO, DIDO, commuting internationally for longer periods of

time or commuting for employment on a daily basis. In the case of community development, it can be understood through top down or bottom up approaches to community building, which can include new forms of governance, economic investments, as well as the greater role of the civil society to promote collective action. This research has addressed the social and economic implications of mobility for communities, which, as research suggests, can in turn impact community development (Douglas, forthcoming). This includes the decreased time a mobile worker has to volunteer in their community, or whether source communities benefit from local economic development from their mobile workers.

Through the lens of the CMF it is important to understand how E-RGM – in whatever capacity that may be – affects community development – whether it affects the community on a economic, social, physical, environmental, or political level (Douglas, forthcoming). In addition, understanding the scale at which labour mobility impacts community development is also important: how does it create effects on a municipal level, a regional level, a provincial level, or beyond? These are some of the aspects that can be considered using the CMF and conceptualizing research through this lens moving forward.

8.3 Limitations of Research

There are limitations to this research that must be acknowledged. The initial operations at the Vale nickel processing facility began in 2015, and thus there has only been a relatively short time for mobile workers to get familiar with the commute. As

such, the duration of time workers have been employed at the Vale plant and engaged in a commuting arrangement may have impacted their responses throughout this study.

This research focused on how a mobile worker's current involvement in E-RGM impacts their source communities. Their previous involvement in labour mobility, whether it was FIFO, DIDO, or daily commuting arrangement, was not recorded. The potential history of E-RGM in previous positions may have also impacted the responses from participants.

8.4 Future Research

This research has focused on how the E-RGM of Vale plant workers impacts their source communities. Overall, there has been little research documented relating to the impacts of daily commuting on source communities. Continuing research on the implications of E-RGM of various types for source communities is crucial to help fill in this gap, as this was a single case study in a particular context.

Moving forward, it is also important to study if and how source communities respond to E-RGM. While this research has suggested local spending by Vale plant workers is rather limited at the local level, perhaps there other case studies where communities receive more benefits from mobile workers that Newfoundland and Labrador communities can learn from. The Vale plant workers are only one of a number of groups of mobile workers, which include people that work offshore, in Alberta, or abroad. Learning the specific opportunities and challenges source communities (both rural and urban) have with E-RGM, and any lessons they have learned when dealing with mobile workforces is important for community development in areas with mobile

workers. Identifying examples where there are formal or informal partnerships between communities that host mobile workers and how this collaboration operates could also open dialogue to discuss the future prosperity of the region and can serve as an example for other jurisdictions experiencing similar situations to follow. An example of ongoing dialogue around mobile workers is the Small Towns Big Business Initiative (STBBI), which is made up for several communities in Eastern NL that host industrial development projects (Keating and Synard, 2016). Through this regional cooperation, previous experiences and best practices are shared for communities to learn from each other to create a more prosperous future for their residents.

Finally, although this research documented multiple source communities associated with Vale plant workers, it will be interesting to determine whether certain source communities will become more predominant hubs moving forward, such as those located a similar distance from the Vale site and St. John's. With some workers considering moving to Holyrood, there is some evidence that movement to such areas may occur in the future. While few workers describe high levels of stress from their commute or the desire to move closer to the Vale facility it will be important to monitor how this changes over time.

8.5 Summary

This research sought to answer three primary questions: i) what factors influence a worker's decision to stay in their source communities and commute rather than relocate closer to the worksite, ii) how do mobile workers spend their time in their source communities, and iii) how do mobile workers financially contribute to the local economy

in their source communities? Using the case of the workers involved with the nickel processing facility in Long Harbour, this thesis has provided some answers to these questions. By doing so, it has helped address a gap in literature by focusing on people involved with labour mobility within the operations phase of a large-scale industrial project (in this case a nickel processing facility), and by examining the socioeconomic impacts of this mobility for source communities.

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APPENDIX A

Section 1: Commuting and Work

1. How many months have you worked at the processing plant?

_____ Months

2. Which work schedule are you most frequently involved in?

Dayshift - Monday-Friday

10 hour day rotational

12 hour day rotational (dayshift only)

12 hour rotational (day and night shifts)

3. Please identify your primary place of residence.

Country: _____

Province: _____

Community: _____

4. Do you own or rent this primary place of residence?

Own

Rent

Other, please explain: _____

5. How long have you lived in your primary place of residence?

6. Do you commute from your primary place of residence to the Long Harbour processing plant on a daily basis?

Yes

No

7. On average, how much time do you spend commuting to the processing plant one way?

Less than 15 minutes

Between 15 and 29 minutes

Between 30 and 44minutes

Between 45 and 59 minutes
Between 60 and 74 minutes
Between 75 and 89 minutes
90 minutes or greater

8. How many months have you been commuting this distance?

_____ Months

9. How do you usually commute to the processing plant? Please select one.

Drive alone

I am dropped off

Carpool/Rideshare

Other, please specify: _____

Multiple methods, please explain: _____

10. Have you moved since you started working at the processing plant? If yes, what was the name of the community you previously lived in?

Yes

No

Community: _____

11. Do you have an RV or a second place of residence for work purposes? If yes, please identify where this residence is located.

Yes

No

Community: _____

12. Do you think you will still live in your community of primary residence one year from now?

Yes

No

Unsure

13. Would you consider moving closer to the processing plant?

Yes

No

Not applicable/I already live within 50 kilometres

14. If you answered yes, which community would you consider moving to? (e.g. Long Harbour-Mount Arlington Heights, Placentia, Chapel Arm, etc.)

15. If you answered no, why not?

16. Which of the following would make you consider relocating closer to the nickel processing plant if it were available in Long Harbour or nearby communities? Please check all that apply.

Daycare
Education facilities
Entertainment
Gas prices
Grocery stores
Housing
Job opportunities for partner
Nothing
Competitive recreation programs
Shopping Centres/Malls
Other, please specify: _____

17. Do any of the following delay or prevent you to get to the processing plant? Please check all that apply and how often they influence your commute.

Factors	Check all that apply	How often (e.g. weekly, once a month, etc.)
---------	----------------------	---

Weather		
Family issues (e.g. childcare)		
Road/Traffic conditions		
Transportation issues		
Other, please specify: _____		

18. On a scale of 1 to 5, how stressful do you usually find your commute? Please circle one.

Not stressful		Moderately stressful		Very stressful
1	2	3	4	5

19. Would you prefer a different option of getting to work than the one you currently use?

Yes

No

If yes, please specify: _____

20. When you decided to work at the processing plant, to what extent were the following important to you? Please circle one response for each factor.

	<i>Not importa nt</i>				<i>Very importa nt</i>
Family/friends work there or nearby	1	2	3	4	5
Family/friends encouraged me to apply	1	2	3	4	5
Higher wages than alternative job opportunities	1	2	3	4	5
Lack of job opportunities in my local area	1	2	3	4	5
Match with my skills/education/experience	1	2	3	4	5
Other, please specify: _____	1	2	3	4	5

Section 2. How do you spend your non-work time?

21. Have you volunteered in your local area in the last six months?

Yes

No

If yes, please identify your volunteer activities. Check all that apply.

Chamber of Commerce

Church

Fire department

Lions/Service Club

Municipal politics

School programs

Recreation

Other, please specify: _____

22. Please identify other activities you participate in within your local area. Check all that apply.

Bingo

Church
 Community festivals
 Fundraisers
 Holiday parades and festivities
 Recreation
 Other, please specify: _____

23. Do you participate in community activities outside your local area?

Yes If yes, please specify what and where:
 No _____

24. Do you spend less, the same, or more time in the following activities since you started working at the processing plant? If you spend more or less time in any of these activities please explain why.

Less time	Same time	More time	Not Applicable	Why?
--------------	--------------	--------------	-------------------	------

Volunteering
 Community Events
 Entertainment
 Sports/Recreation
 Exercise/Fitness
 Time with family
 Time with friends

25. How would you describe your sense of belonging to the community where you primarily reside? Please only check one box.

Very weak Somewhat weak Neutral Somewhat strong Very Strong

26. How would you describe your sense of belonging to the community of Long Harbour? Please only check one box.

Very weak Somewhat weak Neutral Somewhat strong Very Strong

Section 3. Spending

27. Please identify the community(ies) where you do the majority of your spending on the following items or if you purchase them online.

Items	Name of community(ies) or online?
-------	-----------------------------------

Alcohol
Clothing
Gas
Groceries
Household purchases
Restaurants
Tobacco

28. Has this changed since you started working at the processing plant?

Yes

No

If yes, please explain: _____

29. Since starting work at the processing plant, have you:

Check all
that apply

Please identify the name of the
community/if purchased online

Purchased or built a home
Purchased or built a cabin
Renovated your home
Renovated your cabin
Purchased an automobile/truck
Purchased a motorhome/trailer
Purchased a recreational vehicle
(e.g. boat, ATV, snowmobile, etc.)
Purchased or invested in a business
Purchased electronics, appliances
or tools

30. Since starting work at the processing plant, have your community donations in your local area:

Increased

Stayed the same

Decreased

Not applicable

Section 4. Additional Information

31. Identify your age.

18-29

30-44

45-59
60 years or older

32. Identify your gender.

Male
Female
Unspecified

33. Identify your marital status and number of dependents. (Children, seniors, etc.)

Single	0 Dependents
Married/Common law	1 Dependent
Divorced/Separated	2 Dependents
Widowed	3 Dependents
	4+ Dependents

34. Identify your highest level of education.

High school diploma
Apprenticeship/Trades certificate
College certificate/diploma
University degree

Do you have any additional comments about your experience as a commute?

APPENDIX B

INTERVIEW GUIDE – Nickel Processing Employee

Background Questions

1. Where were you born?
2. Where were you raised?
3. a. Where do you currently live? (community name, possibly neighbourhood if St. John's)
 - b. How long have you lived there?
 - c. Do you have other places of residence? Please explain. Do you have a second home, RV or rental accommodation close to your place of work? If yes, where?
4. How old are you? (range will be provided if preferred)

Work and Mobility

5. What is your position at the nickel processing facility in Long Harbour? (title and nature of your job)
6. How long have you worked for Vale in Long Harbour?
7. What were some of your previous occupations? (industry, position, location)
8. How did you get started in the nickel processing industry?
9. What factors influenced your decision to work at the nickel processing facility?
Probe: Meets skills/education/experience, friends/family work there, higher wages than alternatives, lack of job opportunities in the area where you live
10. What is your work schedule? (Days on, days off, shift start and end time, day/night)
11. How far do you commute to get to work? (Discuss - Distance and time)
12. Do many people you work with travel/commute from different places?
Where are they commuting from? What is the furthest that you know of?
13. Tell me about your commute on a typical day.

- a. How do you commute to work? (Discuss carpool, alone in car, multiple means)
- b. How often do you make the trip? (e.g. daily, weekly, biweekly, etc.)
- c. Please describe your journey on a typical day.
- d. Do you usually stop along the way to work or home from work? If yes, where? For how long?

14. Now I would like to hear about your commute on more difficult days.

- a. Are there days when things do not go smoothly for you in your commute? If yes, what kinds of difficulties do you encounter in your commute? (prompt if needed – e.g. car problems, children get sick, weather)
- b. When you have encountered these problems how have you dealt with them? E.g. If you are unable to get home (e.g. weather) what do you do?
- c. In the event of bad weather – forecasts or actual- how do you decide whether or not to go to work? How many days a year on average do you miss due to weather conditions?

15. Do you sometimes feel tired on your drive? If you get tired, what do you do to stay awake?

16. Do you know what your commute costs are?

Probe: Financial cost (e.g., gas, wear and tear on the car, meals)

17. Why do you commute for work (instead of relocate)?

- | | |
|-----------------------|-------------------------------|
| Education facilities | Housing |
| Recreation facilities | Childcare |
| Family | Entertainment |
| Grocery stores | Retail |
| Partners jobs | Partner wishes |
| Friends | Connections to home community |

Please explain (e.g. if housing, is it because they own their home, attachment to the property or?)

18. If there were increased services in Long Harbour (or items you listed above) would you consider relocating? Please explain.

19. How long (months/years) have you been commuting to get to work? (Previous and current position)

Probe: Have your travel/commute patterns changed over time? If so, how?

20. How much longer do you expect to be commuting this distance to get to work?

Probe: Do you believe you will still live in the same community you currently do a year from now?

Impacts on Workers and Communities

General

21. Where do you consider to be home?

Probe: If I ask you about your home what do you think of?

22. a. What do you consider to be your community?

b. Do you consider this home?

23. Has what you consider your community changed since you have worked at Vale?
If yes, please explain.

24. In your mind, what are the pros and cons of working away versus working near your home/source community?

25. Has commuting negatively or positively impacted any area of your life? (i.e. health, family, personal, community)? If so, how?

26. Overall, what do you think is the impact of men/women working away from their home/source communities? Probe: Community impacts, family impacts

Investment of Time

27a. Are you involved with any politics, sports, volunteering etc. in your home/source community or work community? Please explain.

b. Has your involvement with politics, sports, volunteering, etc. in your home/source community or work community changed since you started commuting? Since you started working with Vale in Long Harbour? Please explain. (Note: If respondents have had multiple commuting jobs ask about commuting in general and then about commuting since working at Vale).

28a. Do you participate in community festivals and events?

b. Has your participation in these events in your home/source community changed since you've started working with Vale in Long Harbour? Please explain.

29a. Do you participate in any outdoor recreation activities, such as hunting, fishing, wood cutting, skidoo, quad, etc.? If so where do you do these activities?

b. Have your outdoor recreation activities in your home/source community or work community changed since you've started working with Vale? Please explain.

30a. Aside from your household, do you have family living in your community of residence and/or nearby?

- b. How long have you had family living in this community?
- c. Do you have a partner or children? How many children?
- d. On average, how much time do you spend in a week with family?
- e. Has this changed over the time you have worked at Vale? If yes, please explain.
- f. Has there been any change in the types of things you do with family in your home/source community since you began work at Vale? If yes, please explain.

31. Do you have friends living in this community and/or nearby?
- a. On average, how much time do you spend in a week with these friends?
 - b. Has this changed over the time you have worked at Vale? If yes, please explain.
 - c. Has there been any change in the types of things you do with friends in your home/source community since you began work at Vale? If yes, please explain.

32. Do you interact with your neighbours in your community?
- a. Has there been any change in the types of things you do with neighbours in your home/source community since you began work at Vale? If yes, please explain.

33. Has there been any change in informal community activities you are involved in since you began work at Vale, such as household repairs, helping a neighbour build a patio, etc.?

Spending

34. Do you make more money at the nickel processing facility than your previous position? What percentage more (if comfortable sharing)?

- 35a. Do you own or rent your home?
- b. Do you have a mortgage?
 - c. Was this home purchased or built since you began commuting? Since you began work at Vale?

36. What do you spend your money on and where do you buy it?

Automobiles	Childcare
Entertainment	Gas
Groceries	Property/Property upgrades
Recreation	Recreational Vehicles
Restaurants	Technology
Vacations	

Have these spending patterns changed since you began commuting? Since you began work at Vale? Please explain.

Probe: More disposable income (%?), more on gas/upkeep of vehicle, more on childcare

37. Have you invested in business opportunities? If yes, what kind/in which community? Have these investments been since you began commuting for work? Since you began work at Vale? Please explain.

38a. Do you donate goods or money?

b. If yes, in which community(ies)? What organization(s)?

c. Has this changed since you've started working at the nickel processing facility?

Sense of place/belonging to community

39. Please describe your community to me.

40. Aside from where you work and where you live, do you regularly spend time in any other community(ies)? Please explain.

41. Of the communities you are affiliated with, which community do you receive the most enjoyment?

What do you enjoy from this community?

Has working away changed this in any way?

42. Overall, how satisfied are you with your home/source community? Very unsatisfied, somewhat unsatisfied, neither satisfied or unsatisfied, somewhat satisfied, very satisfied

43. Do you plan on staying here or are you looking to move? If yes, where about?

44. What would you miss most if you had to leave your community?

45. How would you describe your level of attachment to your home/source community?

To what extent do you feel a sense of belonging in your community?

What factors have influenced your sense of belonging?

46. Do you have any sense of belonging or attachment to the community of Long Harbour? Explain.

Improving the Commuting Experience

47. What, if anything, could employers do to improve the experience of commuting employees and/or their families and communities?

48. What, if anything, could governments do to improve the experience of commuting employees and/or their families and communities? (Probe re. various levels of government)

49. What, if anything, could organizations in your home/source community do to improve the experience of commuting employees who live there and their families?

Thank you for your time and your willingness to participate in this study.

Are you aware of any other workers that may be willing to participate in an interview for this research

INTERVIEW GUIDE – Company Representatives

Background Questions

1. What is your job title?
2. How many people will be employed at this operation?
3. Where were you born?
4. Where were you raised?
5. a. Where do you currently live? (community name, possibly neighbourhood if St. John's)
 - b. How long have you lived there?
 - c. Do you have other places of residence? Please explain. Do you have a second home, RV or rental accommodation close to your place of work? If yes, where?

Note: if the respondent does not live in Long Harbour questions related to mobile workers (see below) will also be asked if time allows.

Company policies and labour mobility

6. What percentage of your workforce travels/commutes?
 - Where are they commuting from?
 - What percentage travel one hour or more each way?
 - Does this vary by type of employee?
 - How do they commute to work? (Discuss carpool, bus, plane)
7. In your opinion, why do they commute?
8. a. Who pays for their commute costs? (Discuss – personal expense, if company - how)
 - b. Who organizes the travel details/logistics?
 - c. Does this vary by type of employee?
9. a. How often do they make the trip? (e.g. daily, weekly, biweekly, etc.)
 - b. Does this vary by type of employee?
10. Has your company used any methods to encourage commuting? (i.e. incentives, bonuses, pay for travel; camp housing, infrastructure investments, buses)
 - b. Did you work with any community/regional partners? Discuss.

11. a. Has your company used any methods to discourage commuting? (i.e. housing bonuses, allowances, interview practices)

b. Did you work with any community/regional partners? Discuss.

Impacts of labour mobility on workers and communities

12. Do you face any special or unique HR challenges when it comes to mobile workers?

13. Overall, in your view, what are the pros and cons of commuting for Vale?

14. Does your company work with any local/community/regional organizations on these issues? If so, please provide more detail (name, history, people, process, outcomes)

15. Overall, in your view, what are the pros and cons of commuting for the 'work', or 'host' community?

16. Overall what are the pros and cons of commuting for the 'home', or 'source' communities?

17. Does your company work with any local/community/regional organizations on these issues? If so, please provide more detail (name, history, people, process, outcomes)

18. Overall, do you have any further comments to add based on your experience on the impacts of men/women working away from their home communities (for the workers and their families or for their communities)? Any further comments on how these impacts might be managed (to maximize benefits or minimize challenges)?