

**IDENTIFYING THE BUILT SPACE IMPACTS OF FLY-IN/FLY-OUT EMPLOYMENT-
RELATED GEOGRAPHICAL MOBILITY IN DEER LAKE, NEWFOUNDLAND AND
LABRADOR**

by © Leanna Butters (Thesis) submitted to the School of Graduate Studies in partial fulfillment
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Abstract

Fly-in/fly-out (FIFO) is a long-distance commuting arrangement involving the travel of individuals to and from a place of work by airplane. Research suggests that host, source, and hub communities associated with FIFO are faced with both challenges and opportunities. It has also been suggested that compound community types exist, including the source-hub community. Built space, such as airport infrastructure, housing, and services, are integral to the functioning of source-hub communities but have not yet been studied in the FIFO context. This research project identified the town of Deer Lake in Newfoundland and Labrador as a source-hub community with the goal of better understanding the role and impacts of FIFO on built space in the community. This study found that Deer Lake is a source-hub community, that FIFO has impacted built space in Deer Lake, and that FIFO may have had additional impacts on the community.

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Chapter 1 Introduction

Fly-in/fly-out (FIFO) employment-related geographical mobility (E-RGM) has become increasingly utilized as an employment strategy around the world, including in the province of Newfoundland and Labrador (NL). The movement of NL workers to the Alberta oilsands for work, for example, has been documented (Keough 2013, Keough 2015). FIFO has been noted as having impacts in host communities (where workers work or live while they work) (Storey 2010, Vodden & Hall 2016, Markey, Ryser & Halseth 2015, Finnegan & Jacobs 2015), source communities (where workers live permanently) (Haslam McKenzie 2011, McKenzie et al. 2014, Meredith et al. 2014, Templeton et al. 2011), and hub communities (connection points with airplane, and sometimes bus, services that allow workers to move between their host and source communities) (Storey, 2016, Haslam McKenzie 2011). While some communities can be characterized as one of the abovementioned community types, others operate as compound communities, experiencing the impacts of host and/or source and/or hub communities at the same time. For instance, in this study, we define hub communities as communities with airport infrastructure that one or more FIFO workers use to get to and from their host and source communities. But, a hub community may also be a source community if it has one or more permanent resident FIFO workers – a source-hub community. So far, source-hub communities have only been identified and studied in Australia (Haslam-McKenzie 2011, Victorian Department of Transport 2013).

This project identified the town of Deer Lake NL as a source-hub community in NL to study how FIFO operations have impacted the community. It responded to three primary objectives: 1) to determine whether Deer Lake NL is a source-hub community; 2) to identify

built-space changes linked to FIFO between 2000-2016; and 3) to identify additional potential environmental and/or socio-economic impacts in Deer Lake that may be attributed to FIFO.

Methods chosen were a door-to-door census of new and significantly renovated homes in the town and semi-structured stakeholder and resident interviews. Data collected via door-to-door census were intended to respond primarily to objectives 1 and 2 of the study. The semi-structured interviews helped expand on the census data by providing context and additional insights regarding the impacts of FIFO on the community; as such, the semi-structured interviews responded to all 3 objectives but with emphasis on objective 3.

Findings suggest that Deer Lake is a source-hub community in the FIFO context and confirm that some built space change in Deer Lake between 2000-2016 can be linked to FIFO, particularly residential built space change. In addition to built space impacts, both census and interview participants volunteered additional environmental and socio-economic challenges and opportunities they felt were related to the presence of FIFO in Deer Lake. It was beyond the scope this project to confirm these impacts; however, they may be significant as areas of future research and/or policy discussions and so have been noted here for that purpose.

This thesis has been structured as follows: Chapter 2 offers a literature review of E-RGM, FIFO E-RGM, and FIFO in source-hub communities. Chapter 3 gives an overview of data collection and data analysis methods and discusses why Deer Lake was selected as the case study community for this project. Chapter 4 discusses findings demonstrating that Deer Lake is a source-hub community. Chapter 5 discusses findings identifying built space change linked to FIFO as well as additional environmental and/or socio-economic impacts in the community. Finally, Chapter 6 outlines some concluding thoughts and opportunities for future research.

Chapter 2 Literature Review

This chapter discusses key concepts guiding this research project. Section 2.1 looks at E-RGM with a focus on long-distance commuting (LDC) and the community impacts associated with LDC, both generally and in NL. Section 2.2 then focuses on fly-in/fly-out (FIFO) E-RGM, a type of long-distance commuting arrangement, including how FIFO may impact communities generally and in NL. Section 2.3 defines built space and the relationship between built space and FIFO in source-hub communities specifically. Finally, Section 2.4 identifies gaps in existing literature and the significance of this research study.

2.1 Employment-related Geographical Mobility

Hannam, Sheller and Urry (2006) argue that a mobility turn in the social sciences has transformed the social science field by presenting researchers with the task of re-evaluating established territorial and sedentary tenets. This is because the study of mobility is complex and transdisciplinary, amounting to a “new mobilities paradigm” (Sheller & Urry 2006, Hannam, Sheller & Urry 2006). Employment-related geographical mobility (E-RGM) has established itself as one facet of mobility research. E-RGM is defined as “situations where workers regularly and repeatedly cross municipal, provincial or national boundaries to get to and from their place of employment” including work in mobile workplaces such as fishing vessels, planes, trucks, and cargo ships (Temple Newhook et al. 2011, p. 66-67). In line with the transdisciplinary nature of mobility research overall, E-RGM has been studied from a variety of perspectives including in the fields of geography, sociology, anthropology, economics and psychology. Under the

umbrella of E-RGM, research on the impacts of work-related mobility has been undertaken at several scales including national, provincial, community, family, and individual. The study of E-RGM is also a topic of international interest with research ranging from daily commutes to/from urban centers to seasonal work between countries (Temple Newhook et al. 2011). Studies have highlighted, for instance, challenges and opportunities of transnational work-related mobility in family settings. Some examples include intra-familial care among transnational families and ‘temporary fathers’ in the families of temporary foreign workers (Baldassar & Merla 2014, McLaughlin et al. 2017). Other studies have addressed the economic and social impacts of remittances related to seasonal and temporary foreign workers programs (Szabo, Adegere & Matthews 2018), including the experiences of temporary foreign workers in host communities (Foster & Taylor 2013, Perry 2018). Within this context significant attention has also been dedicated to the study of one E-RGM classification: long-distance commuting (LDC).

LDC, also referred to as long distance labour commuting (LDLC), has been defined as non-residential workforce arrangements where workers regularly leave their usual place of residence to work and/or live at a distant place, often following a roster schedule (Storey 2001, Haslam McKenzie 2011, Hoath & Haslam McKenzie 2013). LDC encompasses several commuting arrangements, such as fly-in/fly-out (FIFO), drive-in/drive-out (DIDO), and bus-in/bus-out (BIBO) (Hoath & Haslam McKenzie 2013; Vodden & Hall 2016). LDC as it exists today originated in the offshore oil industry after World War II (Markey, Ryser & Halseth 2015). Continued use of and engagement with LDC been attributed to several factors: 1) for companies, LDC is a low-cost alternative to the development of company towns (Storey 2001); 2) for communities, it offers potential for helping avoid challenges associated with industry-dependent

towns, including boom and bust cycles (Storey 2016, Vodden & Hall 2016), and 3) for workers, the incentive of monetary gain and/or income security (Whalen & Schmidt 2016).

Though LDC has become common in many countries (Markey, Ryser & Halseth 2015) and the study of LDC has been undertaken in several countries (see examples: Sandow 2013; Ralph & Staeheli 2011), much literature in the last few decades has come from Australia where the mining industry has helped motivate research on the impacts of LDC arrangements on worker, family, and community health and/or sustainability (See examples: Houghton 1993, Victorian Department of Transport, Planning and Local Infrastructure 2013, Hoath & Haslam McKenzie 2013, Perry & Rowe 2015) in addition to research on labour supply, productivity, and turnover, among others (Barber 2016). In Canada, LDC has grown dramatically, in part due to oil sands development in Alberta (Whalen & Schmidt 2016). Foci of the study of LDC arrangements in Canada have been impacts on workers, communities, and regions particularly Newfoundland and Labrador, British Columbia, Ontario, Alberta, and the Canadian Arctic (See examples: Dorow & O'Shaughnessy 2013, Newbold & Scott 2013, Schmidt 2014, Finnegan & Jacobs 2015, Ryser, Markey & Halseth, 2016, Vodden & Hall 2016).

2.2 Fly-in/Fly-out E-RGM

FIFO emerged in the offshore oil industry in the Gulf of Mexico in the 1950s, when establishment of a permanent company town in proximity to the worksite was not an option (Storey 2001). FIFO, and related LDC models (DIDO, BIBO, etc.), have increasingly been adopted by land-based resource sectors in Russia, Australia and Canada as a more cost-efficient

and flexible alternative to the development of permanent settlements or ‘company towns’ (Storey 2010, Vodden & Hall 2016). For instance, non-permanent FIFO arrangements have been found to be less costly for corporations to build, maintain and decommission than permanent settlements (Haslam McKenzie 2011). FIFO workers are transported to and from their place or region of work by airplane. Food and accommodations are typically provided for workers on-site, though these are not extended to the worker’s family (Storey 2001). As such, employees work on rotational schedules spending fixed periods of time at home followed by fixed periods of time at work. Despite the perceived advantages of corporate use of FIFO E-RGM, academics have suggested that FIFO presents a combination of socio-economic costs and benefits for regional host, source, and hub communities and/or regions, as well as for FIFO workers and their families.

2.2.1 FIFO and Communities

Three community types have come to be associated with FIFO operations: host, source, and hub communities. Host communities are communities in geographical proximity to worksites employing FIFO workers. These communities may provide transportation and other services, amenities and/or accommodations to FIFO workers while they are at their place of work; however, it is important to note that communities may unwillingly become host communities, with workers living there due to proximity to a worksite rather than through formal negotiations with resource companies (Haslam McKenzie 2011). Source communities are the usual places of residence for FIFO workers (Hoath & Haslam McKenzie 2013). Families and/or social networks of FIFO workers are also present in their source communities (Vodden & Hall

2016). Hub communities are communities with a mobility infrastructure (e.g. airport) that facilitates movement of workers between their host and source communities or regions. These communities' function as connection points for FIFO workers. Because of their differing relationships with FIFO, host, source and hub communities are each impacted by FIFO differently.

2.2.1.1 FIFO in Host Communities

With regards to host communities, the literature indicates that without the implementation of specific provisions, such as corporate-community benefit agreements (Storey 2010), FIFO operations present some economic and social opportunities, but also several challenges. It has been suggested, for instance, that host communities may benefit from an influx of workers, as FIFO can encourage cultural diversity and economic flows as well as attract a skilled population to communities which may have lacked these otherwise (Keough 2013, Vodden & Hall 2016). However, Haslam McKenzie (2011) argues that such benefits are often compromised by the challenges of FIFO, particularly the fly-over effect, which sees economic benefits flow outside the region due to a lack of local spending and through wages paid to non-resident FIFO workers (Storey 2010, Markey, Ryser & Halseth 2015). The fly-over effect has been credited with undermining local employment through the hiring of non-local workers and limited local expenditure on goods and services (Finnegan & Jacobs 2015). In addition, the use and degradation of infrastructure by FIFO workers whose taxes support only their source community is referred to as the free-rider or fly-through effect (Storey, 2001, Haslam McKenzie 2011, Finnegan & Jacobs 2015). A link has also been made between host communities with large FIFO

populations and a decline in social well-being (such as increases in poor lifestyle choices), low rates of community participation/volunteerism, as well as limited to no sense of place attachment among the host population (Storey 2001, Haslam 2011, Keough 2015). As such, while host communities may experience some benefits from FIFO operations, existing literature indicates that FIFO has also resulted in significant socio-economic costs.

2.2.1.2 FIFO in Source Communities

The literature surrounding FIFO impacts in source communities seems to suggest that source communities typically benefit economically from FIFO operations while experiencing some social and community challenges. For instance, Haslam McKenzie (2011) demonstrates that the income of FIFO workers typically flows into source communities through local spending and taxation. McKenzie et al. (2014), similarly, found that FIFO workers in Busselton, Australia often have higher incomes than their locally employed counterparts. These economic considerations, however, appear to have had some social repercussions. For instance, research has been undertaken on the impacts of FIFO for workers, couples and families finding that these relationships may experience challenges while one partner and/or parent are away (Lifeline WA 2013, Clover Taylor & Graetz Simmonds 2009, Meredith et al. 2014). In Busselton, resentment from non-FIFO residents towards FIFO workers and among FIFO workers due to higher incomes coupled with inflated expectations of their ability/willingness to spend, has also been noted (McKenzie et al. 2014). In addition, FIFO work has become associated with specific community costs such as the loss of local talent, volunteers and community leaders for long stretches of time as well poor lifestyle choices (e.g. spending on illicit activities) (Storey 2010, Haslam McKenzie

2011). As such, while it seems FIFO operations benefit source communities economically, there may also be negative social repercussions.

2.2.1.3 FIFO in Hub Communities

I define hub communities in this study as communities with airports that allow them to function as connection points for mobile workers: hub communities allow workers to move between their host and source communities by airplane. For some hub communities, their relationship to FIFO operations is made more complex by the long-term presence of FIFO workers in the community. For the purpose of this study, I argue that these communities function as compound communities by expressing characteristics of other community types. For instance, a hub community may also be a host community if mobile workers live in the community while employed at a worksite of close proximity. A hub community may also be a source community if it also has a permanent resident population of FIFO workers. In the literature, hub communities have been studied most often as source-hub communities, also referred to as source hub or FIFO source-hub communities in the literature (Haslam McKenzie 2011, Victoria Department of Transport 2013, Storey 2016).

Few studies identifying the impacts of FIFO on hub communities have been undertaken; however, there is evidence that in Australia, hub communities may provide an option for communities facing employment/economic challenges and with airport infrastructures to diversify their development options (Storey, 2016). For instance, some communities in Australia, such as Cairns in Queensland, have been designated as source-hub communities by companies,

and though it isn't common practice, other communities have sought to promote themselves as potential labour hubs in pursuit of these benefits (Storey 2016, Victorian Department of Transport 2013). Being a compound community, source-hubs may also experience some of the challenges and opportunities of being source communities (Haslam McKenzie 2011). This can include socio-cultural impacts, such as the loss of local talent and community leaders to host communities for significant periods of time (Storey 2010, Haslam McKenzie 2011) and economic impacts, such as benefiting from FIFO incomes through taxation and local spending (Haslam McKenzie 2011).

2.2.2 FIFO and Community Development in Newfoundland and Labrador

Workers in NL have long been engaged in E-RGM and LDC, particularly in natural resource sectors. Traditionally, E-RGM in NL is often linked to offshore fisheries work, but workers from NL have a long history of going away to work in regions such as New York, Boston, and Ontario (Storey 2010). Over the last decade or so, FIFO has been embraced increasingly by workers in NL as it has allowed them to maintain their places of residence in the province while providing access to well-paying jobs within and outside of the province, such as in Alberta (Keough 2015). Oil sands development and operations in northern Alberta increased significantly in the early 2000s. The construction boom occurred in 2003, at which time it became a destination for many FIFO workers from NL (Storey 2010). The oilsands continue to employ many workers from NL. For instance, research on the mobile workforce in NL suggests that between 7,034 and 9,385 individuals worked or had worked in Alberta during 2008-2009 (Department of Human Resources, Labour and Employment, 2011). In addition, in 2013, the

University of Alberta found that 16% of labourers living in camps in the Municipality of Wood Buffalo were from NL (University of Alberta, 2013).

It has been suggested that FIFO work to Alberta has assisted in the sustaining of rural and outport communities in NL by allowing workers to live in communities that lack reliable employment options (Storey 2010). For instance, workers in Marystown have been known to commute regularly or periodically to Alberta when local employment in the offshore fishery and fish processing is not available (Storey 2010). It has also been suggested that ‘Alberta money’ has spurred development in FIFO source communities throughout the province. For instance, Town staff in Deer Lake stated that the community had seen an increase in housing development attributed to FIFO workers moving into the community for access to the Deer Lake Airport (EDO, 18 November 2016). To this end, it seems that FIFO has been a mechanism to allow rural source communities in NL to retain some of their population and potentially derive economic benefits from FIFO workers.

In light of the post-2014 downturn, however, this idea was being re-thought as media reports suggested that NL may have been hit hardest by the collapse in oil prices and subsequent job losses (The Canadian Press 2015). As such, it is unclear at the current time how communities in NL that have benefited from incoming FIFO wages and/or experienced spatial growth associated with FIFO workers will fare moving forward. In some cases, like Deer Lake, where residential development has occurred, there are questions about whether the loss of FIFO jobs in Alberta will impact the ability of residents to afford homes they built while employed. As such, the overall sustainability of built space changes/development attributed to FIFO in the community is an issue of concern for the town, local business owners, and residents. In addition,

concerns about the social impacts of FIFO have been raised, such as the impacts of FIFO on family and community dynamics. Unfortunately, programs and policies developed to support the socio-economic sustainability of FIFO source communities in NL are limited, but there is evidence of such practices in parts of Australia.

FIFO operations are a substantial source of employment for many Australian residents. In Queensland, for example, a Parliamentary Committee Report suggested that over 37,000 non-resident workers were employed in projects in the Bowen Basin, Surat Basin and Gladstone Basin in 2013 (Infrastructure, Planning and Natural Resources Committee in Queensland 2015). However, tensions between regions, companies and government in the context of FIFO have been well documented. In 2001, Storey documented mismatches between company economic objectives, government policies, and regional demands where communities felt they were losing out on regional benefits of mining projects because companies opted to follow the most profitable route and government did not ‘make good’ on promises of decentralization. At this time, the Australian State governments did not take an interventionist approach to regulating FIFO operations or negotiating with companies and this was seen by regions and communities as a challenge to their sustainability and resilience (Storey 2010, Hoath & Haslam McKenzie 2013).

Since that time much research has been done on the impacts of FIFO on workers, families, and communities in Australia. Many of these studies called for greater coordination between governments, companies, and communities to develop policies and programs that would reduce the loss of regional benefits, social and economic, including: employee and family counseling services and other family support programs, local buying programs, employee financial planning services, and community liaison groups (Storey 2001, Sibbel 2010, Hoath &

Halsam McKenzie 2013). In recognition of the need for support services for FIFO workers and their families and for the communities in which they live and work, in 2015, the Infrastructure, Planning and Natural Resources Committee in Queensland (2015) made several recommendations, including: 1) that social impact assessment processes for major projects be prescribed by legislation; 2) research be undertaken to identify strategies to address effective workplace programs or external programs to prevent mental health injuries in FIFO workers; and 3) effective family support programs. The report also indicated that that a community liason group was to be established with the company BHP Billiton Mitsubishi Alliance (BMA), and that a Local Buying Program had also been implemented by BMA. In addition to these, Sibbel (2010) noted that several companies were implementing various forms of psychosocial support for workers and their families including the Employee Assistance Program (EAP) counseling services (available to employees and their immediate families). The goal of these programs was to support sustainable and resilient community and regional development in Australia particularly in host communities.

Similar supports for FIFO workers, families, and their communities do not exist in NL currently. The study of communities in NL impacted by FIFO has been focused primarily on source communities and it indicates that these communities in NL experience comparable challenges and opportunities to communities in Australia (Barrett 2017, Barber 2016). Though the majority of programs developed in Australia seek to support workers in their host communities, by supporting the families of mobile workers they impact their source communities as well. Perhaps these service provision programs present models from which NL can draw. Unfortunately, fewer studies have been undertaken on host and hub communities in

NL. This project hoped to help address this research gap by identifying a source-hub community in the province.

2.3 FIFO Source-hub Communities

As mentioned earlier, a source-hub community is a compound community type. Source-hubs have an airport infrastructure that allow FIFO workers living within a region to travel between their place of work and their place of residence in addition to having FIFO workers as permanent residents. Studies suggest that source-hub communities may be better equipped than other regional communities to capture economic benefits through their ability to attract populations via access to services and mobility infrastructures (e.g. airports). Most studies on FIFO impacts in source-hub communities seem to indicate that while FIFO may present social challenges in communities, it may also present opportunities for socio-economic development and community economic sustainability. In Stawell, for example, a study undertaken by the Victoria Department of Transport, Planning and Local Infrastructure (2013) argued that while FIFO may result in isolation, disruption of lifestyle patterns, and family burdens at the individual level (Houghton 1993), becoming a FIFO hub could potentially enable Stawell to retain youth and lessen out-migration in addition to capturing economic benefits via FIFO workers' wages. As such, it was argued that becoming a source-hub, in the case of Stawell, could improve the overall stability, and perhaps sustainability, of the community (Victoria Department of Transport, 2013).

This notion, however, has recently been challenged. Writing in the midst of an economic downturn, Storey (2016) has suggested that while it was hoped that drawing workers from dispersed geographical areas via hub and source communities would distribute the community impacts of a downturn rather than concentrate them, that may not actually be the case. He writes, “the emergence of targeted source communities or natural hubs has, to a degree, effectively re-created one of the most significant disadvantages of the single-industry community” (Storey 2016, p.8). While the source-hub community model has been presented as an opportunity for regional communities to sustain themselves amidst the challenges presented by FIFO E-RGM, the overall sustainability of these communities may still be subject to the ups and downs of natural resource sector economies. The effects of the 2016 downturn were being felt in NL where, in 2012, 7.9% of the province’s employed labour force was employed in Alberta (Long, 2016); however, an understanding of the breadth of these impacts is only just emerging. For instance, research being undertaken by the *On the Move Partnership* suggests that housing (development, costs, etc.) has been affected by the current economic climate in NL and Alberta; however, the extent to which changes in housing development and cost can be attributed to a loss of employment opportunities for long-distance-commuters is not clear.

2.4 Source-hub Communities and Built Space

Built space, or space constructed by people as a setting for particular actions or activities (Yannow, 1995), appears to be integral to the functioning of source-hub communities. For instance, it has been suggested that natural hub communities emerge because they have an existing airport infrastructure (Storey 2016). These hubs may also develop into source

communities if they are able to attract a resident FIFO population or if much of its existing population become FIFO workers to take advantage of existing hub infrastructure (Storey, 2016). As such, a community would require airport infrastructure to become a hub community, but attributes such as affordable housing and service access may assist in the development of the hub community into a source-hub community by attracting workers and their families to reside in them (Victorian Department of Transport 2013, Haslam-McKenzie 2012). It is reasonable to assume that built space in source-hub communities may be impacted by the presence of FIFO either by efforts of government or private sector interests to cater to the infrastructural needs of these workers. For instance, increased use of airport facilities by FIFO workers travelling from outside communities may necessitate the development of services/amenities to support those workers, such as temporary accommodations. In addition, if a source-hub community does attract FIFO workers as permanent residents, residential and service development may occur to accommodate these. The role that built space plays in the functioning of source-hub communities suggests that the study of built space these communities may assist with furthering our understanding of how source-hub communities function in addition to contributing to discussions related to community development amidst the use of FIFO.

2.5 Gaps in the Literature and Research Significance

With regards to FIFO, existing research comes primarily from Australia, particularly Western Australia and Queensland, Canada, particularly Alberta, the Canadian Arctic and NL, as well as Russia, the United States, South Africa, and Chile. Research on the implications of FIFO at the community level has been studied primarily in Australia and Canada. The bulk of research

on FIFO hub and source-hub communities are further limited to studies from Australia – there are no existing studies of FIFO source-hub communities in the Canadian context and no existing studies on the built space impacts of FIFO in source-hub communities. As such, the research undertaken in this thesis represents a first attempt to examine a source-hub community in the context of both NL and Canada. It also presents an opportunity for the investigation of socio-economic impacts of FIFO on a source-hub community through the study of built space change prior to and during an economic downturn.

Literature on source-hub communities seem to indicate that the source-hub model may allow regional communities to capture the economic benefits afforded by FIFO (Victorian Department of Transport 2013, McKenzie et al. 2014); however, the long-term sustainability of these communities has been called into question (Storey 2016). As such, further study of the FIFO source-hub phenomena may contribute to the discussion of strategies to improve rural community sustainability and development into the future. In the context of NL, where many rural regions are perceived as being in decline, investigation into the impacts of FIFO on permanent residency and development in these regions may help inform community development considerations. As such, investigation into potential source-hub communities in the NL context may be significant in forwarding community development and sustainability discussions in the province. In addition, the identification of any socio-economic impacts with regards to accommodating both a permanent and transient population in one geographical location may inform future policies for these communities and other communities facing similar combinations of opportunities and challenges.

Chapter 3: Methodology, Methods, and Case Study

This chapter describes methodologies and methods adopted as part of this research study. 3.1 discusses the overall methodological approach, with discussion of the case study approach. Section 3.2 outlines data collection methods employed while 3.3 outlines data analysis methods. 3.4 describes ethical considerations of the study and 3.5 discusses limitations of the research. Finally, 3.6 offers an introduction to the Town of Deer Lake, including how it was selected as a case study, a brief history of Deer Lake as a self-identified hub community, and current demographic and housing information.

3.1 Methodological Approach

A mixed-method case study approach has been adopted for this project. In qualitative research, the validity of observations or perceptions is often determined by the extent to which patterns emerge from the data. For instance, it is assumed that the more participants share similar perceptions of a given subject, the more valid those perceptions (Silverman 2011). At the same time differences in opinions call individual perceptions into question. The mixed-method approach using both qualitative (interview) and quantitative (census) methods allows for each independent method to build on the other in order to compare and contrast this data and differentiate between facts and perceptions. Determining perceptions is significant in this study because exaggerated perceptions exist with regards to FIFO workers (see Section 5.2).

The case study approach is noted by Cresswell (2014) as valuable in allowing in-depth analysis of a particular subject area. Previous work on source-hub communities in Australia have

focused on the study of one or more case study communities to exemplify perceived characteristics of these communities in the Australian FIFO context. As such, the case study approach was selected to allow for comprehensive study of a potential source-hub community in NL and the built space impacts of FIFO in that community. The case study used in this research is explanatory and uses mixed methods in that qualitative data collected before and after distribution of a door-to-door census builds on quantitative data collected via said census (Cresswell 2014).

3.2 Data Collection

Data collection for this project occurred in two phases. The first phase employed both quantitative and qualitative methods responding to the first and second objectives of the project: 1) to determine whether Deer Lake is a source-hub community, and 2) to identify built space changes which have occurred in Deer Lake and may be attributed to FIFO, either as impacts of FIFO or undertaken to facilitate FIFO operations, from 2000-2016. In the first phase, participant observation, media and document review, and a door-to-door census were the methods employed to identify whether Deer Lake is a source-hub community and to determine what built space change has occurred over the study period and whether built space changes in Deer Lake may be correlated with FIFO employment.

The second phase of data collection responded to objective three of the study: to identify additional environmental and/or socio-economic impacts in Deer Lake that may be attributed to FIFO. In phase two, participant observation and semi-structured interviews with stakeholders (some of whom lived in Deer Lake and others who did not) and other residents were used to

build on findings from phase one of the research project. The purpose of this was to identify resident and stakeholder perceptions of FIFO and resulting changes in Deer Lake to highlight any additional concerns or opportunities presented by FIFO and/or provide additional insights into built space change in the community and links between these changes and FIFO.

3.2.1 Participant Observation

Participant observation allows for the comprehensive study of a phenomenon or research problem through participation of the researchers in the phenomenon or problem of interest (Jorgensen 1989). In this study, participant observation was used to observe, first-hand, the Deer Lake context – who lives there, how they interact, what neighbourhoods exist, etc. – to better understand how E-RGM fits within these dynamics. My role as a participant observer began in June 2016 when I worked as an intern with the Town of Deer Lake. I lived in Deer Lake from June to August 2016 and, during this time, worked at the Town office under the Economic Development Officer/Town Planner. I kept a notebook of observations and informal encounters with residents and how these related to or informed my understanding of FIFO labour and its implications for the community. I continued to record observations during return visits to Deer Lake from September 2016 to April 2017. I also took photographs of different neighbourhoods during my time in Deer Lake to record similarities and differences in newer and older areas in terms of planning and architectural form (ornament, size of buildings, external materials used, etc.).

3.2.2 Media and Document Review

Media review/content analysis is a systematic method used to understand and interpret popular representations of ideas and/or events (Macnamara 2005). Document review is a systematic procedure for evaluating print and/or electronic documents to gain understanding and develop knowledge (Bowen 2009). I undertook a review of relevant media and documents throughout and in preparation for this research study to understand popular perceptions and the broader community and/or regional dynamics with which FIFO interacts.

Media review began in October 2015 to help guide and justify the research topic. Media articles continued to be collected from CBC.ca and the Western Star until April 2017 to keep up with trends, perspectives, and developments in E-RGM in NL that could be relevant to the study area. These two sources were selected to ensure local (Western Star) and provincial/national (CBC) media corporation perspectives were represented. I searched for media articles from these two sources online using combinations following key words: mobile, mobility, work, employment, housing, infrastructure, airport, Newfoundland, Deer Lake.

Document review commenced in June 2016 while I lived and worked in Deer Lake. I reviewed archival documents, including interview transcripts (conducted by a local historical society with town residents) and typed, first-hand accounts, from the Deer Lake Public Library and the Town of Deer Lake to provide context for the historical development of Deer Lake into a hub for E-RGM. Archival photographs, including aerial images, were also requested from the Town of Deer Lake and the Memorial University Map Room to help identify spatial changes in Deer Lake from 1961 to 2001. These images were then compared with more contemporary maps, accessed via Google Earth.

Municipal documents, including municipal plans, zoning maps, and environmental agreements were reviewed to better understand policies governing built space development in Deer Lake. A registry of building permits issued in Deer Lake from 2001 to 2016 was digitized and reviewed to glean: 1) housing and business developments in Deer Lake, 2) the value of these developments, and 3) to derive a population from which a sample may be selected and surveyed (see 3.2.3).

3.2.3. Door-to-Door Census

A door-to-door census¹ was selected for this project to help conclusively test the pre-study notion presented by stakeholders that FIFO workers were building new homes and sheds/garages in Deer Lake. Several research assistants, Dr. Kelly Vodden, and I conducted the door-to-door census over 11 separate days in Deer Lake between February and April 2017. The census population consisted of all new homes and homes with renovations over \$20,000 contained in the Deer Lake building permits for the years 2000-2016. The years 2000-2016 were selected to ensure addresses were included before and after increased engagement with FIFO in NL. The building permit ledgers had 691 entries with new homes and renovations over \$20,000 during this period. These ledgers were digitized (in the form of an Excel spreadsheet) and any entry over \$20,000 was included in the census population. Duplicate addresses were removed; however, if an address had multiple renovations over \$20,000, each renovation was considered.

¹ This method is a census (as opposed to a survey) because a sub-population was identified in Deer Lake (all addresses with new homes and renovations over \$20,000 in Deer Lake, 2000-2016) and all accessible members of that population were surveyed.

After removing duplicate addresses and incomplete addresses, the final census population included 633 addresses.

During the surveying process 556 of the 633 addresses were visited. 77 addresses were not found because, for example, the site was a vacant lot, there was no house number, or no matching address. If a resident was not encountered during the first visit to an address, researchers returned to that address a second time. If a resident was not encountered during the second visit, a mail-back kit with information letter, survey, and pre-paid envelope was left at the most accessible door of the residence. In total, 224 surveys were completed, and an additional 50 residents chose to answer whether a FIFO worker lived in their dwelling. As such, the response rate for the full survey was 35.4% and the response rate for the survey and FIFO question (whether or not there was a FIFO worker living in their dwelling) together was 43.3%. As a representative sample responded to both the full survey and the FIFO question, the door-to-door census provided a good indication of what proportion of new and significantly renovated homes in Deer Lake (2000-2016) had a FIFO worker living in them and allowed for the identification of building permit entries attributed to FIFO residents specifically.

Census participants varied by age but captured an older demographic primarily, with approximately one-third of participants ages 60 or older, and two-thirds of participants ages 20 to 59. (see Figure 1). According to Canadian census data from 2016, 66.5% of the total population in Deer Lake was working age individuals (15-64), while 16.6% were individuals over age 65 (Statistics Canada, 2017). Census respondents may over-represent the 60 and over age group. In terms of gender, the census had slightly more female participants (see Figure 2). According to Canadian census data, 52.9% of residents in Deer Lake ages 20 and over were female and 47.1%

were male (Statistics Canada, 2017). Census respondents, split by gender, may be representative of the wider population in DL. It is important to note, however, that not all homes in Deer Lake received a census and that statistics presented above only include the Municipality of Deer Lake and not surrounding communities such as Reidville. The census was also only delivered to addresses with new and significantly renovated homes (\$20,000 or more)

Figure 1: Census participants, by age

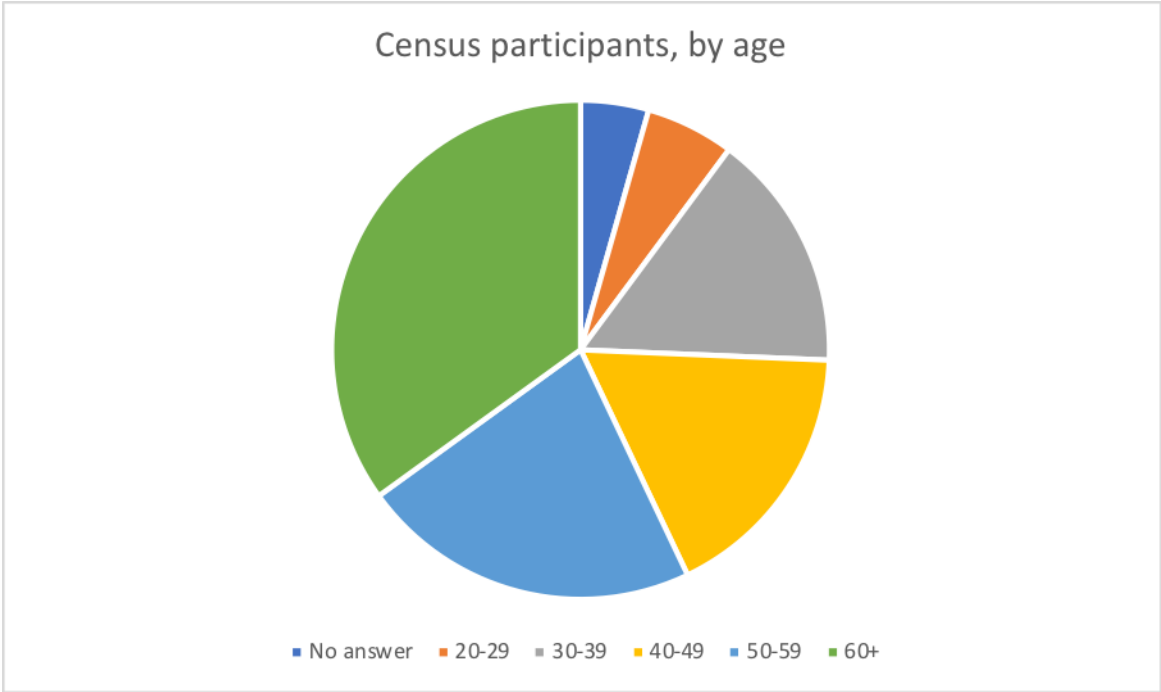
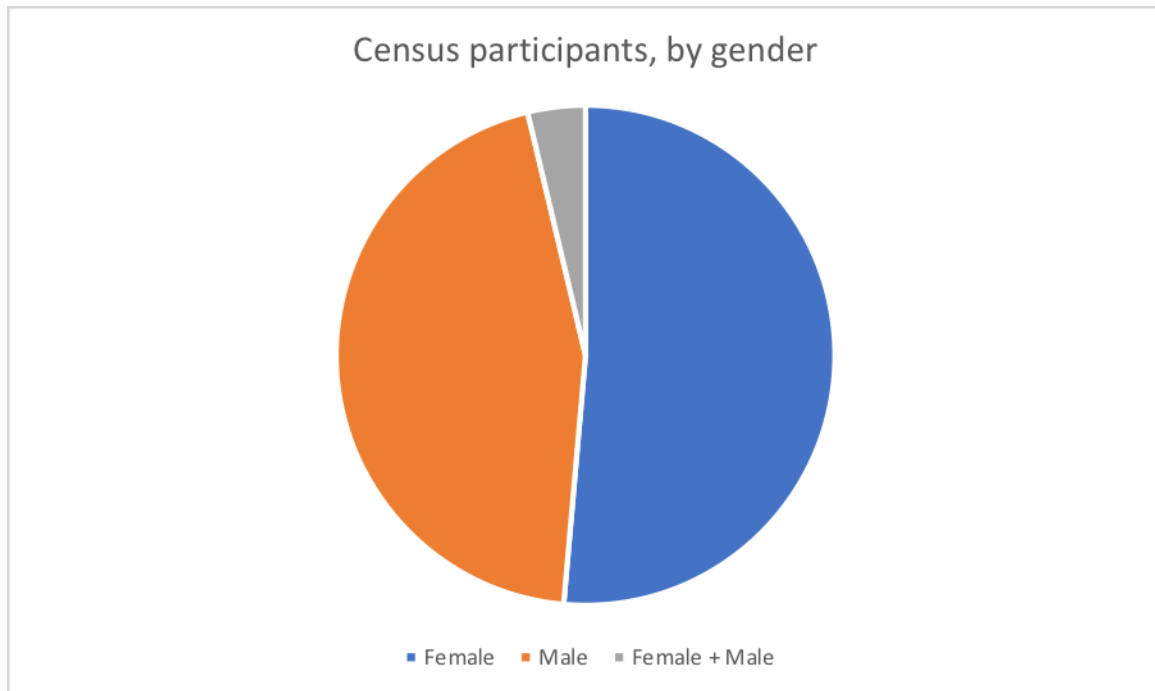


Figure 2: Census participants, by gender



3.2.4 Semi-structured Interviews

Interviews are noted as useful for understanding and identifying the complexity of respondent experiences (Weiss 1995). In this study, I used interviews to expand on and provide context for findings of the door-to-door census as well as identify additional impacts of FIFO in Deer Lake. The objectives of the interviews were to highlight stakeholder and resident perceptions of built space and related environmental and/or socio-economic impacts of FIFO in Deer Lake. In total, I conducted 14 interviews, 12 with stakeholders and two with residents. In this study, stakeholders included individuals who held positions with the provincial government, municipal council members, community organization leaders/employees, and business owners/managers. Some of these stakeholders were also residents of Deer Lake (7 stakeholders)

and/or the partners of mobile workers (3 stakeholders). Residents included FIFO workers and/or the partners of FIFO workers that resided in Deer Lake. Because only five of 14 interviewees had an intimate connection to FIFO work (being FIFO workers or the partners of FIFO workers), the views reflected in this study are mostly of non-FIFO stakeholders. Stakeholder interviewees were sought out via snowball sampling. Resident interviewees could volunteer themselves for participation via the door-to-door census (census participants had the opportunity to provide an email and/or phone number where they could be contacted). 24 respondents left their email address or phone number on their door-to-door survey and two agreed to be interviewed when contacted. Both stakeholder and resident interviews were semi-structured. As such, pre-determined questions were used to guide discussion; however, participants were encouraged to raise or elaborate on themes/ideas that were of significance to them. Interviews took place at various venues in Deer Lake at the discretion of interviewees. Each interview was no more than 60 minutes in length and audio-recorded. These audio-recordings were then transcribed in preparation for analysis. The interviews provided insight into how the built spaces of FIFO might be viewed 'on the ground' by members of the community and community stakeholders. They also allowed stakeholders and residents to express potential opportunities and challenges they felt came from the presence of FIFO in the community overall.

3.3 Data Analysis

After their collection, data from interviews, the door-to-door census and other relevant documents/images were compiled, organized and analyzed. Data collected via participant observation and semi-structured interviews were analyzed using content analysis (coding).

Census data was analyzed to generate descriptive charts and graphics to communicate findings related to the locations of new housing developments, neighbourhoods perceived as housing FIFO workers, etc. To analyze the impact of FIFO workers specifically, census respondent addresses were also separated by whether anyone living at that address engaged or did not engage with FIFO and then analyzed.

3.3.1 Content Analysis

Qualitative content analysis allows for the preparation, organization, and reporting of results gathered as part of a qualitative study (Elo et al. 2014). Content analysis, or coding, including the creation of categories into which data may be grouped and sorted, was used to analyze interview transcripts, media articles, municipal documents, and notes from participant observation. Nvivo, a coding software, was selected for this purpose. The coding method employed was inductive as themes emerged while data was being analyzed rather than from a pre-determined list. In order to minimize issues of trustworthiness associated with this method, trustworthiness was considered for each category created during each analysis phase: preparation, organization, and reporting, as suggested by Elo et al. (2014). Patterns in the data were sought, identified and reported.

3.3.2 Statistical Analysis

Statistical analysis was employed to interpret data collected in the door-to-door census. This analysis was descriptive in nature with the intention of providing substance for a narrative around the presence and impacts of FIFO residents in the community. Calculations for proportions, averages, median, max and min were used to help describe findings of the census. In addition, this analysis was interpreted diagrammatically to visualize findings related to spatial and neighborhood change in Deer Lake.

3.4 Ethical Considerations

Because data were being collected from human participants, this study was subject to ethics review. It was approved by the Grenfell Campus Research Ethics Board (GC-REB). The themes of this study were unlikely to pose serious threats to participants and physical, psychological, social, and financial risks were not encountered. Checks were in place to ensure anonymity and confidentiality of participants. Participation in the door-to-door census was entirely voluntary and surveys were returned to researchers in a sealed envelope and without names. Only researchers who had signed confidentiality agreements had access to addresses and other confidential data related to the door-to-door census. Interview participation was also voluntary, and anonymity was offered as an option to interviewees. Informed consent was ensured through disclosure of the role of both participants and researchers in this study as well as through the offering of both written and oral descriptions of these roles and the research project. All transcripts generated from interviews were anonymized unless interviewees specified

otherwise on their informed consent forms. Interviewees were given until June 2017 to withdraw their participation in the study. All data generated from this study will be securely stored a locked space for a minimum of five years as required by Memorial University's policy on Integrity in Scholarly Research, after which it will be destroyed.

3.5 Community Engagement and Report Back

The Town of Deer Lake was integral as a support for this research study. I was able to work as an intern for the town Economic Development Officer/Town Planner from June to August 2016. This internship period formed the bulk of my participant observation efforts. To ensure the community was kept informed about the research project, updates were posted by the Town on their website and Facebook pages. A public report back session was held in Deer Lake on January 23, 2018 at the town office. Findings from the project were presented to community and municipal council members to get feedback on the project prior to its completion. A condensed version of the study findings was made available to attendees in print form. Print versions of this document were also left at the town office and shared by the Town on their Facebook page on January 25, 2018. Comments on the project were made at the report back session and on the town Facebook page. All comments were constructive and have been considered in the writing of this thesis. A copy of the summary document made available to residents can be found in Appendix A.

3.6 Limitations of the Study

This project confirmed that Deer Lake is a source-hub community; however, findings are limited in that data was only collected for addresses with new and significantly renovated homes as opposed to the entire town of Deer Lake. It is possible that FIFO workers live at addresses that are not new homes or at addresses where no significant renovations had been made. As such, this study cannot confirm what proportion of all addresses in Deer Lake has a FIFO worker living in them.

In terms of data collection, the time of year at which surveys were distributed (February-May) meant that some homes might have been vacated by residents who spend winter months away. As such, this may have affected the ability of residents to participate in the census. Certain questions on the census, particularly demographic information such as household income, were not answered by all participants. As such, this research is unable to definitively address questions related to incomes of mobile workers in relation to non-mobile workers or correlate these numbers with built space changes in the community. The majority of interviews were also conducted with stakeholders (as defined in 3.2.3). As such, the perceptions of the presence of FIFO workers in Deer Lake reported in this paper have been derived from these individuals and are not representative of FIFO workers themselves.

3.7 Case Study: Deer Lake, NL

The Town of Deer Lake is an incorporated town located on the west coast of Newfoundland in the Grand Lake region. The town's name is borrowed from the freshwater lake

on which it sits, so-called because early visitors to the area mistook caribou swimming across the lake in their annual migration for deer (White 2007). A self-proclaimed ‘hub’ community in the region, the Town of Deer Lake stands as the gateway to the west coast of the island, being located at the intersection of the Trans-Canada Highway (TCH) and the Viking Trail (one must pass through the Deer Lake to continue north to the Northern Peninsula or south to Port aux Basques), and home to the Deer Lake Airport. This hub identity was identified by stakeholders as part of this study and also noted on interpretive signage in town (see image below). It was suggested that this identity was linked to the opening of the powerhouse in 1925 (servicing Corner Brook’s pulp and paper mill), the forest industry, which brought permanent settlers to Deer Lake, and the opening of the Deer Lake Airport in 1955 (discussed further in 3.7.3). Unlike many communities in Newfoundland, Deer Lake is not a coastal community. As such, Deer Lake’s development is linked more closely to the Island’s woods and pulp and paper industries than its ocean fisheries. It has been suggested by key informants that its interior placement and development trajectory may have aided Deer Lake in securing its place as one of the only towns in NL with a growing, rather than declining, population in recent years (EDO, 8 November 2016).



Interpretive panel outside the Deer Lake Powerhouse identifying Deer Lake as a ‘hub’ community, June 2016

3.7.1 Selection of Case Study

Emerging findings from the *On the Move Partnership* in Newfoundland and Labrador suggested that long-distance commuting practices, such as FIFO, were having significant socio-economic impacts on the island of Newfoundland. New statistics provided to *On the Move* researchers by Statistics Canada (T4, T1, Canadian Employer-Employee Dynamics Database) suggested that between 2006 and 2011, approximately 5-6.5% of the inter-provincial employed labour force in Alberta, with a peak of 14,000 employees in 2008, were from NL (Lionais,

2016). Research on the labour force in NL also identified that between January 2008 and March 2009, approximately 6% to 7% of the NL labour force (between 13,127 and 16,240 persons) were, or had been, mobile workers at that time. This number increased to 7% to 8% (between 19,454 and 23,507 persons) in the January 2009 and March 2010 period (Long 2016). Subsequently, concerns we expressed about changes in housing availability and affordability attributed to workers living in NL but working in Alberta (Butters et al. 2016).

Deer Lake was initially noted as a community of interest because local stakeholders suggested that E-RGM work had socio-economic and housing impacts in the Town, including changes to the local housing stock (Butters et al., 2016). Efforts were made to determine that Deer Lake was the most appropriate community to study as a potential FIFO source-hub community and it was decided that, of the five airport towns on the island of Newfoundland (St. John's, Gander, Deer Lake, St. Anthony, and Stephenville), the size (population of 5,000), location (at the Viking Trail and TCH junction), and presence of both charter and commercial flights with connections to and from Alberta made Deer Lake appropriate for study as a source-hub community.

3.7.2 Statistical Profile

The Town of Deer Lake is one of few communities in NL that is not declining in population. Deer Lake had a population of 5,249 in 2016 (Statistics Canada, 2016). This represented a 5.1% change from 2011 (population 4,995), which is higher than the provincial average of 1.0% change and close to the national average of 5.0% (Statistics Canada, 2016). In

the period of interest to this study, 2000-2016, Deer Lake experienced steady growth. As can be seen in Figure 3, the population of Deer Lake dropped significantly between 1996 and 2001 but demonstrates growth from 2001-2016. In 2016, the population of Deer Lake was slightly higher than it was in 1996 (Community Accounts, n.d.). The residual net migration for Deer Lake was 0.94% (50 individuals) in 2015. This was higher than the provincial net migration of 0.63% in 2015 (Community Accounts, n.d.).

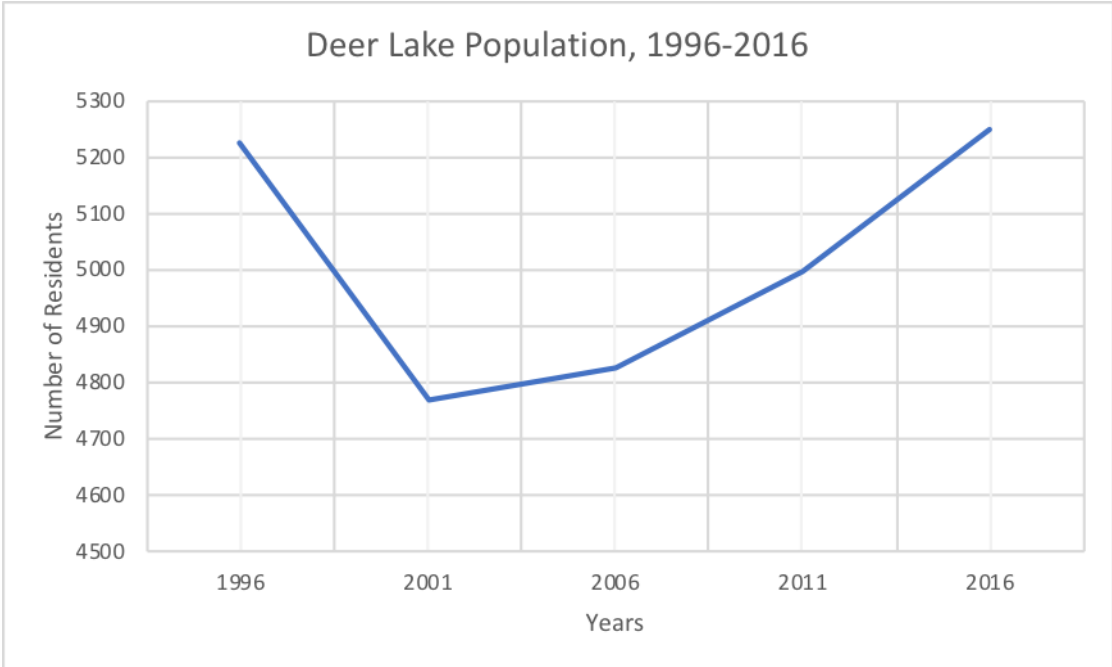


Figure 3: Deer Lake Population, 1996-2016

In 2016, 2,164 private dwellings existed in the town of which 78.1% were single detached homes (Statistics Canada, 2016). This is higher than the provincial average of 73.3% and the national average of 53.6% (Statistics Canada, 2016). 6.7% of private dwellings were apartments in a building fewer than five stories, 3.7% were apartments in a duplex, 2.8% were

row houses, 5.8% were semi-detached homes, 2.8% were mobile dwellings, and 0.5% were other single-attached houses. The total number of occupied dwellings in Deer Lake in 2016 represented a 9.2% change from 2011 (Statistics Canada, 2016).

In 2016, the majority of Deer Lake residents were of working age (15-64), making up 61.9% of the total population (Statistics Canada, 2016). 15.3% of residents were children (0-14) and 22.9% were adults over age 65 (Statistics Canada, 2016). From 2011-2016, the town saw a .9% increase in children (0-14), a 1.2% decrease in working age residents (15-64), and a 26.3% increase in adults age 65 and over (Statistics Canada, 2016). As such, the population change in Deer Lake appears to have been driven primarily by older and younger demographic categories, while the number of working age adults has declined overall. The average age of residents in Deer Lake is 44.8, which is slightly higher than the provincial average of 43.7 and also higher than the national average of 41.

Table 1: Population by age (% of total and average age) in Deer Lake, NL and Canada

Age	Deer Lake	NL	Canada
0-14	22.9%	14.3%	16.6%
15-64	61.9%	66.2%	66.5%
65 and over	26.3%	19.4%	16.9%
Average age (years)	44.8	43.7	41

The median total income of private households in Deer Lake in 2015 was \$60,320, which had increased from \$49,787 in 2011 (21.2% change) (Statistics Canada 2016). In 2015, the average income for all households was \$74,707. The distribution of households by household

total income in Deer Lake showed that in 2015 a higher proportion of Deer Lake households had incomes of \$0-59,999 when compared to those of NL, while a lower proportion of Deer Lake households had incomes of \$125,000 to \$150,00 or more (see Table 2). Proportions of households in Deer Lake with incomes \$60,000 to \$124,999 were comparable to provincial proportions (see Table 2). Average incomes in the town have increased, and stakeholders believe this is due, in part, to the presence of FIFO workers (EDO, 5 October 2017).

Table 2: Distribution (%) of households by household total income, Deer Lake and higher-level geographies, 2015 (Source: Statistics Canada, 2016)

Geography	Under \$30,000	\$30,000 to \$59,999	\$60,000 to \$99,999	\$100,000 to \$124,999	\$125,000 to \$149,999	\$150,000 or more
<i>Canada</i>	17.8	24.7	25.0	10.4	7.2	14.7
<i>NL</i>	19.8	25.2	23.2	9.7	7.3	14.7
<i>Deer Lake</i>	22.5	27.3	23.8	9.7	6.3	10.9

With regards to employment, in 2016, the employment rate was 44.9 for the population aged 15 and over, lower than the provincial average of 49.5 (Statistics Canada, 2017). The majority of residents were employed in sales and service occupations (635 of 2,400) and trades, transport and equipment operators, and related occupations (510 of 2,400). Significantly more residents were employed in the following National Occupation categories in 2016 than in 2011: sales and service occupations; trades, transport and equipment operators and related occupations; and, natural resources, agriculture, and related occupations (see Table 3)

Table 3: National Occupation Classification (NOC 2016), aged 15 years and over; (Source: Statistics Canada 2012, 2017.)

Occupation Sector	National Occupation Classification, aged 15 years and older 2016	National Occupation Classification, aged 15 years and older 2011
Management occupations	190	190
Business, finance and administration occupations	285	385
Natural and applied sciences and related occupations	110	80
Health occupations	180	175
Occupations in education, law, and social, community and government services	260	255
Occupations in art, culture, recreation and sport	30	0
Sales and service occupations	635	520
Trades, transport and equipment operators and related occupations	510	465
Natural resources, agriculture, and related production occupations	125	60
Occupations in manufacturing and utilities	80	85
Total	2,400	2,295

In terms of commuting, Statistics Canada data from the 2016 census suggests that 90 individuals of a sample of 1,400 in Deer Lake commuted to a different census division or census subdivision in 2016, while 65 individuals from this sample commuted to a different province or territory (see Table 4). 1,240 commuted within their census division of residence.

Table 4: Commuting destination for the employed labour force aged 15 years and over in a private household with a usual place of work – 25% sample data (Statistics Canada, 2017).

Commuting destination	Number of commuters
Commute within census subdivision (CSD) of residence	990
Commute to a difference census subdivision (CSD) within census division (CD) of residence	250
Commute to a difference census subdivision (CSD) and census division (CD) within province or territory of residence	90
Commute to a different province or territory	65
Total	1,400

Based on the above data, the Town of Deer Lake is a growing community experiencing increases in both population and residential built space. The majority of residents are of working age (15-64), though growth has been experienced in the 65 and over and 0-14 age ranges only between 2011-2016. While there is a higher proportion of households in the \$0-59,999 income range in Deer Lake than in the province, the average household income in the community in 2016 has increased by 21.2% since 2011.

The above data makes clear that Deer Lake is a growing community. And yet, growth is being experienced primarily in the 0-14 and 65 and over age categories. How a FIFO workforce fits into this dynamic is not clear, though the data indicate that out-of-province workers are members of the commuting workforce. Some stakeholders have attributed housing growth in Deer Lake to the increased presence of FIFO in the town by (e.g. EDO, 18 November 2016).

This study sought to determine how true this may be. It also addresses how FIFO workers have contributed to growth in Deer Lake and what socio-economic and sustainability impacts growth related to FIFO work may have in order to better understand the presence of this population in the community.

3.7.3 A Brief History of Deer Lake – Becoming ‘the Hub’ of Western Newfoundland

While the Grand Lake Region has been noted as a favoured hunting area for early Beothuks (Harp 2003), records indicate that Deer Lake’s first permanent settler was George Aaron Nichols, after whom the neighbourhood (formerly town of) Nicholville was named (White 2007). Sometimes referred to as ‘Deer Pond’ in archival documents, this area of the Humber Valley region was prized for its abundant natural resources. For instance, Deer Pond was described in Lovell’s *Gazeteer of British North America* (1874) as “surrounded by land of a most fertile description bearing on its surface great quantities of pine and birch”. By the 1890s, tourism was being promoted in the Humber Valley, linked to agricultural settlement policies put in place by the Newfoundland government; however, despite the completion of a railway station at Deer Lake by the Reid Newfoundland Company, a major industry did not emerge until the establishment of a hydroelectric plant in Deer Lake in 1923 (White 2007). After 1923, Deer Lake was developed as an industrial satellite town servicing the pulp and paper mill in Corner Brook (White, 2007). A powerhouse, dam and canal were constructed to provide power and route lumber to the paper mill in Corner Brook (Sutherland 1995). The Town of Deer Lake was planned around these developments to accommodate permanent and temporary workers as well as Newfoundland Pulp and Paper executives (Sutherland 1995, White 2007). As such, Deer

Lake developed into a destination and host community for workers from across Newfoundland who would travel along the railway and live in Deer Lake to work as loggers in the region (Sutherland 1995, MacLeod 1985, Humber Valley Development Association 1989).



The Powerhouse (hydroelectric plant) in Deer Lake, June 2016

Besides the construction of a road between Bonne Bay and Deer Lake in 1924 (Deer Lake Public Library, n.d.) and Deer Lake and Corner Brook in 1937 (Humber Valley Development Association, 1989), the next major development occurred in 1955 with the construction of a local airport. Deer Lake had become an incorporated town in 1950, after which road and sewer construction, the provisioning for a fire station, and other service-related changes occurred (Deer Lake Public Library, n.d.). Discussions about the construction of an airstrip in Deer Lake began in 1953, backed by the local council, federal and provincial governments, and the Bowater Corporations to encourage tourism to the region. It was located just east of the town

near Junction Brook and was initially comprised of a 200 by 4000-foot gravel strip and small shelter (Humber Valley Development Association, 1989).



Deer Lake's First Terminal, 1961 (Photograph displayed in the Deer Lake Airport café in 2016)

In this way, over the course of its development, Deer Lake assumed the position of a 'hub' in Newfoundland, developing the capacity to provide power to the Humber River Region as well as the capacity to move people by railway, airplane, and automobile. And while the development of Deer Lake into a potential hub for FIFO workers is a more recent phenomenon, key informants have suggested that components of this history and perceived 'hub' identity may have lent itself to the use of infrastructure in Deer Lake for the purposes of FIFO operations (EDO, 18 November 2016; Deer Lake Airport Representative, 24 November 2016; Business Owner, Council Member and Resident, 5 December 2016). In other words, Deer Lake emerged as a natural FIFO hub because of existing infrastructural assets, particularly the Deer Lake Airport.

Chapter 4: Deer Lake as a Source-hub Community – Results and Discussion

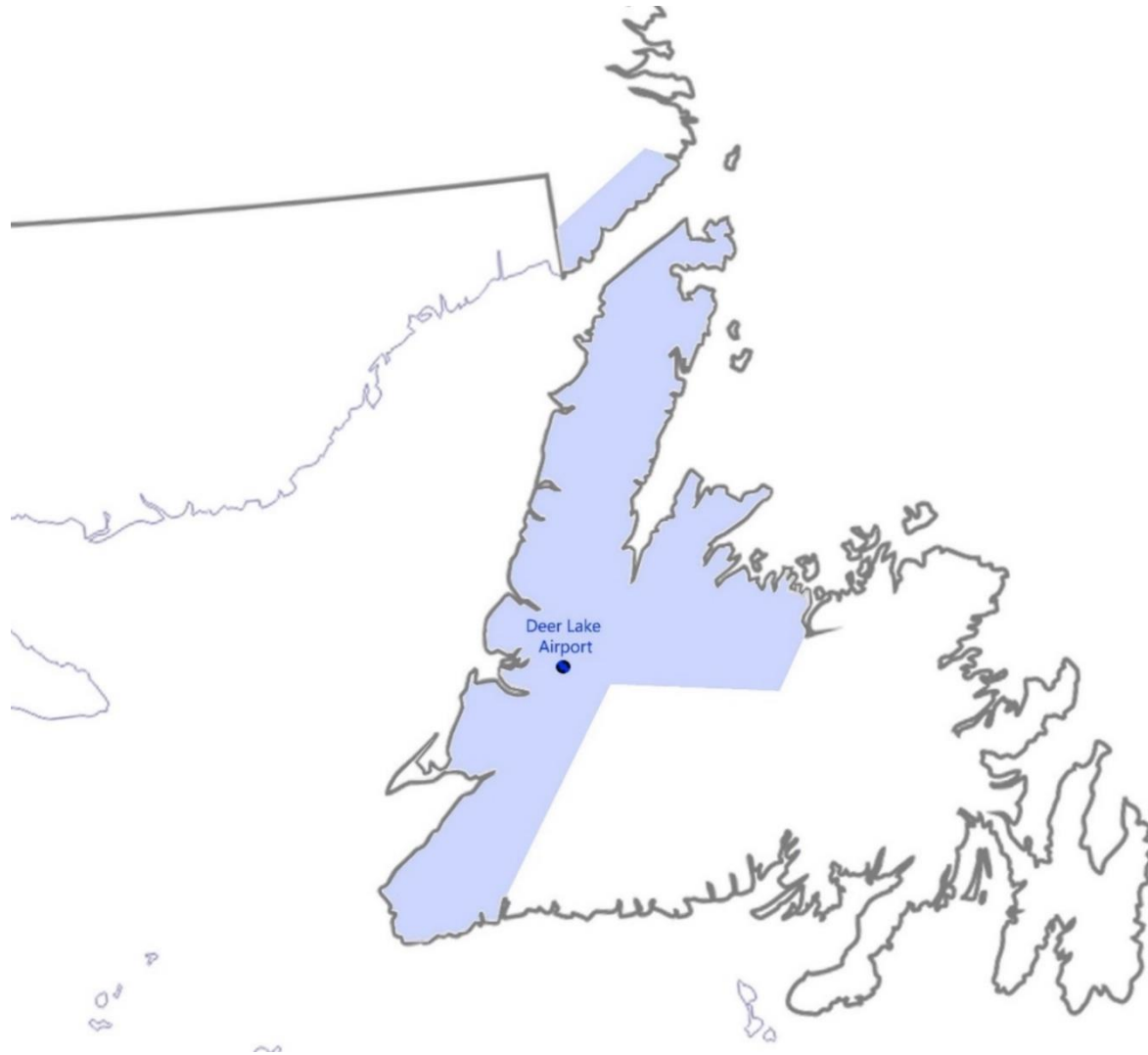
This chapter discusses findings related to the first objective of this project: to determine whether Deer Lake is a source-hub community. The contribution of this chapter is significant conceptually in that it adds to existing research on source-hub communities by providing insight into a potential source-hub community in Canada. Section 4.1 outlines why Deer Lake is a hub community. Section 4.2 discusses why Deer Lake is a source community. Finally, Section 4.3 provides a summary discussion of Deer Lake as a source-hub community and what this might mean for the concept of source-hub communities more broadly.

4.1 Deer Lake as a Hub Community

The Deer Lake Airport is perceived as playing a vital role in the growth and stability of the Town of Deer Lake. According to one participant, “The airport is hugely important to the town, economically and otherwise” (EDO, 8 November 2016). Prior to beginning this research project, employees at the Town of Deer Lake suggested that FIFO workers were moving to Deer Lake to be closer to the Deer Lake Airport. It was suggested that workers who lived elsewhere in the province, particularly in the Northern Peninsula region, and did not want to make a 5 or 6-hour drive home would opt to live in the community for more convenient airport access; however, it was also suggested that individuals living outside of Deer Lake continued to commute into Deer Lake to use the airport to get to and from work within and outside of the province (St. Anthony Town Council Representative, 18 November 2016). According to the literature, natural hub communities emerge when communities with an airport infrastructure see

mobile workers come for outside communities to use the airport, often to access charter flights (Storey, 2016).

Figure 4: Approximate catchment area of the Deer Lake Airport (as described by a representative of the Deer Lake Airport, 24 November 2016)



The Deer Lake Airport has a catchment area from the Labrador Straits to the west, north to the Northern Peninsula, south to Port au Basques, and east to Grand Falls-Windsor (Deer Lake

Airport Representative, 24 November 2016) (see Figure 4). The size of the catchment area may reflect the availability of more direct flights from Deer Lake to other parts of Canada than at smaller airports in the western part of the island (St. Anthony, Stephenville). For instance, according to one participant, people are going to Deer Lake because they can access direct commercial flights there that they can't access in smaller airports like St. Anthony:

“And I guess, you know, we have everything that people would require and need for such a small region, a small rural area. And some people don't realize it, but you know, like if you haven't flown from, you know, Cuba or back in the 2007, 2008, 2009 years, we were getting charter flights from the UK, from Gatwick, Australia” (Deer Lake Airport Representative 18 November 2016).

In 2016, the Deer Lake Airport housed 7 airline services: Air Canada Express, Air Canada, Air Canada (EVAS), Air Labrador, PAL (Provincial) Airlines, Sunwing Airlines, and Westjet (Deer Lake Airport Representative, 24 November 2016). Flights from the Deer Lake Airport in November 2016 included daily flights to Halifax NS, Toronto ON, St. John's NL, Goose Bay/Wabush, as well as winter service to Cuba (Deer Lake Airport Representative, 24 November 2016).

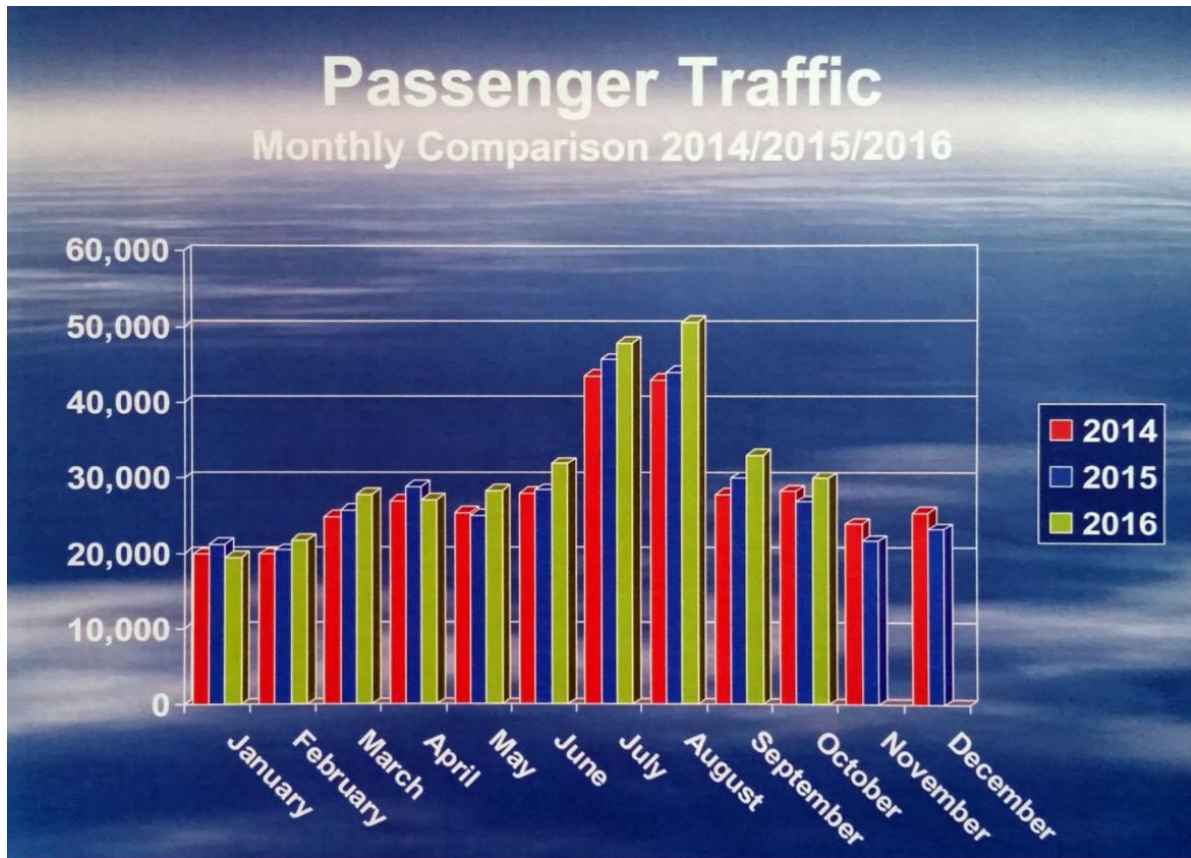
Traffic statistics from the Deer Lake Airport over time demonstrate a growth trend in passenger traffic overall since 1975 (Deer Lake Airport Representative, 24 November 2016). A significant spike in traffic at the Deer Lake Airport occurred in 2007-12 (see Figure 5). The airport has identified several market drivers which have helped contribute to this growth including: commuting workers and related charter flights, local/regional tourism, increased airline capacity, new route networks, lower fares/competition, special events/meetings/conventions, and transportation links (i.e. to Labrador) (Deer Lake Airport

Representative, 24 November 2016). It is difficult to say what proportion of Deer Lake's traffic might be due to a FIFO workforce and what proportion is due to other drivers, particularly tourism. For instance, a seasonal breakdown of flight traffic shows that flight traffic from 2014-2016 has been consistently higher in the summer months (see Figure 6). While exit surveys in tourism were conducted at the Deer Lake Airport by the Department of Business, Tourism, Culture, and Rural Development in 2016, data on individuals travelling for work is not available due to travel for work being an exclusionary criterion for the survey. We do know, however, that charter flights to Alberta, a major destination for mobile workers in NL, were available in 2007-8 at a frequency of 3 charter flights a week. This would certainly have encouraged the use of the Deer Lake Airport by FIFO workers and likely contributed to an increase in passenger traffic at that time (see Figure 5) (Deer Lake Airport Representative, 24 November 2016). Charter flights were discontinued in 2009, coinciding with the recession and downturn in resource related activity in Alberta, but a representative from the Deer Lake airport suggested that FIFO demand at the airport has continued with FIFO workers travelling on regular commercial flights rather than charters (Deer Lake Airport Representative, 24 November 2016). As such, Deer Lake is a hub community for FIFO workers and has been for the last decade, at least.

Figure 5: Passenger Traffic at the Deer Lake Airport, 2000-2016 (Source: Deer Lake Airport, 2016)

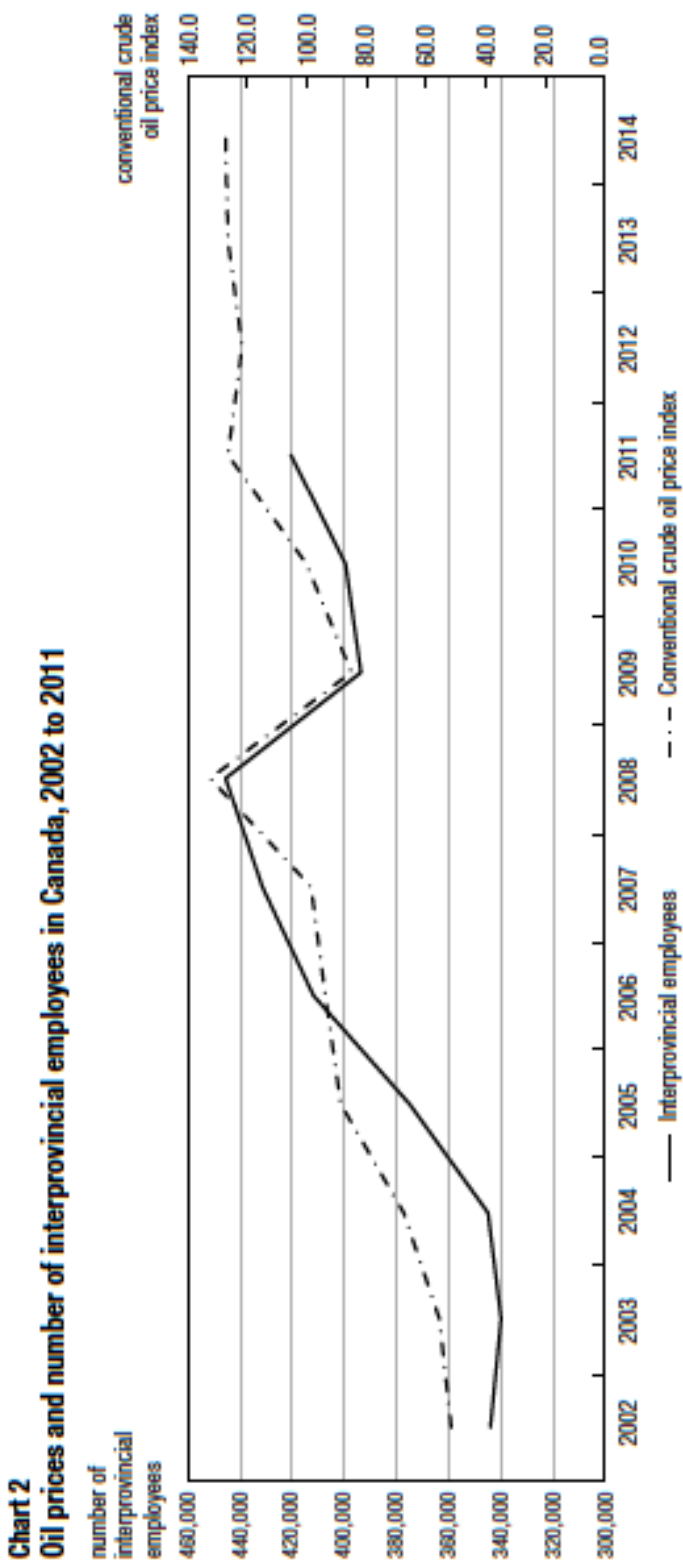


Figure 6: Passenger Traffic at the Deer Lake Airport, Monthly Comparison 2014-2016 (Deer Lake Airport, 2016)



The global price of oil began to rise in 2003. As can be seen in Figure 7, an increase in the number of Canadian interprovincial workers followed. The price of oil and the number of interprovincial employees spiked in 2008, after which a downturn in the price of oil brought both numbers down. An upward trend appears again after 2009.

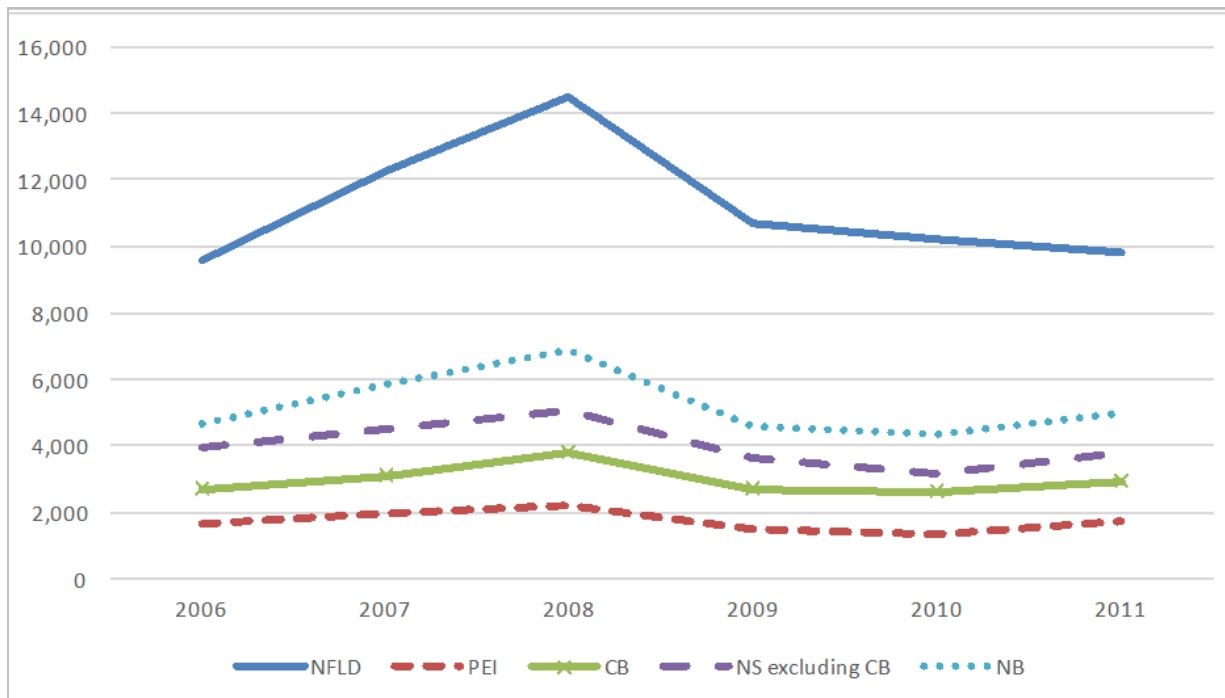
Figure 7: Oil prices and number of interprovincial employees in Canada, 2002 to 2011 (From Lionais, 2016. Source: Morissette, R., & Hanqing, Q. (2015). *Interprovincial Employment in Canada, 2002 to 2011* (Economic Insights No. 11-626-X — No. 047). Ottawa: Statistics Canada. Retrieved from <http://www.statcan.gc.ca/pub/11-626-x/11-626-x2015047-eng.htm>)



Note: Data for the number of interprovincial employees are not available after 2011.
 Source: Statistics Canada, Canadian Employer-Employee Dynamics Database and CANSIM table 330-0008.

There are similar trends in data on interprovincial workers in NL (see Figure 8). As can be seen in Figure 8, the number of interprovincial employees in NL was on the up from 2006-2008. The number of interprovincial employees in NL dropped sharply in 2009 and remained virtually stable from 2009-2011.

Figure 8: Number of inter-provincial employees by province of residence, 2006 to 2011 (Lionais 2016).



Trends in the price of oil, the number of Canadian interprovincial workers and the number of interprovincial workers in NL appear to be reflected in in Deer Lake Airport passenger trends, suggesting FIFO workers have been using the Deer Lake Airport from 2003 to the present. These trends can be separated into 3 temporal periods: 1) 2003-2008, 2) 2009-12, and 3) 2013-2015.

1) 2003-2008

In 2003 the price of oil rose and the number of interprovincial employees in Canada and NL followed not long after (see Figure 7). The price of oil and number of interprovincial employees continued to rise, reaching their peak in 2008. According to Laporte and Lu (2015), the number of interprovincial employees from Atlantic Canada increased almost three-fold between 2004 and 2008 and the largest increase was among those workers from NL. Passenger numbers at the Deer Lake Airport follow a similar upwards trend, where the number of passengers rose steadily from 2003-2008 (see Figure 5). The number of passengers spiked in 2007-8, coinciding with the offering of charter flights to Alberta. The downturn of 2008 began a period of decline in the number of interprovincial workers in Canada and a decline in the number of passengers at the Deer Lake Airport.

2) 2009-2011

In 2008, after the price of oil dropped, the number of Canadian interprovincial employees also dropped. But research on the labour supply in NL suggests that the number of persons in the mobile workforce in NL rose from 6% to 7% and 7% to 8% between January 2009-March 2010, totaling 19,454 to 23,507 persons (Department of Human Resources 2011). This is inconsistent with passenger numbers at the Deer Lake Airport because, as can be seen in Figure 5, the number of passengers at the Deer Lake Airport fell in 2008-2009. This is an inconsistency but may be due, in part, to the cancellation of charter flights to Alberta in 2008. After 2009, price of oil began to rise again, as did the number of Canadian interprovincial employees. Passenger

numbers at the Deer Lake Airport remained stable in 2010, at which point it is estimated that just 16.1% of the mobile workforce in NL resided in the western region (Department of Human Resources 2011). Passenger numbers in Deer Lake began to rise again in 2011 coinciding with increases in the number of interprovincial employees in Canada and the price of oil.

3) 2012-2015

Less information is available on the mobile workforce during this period. Figure 7 predicted that the number of interprovincial employees would begin to grow again after 2011, leveling out in 2014 at similar numbers to the peak in 2008. In NL in 2012, it is estimated that 7.9 percent of the labour force was comprised of interprovincial employees, totaling 20,438 employees (Long 2016). This made NL the province with the largest percentage of interprovincial employees in Atlantic Canada in 2012 (Long 2016) and Deer Lake passenger traffic surpassed its 2008 peak in 2012. After 2012, Deer Lake passenger traffic continued to rise steadily until 2015. Data are not available for interprovincial employment after 2012, but a representative at the Deer Lake Airport indicated that growth during this period is likely the result of tourism and use of the airport by FIFO workers, particularly for work on the Muskrat Falls hydroelectric project in Labrador (24 November 2016).

While it is unclear what proportion of growth in Deer Lake passenger numbers were due to FIFO work from 2000-2016, it is clear that FIFO has contributed to some of the trends presented. We also know that FIFO contributed to increased passenger movements the Deer

Lake Airport in 2016. Annual tourism performance statistics published by the Department of Tourism, Culture, Industry and Innovation found that passenger movements at Deer Lake Airport were up 7.2% from 2015, continuing the growth trend from 2009. The report credited this increase in movements to a strong tourism season and increased activity associated with the Muskrat Falls project, which is believed to have offset declines in traffic to Alberta (Department of Tourism, Culture, Industry and Innovation, 2017).

Expansion projects undertaken at the Deer Lake Airport also suggest that airport growth was driven, in part, by increased demand on the part of FIFO workers. In 2009-10, the Deer Lake Airport facility was expanded significantly, including the development of a bigger runway to accommodate larger planes, and a bigger building facility (Deer Lake Airport Representative, 24 November 2016). It was suggested by a representative from the Deer Lake Airport that, as part of the increased demand overall, use of airport facilities by FIFO workers contributed to this expansion (Deer Lake Airport Representative, 24 November 2016). Linked more decisively to the presence of FIFO workers, three consecutive expansions of long-term parking facilities occurred in 2011, 2012, and 2014. According to a news release from the airport in 2012:

“...the Deer Lake Airport has, once again, expanded its long-term parking area to help keep pace with growing demand. Jamie Schwartz, Airport Chief Executive Officer, indicated that the demand for parking is being driven, in part, by the mobile work force... ‘the demand for parking is increasing at a relatively faster rate than the overall passenger growth. We can only speculate that much of this increased demand is being generated by residents from the western Newfoundland region who are commuting to work in other parts of the country’”.

The above quote demonstrates that increased demand for long-term parking at the Deer Lake Airport in 2012 was linked to use of the facilities by a mobile workforce. A similar note was made in a news release following another expansion of long-term parking in 2014:

“The Deer Lake Regional Airport has completed a parking lot expansion to keep pace with the increasing demand experienced during the past year...Increased activity at the Muskrat Falls Hydro Project and a new Orlando flight this winter will continue to drive demand for parking. It is our hope that the additional parking spaces will see us through the next few years.”

Increased demand for long-term parking at the Deer Lake Airport, associated specifically with travelling to and from work on the Muskrat Falls hydroelectric project, in addition to snowbird traffic travelling to Florida, again supported a third consecutive expansion of long-term parking. According to a representative from the Deer Lake Airport: “Really unique is that an airport this size would have 1,237 parking spaces...that’s really unusual. Counterparts across Canada for doing the same level of traffic that we’re doing would have 300-350 car parking spaces.” (Deer Lake Airport Representative, 24 November 2016). Of airports in Newfoundland, the Deer Lake Airport has the most long-term parking spaces and had the second-highest number of passenger movements in 2016 (see Table 5). In addition, the average number of vehicles in the parking lot over the last few years has averaged 800-900 vehicles a day (Deer Lake Airport Representative, 24 November 2016). And despite the 2015 downturn and provincial government cuts reducing non-essential travel for employees, this number was down by only 12-15% in 2016 (Deer Lake Airport Representative, 24 November 2016). This demand for parking suggests that FIFO workers from outside of Deer Lake park their cars at the airport when they are away at work. As

such, consistent demand for long-term parking in Deer Lake is linked, in part, to the presence of a resident FIFO workforce within the airport’s catchment area.

Table 5: Long-term parking spaces available at airports in Newfoundland

Airport	Passenger Movements, 2016 (TCII, 2017)	Number of long-term parking spaces
St. John’s	1,568,950	950 ²
Deer Lake	365,681	1,237³
Gander	173,690	600 ⁴
St. Anthony	20,285	Unknown ⁵
Stephenville	7,790	No answer provided

Participant accounts, passenger traffic data and infrastructural improvements at the Deer Lake Airport suggest that FIFO workers are using the Deer Lake Airport to get to and from a place of work within and/or outside of the province in significant numbers. The presence of charter flights to Alberta in 2007-8 and similar trends in passenger traffic, the price of oil, and interprovincial employees in NL from 2007-11 confirm that FIFO workers used the Deer Lake Airport to get to and from work during that time. In addition, a significant airport expansion in 2009-10 was driven, in part, by increased use of the airport by FIFO workers with demand for long term parking linked specifically to FIFO workers. Also, in 2016, FIFO movements were partly responsible for an increase in traffic at the Deer Lake Airport. Based on this evidence,

² Short-term and long-term parking (St. John’s Airport representative, 9 April 2018).

³ (Deer Lake Airport representative, 24 November 2017).

⁴ (Gander Airport representative, 10 April 2018).

⁵ No fee charged for parking so number of spaces is not tracked (St. Anthony Airport Representative, 10 April 2018).

Deer Lake has operated and continues to operate as a hub for FIFO workers living in western NL.

4.2 Deer Lake as a Source Community

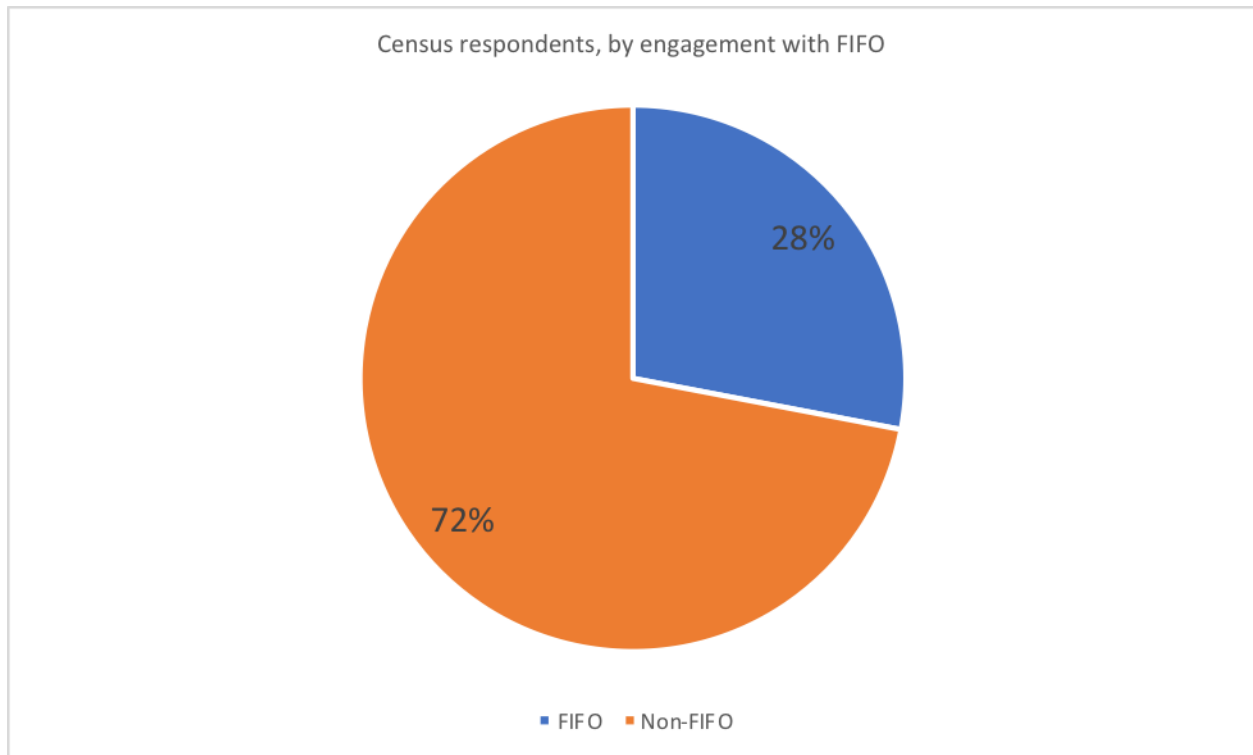
Stakeholders associated with the Town suggested that Deer Lake was a place of permanent residence for FIFO workers and their families. All of my interview participants believed that Deer Lake was home to FIFO workers, with predictions ranging from ‘a few’ to ‘half of the families in Deer Lake’ (Business Owner, Town Council Member, and Resident, 5 December 2016; EDO, 8 November 2016). Most participants also suggested that FIFO workers were moving into Deer Lake and that they were coming primarily from the Northern Peninsula region. It was suggested that a lack of employment opportunities in this region meant that many individuals chose to engage with FIFO (EDO, 8 November 2016; Business Owner, Council Member, and Resident, 5 December 2016). In addition, these individuals were choosing to move to Deer Lake because it was more convenient to access the airport and they could avoid a five or six hour drive up the Northern Peninsula to get home (EDO, 8 November 2016; St. Anthony Town Council Representative, 18 November 2016). It was also suggested by some interview and census participants that individuals may be more likely to engage with FIFO work if they have another family member (e.g. father, father-in-law) also doing FIFO work (Business Owner, Council Member, and Resident, 5 December 2016). In this way, it was suggested that FIFO may be an intergenerational phenomenon in Deer Lake and that FIFO workers may choose to maintain their place of residence in Deer Lake because of these familial connections.

The door-to-door census was designed to determine whether Deer Lake is a source community. In addition, it was hoped that the census data would address the validity of perceptions expressed about FIFO in Deer Lake. The following sections will discuss findings from the door-to-door census in greater detail. Section 4.2.1 discusses Deer Lake as a place of permanent residence for mobile workers. Section 4.2.2 discusses motivations for FIFO workers who moved to Deer Lake from another community to reside in Deer Lake. Section 4.2.3 discusses motivations for FIFO from Deer Lake to continue living in Deer Lake. Finally, section 4.2.4 offers a summary of why FIFO workers choose to live in Deer Lake.

4.2.1 Deer Lake's resident FIFO population

The findings of this study suggest that Deer Lake is a place of permanent residence for FIFO workers and their families. Of the 224 completed surveys, 70 households were found to have one or more resident FIFO worker. In addition, of the 50 respondents who chose not to answer the survey but did identify whether anyone in their home engaged with FIFO work, seven households had one or more resident FIFO worker. Overall, of the total 274 respondents, 77 households had one or more resident engaged with FIFO work, representing 28% of addresses surveyed (see Figure 9). This indicates that 28% of all new homes and homes renovated for more than \$20,000 in Deer Lake between 2000 and 2016 have a FIFO worker living in them. As such, FIFO workers reside in Deer Lake and this has contributed to its function as a source-hub community.

Figure 9: Census respondents by engagement with FIFO



With Deer Lake confirmed as a source-hub community, other questions on the census were designed to shed light on why Deer Lake developed into a source-hub community. As mentioned earlier, Storey (2016) states that natural FIFO hubs emerge when they have an airport infrastructure to conduct mobile workers between their host and source communities. The Australian literature has also identified that factors like affordable housing and access to services can assist a hub community in developing as a source community by attracting FIFO workers and their families as permanent residents (Haslam McKenzie, 2011). The following sections offer insight into the motivations for FIFO workers who chose to relocate to Deer Lake from outside communities and the motivations for FIFO workers from Deer Lake to continue to live in Deer Lake. It is hoped that these findings will be meaningful in contributing to discussion around how source-hub communities are formed and how they operate.

4.2.2 Moving to Deer Lake

As part of the door-to-door census, respondents were asked to indicate whether or not they relocated to Deer Lake from somewhere else. Those indicating that they had relocated were then provided with a selection of motivations that may have contributed to their decision to move to and continue to live in Deer Lake. Respondents were asked to select all motivations that applied them and could volunteer alternate motivations in the ‘other’ category.

Of the 224 completed surveys, 152 respondents had moved to Deer Lake from another community in NL or from elsewhere in Canada. With regards to motivations for their decision to move to Deer Lake, respondents selected Other, Family or friend connections, and Access to the Deer Lake Airport most often (see Figure 10). Within the Other category, Employment and perception of Deer Lake as Home (responses included: ‘my hometown’, ‘where I grew up’, or ‘home’) were volunteered most often as motivations (see Figure 11).

Figure 10: Motivations for relocating to Deer Lake, all census respondents

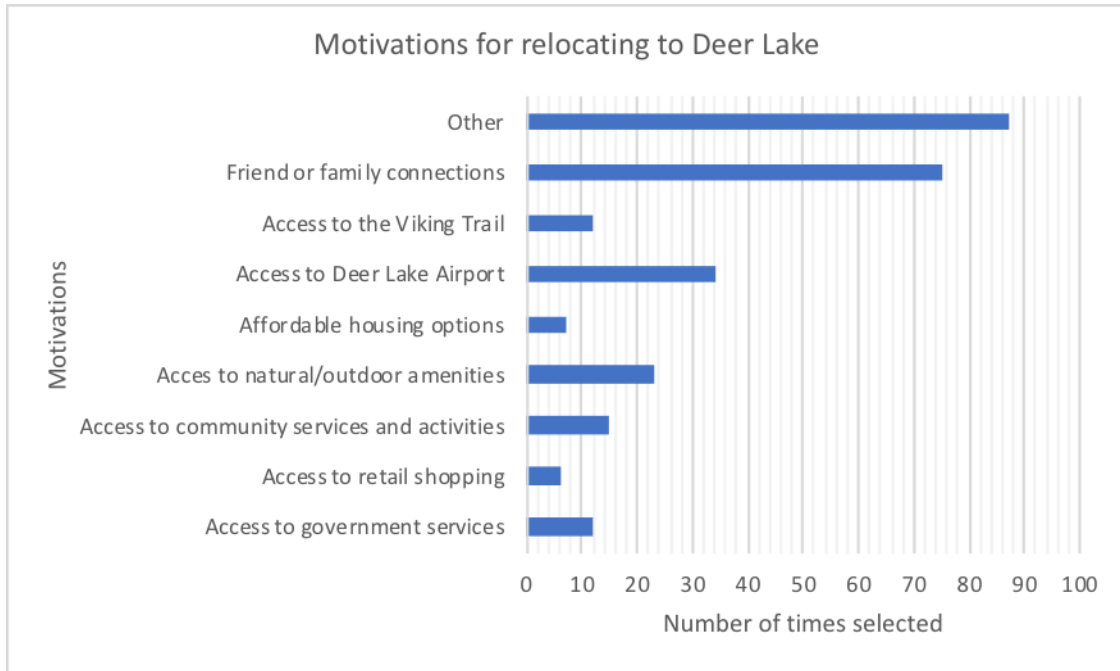
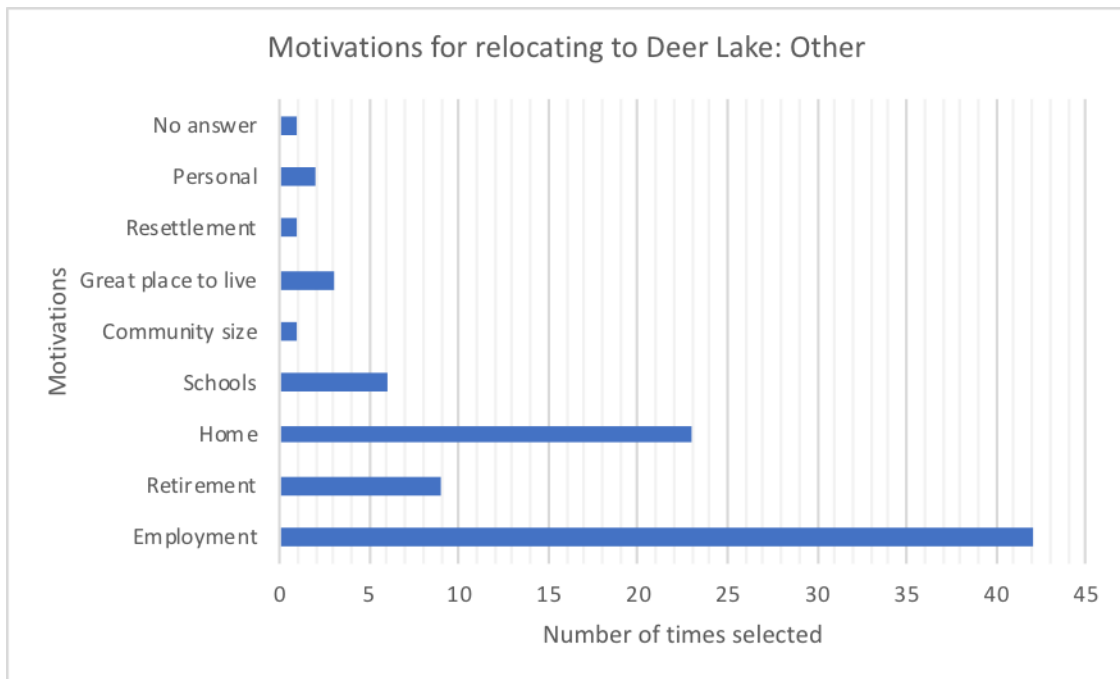


Figure 11: Motivations for relocating to Deer Lake, 'Other' category expanded, all census respondents



When FIFO respondents who had relocated to Deer Lake from another community are isolated, data from the census revealed that motivations of these individuals were largely consistent with those of the larger population who relocated to Deer Lake. For the 70 respondents of the 224 completed surveys who engaged with FIFO work, 48 had moved to Deer Lake from another community within the province or within Canada. Motivations most often selected within this group, as can be seen in Figure 12, were: Other, Friend and family connections, and Access to the Deer Lake Airport. Further analysis of the 'Other' category (see Figure 13) reveals Employment and Home as the motivations volunteered most often.

Figure 12: Motivations for relocating to Deer Lake, FIFO respondents

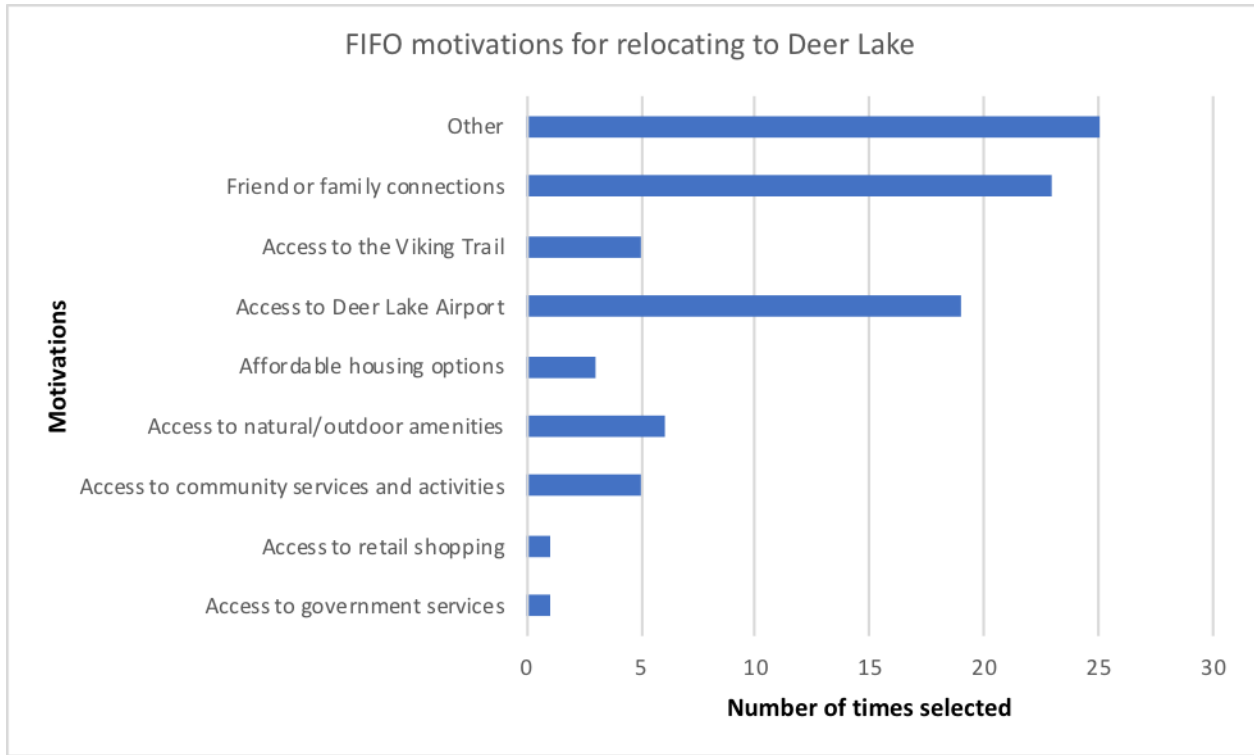
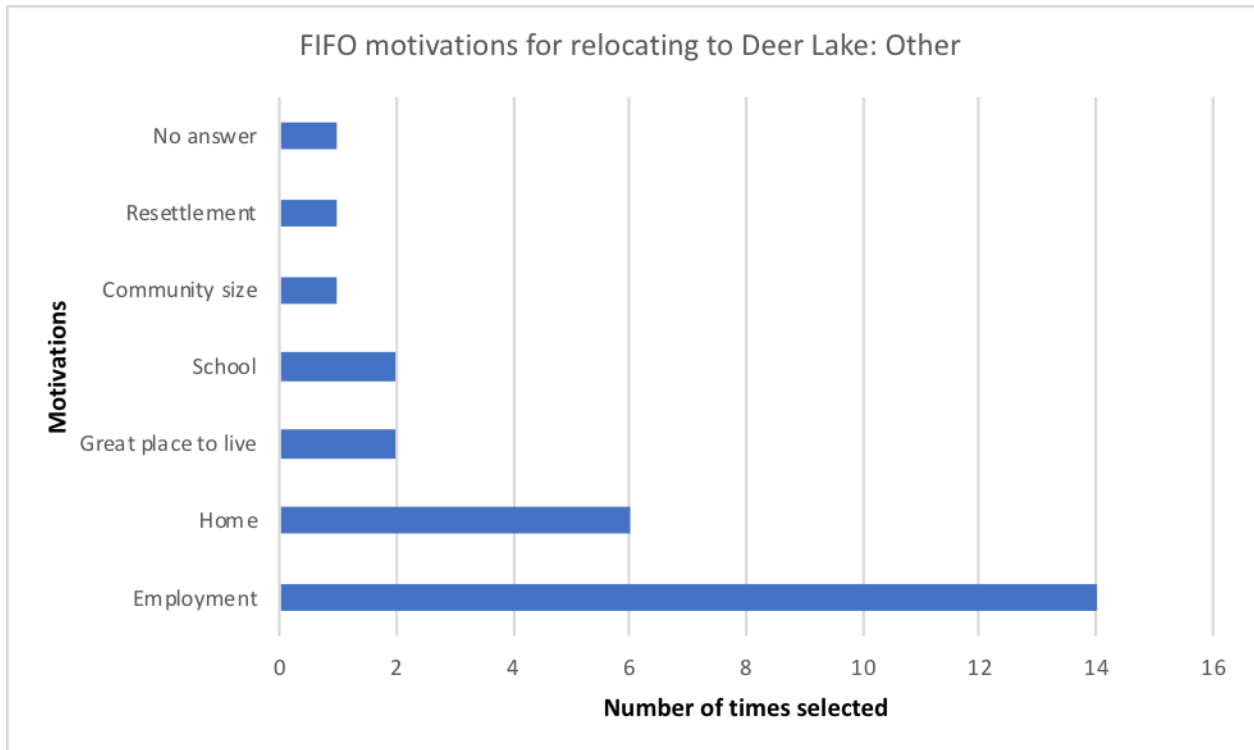
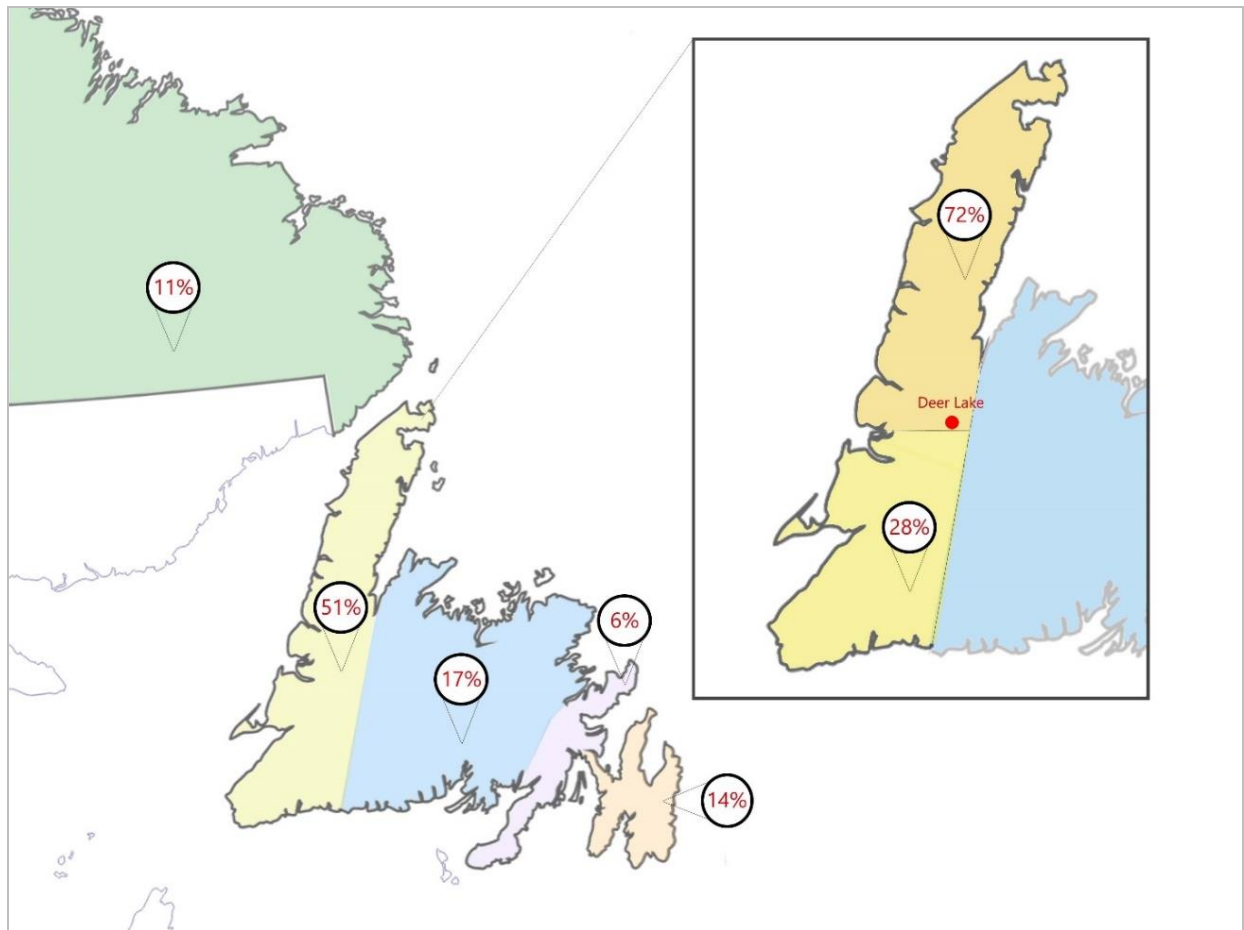


Figure 13: Motivations for relocating to Deer Lake, FIFO respondents: 'Other' category expanded



In addition to motivations, this study hoped to reveal from where FIFO workers were moving to Deer Lake. As can be seen in Figure 14, FIFO respondents who relocated to Deer Lake came primarily from the western region and, within the western region, primarily from the Northern Peninsula. This confirms the suspicions of stakeholders and study participants who suggested that most FIFO workers moving to Deer Lake were from the Northern Peninsula region; however, it also demonstrates that Deer Lake has drawn FIFO residents from across the province. The remaining 14 census respondents with a FIFO worker at their address that had not relocated to Deer Lake from another community within NL had relocated from outside of the province but from within Canada. Of these respondents, the majority had relocated to Deer Lake from Alberta, while others came from Ontario, Nova Scotia, New Brunswick, and Manitoba. In this way, Deer Lake operates as a source community by attracting FIFO residents from elsewhere in the province and elsewhere in the country to live.

Figure 14: Former region of residence for FIFO workers who relocated to Deer Lake from another community in NL



4.2.3 Staying in Deer Lake

Of the same 224 respondents, 60 had not moved to Deer Lake from another community. The reasons why these respondents chose to stay in Deer Lake followed a similar trend to those who had moved to Deer Lake from another community. As can be seen in Figure 15, the motivations for remaining in the community selected most often were Other and Friend or family connections. Within the ‘Other’ category, Deer Lake as Home was the most cited motivation for staying, with Employment second (21 respondents, second overall to Friend or family connections) (see Figure 16).

Figure 15: Motivations for staying in Deer Lake, for those who did not move in from another community, all census respondents

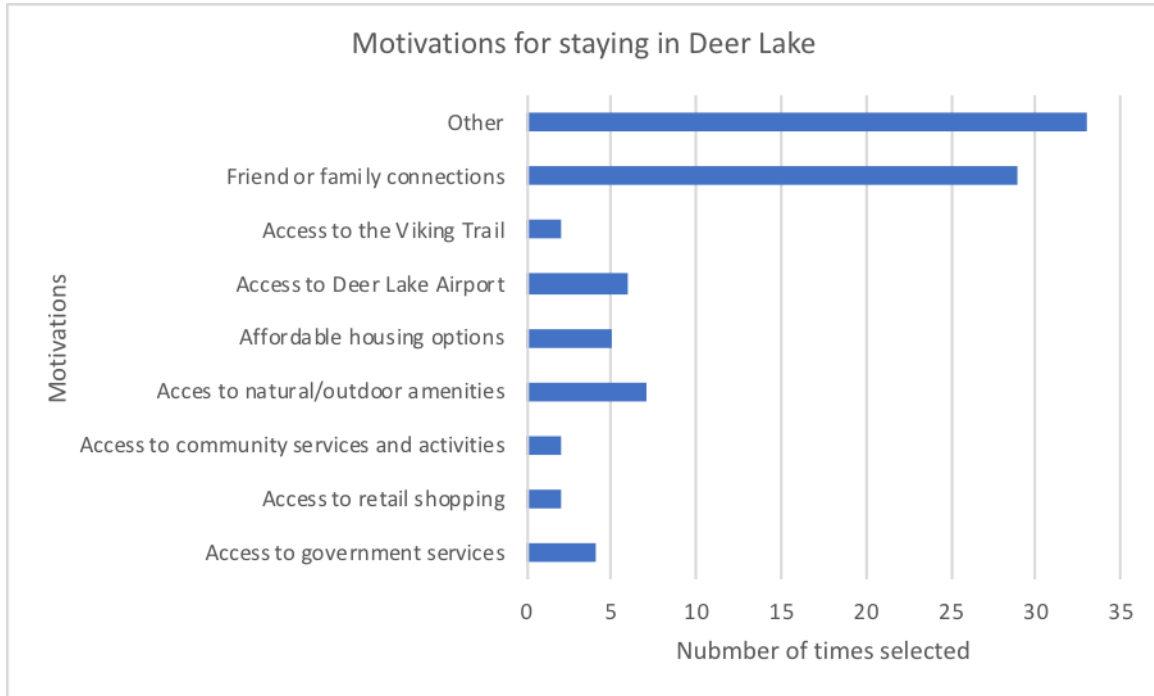
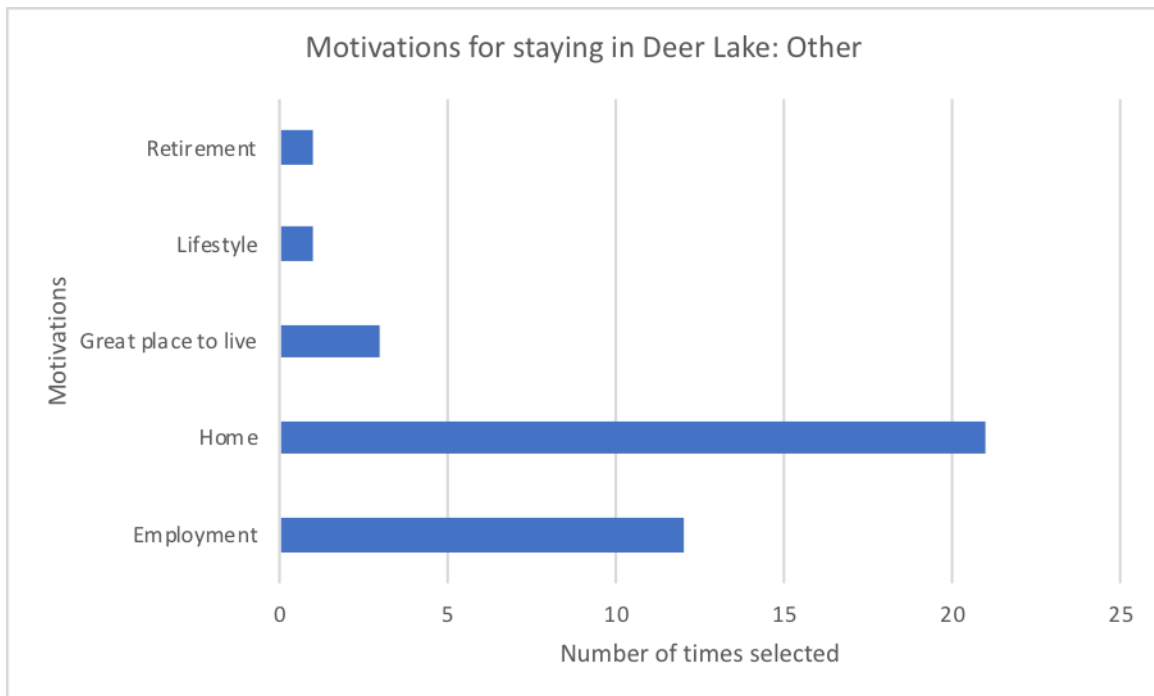


Figure 16: Motivations for staying in Deer Lake, 'Other' category expanded, all census respondents



Of these 60 respondents originally from Deer Lake, 19 were FIFO households. The motivations for staying in Deer Lake selected by the FIFO group had less variation than the FIFO respondents who relocated to Deer Lake. As can be seen in Figure 17, Friend or family connections and Other categories (especially home) were selected most often, with Access to natural/outdoor amenities and then Access to the Deer Lake Airport next; however, Access to the Viking Trail, Access to community services and amenities, and Access to retail shopping were not selected as motivations at all by those who grew up in the community. As can be seen in Figure 18, a breakdown of the 'Other' category also revealed Home as the most often noted motivation for remaining in Deer Lake within this group, unlike FIFO respondents who moved to Deer Lake from elsewhere. While sense of home was volunteered as a motivation by both groups, it seems that employment-related motivations were more often cited by FIFO workers who relocated to Deer Lake than it was for those who did not move to Deer Lake from elsewhere, which, perhaps, is not surprising.

Figure 17: Motivations for staying in Deer Lake, FIFO respondents

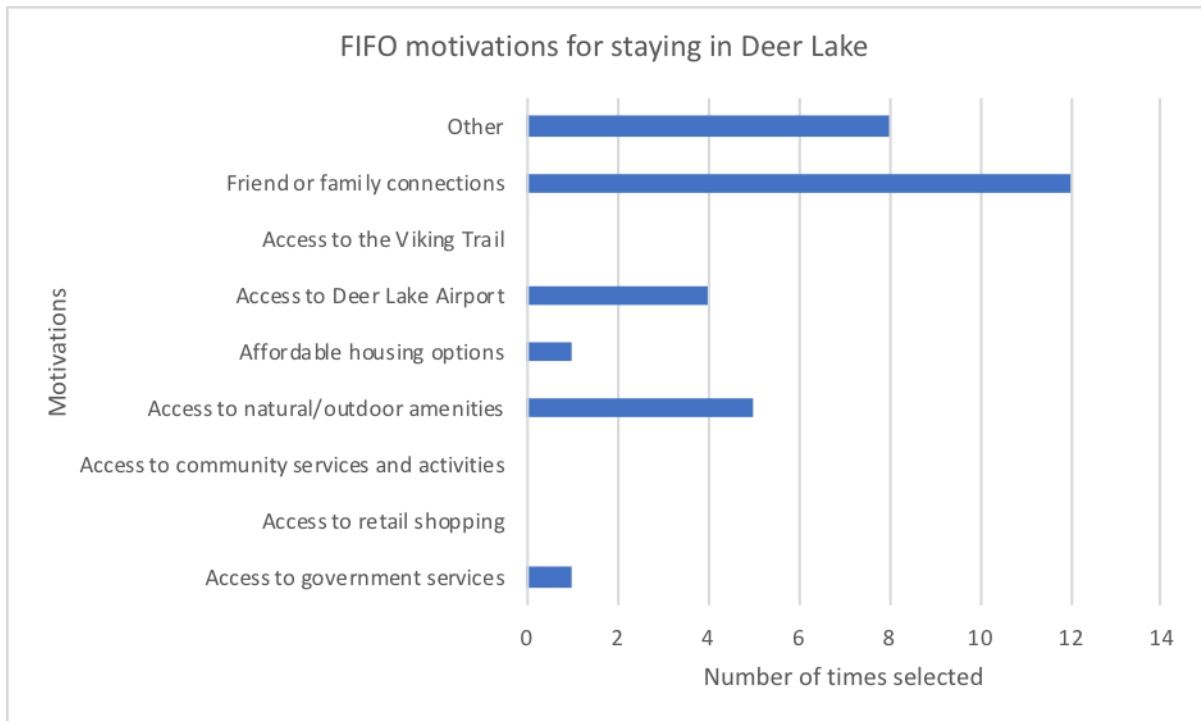
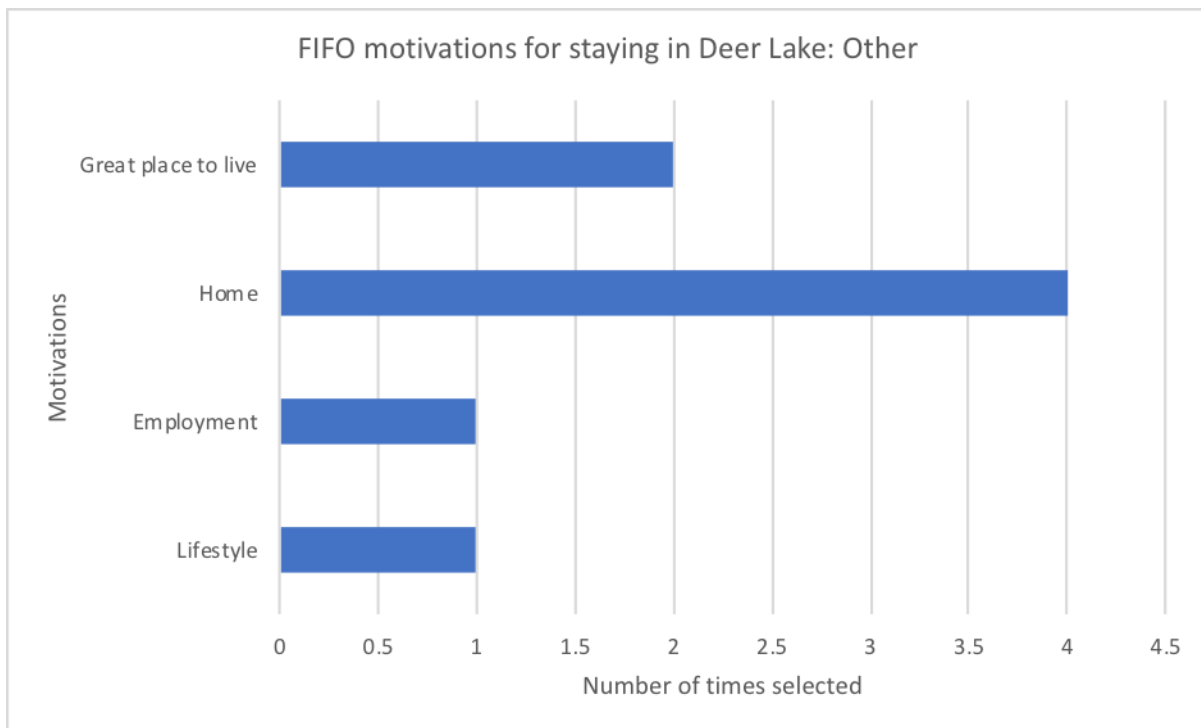


Figure 18: Motivations for staying in Deer Lake, for FIFO respondents: 'other' category expanded



4.2.4 Motivations for Living in Deer Lake – Summary

With regards to motivations for living in Deer Lake, the census data reveals that FIFO workers who moved to Deer Lake from other communities were most often motivated to move to Deer Lake because of Friend or family connections, Access to the Deer Lake Airport and, within the ‘Other’ category, Employment. FIFO workers who did not move to Deer Lake from another community (i.e. grew up in Deer Lake) were most often motivated to stay in Deer Lake because of Friend or family connections, Access to natural and outdoor amenities, Access to the Deer Lake Airport and, within the ‘Other’ category, because Deer Lake is Home.

Findings also confirm that FIFO workers have moved to Deer Lake from all regions of the province. However, the majority of FIFO workers moved to Deer Lake from within the western region of Newfoundland and, within that group, from the Northern Peninsula. This suggests that a lack of employment opportunities in the Northern Peninsula coupled with the convenience of living near the Deer Lake Airport may be encouraging the relocation of FIFO workers from this region to live in Deer Lake, confirming the views of stakeholders in both regions (EDO, 18 November 2016; Business Owner, Council Member, and Resident, 5 December 2016; St. Anthony Town Council Representative, 18 November 2016).

Access to an airport infrastructure was valued by FIFO workers as a motivation for both continuing to live in and relocating to Deer Lake. This suggests that the development of Deer Lake into a source community is linked to the presence of the Deer Lake Airport. This is consistent with the development of natural hubs, as described by Storey (2016), and with findings in the Australian literature (Haslam McKenzie 2011, Victoria Department of Transport 2012). However, these findings also suggest that, unlike the Australian experience, access to affordable housing and services are likely not significant factors in the development of Deer

Lake as a source community. More important to resident FIFO workers are Friend and family connections, Employment, and sense of Home.

4.3 Deer Lake: A Source-Hub Community

Deer Lake is a source-hub community. FIFO workers living in outside communities do use the Deer Lake Airport to get to and from their place of employment. In addition, 28% of all new and significantly renovated homes in Deer Lake have one or more FIFO workers living in them. As will be discussed further in Chapter 5, interview findings suggest that Deer Lake may derive economic benefits from FIFO workers through taxation and local spending. However, the presence of FIFO workers may also be linked to potential socio-cultural challenges, such as changes in family and community dynamics, and increases in poor lifestyle choices.

The Town of Deer Lake also appears to have drawn FIFO workers and their families to live in the community from outside communities, as has been seen in Australia source-hubs. Of the 70 census respondents who had a FIFO worker living at their address, 48 (69%) had relocated to Deer Lake from another community and, 34 of these had relocated from another community in NL. It is important to note that FIFO workers were not the only census respondents who had relocated to Deer Lake from another community. Of the 224 full census respondents, 150 listed a former location of residence on their survey (67%). Of these, respondents, 113 had relocated to Deer Lake from another community in NL, 31 (27%) had moved from another province or territory within Canada, and 8 (7%) had moved to Deer Lake from another country. Of the 113 respondents who moved to Deer Lake from another community in NL, 58% moved from the western region, 20% moved from the central region, 11% moved

from Labrador, 8% moved from the Avalon, and 4% moved from the eastern region. Of those that moved to Deer Lake from within the western region, 57% moved to Deer Lake from a community north of Deer Lake (including the Northern Peninsula region), and 43% moved from a community south of Deer Lake.

These findings demonstrate that the growth of the Town of Deer Lake cannot be attributed to FIFO alone. It appears that FIFO is one of several forces of mobility influencing the growth of the town, including, as suggested by stakeholders, an aging demographic moving to the Town for access to services/recreation and younger families moving in to access services/recreation for their children (EDO, 5 October 2016; Business Owner, Town Council Member, and Resident, 5 December 2016; Stakeholder and Resident, 10 May 2017). These findings also show that the proportion of FIFO respondents that relocated to Deer Lake from another community in NL is slightly higher than the proportion of all respondents who relocated to Deer Lake from another community in NL. This may suggest that more FIFO workers from the Northern Peninsula have chosen to live in Deer Lake because they want to avoid the long drive between home and their point of departure/arrival, as suggested by several interviewees. Perhaps this is an indicator of a lack of local employment opportunities in the Northern Peninsula making FIFO work more appealing and/or viable, again, as suggested by some study participants (5 October 2016). Unfortunately, the data available cannot verify such conclusions, but it raises questions for further research regarding the reasons individuals decide to engage with FIFO work and how they organize their lives around FIFO operations as a result.

As a final point, several interview participants felt that the source-hub concept seemed appropriate for Deer Lake given Deer Lake's history and present identity as a transportation hub in NL. Some participants felt the commuting lifestyle was ingrained in NL culture, particularly

outport culture. Work in the fisheries often required fisherpeople, typically men, to be away at sea for long periods of time (Treehouse Family Resource Centre Representative, 10 May 2017). According to one participant, working away is “in their culture. Especially in outport, a lot of outport communities, if you didn’t fish, you know, you just went away for work.” (Business Owner, Town Council Member, and Resident, 5 December 2016). An example was provided by this participant of older family members who did not work in fisheries but chose to work away in mines in the UK. One participant suggested that due to its location and position as the hub of western Newfoundland, the presence of FIFO workers in Deer Lake seems a natural fit and perhaps this made Deer Lake an anomaly in that it was more likely to become a FIFO source-hub than other airport communities in the province (Business Owner, Town Council Member, and Resident, 5 December 2016; EDO, 8 November 2016). Another participant pointed specifically to the history of Deer Lake, suggesting that Deer Lake was in some ways built by people who went away for work and that the airport has simply made it easier for current generations of residents to do so:

“You have to understand that Deer Lake came from people who came from away, historically. So there’s a few generations and almost all those generations have had people who worked away from home. So it’s kind of in the DNA in a sense...there’s a lot of blue collar workers here and blue collar workers, when they worked in the logging industry for example, they were in woods camps for weeks at a time. When they were in the fisheries they were away for weeks at a time. They used to go to Boston one time, used to go to Toronto one time. It’s just, actually, when paid flights came in it just made it much easier for people to commute. And to maintain their base here.” (Business Owner, Town Council Member, and Resident, 5 December 2016).

Taken together, these accounts demonstrate a familiarity with the phenomena of long-distance commuting in Deer Lake, with FIFO perceived as a more recent, and perhaps modern, extension. One observation from the door-to-door census described by research assistants distributing the census was that the majority of residents with whom research assistants communicated did not need the concept of FIFO explained to them. They knew what FIFO was and that it was present in the community, even if their perceptions of the impacts differed. This public consciousness of FIFO is further evidence of the presence and, possibly impacts, of FIFO in the community.

Overall, this study demonstrates that Deer Lake is a source-hub community. It operates as a source-hub, having FIFO workers as residents and FIFO workers from outside communities using the Deer Lake Airport. It has also attracted residents from other communities in NL and from other provinces to live in Deer Lake. Findings in this Chapter have confirmed the natural development of Deer Lake into a source-hub community, in-migrants being encouraged to move to Deer Lake because of Family and friend connections, Access to the Deer Lake Airport, Employment, and sense of Home. Finally, when compared to factors influencing the development of source-hub communities in Australia, findings here reveal that, while airport access remains significant in Australian source-hub communities and Deer Lake both, there are other motivations and drivers for individuals to move to source-hubs that appear to be context-specific. For instance, in Australian communities, affordable housing and service access were noted as potential drivers for the development of source-hubs, while in Deer Lake social bonds and attachment to place appear to be more significant in influencing the decisions of FIFO workers to live in Deer Lake.



Passengers boarding at the Deer Lake Airport, 2016

Chapter 5: Identifying the Impacts of FIFO in Deer Lake – Results and Discussion

This chapter offers results and discussion of findings responding to objectives 2 and 3 of the study: 2) to identify built space in Deer Lake impacted by FIFO E-RGM in 2000-2016, and 3) to identify additional impacts of FIFO E-RGM in the community. Findings are significant in that they contribute to the broader understanding of the role that built space plays in source-hub communities and, reciprocally, how built space in these communities may be impacted by the presence of FIFO workers/residents. These findings also highlight additional socio-economic and environmental impacts associated with FIFO in Deer Lake identified by participants. It was beyond the scope of this study to confirm these additional impacts; however, they may be significant as areas of future research and have been included in this paper to that end. Section 5.1 focuses specifically on the built space impacts of FIFO including residential and infrastructure/service impacts while 5.2 outlines additional impacts of FIFO in Deer Lake.

5.1 Built Space Impacts of FIFO

Prior to beginning this study, stakeholders in Deer Lake pointed to built space change as evidence of the presence of FIFO workers in the town. Larger, new homes built in Deer Lake, especially in Nicholville (see Figure 19), were presented as evidence of the presence of FIFO workers based on the perception that those residents who worked away were making more money than those employed locally. This perspective initially inspired the focus of this project – to study the built space impacts of FIFO, with a particular emphasis on residential built space such as homes and garages. The analysis of residential built space change is offered in section 5.1.1. Additional built space changes participants associated with FIFO are recorded in 5.1.2.

Finally, the perceptions of interview and census participants on other impacts in Deer Lake associated with FIFO, such as socio-cultural and environmental, are recorded in 5.2.

5.1.1 Residential Built Space Impacts



Newer homes in Deer Lake, April 2017

Understanding housing change in Deer Lake represents one of the initial motivations behind this study. Stakeholders with the Town indicated that FIFO workers were moving to Deer Lake, particularly from the Northern Peninsula, and using ‘Alberta Money’, or money made while working away in the Alberta oil sands (or possibly elsewhere), to construct new houses, especially in Nicholville (5 October 2016). For instance, according to one participant:

“I find you can drive around town and see the physical evidence of [FIFO].

Because these are high-paying jobs people were working for, they’re sending their

money back home... so you look around, some of the houses you're seeing are products of FIFO. Directly related.” (EDO, 8 November 2016)

In this quote, it is suggested that FIFO workers were going to Alberta, making high salaries and spending that money to build large homes in the town. It was also suggested that evidence of FIFO workers in the town included the presence of “bigger garages, and more of them” (EDO, 8 November 2016) to house boats, quads, skidoos, and other recreational vehicles, or ‘toys’, being purchased by FIFO workers. Observations such as these helped frame the door-to-door census in that the census would address the question of how many new and/or significantly renovated homes in Deer Lake could be attributed to FIFO work – in other words, to what extent and in what ways has money coming into the community via FIFO affected the built space in Deer Lake directly?

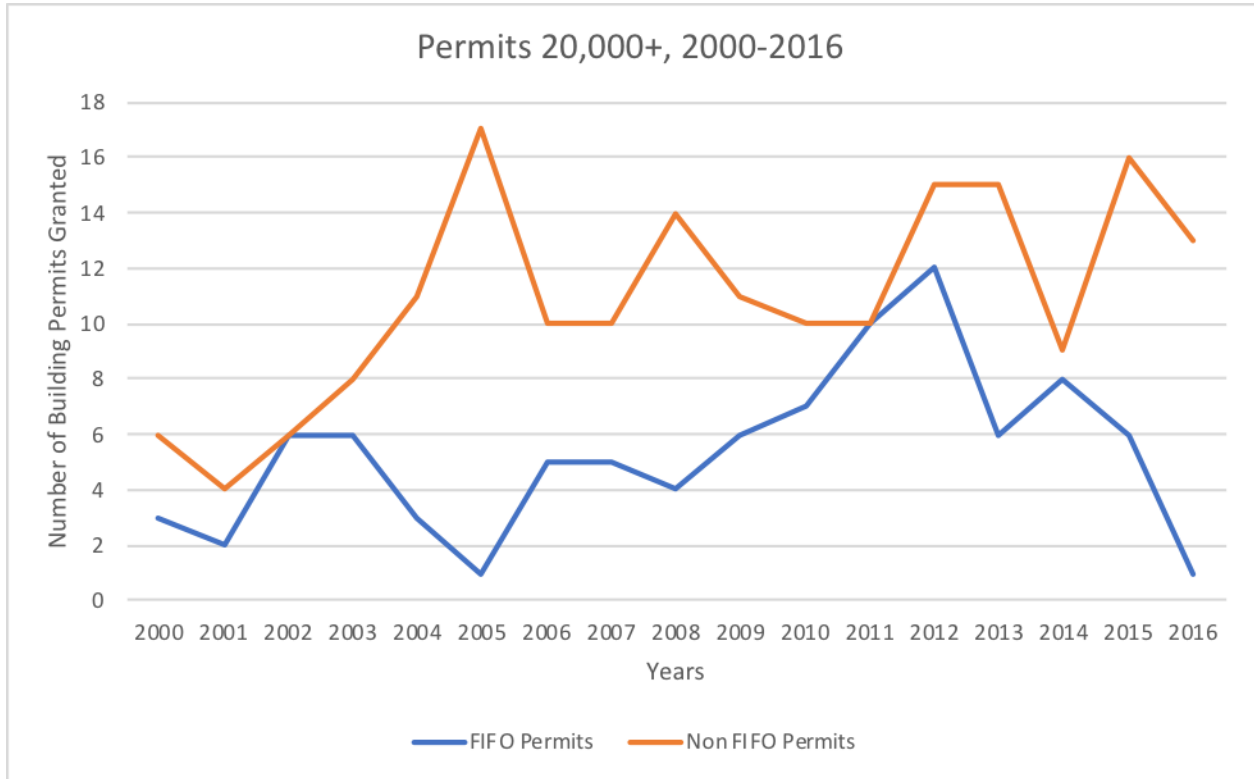
Figure 19: Map of the Town of Deer Lake indicating select neighbourhoods



The door-to-door census was distributed to 556 homes – all new homes and homes with renovations over \$20,000 in the Town of Deer Lake. Of these, 224 full surveys were completed, and an additional 50 individuals chose to answer indicating whether or not someone in their home was a FIFO worker, as discussed in Chapter 3. 276 building permits requests over \$20,000 were submitted 2000-2016 for the 274 respondent addresses. Of these permits, 179 were for new dwellings, 46 were for renovations, 31 were for extensions to dwellings, and 20 were for garages and/or sheds.

To analyze the impact of FIFO workers specifically, respondent addresses were separated by whether anyone living at the addresses was a FIFO worker. 185 permits were submitted for non-FIFO addresses and 91 were submitted for FIFO addresses. As can be seen in Figure 20, building permits were submitted by respondents to my census in each of the years between 2000-2016; however, the number of building permits submitted varied by year for both FIFO and non-FIFO respondents. A cyclical trend appears in the data on non-FIFO permits – it is not clear whether this is a pattern, as numbers are small. When compared to the price of crude oil and number of interprovincial employees in Canada (see Figure 7), it appears that the years when FIFO workers submitted requests for building permits in Deer Lake followed a similar upwards trend from 2000-2012. The price of oil began to drop after 2013 and the number of building permits submitted by FIFO workers declined after the peak in 2012 and before oil prices collapsed. It is difficult to draw conclusions from the data, but it appears FIFO workers may have been submitting permit requests when the price of oil was high and, presumably, when more jobs were available in Alberta.

Figure 20: Building Permits over \$20,000 in Deer Lake, 2000-2016; FIFO and non-FIFO, by year



With regards to types of permits granted for over \$20,000, the permits for the total census population fell into 4 categories: 1) new dwelling, 2) renovations/general repairs, 3) extension to dwelling, 4) garage/shed. 689 permits were recorded for buildings. Of these 478 were for new dwellings, 69 were for renovations, 70 were for extensions, and 65 were for garages/sheds (see Figure 21). Building permits submitted for addresses which responded to the census also fell into each of the abovementioned categories; however, proportionately, 65% of addresses had permits for new dwellings, 46% had permits for renovations to existing dwellings, 31% had permits for extensions to existing dwellings, and 7% had permits for new garages/sheds (Figure 22).

Figure 21: Total census population, building permits by type

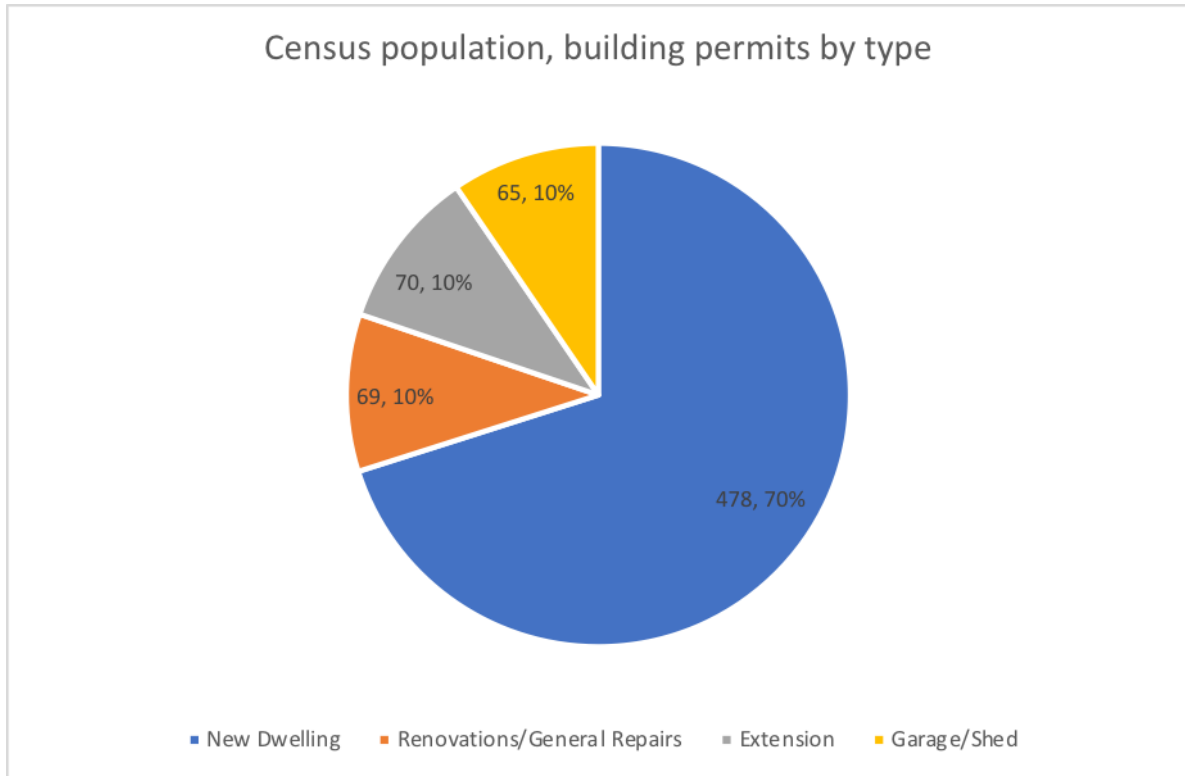
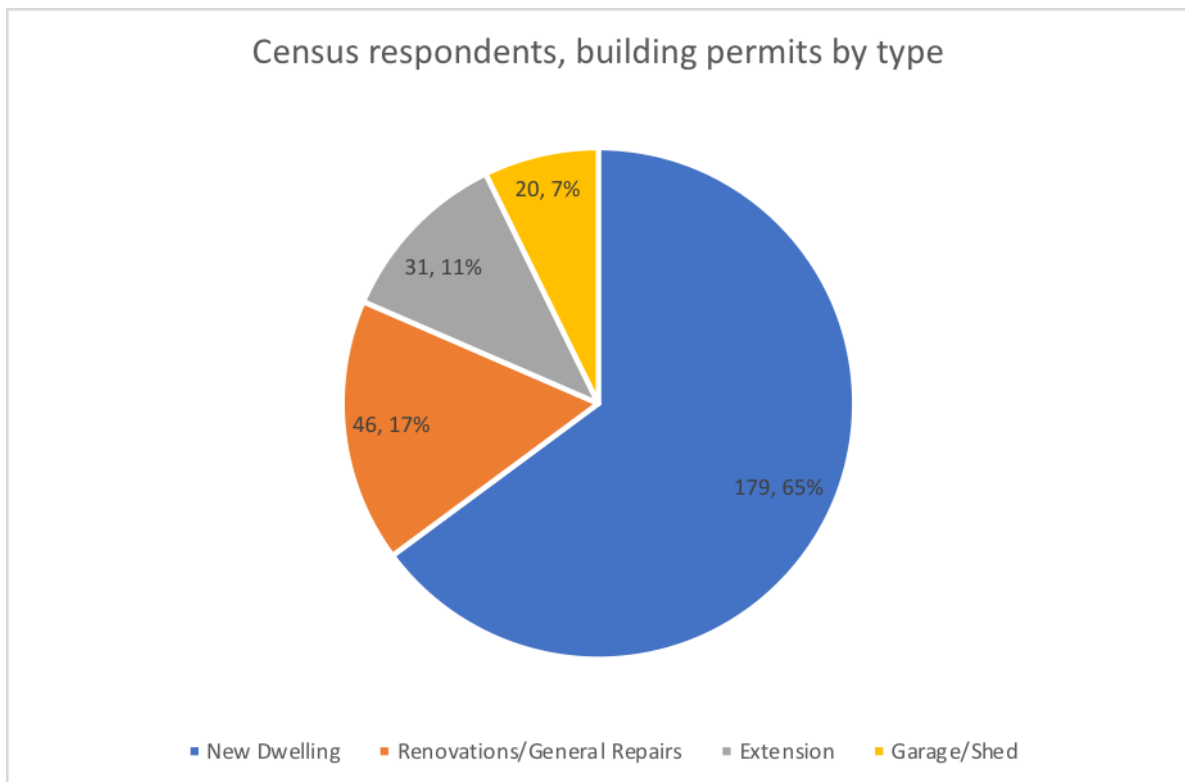


Figure 22: Census respondents only, building permits by type



With regards to non-FIFO and FIFO respondents, though more building permit requests were submitted by non-FIFO respondents than FIFO respondents overall, the proportion of dwelling, renovation, extension and garage/shed permits submitted by each group was quite similar. For non-FIFO addresses (Figure 23) 72% of permits submitted were for new dwellings, 13% renovations, 10% for extensions and 5% for garages/sheds. For FIFO addresses (Figure 24), 72% of permits submitted were for new dwellings, 7% for renovations, 15% for extensions and 6% for garages/sheds. This finding was contrary to initial expectations. Based on stakeholder suggestions, with estimates like “80% of new homes” were built by FIFO workers (Business Owner, Town Council Member, and Resident, 10 May 2017), it was expected that FIFO workers would have submitted more building permits for new homes than non-FIFO respondents. However, of the proportion of new dwelling permits submitted for FIFO and non-FIFO addresses 2000-2016 was the same. As such, FIFO workers were not more likely to build new homes versus expand or renovate them than non-FIFO respondents, based on the sample.

Figure 23: Non-FIFO building permits, 2000-2016

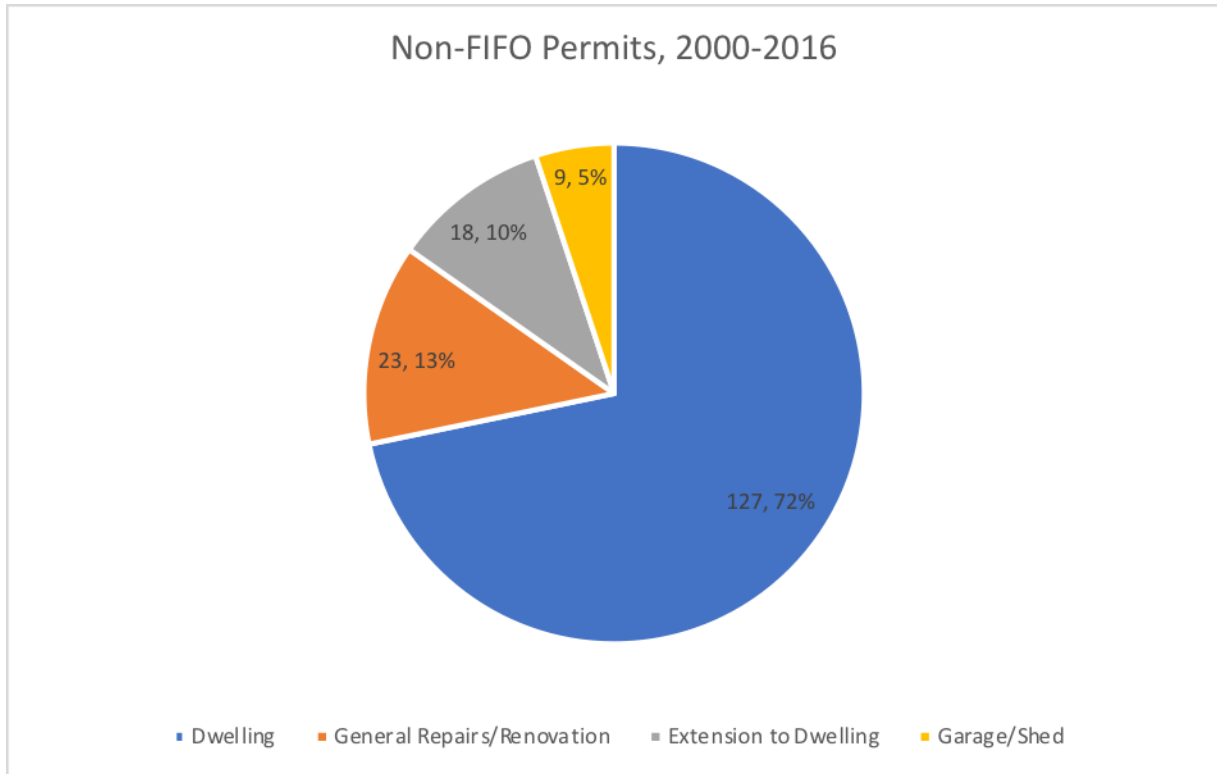
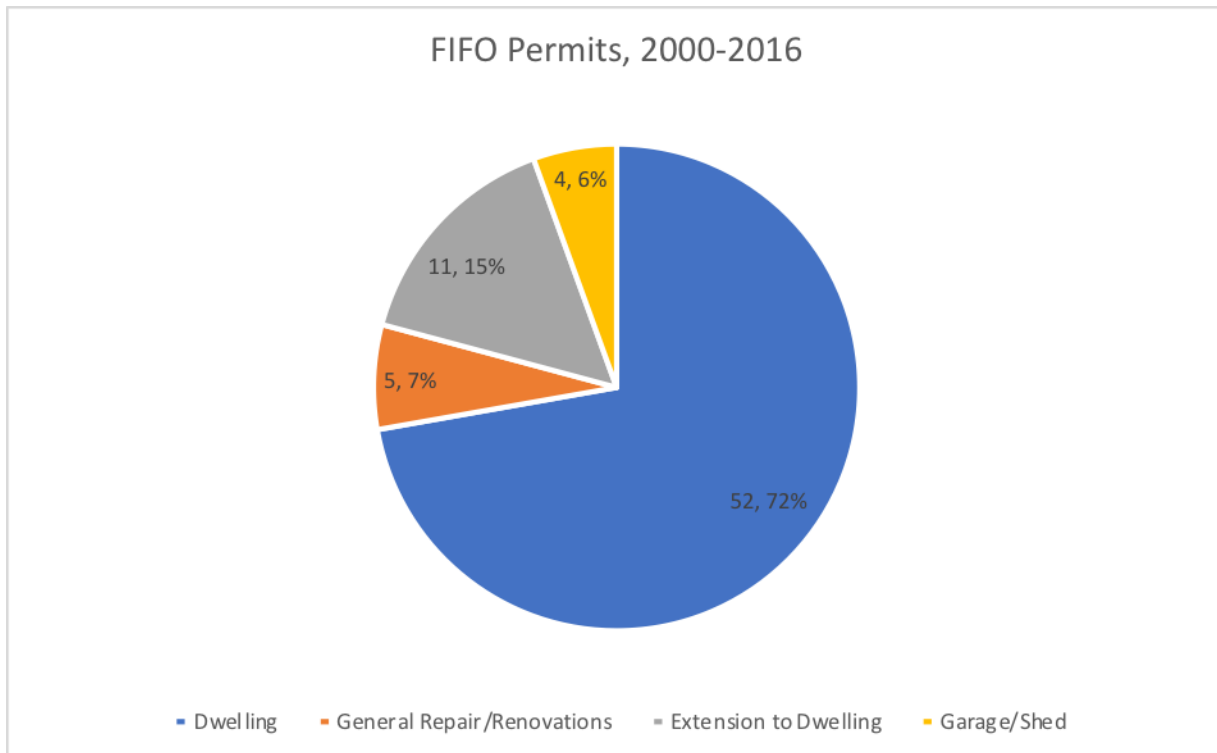


Figure 24: FIFO building permits, 2000-2016



With regards to cost, again, the cost of dwellings, renovations, extensions and garages/sheds between FIFO and non-FIFO were quite similar. Permits granted to FIFO workers for new dwellings and extensions were valued higher on average than those submitted by non-FIFO (see Figure 25); however, as can be seen in Table 6, the most expensive homes were not FIFO addresses. Census data for the most expensive home in my sample showed that the respondent was employed in an occupation in Business, finance and administration (National Occupation Classification category). Census data for the most expensive garage in the sample showed that the respondent was not employed in 2016. Renovation and shed permits granted to non-FIFO addresses were also valued higher on average than those submitted by FIFO workers. While it was expected that FIFO workers spent more on their homes on average, and my findings suggest that they did (see Figure 25), it was also expected that FIFO workers were responsible for building the most expensive homes and garages based on interviewee perceptions. These findings, however, suggest otherwise.

Figure 25: Non-FIFO and FIFO building permits, average cost

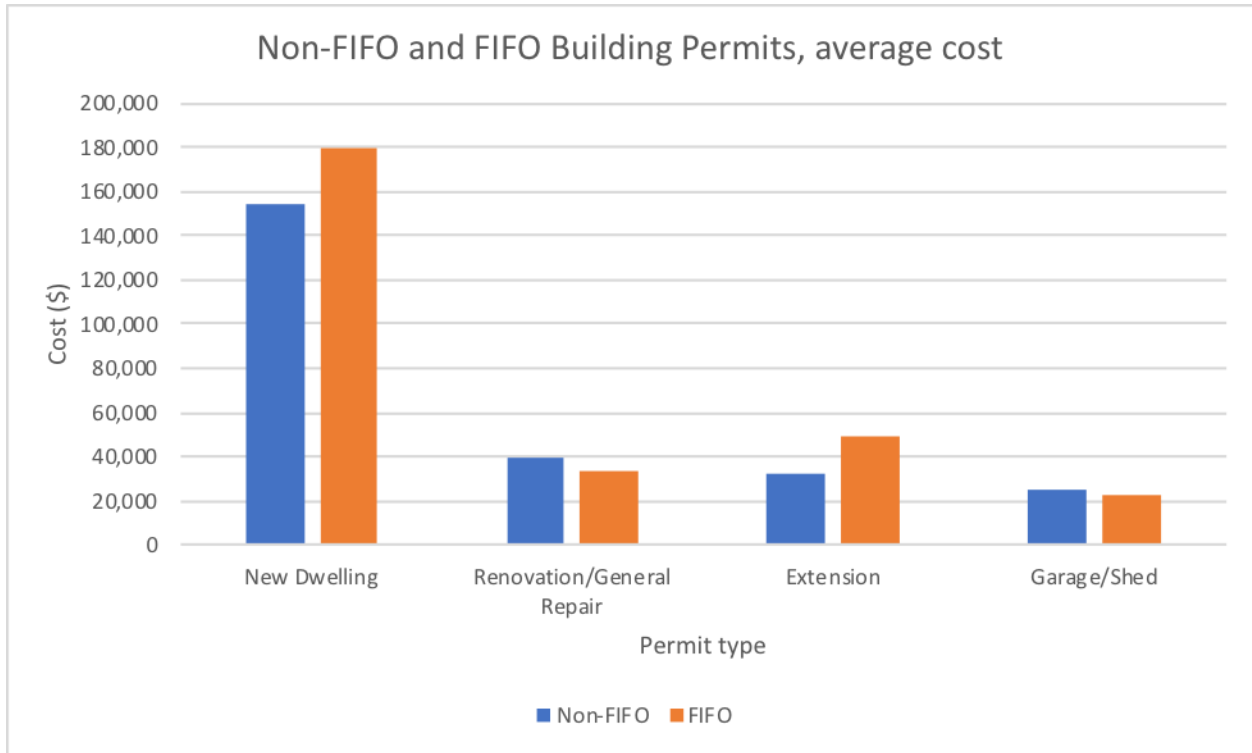


Table 6: Average, median, max/min estimated cost for building permits, non-FIFO and FIFO

	Non-FIFO Average Estimated Value (\$)	FIFO Average Estimated Value (\$)	Non-FIFO Median Estimated Value (\$)	FIFO Median Estimated Value (\$)	Non-FIFO Max/Min Estimated Value (\$)	FIFO Max/Min Estimated Value (\$)
New Dwelling	154,807	179,500	150,000	187,500	400,000/ 40,000	338,000/ 56,000
Renovation/General Repair	39,609	34,000	35,000	40,000	92,000/ 20,000	45,000/ 20,000
Extension	32,300	48,818	28,000	25,000	80,000/ 20,000	160,000/ 20,000
Garage/Shed	24,688	22,500	20,000	22,500	67,000/ 20,000	25,000/ 20,000

On the door-to-door census, respondents were asked to volunteer demographic information including household income. It was hoped that a comparison of FIFO incomes and incomes of non-FIFO residents would help determine whether the household incomes of FIFO workers are typically more than non-FIFO residents. Unfortunately, only 142 of the 224 full survey respondents chose to answer the household income question. This makes the response rate 25.5%, which is less than the response rate to the full survey. Still, as can be seen in Figure 26 and Figure 27, two-thirds of non-FIFO respondents had a household income of \$99,999 or less while almost three-quarters of FIFO worker respondents had a household income of \$100,000 or more. This suggests that FIFO worker households do have higher household incomes than non-FIFO households; however, it is important to note that many respondents for both FIFO and non-FIFO fell into the \$100,000-149,999 range (see Figures 26 and 27).

Figure 26: Non-FIFO respondents, by household income

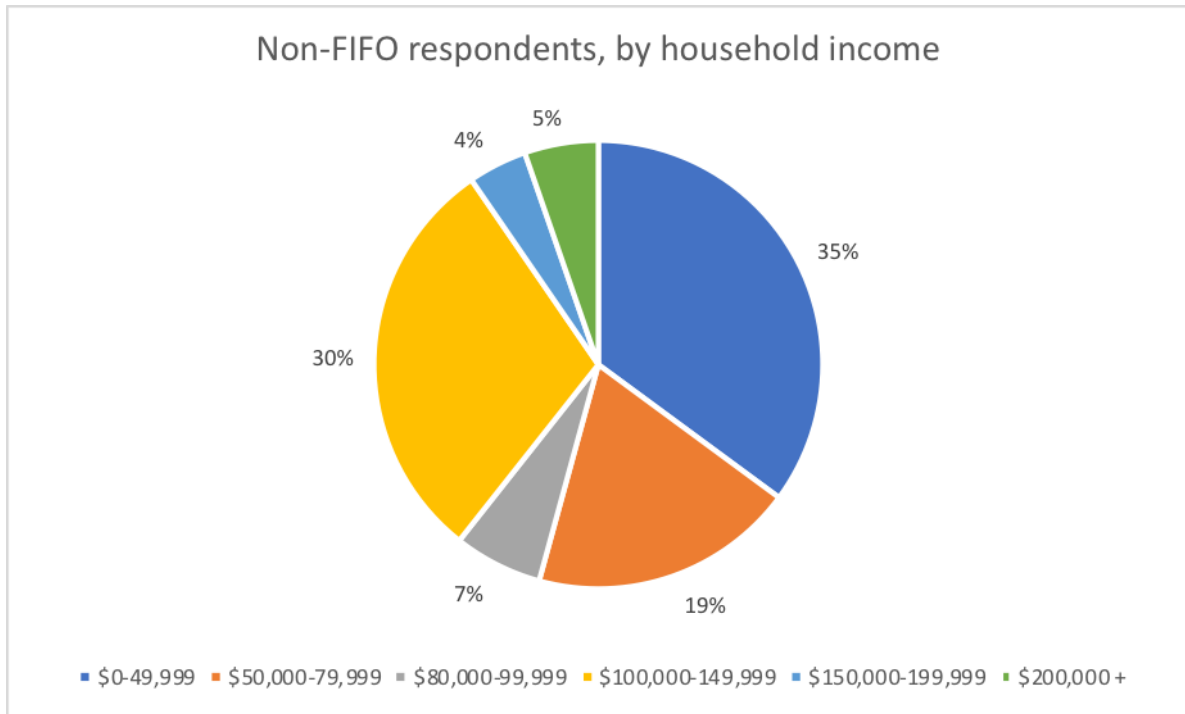
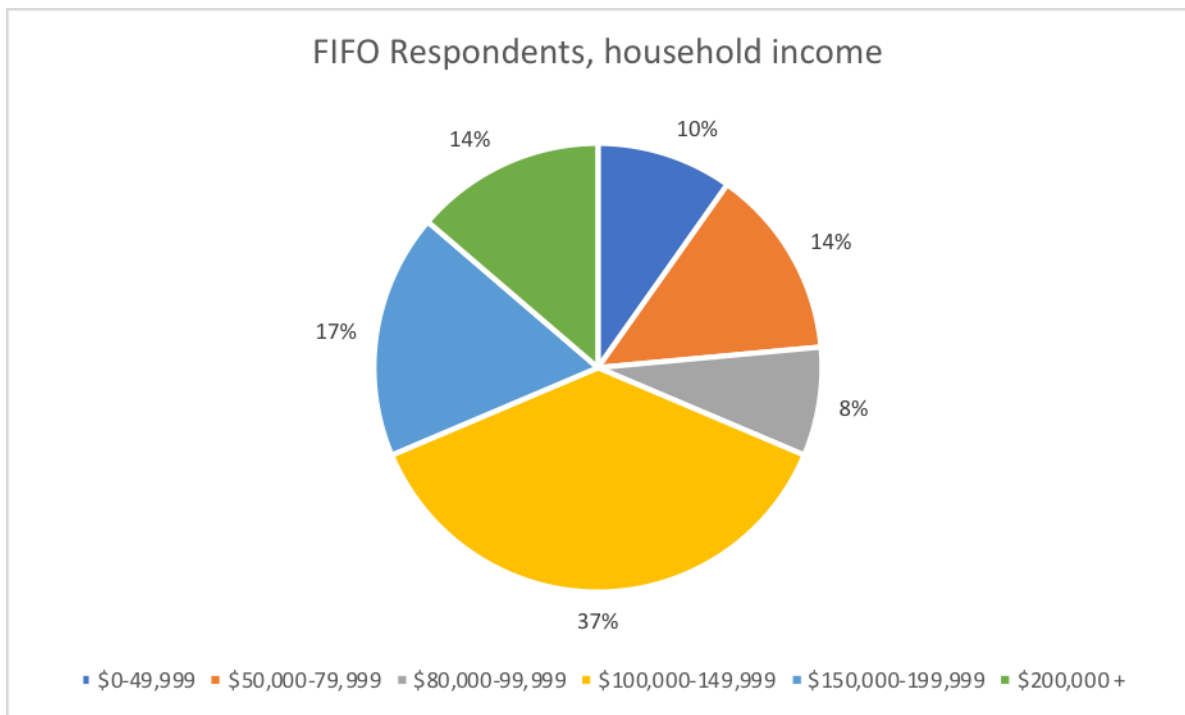


Figure 27: FIFO respondents by household income



To get a better sense of the sectors in which FIFO and non-FIFO respondents were employed, and perhaps to help explain why FIFO workers were not the only respondents moving into Deer Lake and building new, expensive homes in the town, an analysis of respondents by employment sector was completed. In the door-to-door census, respondents were asked to select whether they were employed or not and in which sectors they were employed. These responses were then correlated with whether they worked FIFO, as can be seen in Figure 28. As is demonstrated in this chart, the majority of FIFO census respondents were employed in mining, quarrying, oil, and gas, while the majority of non-FIFO respondents indicated that they were not employed. For census respondents who were not employed (76 respondents) 52 were over the age of 60, as can be seen in Figure 29. As such, it is possible that many of my respondents are retirees who moved to Deer Lake to build their ‘dream homes’ as suggested by some interviewees (EDO, 8 November 2016; Stakeholder and Resident, 10 May 2016). FIFO respondents were found to be employed in a variety of sectors. Mining, quarrying, oil and gas as well as Construction were sectors indicated most often by FIFO respondents; however, FIFO workers were also employed in Transportation and warehousing, Agriculture, forestry, fishing, and hunting, Educational services, healthcare, social assistance, and Other.

Figure 28: Census respondents by employment sector

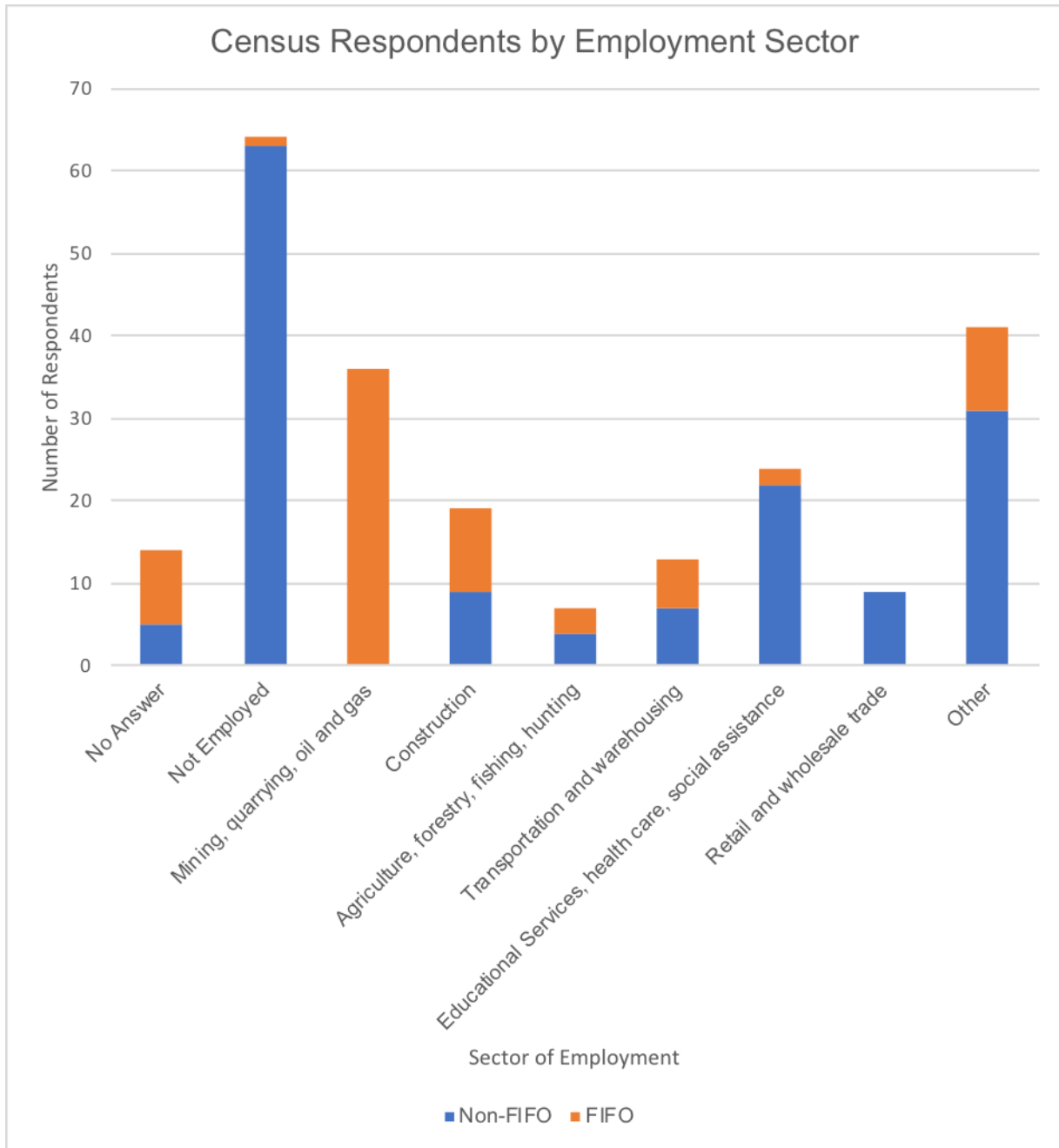
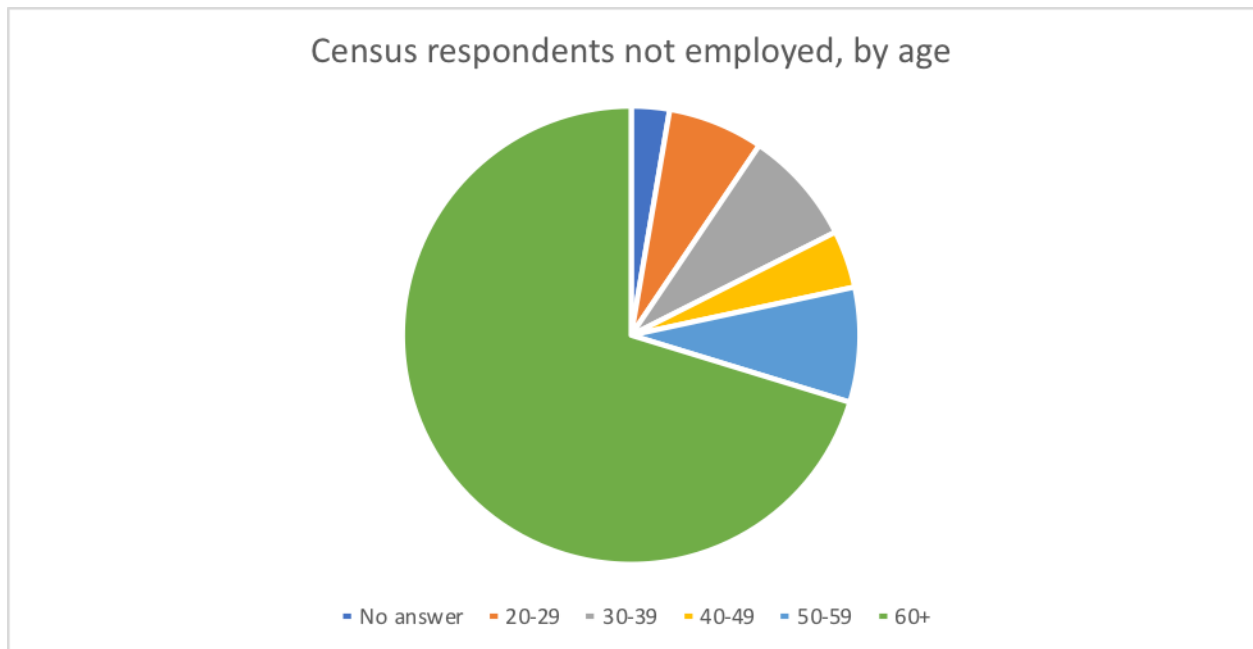


Figure 29: Census respondents not employed, by age



It was also suggested by stakeholders associated with the Town and some census respondents that FIFO workers tended to live in particular areas of Deer Lake. This was further explained as being due to the availability of vacant land in these areas coupled with the perceived tendency of FIFO workers to build new rather than renovate existing homes (EDO, 5 October 2016; Business Owner, Town Council Member, and Resident, 5 December 2016). Based on these suggestions, I decided that to further understand the impact of FIFO workers on built space, an analysis of where FIFO workers live in Deer Lake would also be valuable – has the town grown in particular areas due to demand for housing by FIFO workers?

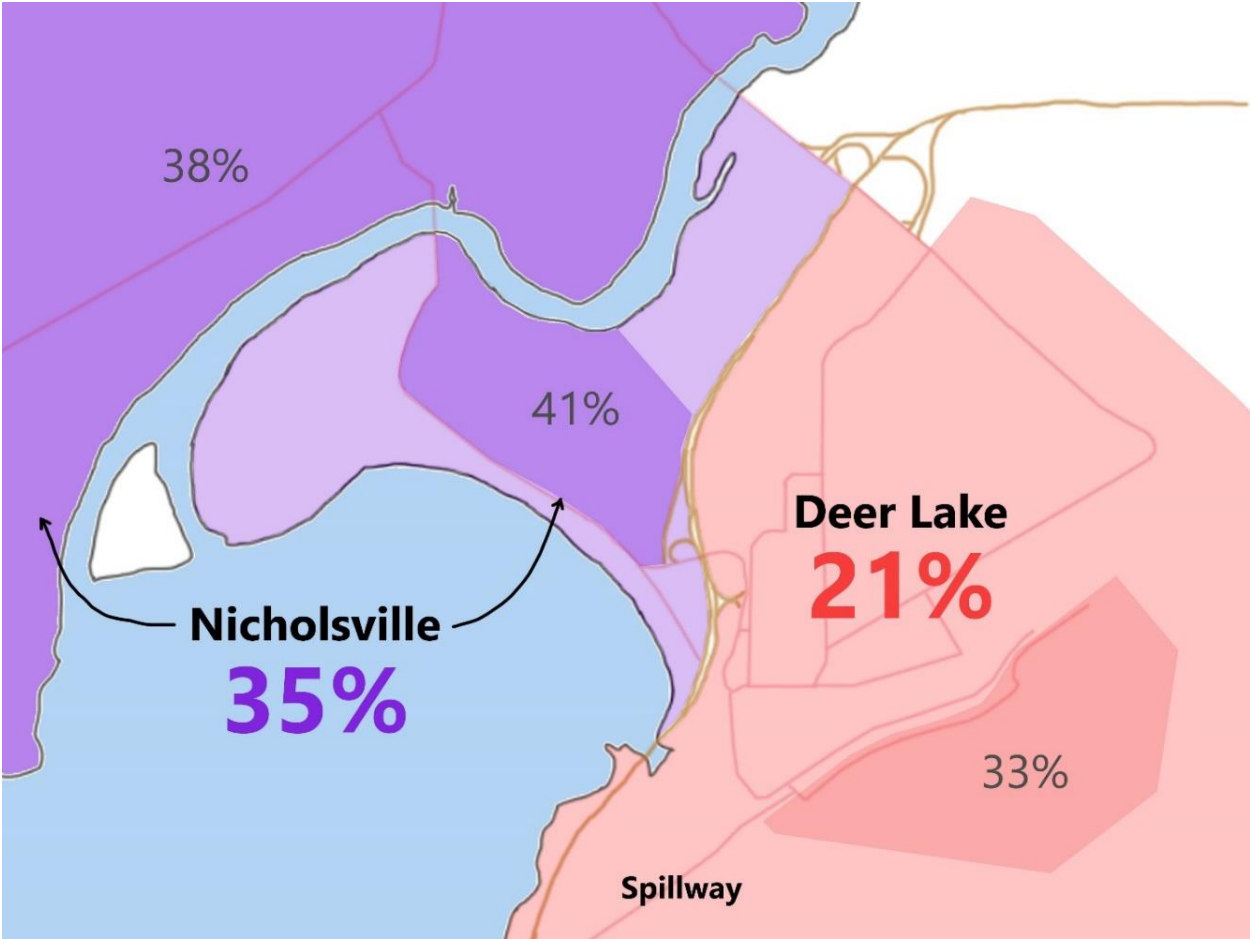
Nicholsville was pointed out frequently by stakeholders with the Town and some census participants as the neighbourhood where more FIFO workers lived. Nicholsville is located north of the Trans-Canada Highway (TCH) and was once a separate town from Deer Lake (see Figure

18). In that last couple of decades, Nicholsville has seen significant residential growth, especially along the Upper Humber River. In particular, a new subdivision in Nicholsville called ‘Nichols Landing’ was suggested as an area with high concentrations of permanent resident FIFO workers. Again this was linked to more vacant land being available in Nicholsville as opposed to in ‘New Town’ Deer Lake (Business Owner, Town Council Member, and Resident, 5 December 2016). It was hoped that the door-to-door census would help identify any areas in Deer Lake where FIFO addresses were more concentrated to try and understand if FIFO work has impacted the physical footprint of the town.

As can be seen in Figure 30, the census revealed that there were more FIFO addresses in Nicholsville (35%) than in the rest of Deer Lake (21%). The census also revealed that FIFO addresses were more concentrated in particular areas – along the south shore of the Upper Humber River in Nicholsville (41%), along the north shore of the Upper Humber River and Goose Arm Rd, referred to by study participants as ‘across the river’ or ‘Goose Arm’ (38%), and in central Deer Lake in an area referred to by participants as ‘Deer Lake’ or ‘across the tracks’ (33%). As expected, the highest concentration of FIFO addresses was in Nicholsville; however, FIFO addresses were not found to be the majority of any one neighbourhood in Deer Lake. Of significance, however, is that 76% of respondents in Nichols Landing subdivision in Nicholsville had a FIFO worker living at their address. As such, it appears true that FIFO workers and their families are moving into newer housing developments in Nicholsville, as suggested by stakeholders, and in particular, to Nichols Landing. There was no evidence to suggest that the same is happening in other new subdivisions in Deer Lake. For instance, stakeholders suggested that two new mini-home developments in Deer Lake, Boulos Place and Woodford Drive, were largely inhabited by retirees and first-time home-buyers, rather than FIFO workers (EDO, 18

November 2016). This was supported by the data collected. 45% of respondents to the door-to-door census in Boulos place were not working or retired and only 10% of respondents were FIFO workers. 78% of respondents in Woodford Drive were not working or retired and 7% were FIFO workers. Again, this highlights that FIFO is one of several patterns of mobility impacting the growth of Deer Lake overall, but that FIFO workers have tended to locate in specific parts of the town.

Figure 30: Census respondents, concentration of FIFO workers by neighbourhood



By being one driver in the development in newer subdivisions in Deer Lake, FIFO has also impacted the physical footprint of the town. This is because the development of subdivisions and other built spaces has contributed to the growth of Deer Lake's urban surface area. Analysis and compiling of aerial images from the Town of Deer Lake and the Map Room at Memorial University and Google Earth shows that Deer Lake's footprint grew significantly between 2001 (Figure 31) and 2016 (Figure 32). Figure 33 highlights areas of significant growth and was developed through comparison of Figure 31 and 32 in consultation with staff at the Town of Deer Lake.

Figure 31: Composite aerial image of Deer Lake, 2001



Figure 32: Aerial Image of Deer Lake (Google Maps, 2016)



Figure 33: Areas of significant growth in Deer Lake between 2001-2016



Figure 33 shows that the majority of new growth in Deer Lake has occurred in Nicholsville (right of the Trans-Canada Highway in Figure 33). Areas of growth in Deer Lake proper (left of the Trans-Canada highway in Figure 33) are the mini-home developments Boulos Place and Woodford Drive. Census data determined that housing growth in Boulos Place and Woodford Drive is attributed primarily to non-FIFO workers and retirees while housing growth in Nicholsville is attributed in part to FIFO workers. Again, this highlights that there are other drivers, such as the rural to urban migration of retirees to Deer Lake, that are also responsible for the growth of Deer Lake's urban surface area. However, it appears that FIFO has played a significant role, especially in the growth of subdivisions in Nicholsville.

Overall, this study has found that FIFO has impacted some residential built space in Deer Lake. FIFO workers are not responsible for building more new dwellings than non-FIFO worker respondents, but it appears that FIFO workers have impacted the spatial footprint of the town by building homes in particular areas of Deer Lake, such as in Nicholsville. These findings confirm that FIFO workers are building new houses and that the majority of FIFO respondents did live in Nicholsville; however, these findings also challenge some community perceptions. For instance, findings do not indicate that FIFO workers are building more homes than their non-FIFO counterparts (see Figure 23 and Figure 24). And while FIFO workers do appear to spend more on their new homes on average, my FIFO respondents did not build the most expensive new dwellings or garages in my census sample (see Figure 25 and Figure 26). In addition, more of my FIFO census respondents were found to live in Nicholsville, but FIFO respondents also lived in each of the neighbourhoods surveyed. In this way, it appears that FIFO has impacted residential built space in Deer Lake, but the scale of that impact may be over and underestimated in some

regards. Still, it appears that FIFO is an important driver in residential growth and property investments in Deer Lake.

5.1.2 Additional Built Space Impacts

In addition to residential built space, FIFO has contributed to other built space changes in Deer Lake. It is important to note that study participants rarely attributed these additional built space changes to FIFO workers alone. Often, these changes were framed as part of the overall growth of Deer Lake of which FIFO workers moving to the town and spending money in the town are part. As such, the impact of FIFO on built spaces was often perceived as direct at the individual scale – certain changes to one individual property, for instance, could be attributed to a FIFO worker and their family; however, what an individual FIFO worker did was not often felt to be translatable to non-residential infrastructure development. These types of developments were more often attributed to the growth of Deer Lake in general. Keeping this in mind, other built space changes, which emerged as part of this research, are: airport, streets and infrastructure, new businesses, wharves, and landscape.

1) Airport

As discussed in Chapter 4.1, growth and infrastructure change at the Deer Lake Airport has been attributed, in part, to a FIFO workforce. According to many interview and census participants, the Deer Lake Airport had been “boosted” by use of the facilities by FIFO workers (EDO, 8 November 2016). Over the last 10 years, the Deer Lake Airport has seen increased demand for services and has responded with the following

infrastructural changes: expansion and renovation of Air Terminal Building (2007); new car park facility (2007); new 8,005 ft. runway (2010); and, long-term parking expansion (2011, 2012, 2014) (Deer Lake Airport Representative, 24 November 2016). According to a Deer Lake Airport Representative (24 November 2018), the Airport has worked to consistently provide better facilities, more services, and increased efficiency to meet the growing demand for services, of which FIFO is a part.



View of the runway from the Air Terminal Building welcome area (2016)

2) Streets, sewers and related infrastructure

As part of the residential development in Deer Lake, the town has seen new streets and sewer infrastructure built to services these new homes. These new service infrastructures were put in by residential developers and subsequently serviced by the town (EDO, 8

November 2016). According to one participant, “there’s 7 new streets in Deer Lake, which is a big difference for a town with a population of 5000 people” (Resident and Town Representative, 8 November 2016). As part of the overall growth of Deer Lake, new water and sewer lines are being updated in older parts of town and new water and sewer are being put into newer parts of town (Resident and Town Representative, 8 November 2016). As discussed above, this new housing development and related infrastructure changes are believed to be driven, in part, by FIFO workers.



New street in Deer Lake, March 2017

3) New businesses

Due to increased commuter traffic and Deer Lake’s location as a transportation hub in NL, new businesses and services have opened. Interview participants have framed this new

business and service development as a spin-off of FIFO work. As an airport town, people come to Deer Lake and use services, buy food at restaurants, and stay in local hotels while going to and coming from their flights (Business Owner, Town Council Member, and Resident, 5 December 2016). Some respondents identified new restaurants in the town as a change possibly linked to the presence of FIFO workers moving through the town. According to one participant:

“...there’s no doubt that what’s happening has driven the service trade as well. So you’ve got, you know, not only do you have a new hotel, and the other hotel is renovated, but you also got added restaurants and that’s directly related to the traffic that’s moving in and out of here. You’ve also got, you know, gas stations that have been renovated, competing with stores and so on, and more and more fast food outlets too” (Deer Lake Airport Representative, 24 November 2016).

A new Holiday Inn express hotel was opened in Deer Lake in 2011. According to a Business Owner, Town Council Member and Resident, all three hotels in Deer Lake were “booming” in 2016 (5 December 2016). Business at the hotel is linked by this participant to airport traffic. According to a hotel representative in Deer Lake, the Holiday Inn, on average, sees 25% more visitors than the hotel in Corner Brook (7 July 2017). It is presumed that the airport traffic contributes to this difference with the total make visitor make up including tourists, business travelers (one-nighters), and FIFO workers (Hotel Representative, 7 July 2017). As of 2017, the Holiday Inn was planning and expansion of 40 rooms and the addition of a conference facility (Hotel Representative, 7 July 2017).

4) Wharves

The construction of new wharves along Deer Lake and the Upper Humber River was another built space impact volunteered by participants as a possible spin-off of FIFO. This study was not able to verify whether wharves were constructed by FIFO workers; however, changes in lifestyle associated with FIFO work, including purchasing of recreational vehicles, were linked to wharf construction by interview participants. According to one participant:

“10 years ago, on any given day you could count the boats, you know, very easily, what you’d see in Deer Lake. But today you’re in a lineup to get off the boat launch. You know, I’ve had to put a wharf in and leave my boat in the water cause it’s no longer an option to take it in and out of the water. It takes you an hour to get in and an hour to get out” (Business Owner, Town Council Member, and Resident, 5 December 2016).

This participant further suggested that increased money in Deer Lake and higher earnings because of FIFO work have led to purchasing of more recreational vehicles, such as sedoos and boats, that has in turn led to this increased traffic and long line-ups to launch boats at the community’s only boat launch (Business Owner, Town Council Member, and Resident, 5 December 2016). In response, homeowners with lake or river access have begun to build their own wharves so that they can keep their boats in the water (Resident and Town Representative, 8 November 2016). In fact, this demand has driven the Town to consider constructing a marina in Deer Lake (Business Owner, Council Member, and Resident, 5 December 2016). Again, this study was unable to confirm whether wharves that had been constructed were associated with FIFO properties on the Upper Humber River.

5) Landscape

Finally, respondents suggested that FIFO has altered the visual landscapes of Deer Lake. Two respondents suggested that FIFO workers building new homes has altered the character of the town in that neighborhoods that would formerly have been ‘hard parts of town’ and have now been gentrified (Business Owner, Town Council Member, and Resident, 5 December 2016; Stakeholder and Resident, 10 May 2017). A review of Deer Lake municipal documents, particularly Deer Lake’s 1976 Municipal Plan, revealed that no development had occurred along the Deer Lake beach area and most of the Upper Humber River at that time. In addition, census findings suggest that many new homes (built since 2000) have been constructed in these areas. According to one participant, some of the newly developed areas along the river were not developed before because these areas are in a floodplain (Business Owner, Town Council Member, and Resident, 5 December 2016). The floodplain is located primarily in Nicholsville along the beach and the south shore of the Upper Humber River (Business Owner, Town Council Member, and Resident, 5 December 2016). And so, this participant suggested that these landscapes changed significantly with recent housing developments, in part due to development by FIFO workers. Some environmental concerns were expressed about development in these areas, as discussed in 5.2.

Another participant suggested that when people started moving in and buying up the lots in these areas, the development of personal properties impacted the character of the town (Stakeholder and Resident, 10 May 2017). By landscaping their yards and incorporating the beach into their backyards, these landscape changes contributed in a small way to the Town’s strategic economic plan on trails development and beautification

(Stakeholder and Resident, 10 May 2017). In this way, as Deer Lake grows, more green spaces, parking spaces, and more connectivity between green spaces in the town are being developed. The demand for housing has been so great that the need to improve green spaces and recreational spaces has grown in parallel because these services are what a growing, livable community demands (Stakeholder and Resident, 10 May 2017). Census findings suggest that this growth is due, in part, to FIFO workers.

Participants also expressed that the style of home being built by FIFO workers was different than older homes in the community. Often the home of FIFO workers, particularly after the 2012 boom in Alberta, were larger, more ‘lavish’ or ‘extravagant’, sometimes built on smaller lots (EDO, 8 November 2016; Business Owner, Town Council Member, and Resident, 5 December 2016). Sometimes these homes would also feature large garages to house the recreational vehicles purchased by mobile workers (EDO, 8 November 2016). Findings from the door-to-door census do not support many of these perceptions. As mentioned in section 5.1.1, for example, FIFO workers did not build the most expensive home or garage in Deer Lake, though they do spend more on their new homes, on average, than non-FIFO workers. This suggests that inflated expectations of the ability and/or willingness of FIFO workers to spend money, as noted by McKenzie et al. (2014) in their study of source communities in Australia, may also be present in Deer Lake.



Homes in Nicholsville of different styles and sizes, June 2016

Overall, study findings suggest that FIFO has impacted built spaces in Deer Lake. FIFO workers, by building and renovating homes, garages and building extensions in the town have altered Deer Lake's spatial footprint while contributing to the growth of new neighbourhoods, such as Nichols Landing in Nicholsville, and housing changes in older neighbourhoods. In addition to this, FIFO may have also helped to fuel changes in airport infrastructure, street and sewer infrastructure, new business development, wharf infrastructure development, and landscape change in Deer Lake. Again, it is important to note that FIFO is not the only driver of built space change in town. Census and interview participants also noted that rural to urban migration of older residents for service access has also contributed to the growth of the Town.

5.2 Additional Community Impacts

This chapter responds to objective 3 of this research project: to identify additional (beyond landscape-related) environmental and/or socio-economic impacts in Deer Lake that may be attributed to FIFO. It is hoped that these findings will be helpful in contributing to the growing literature around source-hub communities by identifying areas for further research. It is important to note that these impacts are based on the perceptions of interview and census participants only, comprised of Deer Lake residents and community leaders/stakeholders. Further exploration of these perceptions is recommended.

In addition to built space impacts, study participants voiced several socio-economic and environmental impacts they attributed to the presence of a FIFO work force in Deer Lake. These findings were sourced from both interview transcripts and census responses to the question: “Would you say that fly-in/fly-out work impacts the Town of Deer Lake?” and “If yes, how?” Seven different types of impacts were highlighted by respondents and are discussed below: Economic, Crime, Community Dynamics, Community Involvement, Family, Environmental, and Community Sustainability.

1) Economic

Of the additional types of impacts raised by participants, economic impacts were the most prevalent. The majority of respondents agreed that FIFO workers contributed economically to the community through their taxes, local spending, and large-ticket purchases such as homes (as discussed in 5.1) and recreational vehicles. They suggested that, as a result of FIFO, the general wealth of the town was greater than it would have

been otherwise (Business Owner, Town Council Member, and Resident, 5 December 2016).

Some local business representatives suggested that they had altered their businesses to keep up with demands attributed to FIFO workers. For instance, one local business owner keeps a current Alberta life insurance license, so they are able to do business (i.e. broker insurance policies) with NL FIFO workers whether they are home in NL or away working in Alberta (Business Owner, Town Council Member, and Resident, 5 December 2016). Another business owner saw increases in sales of recreational vehicles, such as skidoos, quads, and enclosed utility trailers and made changes to accommodate those needs:

“You get money into a community and, with a lot of individuals, the more money you make, the more money you spend. And then all of a sudden recreation becomes a big part of your lifestyle. And people with boats and cars and snowmobiles and ATVs and they need a trailer to tow it around in and so it’s all, it all has to do with how your market and how your residents and, you know. You know, the amount of money that each individual brings into that house, the more money you make, like I just said, the more money you make the more money you spend.” (Business Owner, Council Member, and Resident, 5 December 2016).

Despite the positive economic contribution of FIFO workers to the community, the impacts of economic growth were also suggested as placing a burden on some residents. According to some participants, FIFO has contributed to increased housing and real estate costs in the town (Resident and Town Representative, 8 November 2016).

According to one participant, housing costs are more than double what they were 10 years ago: “I bought in 2007 and I bought at what they wouldn’t even give a house away for now.” (Resident and Town Representative, 8 November 2016). Increased property values have also led to increases in property taxes which may make it more difficult for residents who don’t work away to afford to live in the town, according to census and interview participants (Resident, 8 November 2016; Business Owner, Council Member, and Resident, 5 December 2016). These financial pressures are sometimes made worse by expectations of other community members who assume that all individuals who work away “have money” when, in reality, not all FIFO workers are in similar financial circumstances. Some have their flights and accommodations paid for them, for example, and some do not (Business Owner, Town Council Member, and Resident, 10 May 2017).

Some concerns were expressed for younger generations of FIFO workers who, during their employment away, built large homes, but following the 2015 downturn, found they could no longer afford them. According to participants, the downturn saw more homes for sale because people were offloading big purchases they made during the boom (Business Owner, Council Member, and Resident, 8 November 2016; Stakeholder and Resident, 10 May 2017). However, some participants were still optimistic about real estate in Deer Lake overall, suggesting that the market was down now but that would only be temporary (Business Owner, Town Council Member and Resident, 5 December 2016).

Overall, study participants perceived the economic contributions of FIFO as primarily positive; however, there was also a perception among participants that this economic prosperity has had both positive and negative impacts on the community.

Census results indicate that FIFO workers may have higher incomes than non-FIFO residents (Figure 26) and appear to spend more on their new homes, on average (Figure 25), than non-FIFO residents. This indicates that FIFO workers may be contributing to the Town economically through local spending. Due to the high proportion of non-FIFO residents in the \$0-49,999 household income category (See Figure 26), it is also possible that increased property values resulting from new housing development (which is driven, in part by FIFO) may be a challenge for these residents. However, it is important to note that the household income question was only answered by 25% of all addresses surveyed. More targeted research on this topic is needed.

2) Crime

Linked to more wealth in Deer Lake resulting from FIFO, some participants expressed concerns about increased crime in the community such as drug and alcohol abuse. Some participants feared that parents working away might pick up addictions which could then impact their children at home and eventually filter into local schools (Business Owner, Town Council Member, and Resident, 10 May 2017). It was also suggested that not enough support is available for individuals suffering with addictions and that, as a response, more government assistance for dealing with these kinds of challenges would be necessary if FIFO were to continue in Deer Lake (Business Owner, Town Council Member, and Resident, 10 May 2017).

This research project was not able to confirm whether crime in Deer Lake had increased during 2000-2016 or if any criminal activity was linked to FIFO specifically. The potential for the exacerbation of drug and alcohol abuse in host and source

communities associated with FIFO has been noted in Australia and Canada (see Hoath & McKenzie 2013, Keough 2015, McDonagh 2007). For instance, Hoath & McKenzie (2013) found that many companies have prohibited the use of drug and alcohol consumption at the workplace and that such restrictions may encourage increased consumption of these items by workers while they are in their source communities (away from worksites); however, more research is needed to determine the validity of such perceptions and whether they are applicable in Deer Lake.

3) Community Dynamics

In terms of community dynamics, all respondents indicated that that FIFO had brought new residents to Deer Lake. Because some FIFO workers and their families were not originally from Deer Lake it seemed to some participants that they hadn't integrated into the community like native Deer Lakers (EDO, 8 November 2016). It was suggested that this lack of integration might be motivated by culture shock since individuals moving in from remote communities might not be used to Deer Lake, "a city by Newfoundland standards" (EDO, 8 November 2016). Interestingly, these perceptions do not reflect census findings, where many FIFO workers expressed that friend and family connections and sense of home brought them to Deer Lake.

At the same time there was optimism expressed about the presence of new, and often young, FIFO residents. One participant suggested that young people give the town 'a twist' and bring a 'unique character' to the town (Stakeholder and Resident, 5 December 2016). Another participant suggested that the social fabric of the community is

impacted by virtue of the town's ability to attract people to live here – expats, new residents from abroad and other parts of the island. They argued that this is an important part of a growing, vibrant community unlike some communities up the coast (Stakeholder and Resident, 10 May 2017). It was also argued that new FIFO residents, through exposure to other parts of the country and the world, bring back ideas, innovations, knowledge of best practices, and experiences and that these ideas get incorporated into new businesses and new practices. It was argued that this was a positive change in the community dynamics in Deer Lake and a significant opportunity in that knowledge from away comes back to the town and those individuals learn to expect and/or disseminate that knowledge through their networks (Stakeholder and Resident, 10 May 2017). Overall, most participants saw changes in community dynamics attributed to incoming FIFO workers as positive.

At the neighbourhood scale, the impact of FIFO was perceived as both negative and positive. On one hand, it was suggested that the presence of new FIFO residents in older neighbourhoods meant that Deer Lake residents who have lived in the town their whole lives felt they no longer knew their neighbours (EDO, 8 November 2016; Deer Lake Airport Representative, 24 November 2016). With this lack of knowing, participants suggested that changes in sense of home might occur, where suddenly everyone is locking their car doors because they don't know the people around them (Business Owner, Council Member and Resident, 10 May 2017). It was beyond the scope of this study to confirm, however, whether these types of community changes had occurred or whether any such changes are associated with FIFO workers. As with

economic expectations of FIFO workers, these perceptions may not reflect reality (Hoath & Haslam McKenzie 2013).

Commenting on another perceived change in community dynamics, according to one interview participant, in some weeks, whole streets in Deer Lake would be inhabited solely by mothers and children because all the fathers are away at work (Resident, 10 May 2017). This was corroborated by some census participants in Nichols Landing subdivision. While this dynamic might place stress on individual mothers, it also fosters a sense of community among those women who will often help each other with chores like mowing the lawn (Treehouse Family Resource Centre Representative and Resident, 10 May 2017).

For both new and long-term FIFO residents, another positive impact of FIFO in neighbourhoods, according to one participant, was that FIFO allowed workers and their families the option of maintaining a place of residence near their families in their neighbourhood, as opposed to living and working elsewhere in the province (EDO, 8 November 2016). Census participants also suggested that FIFO is seen as a necessity for many individuals who want to remain connected to their families and culture but make enough money to continue living in NL. For instance, individuals with training in trades were able to find employment that corresponds to their skillset and offers a good income while allowing their family to maintain their place of residence in Deer Lake near their families, whether their families are in Deer Lake or in the Northern Peninsula (Resident, 7 July 2017). It was suggested that this might positively impact community sustainability, contributing to Deer Lake's positive population growth in contrast to the declines experienced in many other rural NL communities. And it is thought that for new Deer

Lake residents moving from the Northern Peninsula, Deer Lake is close enough to home to maintain that cultural connection (EDO, 8 November 2016). Overall, FIFO is perceived as impacting neighbourhoods in Deer Lake both positively and negatively. Again, however, these community and neighbourhood changes cannot be attributed to FIFO alone because, as this study found, FIFO is just one of several factors impacting the growth of Deer Lake.

4) Community Involvement

This study was not able to confirm the extent to which mobile workers and their families are involved in community activities in Deer Lake; however, according to many participants, FIFO workers were not involved in community activities in Deer Lake. One participant suggested that this might be because many FIFO workers are not native to Deer Lake, having moved in from outside communities (Business Owner, Council Member, and Resident, December 5, 2016). Others suggested that the work schedules of FIFO workers did not allow them the time to volunteer regularly (EDO, 8 November 2016; Resident and Town Representative, 8 November 2016; Resident and Town Representative, 8 November 2016). Despite this, participants suggested that the spouses and children of FIFO workers were sometimes involved in recreational and community activities, but that the scale of that involvement varied family by family (Resident and Town Representative, 8 November 2016; Business Owner, Council Member, and Resident, 5 December 2016).

5) Family

The family impacts of FIFO were the most noted social impact by participants. FIFO was suggested as impacting individual FIFO workers, their spouses, and their children, but also having larger impacts on the community. In terms of FIFO workers, it was suggested that being away from family for long periods of time could be stressful, particularly if they miss out on important family milestones while they are away (e.g. birthdays, children's sports competitions) (Treehouse Family Resource Centre Representative and Resident, 10 May 2017). In terms of spouses, it was suggested that FIFO disrupts family dynamics, often leaving mothers acting as single parents. These challenges were linked to increased separation and divorce rates (Business Owner, Council Member, and Resident, 10 May 2016), though it was also suggested a few participants that their outcomes depend on the personalities of individuals involved in the relationship – women who are able to operate independently were thought to be better able to deal with FIFO relationships (Business Owner, Town Council Member, and Resident, 5 December 2016). In addition, technology has made navigating the challenges associated with distance more manageable. Challenges in communication related to time differences and scheduling conflicts remain, however (Treehouse Family Resource Representative and Resident, 10 May 2017).

With regards to children, it was suggested by a representative of the Treehouse Family Resource Centre that kids may be most impacted by FIFO work arrangements within the family (Treehouse Family Resource Centre Representative, 10 May 2017). Reflecting on their own experience, this participant suggested that the children of FIFO parents have more expectations placed on them in the sense that, if an emergency occurs

and only one parent is home, they need to know how to handle the situation (Treehouse Family Resource Centre Representative, 10 May 2017). The challenges of having a parent away might also translate into anxiety and fears about what might happen to their parent while they are away and navigating everyday life without one parent present (Treehouse Family Resource Representative, 10 May 2017).

It was suggested by a small number of study participants that challenges in the families of FIFO workers could affect community dynamics overall. For instance, conflict between parents could affect their children. It was thought that this anxiety and stress could translate into children acting out in school settings (EDO, 18 November 2016). It was also suggested by one census participant that drug-use had become a challenge at the local school because the children of FIFO workers were being exposed to substances through their parents. Other study participants did not corroborate this however, and it was beyond the scope of this project to confirm the validity of these observations. Further research is recommended.

Thought to be unique in the province, a program to address impacts of FIFO on families exists in Deer Lake. The Treehouse Family Resource Centre is a nonprofit organization. It provides free programs catering primarily to families with children age 0-6 years. The Deer Lake site services the town of Deer Lake specifically; however, the Centre has locations in various communities in western Newfoundland. The 'Home Again, Gone Again' program was started by an employee of the Treehouse who was asked to speak at a conference about the impacts of FIFO on families in NL. She designed the program based on her experience at the conference, where she observed that there was need for a program to address the family challenges of FIFO in NL

(Treehouse Family Resource Centre Representative and Resident, 10 May 2017). The program has changed a bit over time but is now run as a support program for families with children of any age whose spouses work away (married, common law), and is open to both men and women. The program is currently only run in Deer Lake and Pasadena. In each community 12-13 families are registered for the program (Treehouse Family Resource Centre Representative and Resident, 10 May 2017).

6) Environmental

Some environmental concerns were raised by participants related to development in the town. It was believed that FIFO contributed, in part, to these developments and related concerns; however, some participants did not believe FIFO had contributed directly to environmental concerns in the town at all (Business Owner, Council Member, and Resident, 5 December 2016; Business Owner, Council Member, and Resident, 5 December 2016). Environmental concerns raised by participants revolved around housing development and use of the river, primarily. With regards to housing, it was suggested that ‘conspicuous consumption’, such as larger houses, might have environmental impacts at a smaller scale (Business Owner, Town Council Member, and Resident, 5 December 2016). Again, my census findings raise questions about the perception of FIFO workers building the largest, most expensive houses in town. Some fears were expressed about future development on zoned agricultural land, though several stakeholders expressed that development on agricultural land would not benefit the town long-term and was not being considered (EDO, 8 November 2016; Business Owner, Town Council Member, and Resident, 5 December 2016). The removal of trees for new housing

developments, particularly in developments along flood plains near the lake and river, were expressed as concerns, as the trees were suggested as important for drainage, soil retention and as a wind block for gusts coming off Deer Lake (Business Owner, Town Council Member, and Resident, 5 December 2016). With regards to the Upper Humber River, development in the floodplain was seen as risky for homeowners in those areas (Business Owner, Town Council Member, and Resident, 5 December 2016). The construction of wharves along the river was also raised as an issue of concern, with individuals paving down to the river without a buffer zone (EDO, 8 November 2016).

In January 2018, the Town of Deer Lake experienced flooding along the Upper Humber River as a result of unusually high rainfall and warm weather in western NL (CBC 2018). According to the Western Star, the Town asked the following streets to prepare for evacuation: Pinetree Drive, Riverside Drive, Oakes Road, Reginald Drive, Tower Road, Moss's Lane, and Bailey's Avenue (Western Star 2018). These streets are located in Nicholville along the south shore of the Upper Humber River, the area participants in this study indicated were part of the flood plain. Several homes in this area were constructed between 2000-2016. Erosion of the riverbanks led to the evacuation of homes on Pinetree Drive (CBC 2018). This is not to say that these environmental challenges were caused by FIFO workers; however, increased development along the Humber River, proved in this instance to be a cause of local concern. FIFO-related housing development may have contributed to this, in part.

7) Community Sustainability

Finally, the topic of community sustainability was raised frequently over the course of this study. Many participants expressed optimism about the future sustainability of Deer Lake and the continued presence of FIFO in the town. It was suggested, for instance, the attracting FIFO workers to the town was significant in providing the town with more money through local tax dollars and spending (Business Owner, Town Council Member, and Resident, 5 December 2016). This, in turn, was seen as providing the town opportunities to diversify the local economy by investing in development for other industries, such as tourism which, in turn, would help improve the quality of life for residents and help the town sustain itself in case of a downturn (EDO, 5 October 2016; Business Owner, Town Council Member, and Resident, 5 December 2016). For example, the Town of Deer Lake's tourism development plan seeks to encourage visitors to stay in Deer Lake for one night or more enroute to other destinations, like Gros Morne National Park. As part of this strategy, the Town is working on developing local attractions. For instance, in 2016, the Town was developing a new multi-use trail to this end (EDO, 8 November 2016). Investments like these may help diversify the Town's economy by helping it develop into a stop-over destination for tourists.

That being said, the 2015 downturn was a common topic of discussion related to community sustainability, with mixed opinions on its impact. The downturn saw fewer housing starts in 2016 than in previous years and participants stated that many FIFO workers lost their jobs (EDO, 8 November 2018; Business Owner, Town Council Member, and Resident, 5 December 2016). Jobs lost translated into more houses for sale and, in some cases, homes lost because the FIFO workers who built them could no longer

afford to keep them (Business Owner, Town Council Member, and Resident, 5 December 2016). Some participants felt that the impact of the downturn on Deer Lake was overstated and felt that, rather than a substantial hurdle, the downturn was more of a hiccup from which the town would recover without trouble. For instance, one participant suggested that, rather than selling homes out of necessity, FIFO workers were just being more careful about how they spent their money (Business Owner, Town Council Member, and Resident, 5 December 2018). Perhaps they would choose to renovate their house rather than build a new home this year or be more cautious about making big-ticket purchases (EDO, 5 October 2016, Business Owner, Town Council Member, and Resident, 8 November 2016). In addition, job losses were thought to be just one of two factors bringing Newfoundlanders back to Deer Lake in 2016, the other being the wildfires in Alberta which destroyed many homes Fort McMurray. According to one participant:

“The hiccup that we’ve seen on that piece of it now, yes a lot of our local fellas have been home longer period of time but are now getting back to work. The businesses made a lot of changes in the way they do business which, you know, in a lot of cases the fire in Alberta gave a lot of people the opportunity to reevaluate and a lot of companies to reevaluate on how we’re doing business. So it’s a – even though this year has been a lot of challenges for a lot of people, you know, oil is still there. So they’re still going to continue that. Alberta is not going away. Alberta is going to regain, rebuild, and be just as strong as ever they were. And that’s great

news for all of us” (Business Owner, Town Council Member, and Resident, 5 December 2016).

Overall, the sentiment expressed by many participants was that eventually, the growth of Deer Lake would continue and things would ‘go back to normal’ (Business Owner, Town Council Member, and Resident, 5 December 2016). It was also expected that FIFO would continue despite rumours of companies in Alberta requiring workers to move closer to their worksite due to the downturn, though it was felt that such a policy change would certainly impact Deer Lake economically (EDO, 5 October 2016; Business Owner, Town Council Member, and Resident, 5 December 2016).

Those who anticipated continued growth of the Deer Lake population suggested that in-migration from rural and outport communities would continue to access employment opportunities not available in these areas (EDO, 8 November 2016). According to one participant: “there’s only so many welders you can employ in a small town, in a small area. And there’s only so many engineers within a province really, because unless you have the big shipbuilding industries.... you don’t find these kinds of people in small communities” (St. Anthony Town Council Representative, 18 November 2016). In addition to this, the services and amenities available in Deer Lake are expected to be significant in helping to keep new residents in the Town. These include recreational opportunities for children, as well as airport and service access (EDO, 8 November 2016; St. Anthony Town Council Representative, 18 November 2016; Business Owner, Town Council Member, and Resident, 5 December 2016). Census results indicated that access to community services and activities was the fifth-highest motivation for all census

respondents to live in Deer Lake; however, it was only selected by 15 of 224 respondents (see Figure 10).

Overall, most interview participants viewed the future of Deer Lake and its relationship to FIFO optimistically. Some argued that Deer Lake would continue to be successful if FIFO work were to cease completely. According to one participant:

“If the fly-in/fly-out stopped today, there’d be minimal changes to Deer Lake. You know, yes there is families that would be affected. But in regards to would businesses close, or would Deer Lake’s – I mean, no. I don’t think for a second. And now, don’t get me wrong, I’m not underestimating the cash flow that comes through Deer Lake from those [FIFO] businesses...would we do some belt-tightening? Sure we would...but Deer Lake is in a position to be strong for a lot of years to come.” (Business Owner, Town Council Member, and Resident, 5 December 2016).

For this study, a mixed-method approach was adopted so that census and interview data could build on one another and add to the validity of findings related to the impacts of FIFO. In addition to built space impacts, FIFO is perceived to have had socio-economic and environmental impacts on the town of Deer Lake. In some cases, census findings were able to corroborate these perceptions. In others, findings raised questions about the validity of these perceptions. While perceptions are themselves valuable, it must also be acknowledged that, as with any research method used in isolation, there are limitations to determining the objective truth of a given situation (Thomas 2011). For instance, in the case of FIFO, research in Australia has revealed that an inflated expectation of the ability and willingness of FIFO workers to spend

money exists in source communities (Hoath & McKenzie 2013). This suggests that the economic impacts of FIFO may be exaggerated in these communities and that perceptions of community residents may not accurately reflect of the actual economic standing FIFO workers and their families. By comparing census and interview data, this study has revealed that FIFO workers do have higher incomes than non-FIFO residents in Deer Lake on average; however, it also revealed that FIFO workers are not building the most expensive houses or garages. FIFO households build more expensive homes on average than non-FIFO but the differences are not as large as some residents and community leaders would suggest. In this way, the mixed-method approach has helped shed light on a stereotype of FIFO workers building large homes and garages in the community, with associated socio-economic and environmental impacts. Other stereotypes may exist in the data presented in this chapter and interviews alone cannot determine what they are. As mentioned in the paragraphs above, I suggest that additional, targeted research on these themes be undertaken to help separate stereotypes from reality. In the meantime, these perceptions remain valuable as they reflect how FIFO has been received by stakeholders and residents in the community to date. They are also valuable as opportunities for of future research in Deer Lake and in other source-hub communities.

With this in mind, this study identified several perceived impacts of FIFO in Deer Lake: economic, housing, crime, community dynamics, neighbourhood changes, community involvement, family, environmental, and community sustainability. Despite the strong optimism for Deer Lake's continued growth, it seems that, amidst the opportunities presented to the town by FIFO, there may be challenges that need to be addressed. Further research is recommended to this end, particularly with regards to social challenges in community dynamics, crime, and family dynamics, as well as environmental concerns.

It is also recommended that research be undertaken to identify how any confirmed challenges may be dealt with and/or how opportunities presented by FIFO, such as economic opportunities, may be capitalized on. As mentioned in 2.2, some communities, companies, and governments in Australia have made efforts to provide for the socio-economic wellbeing of FIFO workers, their families, and the communities in which they live and work, for example, by providing psychosocial support for workers and their families. To date, no dedicated plan, program, or policy has been implemented in NL. One exception is the Treehouse Family Resource Centre program called ‘Home Again, Gone Again’, which has emerged over the last few years in response to a need for social programming servicing the resident FIFO population in Deer Lake. As discussed above, this program is unique in the province and its reach is limited due to limited capacity. To the knowledge of the Treehouse, it is the only family resource centre in NL that runs a program of this kind (Treehouse Family Resource Centre Representative and Resident, 10 May 2017). Still, it is believed that the program fills a need in these communities and, in hopes that other resource centres will develop similar programs, the centre has made a parent handbook for parents and child-focused activity book for families available online for anyone who wants to run a support group (Treehouse Family Resource Centre Representative and Resident, 10 May 2017). ‘Home Again, Gone Again’ is a grassroots program, which aims to address some of the social challenges of FIFO in Deer Lake and, as is described in the Australian literature, “welcome and integrate LDC workers and families into the community” (Hoath & Haslam McKenzie 2013). It represents an attempt to provision for the welfare of FIFO families in NL, which, as discussed in Chapter 6, may be significant in provisioning for the sustainability and resilience of FIFO workers, their families, and communities.

Chapter 6: Conclusion

This research project was designed to respond to three primary objectives: 1) determine whether Deer Lake NL can be considered a source-hub community; 2) identify built space impacted by FIFO E-RGM in 2000-2016; and 3) identify additional impacts of FIFO E-RGM on the community of Deer Lake NL. In addressing these objectives, it was hoped that findings from this study would contribute to understandings of the functioning of source-hub communities impacted by FIFO E-RGM generally, and, with a case study in NL, provide insights into the community-level impacts of FIFO in the NL context specifically. This study found that Deer Lake NL is a source-hub community, having both transient and permanent resident FIFO populations using the airport for work-related travel. In addition, findings suggest that FIFO E-RGM has impacted built space in Deer Lake, especially residential infrastructure but with spin-off impacts on airport growth, street and sewer infrastructure, and possibly also wharf development, new business development, and landscape change in the town. In addition to these built space changes, additional socio-economic and environmental impacts were voiced by study participants, including: economic, crime, community dynamics, community involvement, family, environmental, and community sustainability. It is hoped that these perceptions, presented in section 5.2, can be used to inform further research on these topics.

This project represents a first attempt to document the growth of a source-hub community and analyze its characteristics outside of Australia. In terms of resident FIFO workers, the census data showed that 28% of new and significantly renovated homes had a FIFO worker resident. It also found that FIFO workers have moved into Deer Lake from outside communities for airport access and that some residents who grew up in Deer Lake also chose to engage with FIFO work. A major finding of this study is that, outside of airport infrastructure, factors

influencing the development of a community into a source-hub community appear to be context-specific. For instance, availability of affordable housing and services was not as important a motivation for FIFO workers to live in Deer Lake as for source-hub communities in Australia.

In terms of built space change, this study found that FIFO has impacted built space in Deer Lake. Some residential built space change can be attributed to FIFO workers. FIFO workers were found to have built new homes, built extensions to existing homes, renovated their homes significantly, and built new garages/sheds; however, they were not more likely to undertake any of these built space changes than non-FIFO workers. This suggests that, while FIFO workers have played a role in the growth and development of Deer Lake, they are not the only factor influencing these. For instance, study participants identified the rural to urban migration of older residents for services as a factor also influencing housing growth in Deer Lake, particularly in neighborhoods with pre-fabricated mini-homes.

Finally, findings suggest that FIFO has presented a complex mix of opportunities and challenges for the town of Deer Lake. Opportunities presented by FIFO in the community are perceived to be largely economic, in terms of money being brought into the town; however, FIFO has also presented potential human capital gains: 1) by allowing people to live in the community and keep their families there, and 2) in that the exposure of FIFO workers to innovative ideas, best practices, and other experiences while away for work have the potential to inspire new businesses and practices in NL (Stakeholder and Resident, 10 May 2017). Examples of such businesses did not emerge over the course of this research study; however, the potential for such ventures is still significant. These opportunities are countered by potential social and environmental challenges presented by FIFO including limited community involvement, disruption of families, and housing development in environmentally sensitive areas.

The lack of programs in NL addressing the social challenges presented by FIFO is worth consideration, keeping in mind that stereotypes similar to those observed elsewhere may be reflected in the data presented here. Several participants voiced a need for more social programs to support workers and their families (Business Owner, Council Member and Resident, 10 May 2017; Business Owner, Council Member, and Resident; 5 December 2016; Treehouse Family Resource Centre Representative and Resident, 10 May 2017). To date, some of the challenges presented by FIFO are being addressed by the program ‘Home Again, Gone Again’, offered by the Treehouse Family Resource Centre in Deer Lake and Pasadena; however, the reach of the program has been limited so far in that it is only offered in two communities in NL. Though Home Again, Gone Again has been significant as a resource for 12-13 families in Deer Lake up to this point, there is potential, with increased capacity, for this program to assist more FIFO families in Deer Lake and for the development of similar programs in other source communities in NL. It is recommended that this program in Deer Lake continue to be supported and the development of similar programs in NL be considered.

As this project represents the first comprehensive study of a source-hub community outside of Australia, it is suggested that further research on source-hub communities, including the identification of other source-hub communities, would be useful in determining whether factors influencing the development of source-hub communities are, in fact, context specific. In addition, further research on the socio-economic and environmental impacts of FIFO in source-hub communities, such as in Deer Lake, would be helpful in determining how best to build on and address the opportunities and challenges presented by FIFO in these communities. With regards to sustainability, the study finds that the unpredictable nature of work in resource-related industries may impact the overall sustainability of source-hub communities in the face of a

downturn. For instance, it appears that job losses as a result of the downturn in Alberta in 2016 were felt in Deer Lake and that this was an item of concern for some residents and stakeholders. In answer to questions about the future sustainability of Deer Lake, Town officials have suggested that they endeavor use revenue derived from FIFO (and other sources of growth) to diversify the town's economy. For instance, tax dollars were used to develop a new walking trail, completed in 2016, to help improve livability in Deer Lake and assist the Town in meeting its main tourism objective – to encourage visitors to stay in Deer Lake one extra night on their way to other destinations in NL. If the Town does take steps to plan for the continued presence of FIFO residents through investments that promote economic diversification, some of these socio-economic impacts may be lessened in Deer Lake. That being said, it does seem that continued engagement with FIFO will continue to challenge the sustainability of smaller rural and coastal communities in NL who are seeing residents relocate to Deer Lake.

In summary, the contribution of this research to existing literature is: 1) a working definition of source-hub communities, 2) insight into the role of built space in the development of source-hub communities, 3) identification of built space impacts attributed to FIFO workers, and 4) identification of other possible socio-economic and environmental impacts attributed to FIFO at the community level. More specific to the NL context, findings also seem to challenge common notions of the 'Alberta worker'. In some ways, this project paints a more modest portrait of the FIFO worker as working away, not to make exorbitant amounts of money, but to make enough money to maintain a connection to their culture, heritage and family on the island. While access to the airport is significant among FIFO workers as a motivation for living in Deer Lake, an attachment to family and sense of home appeared more strongly as a motivation for living in Deer Lake among FIFO workers than was expected. As such, it appears that working

away may allow these individuals and their families to make enough money to continue to live at home on the island. Perhaps engagement with FIFO work, in this sense, is seen as a more viable employment option for NL workers because of a lack of employment opportunities locally.

Perhaps also, these findings point to a mismatch in education/training and employment options in the province. While answering these questions is beyond the scope of this research project, these questions are worth consideration in future research as they may prove significant in planning for the growth of communities attracting FIFO workers and the rural and outport communities at the expense of which communities, like Deer Lake, are growing.

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Appendix A – Deer Lake Report Back Summary Document

Fly-in/Fly-out Commuting in Deer Lake

Findings from the research project: *Identifying the Built Space Impacts of Fly-in/Fly-out Employment-Related Geographical Mobility in Deer Lake, NL*

What is Fly-in/Fly-out?

Fly-in/Fly-out employment-related geographical mobility (also known as FIFO), is a long-distance commuting arrangement often involving work in remote areas. Employees are transported to and from their worksite by airplane and spend fixed periods of time at their worksite and at home in rotation (Storey, 2001).

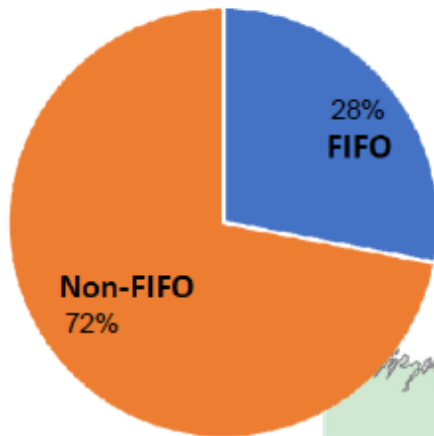
FIFO has been researched extensively in Australia where it has been found to have many impacts on host (or work) communities, source (or home) communities, and hub communities (communities with an airport to move workers between host and source communities).

Less research has been done on the impacts of FIFO on communities in Canada.

This research study sought to determine if Deer Lake is a source-hub community and identify changes in built space that might have occurred in the community because of FIFO in 2000-2016. The project also identified other potential socio-economic impacts of FIFO in the town.

Results of this study are based on findings from a door-to-door survey in Deer Lake of all new homes and homes renovated for more than \$20,000 in 2000-2016 as well as 14 interviews with key stakeholders and residents.

Figure 1: Survey respondents by engagement with FIFO



Deer Lake: A FIFO Source-Hub Community?

A source-hub community is a community that has a resident FIFO workforce and also has FIFO workers from outside communities using their airport to get to and from work.

Deer Lake is a source-hub community. FIFO workers do live in Deer Lake and FIFO workers also live in other communities outside Deer Lake but commute into Deer Lake to fly to and from their place of work. As can be seen in Figure 1, 28% of respondents to our door to door survey in Deer Lake had a FIFO worker living in their home.

Findings also suggest that FIFO workers have moved into Deer Lake from outside communities, often to have easier access to the airport, as can be seen in figure 2; however, some individuals who grew up in Deer Lake also chose to engage with FIFO work. Sometimes these individuals had another family member who also did FIFO work.

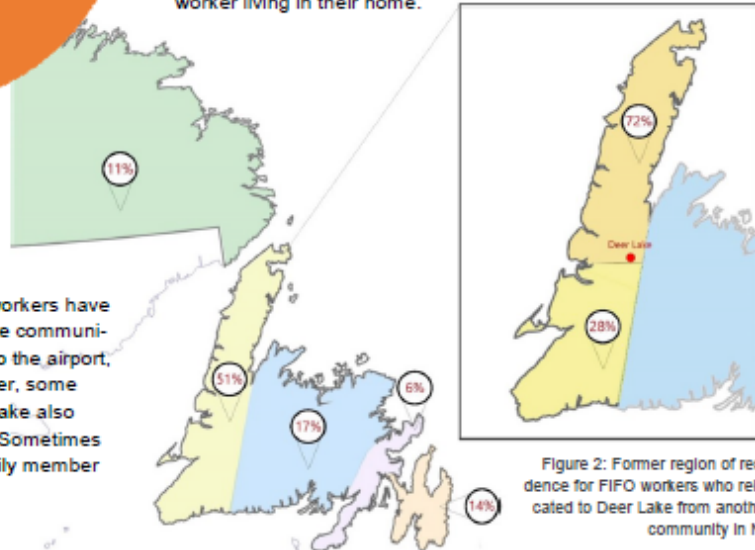


Figure 2: Former region of residence for FIFO workers who relocated to Deer Lake from another community in NL

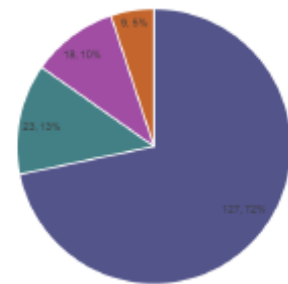
Has FIFO Impacted Built Space in Deer Lake?

Built space, or any landscape changed for human use in accordance with one or more policies, is important with regards to FIFO because housing, infrastructure, service structures, and more may be changed to allow FIFO to happen or as a result of FIFO in host, source and hub communities. This research project was the first study of the built-space impacts of FIFO in a source-hub community in Canada.

Some **commercial** built space change in Deer Lake from 2000-2016 was linked to FIFO work. For instance, renovations at the Deer Lake Airport, including several long-term parking expansions, were driven, in part, by the demand of FIFO workers.

Some **residential** built space change in Deer Lake from 2000-2016 was also linked to FIFO work. As can be seen in Figure 3, addresses with a FIFO resident have seen new homes, renovations/general repairs, extensions to existing homes, or new garages built over that time period; however, there was not a significant difference between built space changes in addresses with FIFO residents and addresses without FIFO residents in any of those categories.

Figure 3: Non-FIFO and FIFO built space change
Non-FIFO Permits, 2000-2016



FIFO Permits, 2000-2016

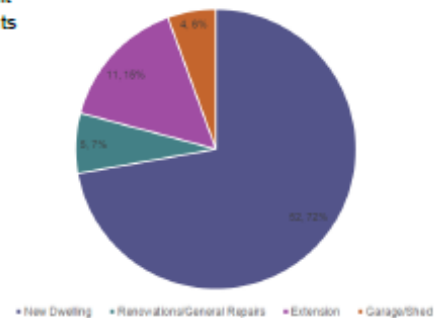
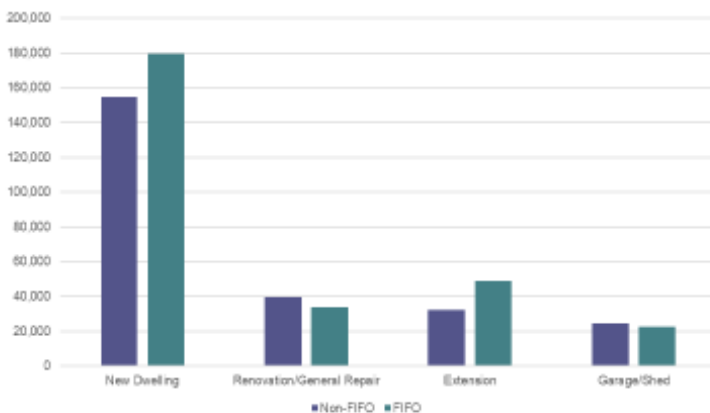
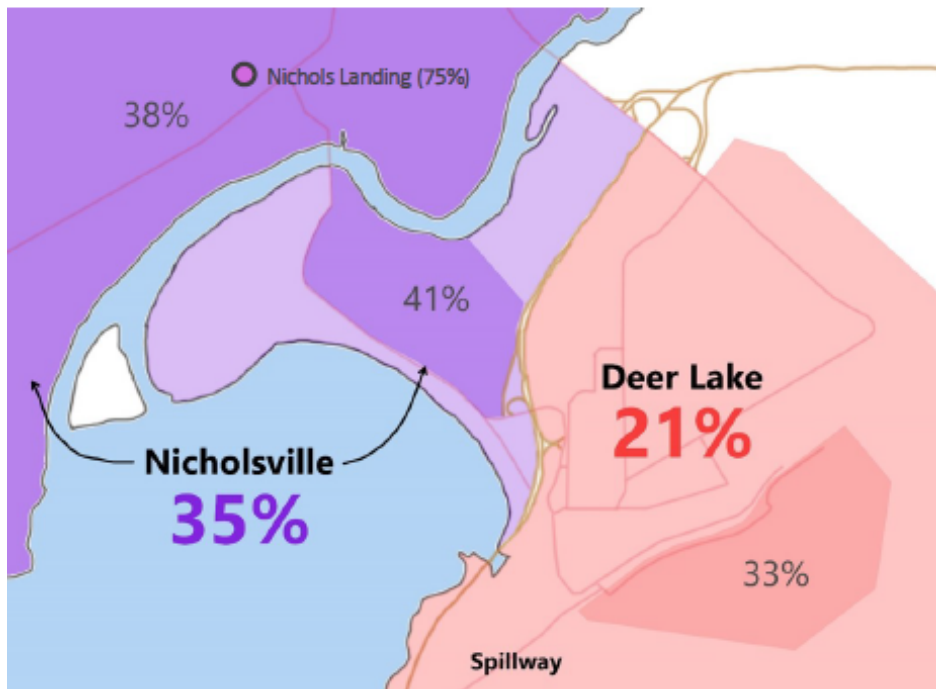


Figure 4: Non-FIFO and FIFO Building Permits, average cost (\$CAN)



In terms of cost, addresses with FIFO workers had more expensive extensions to existing homes and more expensive new homes built than addresses without FIFO workers on average; however, addresses without FIFO workers had more expensive renovations and garages built. This can be seen in Figure 4.



FIFO addresses were also more concentrated in particular areas of Deer Lake. Figure 5 shows the highest concentrations of FIFO respondent addresses in the areas surveyed. The highest overall concentration of FIFO workers was found in Nicholsville north of Nicholsville Rd (41%). The next highest was in the Goose Arm Rd area (38%) followed by the area up above the old railway tracks in Deer Lake (33%).

It was noted by many study participants that several FIFO workers lived in Nichols Landing subdivision. This appears to be true as 75% of our survey respondents in Nichols Landing had a FIFO worker living in their home.

Figure 5: Concentration of FIFO addresses by zones surveyed.



Figure 6: Newer homes in Deer Lake, April 2017

Has FIFO had other social and economic impacts in Deer Lake?

Study participants noticed several social and economic changes in Deer Lake that they believed were related to the presence of FIFO. It was beyond the scope of this research study to confirm these impacts; however, they are relevant as areas of potential future study and are noted here for that purpose.

Economic

Participants felt that FIFO workers contributed economically to the Town through local spending, taxes, and the purchasing of large-ticket items (e.g. homes, ski-doods, trucks). Some local businesses in Deer Lake have adapted their businesses to accommodate a mobile workforce. The overall economic contribution of FIFO, however, was suggested as placing a burden on some residents as a result of increased property taxes and other financial pressures. Fears were also expressed about the spending habits of young FIFO workers—it was suggested that while older FIFO workers save and invest their money, younger FIFO workers spend more recklessly. Some participants worried these younger workers would suffer in the event of a downturn or job loss and that more education in financial planning would benefit them in the long-term.

Housing

Changes in the affordability and aesthetic of homes was also raised. It was felt that homes had become more expensive in Deer Lake due to demand for homes by FIFO workers and their families. It was also suggested that the style of homes being built by FIFO workers were different than what is usually seen in Deer Lake—they were perceived to build larger homes with more garages and often aesthetically more “lavish” and “extravagant”.

Crime

Some participants were concerned that increased wealth in the community because of FIFO had contributed to increased drug and alcohol abuse. It was also felt that not enough support is available in town for individuals suffering with addictions.

Community Dynamics

Because FIFO has attracted new residents to Deer Lake, it was suggested by participants that the integration of these new residents into the community was sometimes difficult and that this affected community dynamics. It was thought that this might be the result of culture shock, especially for individuals moving in from outport communities. Despite this, there was much positivity expressed about the presence of new people in the town. It was felt that new people have brought new ideas to the town and could, in turn, help develop or inspire innovative businesses or programs.

The presence of new, and often FIFO, residents in neighbourhoods was felt to contribute to a growing sense of “not knowing your neighbours” in the Town. It was also suggested that neighbourhoods with high concentrations of FIFO workers sometimes feel like they are completely inhabited by women and children because the men are all away at work. While more stress may be placed on women in this re-

“You get money into a community and, with a lot of individuals, the more money you make, the more money you spend. And then all of a sudden recreation becomes a big part of your lifestyle. And people with boats and cars and snowmobiles and ATVs, they need a trailer to tow it around in...”

(5 December 2016).

“I bought [a house] in 2007 and I bought at what they wouldn’t even give a house away for now.”

(8 November 2016)

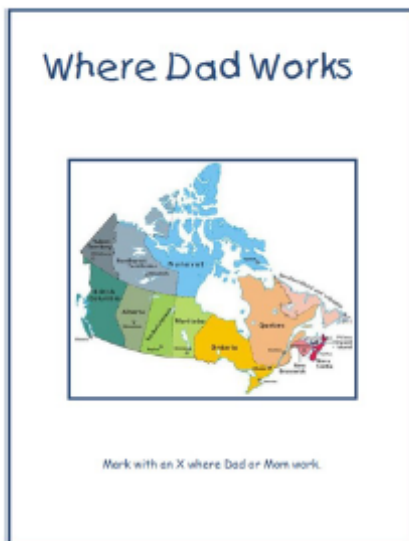


Figure 6: A page from the children's activity book for *Home Again, Gone Again* at the Treehouse Family Resource Centre

gard, some participants felt this unique dynamic was positive in fostering a sense of community among these women, who often help each other look after children and complete chores, like mowing the lawn.

Community Involvement

Participants felt that FIFO workers were often not involved in community activities in Deer Lake. Some suggested new resident FIFO workers might be less inclined to get involved than native Deer Lakers. Other suggested that the unpredictable schedules of FIFO workers did not afford them time to be involved. Whether the spouses and children of mobile workers were involved in community activities was believed to depend family by family.

Family

It was suggested that being away for long periods of time could be stressful for FIFO workers, especially if they have to miss important family milestones for work. For spouses of mobile workers, it was suggested that FIFO can disrupt family dynamics by leaving mothers as virtual single parents. Some participants felt that kids were most impacted by FIFO in the family setting. The kids of a FIFO parent may have more responsibilities placed on

“There are times I get upset that my husband isn't there to help out with certain things, especially when something breaks and I need him to fix it. I get sad when I see other families doing things together that I wish we could be doing.”

(10 May 2017)

them in the absence of their parent and they may develop anxiety or fears about what might happen to their parent while they are away.

Thought to be unique to the province, a support program exists for the families of mobile workers at the Treehouse Family Resource Centre. *Home Again, Gone Again* emerged from a perceived need for social programming servicing the resident FIFO population in Deer Lake. The program is run in Deer Lake and Pasadena and in the spring of 2016 had 12-13 families registered at each location. Figure 6 is a page from a children's activity book developed for the program. The activity book is free and available online at: www.treehousesresourcecentre.com.

Environmental

Some environmental concerns were voiced by participants related to development near and recreational use of the river. The removal of trees for new housing developments, particularly in flood plains, was a concern. The development of wharves along the river which required the assessment of landowners only, were also raised as a concern. Fears were also expressed about future development of zoned agricultural land; however, stakeholders felt agricultural land was too important an asset to the community and region to be developed.

Community Sustainability

Many participants expressed optimism about the future sustainability of Deer Lake in the continued presence of FIFO. For example, if economic benefits from FIFO result in investments into efforts to diversify the local economy, this could help with the overall sustainability of the town. Some felt the downturn in 2016 was a significant challenge for the town, particularly it's FIFO population, while others felt the impact of the downturn was often overstated and that it was a 'hiccup' from which the town would recover. It was felt by most participants that Deer Lake would continue to grow by attracting residents from rural and outport communities for services and employment, FIFO workers included.

The research project *Identifying the Built Space Impacts of Fly-in/Fly-out Employment-related Geographical Mobility* was conducted by researchers from Grenfell Campus, Memorial University in 2016-2017. Research findings were compiled into a Master's Thesis of the same name by Leanna Butters, student of the Environmental Policy Institute.

Data was collected via a door-to-door survey of homes in Deer Lake as well as semi-structured interviews with local stakeholders and residents. This

project was approved by the Grenfell Campus Research Ethics Board.

This project is part of a 7-year Social Science and Humanities Research Council and RDC-funded research project, the *On the Move Partnership*. www.onthemovepartnership.ca

Thank you to those who participated in and supported this project, including the Town of Deer Lake.

This report was completed in January 2018.

on the move
partnership

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