Harbour Facilities and Marine Accessibility in British Columbia's Isolated and Coastal Communities

By

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Table of Contents

Table of Contents **2**
Abstract 4
Acknowledgments 5
Chapter 1. Introduction **6**
1.1 Thesis **8**
1.2 Research Questions 9
1.3 Outline 10
1.4 Methodology 10
1.5 Limitations 12
Chapter 2. Harbour Facilities & Infrastructure **14**
2.1 A Desolate and Fractured Coast 14
2.2 A Multifaceted Trade 17
2.3 Literature Review 23
Chapter 3. Coastal Transport Providers **27**
3.1 Informal Interviews 27
3.2 Semi-Structured Interviews 29
3.3 Opportunities for Cooperation 30
3.4 Barriers to Cooperation 32
3.5 Cooperation Outside Cost Reduction 34
3.6 Analysis 35
Chapter 4. Isolated and Island Communities **37**
4.1 Survey Results 37
4.2 Community Problems 38
4.3 Community Solutions 41
4.4 Opportunities 42
4.5 Barriers 43
4.6 Analysis 44
Chapter 5. Coastal Transport and Marine Management **46**
5.1 Towards Coastal Management Plans 46
5.2 “The Fuel Business is Changing” 50
5.3 A Rising Tide Lifts All Boats 51
Chapter 6. Conclusion **53**
Bibliography **57**

Table of Figures & Tables

Figure 1 BC Ferries Routes (BC Ferries, 2021) 19
Figure 2 Non-Core Wharf at Esgenoôpetitj, New Brunswick (McDonald, 2019) 22
Figure 3 Transport Company Costs 28
Figure 4 Tug & Barge Operators (Tanner, 2017) 30
Figure 5 Barriers to Transport Company Cooperation 33
Figure 6. Problems for Coastal Communities 38

Abstract

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In British Columbia, growing concerns of economics, demographics, and infrastructure are impeding the traditional marine transporters that are a lifeline to the rest of Canada. Trying to offset increased costs of operating the service is one potential method of improving resilience in the transport sector, but a combination of literature review and interviews with operators and community members shows that this may not be practical. Despite similarities to other examples of "lifeline" services, such as the Orkney Islands off the north coast of Scotland, the distances, number, and variety of communities along the coast of British Columbia pose particular challenges. Dealing with problems experienced by the isolated coastal communities will provide resilience to the transport system as a whole. This project examines the current marine transport paradigm in British Columbia and makes a number of recommendations for the development of a comprehensive coastal transport management plan. Key among these is the need to conduct a survey of the communities involved, and identify facilities that exist in communities, the lack of which is a serious concern for "visibility" when developing a management plan.

Keywords: Coastal Transport, Coastal Communities, Transport Management, Resilience, British Columbia

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Chapter 1. Introduction

For isolated coastal and island communities in British Columbia, small-scale transport from the Mainland or Vancouver Island (which is included in the term "mainland" for the purposes of this paper) is the lifeline to the rest of Canada. Communities of the Salish Sea and coast north of Vancouver Island have always depended on marine transport. From fuel deliveries (Tanner, 2017) to commuting and grocery trips (Hodson, 2007; Redlin, 2018), the varied fleet of small commercial vessels, ferries and barges maintains communities that are isolated from the rest of the province. Beyond duty as a lifeline service, vessels also provide tourism access, allowing small but vibrant economies to prosper, especially in the Southern Gulf Islands (Siemens, 2014).

These transport companies are often marginally profitable business ventures. As Tsoi (2021) explains, the circumstances in which lifeline ferries and transporters operate is often contradictory to being economically successful: isolated communities generate limited traffic, so that regular services see relatively low returns from fares compared to other marine transport situations. This raises challenges that can be seen through the lens as a "3D problem": Density (or lack thereof), Distance, and Diversity (of products). With rising fuel costs, fuel being the second largest expense to BC Ferries, after labour (Redlin, 2018), and consistent requirements on services and operational expenses, transport to isolated communities requires additional income, or reduced costs, if it is to remain financially sustainable. A significant increase to "ticket price" is an untenable option, as the cost can rarely be absorbed by the individual inhabitants of rural, often low-income areas (Redlin, 2018; FACC, 2011).

Defining what an "isolated coastal community" is exactly, what *relationships* mean, and how to classify them is a complex matter. As Siemens (2014) points out, depending on the

scheme or criteria used, when it comes to communities being “isolated” or “rural” essentially all the communities along the coast would fit the criteria, especially when basing the assessment on access to common amenities, e.g. clinics or grocery stores. There is also the question of how to define *community*, as it goes beyond simple census municipalities. This paper sets out the rural and isolated criteria as those accessible only by water (excluding major ferry services to Vancouver Island), or which are primarily dependent on marine transport for supplies and economic activity, such as Zeballos, on the western coast of Vancouver Island. Therefore, the definition of *community* includes the whole of an island, as Salt Spring Island, or the municipality or administrative region when that is not practical, as Masset, or Hartley Bay. Finally, while *relationships* are defined by the characteristics of the particular community and transporter in question, the objective of “improved relationships” can be understood as a level of mutual communication greater than simply an emailed order form; two-way, or bilateral, communication in which communities and the transporters identify their respective needs to the other party.

The question of whether a community should survive is not addressed in this paper. Rather, taking it as granted that efforts should be made to support communities through sustainable long-term planning, potential solutions to the viability of maritime services to small coastal communities are examined. Specifically, the paper addresses the opportunity for enhanced cooperation between organized communities and the companies that provide local marine transport to enhance service efficiency and viability.

1.1 Thesis

The thesis of this paper is that there is value in the development of business relationships between marine transporters and communities even while individual communities may differ in opportunities, challenges and barriers. This paper argues that a greater examination of how small and isolated coastal communities communicate and cooperate with the transport companies that act as their lifeline with the rest of Canada could result in stronger communities, and greater prosperity.

With changing weather patterns and uncertain economic stability, it is crucial that the patterns of life, of facilities and of marine transport identified in this paper be considered in management plans affecting the marine and coastal zone. In the past, many communities were sustained by facilities maintained by the federal government, while in other cases company-community relationships supporting harbour facilities and marine transport have existed for decades, developing out of commercial and industrial contracts dating back to eras of primary resource extraction. Those relationships have now evolved to focus on serving consumer needs, i.e. provision of finished products, food, and retail quantities of fuel and construction materials. In other communities, where no entrenched relationships exist, there is increasing opportunity and need for cooperation as infrastructure once supported by the government is left to decay (McDonald, 2019).

The paper examines the existing paradigm of cooperation in the provision of shipping services on the west coast of British Columbia, and how enhanced or more developed relationships could provide a greater degree of sustainability to an industry facing increasing financial challenges. Information and ideas are derived from three sources: a literature review, a survey of community leaders, and interviews with transport company managers.

1.2 Research Questions

In the examination of cooperation between communities and coastal transport organizations, two groups can be identified. These groups are composed of the primary stakeholders in the discussion on how to make coasting transport financially sustainable in the long term. Synthesizing from the BC Ferry Commission's (2012) identification of principal stakeholders (ignoring the group labelled as "Interests of the Taxpayer"), the two groups can roughly be defined as "Users" and "Providers". Users are generally communities, local services and businesses integral to those communities, e.g. a clinic, grocery store, or ambulance from the "mainland", or individual community members. Providers are the groups that can respond to those requirements, including BC Ferries, Seaspan, or North Arm Transport.

Three questions are investigated to identify the interests of service providers and community members in advancing potential cooperation. First, are facilities a significant part of the operations cost for companies working in the marine trade, especially labour costs, labour costs here referring to the maintenance and construction labour for a facility? Second, is there interest on the side of marine transport companies to further develop relationships ashore in the pursuit of reduced costs. Finally, are communities interested or capable of meeting the needs and desires of these transport companies?

Determining the financial necessity of a program of cooperation is the paramount concern. If facilities costs are universally low, or would have a low impact on the financial sustainability of the industry, there will be little interest in pursuing potential complex relationships with isolated communities. In the situations where there is a relative benefit, or even interest simply on the basis of social responsibility, the deciding factor for any kind of program framework will depend on the ability or willingness of the community to participate in

the program. While the transport companies may be able to initiate cooperation, the focus of this paper is on the community and facilities, and how communities must be actively in support of a program.

1.3 Outline

This paper is divided into six chapters, including the introduction and conclusion. Chapter One introduces the project and thesis, research questions, outline, methodology, and the limitations encountered in the study. Chapter Two provides the context of the topic by describing the geography, history, and marine trade currently active on the west coast. Following this, a review of literature is conducted, focusing on the use of ferries and similar coasting services, in the sense of local commercial marine transport. Chapter Three is focused on the first and second research questions. It includes a description of information garnered from interviews with operations managers, and an analysis of that material. Chapter Four is focussed on the third research question. It draws primarily on the interviews conducted with community leaders. Both chapters three and four include a brief discussion of the barriers that may exist to cooperation. Chapter Five examines how these results can contribute to the goal of informing a future coastal management plan, based on the needs that communities exhibit, and on the potential gains seen by the encouragement of community-company relationships and cooperation. Finally, Chapter Six concludes the study, re-examining the topics discussed, the importance of bridging the shore-sea gap, some recommendations, and what further investigation is necessary.

1.4 Methodology

Due to of the relatively small numbers of potential communities and service providers in coastal British Columbia, qualitative data from interviews is used in this paper, rather than quantitative surveys. The first set of interviews focus on the local transport companies,

determining interest and needs with regards to cooperation, and then use that information to determine questions for the isolated communities.

Interviews with managers in the transport industry, and therefore the first two research questions, were conducted in a two-step process. An initial, informal interview was conducted to explain the aims and interest of the project, and to determine both the ability of the interviewed person to answer questions on the research topics, as well as whether the company considered facilities part of their work. These interviews were aimed at senior operations and financial management personnel of the transportation companies, using contact information available to the public. The second interview was semi-structured, and developed the answers from the first interview on facilities, but focused on the second research question.

Surveys aimed at the community were originally planned to be a survey of skills available in communities, but because of limited responses, and responses from the first two sets of interviews, the surveys focused more on the requirements and desires of the community regarding both harbour facilities and marine transport. This set of questions was directed at "community leaders", generally mayors or town councils, or in many communities, harbour masters or managers, contacted using publicly available contact information. In order to source the most responses available, a snowball sampling method was used to further identify participants who could be identified from within the community as "community leaders", but who were not apparently so to an outside observer.

1.5 Limitations

This study is restricted by the breadth of the subject under study. As is discussed in Chapter Two, communities on the west coast of Canada are diverse, each having a unique set of requirements, and being affected differently by the changing systems they exist in. These changes vary from changing demographics to loss of infrastructure, and loss of traditional employment; they are examined more closely in Chapter Four. Key within this discussion of diversity is the nature of distance and travel time between communities. As Siemens (2014) explains, the expenditure of time in transit by ferry or other marine transport is a major consideration when examining coastal communities. Because each community is unique in distance to any particular travel objective, a fair examination of this topic would require far greater study and discussion than this paper can provide. Therefore, the question of distance will be simplified to three general geographic areas, which share similar characteristics: the Salish Sea, and especially Gulf Islands, which encompass everything south and west of Vancouver Island, the Central Coast, from the northern tip of Vancouver Island to Klemtu, and the North Coast, which includes Haida Gwaii. This classification is somewhat based on BC Ferries' (2021) classification of routes, though some documents refer to the Central Coast as the "Mid Coast".

In the long-term objective of establishing a framework recognizing coastal transport's role with communities, there would need to be separate considerations for each community; for example, the US Army Corps of Engineers (Northern Economics Inc, 2011) looked at how some Alaskan communities acted as transport "hubs" for further distribution of supplies. Such communities clearly exist in coastal British Columbia as well, such as the various communities of Salt Spring Island, or Masset on Haida Gwaii, so there would be value in developing the subject.

A further limitation was encountered in trying to contact First Nations communities. As will be noted throughout this paper, many of the communities of Coastal British Columbia are predominantly or entirely First Nations, and, as will be noted in Chapter Five, some of these communities are among the smallest and most isolated, in the sense of access to regular, scheduled transport. As is noted below, communications issues were encountered with a number of communities, and a further study into the issues noted in this paper will need to address the concerns of First Nations communities more effectively, especially on matters that are not readily accessible through existing literature and the internet.

Finally, two adverse environmental effects challenged this study. The isolated and remote nature of the British Columbia coast made communication difficult, with many respondents only checking email or other communications methods sporadically. For example, some communities tend to use alternate methods of communication that are difficult to access from outside the community, such as web "noticeboards". Compounding the issue of sampling both for Users and Providers, the COVID-19 pandemic led many companies and organizations to let employees work from home, further increasing response times, and in some cases making it impossible to reach an office or particular manager. The prime example of this is when a "work" phone number is listed, but the office is not in use.

Chapter 2. Harbour Facilities & Infrastructure

Harbour facilities and infrastructure have developed to fit the needs of both communities and industry. This is certainly true of the variety of facilities and industries seen along the coast of British Columbia. Influenced by a fractured coastline, modern facilities have developed from a history of primary resource exploitation and early tourism, to now serving the multi-faceted needs of coastal towns and villages. While primary resource extraction still exists along the coastline, materials produced are generally exported to overseas markets, as opposed to being transported to other destinations for use in British Columbia. For example, the BC Works aluminum smelter in Kitimat, operated by Rio Tinto (2021), primarily exports products to Japan, South Korea and south to the United States. This means that the majority of intercoastal transport is composed of passengers, or small and diverse cargoes, from consumer goods to commercial machinery, chemicals, and fuel.

2.1 A Desolate and Fractured Coast

Maritime trade and transport have existed on the coast of British Columbia for thousands of years, with the trade in one harvested resource, sea shells, dating back at least 7,000 years (Sloan, 2003). However, this trade required little in the way of permanent facilities, as did the harvesting of resources from the sea. The advent of whaling among the Nuu-Chah-Nulth (McMillan, 2015) required the development of specialized equipment, and often involved seasonal hunting camps being built, but beyond specific shrines dedicated to the hunt, no building efforts were focused specifically on the safety and use of boats or their cargo. This development would come with the fur trade, and westward expansion by European settlers.

The first of what would become modern harbour facilities on the west coast of Canada began to be built at the turn of the 19th century. South of what would become the international

border, the Columbia River the construction of a series of fur trading posts (Gough, 2016). Over the next decades, both economic and military interests would establish themselves on Vancouver Island and the Mainland, with harbour facilities being necessary for the supply ships coming from England. Victoria, formerly the trading post of Fort Camosack, was renamed in 1843; the naval base of Esquimalt was established in the early 1850s, and formally surveyed in 1858 (Gough, 2016). To the north, coal had been reported as early as 1835, and a purpose-led mission would be sent to establish a local supply source of coal for the Royal Navy's growing needs. With these developments, maritime trade became a key economic driver of the coastal communities, and until the grand project of the Canadian Pacific Railroad met water at Vancouver in 1885, the facilities needed to load and offload ships were crucial for anything not produced locally.

The wooden wharves and jetties that were soon built to meet the needs of the marine trade would be recognizable today as a standard part of small harbour facilities. Rushton (1990) describes Burrard Inlet, now the Port of Vancouver, with wharves for a lumber mill, and a regular ferry service as early as 1868. By this point, trade up and down the fractured coast had become an international affair, with vessels sailing from as far as Australia and China to load lumber and other goods in the growing colony (Rushton, 1990). However, much of the development at this time was still focused on the further development of primary resource industry, rather than the growing population. Gough (2016) describes a conflict between the Hudson's Bay Company and government leaders in the early days of the colony, as the belief was that greater settlement would stifle profits made by the shipping of resources, especially furs, east.

Beyond mercantile transport between Victoria and Vancouver, or ferries crossing their respective harbours, significant passenger service, and accompanying facilities, were scarce in the years prior to the turn of the 20th century. Several factors combined to bring the public eye to coastal transport, and the economic potential in the expansion of passenger travel. First, the continued expansion of American shipping to the south, in Puget Sound, as well as the completion of the trans-continental railway provide both access to larger markets for goods, and therefore an increase in shipping, and a means for passengers to reach the ports of departure on the west coast. Second, the visit by Lord Stanley, then Governor General, provided the media attention that drastically increased the "marketability" of west-coast tourism, another significant economic driver (Rushton, 1990).

With an increase in passenger travel, what had been limited to the loading and unloading of cargo began to expand. The transit of people required a greater presence at the waterfront, initiating the construction of many of the facilities we would expect to see today. Tickets or transit fares needed to be collected, and passengers transferring from the train needed places to stay. The development of the communities led to even further development of tourism, identified by Rushton (1990). An ad from 1891, describing the route and islands passed, would not be out of place among modern cruise-ship marketing, while the routes are still sailed by BC Ferries today. The fjords and islands that make up the fractured coast of British Columbia became more than sources for goods; they became destinations, and as such required their own facilities to deal with the transit of people.

As the transport of people increased, vessels began to become more specialized, which also had an impact on the facilities offered. Rushton (1990) describes the gradual focus on the transport of people, which led to development of infrastructure near the areas of what were

becoming coastal towns. Less and less were these frontier towns, with carts driving to and from the shore. Cargo and passengers became segregated, and while some of the steamers continued to trade in mixed cargo, especially visiting logging camps, mines and other sites in remote coastal locations, a defined passenger service had begun separate from the original resource trade.

2.2 A Multifaceted Trade

The inter coastal trade in British Columbia today encompass a vast array of goods, services, and people, who travel for many reasons. Much of the passenger vessel traffic is accounted for by BC Ferries, which operates several dozen routes, while large marine corporations like Seaspan Marine focus primarily on transportation of commercial and industrial goods between the larger communities. Along with these large operators are medium-sized companies that provide service to more isolated communities, primarily via tug and barge operations, including Island Tug and Barge, and North Arm Transport. Finally, there are a large number of single-vessel operations that conducted a very small-scale coasting trade, from single tugs and barges to decommissioned military landing craft. The community manager from the Southern Gulf Islands stated that “there are over 2,000 small tugs operating on our coast”, the coast being the whole of British Columbia.

Focusing on the movement of passenger traffic, it becomes important to differentiate between discretionary travel and necessary travel. Necessary travel may be exemplified by some of the “minor” routes conducted by BC Ferries, including, for example, ferry Route 25u, which provides transport to students in the Alert Bay-Port McNeil-Malcom Island area (Redlin, 2018), see Figure 1. Other necessary services would include the fuel barges of North Arm Transport (Tanner, 2017), which provide for the energy needs of primarily mid- and north-coast communities. Discretionary services are those that are not immediately necessary to the survival

of a community; however, many communities do rely at least in part on tourism revenue, and so this must be taken into account (Hardy, 2006; Siemens, 2014).

For many communities, the "necessary" sailings are equivalent to a scheduled bus or train route; they form the necessary timings for the day (Hodson, 2007), and are often the reason for the portrayal of island communities being somewhat more relaxed; when the ferry sails at specific times, there's no reason to be in a rush. Hodson identifies this as "Island time", and further sees the ferries as a means of communication and community identity. Especially in the communities where children use the ferry to commute to school, the ferry becomes a central focus of town. This dependence on the ferry, and associated facilities, means that communication with the corporate structure of BC Ferries is very important. As a means to ensure community needs are being met, the Ferry Advisory Committees were established (BC Ferries, 2019), and generally hold biannual meetings.

In addition to the "discretionary" and "necessary" sailings, there are some services (ferry routes) which are only operated in the summer. Redlin (2018) identifies this "special" service, noting that it is primarily in place to serve the tourism industry. Seasonal services do have a small transport benefit for local communities, as they alleviate long waits for ferries during peak tourist season. However, as will be discussed in section 3 and 4, an increasingly severe summer "boom and bust" cycle is beginning to have impacts on both communities and marine transport companies, where significantly smaller winter populations have meant that maintaining staff numbers and maintenance on seasonally unused or underutilized assets is a problem.

Figure 1 BC Ferries Routes (BC Ferries, 2021)

In addition to the complex nature of passenger traffic, a dizzying variety of cargoes, some with special transport requirements, must be moved around the coast. For much of the consumer goods market, transport trucks embark on ferries, barges, or make use of a commercial drop-trailer service (BC Ferries, 2021). Dangerous goods, however, are generally handled by other marine operators, more focused on the commercial market. The ferries also occasionally schedule the transport of special dangerous goods shipments, but this is an infrequent practice, generally not more than once every two weeks (BC Ferries, 2021). Tanner (2017) notes that the practice of dangerous goods transport on ferries is cost prohibitive, and both truck delivery companies and generally distributors prefer an option like North Arm Transport, particularly when transporting fuel, using either purpose-built fuel barges, or smaller barges that can transport fuel trucks in a more cost-effective manner.

As is discussed in section 1.5, there are limitations on how the geographic nature of distance can be included in this paper. In accordance with the research goals set out, the focus is on the specific bridging of the sea-shore gap that harbour facilities provide, and how their continued operation can be sustained and made more resilient. The community leader on Salt Spring Island, in the Southern Gulf Islands, noted that "BC has long relied on government docks as part of the marine highway". The distance between islands or otherwise isolated communities is a consideration, but the simple fact is that without some form of harbour facility, an island community would have no capacity to source any significant quantity of supplies. Even Bowen Island, sometimes described as "a suburb of Vancouver", and less than four kilometres from North Vancouver as the crow flies, would be near-inaccessible without the ferry terminal and other harbour facilities. Harbour facilities, from ferry terminals to industrial wharfs or small jetties, are the off ramps on British Columbia's marine highway.

Further to the commercial and industrial facilities that exist along the coast, there is another, often small, form of facility: the Small Craft Harbours, which were codified in law as pieces of government property in 1977 (McDonald, 2019). Taking a variety of forms, these harbour facilities were often a key part of communities, and are still often known as the "the old government dock", even if they are no longer managed by the Department of Fisheries and Oceans (DFO). Since a review of the program in 1995, however, there has been a significant shift away from the "non-core" (McDonald, 2019) or "non working" docks, as described by one of the community leaders. Because of this, which has already resulted in the divestment of more than 1,000 harbour facilities across Canada, some communities have lost the facility that previously was their primary means of access, or have seen it significantly degraded. Figure 2 shows how even the facilities that are kept on "the books" have been allowed to fall into disrepair. While the example may be of New Brunswick, the same experience has been felt in British Columbia, with the community manager from the Central Coast stating that when their wharf was divested, "The agreement was for the Feds to fix up the docking facilities and harbour, then after a legal transfer, wash their hands of any responsibility". The problem for continuing support of communities is that those facilities are often where today a tug and barge would offload goods, or where the remaining boats in a fishing fleet tie up.

Fisheries and Oceans Canada (2018) indicates there are still some 54 Harbour Authorities in British Columbia, and 96 Harbours designated as Fishing Harbours, with an unclear number being managed by Harbour Authorities. While there is a concentration of harbours in the area of the Salish Sea and Southern Gulf Islands, communities based around harbour facilities are present all the way up the coast to Prince Rupert (Fisheries and Oceans Canada, 2017).

Figure 2 Non-Core Wharf at Esgenoôpetitj, New Brunswick (McDonald, 2019)

As much as there is diversity among communities based on distance, facilities and geography, communities are also not uniform in size and amenities. The largest of the island communities are fairly sizable small towns. Salt Spring Island, in the Southern Gulf Islands, is home to some 10,000 (Statistics Canada, 2017), in the three separate villages of Ganges, Vesuvius and Fulford Harbour, though much of the island is inhabited as rural land would be on the mainland, with a number of farms and vineyards. However, Salt Spring Island is by far the largest of the island communities, excluding Vancouver Island. Most of the communities in question range between 500 and 1,000 residents; Alert Bay reported just under 500 at the last census, while Bella Bella reported slightly over 1,000. This pattern continues from the Salish Sea to the North Coast and Haida Gwaii, where the village of Masset is home to almost 800 people. Even smaller communities can be found along the coast, but these are primarily First Nations communities, such as Hartley Bay. It is important to note that the population of some of these

communities fluctuates significantly in the summer. While it is difficult to quantify just how much bigger the summer population is, various sources report populations doubling, including on Salt Spring Island, according to SaltSpringMarket.com, while the community leader in Salt Spring simply identified that "it grew by a fair amount". While the Central Coast leader did not directly comment on their communities' population, they did identify that only a few families lived there year round, noting that the summer tourist population was a significant force in the management of the harbour.

The demands of passengers and cargo alike require purpose-driven facilities, from lounges and food services for passengers to secure storage and terminal transport for businesses using drop trailer services. These facilities ultimately require personnel to operate, maintain, and repair them. Ensuring the long-term sustainability of these facilities, in the absence of further government support will require co-operation both in the sense of communication between operators and the community, and in the integration of local communities in the operation of these facilities. These challenges are not unique to British Columbia, but a literature review reveals that they are distinctive here.

2.3 Literature Review

The British Columbia coasting trade has always been a matter of relatively small-scale trade, reflected in a relative paucity of scholarly literature on the subject. This, combined with the changing demographics along the coast and new legal framework for BC Ferries, has created a unique environment that is difficult to compare to other marine transport environments. Waters (1996) compares the specific case of BC Ferries to other operators in the United States, Europe and Australia, but this is a single sector of the marine trade in British Columbia, and predates the current *Coastal Ferry Act*. Two separate examinations are therefore required to develop a sound

understanding of the current transport paradigm, beyond historical and geographic foundations. These are an examination of the current, but limited material available on the actual coastal services in British Columbia, and a broad examination to situate trade and facilities in similar circumstances. There is, however, a wealth of material considering the development of coastal management plans, some elements of which will be considered in Chapter Five.

Useful scholarly material on marine transport and harbour or shore facilities specifically focused on British Columbia can be broadly divided into two sections, focusing either on the resilience of systems in place (Tanner, 2017; Bell, 2020) or on the sociology of isolated or island communities (Hodson, 2007; Siemens, 2014). In addition to the scholarly material, there have been numerous studies on the efficiency of the current BC Ferries system. The most recent major review, *Connecting Coastal Communities* (Redlin, 2018), provides a great amount of information on the management of the company, and effectiveness at meeting requirements set by the province, but does not identify where BC Ferries sits in the larger scheme of marine transport along the north coast. This being said, the report does identify that communities have a vested stake in the continued provision of service, noting that the *Coastal Ferry Act* defines users as not solely the passengers, but also communities and businesses serviced by or reliant on the ferries. The report does identify that BC Ferries should be operating in a larger, coordinated plan for coastal transport, stating of the subsidized BC Ferries routes "it is up to the provincial government to determine which routes and service levels make sense within the context of its overall plan for coastal transportation" (Redlin, 2018). Other documents, such as the *Review of the Coastal Ferry Act* (BC Ferry Commission, 2012) contribute to an understanding of the needs of transport companies, but shed little light on the needs of communities themselves.

The broader set of literature on marine services, especially ferries and light coastal trade, echoes many of the points identified in scholarly literature and "grey" literature focused on British Columbia, such as the issue with marginal "lifeline" services. Examinations of ferry services in other parts of the world find similar sets of challenges, recognizing at the same time that BC Ferries operates a fairly unique service. One of the managers from BC Ferries identified that they were the only service to operate both vessels with transit times of less than an hour, and vessels with a transit time of almost a day. Tsoi (2021) identifies two of the previously described "Ds", (low) density and diverse (described as "heterogeneous") services in a matrix of favourable and challenging conditions to the premotion of ferry services. A report written for the US Army Corps of Engineers (Northern Economics Inc, 2011) identifies similar problems in Alaskan coastal communities, with regards to ferries and "lifeline" services, and makes some recommendations that could be applicable to the British Columbia coast. However, in the pursuit of gaining efficiency, it considers reductions in service as a potentially viable solution, which would likely not be accepted in British Columbia (FACC, 2011).

Many of the individual elements of a sound sustainable transport regime have been identified and discussed, especially in the field of integrated coastal management. These include community consultation, in the form of the Ferry Advisory Committees (BC Ferries, 2019). However, the adverse geography and demographics described (the 3 Ds) introduce elements that often go unaccounted for. Baird (2012) examined the case of *NorthLink* and *Pentland Ferries*, which serve the Orkney Islands off the northern coast of Scotland; while this example bears a close resemblance to the case in question in British Columbia, including the issue of harbour facilities and meeting "lifeline" needs, the focus is more on subsidization of a less-efficient service, than on the support of a sole provider. For the isolated communities of British Columbia,

long term sustainability will be dependent on the ability of communities and companies to cooperate.

That cooperation, conflict, and the initial stage of bringing parties together in the pursuit of a coastal management plan is a well-developed concept in academic literature. Mason (2015) describes the important element of gauging a community or groups' willingness to become involved in a greater management plan, while Weinstein (2007) explores how an ICZM plan can be developed. The issue of communities and stakeholders in conflict is explored by Harrison (2020), especially the idea of "constructive" conflict compared to "pathological" conflict. While not specifically examining transport paradigms, Weinstein (2007) highlights that transport is part of our dependence on the coastal zone, and that management directed at sustainability is important. Finally, Billé (2008) and Devine-Wright (2009) identify some of the issues that will always be present in planning; respectively, on the side of the person developing the coastal management plan, and then on the side of the area it will be implemented.

Chapter 3. Coastal Transport Providers

Interviews were conducted with senior operations and terminal managers at coastal transport companies through August and September 2021. Three complete interviews were conducted with managers of the major transport companies identified in Chapter 2. A fourth "set" was begun, but only completed the first step, as described in section 1.4. These interviews addressed Research Questions 1 and 2, determining whether harbour facilities are considered a significant cost by these companies, and whether there was interest in the cooperative management of facilities with local communities to reduce costs. A format of two interviews was established, with the option for respondents to answer in person, via telephone, or using internet conferencing software such as Zoom or Microsoft Teams. Respondents preferred the option to answer via telephone, and they requested that both interviews be conducted as a continuous session, with a short break between the informal and semi-structured interview. Results were then recorded as a written transcript.

3.1 Informal Interviews

The discussion leading from the first research question "Is the financial cost of harbour infrastructure a significant expense for the marine transport companies?" and questions about the nature of a particular company's involvement in infrastructure showed that each company operates a range of facilities, transporting a wide variety of cargoes. Examples of this include how BC Ferries directly leases terminals from the province, while other operators may use existing infrastructure "inherited" from previous enterprises, such as in Masset. Sometimes, as in the case of government docks, the infrastructure is simply "there", and the company will offload directly to the consumer, without maintaining any fixed infrastructure in the community. In these cases, as described with the paragraph on the Small Harbour Program in Chapter Two., the cost

is carried by either the federal government, occasionally provincial government, or local community governments or organizations. In some rare cases, facilities are shared by two or more marine transport operations, or by commercial and recreational services, such as the case of Sturdies Bay, on Galliano Island. There, the "terminal" for BC Ferries is actually just the parking lot, and the jetty is shared by both the ferry and recreational sailors. In a few examples, including the Port Alberni Port Authorities' harbour revitalisation project, facilities development or redevelopment was funded by an outside source of development funding, in this case the Island Coastal Economic Trust (ICET) (ICET, 2021). There are too many individual systems of ownership to accurately portray them in this paper; as described in section 2.3, one of the prevailing themes throughout the study was diversity, that each must be understood as a discrete and unique example. Because of this diversity, there is no definitive answer, but rather a set of conditions where facilities may or may not represent a high cost, which is explored in the table below. It should be noted that not all of the respondents identified each service as being one undertaken by their organization; rather, this is a collation of all responses.

Situations with Significant Facility Costs	Situations Without Significant Facility Costs
• Passenger transfer, ticket sales or retail venues • The transfer of fuel and other liquid cargoes • Company managed cargo transfer, i.e. drop-trailer service	• Roll on-roll off and ramped barge operations • "Retail" transport, i.e. consumer goods, large appliances • Use of "Government Docks" and similar facilities

Figure 3 Transport Company Costs

Each of the respondents further identified certain facilities that their companies owned and/or operated, and which ultimately correspond to one of the situations in the "Significant Facility Cost" column. Particularly in the case of fuel and passenger transfer situations, labour

and maintenance costs are a major operating cost, and companies identified a desire to reduce these expenses.

3.2 Semi-Structured Interviews

The semi-structured interviews followed a short set of questions (See Annex A) prompting discussion, with respondents encouraged to develop responses based on the particular situation of their company or management situation. A key element to recognize in this discussion is that each company generally operates within a defined commercial "lane", with relatively little competition. The prime example of this would be Island Tug and Barge, regarding the transport of fuel, or BC Ferries being the sole major passenger transporter, though individual "water taxis" do exist, and are often used as substitutes when a ferry is out of service for repairs or other reasons. Tanner (2017) notes that only four companies are generally engaged in the transport of goods and people to isolated and island communities. These four are: Island Tug & Barge, which is responsible for the majority transport of bulk fuel, North Arm Transport, primarily serving Mid and North Coast, Seaspan Marine, which operates both Ro-Ro ferries and a Tug & Barge service, and BC Ferries, which operates passenger and truck transport services, as well as infrequent Dangerous Goods sailings. In the discussion of dangerous goods transport, one of the managers from BC Ferries identified that, especially on busy routes, the business model for transporting dangerous goods was marginal, as little else could be transported at those times. BC Ferries was more than happy to share the business with other transport companies, focusing instead on the passenger and "regular" cargo business.

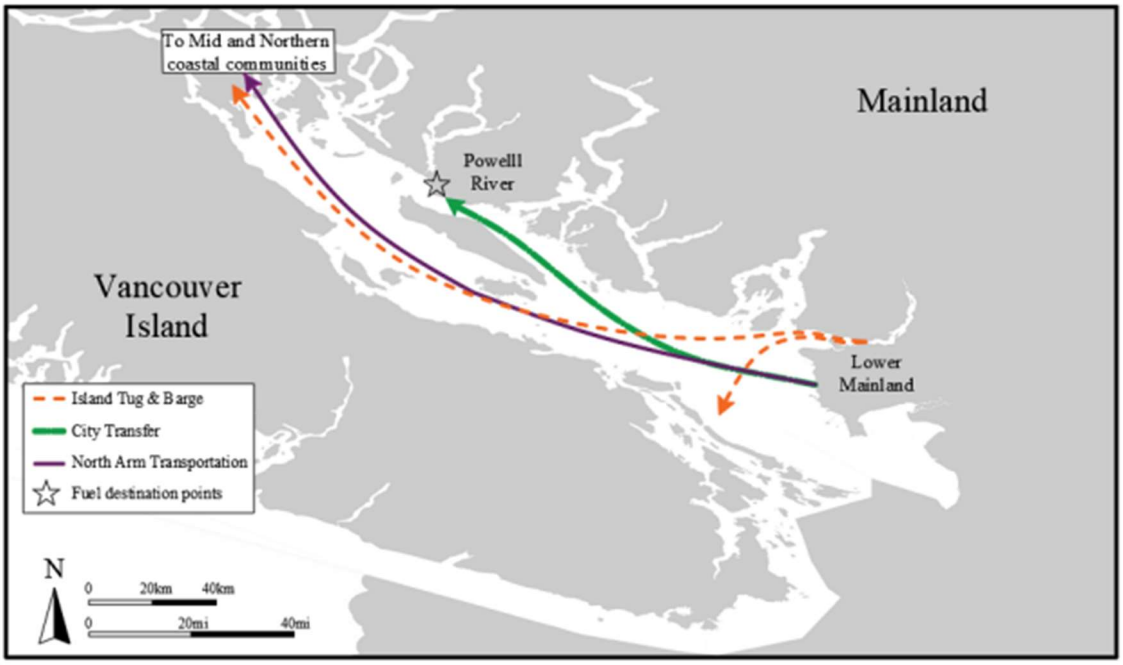

Figure 4 Tug & Barge Operators (Tanner, 2017)

Developing the responses from the informal discussion, respondents identified a few opportunities for cooperative management of facilities, and cooperation in the provision of facilities, but noted that many of these opportunities are either being pursued, or had significant barriers preventing further development of cooperative management initiatives. There was also elaboration on situations which were not judged to have significant costs, but which nonetheless could benefit from closer relationships.

3.3 Opportunities for Cooperation

The most immediate opportunity for cooperative management identified was in the employment of non-operations staff at facilities. Both for fuel and passenger transfer facilities, companies have been making a practice of employing personnel from the local community. North Arm Transport, one of the tug and barge operators, employs several community members in the community of Masset, in Haida Gwaii. The office there is responsible for the orders to the

local community, as well as distribution of fuel across Graham Island. In both northern and southern communities, however, there is difficulty in sourcing sufficient labour to make a practice of employing local community members possible. As will be seen, this is a problem that communities have also elucidated, noting that both skilled (in the sense of technically qualified) and unskilled labour shortages exist. Several issues present themselves with the employment of local community members, which will be discussed in section 3.4. The other "active" opportunity proposed was based around the idea of the community taking on the costs of some auxiliary services at the facilities in question. A version of this system is already in place, with BC Ferries operating concessions at the Tsawwassen and Swartz Bay terminals. Proposed areas of cooperative management were in support and customer service, rather than operations; one potential desire was to have the community manage a free wi-fi system at certain ferry terminals, as it was noted that the community operated a second free wi-fi network that was "competing" with the one provided by BC Ferries. Other thoughts centered around the seasonal-specific tourism industry, with "community markets" and concession stands at terminals being an additional revenue stream draw for the passenger ferries.

An opportunity adjacent to harbour facilities identified by both a manager from BC Ferries and in Redlin (2018) was the desire to support communities by either having local companies work as prime contractors (the example given is Corvus Energy), or thorough a policy of "buy local". While such a program would primarily benefit the larger population centres of Vancouver and Victoria, an identified policy of sourcing products from local communities could prove beneficial. The community manager identified that there is a desire to spur economic growth in communities, which dovetails with Redlin's (2018) note that there should be support for "Canadian supply chains".

More "passive" opportunities being employed involved the co-management of certain projects (described as "Joint Ventures"). These joint ventures generally involved the company helping meet the up-front cost of certain projects, allowing small communities with limited incomes to pursue projects that may otherwise be impossible, such as the procurement of a large number of replacement golf carts for Hartley Bay. This point was not reflected by the managers at BC Ferries, but they did note that it was desirable to "spur economic development" on routes that had traditionally been marginal, or which had been operated at a loss. Mentioning the joint venture at Hartley Bay, the tug and barge manager noted that they see these joint ventures as being key to their own safety as mariners; it was members of that community which proceeded to render assistance shortly after midnight on March 22nd, 2006, when BC Ferries' M/V *Queen of the North* sank after striking Gil Is. (Transport Safety Board of Canada, 2008).

A recurring point in each interview was that companies desired greater communication with communities, and were interested in developing ways to cooperate, despite perceived difficulties in communication, and lack of opportunities. This point will be discussed in section 3.5.

3.4 Barriers to Cooperation

Intentional barriers, preventing industry-community cooperation were not found to exist. However, several unintentional challenges were identified that prevent developing cooperative management of facilities with the aim of reducing costs, either by hiring labour locally or by having the community take on some of the costs of facilities management. The following table identifies some of the key barriers, focusing on various forms of labour and facilities.

Labour Obstacles	Facilities Obstacles
• Responsibility for Employees • Unionized Employers • High Cost of Living in Communities • Labour Availability • Future "Unmanned" Services	• Responsibility for Safety • Responsibility for Capital Projects • Long-Term Project Security

Figure 5 Barriers to Transport Company Cooperation

The key issue for both facilities and labour co-management is a concern about legal responsibility. Both BC Ferries and the tug and barge company managers vocalized concern about the legal and safety liabilities for "outside" workers conducting maintenance or safety-critical tasks; this extended to a consideration of "authority" over workers. Regarding the concept of having local community members conducting other maintenance tasks, there was concern as to whether community "employees" would be subject to union or collective bargaining unit agreements. One of the concerns noted was the potential issues of "maintaining tools, equipment and BC Ferries information at a satellite location", as outside maintainers may not have been expected to provide their own equipment because of union agreements. These concerns were a key element identified when looking at the potential for terminal cooperative management and BC Ferries. Finally, it was noted that there are already issues with initiatives to employ local community members due to both a labour scarcity, and the high cost of living, particularly among communities in the Southern Gulf Islands. It should be noted, however, that the lack of labour can be an issue in other communities; for example, personnel are often required to move to communities off the north coast of Vancouver Island to provide crews for the ferry service there. Respondents were concerned about co-management of the facilities, and the long-term security of a co-management agreement, if popular opinion in a community

changed. This is especially of concern with capital projects, such as the development or expansion of facilities.

3.5 Cooperation Outside Cost Reduction

As mentioned, each of the respondents identified a desire to enhance communication with community members, with the stated interest being that it would be more effective to increase service efficiency, or develop sales, rather than trying to save money in facilities operations. Part of this is that there are "structural limitations" to cost savings on facilities. This point was described by one manager at BC Ferries, in the context of the discussion above, where some costs simply cannot be offset. For the passenger ferries, the potential from communication was identified as being particularly valuable when a ferry route was used as a commuter service; the specific example given was of the ferry service between Alert Bay-Sointula-Port McNeill, which carries students to school each morning. If the bus schedule or time school starts changes, that would need to be passed on to the passenger ferry service. Furthermore, there is an element of the discussion on "discretionary" travel; if a community is able to or in the process of developing a tourism industry, the ferry service can benefit from discretionary ferry travel, which generally results in more profit than the "necessary" transit of commutes to work and school. This thought was mirrored by the second manager at BC Ferries, with the note that on discretionary routes generally associated with tourism, such as transiting among the Southern Gulf Islands or the Alert Bay-Port McNeill-Sointula service, developing a program of community "tour guides" to provide information about the islands as they sailed past could be of benefit.

In a similar way, fuel transporters need constant communication with communities, as the trip to northern BC takes approximately 18 days (Tanner, 2017). The companies involved in commercial transport (e.g., bulk construction supplies, construction equipment, heavy

machinery) also indicated a desire to be involved in community planning, as their ability to meet customer needs was highly dependent on long-term planning and coordination. This element of long-term planning was also mentioned by the community manager in the Southern Gulf Islands, especially for major projects like road building, where large quantities of materials like gravel would be required.

Another area where increased cooperation was desired was in "exceptional service", in the sense of out-of-the-ordinary requirements. For BC Ferries, there are occasionally problems that occur, either mechanical or logistical, that need to be resolved at a local level. While these are not likely to be recurring tasks, there was a desire to develop methods of rapidly addressing these issues at the local level, especially tasks including emergency repairs on a ship; this is despite the identified concern of employing non-company personnel in maintenance. For North Arm Transport, the concern echoed the mention of MV *Queen of the North*: as a fuel transporter, there is significant concern about marine safety, and so there is a desire to maintain tripartite relationships with communities and Western Canada Marine Response Corporation (WCMRC), which is responsible for oil spill response in coastal B.C. WCMRC is known for engaging communities in the development of incident response plans, and since 2017 has engaged communities in both planning, involving community mapping, and in the potential response to a spill (WCMRC, 2021).

3.6 Analysis

Coastal transport companies broadly showed little interest in cooperative management of harbour facilities, but were open to increased communication with isolated coastal and island communities. For example, the tug and barge manager simply stated that "we offload directly to the customer, and have little shore interaction", in reference to current co-management of

facilities and cargo delivery. In the situations where some degree of cooperative management exists, such as concessions, there is little room for further development. As noted, there are structural limitations to how much a specific plan or system can earn or save for a company. However, there is a strong belief in these communities being key to the long-term financial success of the companies, with the smaller tug and barge operators seeing the communities as their "market niche"; because of the economies of scale, these operators are unable to compete with the large fuel transport industry that services Vancouver Island. As mentioned, there is also a strong identification with communities as elements of the marine safety network, though one manager did have concerns about communities approaching transporters who charged less, but did not comply with marine safety regulations, or who tried to skirt regulations, stating "fuel isn't being carried in the proper barges, and some of the people aren't qualified to do the work".

The issue of continuing economic development, with the objective of making more "marginal" services resilient to economic strain shows that the "Joint Ventures" between communities and marine transport companies may be an area for further investigation. In the past the ICET provided significant amounts of funding to aid in the diversification of community economies, but the maximum amount of funding has decreased over time, as the Trust focuses on drawing in other sources of funding, rather than being the sole supporter for a given project (D. Regnier, personal communication, 10 Aug. 2021). Through communication and cooperation on potential development projects, marine transport companies would be in a position to ensure the continued existence of a resilient market, while also having the information necessary to meet the needs of communities that have already been identified as having diverse needs, each with a different shopping list, and which may change with a significant lead time.

Chapter 4. Isolated and Island Communities

Surveys were conducted with community leaders in September and early October 2021. These interviews addressed Research Question 3, assessing the interest local communities may have in developing cooperative relationships with previously identified coastal transport companies. Subjects were initially identified from publicly available records of mayors, harbour masters and other community leaders, and an effort was made to collect further survey results through a "snowball" collection technique. Respondents were emailed a set of questions (Annex B) to answer, and were encouraged to elaborate as their circumstances may require. As is noted in the introduction, this portion of the study was severely hampered by the nature of rural and northern British Columbia; additionally, there was some difficulty in contacting follow-up leaders as identified by the snowball technique. Two community managers responded, one in the Southern Gulf Islands, the other "Mid-Coast" (see Fig. 1, the area between the north tip of Vancouver Island and Klemtu), with a follow up recommendation to contact a person who had already been interviewed as a transport company manager, but who had specific knowledge of the community of Masset in Haida Gwaii.

4.1 Survey Results

Based on the survey questions, and the earlier interviews with coastal transport companies, the long-term sustainability of the coastal transport industry is a complex subject for communities. Three general problems were identified, each directly linked to the issue of harbour facilities. As seen in figure 6, the problems are the potential loss of government infrastructure, issues of housing and labour, and a shift to seasonal communities. While there were no clear solutions to these problems, many ad-hoc remedies have been identified. These remedies follow general patterns or themes, based on the issue experienced. These themes all

center on the understanding communities have that they are dependent on the coastal trade, but that they are also the drivers of the industry. As will be described, communities have worked hard at finding solutions to the problems, but these solutions are often tenuous and fragile. Greater resilience in both communities and their solutions is required to ensure enduring strength.

Figure 6. Problems for Coastal Communities

4.2 Community Problems

The first key concern that community leaders expressed was the loss of funding for a "government dock". These facilities take many forms, but can generally be identified as a wood or cement wharf, sometimes with a breakwater, and with some basic facilities. The respondent in the Southern Gulf Islands identified that funding from the government for the maintenance of this infrastructure as being insufficient, and noted that they had seen news article saying that fishing fleets were down 60%, and that access to docks was one part of the problems the fishermen faced. This concern is supported by an investigation into the Small Craft Harbour

program prepared for Parliament on 2019 (McDonald, 2019), which identified a general lack of funding to be a key issue.

In addition, both McDonald's report and the central coast community leader have identified that the divestment of infrastructure has led to communities either seeing a dock slowly rot under the auspices of the Small Craft Harbour Program, or attempt to manage it as a Harbour Authority, the result often being that they were left with a dock that they could not afford to maintain. The community leader characterized this as "The Canadian government's initiative to rid itself of non working harbours". "Non-working" refers in this context to harbours that primarily serve recreation, tourism, and other small private vessels. McDonald does identify that the 1995 Program Review, subsequent pivot to fishing harbours, and divestiture program focusing on recreational harbours, is having an extended impact on communities, and recommends that greater importance be placed on these "non working" facilities, as they are often a key sector in small community economies. Furthermore, some of the facilities still in use have become safety hazards, but must be used as they are the sole option available, such as for the community of Bella Bella, on Campbell Island (McDonald, 2019). This change should also be framed from the point of view of the tug and barge manager, whose business is reliant on these jetties; without properly dredged harbours, and maintained landing areas, it would be unsafe to bring fuel or cargo barges alongside, and so the community would be dependent on very small cargo transports.

The general effect of this, as well as other changes, has been a shift towards "seasonal communities". This is a significant concern that was noted by the community leader in the Southern Gulf Islands, who gave the greater example of Zeballos, on the west coast of Vancouver Island. Zeballos, on the North-West coast of Vancouver Island has seen a decline in

fishing, referencing the 60% decrease in the small boat fleet, and the community grocery store and gas station are shutting down in the off-season because of a lack of business. The manager also identified the advent of fly-in resorts along the coast as another example that draws away labour in the summer season, but adds little to the local economy. The result of this change has been that community members' sole source of supplies requires they drive through mountainous roads for several hours. Here the community leader also referenced the fact that Zeballos acts as something of a marine hub, as identified in the discussion on Alaska's "marine hubs" in Chapter Two, stating that this change "impacts the smaller more remote marine access only communities and local economies". This change, and the potential effects on harbour facilities is a serious concern, as was seen in the summer of 2018; a forest fire threatened the sole road to and from the town, and a Royal Canadian Navy vessel, HMCS *Edmonton*, was tasked to stand-by to evacuate the town (Global News, 2018; HMCS Edmonton, 2019). Without harbour facilities, this kind of emergency action would be impossible.

The final problem affects both communities and coastal transport companies. As the shift to seasonal communities is experienced, land prices have risen in some communities, with wealthy seasonal vacationers purchasing properties that are often used for only a few months or even weeks every year. An excellent example of this is in the smaller of the Southern Gulf Islands; while the large island community on Salt Spring Is. has been able to maintain a more varied population, the smaller islands are limited because of their size. However, this effect has also been noted in the Central Coast, with the community leader there noting that not only did it have an effect on the harbour's management (Chapter Two), but that it also fed into the problem of maintaining the government dock, as relatively few people lived in the community over the winter. This has had the effect of reducing available labour, while also increasing demand for

both skilled tradesmen and manual labourers. The community leader on Salt Spring noted that "most trades people are desperate for crews", e.g. manual labourers, and more skilled trades, such as carpenters and electricians. Both the community leader from the Southern Gulf Islands and the tug and barge manager also noted that they identified the availability of amenities (hospital, school, bank) as a draw for skilled trades people who could afford the higher coast of living. While the increase in traffic may aid coastal transport companies in the short term, the loss of year-round income may become a problem, especially for routes with low margins, and constant maintenance costs on vessels and equipment.

4.3 Community Solutions

The community leaders interviewed indicated that they had worked to find solutions to the problems identified, but that their ability to resolve issues and conflicts is severely restricted, especially when it comes to issues like real estate and demographics of communities. Solutions to the first problem have generally been the most effective, and were mentioned in multiple responses. Some communities have taken over the entire operation of management of the harbour facilities; this was noted to be an effective strategy for municipalities by the Central Coast community leader, referencing a pair of local towns: "[town] & [town] are municipalities that are able to provide labour and materials to further develop their locations". However, while this may be effective for more organized communities, with employees on payroll and a set budget, it was not thought to be replicable in smaller villages, or unorganized communities by the Central Coast community leader. In that case, a private co-operative organization was formed to deal with the issue, but has had difficulty because of their reliance on volunteers, as no full time employees or resources existed to maintain the facility.

Another solution, practiced on Salt Spring Island, in the Southern Gulf Islands, is to have a number of separate facilities on an island all be managed by one Harbour Authority; saving money and effort by being able to coordinate efforts, and through economies of scale. However, beyond providing berths for vessels that operate year-round, neither of these solutions can resolve the other, more structural problems experienced by the communities. The issue of seasonal populations actually contributed to the problems experienced by the private co-operative, which effectively had to shut down in the off season due to lack of potential volunteers.

4.4 Opportunities

There are a number of ways in which a greater relationship with transport companies may support small communities. Focusing on the three major concerns laid out at the beginning of this chapter, a coastal transport company will generally have an established relationship with Transport Canada, and so can help communities that may be having trouble with administrative requirements of harbour facilities, associated with the loss of direct government management of the facility. These can take several forms, but may be issues of regulatory compliance, or the identification of the correct legal authority. This can be a key concern when money is available, such as from ICET, but requires that a community or organization apply for a grant; the federal government has recently announced that some $300 million will be provided to revitalize the Small Craft Harbours program (Department of Finance, 2021). While it might be only a small contribution, relative to the projected costs of actually repairing facilities and meeting the needs of communities (McDonald, 2019), both the communities and transport companies can benefit from safe facilities that have long-term support.

Furthermore, the continued development and construction of homes in isolated communities creates an opportunity for the commercial transport of building supplies and equipment. It should be noted that the Southern Gulf Island community leader identified “Most of these contractors ‘have their own barges’”, and there are many single-tug operations in the Southern Gulf Islands, but also that there has been continuous development over the past few years, as real estate development looks to capitalize on the noted high land costs. While there may not be a solution to the lack of available housing, the continued development is certainly an opportunity for transport companies, and continued interest will certainly strengthen communities. While a portion of new arrivals will always be seasonal vacationers, many are interested in the semi-isolated lifestyle that the islands bring, a fact Siemens (2014) noted.

Finally, the continued need for labour on the islands, especially in the smaller Southern Gulf Island communities, is an opportunity for the passenger transporters, particularly BC Ferries. However, the opportunity also re-enforces the need for close communication between communities, the Ferry Advisory Committees, and BC Ferries. The current system of biannual meetings (Spring and Fall) is insufficient, and should be changed to at least quarterly meetings, given the amount both community leaders and transport managers have identified communication as a problem.

4.5 Barriers

Beyond the problems identified, barriers in communities are general based on the perception that communities may have of coastal transport companies, and of internal politics. Examples of this abound, but a recent example can be found in BC Ferries plan to expand and redevelop the terminal at Snug Cove, on Bowen Island (BC Ferries, 2021). Some opposition is directed at the actual redevelopment, while others oppose certain elements. There is also an

undercurrent of concern that an expanded ferry service will change the "nature" of the community by allowing too much vehicle traffic, among other things. Another example of this was identified by the Central Coast community leader, who has reduced their direct involvement in the management of the harbour because of personal conflict. Because of the often close relationships community members have, personal conflict can be a significant issue, in addition to more "constructive" conflict (Harrison, 2020). Especially in small communities, where people's personalities may be based on a sense of resilience, either tools are developed to deal with conflict internally, or as Harrison states "they enter problematic conflicts that can fracture communities and undermine community resilience and well-being ". Unfortunately, there is no real solution to these public opinion barriers; communities must be able to show majority support for a project, or it is inevitably doomed to fail.

4.6 Analysis

Communities are the driving force behind the coastal transportation trade, and as work based on primary industry continues to diminish, they will remain as the key market for transport companies. However, just as the companies are dependent on the communities, so too are communities dependent on the transporters for fuel, supplies and equipment. These communities have the most to lose from a loss of facilities, and so ensuring that the coastal transport trade is sustainable is key to ensuring the sustainability of the self-same communities. A manager at BC Ferries noted that British Columbia saw the example of this in the early 00s, when the prohibition on ferry cross-subsidization disproportionately affected small communities, and those obliged to use the ferry service. This is reflected in the *Review of the Coastal Ferry Act*, (British Columbia Ferry Commission, 2012), which states "A one price cap model is more straightforward and equitable", which Redlin (2018) further develops as the fact that the

multiple-fee cap structure previously in place had lead to ballooning costs for ferry services which were not financially viable as independent operations. Communication and cooperation can take a number of forms, but developing relationships between the communities and the transport companies will be an important item to ensuring resilience of the system. Communities continue to develop and use ad-hoc solutions, or make do with unsafe facilities, when typical systems fail to meet needs, but the entrenchment of solutions is necessary for strong, independent communities. Some ways of cooperation may be as simple as a transport company lending a community an administrator for a few hours, to resolve an issue with Transport Canada; other conflicts or problems will, however, require concerted efforts from within a community to overcome barriers in opposition.

The varied nature of the communities along the West Coast of British Columbia dictates that each will experience its own problems. From active, diverse communities to quiet hamlets of two or three hundred, each will have to investigate its own potential for long-term sustainability. Transport companies may seek out the larger markets to cooperate with and develop relationships, but smaller communities will need to be able to pursue relationships from where they stand; their existence depends on it.

Chapter 5. Coastal Transport and Marine Management

The development of effective integrated coastal zone management (ICZM) plans for coastal British Columbia is a critical objective in the coming years; however, the actual institution of an ICZM plan is beyond the scope of this paper. Rather, recognizing the objectives set out in Chapter One, this paper identifies certain necessary recommendations that will aid in the development of a coastal management plan in the coming years. As Chapters Three and Four indicate, there are certain areas where direct communication, or improved communication frameworks, can solve problems that communities and transporters share. There are other issues, however, that need to be considered along with the immediate concerns of the two groups. As we continue to see the effects of climate change, facilities will need to be made more resilient, and with the advent of increased renewable energy, companies that once focused on the bulk trade in fuels, such as Island Tug & Barge, and North Arm Transport (Tanner, 2017), will need to reconsider their business models. This is a key point identified by the manager from North Arm Transport. Finally, it must be recognized that changing dynamics of coastal trade will disproportionately affect small- and low-income communities, which are less able to absorb the costs of harbour facilities than large communities that have more resilient economies.

5.1 Towards Coastal Management Plans

An integrated plan aimed at the management or regulation of the coastal transport trade in British Columbia is clearly warranted. Both Redlin (2018) and McDonald (2019) identified a need to develop plans to manage both the various transport methods, as well as the various kinds of harbour facilities that are associated with the transport of goods and people. One of the community leaders noted that the waters of coastal British Columbia are a marine highway, an

apt comparison. The marine transporters form the “invisible skeleton” on which coastal economies are formed (Dr. N. McDonald, personal communication, Nov. 2021), and without measures to ensure adequate dock facilities, the marine highway will not exist. The measures taken must reflect individual community conditions.

The principal factor in developing a coastal management plan is that, as examined in Chapters One and Two, each provider and community is unique, and a plan would need to carefully assess the potential impact on each sector of maritime commerce. Because each transporter focuses on a separate segment of the market, a plan focusing on passengers and retail goods, and leaving out barge operators, may cause just as much harm to communities as if there were no plan. Therefore, any plan must be comprehensive with an analysis of secondary third order effects and potential unintended consequences.

Second, internal conflicts that may exist within a community, as described in section 4.5, will need to be managed and resolved. As Harrison (2020) describes, there are a number of potential root causes for intractable conflict, especially when considering personal history; this is reflected by the comments of the Central Coast community leader. In addition to personal conflicts over management, local opposition to projects was an element that was identified by several coastal transport managers in interviews. Often described as NIMBYs, community members oppose new development with dual concerns as to personal identification with a place, and concern about surrounding structures (Devine-Wright, 2009). Opposition to change is often inevitable. A well-reasoned strategy explaining the reason for the changes and the tangible benefits of change will assist in quelling opposition.

Finally, a third planning factor is addressing the ways in which different communities approach decision making. While some communities, especially organized communities,

maintain a traditional municipal structure with mayor and council, other communities may base their decision-making process on consensus. Because of this, any coastal manager looking to involve communities in the planning process will need to consider how to accurately represent these decision-making processes.

As requirements change, especially when communities are growing, operators have a three-sided dilemma: add more sailings, which results in busier harbours, use larger vessels, which may require noisy and unpopular facility upgrades, or leave potential customers waiting on the dock. While the sudden growth is primarily a concern for southern communities, northern communities have similar changes in requirements; building on the example of the ferry as a school bus, the closure or opening of a new school will require a review of the ferry schedule, and may leave some customers waiting.

Addressing the concern of "seasonal" communities, some effort must be made to support the development of stable, resilient communities. Siemens (2014) identifies that one of the previous barriers to isolated communities was the difficulty in communication and movement. However, since 2014, and especially since March of 2020, Canadians have become much more used to using electronic meeting software, and less reliant on face-to-face meetings. With this, and other barriers overcome, the potential for small communities to develop vibrant, stable economies is much greater.

A basic framework for ICZM can be set out with the opposition, growth and seasonality conditions identified above, as well as the concerns and desires described in Chapters Three and Four, and elements identified as important to the development of a coastal zone management project (Mason, 2015; Weinstein, 2007). Four steps are laid out in ICZM literature for the development of a PLAN: initiation, in which the stakeholders and goals are identified, planning,

in which a set of manageable objectives are laid, implementation, and then monitoring. A crucial element of the first step would actually be in identifying communities themselves; as Siemens (2014) discussed, there can be some difficulty for a project when identifying participants. However, with participating "Users" and "Providers" identified (see section 1.2), a basic outline of goals can be formulated with the needs of a community, the transport systems in place, and the current barriers to resolving the problems that are identified in Chapters Three and Four. Setting out the objectives can be made easier through a tool like participant mapping, which would be particularly apt in communities of sailors and fishermen, who would be intimately familiar with the coast and oceanography of the area around them. This practice of community mapping is already in use in coastal British Columbia, as noted in section 3.5; WCMRC has been using the practice to better develop marine incident response plans. Using a system of community mapping (in this case involving the transport companies in the economic "community") would address the problem of identifying communities to include in a management plan, but also address potential issues that exist when trying to use traditional management methods, a point identified by Billé (2008).

A well-developed set of community maps, showing what the community considered of importance, would have value in resolving the first two problems identified in figure 6. Through the community maps, it would be easier to formalize the need for housing and reiterate the need for facilities. Furthermore, by directly involving transport companies, a well developed ICZM program would address the issues of each segment of the transport community. The third problem from figure 6, of stable, year-round communities, would need a much deeper investigation of why people move to or from the places in question. While Siemens (2014) does develop the idea, looking at how "many are interested in meeting lifestyle objectives and perhaps

with ‘making do’”, such a way of life will not be accessible, or acceptable for many, and requires more than “lifestyle” to ensure a resilient economy.

5.2 “The Fuel Business is Changing”

Marine Transport companies face a number of concerns beyond those that purely involve harbour facilities, but other concerns associated with the provision of goods to coastal communities should also be considered. The foremost of these changes identified, quoting from the North Arm Transport interview, is “the fuel business is changing”. There is a general shift from fossil fuels to renewable energy, a change which can be observed in many sectors. In the marine transport sector, vessels have been constructed, or modified to use Liquified Natural Gas (LNG) since the early 2000’s (Thomson, 2015). This is in part because of restrictions on so called “stack emissions” but also because of the cost of LNG compared to traditional marine fuel oils. In British Columbia, the discussion of LNG as a fuel for marine transport has existed since the early 2010’s (Marrack, 2011), but it was not until 2018 that BC Ferries adopted the fuel for ferries, beginning with the largest *Spirit*-class vessels (Wilson, 2018).

Despite the recognition that LNG has certain inherent limitations, especially for some of the longer ferry routes, or those in communities with the necessary infrastructure, LNG represents a “transition” fuel in the continuing process of reducing emissions for marine transport (Lindstad, 2020). There is little discussion considering the implication on marine transport of coastal B.C. communities ceasing or reducing the use of fossil fuels, which would have both an impact on the transporters that move fuel from the “mainland” to isolated communities, but also within communities that may act as hubs for a “provisioning area” (Dr. McDonald, N., personal communication, Nov 2021). Recognizing both the plentiful renewable energy sources in British Columbia, and a clear trend away from traditional fuels in remote

communities (Canada Energy Regulator, 2021; McFarlan, 2020), the marine transport community has clear justification to be concerned about markets that continue to change. With changes in demands for traditional liquid fuels, especially for vessels that consider isolated communities "home", facilities dedicate to the storage and distribution of diesel, gasoline and heating oil, such as North Arm Transport's operation in Masset, in Haida Gwaii, will need to be decommissioned, or converted to other purposes. As the same companies that transport fuel also move cargoes for such crucial processes as water purification, a constant issue in northern communities, a long term, sustainable framework for the "marine highway" must be established, so even with changing markets, or disappearance of some markets, even the smallest communities are able to thrive.

5.3 A Rising Tide Lifts All Boats

Returning to the issue of community viability, it is important to reiterate the issues associated with the survival of the smallest and low-income communities. A prevailing element of the results of interviews, surveys, and through this discussion has been that communities with already diverse economies are the most ready to adapt to changes; these communities are already resilient, to a certain degree. Examples of this can be found in the Southern Gulf Islands, or in the discussion of Snug Cove (BC Ferries, 2021); Bowen Island is unlikely to have economic trouble due to a lack of facilities, being adjacent to the metropolis of Vancouver, and a popular tourist location. However, many northern communities are not so fortunate in geography; as mentioned by marine transporters, primary industry has become much less prevalent than in earlier decades, removing a traditional source of income. Meanwhile, the salmon fishery, arguably the most historic source of income, has been drastically reduced (The Canadian Press, 2021). While the closure of the fishery may be necessary for the long-term health of the coastal

ecosystem, it poses a critical problem for communities who have few other sources of income. As noted in section 4.2, one community leader noted that the advent of fly-in resorts has created a very complex problem, both for nearby communities and transport companies. These resorts are the purest example of two of the problems identified by communities, in figure 6: being by nature a service industry, they absorb much of the "free" labour in the area, returning little to the community, but also perpetuate that seasonal boom-and-bust cycle for marine transporters, who will see increased demand for a short period before and during the "tourist season", but then have little to no work in the off season. This boom-and-bust cycle will also affect communities, as they see reduced availability in summer months, or increased prices.

Further to this issue for small and low-income communities is the fact that a preponderance of communities along the coast are primarily First Nations, especially north of Vancouver Island (Coastal First Nations, 2020). These communities have historically been marginalized; the blockade of Lyell Island and arrest of Haida members in 1985 represented some of the first actions taken to ensure First Nations had a role in the management of land around their communities (O'Hara, 1985). Since then, the importance of First Nations groups in management of land, sea and coastal resources has become much more clear, as can be seen in the plan for the Pacific North Coast Integrated Management Area (Fisheries and Oceans Canada, 2020). However, many of the First Nations communities still have decades of marginalization to overcome, and a crucial part of that is ensuring that reconciliation includes the development of systems to ensure community stability. The sustainability of these communities goes beyond a responsibility to right past wrongs; the community of Hartley Bay, discussed in Chapter Two, is the home community of the Gitga'at people (Coastal First Nations, 2020).

Chapter 6. Conclusion

British Columbia is a province of marine trade. From the first peoples to establish coastal communities, some 7,000 years ago (Sloan, 2003), to the advent of steam shipping in the mid-19th century, marine transport has been the arterial network that connects communities. In the 21st century change continues unabated, from new fuels in ships to changing demographics on land. However, one thing has not changed: isolated and island communities depend on the boats and barges that move along the coast and between the islands. The facilities that bridge the gap between land and sea are as crucial today as they were 150 years ago, when the Canadian Pacific Railroad tied sea to shining sea (Gough, 2016).

The primary concern for communities reliant on coastal trade is not actually one of diminishing margins for the coastal marine transport industry. The companies that conduct business along the coast of British Columbia continue to prosper: BC Ferries maintains one of the highest farebox recovery rates (Redlin, 2018) of any comparable ferry service, double historical numbers for other Canadian ferry services (Waters, 1996), while other providers, including the tug-and-barge services, have been able to sustain their services. Furthermore, the concerns of operating costs for facilities, while certainly a consideration in community life, are not ones that can be addressed by the community. Rather, it is the interface between those providers and the communities that needs to be addressed, and which has significant potential for development. There is both need and interest from transporters and communities to develop relationships, if not necessarily on the co-management of facilities.

Marine transport companies and communities must work together to develop relationships based on mutual communication and long-term planning. Only through the development of plans that involve bilateral communication between users and providers will

communities continue to thrive. While a greater examination of the patterns developed in this paper is desperately required, it is clear that both communities and transport companies understand the need for improved communication. In the situations where there is effective bilateral communication, such as the Ferry Advisory Committees, organized by BC Ferries, the needs of a community have been identified, and through that information a more effective coastal trade can be organized.

This paper cites instances where communication has been effective, such as fuel distribution on Graham Island, road construction in the Southern Gulf Islands, and joint ventures in the Central Coast. Even within those examples, however, there is a need for increased and more timely communication. Ferry Advisory Committee meetings, for example, should be at least quarterly, giving the committee the opportunity to identify issues and opportunities as the seasons change. As the tug-and-barge manager identified, there were great successes when Users and Providers communicated, such as with the "Joint Ventures". However, in the same business are examples where the communication between user and provider is limited to emailed order forms and confirmation of payment, which provide little opportunity for either enhanced relationships or long-term planning.

Communities and transporters have mutual problems that will need to be addressed, even before cooperation on facilities management can be considered. As identified in Figures 3, 5 and 6, with the interviews and surveys conducted in the execution of this project, several key problems were identified that need to be considered. Insufficient or expensive housing in the Southern Gulf Islands perpetuates issues with labour and "seasonal" communities, reducing the potential support for facilities. In northern communities, loss of government support has compounded pre-existing issues associated with the decline of fisheries and other primary

industry. Even in communities where labour may be available to contribute to a reduction in costs, the adoption of this strategy is a marginal option. Facilities like the terminals managed by BC Ferries have very specific labour requirements, and concerns of safety and union membership relegate local labour to retail or interpretation positions.

Communities that are dependent on a government dock should be helped with the development of management plans for the infrastructure, recognizing the continuing divestment program. While the subsidization of marine infrastructure by the federal government and other organizations may have been effective at times, this paper demonstrates that such support can be irregular or unreliable. Therefore, communities must be able to manage their own facilities independent of continuous support from the government.

A variety of opportunities for cooperation have been explored, but the development of those relationships, whether ad hoc, or pro forma, is beyond the scope of this paper. So too is the development of an Integrated Coastal Zone Management (ICZM) plan; while the region could certainly benefit from a comprehensive transport plan, such an endeavour will be the work of years of research and consultation. Rather, this paper serves to identify a necessary element when discussing the issues of coastal communities, that is, the understanding of marine transport and facilities as part of a community's needs. Even modern discussions of coastal communities often lack in-depth examination of the marine transport systems; Siemens (2014) discusses the novel entrepreneurial environment of rural British Columbia communities, including the difficulties caused by lack of mobility, but limits the scope of research to simply that of passenger ferries (Dr. L. Siemens, personal communication, Oct. 2021).

I recommend three immediate actions in pursuit of effective transport management for Coastal British Columbia. The first, and greatest task is a comprehensive inventory of the

communities, their current harbour facilities, and their needs with reference to those facilities. Such an endeavour will require input from many sources, and must include a comprehensive mapping project, as described in Chapters Three and Five. Without such, any new plan or study of the region will face the same and greater barriers as available information becomes out-of-date. Secondly, there must be a further review of the subjects of McDonald's (2019) report on the Small Craft Harbour Program. Described in Chapter Four, the fishing industry has significantly declined in the region, and cannot be expected to continue supporting communities alone; the program should not be exclusively the "Small Fishing Craft Harbour Program". A lack of investment in the "non-working" harbours may not be the only concern to communities, but is an added stressor. Finally, both companies and communities should examine how they can compensate for the changing demographics seen in communities. While large communities like Salt Spring Island may benefit from proximity to other population centres, the shift towards seasonal populations is of concern.

The west coast of Canada is a vibrant, diverse space, where the future continues to reconcile itself with the past. However, as we move towards a paradigm of evidence-based planning, marine managers will need to recognize and strengthen the links between sea and shore. The problems experienced by communities along the coast will inevitably lead to problems for the marine transporters. The waters of coastal British Columbia are a marine highway, and the harbour facilities the access points. A highway without offramps would be a terrible design; a coast without facilities is just as much a failure.

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