Abstract

Infrastructure is a popular unit of analysis among geographers and planners. The broad field of infrastructure studies provides a means of exploring the ways in which we materialize certain aspects of our communities. This study mines the extensive research into infrastructure and contributes new data and analysis in order to theoretically, historically, and empirically explore the social relations of trade infrastructure; here explored as infrastructure intended for the purposes of international trade that is geographically located within border regions. The context in which this study takes place is spatially located at the border of the U.S. state of Michigan and the Canadian province of Ontario. I also consider two different temporal contexts. First, I look to an historic case study of the first infrastructural crossing of the Detroit River between Windsor and Detroit—a period of roughly 40 years between 1870 and 1911—in order to locate historical consistencies in the economic forces that drive trade infrastructure. Second, I explore the contemporary case study of the Herb Gray Parkway in Windsor, Ontario and the eventual construction of the Gordie Howe International Bridge. This contemporary case features the unique involvement of Walpole Island First Nation (WIFN) and the ways that this Indigenous community informed the planning and development of the parkway and international crossing. A key thread running through these case studies is the inherently social nature of infrastructure.

Setting infrastructure into motion require a great deal of social planning; the material expenditures of infrastructure could not exist without first laying a social groundwork that the planning process can move through. Ultimately, this social process is organized in a contractual apparatus that favors the distribution of infrastructural value to a financial class, while the local communities surrounding the infrastructure itself are relegated to securing minor contracts in the hopes of speculative economic benefit.
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# Table of Contents

Abstract ........................................................................................................................ ii
Acknowledgements ........................................................................................................ iii
Table of Contents ......................................................................................................... iv
List of Figures ............................................................................................................... vii
List of Tables ............................................................................................................... viii
List of Abbreviations ................................................................................................... ix
Glossary ....................................................................................................................... x

Chapter 1 Introduction ................................................................................................. 1
  Research Aim and Objectives ..................................................................................... 3
  Theoretical Framework ............................................................................................... 4
  Trade Infrastructure .................................................................................................... 5
  Contractual Apparatus ............................................................................................... 8
  Marx’s Value Theory and The Social Relations of Infrastructure ......................... 13
  Limitations of Marxist Theory .................................................................................. 16
  Overview of Chapters ............................................................................................... 20
  Theoretical Contribution ........................................................................................... 21
  Historical Contribution ............................................................................................. 21
  Contemporary Contribution ....................................................................................... 22
  Conclusion .................................................................................................................. 22

Chapter 2 Methodology ............................................................................................... 25
  Methodological Framework: Case Studies using Dialectical Materialism ............... 25
  Application of Method: Defining the Case ............................................................... 29
  Methods & Approach ............................................................................................... 32
  Literature Review ...................................................................................................... 34
  Document Analysis ................................................................................................... 34
  Interviews .................................................................................................................. 35
  Archival Research ...................................................................................................... 37
  Site Visits ................................................................................................................... 39
  Limitations ................................................................................................................ 39
  Conclusion .................................................................................................................. 41

Chapter 3 Theorizing Trade Infrastructure and the Economies of Border Regions .... 43
  Introduction ................................................................................................................ 44
  Why Infrastructure? Why Borders? .......................................................................... 46
  Trade Infrastructure and Planning Border Economies ........................................... 52
  Defrauding One Another: Trade in Marx ................................................................. 55
  From Cross-Border Growth Machine to Trade Infrastructure Financialization .... 61
  Conclusions and Recommendations for More Just Planning Practices at the Border .................................................................................................................. 69

Preface to Chapter 4 .................................................................................................... 76

Chapter 4 Defrauding One Another: A Partial Economic History of Crossing the Detroit River .... 77
  The Role of Infrastructure in Canada’s Economic Dependency ............................. 81
  Importing Technical Expertise in the Emergent Canadian Planning Profession .... 83
  The Social Relations of the Detroit River Tunnel Company .................................. 86
  A Brief History of Tunneling the Detroit River: 1867-1911 ................................... 87
Infrastructural Finance and the Economic Relations of the Built Environment ........................................... 94
Finance, Railways and the Panic of 1873 ........................................................................................................ 95
Post-Crisis Infrastructural Monopolies: 1883-1905 ...................................................................................... 98
Finance and the State: H.B. Ledyard’s Plea to Congress ........................................................................... 99
The Contractual Apparatus as Infrastructure in Practice ........................................................................... 102
Duncan D. McBean (1842-1918): Courageous Foreman, Disgruntled Contractor .................................. 104
William J. Wilgus (1865–1949) and the Myth of the Winning Bid ......................................................... 106
Conclusion ................................................................................................................................................. 110
Preface to Chapter 5 ................................................................................................................................. 114
Chapter 5 Promises and Perils of a Parkway: The Built Relations of Indigenous and Multi-jurisdictional Infrastructure Planning at the Detroit River ................................................................. 115
Trade Infrastructure and the Social Relations of Capitalism .................................................................. 117
Public-Private Partnerships and Infrastructure Planning and Development with Indigenous Peoples .................................................................................................................. 119
Method ....................................................................................................................................................... 124
Case Study Methodology ......................................................................................................................... 124
Background & Context .............................................................................................................................. 127
Bkejwanong .............................................................................................................................................. 130
Engagement History of Walpole Island First Nation in the Herb Gray Parkway Project ................................. 133
From Engagement to Contract.................................................................................................................. 134
Manifesting the Contract .......................................................................................................................... 136
Interpreting the Results within a Contractual Apparatus ........................................................................ 138
Engaging in an Infrastructural Contractual Apparatus ........................................................................... 139
Relationship Building in a Contractual Apparatus ................................................................................... 144
Conclusion ................................................................................................................................................. 148
Chapter 6 Conclusion ................................................................................................................................. 151
Contributions to the Study of Trade Infrastructure .................................................................................. 151
Limitations in Theory and Method to the Study of Trade Infrastructure ............................................... 154
Further Relevance and Research Potential ............................................................................................. 156
References .................................................................................................................................................. 159
Appendix A Timeline of the Detroit River Tunnel Company Project against the Consolidation of American and Canadian Railways ........................................................................... 177
Appendix B General Research Ethics Board (GREB) Approval Letter .................................................. 178
List of Figures

Figure 1 Dialectical relationship between conceptual categories of trade infrastructure and contractual apparatus and the subjects explored in subsequent chapters of this dissertation. ...... 13

Figure 2 Map of Upper Canadian & American railways circa 1860 showing an extensive network running east and west across southern Ontario between New York and Chicago .......... 89

Figure 3 Maps of Detroit-Windsor showing how the Herb Gray Parkway extends Highway 401 to the future site of the Gordie Howe International Bridge connecting the two cities across the U.S.-Canada border................................................................. 129

Figure 4 Map showing the location of Walpole Island and Windsor near the rivers that make up the U.S.-Canada border in southwestern Ontario. ......................................................... 130

Figure 5 Trail Marker and Pedestrian Bridge........................................................................ 137

Figure 6 "Homage to Safe Passage" Sculpture..................................................................... 138
List of Tables

Table 1: Data sources, perspectives included, and subjects covered for each case study. .......... 33

Table 2: Documents Reviewed by Type .................................................................................... 127

Table 3: Documents Reviewed by Source ............................................................................... 127
List of Abbreviations

AFP alternative financing and procurement
APP Aboriginal procurement program
DBFO design, build, finance, and operate
DRIC Detroit River International Crossing
DRTC Detroit River Tunnel Company
EA Environmental Assessment
GDP gross domestic product
ICC Interstate Commerce Commission
MNR Ministry of Natural Resources
MTO Ontario Ministry of Transportation
PPP public-private partnership
SADC Southern African Development Community
SEZ Special Economic Zones
TPIC Town Planning Institute of Canada
VfM value for money
WEMG Windsor Essex Mobility Group
WIFN Walpole Island First Nation
Windsor BIIG Windsor Border Initiative Implementation Group
Glossary

Aboriginal Title: In Canada, Aboriginal Title refers to the right of Indigenous people to the lands that they have held long-term customary use and occupancy prior to European colonization.

Contractual apparatus: The organization of contracts in an infrastructure project that is mediated by the project’s financiers. It expresses the internal relations of capitalism so that the contracts themselves reflect competing entities selling their labor power to the financiers of capital. It is therefore not simply a natural distribution of project resources, but a political arrangement laden with power differentials.

Crown duty to consult and accommodate: Legal precedence decided by the Supreme Court of Canada mandating that whenever the Crown performs any action, including land development, that may negatively impact Indigenous rights—as they are established in the Constitution Act of 1982—then the Crown must consult and accommodate the Indigenous community affected.

Design, build, finance, operate (DBFO): A type of long-term infrastructural contract in which a private entity agrees to design, build, finance, and operate the infrastructure for the contract tenure. This type of contract is a prominent feature in public-private partnerships.

Dialectical materialism: A philosophical understanding of Marx’s method for empirical study (dialectics) whereby the material world and its component economic forces (e.g., production, consumption, labor, etc.) emerge out of internal social relations.

Financialization: A process by which financial instruments (i.e. traded monetary contracts) such as stocks, bonds, derivatives, and futures become an increasing part of investment and economic activity. It has become an increasing historic trend in the global economy since the early 1980s.

Interstate Commerce Act of 1887: An act of the U.S. Congress meant to regulate interstate and international trade in the railroad industry by ending rate cutting and collusion and preventing discriminatory rates from being set.

Interstate Commerce Commission: The regulatory agency established to enforce the Interstate Commerce Act of 1887.

The Long Depression (1873-1896): A period of deflation and economic contraction following the crash of major stock exchanges in America and Europe. The preceding decades had seen increased investment in the railway industry and the bursting of this speculative bubble was one of the major causes of the depression.

National Policy of 1879: A major policy championed by John A. MacDonald during his re-election campaign of 1878. It called for high tariffs on imported goods, major infrastructural investment in railways and canals, and the increasing settlement of western Canada. The National Policy shaped Canada’s economy for years to come and was a major driver for U.S.
foreign direct investment and the shifting of Canada’s economic relations away from the United Kingdom and towards the United States.

**Overproduction crisis:** The tendency within capitalism to create a material glut through technological advancements in production and therefore lower the rate of profit. To Marx this was an internal symptom of capitalist production and could only be temporarily alleviated through locating new markets for realization—for example—through foreign trade.

**Public-private partnership (PPP):** A term given to a mutual undertaking between government and private industry. It applies to a diverse set of projects and services, but has generally included the injection of private finance into public provision such as infrastructure and service delivery.

**Special purpose vehicle (SPV):** In public-private partnerships, a subsidiary of a parent company serving as a private partner that takes on the administration of a project

**Staples thesis:** An economic theory developed by Harold Innis and William Mackintosh arguing that the Canadian economy developed as an export-led economy emerging from the exploitation and trading of natural resources.

**Trade corridor:** A bundling of transport infrastructure and logistical services that facilitates trade between major economic centers.

**Trade infrastructure:** Infrastructure intended for the purposes of international trade that is geographically located within border regions and is socially useful for the movement of goods and services across international demarcations.

**Traditional territory:** For Indigenous peoples, the lands in which they have held long-term and continued customary use and occupation prior to and occurring throughout colonial settlement.

**Traditional Knowledge:** Indigenous knowledge systems that emerge out of land-based practices with traditional territory necessary for survival and preservation of land, culture, and community. Traditional Knowledge is often maintained by oral histories, stories and folklore, and spiritual practices.

**Value for money (VfM):** An assessment tool used by governments to determine how much cost-savings occurs when a project is delivered through public-private partnership as opposed to traditional public procurement methods.
Chapter 1

Introduction

The built environment displays human beings’ vast ability to mobilize the material world. For me, however, the temptation to write about infrastructure comes not just from this sheer materiality, but from how that materiality emerges out of a distinct social process contextualized in space and time. The sensory qualities of infrastructure are hard to ignore—the built environment can be seen, touched, tasted, smelled, and heard all around us. But the sensory perceptions of infrastructure obscure a dominant social relation underneath; what Marx refers to as a “developed relation of contradiction: a vigorous relation…driving towards resolution” (Marx, 1932/1992b, p. 345). Here Marx is speaking to the contradictory relation between labor and capital internalized in the economic relations of capitalism. Marx’s abstraction to internal relations is evident in his study of the material world as a whole—and why he brought his method of dialectics into the realm of political economy (Harvey, 2010). The material world, and therefore the built environment—as planned and developed under capitalism—takes on the appearance of strict, asocial materiality, but it ultimately internalizes relationships that are profoundly social. I take from Marx’s relational concept of the material world the broad questions at the center of this study: how are the social relations of capitalism expressed in the planning and development of infrastructure, and what can be gleaned from historic and contemporary examples of infrastructure development? With these broad questions in mind, I define a more particular context that presents a research project capable of theoretically exploring the social relations of infrastructure planning and development as well as empirically explaining these social relations in defined historic and contemporary case studies.
This study takes place in the Detroit River border region at the border of the U.S. state of Michigan and the Canadian province of Ontario. While this is the spatial context, I also consider two different temporal contexts. First, I investigate the historic development of the first infrastructural crossing of the Detroit River between Windsor, Ontario in Canada and Detroit, Michigan in the United States—a period of roughly 40 years between 1870 and 1911. In this case study, I explore the influence of American railway finance and technocratic engineers in the Detroit River Tunnel Company and the ways in which their influence is emblematic of the American financial and technical takeover of Canada’s economy more broadly, and its planning sector and built environment more specifically. Second, I engage a contemporary case study of the construction of the Herb Gray Parkway (Parkway) in Windsor, Ontario and the eventual construction of the Gordie Howe International Bridge. Within this contemporary case study, I specifically examine the partnership between Walpole Island First Nation (WIFN) and the Ontario Ministry of Transportation (MTO) in the planning and development of the Parkway as well as the ways in which the WIFN engaged in a project heavily influenced by private infrastructural financiers.

Given that the spatial context encompasses an international border region and that the case studies explored are infrastructural projects that support the movement of goods and services across that international border, the social relations of infrastructure to be explored in this study are the social relations of infrastructure specifically planned and developed for international trade. I will therefore later define these infrastructure projects as trade infrastructure and will theoretically explore trade infrastructure in Chapter 3 of this dissertation in order to fully articulate the social relations in each infrastructural case study.
Research Aim and Objectives

Given the contextual domains of this research and the broad question guiding the study, I developed the following, more detailed questions to interrogate: How are the social relations of capitalism expressed in infrastructure in border regions that support international trade? In what ways have these social relations shaped the planning and development of historic and contemporary examples of trade infrastructure? In answering these questions, I offer an understanding of how social relations of capitalism impact the planning and development of infrastructure at the border for the purposes of international trade. The specific research aims are to theoretically define trade infrastructure and provide historic and contemporary examples of trade infrastructure planning and development in unique contexts. The unique historic context considers the role of a trade infrastructure project in the shaping of the nascent independent Canadian economy and planning sector, while the unique contemporary context considers the inclusion of Indigenous peoples in a case of trade infrastructure planning and development. Out of the broad and specific aims of the study I have developed the following research objectives:

1. Develop a theory of trade infrastructure that can be used to investigate the social relations of planning and development of historic and contemporary examples of infrastructure at international borders intended to support trade.

2. Document historic and contemporary case studies involving the planning and development of trade infrastructure.

3. Analyze the historic and contemporary case studies with attention to the particular ways in which the social relations of capitalism are expressed in the planning and development of trade infrastructure.
4. Connect this analysis to the politics of planning and development of trade infrastructure broadly within the practice of planning, and specifically within the practice of planning with Indigenous peoples.

Theoretical Framework

I am writing this dissertation in a manuscript format. Each of the manuscripts draws on and engages their own body of literature; collectively, however, they are guided by an overarching theoretical framework. In order to answer my overall research question and achieve my theoretical and empirical objectives, I deploy a Marxist dialectical framework to the study of my infrastructural cases in order to understand how these cases are expressions of the social relations of capitalism.

International trade is not specific to capitalism, but capitalist trade is a unique form of international trade. To Marx, trade in a capitalist mode of production is simply the expansion of the social relations of capital on an expanded scale. In fact, Marx uses the terms “cheating” or “defrauding” to describe not only the relation between labor and capital, but also the relation between two trading nation states at the international scale (Marx, 1932/1992, p. 336; Marx, 1939/1993c, p. 872). Marx further defines international capitalist trade in his critique of free trade as "the unfettered movement of capital, freed from all political, national and religious shackles" (Marx, 1852/2010, p. 262). This explanation comes from an article in the New-York Daily Tribune in 1852 where Marx articulated the differences in trade theory between the emerging bourgeoisie of industrial capital and the traditional landed aristocracy of the British economy at the time. To Marx, free trade and capitalist trade were synonymous in that free trade did not “[tolerate] any political or social restrictions, regulations or monopolies, unless they
proceed[ed] from…the conditions under which Capital produces and distributes” (Marx, 1852/2010, p. 262). Unfettered free trade, therefore, is simply a form of trade imbued with the internal relations of the capitalist mode of production—that is, the primacy of capital over the distribution of socially-generated value.

Trade Infrastructure

Marx opens *Capital Volume I* with a discussion on commodities. To Marx, the mode of capitalist production “appears as an immense collection of commodities” (Marx, 1867/1992, p. 125). These commodities are bought and sold in order to realize surplus value in a capitalist system. In order for a commodity to possess value in the first place, however, it must “satisfy a human need” (Marx/ 1867/1992, p. 125); that is, it must have a *use-value*. It must also, however, bear *exchange-value* recognized within the marketplace. Generally, exchange-value appears as the monetary form. Just as all commodities bear use-value and exchange value, so too does infrastructure. Infrastructure is an aggregate of useful substances (e.g., concrete, iron, copper wiring, glass, fiber optics, etc.) and is given an external monetary value recognized in the marketplace (e.g., title of ownership, line item on government balance sheet, asset leveraged on financial markets). In the context of my study I use the term “trade infrastructure” to describe the useful aspects of the infrastructure I explore in each case study. Trade infrastructure is defined by its usefulness, just as a commodity’s use-value is defined by its usefulness, according to Marx. Use-value is materially bounded to the physical world as “usefulness does not dangle in mid-air” (Marx, 1867/1992a, p. 126). To Marx, usefulness is “conditioned by the physical properties of the commodity, and has no existence apart from the latter [i.e., the materiality of the commodity]” (1867/1992a, p. 126). So, with trade infrastructure, it is the material infrastructure
that is foregrounded—the bridge that traverses a river or a canal that connects major shipping lanes. Importantly, however, it is also what this material infrastructure is useful for—and, in the case of trade infrastructure, trade is what determines the exchange value of infrastructure. This condition of usefulness is a result of use-values only becoming realized as such when they are consumed; that is, when they are used (Marx, 1867/1992a). As I define it, in order for trade infrastructure to express its usefulness as infrastructure it must be physically located in a geographic border region and serve as its major purpose the transportation of goods and services as a traded product in international markets (although not necessarily capitalist markets—that is the realm of exchange-value, as discussed below).

To more fundamentally summarize the definition of trade infrastructure as use-value: infrastructure is trade infrastructure if it is socially useful in facilitating international trade. This can be a mobile usefulness, such as a piece of infrastructure used to traverse a natural barrier between nation states (e.g., a bridge constructed to cross a river that demarcates an international border). It could be a logistical usefulness in that the infrastructure bundles trade activity in space and time in order to more effectively keep supply chains moving at border choke points (e.g., updated customs plazas featuring technologies to expedite crossing and processing times for freight traffic). Vitally, however, there is always social usefulness to trade infrastructure. There is a social need to move items across international boundaries, which necessitates the need (and value) of infrastructure that can accommodate that very social need. It is built with the intended purpose of enhancing trade. It is consciously constructed in border regions, and regularly necessitates the crossing of a physical barrier. The usefulness of the infrastructure, therefore, is that it is used for trade activity either by speeding up the process of traversing space and
removing barriers to the movement of goods, services, and people, or by acting as a material conduit between two trading entities.

A unique phenomenon that has occurred in the era of neoliberal globalization is the way in which the usefulness of trade infrastructure is being captured for other purposes outside the simple trading of goods and services. For example, Deborah Cowen demonstrates how trade logistics and supply chain management imbue the practice of international trade with the violence of warfare. Cowen specifically targets the “soft infrastructure,” of trade corridors which she defines as “the integration, standardization, and synchronization of customs trade regulations [and] the entire realm of efforts to secure the actual space of…logistics corridors” (Cowen, 2014, p. 65). To Cowen, there is an underlying violence embedded into the bundle of infrastructure networks involved in supply chain logistics within capitalist global trade. Likewise, fellow critical geographer Matthew Sparke explains how technological infrastructural advances at the border, such as NEXUS—a border management service designed for high frequency travelers across the U.S.-Canada border—and other so-called Smart Border programs are “shaped at once by the transnational entrenchment of free market rights and the increasingly oppressive impact of securitized nationalism” (Sparke, 2006, p. 174). Like Cowen, Sparke sees how the organization of infrastructure for the purposes of free trade is inextricably linked to the organization of infrastructure for ethno-nationalist state violence at the border.

Trade infrastructure, as I define it, imagines a different usefulness of infrastructure at the border. For the purposes of this research, trade infrastructure should be understood as organizing the social usefulness of trade not at the expense of communities in border regions or the communities that wish to traverse borders themselves, but instead with a shared economic consideration in mind. In a sense, trade infrastructure should embody the usefulness that I
theoretically aim to capture by serving the “direct provision of adequate use values for all” (Harvey, 2014, p. 294). That is, trade infrastructure should not service the project of capitalist trade and transport systems as defined by Young (2020, p. 954) as “the ‘artery’ of multiple capitals transform[ing] geographies towards the concentration of transnational class power,” but instead use the trade and transport system to more equitably link communities to the necessary use-values (e.g., food, housing, clothing, leisure products, etc.) needed for the full social expression of human well-being.

In this sense, trade infrastructure is aspirational infrastructure that seeks to shift the flow of goods and services away from the realm of exchange and more towards the realm of social usefulness. The planning and development of trade infrastructure would therefore be consciously executed with this social distinction between usefulness and exchange. The subjects listed under “trade infrastructure” in Figure 1 are linked to the particular historic and contemporary topics that I see as central to the organization of the social usefulness of trade infrastructure. The social usefulness featured in these topics is a social usefulness recognized under the capitalist mode of production, but could also be re-oriented toward planning and developing of infrastructure under a different mode of production. On the other hand, the following discussion of what I call the “contractual apparatus” features a relation of exchange specific to capitalism and illuminates the ways in which the usefulness of trade infrastructure is directed towards the accumulation of capital.

**Contractual Apparatus**

If trade infrastructure can be understood as infrastructure that supports the qualitative social usefulness of trade, then I use the term contractual apparatus to explain its dialectical
counterpart in the social relations of infrastructure—exchange-value. I begin defining the contractual apparatus as the transactional space where various social influences can express their usefulness to the project in an agreed-upon monetary exchange of services. In many ways, the contractual apparatus constitutes the bundle of legally recognized contracts that enroll contractors, engineers, consultants, laborers, administrative support, and any other necessary waged workers into a quantitative expression of their services in the form of monetary payment. In effect, the contractual apparatus is the arena in which the exchange-value of trade infrastructure is expressed. I argue that it is the unique form of this contractual apparatus that works dialectically within the infrastructural case studies in this project to engender the social relations of capitalist trade. While the usefulness of trade infrastructure could reasonably be expressed in other modes of production—for instance, Indigenous peoples in the Detroit River border region utilized canoe and portage infrastructure to engage in subsistence economy trade—it is the expression of trade infrastructure in the exchange-oriented field of the contractual apparatus that allows the social relations of capitalism to emerge.

It is important to consider how the social relations of capitalism feature in infrastructural planning and development because the public sector is increasingly ceding ground to private industry in the development of massive infrastructure (Harvey, 2010, p. 317). Traditional procurement of public infrastructure, which were public-designed projects bid on by private contractors (i.e., bid-build), has transformed into an investment opportunity for the private sector in which private contracts further permeate the design, build, finance, and operational (DBFO) phases of public infrastructure (Shaoul et al., 2006; Whittington, 2012). While the infrastructure and services themselves are not sold off as they would be in a fully privatized model, the contracts to private companies made in these so-called public-private partnerships (PPPs) offer
private interests a unique space to capture the value of public assets within the private sector. Moreover, in spite of these contracts being far more complex than in traditional procurement, special concessions to private entities in the bidding process limit the transparency and accountability to the public (Willems, 2014). Such concessions include the bundling of contracts themselves in ways that favor bids by larger corporations, as well as the acceptance of unsolicited bids that are given extra consideration in procurement decisions because of their promise to draw upon the “innovation” of the private sector (Verma, 2010). Central to the critique of the contractual arrangement of PPPs is the suspicion of what public and private sector proponents of the procurement model call Value for Money (VfM), which implies that a private sector partner, in the provision of public services and infrastructure, “are more cost effective in the design, construction and subsequent operation of many public sector projects” (Wall & Connolly, 2009, p. 708). The nature of contracts in an accurate accounting of VfM are important to Siemiatycki and Farooqi (2012); these authors contend that limiting contracts to the design and build phase of the project reduces the risk to the public sector of getting into rigid, long-term contracts that disproportionately benefit private partners.

The contractual apparatus is not simply limited to the DBFO schemes of public-private partnerships, however. The use of PPPs has followed an overall arc of neoliberalization in the built environment. By this I mean not just the process of neoliberalism by way of intensified marketization and privatization of otherwise public spaces and services, but also to what Wendy Larner (2003, p. 511) refers to as the “techniques of neoliberalism” such as best practices, performance indicators, benchmarks, and contracts. To Larner, these techniques are “the apparently mundane practices through which neoliberal spaces, states, and subjects are being constituted in particular forms” (2003, p. 511). The development and experimentation of these
techniques during the neoliberal turn that runs from the late 1970s to today brought an exponential rise in financial influence to infrastructure planning and development. In this study, I will theoretically and empirically explore the ways in which financiers dominate the exchange relationships in the contractual apparatus and therefore determine the value and distribution of contracts.

As indicated by Figure 1, I begin my exploration of the contractual apparatus in the historic period as a type of proto-financialization involving the influence of monopoly capital and foreign direct investment. From there, I move into an analysis of public-private partnerships and what becomes a more aggressive presence of financialization involving multi-national corporations, more complex contractual arrangements, and the ways in which Indigenous communities are being subsumed into these infrastructural practices in the planning process. Through this analysis, I highlight the ways in which contracts can be leveraged as assets on financial markets to further draw upon the usefulness of infrastructure within what Marx calls fictitious capital or, as Marxist political economist Ben Fine explains it, capital that is “distinct from the circulation or performance of the capital it represents” (Fine, 2013, p. 50). That is, fictitious capital is more of a speculative promise that an asset may bear returns than an abstraction of value garnered in the production process. An infrastructural asset bundled as a type of fictitious capital on financial markets, therefore, is so detached from its true social value that it becomes prone to crisis—especially when the managers of infrastructure finance become the direct managers of infrastructure themselves (O’Neill, 2017, 2015).

Considering all the pathways of exchange in the contractual apparatus, therefore, requires a consideration of the process of infrastructural financialization. Urban geographers Stephen Graham and Simon Marvin (2001) framed the financialization of infrastructure as “splintering
urbanism,” a process where local infrastructure are de-linked from their material locations and circulated through an internationalized capitalist political economy by multi-nationals that “dominate trade, investment patterns, technological innovation and the reshaping of systems for the provision of infrastructure networks” (p. 95). Torrance (2008) likewise argues that “infrastructure provisions are increasingly becoming financial products” through the unbundling of infrastructure services (i.e., the contracting out of services through DBFO delivery) that are “placed in global infrastructure funds that are managed by specialized financial institutions” (Torrance, 2008, pp. 1-2).

Infrastructure, whose usefulness is defined by international trade (i.e., trade infrastructure), is a particularly recent example of this divestiture from public coffers in the form of non-publicly funded finance schemes such as public-private partnerships (Carruthers & Kunaka, 2014). In this study, I argue that organizing a consortium of private capitals into the financing of trade infrastructure inevitably overdetermines the role of finance in the planning and development process. That is, the social contributions of the various participants in the planning, development, construction, and maintenance of infrastructure (i.e., the socially-necessary labor power needed to complete the project) are primarily shaped by private project finance. The contractual apparatus also directly implicates the planning and development process in the expression of trade infrastructure as a useful agent for capitalist trade. It, therefore, provides a target for political and social change within the planning profession. I conceptually utilize the contractual apparatus in my research in order to argue that the contracts at hand in the planning and development of trade infrastructure should not be employed to serve a capitalist class, but instead be thought of as ways to negotiate an expropriation of capitalist class power in the manner of collective bargaining by trade unions.
Marx’s Value Theory and The Social Relations of Infrastructure

Figure 1 below visualizes how I have used Marx’s dialectical framework for analyzing the social relations of infrastructure with the help of two novel concepts that I call “trade infrastructure” and the “contractual apparatus,” as discussed in the previous section. The concepts emerge out of my use of Marxist theory in interpreting discussions on infrastructure in existing geography and planning literature, and will be detailed further in the sections below. I list the subjects related to each concept in Figure 1. Chapters 5 and 6 of this dissertation explore these subjects as they relate to the concepts of trade infrastructure and the contractual apparatus. The dialectic here follows Marx’s method of exploration into his construction of the commodity, and so Marx’s exploration of the component parts of the commodity—use-value and exchange-value—help explain my definitions of trade infrastructure and the contractual apparatus.

Figure 1 Dialectical relationship between conceptual categories of trade infrastructure and contractual apparatus and the subjects explored in subsequent chapters of this dissertation. Source: author.
Ultimately, and important for understanding the framework of this study, the infrastructural systems that support capitalist free trade are dialectically comprised of trade infrastructure (i.e., the social usefulness of infrastructure that supports trade) and the contractual apparatus (i.e., the expression of exchange value in the planning and development of trade infrastructure). In order to define commodities as the basic units of capitalist production, Marx needed to find a commensurate element between all commodities. Use-value and exchange-value are both qualitatively and quantitatively different across commodities, thus a common value needed to be understood. Marx identified this in his labor theory of value, therefore locating the value of all commodities as socially necessary labor time (Marx, 1867/1992a). This is the value that capital seeks to exploit in the production process, and is also a prominent example of Marx’s dialectical method (Fine & Saad-Filho, 2016). Effectively, Marx takes dialectically opposing and incommensurable concepts (i.e., use-value and exchange-value) and explores their internal tensions, relationships, processes, and contradictions.

Just as Marx developed a definition of socially necessary labor time out of the relations between use-value and exchange-value, I use a framework of the social relations of infrastructure in order to explore the incommensurable tensions between the social usefulness of trade infrastructure and the exchange-mediated value of the contractual apparatus in my historic and contemporary case studies. The subjects and themes discussed above and displayed in Figure 1 are the dialectical elements that I gather into an analytical corpus in order to consider how the contradictory and overwrought relationship between the social usefulness of trade infrastructure and the primacy of exchange in the contractual apparatus are “driving towards resolution” in a dominant social relationship of capitalist planning and development of infrastructure in the Detroit River border region (Marx, 1932/1992, p. 345).
Why use such a framework in the study of historic and contemporary infrastructure projects in the Detroit River border region? There are many other studies that situate infrastructure as an important unit of analysis. For example, the various approaches to the study of infrastructure by geographers and planners include: framing infrastructure as a logistical problematic to be objectively executed (Björkman & Harris, 2018); considering the role of infrastructure as a mechanism of controlling affect in a given space (Merriman & Jones, 2017; Street, 2012); exploring the occupation of infrastructure as a target for social unrest (Vasudevan, 2015); situating infrastructure within the larger global economy (O’Neill, 2013); and illuminating the systemic temporal-spatial assemblages built into contemporary infrastructure (McFarlane, 2011). These, and many more empirical and theoretical studies, work hard to place infrastructure within its own category of scholarship. While these studies provide a solid foundation to explore the many intellectual and practical lessons attached to previous, existing, and even future infrastructure projects, the unit of analysis is often firmly placed within the infrastructure itself and does not explicitly implicate the various social entities engaged in the planning and development of said infrastructure.

It is from this point of departure that I situate this research. In this study I work to move the lens of analysis from specific infrastructure to the social relations at play in the planning and development of infrastructure. I do so by examining how those relations continue throughout the maintenance and use of infrastructure. Therefore, I apply this Marxist dialectical framework to locate how the social relations of capitalism are featured in the planning and development process of trade infrastructure in the Detroit River border region. The Detroit River border region serves as a useful geographical case as it has consistently featured some of the heaviest trade traffic in North America, with the current bridge spanning the Detroit River between Windsor
and Detroit—the Ambassador Bridge—remaining the busiest land border crossing in the world since its completion in 1929 (Sutcliffe, 2012; Widdis, 2011). These trade conditions demonstrate the exceptional qualities of the historic and contemporary cases I explore in this study, while also generalizing them within the broader trends of expanding global trade networks over time due to waves of economic globalization.

**Limitations of Marxist Theory**

Notably absent in this theoretical framework is the connection between racial capitalism and settler colonialism. In earlier considerations of this project I consulted Cedric Robinson’s seminal text *Black Marxism* and the arguments laid out there on the early insertion of racism “into the larger tapestry of the modern world’s political and economic relations” (Robinson, 1983/2000, 10). Crucial to Robinson’s understanding of capitalism is that construction of a racial social order was a constitutive part of the capitalist mode of production. Dorries, et al. (2019) have further elaborated on Robinson’s arguments of racial capitalism to explain how “the creation of a racialized property regime…[and] legalized racial hierarchy…shape racist and capitalist urbanization processes” in settler colonial contexts (p. 6). Given that these critical viewpoints are not foregrounded in the overall theory of this project it is important to include a discussion on the tensions and limitations of using a Marxist theoretical framework on a study about infrastructure in a settler-colonial context involving Indigenous people. While there is value to using a Marxist framework in my study’s context, postcolonial theory more broadly and planning with Indigenous people literature more specifically point to considerations that Marxist theory does not account for.
Taking up postcolonial theory first, early stalwarts of the theoretical intervention such as Gayatri Chakravorty Spivak (1988) and Edward Said (1979) lamented Marxism’s narrow subjectivity, sweeping universal claims and the consequences of both on the representation of non-Western perspectives in theory, culture, and politics. Postcolonialism, therefore, takes issue with what the theory views in Marxism as the representation of a white, European male member of the working class as the agent of history and the universalist presumption that the capital relation is the dominant force of social ordering (Chibber, 2013). Hardt and Negri (2009) acutely and succinctly supply this critique when describing Marx’s propensity in his writings to depict non-Western subjects as “people without history…separate from the development of capital and locked in an immutable present without the capacity for historical innovation.” (p. 84). Still, postcolonial scholars such as Spivak engaged with the Marxist philosophical tradition in a way that points to its value as well as its major limitations. To Spivak (1999), Marx’s universalist claims of the dominance of the capitalist system was the search for a “system that will remove difference after taking it into account. Thus…[an] accounting for difference lies at the heart of Marx’s system.” (p. 79). In Critique of Postcolonial Reason, Spivak (1999) investigated where Marx dealt with difference in his writings by developing a “schematic version of a logic of difference and excess internal to capitalism” through an extensive critique of Marx’s Asiatic Mode of Production (p. 80). While Marx simply used this term to account for differences in the stages of capitalist development of non-European economies, Spivak deconstructed the text “for a new politics of reading [Marx].” (Spivak, 1999, p. 110). In doing so, Spivak “enter[s] the protocols of Marx’s text in order to re-inscribe it for use” in way that challenges Marxism’s overdetermined critique of the capital relation as an “adequate blueprint for social justice” (Spivak, 1999, p. 91, emphasis in original).
Similarly, Frantz Fanon extends Marx’s treatment of colonialism in ways that have caused much debate amongst scholars with regards to latter’s influence on the former (Gibson, 2020; Rabaka, 2011; Said, 2000). Notably, Fanon writes of Marxism that “Marxist analysis should always be slightly stretched when it comes to addressing the colonial issue.” (Fanon, 1961/2004, p. 5). Fanon stretches Marx’s materialist machinations of colonialism by offering a detailed rendering of the subjugation of colonized peoples under the forced application of colonial thoughts, desires, and behaviors. In this way colonialism is not simply a historic material development of capitalism but is an ongoing ideology producing and reproducing power differentials between colonizer and colonized through the rendering of whiteness as normative.

Indigenous political scholar Glen Coulthard takes up this Fanonian understanding of colonial ideology by exploring the modern reproduction of colonial subjugation of Indigenous peoples through the contemporary politics of recognition. In addition to Fanon, Coulthard draws upon the Marx’s writings on colonialism—namely, the final section of *Capital Volume I* titled “So-Called Primitive Accumulation.” (Marx, 1867/1992a). Before doing so, however, he notes the debates between Marxism and Indigenous studies around Marx’s treatment of colonialism:

> these debates have at times been hostile and polarizing. At its worst, this hostility has led to the premature rejection of Marx and Marxism by some Indigenous studies scholars on the one side, and to the belligerent, often ignorant, and sometimes racist dismissal of Indigenous peoples’ contributions to radical thought and politics by Marxists on the other. (Coulthard, 2014, p. 8).

Ultimately, however, Coulthard believes that to “ignore the insights of Marx would be a mistake…[because of] his extensive writings on the entangled relationship between capitalism and colonialism.” (Coulthard, 2014, p. 8). Still, Coulthard expresses the limitations of Marxist theory as I articulate here—namely, its historicization of colonialism as a materialist progression towards capitalism and not as an ongoing oppressive ideology, its narrow subjectivities and
sweeping universal claims; and finally, its tendency to overdetermine the capital relations over the colonial relation (Coulthard, 2014; 2016).

In a similar way to postcolonial scholars critiques of Marx, contemporary Indigenous and non-Indigenous planning scholars take similar issue with Western planning practices—further implicating Marx in the tendency for Western theories to universalize white, European perspectives and experiences. Notably, Leonie Sandercock argues that postcolonial and Indigenous theories in planning challenge western planning practices by “acknowledg[ing] that population groups differentiated by criteria of ability, age, gender, class, ethnicity, sexual preference, and religion, have different claims on the city for a full life and, in particular, on the built environment.” (Sandercock, 2000, p. 7). To Sandercock and others in the field of planning with Indigenous peoples (Dorries, 2017; Jojola, 2008; Matunga, 2013; Porter, 2006; Wensing & Porter, 2016) spatial structuring of private property relations under Western planning were a distinct form of colonial oppression. Marx’s overall critique of private property relations (which are at the heart of the social relations of capitalism) therefore are pertinent to the discussion of infrastructure projects in a settler colonial context. Ted Jojola (2008) accuses private property of turning land-use planning into “the embodiment of a corporate entity that develops [land] with the primary intent of raising capital valuation.” (p. 43). Furthermore, Heather Dorries (2017) defines a “legal architecture that allows the benefits of property to accrue to non-Indigenous peoples through the vehicle of planning.” (p. 73). All of this is to say that while Marxism holds a serious blind spot when it comes to the analysis of racial difference in relation to the built environment, Marx’s extensive critique of private property relations under the capitalist mode of production makes Marxist theory a useful framework for my study on trade infrastructure.
Overview of Chapters

I have decided to submit this research as a series of related manuscripts. Each manuscript takes a distinct slice of the overall pie of my study into the social relations of infrastructure. The individual slices each have their own specific contribution. The first manuscript focuses on a theoretical contribution grounded in Marx’s dialectical materialism, which further explains the function of trade infrastructure planning and development in the expansion of the social relations of capitalism. The second considers a historical contribution—namely, an examination of trade infrastructure in the Detroit River border region circa late 19th and early 20th centuries. The third manuscript submits a contemporary empirical contribution centered on the case the Herb Gray Parkway. These three manuscripts constitute the three main chapters of this dissertation, preceded by a methodology chapter that explains the overall methodological framework, and a concluding chapter that summarizes the main arguments and considers future directions. The following section provides more specific detail of each chapter.

Methodology

This chapter covers the overall methodological framework and the specific methods utilized for this research. The overall methodological framework is drawn from Marx’s dialectical materialism (Ollman, 2003; Sayer, 1979). It applies Marx’s methodology to explore the processes and relations (i.e., who is involved and who benefits) of material infrastructure that is mobilized for trade purposes. This overall framework grounds the theoretical explorations of the research. Marx’s methodology is the justification for deploying a case study method that incorporates the reflexive science of Michael Burawoy’s “extended case method” (Burawoy, 1998) for the specific spatial-temporal case of analyzing trade infrastructure in the Detroit River
border region circa late 19th and early 20th centuries, as well as the contemporary case of the Herb Gray Parkway. The exact qualitative methods will also be described in this chapter, including document analysis, interviews, and archival research.

**Theoretical Contribution**

This chapter draws from Marx’s writings on transport and communications infrastructure found mainly in *Volumes II* and *III of Capital* and the *Grundrisse* (Marx, 1885/1993a, 1894/1993b, 1939/1993c). It brings these writings into conversation with current work on infrastructure, specifically aiming to explain how social relations of the planning process help determine the nature and function of infrastructure meant for the purposes of trade. In doing so, it both more clearly defines trade infrastructure and argues that planners in border regions play a role within the contractual apparatus that can either serve an infrastructural investment class, or the communities in which the trade infrastructure is located.

**Historical Contribution**

This chapter submits a historical analysis of trade infrastructure around the Detroit River. It specifically considers the roughly 40-year period between 1870-1911 when two different infrastructural schemes under the same corporate name of the Detroit River Tunnel Company attempted a tunneling under the Detroit River between the cities of Detroit, MI and Windsor, ON. It explores historic trade policy and trade relations between the U.S. and Canada and draws on evidence that historic firms dictated much of the planning and development around the infrastructure that traverses the Detroit River. In doing so, the analysis draws attention to historic processes of financial intervention into infrastructure at the U.S.-Canadian border and the ways
in which both British and American capital shaped infrastructure at the border through a public-private contractual apparatus of government agencies and private engineering firms. This chapter also explores the historic roots of the Canadian planning profession as a technocratic class that, on the one hand, colluded with global financial interests while, on the other hand, directly competed against them.

**Contemporary Contribution**

This chapter analyses primary research documents and interviews conducted between September 2016 and May 2019 in order to demonstrate a current case study of trade infrastructure planning and, in the process, the inclusion of Walpole Island First Nation. This empirical study brings in new phenomenal approaches to trade infrastructure planning, such as the use of public-private partnerships and the inclusion of ecological restoration alongside major infrastructure projects. I argue in this chapter that there are unique expressions of the contractual apparatus when including Indigenous people in contemporary spatial planning, and that the relationship between Indigenous people and the planning profession is important in determining the ways in which Indigenous communities engage in the social relations of infrastructure.

**Conclusion**

Foremost planning scholar on infrastructure Matti Siemiatycki has consistently argued that infrastructure has meaning beyond its material specifications (2005, 2006; Siemiatycki, Enright, & Valverde, 2020). The logical argument follows that the decisions around the planning and development of infrastructure also have meaning. One articulation of meaning argued by architect Keller Easterling is that infrastructural development has been "treated as a universal
platform for rationalizing global exchange” (2014, p. 138). But, the meaning behind trade infrastructure need not be synonymous with the expansion of the economic relations of capitalism to the international scale. Through the analysis of historic and contemporary trade infrastructure in this study it is my hope that further conversations within the fields of geography and planning will emerge regarding how to orient the planning and development process of infrastructure meant for trade towards the realm of use-value, and away from that of exchange-value.

While each individual chapter presents its own specific arguments, draws on its own data, and prioritizes particular arguments, the distinct sections of this study also operate within a defined whole. Namely, the collective body of this research provides an overall contribution to the discussion of trade infrastructure and the social relations that define trade infrastructure in the planning process. The separate manuscripts can be read as stand-alone contributions, but reading them together offers a potent exploration of the social relations of infrastructure under the capitalist mode of production.

Additionally, the individual sections and the overall body of this research present useful contributions to both the specific context of infrastructure planning in the Detroit River border region as well as to the global study of trade infrastructure. At a local level, this research will be useful to take up and add to as further development of a new international crossing—the Gordie Howe International Bridge—and customs plaza on the Detroit River, including as a means to better understand the role of Walpole Island First Nation and other Indigenous communities—not to mention other underrepresented groups in the planning process. From a broader perspective, this research will be useful as it connects to relevant factors such as the crumbling
state of global infrastructure, the changing trade relations between the U.S. and Canada, and the need for continued involvement of Indigenous people in the planning process.
Chapter 2
Methodology

This chapter outlines my overall methodological framework, provides an overview of the specific methods deployed, and explains how those methods connect within the framework itself. While individual chapters of this dissertation represent distinct manuscripts with their own particular methods, I have taken an overall methodological framework that guides the work of each chapter. The specific methods used for the research of each manuscript will be discussed in those individual chapters; here I layout the overall methodological framework and how each method was implemented in that framework.

This chapter begins with an explanation of my methodological framework, argues for the relevance of that framework given the theory explored and the data collected, and concludes by situating the specific methods used in this framework, and explaining the logical pursuit of those methods within the overall study. In short, I will explain how my historic and contemporary cases incorporate Marx’s use of dialectics into the traditional case study method (Sayer, 1979). Careful attention is paid to defining the specific qualities of this type of case study approach and the rationale for leveraging such a method for the research in this study.

Methodological Framework: Case Studies using Dialectical Materialism

I approach the case study method with inspiration from Marx’s dialectical materialism. Initially, the aim of this study was to more precisely mimic Burawoy’s (1998) extended method; however, an ethnographic approach was never applied so the actual result has been to follow traditional case study methodology informed by Marx’s method. Still, I drew inspiration from Burawoy’s commitment to reflexive science. The Marxist approach to case study in the historic
and contemporary cases of trade infrastructure that I explored created an iterative process combining theory and data. The deductive reasoning used in this particular case study takes seriously the theoretical assumptions crafted under Marxist scholarship and draws procedural corollaries between those assumptions and the empirical data being gathered under the case study methods engaged. Likewise, the inductive reasoning values the data as they stand as individual experience ready for theoretical abstraction. The dialectic power of the deductive-inductive relationship lies in the tension between mining a case study for the empirical proof of existing theory and the possibility of theoretical incongruities emerging from the data. The following explains this process in greater detail by defining my interpretation of the case study method as informed by Marxist theory and an extended approach and how it plays out in the context of this research project.

Since the Marxist qualifier inspires my overall interpretation of case study method in the context of this research, it is important to clarify how this research understands the case study method and what makes it distinctly Marxist. First, to Baxter (2010, p. 81) “case study research involves the study of a single instance or small number of instances of a phenomenon in order to explore in-depth nuances of the phenomenon and the contextual influences on and explanations of that phenomenon.” Contextualization within a case study is possible by locating the instances within a bounded system (Stake, 1995). The bounded system is important because it contextualizes the case instead of divorcing any particular phenomenon from its surrounding context as would typically be done in an experiment (Yin, 2008). According to Flyvbjerg (2006), the contextualization of a phenomenon is important in two ways. First, context-based knowledge is important to move from cursory knowledge of a subject to more expert depth. Second, it is likely impossible to study the social world from a context-independent place of pure objectivity.
Feminist scholars have contributed a great deal to the study of methodology to make it a foregone conclusion that the pure objectivity of positivist science is anathema to a clearly subjective social world of context-dependent knowledge (Haraway, 1988; Harding, 1991).

To critical methodologists, knowledge generation supersedes objectivity. Through articulating the extended case method, Michael Burawoy (1998) pushes against the definition of objectivity by the positivistic sciences and instead calls for a reflexivity that “enjoins what positive science separates” (p. 14); it puts into relation “participant and observer, knowledge and social situation, situation and its field of location, folk theory and academic theory” (Burawoy, 1998 p. 14). The isolation of subjective elements for the purpose of objectivity, replication, generalization, and transferability are not goals to achieve in and of themselves within this method. The tensions and contradictions often accompanying observations in the field, the silenced voices within national archives, or the fluctuations of theoretical interpretation over ongoing interaction with data are all examples of opportunities to add methodological depth to a case study. Burawoy’s tenet of reflexivity in case study is one of the key considerations in my methodology as it takes the case study approach beyond the expectations of positive science that assume qualitative rigor must replicate the conditions of experiment. Instead of isolating conditions to prove or disprove theory, Burawoy calls for an “imaginative and parsimonious reconstruction of theory to accommodate anomalies” in order to draw on the phenomena of the study’s context to enhance knowledge-generating possibilities (Burawoy, 1998 p. 5).

While the case study method has been utilized to great efficacy in context-dependent knowledge generation, some of the method’s biggest detractors lament its lack of transferability and generalizability (see also Baxter, 2010; Creswell, 2006). While both Baxter (2010) and Flyvbjerg (2006) provide one defense of case studies by arguing that a single case could falsify a
theory—thus immediately generalizing its application beyond the initial instances studied—Derek Sayer’s (1987) work on Marx’s method suggests the compulsion to generalize obfuscates the phenomenal nature of social relations. To Sayer (1987), Marx himself argued that theoretical categories (i.e., generalizations) are “not free-floating analytic devices innocent of historical content” (p. 126). Put another way, to generalize a case study is to mistakenly abstract away from its potent form of context-dependent knowledge generation. Arguably, Marx’s own research attempted to populate a body of context-dependent knowledge in the form of case studies in order to interpret the internal relations of capitalism. One could interpret Marx’s work in Capital as a series of empirical case studies into such instances as the working day of the industrial factory worker, and the historic, legal framework of the enclosure of common lands (Flyvbjerg, 2006; Harvey, 2010; Legros, 1977). In these case studies, Marx’s dialectical method demystifies the series of abstractions that present the capitalist dynamic as natural; instead Marx unveils the internal relations of these cases in order to inform his broader theory of the social world under the capitalist mode of production. Marx’s unique use of dialectics to filter the murky waters of abstraction can be applied to contemporary case study research as a means of prioritizing an analysis of context-dependent internal relations over de-contextualized generalizations.

But what exactly are Marxist dialectics? While consensus is hard to reach, I will draw on scholars that largely see Marxist dialectics as a means of studying relational processes between inputs that result in a bounded system in order to recognize contradictions, opportunities, extensions, connections, and changes within that system. More broadly put, leading scholar on Marx’s dialectics, Bertell Ollman, defines dialectics as “a way of thinking that brings into focus the full range of changes and interactions that occur in the world” (2003, p. 12). As a method, therefore, dialectics are not so much a set of approaches set out to prove or disprove a series of
hypothesis; instead they act as a mental standpoint from which to observe processes from within a defined system—key to illuminating these processes is the study of internal relations. A method that takes into account internal relations takes as a given the whole (i.e., the bounded system or the case) “so that the interconnections and changes that make up the whole are viewed as inseparable from what anything is” (Ollman, 1998, p. 340). Meaning, from a methodological standpoint individual inputs cannot be studied in isolation; they are internal to the bounded system or the overall case. Marx famously did this for capitalism, and to Ollman and Smith’s (1998) interpretation, Marx’s dialectics did not explain capitalism itself, but instead situated capitalism as a set of relations and processes from which to observe the folding and unfolding of the whole system; the parts and the whole are interdependent and always changing. The dialectical movement, therefore, is “not traversed once and for all, but again and again” (Ollman, 1998, p. 341) in an iterative fashion.

Thus, to say I am taking a similar approach with my research would be a suitable summary of my methodological framework. The whole of the method is an iterative work between the theory-driven elements of Marx’s dialectic with the data-driven extensions of case study methods. The data informs the theory, per Burawoy’s suggestion, while the theory continually moves with the data, per Marx’s insistence: “the only immutable thing is the abstraction of movement” (Marx, 1847/1955, p. 49). Therefore, the method outlined above hopes to unveil the abstractions within a constantly moving field. The following section will describe that field and the application of the method.

**Application of Method: Defining the Case**

The previous section laid out my use of a Marxist approach to case study by defining the constituent parts of such an approach to research. The following will explain how these
constituent parts are applied to my specific context. First, I will outline how the two cases of trade infrastructure in my research are part of a bounded system of study. Second, I will explain the application of the Marxist theory to this bounded study. As outlined in the introductory chapter of this dissertation, I take a theoretical, historical, and contemporary perspective on trade infrastructure in the Detroit River border region. An application of the overall methodological framework, then, uses as its bounded system the concept of trade infrastructure as it exists within the spatial-temporal case of the Detroit River border region at specific historic and contemporary moments. Therefore, in accordance with the need for a case to be a bounded system within a traditional case study method (Creswell, 2006; Stake, 1995) I have bounded my study in three different ways.

First, it is spatially bounded in the Detroit River border region. Second, it is temporally bounded in two distinct time periods: the roughly 40-year period between the initial, failed attempt of tunneling under the Detroit River (1872) and a second successful attempt (1911); and the time period around the construction of the Herb Gray Parkway in Windsor, and the planning of the Gordie Howe International Bridge (roughly 2001-Present). Finally, it is conceptually bounded through the study of infrastructure that spans borders for the purpose of international trade between two nation states. While the different approaches of each chapter (theoretical, historical, and contemporary) take up varying degrees of each of the ways the case is spatially, temporally, and conceptually bounded, the work of the research, as a whole, is defined in this way. Likewise, while the case is bounded in the historic and contemporary planning and development of trade infrastructure in the Detroit River border region, other important conceptual devices comfortably fit into this bounded system and will be explained in greater
detail in each individual chapter (for example, the role of private firms in the planning and development of infrastructure in chapters 4 and 5, and Indigenous-public relations in Chapter 6).

Having clarified how my historic and contemporary cases are part of a bounded system, I will now explain why a methodological framework such as the one outlined works for this research. This research is clearly situated within Marxist theory; however, I often found the theory clunky when too forcefully applied in the field, particularly when interviewing participants in a semi-structured fashion. For me, this resulted in a rediscovery of new interpretations of Marx and a recommitment to the theory’s relevance. The possibility that new data emerge, or new analytical perspectives make the theory’s application arcane is ever present, however, and so the iterative movement between theory and data has remained a steadfast ally in this research.

Ironically, Marx’s method can be the best defense against overly-determining the role of Marx’s theory in any given case. This is in part because Marx’s theory is often misunderstood as deterministic (see, for example, Shaw, 1979) and therefore inappropriately applied. Sayer’s (1979) work into Marx’s method has gone to great lengths to explain this deterministic interpretation on the difference between Marx’s presentation and his method. To Sayer (1979), the presentation of Marx’s work suggests a study of material productive forces and the ways in which they shape society. Marx’s method, on the other hand, reveals that this is a fatal abstraction and that the real point of interrogation lies at the internal relations of these material productive forces. Meaning, the study of capital is not simply the study of capital as a thing, but the study of capital as a process complete with its own dynamic internal relations (Harvey, 2014). This is important to my study because it demonstrates that Marx’s method is useful not just for the study of material infrastructure, but for illuminating that very infrastructure for what
it is—a collection of internal relations situated in a social process. Trade infrastructure in the case of the Detroit River border region is not simply a physical construction—that is, merely the presentation—it is actually a collection of internal relations that have a distinct social quality to them. These internal relations have historic as well as contemporary characteristics. Marx’s method helps reveal these internal relations. The idea is to illuminate what is unique about infrastructure that is put to use for international trade purposes. A road or a bridge can be many things—a conduit, a connector, a divider, a simple structure—but it becomes trade infrastructure when it mobilizes certain relations. A Marxist dialectic, in this case, helps focus the method of analysis on these relations and in turn explores these relations from theoretical, historical, and contemporary standpoints.

In summary, the contextualization and bounding of this study is done in accordance with traditional case study methodology. This particular study has been bounded in spatial, temporal, and conceptual ways. Vitally, Marxist dialectics are applied the case study in order to maintain a focus of research on the social relations of infrastructure. With the rationale for applying Marxist theory to case study methodology explained, it is now possible to provide an overview of the specific methods used in my research.

Methods & Approach

While the above section outlined the framework that guided the methodological approach to my research, and the rationale for such an application, this section looks at the specific ways I deployed this methodological approach. In short, I used a combination of primary and secondary data sources, namely document analysis, semi-structured key informant interviews, archival materials, historic journals and periodicals, government records, site visits, and literature. Table 1 below connects these data sources to the subjects covered and perspectives included in each case.
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<thead>
<tr>
<th>CASE</th>
<th>SUBJECTS COVERED</th>
<th>PERSPECTIVES INCLUDED</th>
<th>DATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>DETROIT RIVER TUNNEL COMPANY</td>
<td>National Policy, 1879</td>
<td>Elected officials</td>
<td>Archival materials; Literature</td>
</tr>
<tr>
<td>(CHAPTER 4)</td>
<td>Interstate Commerce Act</td>
<td>Elected officials; Industry representatives</td>
<td>Archival materials; Government records</td>
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<td>Rail and tunnel infrastructure</td>
<td>Labor; Industry representatives; Infrastructure users; Contractors; Planners</td>
<td>Archival materials; Historic journals and periodicals; Literature</td>
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<td></td>
<td>Monopoly capital</td>
<td>Industry representatives</td>
<td>Archival materials</td>
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<td>Public bonds</td>
<td>Elected officials</td>
<td>Archival materials; Government records</td>
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<td>Technocratic planning</td>
<td>Contractors; Planners</td>
<td>Historic journals and periodicals</td>
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<td>Trade corridor/gateway</td>
<td>Industry representatives; Contractors; Planners; Indigenous planners; Indigenous businesses</td>
<td>Interviews; Documents; Literature</td>
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<td>Elected officials; Industry representatives</td>
<td>Documents; Literature</td>
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<td>Sustainable development</td>
<td>Contractors; Planners; Indigenous planners; Indigenous businesses</td>
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Table 1: Data sources, perspectives included, and subjects covered for each case study.
The following section will outline the methodological approach to each of these methods and connect them to the overall methodological framework outlined in the previous section. While the details of these specific methods are explored in each individual chapter, it is important to explain their connection to the overall methodological framework; therefore, what follows is a description of the methods included in this study from the standpoint of how they are situated within my Marxist case study framework.

**Literature Review**

Because part of this study is to make a theoretical contribution, it was important to consider existing literature from a data collection standpoint. Beginning with a theory of infrastructure planning as a relational process connected to the social dynamics of capitalism and colonialism, the literature review began generally as a study of key texts within these broad social processes. The review then dove into infrastructure specific literature, trade literature, and then planning literature oriented around community-based plans, public-private partnerships, and specifically, infrastructure development in the Detroit River border region. Each body of literature is featured differently in each chapter and, while there was a soft linearity to the methodological approach to the literature, literature was often taken in an iterative fashion as other methods of data collection were engaged at different points of the study.

**Document Analysis**

As one of the key secondary data sources used for this study, document analysis began with first exploring a set of documents connected to the Herb Gray Parkway, and the collaboration between the Ontario Ministry of Transportation and Walpole Island First Nation.
The review of these documents was conducted under the framework of infrastructure as a social process, as constructed through the literature review of the larger social processes of capitalism and colonialism. In this way, much of the analysis was deductive: I began with theory and analyzed the documents based on that theory. Taking this deductive approach put a critical lens to reading the documents, and allowed me to consider how text can “enrol us into a specific way of knowing, acting, being in and understanding the world” (Rapley, 2008, p. 123). Reading the documents in this way not only provided a background to the case study, but it also provided insight into the differences in presentation of the social relations behind the Parkway and the ways in which those relations played out in the planning and development stages.

As data analysis moved forward, the deductive approach shifted as the iterative dynamic of the study triggered inductive lessons into the theory. As discussed in the introductory chapter, Marxist theory poses significant limitations to researching Indigenous communities, so the data from document analysis brought new themes to the study that my theoretical framework might not have assumed. These themes included community-based ecological planning, the cultural recognition of Indigenous communities in infrastructure planning, and economic development in Indigenous and non-Indigenous communities stemming from infrastructure projects. The growing body of keywords that emerged focusing on texts demonstrates that document analysis can be more than just a method of critical analysis; it can also be a method to help scope and bound a case study.

**Interviews**

My research focused on contemporary trade infrastructure of the Herb Gray Parkway draws in part on primary data collected through semi-structured interviews with key informants.
The interview questions and participants were developed from an initial review of documents related to the Herb Gray Parkway. Per Dunn’s (2010) description of semi-structured interviews, an interview guide was developed around content-focused questions that I as the researcher deemed important to the research question. These questions were roughly structured in three different categories related to the case study: background, economic development, and relationship building. An initial group of three key informants were consulted, and the interviews were adapted based on these initial inputs. These key informants were identified because of their familiarity with the case and their unique perspective as informed gatekeepers to critical and relevant information (Gilchrist, 1992). After these initial interviews, the iterative process then took root and an additional three key informants were identified when new, more specified themes such as public-private partnership and environmental assessment became a dominant presence in the discussion.

Overall, I identified the key informants as part of a professional sphere of planning. The informants were all part of a professional staff involved in the Parkway in some capacity. Some participants were staff of the administration of Walpole Island First Nation and therefore brought Indigenous perspectives into a western professional planning sector—a theme that will be taken up in greater detail in Chapter 5 of this dissertation. Three interviews were conducted over the phone, while three were in person between June 2018 and May 2019. The interviews with Indigenous participants were conducted on Walpole Island First Nation as part of three multi-day site visits, which are explained in greater detail below. The interviews themselves were roughly one hour long and were transcribed and coded using themes preconceived from theory (deductive coding) as well as themes that emerged from data collection (inductive coding). This approach constituted my coding structure, which per Cope’s (2010) “enable[d] the data to be
organized in such a way that patterns, commonalities, relationships, and even disjunctures [were] identified and brought out for scrutiny.” (p. 284)

**Archival Research**

Archival research was the primary method used for the historical perspective of the study. It is important to note that the search and collection of archival material was driven by both theory and initial data collection; therefore, the interest in a historical perspective came both from the theoretical assumptions about infrastructure but also from the data collected at other points in the study, and in particular from interviews. The historical backdrop became abundantly clear in the early stages of document analysis and interviews for the contemporary case study. I then identified the spatial-temporal parameters to work within and a relevant historic case within those parameters. Rather than choose a specific piece of historic infrastructure such as the contemporary case of the Herb Gray Parkway, it became apparent that a historical analysis would better connect with the existing data if it were to draw from the themes of those data and explore a case more generally bounded in spatial-temporal terms. Specifically considering public-private partnerships, the archival research looked at archival material related to firms operating around the time of the National Policy (1879) in Canada, and were active in infrastructural development of the Detroit River crossing. In this way, the archival data was collected under an umbrella case of historic trade policy and firm involvement in the construction of infrastructure that traverses the Detroit River for the purposes of trade.

I gathered material from national (Library and Archives Canada), regional (University of Windsor Archives), and digital (HathiTrust Digital Library; The Internet Archive; New York Times TimesMachine) archives. I spent one full day on site at the University of Windsor
Archives in Windsor, Ontario and five full days on site over three separate trips to the Library and Archives Canada. My archival method followed my overall inductive-deductive methodology discussed earlier in this chapter. That is, I used Marxist dialectical materialism on trade infrastructure to narrow the scope of my archival search to relevant topics and sources—namely I focused on a material from elected officials and industry representatives. Identifying these topics beforehand “offer[ed] the ability to add new topics or identify dead ends and see how themes merge or diverge.” (Roche, 2010, p. 176).

Following new leads from the data challenged my deductive preconceptions of Marxist theory. I brought an inductive approach to my method by taking time during my initial archival visits to pursue leads on emergent topics and sources not originally considered. I followed up on these topics and sources on subsequent archival visits as well as searches on digital archives. This method to archival research helped me navigate what Cole Harris (2001) describes as the tendency for archival researchers to “gravitate toward one of two polar reactions.” (p. 331). To Harris, archival researchers tend to react in one of two unfavorable ways to historical research. The first is to rely predominantly on theory and the second is to rely predominantly on data (Harris, 2001). My method was to start with Marxist preconceptions, but to remain open to the challenges of those preconceptions as more and more data became available.

I also considered Ann Stoler’s (2010) approach to thinking through the spaces and liveliness of archives and how they enforce particular imperial narratives. In particular, given that I was connecting this archival research of trade infrastructure to a contemporary case involving participation from an Indigenous community (Walpole Island First Nation), which also has historic roots in regional trade, I was very aware that WIFN’S perspective, and any direct
perspectives from Indigenous groups, would likely not be included in any settler archives. This reality remained present throughout my analysis.

Site Visits

Site visits focused on visiting the Herb Gray Parkway but also included trips to Walpole Island First Nation. Three site visits were conducted in total. The first site visit involved a tour of the Parkway lead by an interview participant from Walpole Island First Nation. On this tour we discussed the features of the Parkway that WIFN were involved in (e.g., pedestrian bridges, ecological features, artwork, interpretive panels, and trails). The second and third visits were done by myself and included recording field notes that were later transcribed and analyzed. All three site visits included informal meetings with research participants at Walpole Island First Nation Heritage Centre (three meetings) and MTO offices in London, Ontario (one meeting). Through these meetings I also become involved as an editor and designer for a book co-produced between WIFN Heritage Centre and MTO on the lessons learned from the engagement of Walpole Island First Nation on the Parkway project. This work was integral in building relationships with my research participants as well as provided valuable information on the intricacies of the Parkway project.

Limitations

Dialectical materialism poses similar limitations to the general limitations of Marxist theory outlined in the previous chapter. Namely, the method does not foreground the intersecting perspectives of different research subjects in the same regard that postcolonial theory might. It also runs the risk of universalizing the experiences of research subjects under the social relations
of capitalism as explained in Marxist theory. As I explain above, my awareness of Marx’s limitations is present in my research, particularly in semi-structured interviews. While applying a consistent commitment to Marx, I also maintain a level of criticism and skepticism that the method could fully capture the perspectives of research subjects—particularly the perspectives of the Indigenous participants. By maintaining a reflexive stance, I aim to temper the urge to fit all data neatly into a dialectical materialist methodological approach, and instead let each data sit with its own theoretical potential. To borrow from Ollman (2003), the whole approach is somewhat of a dance between the desire to frame the research in Marxist perspective as well as a desire not to limit the research participants’ perspectives within the constraints of the theory. This tension is particularly visible in Chapter 5 of this dissertation and therefore the limitations of Marx discussed here and in the previous chapter should be taken into consideration when reading that chapter.

Beyond a defense of the general limitations of Marx’s theory and method, this study requires a defense on the standing of its rigor. Conventional research methodology considers triangulation (Denzin, 1978) when qualifying scientific rigor. In defense of the rigor of this methodology, I have connected my above approach to the ingredients included in the concept of triangulation: multiple sources, methods, investigators, and theories (Bradshaw & Stratford, 2010). This research consults a combination of primary and secondary data in the form of literature, key informants, documents, and archival material; it used various qualitative methods to engage with these sources. As the investigator, my engagement with these sources is informed by critical reflexivity, and brought a flexible conviction of Marxist theory to iteratively engage with the growing body of research. These inputs are all triangulated under the methodological
framework outlined in this chapter to support the analysis of subsequent chapters in a rigorous way.

This approach is not without its limitations. The most glaring limitation is the tension between breadth and depth of this study. The methods employed here can confidently bear witness to a breadth of the study—combining theoretical, contemporary, and historical perspectives into a broad study of trade infrastructural planning and development and the social relations contained therein. The depth of this study requires some further explanation, however. Baxter (2010), Yin (2008), and Flyvbjerg (2006) all argue that the case study method assures a level of depth when the case is appropriately contextualized. This dissertation identifies a spatial context (Detroit River border region), temporal context (historic and contemporary cases), and conceptual context (trade infrastructure planning and development). The data emerging out of these cases from a variety of methods assures a significant depth of exploration into the social relations of infrastructure planning and development under capitalism because these data held obvious redundancies (e.g., the role of finance was redundant across the theoretical, historical, and contemporary areas of this study). To Baxter (2010) case study researchers achieve depth in their study when they expect and find redundancies between cases.

Conclusion

I have thus far outlined a guiding methodological framework and a specific methodological approach to this research. Importantly, I also laid out the rationale for such an approach. While I describe a Marxist approach to case study methods, I do not do so to reinvent the methodological wheel, or to assume that Marxist scholars or those interested in reflexive science have failed to grasp the methodological intent of the incorporated Marxist characteristics
of this research. Instead, I describe my methodology as a Marxist case study because the
dialectical method that I have interpreted reflects well within the scope of my study. My
approach to research is done so in homage to the methodological prowess of the principles
underlying the methodological contributions of Marx. I hope that the spirit of Marx’s method is
captured in the description of this framework and that the rationale for its application in this case
comes through in the above text.
Abstract: For planning scholars, the built environment is apropos for abstraction into theoretical explorations. However, while infrastructure as a whole has provided rich theoretical terrain for planning scholars, little theoretical attention has been paid to transport infrastructure associated with international trade. Not only do these forms of border infrastructure feature in the regular practice of international trade, they materialize trade relations in the built environment, as well as the ways in which trade is folded into the economies of border regions. It is important to consider the specific ways in which the infrastructure of the globalized world trading system is fraught with risks such as debt burden, overscheduled construction, disruptions of daily life, and multi-jurisdictional budgetary challenges. Such risks are often softened with promises that enhanced trade is inherently good for border communities and therefore infrastructural investments are necessary for the economic health of the region. In this paper I offer a theoretical exploration of trade infrastructure through arguing that there are inherent contradictions in the economics of capitalist global trade, and that border communities cannot expect infrastructural investment to automatically result in an economic windfall for their communities. The ways in which multinational contracting firms utilize financial leverage and the willingness to invest heavily in trade infrastructure controls a unique contractual apparatus that offers border communities the only access point to value in a capitalist trading system. Community stakeholders, therefore, are relegated to maneuver through this contractual apparatus, speculating on the hope of securing a set of sub-contracts while major infrastructural financiers consolidate the return of investment into yet another infrastructural asset.
Introduction

In 2014 the World Bank launched its trade corridors toolkit in order to draw upon the global investment bank’s experiences in “assessing, designing, implementing, and evaluating the impact of trade and transport corridor projects” (Carruthers & Kunaka, 2014, p. xiii). The aim was to utilize the World Bank’s experience in developing both the infrastructure (e.g., roads, bridges, railways, ports) as well as the logistical apparatuses (e.g., customs and border services) of trade corridors in order to allow public and private entities to “better appreciate both the importance of good corridor project design and the challenges of and possibilities for improving performance and reducing trade costs” (Carruthers & Kunaka, 2014, p. xiv). The assumption of such an approach was that the bundles of infrastructures and logistical practices that make up trade corridors must function primarily to reduce the costs associated with trade. While this assumption highlights the overall importance of expanding trade networks as a critical function of growing and connecting the global economy, what the toolkit overlooked was how the assumption of benevolence in the reduction of trade costs fails to grapple with the internal contradictions of expanding capitalist trade, and how faith in a capitalist trading system shapes the planning process of trade infrastructure. In this article I explore the following questions: How are the social relations of capitalism expressed in infrastructure in border regions that support international trade? In what ways do these social relations shape the planning and development of trade infrastructure?

The social relations at stake here are those that emerge from financial investment into infrastructural assets and the ways in which those investments are distributed through what I define as a “contractual apparatus” consisting of engineers, contractors, public entities, local
community groups, and other agents who aim to provide services, increasingly through public-private partnerships. I demonstrate that this contractual apparatus of trade infrastructure has far greater implications for border communities than the macro-economics of trade promoted in the mainstream liberal/neoliberal economic thinking of the World Bank. Planners and border community groups engaged in trade infrastructure projects, I argue, should take seriously the planning and development process of trade infrastructure and the social relations within these processes in order to locate how economic value is derived out of the investment in, and execution of, trade infrastructure.

To make the case for the importance of the contractual apparatus of trade infrastructure, I will begin by developing and situating definitions of trade infrastructure and its contractual apparatus within existing theoretical work on infrastructure and borders in the disciplines of planning and geography. Then, I will present a Marxist response to the assumption of the benevolence of reducing trade costs. In doing so, I will complicate the ways in which foreign trade and the infrastructure that carries it is actually understood within capital accumulation and the overall cycles of capitalist growth. With a Marxist critique in place, I will then explore the financialization of infrastructure in order to demonstrate the speculative nature of trade infrastructure development, and how it is not so much the reduction of costs in trading of goods and services across infrastructure that matters, as the creation of a frictionless environment for the trading of infrastructure itself that is an asset in financial markets. Finally, I will demonstrate that the multi-jurisdictional agencies entangled in trade infrastructure planning and development (which planners are heavily featured in) are relegated to negotiate with the proprietors of infrastructural finance within a unique contractual apparatus. The ultimate consequence of this final point is that, while the speculative bubble of economic logics associated with trade
infrastructure would lend one to believe in the benevolence of economic growth through an expansion of trade activity facilitated by superior infrastructure, these benefits do not affect every stakeholder in the planning and development of that infrastructure equally. In fact, as I lay out through the arguments in this paper, there are systems and mechanisms in place which allow large actors to mobilize vast sums of investment capital and only concede to smaller actors what is necessary in a hierarchy of contractualism. In this way, the economic distribution that speculative opportunity suggests fails to come to fruition for these smaller actors. Vitally, then, the expression of the social relations in the planning and development of trade infrastructure through the contractual apparatus resemble the inequitable social relations at the heart of the capitalist mode of production.

Why Infrastructure? Why Borders?

Marxist concepts that explore infrastructure and the unique characteristics of infrastructure at the border are helpful for interrogating the broader social relations of capitalism. I begin an exploration of the social relations of capitalism, as expressed in infrastructure development, with one such Marxist concept: David Harvey’s spatial fix. To Harvey (1981, 2001, 2006), capitalism’s tendency towards overaccumulation has spatial characteristics that can only be temporarily resolved. A spatial fix is one such resolution that targets "capitalism’s insatiable drive to resolve its inner crisis tendencies by geographical expansion and geographical restructuring” (Harvey, 2001 p. 24). One feature of such a type of geographical restructuring focuses on the role the built environment plays in "capital switching” from primary to secondary and tertiary circuits of capital in order to temporarily alleviate pressures of overaccumulation in a given geographic location. Ekers and Prudham (2017) provide a fulsome description of capital
switching. First, latent capital is repeatedly put to use in the primary circuit of capital—that is, the sites of production that have a relatively quick turnover time such as manufactured goods. Capital investment remains intensive in the primary circuit so long as surplus value accumulation is sustained. Eventually, however, in order to generate further surplus value, investment switches to the secondary circuit, which heavily features fixed capital investment, or that long-term, immovable capital whose use value is “welded fast to the surface of the earth” (Marx, 1939/1993c, p. 740). Further switches to the tertiary circuit of capital involves long-term investments into the reproduction of capitalism itself such as research and development as well as necessary investments for general social reproduction such as education and health care. What is important here is that infrastructural development at the border switches capital investment into the fixed capital of the built environment of the border, thus providing a temporary spatial fix. Moreover, the primary, secondary and tertiary circuits of capital are all implicated in border infrastructure investment. Trade infrastructure facilitates the travel of trade goods that require less turnover to ever distant markets on the primary circuit of capital. The secondary circuit, meanwhile, is the direct investment of fixed capital into the trade infrastructure itself. Finally, the tertiary circuit of capital investment considers the investment in new scientific management forms or more effective technologies to enhance the logistical movements of trade goods.

Deborah Cowen (2014) has discussed the tertiary circuit of capital investment at the border by exploring the ways in which global trade under neoliberal regimes have brought into being a new type of capitalist production that relies on production processes across logistics space. The logistics space to which Cowen refers to is a “network space, constituted by infrastructures, information, goods, and people…dedicated to flows” (Cowen, 2014, p. 8). Danyluk (2018) directly connects the development of logistical space committed to flows to
Harvey’s spatial fix, arguing that a logistical fix “has played a vital role in promoting the accumulation of capital—and the reproduction of capitalist social relations” (Danyluk, 2018, p. 632). In this network of flows, both Cowen and Danyluk feature infrastructure as more of a bit-player in the collective act of executing the logistical science of maximizing the efficiencies of just-in-time supply chain operation. I take on the spirit of their critique of global trade, but instead more intently feature the role of infrastructure, and thus turn the focus back to the fixed infrastructural investments of the built environment. Specifically, I consider not just the infrastructure as a material thing, but as a social process that, in the words of Marx, encompasses a “developed relation of contradiction: a vigorous relation…driving towards resolution” (Marx, 1932/1992b, p. 345). Marx refers here to the contradictory relation of labor and capital; a social relation at the heart of the capitalist mode of production that I also identify in the planning and development of trade infrastructure.

I now contribute to this intersection of trade and spatial fixes as analyzed in geography and planning literature by theoretically exploring infrastructure used for trade through a novel concept I refer to as “trade infrastructure.” By this term I mean material infrastructure located in border regions in which the primary social usefulness is the movement of trade goods and services across an international demarcation. Social usefulness is important in this definition—and should be read in a Marxian economic sense—as a material product with a specified social use-value “only realized in use or consumption” (Marx, 1867/1992a, p. 126). Currently, within a capitalist mode of production, trade infrastructure's usefulness is being expressed through an exchange-value in a capitalist global trade system bent on enhancing and securing the frequency of exchanges occurring through the trade infrastructure. The capture of this value is organized in another novel term that I refer to as the “contractual apparatus.” This contractual apparatus is the
realm of exchange that is linked to the social usefulness of trade infrastructure working dialectically to express the internal relations of class-based expropriation of value in a capitalist mode of production. Infrastructural financiers (i.e., capitalists) leverage the social usefulness of trade infrastructure in the planning and development process to articulate a legally binding transactional space where various social influences can express their usefulness to the project in an agreed-upon monetary exchange of services. This contractual apparatus constitutes the bundle of legally recognized contracts that enroll contractors, engineers, consultants, laborers, administrative support, and any other necessary waged workers into a quantitative expression of their services in the form of monetary payment.

In effect, trade infrastructure is defined by both its intent and its geographic location. The intent is the movement of trade goods and services. The geographic location is the infrastructure’s placement on an international demarcation and extends to the peripheral infrastructure of a border region. Examples from the global North tend to feature binational public-private partnerships, such as the Cascadia Innovation Corridor at the U.S.-Canadian Border in the Pacific Northwest (Cappellano et al., 2020), while examples from the global South tend to feature the involvement of multinational development agencies working in special economic zones (SEZs), such as the Southern African Development Community (SADC)-driven effort to twin the cities of Musina and Beitbridge on the South Africa-Zimbabwe border (Nyamwanza, 2017). In any context, the intent remains to facilitate cross-border regional economic integration and enhance international trade flows.

While planning scholars have taken up infrastructure in general as a unit of detailed analysis (Dodson, 2009; Neuman & Smith, 2010; Siemiatycki, 2005, 2009; Sorensen, 2018; Steele & Legacy, 2017; Whittington, 2012), the infrastructures associated with trade corridors
have not received the same attention. As a whole, much of the body of planning scholarship, as well as that of urban studies in general, ascribes infrastructure as either a techno-scientific practice (Hall, 2014) or as a material manifestation of collective social, political, economic, and cultural concerns (Graham & Marvin, 2001). The consequence of the former, according to Dodson, is that it "limits questions of broader, comprehensive and strategic spatial and land-use planning in favor of a project-oriented engineering driven perspective" (Dodson, 2009, p. 120). Neuman and Smith (2010) similarly call for an interpretation of the historical development of urban planning and infrastructure that emphasizes how infrastructure and urban life historically conditioned social relations and shaped what social priorities are placed on cities today. The role of the critical planner or urbanist, therefore, is to approach a project with social context as opposed to just an engineering problematic. Indeed, Steele and Legacy (2017) lament that infrastructure is often the purview of engineers and political bosses that circumvent, or at best pander, to “local scale community sovereignty and responsibility” (p. 1). In this spirit of engaging in community building at the border, trade corridors should be viewed as not just scientific instruments for improving trade logistics, but seen more deeply as material manifestations of broader social relations.

To provide a more detailed treatment of trade infrastructure’s expression of social relations, it is helpful to situate the discussion within the planning literature that features trade. As a whole, the force of international trade in this literature is one that drives cross-border regions into the heights of global economic competition (Cappellano & Rizzo, 2019; Sohn, 2014). Cappellano et al. (2020) have promoted the idea of cross-border regional planning in part through researching the harmonized trade policies and economic integration of cross-border regions between the United States and Canada, such as Seattle-Vancouver and Detroit-Windsor.
The combined cross-border forces of urban economic activity and global trade flows within so-called “innovation corridors” funnel financial investment into a cross-border region as a means of competing on a global scale reminiscent of the global cities network (Sassen, 2002). These competitive urban areas become cross-border metropolitan regions where trade infrastructure investment may cluster economic activity in border regions (Sohn, 2014). To others (see, for example, Timmer et al., 2019) it is not necessarily certain that this economic activity generates value that locates itself within the border region communities. In fact, it has been demonstrated that cross-border investment, including that of infrastructural investment, is at least a “part of the generated value-added [that] will accrue as capital income to multinational firms” (Timmer et al., 2019, p. 7). Furthermore, this value derived from the investment in the fixed productive activities of trade is extremely hard to untangle (Lipsey, 2010; Timmer et al., 2014). Finally, notable in the review of planning literature on trade is that it lacks a Marxist analysis, following the general trend in contemporary planning literature (Holgersen, 2020).

Before moving any further, it is important to note that not all borders are created equal; therefore, an investigation of trade infrastructure must differentiate the special significance of trade borders versus borders in toto. While borders have a diverse set of contexts that provide fertile ground for a variety of theoretical interpretations, an investigation into trade infrastructure cannot harmonize all of these contexts. It would be unfair to universalize the border experiences of the Khorgos Gateway project linking China and Europe through trade infrastructural investment (Lin, 2019), for example, with the experiences of North African migrants at the Melilla Border Fence in Morocco (Johnson & Jones, 2018). While all borders are arguably used for nation-state building through often racist and colonially-driven regimes (Walia & Smith, 2013), there are certain cases in which those forces are muted in favor of the illusion of a
globalized and interconnected economy (see, for example, Mezzadra & Neilson's (2013) argument for the border’s role in the multiplication of labor). The concept of trade infrastructure is important to the latter context. While the securitization of borders; the use of border infrastructure in the formation of white, western ethno-nation states; and the mobilization of infrastructure for racially-driven violence against migrant populations is clearly important in discussions of trade and borders, these discussions are limited in this paper (see, for example, Bebout, 2016). The priority here is, instead, on the globalized imaginary evoked through heavy infrastructural investment in major trade corridors. Still, it is important to recognize the relationship between state building, infrastructure, and the global economy as infrastructural finance has been shown to be central to both state formation as well as the financialization of the built environment (Murton et al., 2016).

Trade Infrastructure and Planning Border Economies

Trade infrastructure planning must contend with a central economic contradiction within all border economies. That tension is that border communities, in part, gain their value from their location, but economic growth through trade demands the circumvention of their very location. Borders are at once seen as mechanisms for generating market-competition and comparative advantage while also instituting barriers to free trade and the movement of goods, services, and people (Sohn, 2014). In this way borders, as socially constructed demarcations, are treated the same as distance—as in there is a marginal transportation cost associated with crossing the border (Brunet-Jailly, 2005). As such, infrastructure plays an important role in trade, because insufficient transport and communications infrastructure limit a country’s ability to link itself into global networks of production and exchange (Limao & Venables, 2001). This is why the
infrastructural network of trade remains important to organizations such as the World Bank, as they link import-export practices to sovereign gross domestic product (GDP) growth and through “reducing trade costs and enhancing the competitiveness of cities, communities, regions, and countries” (Carruthers & Kunaka, 2014, p. xiv). Housed in the theory of export-led growth, this presumed enhancement of GDP associated with trade emerges from the assumption that a country’s economy is stimulated by the technical necessities to move goods and services into foreign markets. These technical necessities include more efficient production processes, market specialization, economies of scale and, important to this paper’s argument, fully developed infrastructural networks (Morgan & Katsikeas, 1997). While trade policy in the form of tariffs and quotas, monetary policy such as interests rates, as well as the influence of global exchange patterns on currency have been shown to influence domestic economic activity, these direct policy instruments are not nearly as important as infrastructural networks to the performance of trade and the associated costs of trade due to transport (Anderson & Van Wincoop, 2004). Celbis et al.’s (2014) meta-analysis of infrastructure’s impact on trade also found that infrastructural investments had a positive correlation on both imports and exports, particularly in developing countries. This need for material investment in infrastructure networks demonstrates that planning and development of major infrastructure projects continue to play a vital role in the global economy.

A few issues emerge, however, in the above interpretation of borders, trade, and infrastructure by mainstream economists. First, the mechanism of measuring the economy through the national accounting of GDP is fraught with assumptions regarding the distribution of the collective relationships of production and consumption (Christophers, 2017). Moreover, a national accounting of GDP assumes that product output within a socially territorialized nation-
state or region is independent of its need to be realized within a global marketplace. Second, the economic thinking of export-led growth fails to consider possible internal underinvestment of infrastructure due to the external necessities of the relationship between nation states and the global economy. Meaning, the consumption of foreign markets (i.e., demands) benefit from the investment of infrastructure domestically (i.e., supply), but there is little cooperation in the planning and development of these infrastructures (Felbermayr & Tarasov, 2015). The externalities of consumer demand in the foreign market leads to infrastructural investment at the border, but then the benefits of that investment do not stay there. Moreover, infrastructure underinvestment remains critical at peripheral locations far away from the border. This generates a massive spatial differentiation in supply and demand that perpetuates with infrastructural investment, as opposed to being diminished by it. This connects to the third issue at hand, which is that the benefits of infrastructural investment on trade carries with it the fraught landscape of trade being interpreted as a zero-sum game. Meaning, that if one country benefits at the trade level, then another country cannot. This holds true in Celbis et al.’s (2014) analysis that, in order for the benefits of infrastructural investment to take shape, equal investments must be made on each side of the border, which the above point illustrates is difficult in the landscape of supply and demand. The following section will address these issues through a critique from a Marxist perspective. Notably, I will first argue that equilibrium does not exist in capitalism because the internal contradictions will always be realized due to capitalism’s inherent problem of overproduction. The overproduction problem, a central tenet to Marxist theory, will then be connected to trade infrastructure development in order to demonstrate how the planning and development of such infrastructure is worthy of important theoretical interrogation.
Defrauding One Another: Trade in Marx

Marx’s understanding of infrastructure and foreign trade is vastly different from much of liberal/neoliberal economic thinking informing World Bank infrastructure investment efforts. To begin, neoliberalism has sought to limit infrastructure planning systems into “quasi-market regulatory mechanisms for dealing with conflict mediation” such as environmental protections (Healey, 2003, p. 518). The relegating of planning to market regulator forms “the conditions under which planners work” by forcing planners to plan infrastructure projects with a view of tinkering around the edges of capitalism’s problem areas such as the instability around supply and demand (Sager, 2011, p. 149). Alternatively, Marx fundamentally views the laws of supply and demand differently. The backbone of Marx’s theory of crisis formation is his interpretation of the tendency for the rate of profit to fall under capitalism (Hodgson, 1991; Marx, 1894/1993b). While classical economists may differ in their interpretation of the rate of profit to fall—see, for example, Ricardo’s (1817/1911, Chapter V) analysis of the rate of diminishing returns—there is a general consensus that interventions and particular organizations driving the productive forces of capitalism could counteract this tendency and return supply and demand to equilibrium. Others, such as the proponents of trade liberalization in the 1980s and 1990s (see, for example, Krugman, 1991), assumed supply and demand in their models, which predicted economic expansion through enhanced trade linkages.

Where Marx fundamentally differs, however, is in his belief that the tendency for the rate of profit to fall is not simply a bug, but a feature of capitalism. Meaning, that even given a natural state of equilibrium in supply and demand, capitalism will inevitably move towards overproduction and underconsumption, resulting in a falling rate of profit that inevitably forms into crisis (Harvey, 2010). How trade infrastructure is implicated in crisis formation, and will be
addressed here. First, I will consider how Marx articulates transportation and communication infrastructure (critical infrastructures linked to global trade) as both a form of productive capital as well as situated fixed capital necessary for the facilitation of value realization through consumption on the global marketplace. Second, I will show how infrastructure, as understood by Marx, as fixed capital is linked to overproduction, or the cause of the tendency of the rate of profit to fall. Finally, I will argue that foreign trade has been viewed as a temporary fix to the tendency toward overproduction and the falling rate of profit.

Here, I explore Marx’s analysis of the role of transportation in the realization of value in capitalism. To Marx,

the transport industry forms on the one hand an independent branch of production, and hence particular sphere for investment of productive capital. On the other hand, it is distinguished by its appearance as the continuation of a production process within the circulation process and for the circulation process. (Marx, 1885/1993a, p. 229 emphasis in original)

In Marxian economics, the spheres of production and circulation are fluid processes of the overall movements of capital, but each have distinct characteristics relevant to this discussion. While the production process spatially mobilizes the ingredients of capital (i.e., fixed capital, means of production, variable capital, labor power) to generate potential value, the circulation process is the point of realization of that value within the marketplace (i.e., consumption). To Marx, “the use-value of things is realized only in their consumption, and their consumption may make a change of location necessary, and thus also the additional production process of the transport industry” (Marx, 1885/1993a, p. 226). Therefore, transportation infrastructure has a twin role in capitalism in that it is both a productive force (i.e., producing the commodity of a change of geographic location) and a force that aids in the process of realization...
by facilitating the movements of other goods and services to the point of realization in a distant marketplace.

Furthermore, the intensification of the exchange of goods and services that accompanies contemporary capitalism renders transportation and communication infrastructure even more important. Contemporary capitalism rests heavily on the rapid exchange of commodities, not just for the direct buying and selling of those commodities, but also for the creation of commodities markets where speculative trading generates more opportunities to realize value (Lapavitsas, 2014). These speculative practices rely less on the means of production and more on the means of circulation, elevating the value of transport and communication infrastructure or, as Marx states, “the more production comes to rest on exchange value…the more important do the physical conditions of exchange – the means of communication and transport – become for the costs of circulation” (Marx, 1939/1993c, p. 524). Moreover, not only does transport and communication infrastructure associated with trade generate further value for its role in the circulation process but, in the form of fixed capital, it can also travel through the circulation process itself—even as it is fixed in location. Infrastructure bound in space and time can change in location when speculators buy and sell the fixed capital associated with the production process as an asset; “what actually moves here is the property title to the thing and not the thing itself” (Marx, 1885/1993a, p. 226). What transport and communications infrastructure ultimately becomes, therefore, are layers of assets in both the productive and circulation processes of capitalism. In this way, transportation infrastructure is not only an investment of capital, but an investment into the mode of capitalist production itself and the relations constituted by that mode of production.
Given that transportation and communication infrastructures are such critical components within the body of the capitalist process, it is important that the next phase of this review on Marx’s thinking deals with one of the central tenets of his critique, which is his treatment of overproduction as endemic to capitalism. While the previous review of liberal/neoliberal economic thinking situates trade as a negotiation of supply and demand in a competitive world marketplace whereby investment in trade-related infrastructure supports worldwide economic growth, Marx considers these investments as simply a pathway towards the inevitable crisis of overproduction and declining rates of profit (Marx, 1894/1993b). The inexorability of overproduction crises in Marx’s thinking is due to the fact that, whereas liberal/neoliberal economists view global crises in supply and demand as quirks of capitalism that can be worked out through fine-tuning, Marx instead finds these features of capitalism as an expansion of the contradictory social relations at the heart of capitalism’s relations of production. While Marx’s explanation of capitalism’s tendency towards overproduction is his general thesis which he articulated in Capital Vol. III (Marx, 1894/1993b), it is interesting that he previews this thesis in a footnote to a discussion of trade speculation in Vol. II where he explains that “the periods in which capitalist production exerts all its forces regularly show themselves to be periods of over-production” (Marx, 1885/1993a, p. 391 footnote 1). The trade economy embodies the tendency towards overproduction because consumers begin to demand their products of consumption (use-values) from ever-distant markets, creating a pressure on demand without an accompanying element of supply within an appropriate time-space context. The need for infrastructural investment for the purposes of supplying consumer demand with foreign goods leads to an “over-supply and speculation in this part of the import trade,” which is then taken up by a “band of speculators, contractors, engineers, lawyers, etc. [to] enrich themselves” (Marx, 1885/1993a,
Firms engaged in trade infrastructure development, therefore, invest productive capital into a speculative frenzy that draws upon latent resources, including reserve labor power, in order to facilitate the realization of consumer goods and services across the global market. The expansion of a global infrastructural network of trade, therefore, is simply an expansion of capitalist social relations.

The final development of Marx’s analysis looks to the ways in which foreign trade serves as a temporary fix to the tendency of overproduction. According to Marx, foreign trade temporarily solves the overproduction crisis by “[cheapening] on the one hand elements of constant capital [means of production] and on the other hand the necessary means of subsistence into which variable capital [labor power] is converted” (Marx, 1894/1993b, p. 344). However, the cheapening of goods and labor power is only permitted through foreign trade so long as trade reaches an ever-extending market and that nations and firms engaged in foreign trade continue to advance in the technological capacities of production. For example, in order to maintain continuous rates of growth of profit, and avoid a crisis of overproduction, firms must reach new markets not previously engaged in trade activity. In order to achieve this, they must do so through enhancing the trade capacity of this market relationship by investing heavily in reducing the costs of transport through infrastructural assets that become fixed within a particular space and time. Within this isolated investment of capital into a condensed location lies an example of Harvey’s spatial fix to the overproduction crisis. For a time, intensified capital investment in fixed infrastructure (such as trade infrastructure) allows for numerous economic actors to actualize potential surplus value in the form of construction, use fees, financial leveraging, contracting of services, and other capital arrangements in order to raise the rate of profit for firms and nations participating in foreign trade.
Foreign trade is only a temporary fix to overproduction, however. As stated earlier, what sets Marx’s economics apart is that overproduction and the declining rate of profit is internal to capitalism. Central to capitalism’s drive of overproduction is the fact that the need of fix capital varies year to year, and therefore a hoard must be developed in order to quickly invest in fixed capital as it is needed (Harvey, 2013, p. 354; Marx, 1885/1993a, p. 544). A particular trade corridor, therefore, may demand an infrastructural investment in a given year and so attract a vast sum of investment to facilitate the demand for foreign goods and services. Eventually, however, aggregate demand will resolve itself and infrastructural investment in that given context can no longer be counted on as a spatial fix for overproduction. Trade infrastructural investment is only a contextual fix whereby the overproduction of fixed capital is remedied in a certain time or place, in a fortuitous exchange relationship with a spatial community with excessive aggregate demand. The contradictions due to the extension of capitalism’s internal relations to the world market will soon emerge because trade “only shifts the contradictions to a broader sphere, and gives them a wider orbit” (Marx, 1885/1993a, p. 544). Marx touches on this in his somewhat zero-sum analysis of foreign trade when he argues that, while mutual gain may develop in the sense of both parties generating profit, the distribution of the contradictions (i.e., the internal contradictions of the distribution of surplus value) will “defraud” one party (Marx, 1939/1993c, p. 872).

Ultimately, if foreign trade and trade infrastructural investment is viewed in mainstream economics as a tonic for economic expansion at the global level, Marx’s critique is that this tonic is ultimately snake oil for a fundamentally dysfunctional economic system. To Marx, capitalist trade is a zero-sum game where one entity defrauds another in a global arena playing out the internal relations of capital. This means foreign trade is not just the exchange of goods and
services, but is actually the exchange of relationships. Therefore, trade infrastructure is not simply being developed for the purposes of moving goods and services across border regions, but it is also crucial in the continued expansion of the relations of capital. How these relations are articulated in a contractual basis in the planning and development of trade infrastructure are important to understand. The contractual arrangements determine who will receive the highest realization of the value that was mobilized for the purposes of the infrastructure project. The surplus value, in the context of trade, appears to gravitate towards the financiers. In other words, a country may receive in its GDP an export-driven bump, but how is its infrastructure network and trade patterns connected to the overall financial grid? The location of the participating developer in proximity to that financial grid is also important and is securely spelled out in the contracting of services and the nature of the financial arrangements as set out in the procurement documents. The increasing scale and concentration of the means of transport is seen in the massive investment into infrastructural megaprojects as an asset class unto itself (Weber et al., 2016).

**From Cross-Border Growth Machine to Trade Infrastructure Financialization**

How does infrastructure become an asset class and what does that mean for infrastructure at the border? To answer these questions, I begin with an exploration of infrastructural investment according to Harvey Molotch’s seminal urban growth machine and end with current considerations of infrastructural financialization as they are expressed in public-private partnerships. Firstly, the growth machine describes urban processes that turn land—or more abstractly *place*—into real estate assets that prioritize exchange value over use value (Molotch, 1976). In this way, various actors and stakeholders such as politicians, developers, businesses,
and other growth-oriented organizations form a “growth coalition” that commoditizes land in order to compete for scarce mobile capital (Rodgers, 2009). In Molotch’s own estimation, “desire for growth provides the key operative motivation toward consensus for members of politically mobilized local elites” (Molotch, 1976, p. 310). These elites turn the city into an investment landscape in which development patterns focus on a narrow type of economic growth that feeds off of a rising urban-area population resulting from expansion of industries, commerce, and intensive land development. In essence, urban landscapes are commodified into property markets that direct capital investment into fixed infrastructure that draws in rents for landlords, realtors, mortgage lenders, and so-called “place entrepreneurs” that experiment with new means of deriving exchange value from the land through speculation (Molotch & Logan, 2007, p. 23; Rodgers, 2009).

An example of a place entrepreneur would be the modern-day house flipper or real estate speculator. Similarly, at the border, innovative practices have emerged that approach the border as a resource to be leveraged for “value-capturing” (Sohn, 2014, p. 604). An example of such a value capturing innovation could be so-called Smart Border infrastructure like NEXUS at the U.S.-Canadian border that attempts to reconcile securitized nationalism with free market transnationalism by establishing a premium for the mobility of a transnational business class (Sparke, 2006). Such an example, however, also brings to the fore the contradictions of commoditizing a place that is meant to be expediently navigated. In other words, how can land meant to be circumvented by capital be valued by capital? This is not to mention the fact that growth coalitions may have competing interests in regards to how land should be developed and therefore commoditized. Local politicians at the border, for example, may wish to see further infrastructure investment and view the border as an asset and not just a site to be circumvented.
Manufacturers dependent on supply chain logistics, on the other hand, may simply see infrastructure development as a necessary function for speeding up border crossings. These competing interests are ultimately at the service of infrastructure financiers that simply looking for a return on their investment and opportunities to leverage that return for further infrastructural investment elsewhere. Contemporary financialized infrastructure is less of a growth coalition and more of a death cult to finance capital. In order to more fully lay out the competing forces within a contractual apparatus that hope to secure a windfall from the financial benefactors of trade infrastructure, it is necessary to look elsewhere for theoretical examination.

Moving back towards Harvey’s spatial fix in order to introduce some of the nefarious ways in which financialization is shaping trade infrastructure development brings a discussion of an infrastructural contractual apparatus into the 21st century of financial capitalism. Infrastructural financiers that leverage public pension funds in private markets or invest private capital into public utilities aim to “smooth out capital flow[s]” in the built environment in order to keep capital circulating and accumulation consistent (Harvey, 2014). However, these circulating capitals are inevitably met with the problems of fixity of infrastructural development. Yet, as Harvey (2014) observes capital continues to be sunk into the built environment until “the mass of…fixed capital increases over time relative to the capital that is continuously flowing” (p. 155). Trade goods cannot move across infrastructure-free borders, and therefore capital must continue to be invested in the built environment. However, capital cannot continuously circulate over fixed infrastructure and therefore the surplus value sunk into the built environment that facilitates trade is disproportionate to surplus value returned via the traded goods circulating over the infrastructure. In Harvey’s words, the fixed infrastructure becomes “sclerotic” and unable to respond to capital’s need to “break out of the constraints imposed by the world it has
constructed” (Harvey, 2014, p. 155). The result is geographic disinvestment where capital abandons a given locality in search of a spatial fix elsewhere. In order to continue the uneven process of spatial fixes, capital seeks creative (albeit destructive) means to continue to realize value in the sunk infrastructure. One of the ways in which capital extends the value of infrastructure is to leverage financial instruments in order to generate what is called “fictitious capital”— or, the capitalization of “debts and securities whose value results from…anticipated revenues” (Durand, 2017, p. 50). This was done famously in the built environment of the housing market through credit default swaps and mortgage back securities in the lead up to the 2007-2008 financial crises. Another way fictitious capital is being linked to the built environment are the ways in which public-private partnerships in infrastructure development are “reconfiguring the governance of municipal entities…to capitalize on future income streams from public services and utilities” (Aalbers, 2019, p. 9).

Before moving forward with an analysis on the financialization of infrastructure through public-private partnerships, it is important to clarify the meaning of “financialization.” Although there is no consensus around the definition of financialization, it is useful to distill a working definition that can be used here. Financialization is the transformation of the economy into a set of practices and processes that prioritize the accumulation of wealth through the management and circulation of financial assets in the form of contracts, debt, risk, investment opportunities, and so forth (Lapavitsas, 2014; Martin, 2002). Important here is that, from a Marxist perspective one could interpret, as David Harvey (2013) has, that in a financialized economy, the accumulation of wealth and the distribution of the total social surplus occurs more within the sphere of circulation and less from the sphere of production. This shift to the sphere of circulation is important, from an infrastructural perspective, because financialization unlinks
infrastructure from its situatedness as fixed capital, where the infrastructure itself is the asset and, by abstracting the infrastructural asset into a bundle of contracts, it can more freely circulate within financial markets for the benefit of an infrastructural investment class (O’Neill, 2010). This process of unlinking infrastructure from its material situatedness is an example of how trade infrastructure’s social usefulness (i.e., use-value) becomes further entangled in the realm of exchange expressed in what I have been calling the contractual apparatus.

When it comes to the financialization of infrastructure, of particular consequence is the inclusion of either full divestiture of infrastructure through privatization that transfers public assets to a private company, or the use of public-private partnership (PPP) schemes that award bundled design, build, finance, and operate (DBFO) public contracts. Generally, these contracts are awarded to a private consortium that forms a special purpose vehicle (SPV) to manage the contracts (Weber et al., 2016). The analysis here will focus on the PPP model, since cross-border infrastructure and the peripheral infrastructure that feeds it (i.e., trade infrastructure) has held firm to traditional public procurement models and has thus far rarely seen direct public divestiture. However, interest in PPP models for trade infrastructure is peaking and so financialization is trending in that direction (Verougstraete, 2017). Nevertheless, PPPs have been criticized for the lack of accountability and transparency of contracts (Willems, 2014), the complex financialization of public assets (O’Neill, 2013; Raco, 2013), the failure to transfer project risks to private partners (Shaoul et al., 2006), and the overall depoliticization that PPPs pose to democratic planning practices (Willems & Van Dooren, 2016). Others argue that, done correctly, PPPs offer extensive opportunities to build meaningful relationships between partners that transform existing power dynamics and provide greater benefit to multiple constituencies than could be achieved through a single entity (Roberts & Siemiatycki, 2015). Regardless of how
the critiques and praises measure up, it is important to realize that not all PPPs are created equal. PPPs are often discussed in a myopic fashion (Boardman et al., 2015); in practice they may be bundled under the same banner, but in theory they are actually a collection of different approaches. What remains consistent, however, is that the dynamism of PPPs have shifted infrastructural investment practices beyond the municipal bond market and has assisted in the creation of infrastructure as an asset class in and of itself (O’Neill, 2017).

The ways in which infrastructure becomes a private asset to be leveraged on financial markets in a PPP is far more complicated than simple public divestiture because the infrastructure remains a public asset. Instead, it is less the infrastructure itself but bundled contracts that exist over the prime life cycle of the infrastructure’s use that become the asset. These contracts are publicly guaranteed and generally insured against the shifting risk of political regimes over the course of the agreement (Verougstraete, 2017). The debt that can be leveraged against these long-term contracts are how SPVs finance 75-90 percent of a project (Yescombe, 2002). The remaining, smaller portion of project finance comes from equity investment, and this allows equity investors to borrow more against a project budget by keeping large upfront investments off their balance sheets. Theoretically, this results in more competitive bids and value for money (VfM) for the public sector (Yescombe, 2013). However, the perceived cost saving of value for money has been criticized for locking governments into long-term, rigid contracts where use fees, facilities expansions, or further development of services cannot be utilized to generate more revenues within existing contracted out PPP projects (Siemiatycki & Farooqi, 2012). The initial VfM, therefore, may be overstated in the long run. So, while investors are able to remain flexible in the ways in which they manipulate the ratio of debt versus equity within the bundled contracts of a PPP, the public sector is granted less tractability. For example,
Siemiatycki (2009) explains how “longterm contractual arrangement between DBFO partners limits the flexibility of future decision makers to respond to changing conditions and make plans that best meet evolving public interests” (p. 47).

Therefore, while the infrastructure remains a public asset, public budgets earmarked toward infrastructural contracts with private entities are effectively backing the financial leverage of private infrastructure companies. In short, the private encroachment upon trade infrastructure through PPPs initiates complicated relations of contractualism between public and private partners, whereby constituent parts of the project are either consciously—or unconsciously—vying for control of the leveraging of infrastructural assets. These assets are highly valuable to both public and private entities and the contracts outlined within the partnership mediates those values. The contracts determine who absorbs the risks, who is guaranteed long-term revenue streams, how the asset contracted out can be further leveraged in financial spheres—ultimately, who wins and who losses.

The shift of infrastructure and infrastructure services provision from the public arena to private investment has mapped onto the general transformation of the public sector under neoliberalism (Graham & Marvin, 2001). While this shift has been occurring in local, state, and national infrastructure networks, recent bundling of infrastructure contracts from ongoing, useful and necessary provision of public services into traded assets in global financial markets has tapped into a growing form of investment from a stable financier class into an emerging speculative market (Torrance, 2007). Interestingly, the trend of private finance interests in infrastructure assets developed over the crisis of the global financial breakdown of 2007–2008, and has since reached maturity as a speculative market for low-risk, long-term reward investments (O’Neill, 2015). That is, private investors are drawn to infrastructure contracts as
assets because the low-risk follows traditional bond market returns on investment, ensuring investors that their investments in public services are safe given that public entities—be they municipalities, state or provincial agencies, or federal governments—would rarely cancel service provision through major infrastructure networks (Torrance, 2008). The combination of geographically stable infrastructure assets with a mobile and evolving political-economic and regulatory apparatus have allowed global equity investors to no longer view infrastructure in the traditional bond market sense, but as an asset class that can be manipulated into a 21st century financial market (Knight & Sharma, 2016; Torrance, 2009).

The role of finance in infrastructure has arguably reached a condition of necessary analysis. Has it matured to a fully functioning and integral part of the economy? Does it obscure structural risks left unresolved following the 2008 financial crisis? Are there possibilities for multi-jurisdictional governments to leverage private investments into long-term partnerships in public service provision? If these investment partnerships continue in a mature financial state across the global economy, what becomes the nature of these relationships?

The following section will discuss these questions, and in doing so argue that trade infrastructure occupies a dialectical space between the financialized trading frequency of infrastructure assets and the contractual arrangements laid out in procurement documents. In this way, border communities may not automatically gain from the reduced trading costs of the enhanced trade corridors proposed by the World Bank. Further, I argue that planners, as professionals within a larger bureaucratic system of a multi-jurisdictional government, should be wary of the promises of infrastructural financiers. The financial forces behind infrastructure development at the border likely do not center the economic interests of border communities;
therefore, the economic dispossession of these communities lurks behind every contract of trade infrastructure.

**Conclusions and Recommendations for More Just Planning Practices at the Border**

The liberal/neoliberal approach the World Bank takes to the infrastructural development of trade corridors limits its scope of analysis to the reduction of trade costs as a mechanism for developing the economies of border regions. A Marxist critique of the economics of trade maximization rebukes the assumption of social value arising out of the exchange of capitalist trade relations. Meanwhile, infrastructural fixes continue their uneven geographic shaping of the built environment. So, does that leave planners, as agents within the public bureaucracy, any hope for generating real value for border economies? Since the use of infrastructure-enhanced trade as a means towards economic growth cannot alleviate capitalism’s tendency towards crisis, perhaps planners can look towards value that can be extracted from the planning and development process of trade infrastructure, as opposed to cooperating with the private sector under the portents of generating value for money through divestiture of public budgets in fixed, long-term contracts (Givoni & Perl, 2017). While certainly not a means of reconciling the internal contradictions of capitalist trade, advocating for favorable language in contracts between public agencies and private infrastructure firms could at least shift the nature of infrastructural negotiations.

In the planning and development of trade infrastructure the people, spaces, and places involved enter into a unique landscape together. That is, the function of speculative infrastructure development associated with economic opportunities, which is in turn flavored by the public-private nature of the project, creates a negotiated space of competition. The competition entails
securing the benefits and influence of favorable contractual language (Knight & Sharma, 2016). The argument here is that the speculative nature of trade infrastructure in a financialized landscape determines a hierarchical landscape where those with the most financial influence hold the most power. From such a position, those with the most financial influence construct a contractual arrangement where the economic benefit of the intended infrastructure is distributed largely toward the financial class operating the infrastructure, while other benefits of the infrastructure (e.g., environmental opportunities, community development, international relations, municipal relations, etc.) are relegated to the hustling of smaller contracts. Critically, these smaller contracts signify more of a tokenistic gesture associated with infrastructure planning than they do any fundamental shift in the social relations. The overall material development of the infrastructure secures the practice of maintaining existing social relations in the spaces, places, and people within the vicinity of trade infrastructure.

Value could be extracted from financiers of trade infrastructure at the procurement level of the planning process, and therefore planners and other multi-jurisdictional agencies might view the contractual apparatus as an opportunity to do just that. Real value can be gained through possible confrontational negotiation of infrastructural contracts. As Libby Porter (2011) warns, “planning scholarship has become far too wrapped up in consensus politics and has, for the most part, turned its attention away from the political, and from conflict” (p. 478). Planners might think of how trade infrastructure projects are both imbued with class-based political economic realities that favor a financial class most likely to benefit from enhanced trading corridors as well as largely unconcerned with the ways in which these so-called enhancements impact border communities. In short, in these negotiations planners might remain vigilant of the consensus
politics that pigeonhole the planning practice into a consulting firm for capital (Holgersen, 2020).

If planners hedge on their ability to influence such large-scale macro-economic forces, then perhaps they should consider that Adams and Tiesdell (2010) remind us that planners are already market actors that frame and reframe property markets. The authors contend that planners are interested in engaging as market actors because many are concerned with the economic development and economic growth of their communities. Planners already negotiate with private sector investors around infrastructure development, and the planning process itself is a contracted one between the public and private sector. It is simply a matter of for who, by/with who, and how large-scale trade infrastructure is planned (Holgersen, 2020). In terms of for who, trade infrastructure needs to service border communities and not just global capitalist trade structures and/or the infrastructural financial class. In terms of by/with who, border communities should have direct influence on how infrastructural contracts are negotiated with more than just bureaucratic nods to public participation. Finally, the how is a bit more complicated and perhaps a theoretical exploration in its own right, but by way of direction, it is useful to look to one of David Harvey’s explanation of Marx’s method of abstraction from material processes to social relations. In his Companion to Marx’s Capital (2010), Harvey discusses an important footnote in Marx’s discussion of large-scale industry—which could easily be replaced with large-scale infrastructure—and his desire to link six conceptual elements in his theoretical explanation: technology, relation to nature, processes of production, reproduction of daily life, social relations, and mental conceptions (Harvey, 2010, pp. 191–192). Harvey goes on to explain how urban planning must interrogate the internal relations of these conceptual elements. In other words, what does the technology utilized in an urban planning project reveal about society’s
relationship to nature? How might the processes of producing an infrastructural feature internalize particular social relations? What mental conceptions of global trade impact the reproduction of daily life? Like all things with Marx, these internal relations are dialectical and a constantly unfolding process under the umbrella of capitalist relations. They will likely remain abstract to the practicing urban planner. Still, from a theoretical perspective the internal relations of these conceptual elements, and the ways in which they reveal the current approaches to major infrastructure planning at the border, may help to demonstrate how planners might move towards a different way of developing trade infrastructure.

Perhaps the low-hanging fruit, however, is to make sure the for who planners are negotiating on behalf of market actors in a financialized infrastructure environment. O’Neill (2017) has argued that the infrastructure investment sector has reached a level of maturity within a financialized economy, which has “generated a new set of institutional players” (p. 179). These institutional players include privatized public utilities, global investment banks, pension fund managers, and multinational construction and development firms. It would be extremely difficult for anyone outside of high-stakes finance to significantly influence this complex cast of characters. However, influencing the procurement process may be a much more attainable approach for planners who want to advocate on behalf of border communities. Moreover, it may be possible for various community stakeholders to achieve levels of equity in trade infrastructure in order to access the financial assets that have only previously been available to private equity players. To Torrance “contracts sit at the heart of the private financing of infrastructures and are used as the formal mechanism to allocate risk between investment partners, define time horizons, define the rewards and penalties of performance and set partners’ performance standards in relation to accepted benchmarks” (Torrance, 2009, p. 816).
The challenge for disrupting the contractual apparatus of the planning and development process of trade infrastructure, however, is that private entities providing project finance for infrastructure secure more favorable terms in long-term contracts that local governments have struggled to renegotiate (Siemiatycki & Farooqi, 2012). The consequence is that, if trade infrastructure follows the general trends of infrastructural financialization, and the contracts developed for the procurement of infrastructural projects related to trade become much more entangled in the intimate relations between government and international finance, border communities will struggle to incorporate favorable language into infrastructural contracts. Ultimately, this leaves communities at a disadvantage in the planning and development process to create a landscape where community equity takes place in the distribution of value of trade infrastructure projects.

Moreover, the contracts formed in the procurement process tend to follow the long-term investment patterns of the bond market, usually lasting at least 20 or more years (Evans & Clark, 1998). This long-term contract arrangement means that the international financiers of infrastructure secure a general rate of return for a significant period of time, which only enhances the bundling of infrastructure contracts into a collection of speculative assets. Still, planners must see that contracts point to the fact that value is placed on infrastructural assets because of their location at the border, and that their value is negotiable in spite of the complexity of major infrastructural contracts. Understanding how property, planning, and the governance of urban spaces intersect to create a counter-bureaucracy to an infrastructural financial class in a negotiating context is helpful when unpacking the power relations behind complex contracts. Public property, governing bodies, and the infrastructure of communities play a critical role in capital investment. Specifically infrastructure, as part of an overall land-based
planning approach, “defines and structures the meaning and value of urban property” (Sorensen, 2018, p. 22). Furthermore, this infrastructure is “produced by a politically-mediated and contested set of funding, management and maintenance institutions that have specific geographies and relationships to property” (Sorensen, 2018, p. 23). The management of infrastructural decisions by planners on the ways in which the built environment is financed, delivered, and maintained are all choices that “reflect the power relations existing at the time they were established, [and] have profound distributional consequences in terms of quality of life, costs, and environmental impacts, and frequently have long legacies” (Sorenson, 2018, p. 29). While infrastructural financiers may have the upper hand in contract negotiations, planners have the agency to influence both the meaning and value of the urban property they plan, as well as the power relations and the distributional effects of major infrastructure folded into those planning regimes.

The lack of theoretical attention to the role of planning and development of trade infrastructure, particularly from a Marxist perspective, in urban and regional planning has unfortunately ceded ground to the liberal/neoliberal economic thinking of World Bank trade corridor development. It has engendered the assumption that infrastructural investments at the border are unproblematically beneficial to border communities. This paper has provided a theoretical investigation into the financial nature of contemporary infrastructural projects, and an examination of the complicated contractual apparatus that determines the distribution of value attained in the procurement process. In doing so, I have demonstrated the necessity for border communities to integrate favorable language in contracts which can secure some type of community ownership of infrastructure. How these community institutions transform into equity stakeholders, and which community institutions in border regions are well situated to do so, will
remain the necessary work of empirical investigations. What remains theoretically relevant to this critical review of the literature is that radical perspectives, such as those from Marxian economics, offer insight into how the internal contradictions of capitalism fix into the logics of enhanced capitalist trade, and how these logics inform infrastructure projects at the border. Given the increased role of private finance in infrastructure projects and the ways in which these financial institutions inform the legal frameworks of contractual relations, it is imperative that border communities seek out necessary planning practices to transform the social relations embedded in trade infrastructure planning and development.
Preface to Chapter 4

The previous chapter theorized how the planning and development of trade infrastructure through a contractual apparatus aids in the overall expansion of the social relations of capitalism. Critical to understanding this process is to look at the ways in which finance and planners (as a body of technocratic professionals) participate within the contractual apparatus. The next chapter will look empirically at this relationship between finance and technocrats within a historic example of trade infrastructure development. Therefore, this chapter addresses the following objectives as part of my overall research aim for this dissertation (see introduction): Document historic and contemporary case studies involving the planning and development of trade infrastructure; and analyze the historic and contemporary case studies with attention to the particular ways in which the social relations of capitalism are expressed in the planning and development of trade infrastructure.

To address these objectives, I consider how financial and planning interests informed a historic case of trade infrastructure planning and development at the U.S.-Canadian border. I provide both a historic overview of the Detroit River Tunnel Company’s project as well as interpret that history under the theoretical argument of the finance-dominated contractual apparatus. I argue that the planning profession developed as a playground for technocrats by providing historical evidence of the roots of the Canadian planning profession. By doing so I provide a case study that argues that when the planning field is ceded to technocrats, the historical tendency has been that technocrats compete with each other within the contractual apparatus that ultimately serves the financial interests of the infrastructural investors. The target publication for chapter 4 is Planning Perspectives.
Chapter 4

Defrauding One Another: A Partial Economic History of Crossing the Detroit River

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Abstract: Between 1870 and 1911, two different infrastructural schemes with the same corporate name – “Detroit River Tunnel Company” attempted a tunneling under the Detroit River between the cities of Detroit, Michigan (USA) and Windsor, Ontario (Canada). The first attempt failed, while the second was a success lauded for its technological accomplishment and financial return. The period between the two tunneling attempts fits roughly into the span of the Second Industrial Revolution (1870-1914) and, in fact, the schemes themselves capture the spirit of this time: feats of industrial innovation, capital-intensive production, and monopolists in pursuit of colossal wealth that defined their robber baron epithet. This paper explores the ways in which historic infrastructure mobilizes financial interests and technical expertise in a contractual apparatus that engenders both competition and collusion between an investment class and a technical regime of engineers, architects, and land surveyors. I argue that the funneling of value from a financial to a technocratic class in this contractual apparatus shaped investment in the built environment at the U.S.–Canadian border and sheds light on the emergence of a Canadian planning profession.
In the final notebook of his manuscripts laying out the foundations of his critique on political economy, Karl Marx briefly touches on the nature of nation-to-nation trade in capitalism. Marx describes international trade as “exchange on an ever-expanding scale,” in which both parties may gain in profit yet one is always “defrauded” (Marx, 1939/1993c, p. 872). This process of defrauding one another in international trade results from profit not always equating to value in an exchange relationship. Just as an individual capitalist can appropriate the surplus labor power of the individual worker in order to realize surplus value, so too can a nation appropriate the collective surplus labor of another nation in order to realize surplus value on an expanded scale. Therefore, international trade expands the social relations of capitalism from a relationship between individuals to a relationship between nation states. In the case of the infrastructure systems supporting international trade, the social relations of capitalism are present both within the individual relationships of those involved in the infrastructure, as well as the nations that are linked by the infrastructural corridor.

This paper is based on the historic case study of one such infrastructural system—the Detroit River Tunnel Company (DRTC) and the infrastructural project of crossing the Detroit River. It explores the role of trade in Canada’s economic strategy and considers the historic linkages between industry, finance, and municipal and provincial planning. The period between 1870 and 1911 witnessed not only the completion of the first subaqueous tunnel of its kind below the Detroit River, but also the implementation of the protective tariff—the National Policy of 1879 that presaged Canada’s economic dependence on the United States. Furthermore, the experimentation by an early planning profession emerged during this period, which later formalized into the Town Planning Institute of Canada, in 1919. I parallel these three historic narratives—the tunneling of the Detroit River, growing Canadian economic dependence on the
United States, and the maturation of a professional Canadian planning sector—in order to explore the formation of what I call a “contractual apparatus” in the built environment between an infrastructural investment class and technocratic regime of engineers, architects, and land surveyors. To accomplish this goal, I will provide a detailed historical narrative of the DRTC project with an analytical backdrop of the development of an American-dependent Canadian economy as well as the maturation of a technocratic-dominated planning profession. Through this historical investigation of what I define as “trade infrastructure” at the Detroit River, I show that industrial financiers utilized infrastructure at the border to create a contractual apparatus favorable to monopoly capital, and that this dominated the financial landscape throughout the 20th century—a period of intense industrial speculation and corporate consolidation that marked the rise of industrial robber barons. This contractual apparatus highlights both the struggle and collusion between financiers and technocrats, as well as the intra-technocratic competition within a nascent planning profession, over the control of infrastructure. The nature of such a method of contracting out infrastructure development aided in the surrender of Canada’s financial interests to American capital and ceded the overall planning of communities to an emergent American technical and professional elite.

Canadian political economists and economic historians have long explored the economic strategy that emerged from Canada’s 1879 National Policy that aimed to develop a national economy independent of the United Kingdom (Easterbrook & Watkins, 1967; Forster, 1986; Innis, 2017a; Innis, 1930/2017b; Neill, 1991; Watkins, 2002). One popular interpretation of this process was that the high protective tariff implemented as part of the National Policy had the effect of prioritizing the export of Canadian staples to the American economy instead of developing a home-grown financial sector within the Canadian economy (Watkins, 1963). The
result, as articulated by Harold Innis’ staple thesis and the dependency school of Canadian economic thought that emerged from it (see Levitt, 2002; Watkins, 1963), was increasing American direct investment, the surrendering of the Canadian economy to American capital, and the limitation of economic activity to the exporting of raw materials (Innis, 2017a; Innis, 1930/2017b). Canadian economic historians have outlined this process from policy, legislative, and regulatory perspectives. Instead, what I offer here is insight into the ways in which the proto-planning sectors of engineering, land surveying, and architecture aided in this surrender of the Canadian economy by ceding infrastructural development to an American financial class and forming contractual relationships with American capital that prioritized a market agenda above a community-centered approach to planning.

In order to present my argument, I first provide an economic context for the crossing of the Detroit River through a review of Canadian trade policy following the implementation of a protective tariff in 1879, along with the parallel history of the development of a Canadian professional planning sector. I then describe the 40-year infrastructural history of the DRTC’s efforts to cross the Detroit River, beginning with an initial attempt in 1870 and leading to a second successful attempt in 1911. This 40-year span is an important period of analysis for a couple of reasons. Firstly, it highlights how industrial financiers leveraged contracts and corporate takeovers in order to situate infrastructure investment as a form of financial speculation built around the promises of trade and controlling borders; secondly, it illustrates the resulting contractual arrangements that emerge from tariffs, tolls, and use fees for border infrastructure. Given the infrastructural and financial complexities in this time frame, I contend that the analysis of the DRTC requires more than a detailed account of the crossing, and must extend beyond previous accounts of the DRTC project that approach the tunnel as an issue of
technical engineering. What such historical interpretations obscure, I argue, are the developments of American monopoly capital entrenched in railway systems and the complicated contractual and legal apparatus that lay familiar bedrock to the engineering application of infrastructure systems. In presenting this case study, I provide a historical narrative centered on the framework of a contractual apparatus in infrastructure planning and development to show how this contractual apparatus prioritizes economic relations where a financial class controls the distribution of infrastructural value.

The Role of Infrastructure in Canada’s Economic Dependency

Shortly after Canadian Confederation in 1867, Prime Minister John A. Macdonald laid out an economic strategy for the newly independent country. This strategy largely pitted a trade-protectionist inclined Conservative party against the free-trade minded Liberals wishing to extend pre-confederation reciprocity with the United States (Forster, 1986). The protectionists won out and, after 12 years of internal political squabbling within Macdonald’s Tories and a Liberal interregnum under Alexander Mackenzie, Macdonald’s Conservative majority was able to implement their National Policy in 1879. The National Policy featured a high tariff that Conservatives believed would protect Canadian home products, grow the population, and develop a national economy that saw Canada as part of a hinterland that provided scarce goods to the home country of Great Britain (Levitt, 2002). However, the paradox of the National Policy was that it began a chain of inward foreign direct investment by American branch plants seeking to circumvent the protective tariff (Watkins, 2014).

In the decades leading up to the implementation of the National Policy, Canadian nationalists experimented with different approaches to extricating the economies of the united
provinces of Canada from the imperial yoke of British mercantilism. One such strategy was a gamble on infrastructural investment, namely in the form of canals and railway networks in order to achieve an “expansion of a commercial economy, whose potentialities were conceived as lying not so much in production as in trade” (Levitt, 2002, p. 48). In this way, the nearly 60-year development of a Canadian national economy from the founding of the Province of Canada as a British colony in 1841, through Canadian Confederation in 1867, and culminating in the National Policy of 1879 was arguably a process of infrastructural investments aimed at building the capacities of trade. Harold Innis (1995) explained the ways in which a robust transport network became inseparable from the development of a Canadian trade-based staples economy. The Canadian government put significant funds into developing national transportation networks and so, Innis explained, “fiscal policy was therefore directly linked to problems of transportation” (1995, p. 132). For example, Innis outlined the fiscal policy of the Minister of Finance, Alexander Galt, as influential in developing trade and the traffic of goods over expanding transportation infrastructure for the newly confederated Canada in 1867. The essence of Galt’s policy was that industrial unification of major infrastructure networks required the political unification of confederation. The financial mechanisms of infrastructural investment, therefore, played a significant role in building the Canadian state, and resulted in the formation of an influential international trade relationship. One such consequence of the expansion of transport infrastructure and the re-orientation of trade policy away from Britain and towards the United States was the rising importance of railroads over the St. Lawrence seaway as an infrastructure crucial to trade (Innis, 1995).

This trade-centered economic strategy based on the creation of railway networks required intensified infrastructural investment, speculation, and expansion. Just as the National Policy
resulted in foreign direct investment in manufacturing, foreign direct investment in railway infrastructure also became an unintended consequence of the National Policy (Baskerville, 1981). While Macdonald’s National Policy hoped to generate the infrastructural networks to support infant national economies associated with manufacturing, Canadian investors saw opportunities in connecting the emerging infrastructure networks to their American contemporaries. Prior to the National Policy, railway infrastructure was largely achieved through British portfolio investment. After the National Policy and the shift to greater north-south trade with the United States, railway infrastructure became increasingly financed through American branch firms operating as subsidiaries of larger rail corporations. The extent to which this orientation towards U.S. investment occurred led one Canadian railway magnate to lament to his fellow shareholders of the Great Western Railway that “ours is not simply a Canadian road” (Baskerville, 1981, p. 333). The Detroit River tunnel was conceptualized in this historic economic context. In short, while Macdonald’s 1879 trade policy prioritized trade in goods over infrastructure networks within Canada, the political and economic consequences of the protective tariff shifted the importance to infrastructure networks that crossed the U.S.-Canada border (Levitt, 2002). Keeping rail traffic in Canada was no longer as important as moving rail traffic through Canada.

**Importing Technical Expertise in the Emergent Canadian Planning Profession**

If the years of the National Policy shaped the condition of a young Canadian national economy, then so too did they shape the emergent profession and practice of Canadian planning. Indeed, just as foreign direct investment penetrated Canadian railway infrastructure, American contractors and engineers were also central to Canada’s railroad networks (Baskerville, 1981).
And while the emergent Canadian national economy was becoming increasingly dependent on American capital, in the decades prior to the formation of the Town Planning Institute of Canada (TPIC), Canadian infrastructural planning was dependent on American technocrats and contractors. Furthermore, these technocrats were not just engineers, architects, builders, and contractors; they also were investors because many Canadian rail companies also paid their contractors in shares and bonds—“thus, to the role of builder, the contractor added short term investor” (Baskerville, 2006, p. 49). American planning practices and theories were also imported in roughly the same period of American direct investment in Canadian infrastructure in the latter part of the 19th century. Even in the years preceding the 1893 Chicago World’s Fair that popularized the “City Beautiful” movement, elements of U.S. planning practice, such as the beautification of dense urban environments and the construction of neoclassical architectural to instill civic virtue were being imported to Canada (Gordon, 2008; Van Nus, 1975; Wolfe et al., 2019).

Combined with this American planning influence was the more Eurocentric pragmatism and realism of British land surveyor and prominent founding figure of Canadian planning, Thomas Adams (Simpson, 1982). Adams is notable for conditioning the field of Canadian planning into a professionalized realm dominated by the technical professions of surveying, engineering, and architecture. In 1919, Adams founded the TPIC, a group of 18 Canadian surveyors, engineers, and architects (Bassnett, 2008). The founding of the TPIC was both a response to the lack of employment opportunities for Canadians in these professions as well as an attempt to mitigate the encroachment of their American counterparts in the planning and development of Canadian infrastructure projects (Van Nus, 1975). An architect and early
member of the TPIC argued the need for an “architectural phase of the National Policy” (Aylesworth, 1888, p. 7).

The influence of Adams and his contemporaries in the lead up to the formal development of a Canadian planning profession is notable for the shift away from the aesthetics of the City Beautiful and Garden City movements to the cold pragmatism of the scientific management of the built environment and urban space (Van Nus, 1975). Indeed, this approach lacked any conscious connections to the politics of community planning and the consequences of prioritizing particular social, economic, and political relations in the processes of planning and developing the built environment. Borrowing from the scientific management principles of productivity and efficiency notable in late 19th century Taylorism, early Canadian planning professionals focused on responding to the challenges of urban growth and development by surveying the problem, analyzing the data, and formulating a solution (Gunton, 1984, p. 400). Notably absent from this approach was any awareness amongst the planning profession of the possible competing interests of the different political forces involved in the planning process. This resulted in a nascent planning profession that was heavily influenced by the financial interests of major infrastructure projects and the overall efficiencies—assumed natural—of a capitalist economic system (Lang, 2001).

The lack of political emphasis and overall responsibility to a broad coalition of community interests in the early Canadian planning profession ceded ground to the already existing and formalized technocratic professions of architecture, land surveying, and engineering. Moreover, these technocrats were then in a position to both compete and collude with the influential infrastructural financial class that blurred the line between railway interests, natural resource extraction, the banking sector, and state authorities. I argue that these elite
financial and state actors competed with technocrats in the sense that technocrats struggled to practice technical authority over the dominance of financial influence. These technocrats also colluded with financial powers in that they maneuvered to secure the lucrative bids put out by infrastructural investment and planning and development in the built environment for the purposes of the financial class. This latter collusion led to intra-technocrat competition that situated the primacy of infrastructural decision making squarely at the feet of the financial class. I further argue that the lack of a professional field to advocate on behalf of communities in this point in history yielded the field of infrastructural planning to the squabbling and colluding of financial and technical elites within a contractual apparatus that failed to respond to and service the infrastructural needs of communities.

**The Social Relations of the Detroit River Tunnel Company**

This study was initially guided by the following questions: How are the social relations of capitalism expressed in infrastructure in border regions that support international trade? In what ways have these social relations shaped the planning and development of the historic case of the Detroit River Tunnel Company? The framework used to address these questions is the theoretical understanding that the social relations of infrastructural planning and development reflect the social relations of capitalism. In this framework, I define trade infrastructure in Marxian economic language that applies a social usefulness (i.e., use-value) to the international movement of goods and services via infrastructural networks in border regions. To be a use-value, trade infrastructure must be consumable; that is, it must be *used* (Marx, 1867/1992a). Trade infrastructure’s use-value is therefore connected to an infrastructure’s purpose and geographic location. That is, it is intended to be used for trade in an international border region.
The usefulness of trade infrastructure, however, is also a bearer of exchange-value in the capitalist mode of production. I organize the various exchange-values of trade infrastructure into what I call a “contractual apparatus” of competing and colluding financial and technical elites for dominance over the social usefulness of trade infrastructure.

I will now use this framework to map the development of the DRTC project between 1870 and 1911 onto the aforementioned historical phenomenon of American financial and technical encroachment into the Canadian economy and early planning profession as an unintended consequence of the National Policy of 1879. The specific material consulted on the DRTC to achieve this aim was gathered from national (Library Archives Canada), regional (University of Windsor Archives), and digital (HathiTrust Digital Library; The Internet Archive) archives. Historic research journals in engineering and urban planning also provided first-hand accounts of the technical elements of the planning and development of the Detroit River tunnels. Through analysis of this material through my stated framework, I refined my guiding questions into more specific research questions: 1) How did financial mechanisms materialize in the DRTC infrastructure project?; and 2) What did this materialization of financial relations look like within the contracting out of technical services in the construction of the DRTC tunnel?

**A Brief History of Tunneling the Detroit River: 1867-1911**

American railroad industrialist and president of Michigan Central Railway James F. Joy initially approached a small group of Canadian businessmen with ties to the Great Western Railway Company in 1867 to begin taking steps on a joint effort to tunnel the Detroit River. By that time, the Michigan Central Railway had completed lines between Chicago and Detroit on the American side, and Great Western had done the same on the Canadian side between Windsor
and Niagara (see Figure 1). In lieu of any permanent crossing, the substantial rail traffic moving between Chicago and New York through Great Western’s roads in Ontario, by way of crossing the Detroit River, was achieved through rail ferries that, not surprisingly, became substantially limited in the winter months due to the river freezing over. While a bridge was initially considered, the scheme settled on a tunnel after the Canadian government refused to charter a bridge project, likely due to the influence of Great Lakes carrier interests (“To Tunnel Detroit River,” 1890). A Canadian Statute assented to on May 12th 1870 incorporated the DRTC and granted a charter to said company to construct a tunnel under the Detroit River (Act to Incorporate DRTC, 1870). The statute also outlined the provisional shareholders, powers of the incorporated DRTC, and the charter said company brought into its possession, as well as outlined intended processes for amalgamation and agreement to contract with another company. The company was capitalized for CAD $3 million,¹ with 30,000 shares of CAD $100 each issued. CAD $1 million of that was held in subscriptions of 1,000 shares at CAD $100/share. Initially the majority of the stock was held jointly by Canadian businessmen and political figures William McMaster and John Carling; however, stock books at the time reveal that a majority of those shares were sold off to London investors Thomas Dakin (Lord Mayor of London and president of Great Western Railway) and Gilson Homan (Detroit River Tunnel Company—Minutes, 1871–1872). The statute required that CAD $100,000 be spent within a year, and it is evident that CAD $100,000 was sent to Great Western Railway to make the investment as a joint effort of Great Western and Michigan Central. The initial shareholders meeting was held in Hamilton, Ontario to set roles and discuss moving forward with the project. From the initial budget, funds were allocated to a consultancy based in Chicago and headed by E.S. Chesbrough, an engineer

¹ All monetary figures are in American Dollars (USD) unless otherwise noted.
familiar in tunnel construction involving drainage. It was decided that a dual tunnel system would be utilized with a third and smaller tunnel designated for drainage. Work commenced on the drainage tunnel in 1872.

![Figure 2 Map of Upper Canadian & American railways circa 1860 showing an extensive network running east and west across southern Ontario between New York and Chicago. The termini at Windsor and Detroit on either side of the Detroit River are connected by rail ferry at this time (Reproduced from Baskerville, 1981)](image)

Shortly after work began, the project stalled after an accident lead to the deaths of two workers, Frank Astenberg and Duncan McPherson (“Tunnel Under River Was Started Over 52 Years Ago,” 1925). The drainage of the tunnel released gas in which the two workers asphyxiated. Due to the hazards apparent after these deaths, work ceased for a time. The DRTC then petitioned parliament for extensions of the timeframe in 1872. In that time, the intention was to still move forward with a tunnel, working through the initial challenges met since work commenced (Detroit River Tunnel Company—Minutes, 1871–1872). However, no further work
ever seemed to have been done on the project, and a tunnel/bridge project was put on hold as car ferries remained the only rail crossing available on the river.

By 1873, Great Western Railway was already making capital investments into the possibility of constructing a bridge over the Detroit River by investing a minimal sum (£924 over consecutive years) into a bridge survey, perhaps as a result of a June 1873 letter from James F. Joy president of Michigan Central complaining of lost revenue due to poor ferriage across the Detroit River to the Windsor side (Great Western Railway Company, 1874). Great Western therefore made capital investments into five more ferry steamers to alleviate traffic. Through all of this, the DRTC remained incorporated and sought a further extension of their charter in 1879 (An Act to Amend an Act to Incorporate the Detroit River Tunnel Company, SC 1879 c. 62.). The Department of Public Works consulted the Ministry of Justice regarding whether or not the DRTC voided their charter by delays. Letters between the Justice and Public Works Ministries dated 4-12th April 1879 indicate that the legal perspective was that the DRTC had not voided their charter and an amendment to the act of incorporation of 1870 was assented to on May 15th 1879. This allowed the DRTC four more years to complete a project that had not been worked on since 1872 (DRTC Charter, 1878). Meanwhile, on the other side of Great Western’s main line ending at the International Bridge, negotiations where underway for a joint ownership of the bridge with competitor Grand Trunk Railways (Correspondence, 1876). The negotiations fell through; however, this incident was one in a series that led to the ultimate dissolution of Great Western and its amalgamation with Grand Trunk. The amalgamation would ultimately end Great Western’s involvement in a Detroit River crossing scheme (Wilgus, 1937).

E.S. Chesbrough, the chief engineer of the tunnel project, provides a detailed account of the technical elements of this unsuccessful attempt (Chesbrough, 1874). First, the engineer
corroborates that time and cost were huge issues facing construction of the tunnel. The backers of the tunnel were frustrated and not willing to continue and the contractors requested to be released from their contract due to the ongoing issues of flooding from sand and water veins during the construction of the drainage tunnel. Second, while the loss of the lives of Frank Astenberg and Duncan McPherson was a surprise to all, a critical reading of Chesbrough’s account suggests that the pressure to avoid delays to the project created a situation where dangers were overlooked. Finally, the engineering problems related to the tunnel could have been avoided by simply choosing to build a bridge instead. Chesbrough admitted that a bridge may have been a sensible option considering both the International and Suspension Bridges had already been constructed on the eastern end of the Ontario lines. The Canadian government refused to allow a charter for a bridge, however, due to protests from lake carrier interests.

The two decades following Chesbrough’s failed attempt saw rival schemes competing for the opportunity to construct a tunnel or bridge to cross the Detroit River. The focus shifted primarily to a bridge crossing; however, the interests of the Lake Carriers’ Association successfully petitioned the American government to block any bridge construction that required piers (Lake Carriers’ Association, 1896). Still, interested parties attempting a crossing tried to keep a bridge a possibility (An Act Incorporating the Canada and Michigan Tunnel Company, SC 1895 c. 71.). Ultimately, two companies under the control of Michigan Central Rail Company—the Canada-Michigan Bridge and Tunnel Company, and the Michigan-Canada Bridge and Tunnel Company—merged, incorporating and receiving charters in Michigan and Canada to construct a bridge or tunnel under the company name the Detroit River Tunnel Company, the second such iteration of the name (Detroit River Tunnel Co., 1907). After receiving further capitalization of CAD $3 million, however, the DRTC completely changed its
directorate. Many of the backers of the company shifted from the sphere of the Great Western Railway towards the U.S.-based financiers of Michigan Central under the leadership of Detroit railway magnate H.B. Ledyard. Michigan Central was itself a central piece in the Vanderbilt Railway empire and subsidiary of New York Central Railways (Chandler Jr., 1993). Importantly, this transition in the two iterations of the DRTC saw a seismic shift from British-backed Canadian financiers to almost exclusively American shareholders.

Work on the project commenced in August of 1906, utilizing recently developed railcar electrification technology learned from the construction of the Harlem Tunnel in New York (Wilgus, 1911). Ledyard consulted an engineer who served as vice president of the Harlem Tunnel Company, William J. Wilgus, for the construction of the new tunnel. Wilgus developed the plan and was also the chair of the advisory board of engineers. The winning bidder of the contract was Butler Brothers Construction Company, featuring Olaf Hoff as engineer. While the original plan to construct the tunnel sought to dig below the riverbed, Hoff’s method was to dredge the river and lower a tunnel constructed of concrete into the channel. Constructing a tunnel by this way of submerging subaqueous tunnel structures would be the first of its kind.

Wilgus’ own account of the construction suggests the approach was novel, cheap, and likely to encounter few challenges or delays. From an engineering perspective, the story of the tunnel’s construction follows that of technical triumphalism whereby brilliant and bold engineers overcome technical difficulties with aplomb. Many of Wilgus’ allies in the engineering community praised his accomplishments in various proceedings at the time (Boller et al., 1911). The first train went through the newly completed tunnel in July 1910 and the tunnel began full operation in 1911 (“Tunnel to Canada Opened,” 1910). Securities backed by Michigan Central were issued in 1914 totaling roughly $16 million, which yielded profitable dividends to investors
for decades to come ("Financial Notes," 1911; United States Congress Senate Committee on Interstate and Foreign Commerce, 1940/1987). The tunnel remains in operation to this day.

Effectively, the interregnum between the two companies featured an interesting expression of proto-financialization of infrastructure where railway speculation also became tied to trends in consolidation and monopolization of existing infrastructure (Ripley, 1911). While new infrastructure developments declined in the final decade of the 19th century, that does not mean that economic activity tied to railways halted. Despite the lack of new material infrastructure, purchasing of rival assets and consolidation of railway infrastructure by the more dominant railway magnates increased between 1890 and 1910 (Hoffmann, 1956). In fact, two-thirds of all rail mileage was consolidated under seven major rail networks leading to “widespread public anxiety [of] financiers’ tightening grip on the transport system” (Fletcher, 2003, p. 48). Following consolidation, there was a boom in further speculation in material infrastructure. Indeed, as one railway economist said in 1911, “at no time in our history have stock-exchange operations in railroad shares been carried on both absolutely and relatively upon any such scale of magnitude as during the decade to 1910” (Ripley, 1911, pp. 185–186).

The contractual apparatus between railroad financiers and technocrats at this time was also implicated in this shift toward consolidation, as railway magnates could control or outright suppress the application of new technological advancements such as the electrification of railcars (Mandel, 1969, pp. 429–430). The consolidation of railway assets—and the power that monopoly forces were able to wield over the technical application of infrastructural techniques, such as electrification—reveal how a contractual apparatus that favors a financial class has direct implications on the planning and development of infrastructure. The following analysis will
consider the ways in which the DRTC’s specific expression of finance over technical application is an example of such a contractual apparatus.

**Infrastructural Finance and the Economic Relations of the Built Environment**

While the above narrative provides insight into the technical achievements of the DRTC’s project, I now turn to a subverted history of the financial entanglements of the tunneling of the Detroit River. I will do this by exploring how financial expansion in the built environment of the railway industry was contracted out to a technical class of engineers. The dominant historic narrative of the tunnel often begins with an initial failed attempt backed by Great Western Railway (Chesbrough, 1874; Godfrey, 1910; Wilgus, 1911; Wilgus, 1937). The story then moves in linear fashion through the first attempt’s technical struggles and the tragic loss of Astenberg and McPherson. What then followed was a period of stasis until the discovery of electrification, and new technologies for tunneling rivers led to a successful second attempt by a Michigan Central-led team.

While this history is relatively straightforward, a narrative that includes the financial entanglements of the various backers of the two infrastructure projects is much more nuanced (see Appendix A for timeline of railway consolidations in the U.S. and Canada). The 15-year period (1873-1888) between the two DRTC tunnel schemes indicates a key shift in both the financial and technical landscape associated with infrastructure projects. At this time there was a massive change in the organization of railway companies due to the Long Depression of 1873-1896, as well as a shift in economic policy in Canada towards a trade relationship with the United States instead of the United Kingdom. As such, I will first examine the shifting financial landscape during the interregnum that began in 1879 and ended with the incorporation of the
second DRTC in 1905. This is key, because it marks the shift away from the Canadian/British capital of Great Western Railways to the American capital of the Vanderbilts. It also marks the arrival of H.B. Ledyard, president of Michigan Central Railway, as the key financial figure in the tunnel’s completion. As I will argue, with the consolidation of American capital in the infrastructural development of North American railway networks, the DRTC project became a financial and material mechanism for railway magnates to leverage a border region in order to build a growing railway monopoly.

Finance, Railways and the Panic of 1873

The market crash of 1873, known as the Panic of 1873, incited a long depression of economic contraction. One consequence of the Panic that is relevant to the case study of the DRTC is that the subsequent pull-back of infrastructural railway investment dampened the British Empire’s material expansion, resulting in a dependency on financial pathways in order to maintain an imperial foothold on the world economy (Arrighi, 2010). Meanwhile, on the other side of the Atlantic, the preceding decades to the Panic saw intensified speculation in American railway infrastructure due in part to the frenzied culture of western expansion and its associated possibility of wealth accumulation (Davies, 2018). The premature infrastructural expansion into the American West put financial institutions in a vulnerable position for a liquidity crisis, and indeed, as the New York Stock Exchange crashed on Black Friday 1873, eastern banks found

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2 The recession following the market crash of 1873 has indeed been called The Long Depression by historians, and the first truly international financial crisis of its kind (Roberts, 2016). In all actuality it was a series of two recessions. The first began after the speculative bubble burst on railroad expansion with the failure of the investment bank and heavy railroad speculator Jay Cooke and Company (Barreyre, 2011). The ensuing depression ended in a partial recovery of 1879. The second was a similar crash in 1893 after the brief period of economic expansion and solidified the overall trend of corporate profit loss over the last two decades of the 19th century (Carchedi & Roberts, 2013)
themselves overextended (Wicker, 2000). The collective banking debt was in large part due to a single industry: railways (White, 2003). For example, after the American Civil War, the railroad industry became the vehicle for U.S. treasury bonds with a bonded debt that “rose from $416 million in 1867 to $2.230 billion in 1874 and $5.055 billion in 1890” (White, 2003, p. 22).

So, while both the American and the British economies were shackled by the crisis, the trajectories of the subsequent decades greatly contrasted. While the British Empire declined into a diffused financial empire, an ascendant American economy became more central to the absorption of global surplus capital and began a series of material investments during the recovery (Arrighi, 2010). The changing political economy immediately post-crisis, however, was shown to favor industry regulation over government intervention—especially in the railway industry (Kolko, 1965/2015). The internecine competition that emerged from the speculative investment prior to the Panic of 1873 had led to a glut of railway infrastructure in the United States and, therefore, a declining rate of profits due to freight rates. Cornelius Vanderbilt took the opportunity provided by the declining rate of profit following the Panic to begin consolidating minor roads into an eastern railway empire.

A stock book containing the minutes and correspondence of the board members of the first DRTC—as well as the distribution of company shares—demonstrates the financial machinations of the various railroad magnates involved in the tunneling of the Detroit River (Detroit River Tunnel Company—Minutes, 1871–1872). The stock book shows that the Great Western Railway Company issued shares held largely by English businessmen. The remainder of the shares were backed by Michigan Central and held under a subsidiary controlled by James F. Joy, called the Detroit River Railroad Tunnel Company. The companies amalgamated on October 25th, 1872. This amalgamation occurred after the deaths of Astenberg and McPherson,
the two workers asphyxiated in the first and failed attempt of building the tunnel, and the subsequent halting to construction.

However, while technical work on the tunnel had ceased, financial activity had nevertheless increased following the deaths of the workers. With the amalgamation moving forward, the financial momentum suggests that the tunnel was not abandoned after the incident. Indeed, archival documents suggest that the intention to move forward with the project may have been driven by Michigan Central’s interests. A committee of shareholders investigating the dwindling returns of Great Western Railway company during the years of the first tunnel construction indicates that Great Western ultimately viewed the drainage tunnel as an “experiment” and did not intend to invest any more capital into the project (Great Western Railway Company, 1874).

By 1873, Great Western had only spent CAD $10,876 of the CAD $100,000 budgeted to the project—money that originated from public funds that initially chartered the DRTC (An Act to incorporate the Detroit River Tunnel Company, SC 1870, c. 51). It is unclear what happened with the remaining funds, but it appears evident that while Michigan Central continued its efforts, Great Western abandoned financial investment of the tunnel while still making capital expenditures towards the possibility of bridging the river. At any rate, financial momentum moved away from Great Western and toward Michigan Central. In fact, Great Western’s financial struggles would ultimately lead to its amalgamation with Grand Trunk Railway in 1882 (Correspondence, 1876). Grand Trunk received heavy government subsidies over the next two decades, but a subsequent bankruptcy lead to its total nationalization in 1923—a process that would aggrieve H.B. Ledyard and many other railway magnates at the time, as will be further elaborated on below (Collum, 1888).
Post-Crisis Infrastructural Monopolies: 1883-1905

Following the economic crisis, American railways had far more capital to leverage while the British-backed Canadian railways struggled to remain solvent. Great Western unraveled financially, and Michigan Central began to explore purchasing competing rail lines in southern Ontario. The financial crises of 1873 left one such Canadian line, Canada Southern, insolvent and was effectively gifted to the Vanderbilt empire after they agreed to back the rail companies failed bonds (Collum, 1888). The Vanderbilts ultimately leased Canada Southern to Michigan Central under the direction of Michigan Central’s president H.B. Ledyard in 1883. At this time, Ledyard began aggressively pursuing a second tunnel project (McBean, 1912).

It is important to point out that, had the original 1872 tunnel scheme worked out, Great Western could have secured a major piece of the Canadian railway system to leverage in bond markets and maintain a monopoly on tolling of the only crossing of the Detroit River. Moreover, Great Western and its British backers already played an integral part connecting the New York Central and Central Michigan systems at the Niagara frontier between Ontario and New York (William John Wilgus, 1937). A completed tunnel at the Detroit River would have granted Great Western the only crossing at the western end of Ontario. This would have positioned Great Western as a major player in the North American Railway business through its control of a southern Ontario through-line between Windsor and Niagara, and the favorite road for American trade goods that accounted for up to 60 percent of all rail traffic in Ontario. Instead, the Vanderbilt empire, through its purchase of Michigan Central and Canada Southern, secured this traffic in trade goods over their roads while Great Western and Grand Trunk competed over local traffic.
Relegated to sharing the market for local traffic, Great Western and Grand Trunk were severely weakened until they were forced to merge in 1882 under Grand Trunk’s management. The new Grand Trunk suffered to near insolvency over the next two decades until it was nationalized and heavily subsidized by Wilfred Laurier’s liberal government in 1903 (Eagle, 2008). Canada Southern, a recipient of foreign direct investment by way of Michigan Central, was now the only road in Canada with the access to enough private capital to construct a crossing at Detroit. However Grand Trunk, as a nationalized system, could still leverage capital from the Canadian State in order to thwart the infrastructural machinations of H.B. Ledyard to build a Michigan Central-controlled tunnel. To avoid competition at the border, Ledyard would enlist the help of the U.S. Congress under the auspices of the Interstate Commerce Act of 1887.

Finance and the State: H.B. Ledyard’s Plea to Congress

While the Panic of 1873 resulted in corporate consolidation and monopoly formation in the private sector, the American State attempted anti-trust interventions in order to prevent future crises from forming—not the least of these interventions was the Interstate Commerce Act of 1887. The intent of this Act was to curb the self-regulatory culture of the railroad industry by restricting rate cutting and rate collusion for interstate and foreign trade (Hilton, 1966). Prior to the Act’s passage, a railway could cut their rates to as low as they needed to remain competitive, which brought revenues down and put the entire industry at risk of collectively overleveraging their debt. Alternatively, they could collude and set rates high in order to drive out competition and establish monopoly control. The Act did not go as far as to set rates, but it did create regulatory measures such as the requirement for rates to be publicized, that flattened competition, kept rates and revenues up, and avoided collusion (Purcell, 1967).
However, these measures did little to curb the financial power of the railroads. Moreover, the unintended consequences of the Act enshrined the private property of corporate railway magnates while legislatively translating the logics of the market onto the regulation of the railway industry (Sklar, 1988). For example, the Interstate Commerce Commission (ICC) overseeing the Act viewed the railway industry as generally benevolent. Thomas Cooley, the first chair of the ICC, believed that,

the true interests of the owners of railroad property may be made to harmonize perfectly with the true interests of the public, and that it will be as wise for the state to encourage and protect whatever in corporate arrangements is of beneficial tendency as it will be to suppress whatever is mischievous. (Cooley, 1884/2010, p. 214)

Ultimately, the Commission saw its role in the application of the Act as simply to guide the industry on the middle path between unwieldy industrial competition and monopoly control (Jones, 1966). Cooley perceived the railway industry’s pursuit of corporate profits as fundamentally harmonious with the public good, so long as it fit within a regulatory framework. Historian Gabriel Kolko interpreted this regulatory framework of the post-1873 railroad reforms as establishing a new relationship between business and the State whereby “if for some reason the power of various key business interests was endangered, even for causes of their own making, the state was to intervene to preserve their dominant position” (Kolko, 1965/2015, p. 12).

Indeed, in the context of the DRTC, H.B. Ledyard was able to use the levers of the state by way of the Interstate Commerce Act to further weaken Grand Trunk’s ability to compete as a through-line for trade goods passing through southern Ontario. In 1888, Ledyard testified before the Interstate Commerce Commission claiming that the national subsidies provided to Grand Trunk by the Canadian government breached the Interstate Commerce Act (Collum, 1888). To
Ledyard, the subsidies gave Grand Trunk an unfair advantage over his competing road, Canada Southern. This grievance was part of a U.S. Senate investigation into Canadian railway forces in America since the passage of the Interstate Commerce Act of 1887. The investigation and report were chaired and prepared by Senator Shelby Collum of Illinois, the champion of the Interstate Commerce Act. Following complaints to the commission regarding uncompetitive rates by Canadian lines, the ICC investigated the competing transportation interests of Canadian and American railroads, specifically focusing on the issue of government subsidies to Canadian railroads competing for traffic in the United States. Ledyard’s testimony provides some insight into the infrastructural relations between Canada and the U.S. at that time. Namely, his testimony speaks to his desire to control infrastructure in that region through his stake in Canada Southern and his grievances with Grand Trunk. Ledyard and Michigan Central’s stake in the new iteration of the DRTC and the Canadian Southern thoroughfare demonstrates the shift away from Canadian finance to American finance in infrastructural development.

It is possible to read all of this as Ledyard grandstanding in an ICC investigation in order to potentially disable his competitor in the run up to further expansion of Canadian operations as he moved to secure charters for the second tunnel. Regardless, while the extent to which the Interstate Commerce Act curbed railway monopolization is debatable, the tension between Michigan Central and Grand Trunk suggests that the Act did disrupt how railways managed their contracts and infrastructure investments (Acemoglu & Robinson, 2015; Prager, 1989). For example, the Act limited the extent to which tariffs and fees could be applied on through-traffic within the U.S. and between the U.S. and Canada. As early as 1896, Ledyard had intended to build a tunnel between Detroit and Windsor in order to further participate in the through-traffic market (Collum, 1888; Wilgus, 1911). He was preparing for the tunnel investment, especially
after Great Western and Grand Trunk merged, opening up an opportunity for Canada Southern to become the dominant competitor in the region. The amalgamation of Canada Southern with New York Central, which shared ownership with Michigan Central, achieved a link of corporate cooperation, which supported the infrastructure investment of a tunnel under the Detroit River. Removing Grand Trunk from the equation paved the way for Ledyard and Michigan Central to consolidate infrastructure under the banner of New York Central’s empire and the Vanderbilts’ financial clout.

This interpretation of events reveals a striking transition between the Canadian/British finance-dominated first tunnel, and the American finance-dominated second tunnel. It also points to the pattern of railway consolidation at the heart of American monopoly capital at the time, and the growing political unrest not fully alleviated by the Interstate Commerce Act of 1887. In a speech in the U.S. Senate, Senator Robert LaFollette of Wisconsin explained to his colleagues, when he shared his “list of men who control industrial, franchise, transportation, and financial business of the United States,” that

any man with intelligence who sees the same names repeated over and over again on the various directorates which, in a national sense, dominate the great industries of this country, will understand how the important business interests are in fact welded and fused together into one mass under one control. (as quoted in Socialist Party (U.S.), & Patterson, 1908, p. 55)

Two directors and two managers of the DRTC were on that list.

The Contractual Apparatus as Infrastructure in Practice

Extending from the financial forces controlling the direction of infrastructural investment was a contractual apparatus that determined who was given contracts in a given infrastructural project. I shall now examine how the contractual arrangement shifted away from the
Chesbrough-led consultancy in the first tunnel to the Wilgus-led consultancy of the second. A key figure in both tunnel attempts is the principled engineer Duncan D. McBean and his patent challenge in a Michigan federal court against the DRTC. The relationship of these three engineers, along with the broader engineering field that serves as a technical pool of talent at the disposal of financiers, speaks to the ways in which the technical elements of infrastructure planning and development are relegated to a speculative contracting out of services at the most competitive bid. This is done, I argue, in order to maintain access to the financial institutions that control the purse behind the infrastructure project itself.

The technical advancements of the transportation industry, namely electrification and the discontinuation of steam power, coincided with competing legal and judicial frameworks for securing contracts, patents, and charters for infrastructure projects (Lamoreaux et al., 2006). Just as American capital shaped the outcome of the Detroit River tunnel, American technical knowledge, professions, and the legal frameworks that supported them ultimately secured the lucrative contracts put out by the financiers of the project. Also, similar to the shifting financial landscape between the first and second tunneling attempts, the contractual landscape of the technocrats was also shifting between the two schemes.

This remaking of the contractual apparatus illuminates a few interesting aspects of infrastructure planning and development. First, while the contract is awarded based on a degree of technical expertise and experience, contracts are also a matter of speculative negotiations. Meaning, how much might an engineering or architectural firm be willing to risk in order to win the successful bid? How do firms leverage technical skills and turn the built environment into a speculative arena of lucrative contracts? Second, the contractual negotiations are also shaped in a political and legal apparatus and are therefore informed by the ways in which those spheres
influence the negotiations of contracts. In the case of the DRTC, there is a clear metamorphosis between the social inputs and social applications of infrastructure development into the private realm of individual corporate contractual relationships in which firms negotiate between the distribution of potential monetary exchanges through infrastructure assets. In a rough sense, the case of the DRTC was always a collection of competing and colluding interests such as the railways, lake carriers, technocrats, and different layers of government. Reconciling different interests with the willingness of financial backers to award a contract ultimately determined the contractual fallout within the political and legal realm. In the case of the DRTC, that political and legal fallout concerned an engineer from the first tunneling attempt: Mr. Duncan D. McBean.

**Duncan D. McBean (1842-1918): Courageous Foreman, Disgruntled Contractor**

Duncan D. McBean was the superintendent of works under E.S. Chesbrough for the first tunnel attempt in 1870. He played a significant role in the planning and construction of the failed tunnel. In fact, according to an account by the *Detroit Free Press*, McBean was on site at the time of the accident that killed Frank Astenberg and Duncan McPherson (“Another Tunnel Horror,” 1872). McBean himself was said to have entered the tunnel to try and revive the workers, but was overcome by the gas and nearly lost his life in the process—the paper hailed his heroism. McBean publicly objected to the abandonment of the project, and after the failure of the first tunnel, he vigorously filed patents related to different methods of constructing and digging subaqueous tunnels in the hopes of one day returning to the Detroit River for a second attempt. In 1903, McBean applied one of his patented techniques to a tunnel under the Harlem River, which involved constructing the tunnel in open air and lowering it into trenches dug into the riverbed. McBean states in an article rejected by the *Society of American Civil Engineers* that it
had always been his ambition since the Detroit Tunnel was abandoned in 1872 to return and attempt the work anew (McBean, 1912). As a result, he contacted Wilgus, then vice president of New York Central (owners of Michigan Central) and invited him to tour the completed Harlem River tunnel. Wilgus sent representatives, including Olaf Hoff, and later requested a meeting with McBean in-person. It is purportedly at this meeting (by McBean’s account at least) that Wilgus revealed his intention to circumvent McBean’s patents.

McBean’s account of the events is detailed, but must be read with some degree of skepticism because there are no further accounts to corroborate his perspective. It is also strange that much of the account is detailed in a series of letters to the Mayor of New York—W. J. Gaynor—from 1906-1912, petitioning the mayor to use the McBean tunneling method for multiple planned tunnels around the city (McBean, 1912). In these letters, McBean appears disgruntled and defensive whenever his method is not recognized or chosen in the bidding process. For example, he explained that an alternative method chosen for a new tunnel under the Harlem River at Lexington Avenue as “tantamount to a fraud on the City of New York” (McBean, 1912, p. 37), and that his protestations were “forced upon him by the injury and injustice done to his method” (McBean, 1912, p. 76). McBean himself admitted that he appeared as an aggrieved party, confessing in his letters that “the charge may be made that the writer is disgruntled because his method of subaqueous tunnel construction was not adopted” (McBean, 1912, p. 76). McBean also appears, however, as an earnest civil engineer committed to his profession and frustrated with the injustices at the intersection of finance, politics, engineering, and the tendering of infrastructural contracts.

Wilgus, for his part, provided a different account of the tender process. The decision was between four bids, and Wilgus’ preferred bid—put in by Olaf Hoff of Butler Brothers
contractors—won the tender. The cost at which the entire construction was built was $4,775,306, which does not consider the contractor’s profit. A final number offered towards the end of Wilgus’ account indicates that the total cost, including work and profits was $10,000,000-$15,000,000, which would tact well with the $15,000,000 offered in secured bonds by the company after the tunnel’s completion. These bonds, along with CAD $3 million in initial capital from the Canadian government and any capital expenditures from Michigan Central—not to mention ongoing use fees for rail travel over the Detroit River—significantly benefitted the contractor, backers, and shareholders. In fact, the DRTC itself secured profits and yielded favorable dividends for years to come (“Dividends Announced,” 1940).

**William J. Wilgus (1865–1949) and the Myth of the Winning Bid**

Given the eventual success of the tunnel, it may be difficult to square McBean’s appearance as both a critical civil engineer and disgruntled contractor. Relevant to the discussion of the DRTC project and the discussion of the speculative nature of contracting in its collusion with financialized infrastructure projects, however, is that McBean’s grievances echo the responses of other engineers, to Wilgus’ own writings on the success of the second tunnel project. That is, Wilgus’ account of the contract and the cost of the project, though praised by his supporters, was also met with suspicion and even disdain by others who questioned the rationality of the chosen method. Even if McBean’s account was rejected from the record of the Society, correspondences in publications such as the *Proceedings of the Institution of Civil Engineers*, reveal a number of participants questioning Wilgus on the method (Boller et al., 1911). Ultimately, Wilgus appeared to secure his favored bid because Hoff put forward a less expensive method than the presumed method of shield-driving (which the first attempt at the
tunnel determined was unfeasible) (Chesbrough, 1874, p. 237). Correspondence from the
Proceedings question whether Wilgus distorted his potential savings to undercut the other
bidders (Boller et al., 1911). Wilgus’ scheme was untested, compared to the shield-driven
approach of other bidders, and so it was speculative at best whether or not this untested method
was indeed cheaper. Commenters on Wilgus’ account were wary of the cost and the lack of
detail on incidentals and labor. All of this is to say that while the successful completion the
project suggested that the best person won the bid, the comments from the engineers in the
Proceedings were suspicious that Wilgus was given the contract. Corroborating these comments
with McBean’s account and grievances, one has to at least consider the subjectivity of Wilgus’
influence on the tender as the vice president of New York Central. One of McBean’s grievances
included the outsized centering of New York Central in the bidding process (McBean, 1912). All
of this demonstrates the significant muscle flexed by the railroad titans at the time.

Other comments regarding Wilgus’ account corroborate McBean’s suspicion that
Wilgus’ approach was indeed an original method. While the comments fall short of hailing
McBean as the originator of the subaqueous trench method used in the successful construction,
several engineers admitted that the method was likely not Wilgus’. At the least, Wilgus’
influence on the bid demonstrates that he perhaps convinced the financiers of the project that his
bid was a novel approach and not a repackaging of already-existing construction techniques. I
argue that Wilgus took advantage of socially-generated approaches to technical problems by
portraying himself and his team as lone geniuses accomplishing great feats of engineering in his
testimony in the Proceedings. McBean, and at least some of the commenters from the
Proceedings, seemed to feel the same way. For his part, McBean appeared to be shaken by
Wilgus’ success and tried to prevent having his ideas coopted in the future by relentlessly
patenting several different techniques, none of which helped him in his suit against the DRTC. Critically, this was because, a judge ruled, a scheme or plan is different than an actual construction (*Bindley v. Detroit River Tunnel Co.*, 253 F. 751, 1918).

Wilgus responded in kind to the commentators’ critiques at the end of the correspondence:

> after a peculiarly vigorous and open competition among the most experienced contractors in the country…the trench design was selected at a price to the Company about $2,000,000 less than was actually bid on the air-shield design.\(^3\) The work had been successfully completed in accordance with the adopted design without the interference to navigation…without accident, without injury to the health and life of employees, and with eminent satisfactory results to the Tunnel Company. (as quoted in Boller et al., 1911, p. 88)

There was a great deal of defensiveness in Wilgus’ abovementioned response that I would like to address in order to challenge the myth of the winning bidder. Wilgus appears to have argued that the contracting process was a technical one in which the winning bidder presented the most practical and technically sound idea. One has to wonder, however, what the contracting process obscured when a singular competition distilled the unique social characteristic embedded in the infrastructure process into a winning bidder.

How can a single bid, made on speculation, encapsulate the historic underpinnings of the development of technical expertise and the social circumstances of a major international crossing? It all begs the question of the degree of effectiveness of contracts in designating value within a social context. Should contracts really reward an aggressive speculative bidder that organizes a narrow body of technical expertise? Is this really an effective mechanism for

\(^3\) Compressed-air shield tunneling is a method that utilizes compressed air in order to counteract the pressure of the digging environment on the boring machine. The shield itself refers to a movable steel tube to provide temporary support until tunnel structures can be finalized. This method was developed for use in unstable soils where water is present (see Moir, 1895)
organizing the social quality of infrastructure? Moreover, based on the communal spirit of the correspondence to Wilgus’ account, it appears as though a strict bidding war for the best-laid scheme was not necessarily happening anyway. All of this is to say that the bidding was speculative, much like the nature of infrastructure development in general, when done for exchange value purposes and not necessarily for use value purposes.

McBean’s grievances and suit against the DRTC, alongside the rigorous debate among the community of civil engineers at the time, demonstrates the imperfections of the speculative contract approach to the social planning, development, and use of infrastructure. While Wilgus’ team reaped the benefits of the contract awarded by Ledyard, McBean felt defrauded of his contribution in the original scheme of the crossing. Whether or not McBean’s suit was justified, the judge’s verdict explains the ways in which the financial use of the legal framework of the contract transforms the social quality of infrastructural development into a winner-take-all result. The judge in the case acknowledged that McBean’s patents were relevant to the work of the tunnel; however, he ultimately ruled that the designing and imagining of a tunnel project is not the same as actually creating a tunnel in context.

Even though McBean took steps through the legal system to secure some value out of an infrastructural contractual apparatus, contracts are so pervasive in finance that they tend to protect financial interests (Evans & Clark, 1998), and so he failed to do so. Moreover, in the contractual approach to engineering infrastructure, the contract is not social, even though the infrastructure is. The bidders competed for ownership of the contract at the behest of their financial beneficiaries. Wilgus won ownership of the contract from Ledyard, and then secured that ownership by fulfilling the contract’s purposes. Alternatively, McBean simply won the possibility of a contract but never secured ownership. In the contractual arrangement of
competing capitals, individual ownership is the supreme metric for recognizing right-to-value. It is the representation of the relations of capital to its core: one person brings their usefulness to the market to sell as the owner of that usefulness to a person who has the initial money capital to secure it.

Wilgus and Ledyard entered into that most sacred of capital relations and so their relationship was legally valid. On the other hand, McBean entered into no such relationship; and while he may have made a social contribution to the tunnel project, the relationship in which that contribution was made and subsequently defrauded was of no concern to the market and the legal apparatus that guided the market. While the judge found that McBean had not been infringed upon, I argue it is less important to prove who was originally responsible for the crossing of the river and the scheme that achieved it, and instead more important to recognize how the contract is an apparatus of competition and collusion between technocrats and financial elite in the formation of infrastructure.

Conclusion

While this paper has provided critical insights into the actions of financial and technical elites in infrastructure planning, it is important to note that markedly absent in the above analysis are the perspectives of the local communities at the border where the tunnel efforts were being constructed. Indeed, the primary sources consulted on the financial background of the tunneling schemes and the mobilization of technical skills and expertise rarely acknowledged the social characteristics of spatial planning of the built environment. It is no wonder that financial powers continue to fail to recognize communities surrounding their infrastructural investments, as their vantage point tends to only consider the economic relations of exchange and not the more
complex social relations that actually constitute infrastructure. It should also be considered a failure on the part of the nascent planning profession at the time, however, that those executing the infrastructural contract did not seem to consult the community’s perspective. Arguably, this is a result of the practice of planning ceding responsibility to merely a technocratic process at the service of financial interests. The techno-scientific approach to planning and development at the turn of the 20th century, I contend, surrendered an entire generation of critical infrastructure to the logics of capitalism by conceptualizing planning as simply a technical exercise.

Writing towards the end of his career in 1935, Thomas Adams—a founding figure of the modern Canadian planning profession—equivocated slightly on strict techno-scientific approach to planning:

Plans have been made too much in the form of rigid patterns, and framed too much to comply with a fixed set of rules. Flexibility in planning is essential, not only to permit adjustment to changes in social and economic conditions, but to allow compliance with varying public demands…In the matter of what may be called the climate of public opinion, [the planner] must recognize that variations occur not only between one time and another but on different levels at a given time. For his guidance he has to find the several levels on which a healthy condition of public opinion exists; that is, those levels on which, in different manner, public opinion is controlled by a common ideal to promote human well-being. (Adams, 1935, pp. 325–326)

While not necessarily a malevolent infrastructural project, it is clear from the case of the DRTC that financial return and technical accomplishment were prioritized over the promotion of human well-being. As long as planning remains organized in a contractual apparatus at the service of financial ends and technocratic advancements, the true social nature of infrastructure will struggle to be realized.

The DRTC tunnel remained profitable through a set of mergers that carried through to the recent past, even as further crossings for automobile traffic have rendered the tunnel less significant. New York Central sold off its assets to Penn Central in the 1960s, which Penn
Central passed on to Conrail in 1976. The tunnel was then sold to Canadian National Railway and Canada Pacific Railway, which each held 50% stake. The two companies eventually sold off a majority of their respective stakes in the Tunnel to Borealis Transportation Trust, a private venture managing the pension funds of Ontario municipal employees. In the early 2000s, Borealis expressed interest in transitioning the Tunnel to automobile traffic in order to alleviate transportation pressure on the other crossings with plans to then construct a new railway tunnel. After the construction of the Herb Gray Parkway in 2016 and final approval of a new international crossing known as the Gordie Howe International Bridge (with an estimated completion date of 2024), Borealis’ plans were scrapped. Importantly, the tunnel remains unable to carry modern double-stacked shipping containers that account for the bulk of modern rail traffic, and so the future of the tunnel’s relevance remains in doubt.

What makes the historical case of the DRTC an interesting infrastructural narrative to consider is that it captures an account of amalgamating capitals in a monopolistic financial landscape. It also highlights the ways in which the social nature of infrastructure becomes measured out in an unintuitive contractual apparatus where only representatives of the financial landscape are sanctioned the value of that infrastructure through monetary exchange. The railway empire of the Vanderbilt’s interest—by way of New York Central ownership of Michigan Central and Canadian Southern and the Vanderbilt’s agent H.B. Ledyard—secured the funneling of financial reward of the infrastructure’s uses by corporate mergers and negotiated contracts. The contractors then entered into a speculative environment in which the bidding of contracts required a nuanced undercutting while maintaining the maximization of profits. This brings to the fore the strange competition within contract negotiations in which the parties involved are intentionally or unintentionally defrauding one another (Marx, 1939/1993c).
This infrastructure project remains relevant, both to the historical record and to contemporary issues regarding infrastructure development. In particular, it remains pertinent to consider how a collusion of financial interests with contractual dispersal of investments shapes the built environment over time. From a geographic standpoint, infrastructural investments are time and place dependent and remain fixed structures of economic relations. If the DRTC project teaches us anything, it is that the usefulness of transportation projects is mediated by the financial interests of the backers. Those financial interests are then carefully litigated through a type of contractual apparatus in order for the usefulness of a project to be distributed through monetary exchanges (either through one-off financial contracts, or through a share of usage fees and tariffs).

Historic investigation of the DRTC reveals that not much has changed in the 150-year history of the tunnel effort, at least in terms of the organization of capital investment and, ultimately, where those returns on investment go. While ownership of the tunnel has changed hands frequently, those who secured the contract and financialized the infrastructure into its own asset class were able to continue to leverage the infrastructural life of the tunnel even as infrastructural priorities changed. While this research has demonstrated the longevity of financial influence on the contracting out of technical services in the planning profession, further research on trade infrastructure is welcome in order to continue to investigate how contemporary planning and development practices can better serve communities at the border.
Preface to Chapter 5

The previous chapter looked to a historical case of trade infrastructure in order to empirically ground the theoretical understanding of the social relations of infrastructure expressed under capitalism. In it, the social usefulness of the trade infrastructure of the Detroit River tunnel was captured in a contractual apparatus of technocrats and financiers. In the next chapter, I look to a contemporary case of trade infrastructure—the Herb Gray Parkway in Windsor, ON. In this case, the role of finance in the contractual apparatus is similar in that it distributes the expression of social usefulness in the form of contracts and sub-contracts in the planning process. However, it differs substantially from the historic case in that infrastructural finance in the contemporary sense has matured to a much more complicated state. With this development in mind, I explore the nature of public-private partnerships in the development of the Herb Gray Parkway. However, I do not limit the analysis to simply public and private entities. I consider the ways in which Walpole Island First Nation was enrolled into this contractual apparatus, and the unique characteristics of a trade infrastructure project including Indigenous communities in the planning and development project.

While the inclusion of Walpole Island First Nation in the Herb Gray Parkway project is an excellent example of Indigenous and multi-jurisdictional relationship building in the planning process, I argue that the inclusion of Walpole Island First Nation in the Herb Gray Parkway project ultimately keeps the contractual apparatus intact. That is, the social relations of infrastructure remain a reflection of the social relations of capitalism.

This chapter is the final manuscript in my thesis. The target publication for this chapter is Environment and Planning D: Society and Space.
Chapter 5
Promises and Perils of a Parkway: The Built Relations of Indigenous and Multi-jurisdictional Infrastructure Planning at the Detroit River

Abstract: The Herb Gray Parkway (Parkway) and the eventual extension of Highway 401 across the Detroit River via the planned Gordie Howe International Bridge enhances the movement of goods, services, and people along an already existing premier trade and transport route—the busiest crossing on the U.S.-Canadian border. The Parkway included intensive capital investment, ecological experimentation, and community engagement foundational to projects of this scale and significance. It also utilized a public-private partnership (PPP) procurement model that has become a popular form of financing major infrastructure in Ontario. One novel feature of this PPP project, however, has been the inclusion of Walpole Island First Nation. In this paper, I examine the ways in which the PPP model informed an infrastructural partnership between the Ontario provincial government and Walpole Island First Nation with the aim of investigating how the First Nation participated in what I call a “contractual apparatus” of public and private stakeholders focused on enhancing the growth of trade in the region through the development of large-scale infrastructure. I argue that despite the unique qualities of the Public Private Partnership that was developed with Walpole Island First, the priorities of private finance still mediated the overall process and the distribution of contacts in ways that shaped the emergent social relations of the planning and development process and the ongoing life (i.e., use, operation, and maintenance) of the infrastructure.
In the spring of 2016 the dust settled on the final touches of the Herb Gray Parkway (Parkway)—a major step forward in the decades long plan to develop a new international crossing between the cities of Windsor, ON, Canada and Detroit, MI, USA. The Detroit-Windsor border has the highest crossing frequency of any land border in North America—the bulk of which crosses the over 90-year old Ambassador Bridge (Nelles & Sutcliffe, 2013). The Herb Gray Parkway fits into the larger national and regional efforts to complement or even outright replace the privately-owned Ambassador Bridge with a new crossing. The Parkway as well as the Gordie Howe Bridge have both featured the use of private finance in their planning and development demonstrating the significant influence of the social relations of capitalism in the new crossing of the Detroit River. In this study, I examine the extent to which the social relations of capitalism remain a dominant force in the planning and development of trade infrastructure in the Detroit River border region through considering the ways in which Walpole Island First Nation participated in what I call a “contractual apparatus” mediated by the influence of private finance in the public-private partnership that constructed the Herb Gray Parkway in Windsor, ON— the most expensive infrastructure project in the province’s history (Rt. Hon. Herb Gray Parkway, n.d.).

The questions I advance in this research are: if the social relations of capitalism are featured in trade infrastructure development at the border, how then are Indigenous communities engaging in those relations and what are the results? To answer these questions, I define a contractual apparatus of trade infrastructure that distributed the overall value of the project through a series of contracts during the planning and development process. I then consider the ways that Walpole Island First Nation influenced that process through partnerships with the other government and private participants in the contractual apparatus. On the one hand, the result has
meant the development of meaningful relationships between planners and the First Nation, the ecological restoration of the area surrounding the Parkway through transplanting species at risk from Walpole Island, the cultural representation of Indigenous Traditional Knowledge as well as the promotion of their treaty rights to their traditional territory. On the other hand, the case study reveals the ways in which infrastructure projects that have clear market-based objectives (e.g. enhancing international trade) pose challenges to Indigenous communities seeking recognition of treaty rights as well as economic dispensations through contracting out their unique services to an infrastructure project.

**Trade Infrastructure and the Social Relations of Capitalism**

Why study the Herb Gray Parkway project with an aim to examine the social relations of capitalism? The participants of this study from the Ontario Ministry of Transportation (MTO), the private project company of Windsor Essex Mobility Group (WEMG), and Walpole Island First Nation (WIFN) had no explicit intention of disrupting the social relations of capitalism, nor has the planning sector more broadly sought to incorporate Marxist critical perspectives in their approach (Holgersen, 2020). The answer relates to the reality that the forces of capitalist global trade are so pronounced that their influences are hard to escape in any case of infrastructure development, and in the case of the Herb Gray Parkway they are present in ways not previously discussed in the literature. There are scholars in the fields of critical geography (Pasternak, 2015; Pasternak & Dafnos, 2018; D. Rossiter & Wood, 2005) that consider the social relations of capitalism in their studies with Indigenous communities, and they will be discussed in a literature review below. For now, however, I will draw upon Marx directly to outline the theoretical
framework that I use to discuss the planning and development of trade infrastructure such as the Herb Gray Parkway.

Critical to the discussion of the Herb Gray Parkway is that it is a case of what I refer to as “trade infrastructure”. I define trade infrastructure as infrastructure whose social usefulness is for the purposes of moving trade goods and services across international demarcations. The usefulness of trade infrastructure should be understood in Marxian economic terms as the infrastructure’s “use-value”. To Marx, use-value is held in the physical properties of a commodity (Marx, 1867/1992a). It is the very material substance of a commodity that makes it socially useful. Use-values need to be consumed in order to be realized—that is, they need to be used; and, in the case of trade infrastructure, they are used for trade. In the capitalist mode of production, use-values have a corresponding, dialectical equivalent of exchange-value. The Herb Gray Parkway, and the conceptual category of trade infrastructure that I apply to it, has a corresponding exchange-value that is present in the planning and development process. I argue that the presence of exchange-value in the planning process is organized within a "contractual apparatus”.

This contractual apparatus constitutes the bundle of legally recognized contracts that enroll contractors, engineers, consultants, laborers, administrative support, and any other necessary waged workers into a quantitative expression of their services in the form of monetary payment. In effect, the contractual apparatus is the organizational mechanism for distributing the value of infrastructure in a monetary form— which expressed in Marxian economic terms is the exchange value applied to the useful contributions of the various entities making up the contractual apparatus. This monetary form is earmarked through a collection of legally binding contracts that are awarded to the different institutions and people that contribute their usefulness
to an infrastructural project. The contractual apparatus encompasses any process of monetary exchange from the payment of a single construction worker on the development site to the totality of the contract awarded by the government to the private developer. In a standard public procurement model the contractual apparatus may simply look like a public expenditure delivered to a winning bidder that is distributed according to the project agreement. In a public-private partnership model, however, the contractual apparatus might be more complicated. In procurement agreements, the project company may be awarded a bundle of long-term contracts to design, build, finance, and operate an infrastructural project. In this way, the contractual apparatus is more prone to the influence of finance (Aalbers, 2019). I argue that finance has an outsized role in the decision making of who benefits and who does not in the contractual apparatus because the social relations of capitalism have it that the expression of usefulness of trade infrastructure in the contractual apparatus is unequally distributed to entities that control infrastructural finance, such as privatized public utilities, global investment banks, pension fund managers, and multinational construction and development firms (O’Neill, 2017).

**Public-Private Partnerships and Infrastructure Planning and Development with Indigenous Peoples**

Literature at the intersection of infrastructure, PPPs, and Indigenous peoples is noticeably absent in any of the major planning and urban geography journals. Studies that do explore Indigenous involvement in PPPs tend to focus on their involvement in the provision of services such as transportation, or telecommunications infrastructure to remote areas (Hudson, 2013; Morrison, 2000; Murton et al., 2016). Insight into why Indigenous communities become a partner in a PPP, however, could be gleaned from broader explorations of the incorporation of
Indigenous communities into the market economy. Indigenous communities have entered into capitalist processes both from the standpoint of ongoing capital expansion and dispossession of traditional territories, but also by a need for material survival within the global capitalist system (Simon, 2011). In the planning and development of infrastructure both capital expansion and material survival are reflected in the ways in which Indigenous communities have become active participants in infrastructural projects. For example, Indigenous participation in impact benefit agreements with extractive resources industries—where companies seeking to work within the traditional territory of Indigenous communities offer, among other things, infrastructural provisions in order to mitigate the socioeconomic risks to Indigenous people from the extractive resources industry (Craik et al., 2017; Kuokkanen, 2019; McCreary et al., 2016). These arrangements are popular political strategies among extractive industries, such as mining and the energy sector, as development of these sectors of the economy disproportionately and negatively affect Indigenous communities (Van Alstine & Afionis, 2013). At any rate, there are clear examples of state and private industry working in consortium with Indigenous communities either in a confrontational way as an extension of colonial capitalist development or in concert with Indigenous communities seeking to develop their own forms of "Indigenous Capitalisms" (Bunten, 2011).

Bunten (2011) has explored the development of Indigenous capitalisms in Alaska and New Zealand, and while finding possibilities for economic empowerment and self-determination through the incorporation of Indigenous business ventures, she nonetheless points to how settler governments "coerced incorporation on the Indigenous peoples within their borders through policy designed to mitigate inherent and treaty rights with economic development in the surrounding cash economy" (Bunten, 2011, p. 62). Alternatively, Rossiter and Wood (2005)
have lamented that efforts to develop Indigenous communities into full capitalist economies "turns squarely on an economic logic that identifies participation in regimes of capitalist accumulation as the ultimate sign of equality" (p. 364). While not explicitly implicating PPPs, Rossiter and Wood argue that private industry works with the public sector in settler colonial contexts such as Canada in order to “equate corporate success with national prosperity” and therefore economic benefit for Indigenous communities (Rossiter & Wood, 2016, p. 907). The authors contend that this fusion of public and corporate activity engenders what they call a “fantastic topography” that situates Indigenous communities as neutral spaces open for corporate investment (Rossiter & Wood, 2005). In this regard, the tensions over land rights are ignored in favor of a depoliticized ideal of economic development in Indigenous communities.

Stanley (2019) likewise critiques settler colonialism at the nexus of public-private partnerships by taking to task the Canada Infrastructure Bank, a roughly $35 billion (CAD) public fund established to entice private investment in public infrastructure projects. While not directly naming public-private partnerships, Stanley admonishes the Infrastructure Bank’s “unstated aim…to bring the aspirations of corporate capital and the settler state into functional alignment” (Stanley, 2019, p. 1141). To the author, examples of such an alignment include large scale “nation building projects” in northern Indigenous lands that leverage federal funds in order to draw in private finance particularly from the extractive resources industry (Stanley, 2019, p. 1139). Others have similarly considered settler-colonial nation state building through the public-private partnership of place naming, and questioned the absence of Indigenous toponyms in the cultural representation of place names. For example, Kearns and Lewis (2019) argue “colonial toponymic landscape represents the systematic erasure of many indigenous meanings of place and all the socio-spatial processes of identity making and sovereignty associated with them” (p.
Rose-Redwood and colleagues (2019) argue that “naming rights sponsorships are a political technology of neoliberal governance that have played a significant role in the commodification of urban place-identities (p. 748). To these authors, the commodification of place-names re-inscribes land with continued forms of imperial dispossession through the veil of corporate marketing in participation with municipal governments.

There is a strong link between the efforts of settler states to maintain control over Indigenous lands and the overall processes and social relations of capitalist production. Pasternak and Dafnos (2018) directly implicate infrastructure in the arrangements of settler states and capital accumulation by demonstrating the ways in which Indigenous communities have occupied critical infrastructures such as private pipelines and public rail transport. The corresponding response has been for private industry and the settler state to not only cooperate in securing this infrastructure by force in order to jointly undermine Indigenous jurisdiction and thus reinforce the authority of settler governments, but also to ensure that infrastructure networks are capable of maintaining the fluid circuitry of capital. The planning and development process of infrastructure, therefore, has had to negotiate between responding to Indigenous resistance of infrastructure development and upholding contemporary colonizing efforts under the guise of economic development. Vitally, I argue, the coordination of the settler state and private industry are similar to the ways in which Pasternak (2015) critiques the privatization of Indigenous lands as an example of how neoliberal “cultural recognition of Indigenous difference serves to construct new institutional arrangements for managing Indigenous lands” (p. 180). That is, the inclusion of Indigenous communities into public-private partnership arrangements—a characteristically neoliberal tool (Miraftab, 2004)—risks reproducing a settler colonial state that
is dependent upon the continued dispossession of Indigenous lands and the expansion of the social relations of capitalism (Coulthard, 2014).

The discussion thus far has demonstrated how infrastructure planning and development with Indigenous communities requires unique considerations of their legal, political, and cultural rights that have not been fully explored in the frameworks of public-private partnerships. Moreover, I have largely followed the criticisms of public-private partnerships that view the procurement model as new type of neoliberal technology anathema to the interests of Indigenous communities. For example, Rossiter and Wood (2016) explain how neoliberal interventions reinforce a settler government’s control over Indigenous territory under the auspices of increasing private capital investment. Furthermore, public-private partnerships are themselves a type of long-term private investment into public projects operated by a consortia of private investors (Willems & Van Dooren, 2016). While these critiques of private investment in infrastructure projects in a settler-colonial context are apt, they do limit the achievements of Indigenous communities who have actively and willingly participated in public-private partnerships. In a most basic sense, Indigenous people are neither public nor private entities. They are distinct self-determined nations in a unique position as the original and continued inhabitants of the traditional territories in which many infrastructural developments take place. It is useful, therefore, to submit to the above discussion of PPPs and Indigenous communities the case of Walpole Island First Nation and the Herb Gray Parkway. This case study examines the First Nation utilized the PPP framework to express treaty rights, build relationships in government and industry, as well as pursue economic development opportunities. Significantly, however, despite these developments, the case of the Parkway is also one that ultimately reinforces the argument that public-private partnerships have served to reinforce the logics of
settler-colonialism and the social relations of capitalism through the planning and development of infrastructure.

**Method**

The methods used for this study are qualitative in nature. They include key informant interviews, document analysis, and field observations. The overall methodology utilizes case study analysis to understand how the emergent particularities of the singular case of the Herb Gray Parkway are linked to the broader realities of infrastructure planning and development in border regions. More universally, the case abstracts to consider the larger economic relations constituting the various social structures of economic life. In this way, the inductive-deductive relationship of the theory and the data emerging out of the case study form a methodological bed of analysis.

**Case Study Methodology**

To Baxter, “case study research involves the study of a single instance or small number of instances of a phenomenon in order to explore in-depth nuances of the phenomenon and the contextual influences on and explanations of that phenomenon” (Baxter, 2010, p. 81). Contextualization within a case study is possible by locating the instances within a bounded system (Stake, 1995). According to Flyvbjerg (2006), the data gathered in the bounded case is context dependent. The data collected in the case of the Herb Gray Parkway are extremely context-dependent; they must be considered in the macro context of bi-national trade relations and the struggles of a First Nation exerting sovereignty over its traditional territory. The data must also be considered in terms of the ways in which these macro relations play out in the
individual relations of the key participants. In order to flesh out the context of this case, data were triangulated between key informant interviews, document analysis, and field observations to illuminate background elements of the Parkway planning and development narrative in order to link this narrative to cogent and critical analysis related to the economic relations embedded in the planning and development of the Parkway itself. Each method listed below is explained in more detail within the broader case study methodology in order to directly link the data to analysis.

This research included a review of 55 documents related to Walpole Island First Nation involvement in the Parkway project such as memos, contracts, comments to formal planning processes, meeting minutes, as well as presentations and reports (see Tables 1 and 2). These documents were analyzed through content analysis, which is “a careful, detailed, systematic examination of a particular body of material in an effort to identify patterns, themes, biases, and meanings” (Berg, 2008, p. 303). Initial themes relating to the theoretical framework of the study—specifically, the thematic arena of the social relations of capitalism—served as a starting point for analysis. Building upon this deduction, an inductive approach expanded the thematic field to consider emergent themes in the data. This deductive-inductive combination approach to thematic coding is reminiscent of Strauss’ method of grounded research that demands the researcher “must search for relevant structural conditions, which means they must be linked as specifically as possible with the interactional/processual” (Strauss, 1987, p. 80, emphasis in original). These data were corroborated with six key informant interviews, with two representatives from Walpole Island First Nation, three from the Ontario Ministry of Transportation, and one from the Windsor Essex Mobility Group—the private consortium that won the bid to complete the Parkway. Individuals were recruited for the study due to their
familiarity with the case and their unique perspective as informed gatekeepers to critical and relevant information (Gilchrist, 1992).

Interviews were roughly one hour long. Three interviews were conducted over the phone, while three were in person between June 2018 and May 2019. The interviews with Indigenous participants were conducted on Walpole Island First Nation as part of three multi-day site visits. All three site visits included informal meetings with research participants at Walpole Island First Nation Heritage Centre (three meetings) and MTO offices in London, Ontario (one meeting). Through these meetings I also became involved as an editor and designer for a book co-produced between WIFN Heritage Centre and MTO on the lessons learned from the engagement of Walpole Island First Nation on the Parkway project. I identified all the informants as part of a professional sphere of planning because each informant operated in a professional, paid capacity on the Parkway. However, informants from Walpole Island First Nation Heritage Centre brought Indigenous perspectives into this professional identity. It should, therefore, be noted that while I view the informants as part of the Parkway’s professional planning sphere, I also recognize the power differentials between those informants representing the private and public Western planning entities and those that I view as operating as Indigenous planners working as part of an Indigenous professional bureaucracy (i.e., as paid staff of Walpole Island First Nation).

Finally, field observations were conducted during the three site visits to the completed Parkway, during which I gathered field notes on the elements of Walpole Island First Nation’s involvement such as the ecological, cultural, and artistic features of both the Parkway and the accompanying trail system that was built alongside the Parkway as part of the overall project. The trail system is intended for pedestrian travel and features ecological restoration work that
Walpole Island First Nation was heavily involved in. All field notes and interviews were transcribed and coded using the same deductive-inductive system as the documents were.

<table>
<thead>
<tr>
<th>Document Type</th>
<th>Examples</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal Communication</td>
<td>Official memos/letters</td>
<td>12</td>
</tr>
<tr>
<td>Meeting Materials</td>
<td>Minutes, presentations</td>
<td>12</td>
</tr>
<tr>
<td>Project Materials</td>
<td>Reviews, commentary, budgets, workplans, agreements</td>
<td>23</td>
</tr>
<tr>
<td>Public Communication</td>
<td>Press releases, public meeting minutes, public notices, speeches</td>
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</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>55</strong></td>
<td></td>
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Table 2: Documents Reviewed by Type

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</tr>
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</tr>
<tr>
<td>Ontario Ministry of Transportation</td>
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</tr>
<tr>
<td>Transport Canada</td>
<td>1</td>
</tr>
<tr>
<td>Windsor Essex Mobility Group</td>
<td>4</td>
</tr>
<tr>
<td>URS Corporation</td>
<td>11</td>
</tr>
<tr>
<td>Neegan Burnside</td>
<td>5</td>
</tr>
<tr>
<td>Infrastructure Ontario</td>
<td>3</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>55</strong></td>
</tr>
</tbody>
</table>

Table 3: Documents Reviewed by Source

**Background & Context**

The Herb Gray Parkway is an 11-kilometer freeway in Windsor, Ontario (see Figure 3).

The planning and development of the Parkway began in 2005 when a bi-national group of Canadian and American government officials, organized under the Detroit River International
Crossing (DRIC) study, started exploring the feasibility of a new publicly-owned border crossing between Windsor and Detroit, Michigan on the U.S. side. The crossing between Windsor and Detroit currently includes the publicly-owned Detroit-Windsor Tunnel and the privately-owned Ambassador Bridge and Detroit River rail tunnel. Collectively, these crossings make up the busiest trade route on the U.S.-Canadian Border (Sutcliffe, 2012). Non-traded goods, such as tourism and a shared labor pool, also frequently traverse the border, significantly impacting both the local economies of Detroit and Windsor (Burke, 2015). As a result, the Detroit-Windsor border has been the center of regional, national, and international debates over infrastructural improvements to help with wait times and the seamless flow of border traffic (Nelles & Sutcliffe, 2013).

Despite this important infrastructural corridor, there remains a 16-kilometer gap between Highway 401 on the approach to the Ambassador Bridge on the Ontario side. As a result, border traffic is intermingled with local traffic in order to access a bridge that is arguably the most important infrastructural element on the North American Border (Anderson, 2012; Burke, 2015; Sutcliffe, 2012). Reconciling the importance of the trade corridor with a new approach and a crossing that removes barriers to the flow of goods, services, and people—while minimizing impacts on local traffic—were the impetus to develop the Parkway and the future Gordie Howe International Bridge. The funding of the Parkway is based on an alternative financing and procurement (AFP) model; a form of public-private partnership favored by Infrastructure Ontario, which is the Crown agency created to assist in the long-term infrastructure planning of the province (Bordeleau, 2014; Office of the Auditor General of Ontario, 2014). The Windsor Essex Mobility Group (WEMG)—a private consortium—won the contract for this project. Walpole Island First Nation (comprised of Chief and Council, Walpole Island First Nation
Heritage Centre, and the private Indigenous-owned business Danshab Enterprises) served a key consultative role to WEMG. With WEMG as a proponent of the project, the Ontario Ministry of Transportation (MTO) operated as client on behalf of the public.

*Figure 3* Maps of Detroit-Windsor showing how the Herb Gray Parkway extends Highway 401 to the future site of the Gordie Howe International Bridge connecting the two cities across the U.S.-Canada border. Produced by author from Hebstreits Vector Maps Open Database License (ODbL) 1.0 (https://hebstreits.com/licensing/).
Figure 4 Map showing the location of Walpole Island and Windsor near the rivers that make up the U.S.-Canada border in southwestern Ontario. Produced by author from Wikimedia Commons (https://en.wikipedia.org/wiki/Lake_St._Clair#/media/File:Lake_st_clair_landsat.jpeg).

**Bkejwanong**

Bkejwanong is the Anishinaabemowin name given to Walpole Island that means “Where the waters divide.” Walpole Island First Nation is a First Nation reserve situated on unceded territory 120 kilometers northeast of the city of Windsor—on the opposite side of Lake St. Clair to where Windsor is situated (see Figure 4). Walpole Island First Nation is part of the larger social and political compact of Anishinaabemowin-speaking peoples that compose the Three Fires Confederacy (Ojibwe, Potawatomi, and Odawa). The city of Windsor is currently situated on what has been the traditional territory of the Anishinaabe people of Walpole Island since time immemorial. The lands under the Canadian portion of the Detroit River, along with Lake Erie, Lake Huron, Lake St. Clair, and the St. Clair River are currently claimed by Walpole Island First
Nation through Aboriginal Title that Walpole Island First Nation continues to assert through claims to the Ontario Superior Court of Justice.\(^4\) Walpole Island First Nation holds rights within its Reserve and Traditional Territory including the right:

- to sustain and strengthen its spiritual and cultural connection to the land, to protect the Environment that supports its survival, to govern itself, and to participate in all governance and operational decisions about how the land and resources will be managed, used and protected. (Walpole Island First Nation Consultation and Accommodation Protocol, 2014, p. 4)

On account of these rights, the Detroit River International Crossing (DRIC) study was bound by the duty to consult and accommodate First Nations in the initial Environmental Assessment (EA) phase of the study. Walpole Island First Nation Chief and Council, as well as the Walpole Island First Nation Heritage Centre—a multi-functional facility on the Island that houses Walpole Island First Nation’s Natural Heritage Program, Environmental Program, Research Department, External Projects Program, and archival building for land claims and research—became involved in the early phases of the DRIC study. By exercising their right to be consulted and accommodated, WIFN eventually built relationships with all the agencies involved in the DRIC study, which included the Windsor Border Initiative Implementation (Windsor BIIG) Group, the Ontario Ministry of Transportation (MTO), Transport Canada, Infrastructure Ontario, and eventually the private consortium leading the project—the Windsor Essex Mobility Group (WEMG). Through the early engagement, Chief and Council expressed to Windsor BIIG

\(^4\) Aboriginal Title refers to the inherent rights of Indigenous peoples to the land that they have occupied since time immemorial. In Canada, various legal decisions have shaped how the Canadian courts interpret Aboriginal Title. Major precedent is set by the Royal Proclamation of 1763, which the British issued regarding all of its territories in North America. According to the Proclamation, Aboriginal Title to the land can only be extinguished by direct treaty with the British Crown. Walpole Island First Nation has negotiated no such treaty with the Crown and therefore the reserve is situated on what is known as unceded territory. It is also important to note that while legal decisions inform how settler governments may interpret Aboriginal Title, this is not a right that needs be granted by an external source. Aboriginal Title is an inherent right to an Indigenous community’s ancestral territories (Union of British Columbia Indian Chiefs, n.d.).
and MTO that they intended to negotiate an impact benefits agreement with whoever became the proponent of the DRIC crossing. The impact benefits agreement did not come to fruition, and instead MTO and WIFN negotiated a set of consultative roles and associated budget for the First Nation in the project. The tenor of the early dialogues involving Walpole Island First Nation was aspirational in the sense that the First Nation saw this infrastructure project as a means of improving Indigenous-non-Indigenous relations. However, the project was also used as a mechanism to secure and protect land claim rights, as well as an opportunity to discuss historic and contemporary points of dispossession of traditional territory. As a result, the discussions often featured how WIFN transcends the current political borders and maintains a current and previous historical relationship with the land beyond that of the various jurisdictional bodies involved in the DRIC study.

After successfully submitting an EA application for the crossing, Windsor BIIG and MTO began focusing its efforts on the Canadian approach in Windsor. Infrastructure Ontario launched an AFP model that would offer public funds to a winning bidder to design, build, finance and operate (DBFO) the Parkway. At this juncture, Walpole Island First Nation shifted their focus to secure favorable language for First Nations’ participation requirements in the procurement documents. Interestingly, the successful tender was a Spanish-led private consortium of three companies that, together, became known as the Windsor Essex Mobility Group (WEMG). Construction began on the Parkway in 2011.

With WEMG securing the bid, documents consulted in this research demonstrated how various contracts and subcontracts began to unfold once the project team and implementation group secured the funding. WIFN built significantly on their experience engaging with the various entities throughout the DRIC study, remaining a part of the contractual apparatus as a
relevant consulting service specifically focused on executing elements of the Endangered Species Act as well as supporting cultural and artistic elements of the parkway project. These details will be expanded on in later sections of the paper, but the key takeaway of WIFN’s engagement is the ways in which they became entangled in and effectively maneuvered the contractual apparatus throughout the shifting history of the Herb Gray Parkway.

Engagement History of Walpole Island First Nation in the Herb Gray Parkway Project

From both a legal and cultural standpoint, the unique position of Walpole Island First Nation informed much of the engagement around the Herb Gray Parkway project in the early days of the Detroit River International Crossing (DRIC) study. Meetings were held in January and February of 2006 on Walpole Island between Heritage Centre and MTO staff where participants discussed early points of engagement and received comments from Walpole Island First Nation (URS Canada, Inc., 2006). WIFN consistently leveraged their right to traditional territory in negotiations for formal inclusion in the project. From the earliest stages of their involvement, WIFN’s participation was a supplemental strategy for protecting their claim in the Ontario courts to Aboriginal Title of the Canadian side of the Detroit River bed. WIFN also raised concerns about how they might be engaged in the protection of cultural resources found through the archaeological process and the protection of the natural environment through safeguarding endangered species while mitigating the introduction of foreign species. Critically, undergirding all of the points raised by WIFN was their consistently expressed demand to receive a budget and funding for meaningful engagement in the project. The request for funding was also folded into the demand for economic development for the government and community of the First Nation and enhanced employment opportunities for WIFN members related to the
These interests remained consistent throughout and were communicated to the public via Transport Canada memo on January 2008. This memo explained why Walpole Island First Nation was receiving funding (Natarelli, Letter, January 25, 2008). The memo states that the “specific areas of interest [to be funded] include archaeological resources, species at risk, fisheries, air quality and economic implications. Their stated overall interest is to sustain and enhance the economy and quality of life of their people.” As I explain here, it is clear from the documents analyzed that Walpole Island First Nation successfully advocated for their interests to be formally incorporated into the overall budget of the project.

**From Engagement to Contract**

The formal process of budgeting to include Walpole Island First Nation engagement, however, was not a smooth and efficient process. Walpole Island First Nation received their first round of funding from the MTO in January of 2008, nearly two years after they had expressed a need for formal funding commitments. WIFN had already invested resources into securing technical expertise from Neegan Burnside, an Indigenous-owned environmental and engineering consulting firm, in order to fully and properly provide comments on the project’s Environment and Archaeological Assessment. Importantly, this investment highlights that WIFN had engaged technical experts, that they were awaiting funding commitments, and that Canadian law requires First Nation’s consultation in such projects. The letter goes on to say that “Walpole Island First Nation is prepared to be full partners…but we must be resourced to do so” (D. Jacobs, personal communication, Letter, April 24, 2006).
The failure to secure a full, well-funded partnership in the early stages of the project resulted in frustration between WIFN and MTO. According to one Walpole Island First Nation member:

the first days were really frustrating. They did have some directors that were very cautious...because we were always ahead of the duty to consult and MTO just kept trying to lower the bar. Our approach was that’s the lowest, but we gotta do better, and we can do better. (Walpole Island First Nation Member 2, Personal Communication, May 17, 2019)

Tensions also emerged between WIFN and MTO as well as United Resource Services (URS, now AECOM), the firm hired to conduct Archaeological and Environmental Assessments. The frustration was that WIFN was not allowed more time and input into the EA process (Jacobs, Letter, February 6, 2009). WIFN had already engaged technical experts to comment on the Archeological Assessment and the Generation and Evaluation of Illustrative Alternatives (Radburn, Letter, December 11, 2008). The services rendered by Walpole Island First Nation, which involved consultations on environmental and ecological restoration as well as artistic, archaeological, and other comments and inputs on issues related to culture, required significant human and financial investment (Radburn, Letter, June 24, 2010).

In part because of their frustration with the EA phase, WIFN planned to also pursue an impact and benefits agreement with the proponent of the project. Following the completion of the EA phase of the DRIC study in November 2008, Chief Gilbert of Walpole Island First Nation requested to open up impact and benefits agreement negotiations with the DRIC. The Chief proposed to “negotiate an Impacts and Benefits Agreement with the DRIC proponents, in order to ensure that the DRIC project respects the views, rights, and values of Walpole Island First Nation members, and shows due regard to the environmental and community needs of Walpole Island First Nation” (Gilbert, Letter, November 28, 2008). The response from the Windsor BIIG
office was that they “do not contemplate entering into such an agreement [but] we do seek to address your concerns through accommodation measures such as design modifications and mitigation approaches to environmental aspects” (Wake, Letter, March 2, 2009). But Walpole was concerned that the comments provided to the EA study were not being addressed in a timely manner, given the fact that the project had moved from the preferred alternative stage to the practical alternative stage (Radburn, Letter, December 11, 2008).

The impasse was largely resolved when, on July 10th 2009, a meeting between Walpole and MTO listed different potential areas of involvement as the DRIC study moved into implementation. This list also served as a letter of intent for “future action by MTO and commitment to partnering with Walpole Island First Nation” Ward, Letter, July 10, 2009). The agenda included Walpole Island First Nation budget considerations up to, but not including, their participation in the Endangered Species Act permit application. It also included Walpole Island First Nation’s areas of interest for future involvement, such as creating an archaeological repository for artifacts found during the project, building in incentives to contract with First Nations in the procurement documents, and the exploration of a greenhouse as part of the project.

**Manifesting the Contract**

Initially, Walpole Island First Nation wanted to secure funds to construct a greenhouse in order to transplant ‘species at risk’ to the project site. While plans for the greenhouse were included in the initial economic partnership in 2009-2010, the greenhouse never materialized. The greenhouse plans were prevented by project timing constraints and imminent construction once the WEMG was formed. Instead, MTO and WIFN looked internally in Walpole Island for
experienced ecological workers and selected Danshab Enterprises to lead the ecological restoration elements and the transplant of native species (Walpole Island First Nation Member 1, Personal Communication, Interview, June 6, 2018). MTO worked with the Ministry of National Resources (MNR) and Indigenous Affairs (then Aboriginal Affairs) to secure funding for Danshab’s participation through the Aboriginal procurement program (APP).

The APP opened up possibilities for more meaningful engagement associated with a direct budget. The work associated with APP featured species-at-risk transplanted into the Parkway and the associated trail features. Namely, the Parkway and trail systems feature restoration areas of Tallgrass Prairie and Oak Savannah native species. For this work, the environmental team on the Parkway received the Ontario Endangered Species Act Conference Award in 2013. The collaboration on the ecological aspects of the Parkway also opened up other forms of engagement that incorporated cultural and artistic elements of Walpole Island First Nation Traditional Knowledge. Extensive design features on the trail system connected to the Parkway, for example, contain Indigenous elements incorporating the four colors of the medicine wheel (red, black, white, and yellow), and the colors of life on Earth (blue, purple, and green). These representations, featured on doodems\(^5\) on seven pedestrian bridges and incorporated into the trail system, were designed by Walpole Island First Nation artist Teresa Altiman (see Figure 5).

\(^5\) For the Anishinaabe people, a doodem identified which clan you belonged to.
5). The design elements emerged from Walpole Island First Nation elders in one of the Ecosystem Circle meetings hosted by Walpole Island First Nation for the Parkway project. The westernmost section of the trail system, closest to the Detroit River, also features a limestone boulder found during construction placed atop a turtle sculpture designed by Altiman (see Figure 6). This “Homage to Safe Passage,” as it has since been called, centers on an interpretive site informing visitors of the significance of the Detroit River to Indigenous peoples crossing from Lake Erie to Lake St Clair. The stone represents the original marker of this cultural significance, the *Mishomis Asin* (Grandfather Stone), that was destroyed by missionaries in 1670.

**Interpreting the Results within a Contractual Apparatus**

I interpret two major results from the Herb Gray Parkway case study in order to evaluate the distribution of value in the contractual apparatus and the dynamics of the social relations of capitalism in trade infrastructure development. The first result is that Walpole Island First Nation entered into the contractual apparatus of the Herb Gray Parkway as Indigenous cultural and ecological consultants in order to express their treaty rights to Aboriginal Title and develop the First Nation’s economy. The second is that WIFN worked hard to build meaningful partnerships within this contractual apparatus, particularly with the Ontario Ministry of Transportation. To
help illustrate the first point, I will explain how the objective for trade growth and the role of finance in the project set certain limitations to WIFN’s expression of treaty rights and economic development goals. With regards to the second point, I examine the relationship building between WIFN and the Ontario Ministry of Transportation as one fraught with the tensions of bringing Indigenous communities into the public-private partnership framework. On the one hand, WIFN’s engagement in the Parkway project maps onto other studies cited in this paper that have shown how public-private partnerships with Indigenous people perpetuate colonial relations through the expansion of capitalism (Bunten, 2011; Pasternak, 2015; Pasternak & Dafnos, 2018; Rossiter & Wood, 2016). On the other hand, WIFN and MTO participants largely expressed positivity about their shared experiences on the Parkway project, and in this regard demonstrate the capacity for building meaningful relationships in PPPs (Roberts & Siemiatycki, 2015).

Engaging in an Infrastructural Contractual Apparatus

While WIFN engaged in the Parkway in order to express treaty rights and develop the First Nation’s economy, trade growth was the primary objective of the project. As one provincial government official stated:

There was an inherent understanding that this was a border crossing first, and that there were certain timelines and restrictions. The fact that it was a border crossing and a big economic driver for the province…you knew there were bigger things other than the environment or First Nation consultation sort of driving it. (Government Official 2, Personal Communication, Interview, July 5, 2018).

According to another interviewee:

What made this project so interesting and complex was it’s a border crossing…North America’s busiest trade border crossing, which obviously has a whole host of other complexities which certainly play into that story” (Government Official 3, Personal Communication, Interview, August 23, 2018).
With an estimated trade value of USD $1.6 million crossing between Detroit and Windsor every minute, the region serves as a unique investment opportunity for both private and public institutions (Cautillo, 2017). The Detroit-Windsor border, like all borders, are influenced by how trade relations shape the real estate of border regions and therefore the role of infrastructure in building particular uses of exchange within and across the region (Mezzadra & Neilson, 2013). The Great Lakes region, specifically, has been both a contemporary and historic site of trade infrastructure development and speculation (Smith, 1995; Widdis, 2011). The border at the Detroit River, therefore, had been targeted by proponents of trade growth from government and industry in a way that incorporates investment opportunities in the built environment of trade infrastructure. Not only did the record-breaking budget of $1.4 Billion (CAD) offer a wealth of contractual opportunities to the winning proponent, but the intensified trade presence in the region offered speculative real estate value as well. The speculative value of the Herb Gray Parkway, therefore, was indicative of the ways in which infrastructure becomes “the property of specialized financial institutions, capturing the value of a place while distributing the risk of being invested in it” (Torrance, 2008, p. 2).

WIFN felt hamstrung into joining the Parkway’s trade objective in order to advocate for their rights as noted by one interview informant from Walpole Island First Nation:

If we didn’t come to the table we lost an opportunity to advance and assert our title to the Detroit River …I think that was the real push to get involved. As a First Nation we had to advance who we were and what our rights were; so, it’s more of a rights-based involvement. (Walpole Island First Nation Member 2, Personal Communication, Interview, May 17, 2019)

In the same interview, the Walpole Island First Nation member stated that participating in EA stages of projects like the Herb Gray Parkway was an effective tool to supplement land claims of traditional territory:
We didn’t know back then that [participating in EA process] was engagement and consultation and accommodation…It was just something we thought we had to do because the land claims were going so slow that we decided in the interim that we better make sure to occupy the field and protect our resources and our territory while we get our land claims through our courts. (Walpole Island First Nation Member 2, Personal Communication, Interview, May 17, 2019)

While trade growth was not their primary objective, WIFN not only needed to ingratiate this primary objective of the project, they needed to become a part of it. Realizing treaty rights through other avenues was not happening, and therefore cooperating in the trade growth objective was viewed by the First Nation as a viable option.

Alongside expressing treaty rights, WIFN also desired to increase economic development opportunities for the First Nation. Yet, just as treaty rights were subordinated to the trade growth objective so too was an Indigenous economic development agenda. My analysis of the data collected is that WIFN’s economic development concerns remained secondary to economic priorities of infrastructure financiers and political leadership. While WIFN sought concessions in the contractual apparatus for Indigenous economic development such as a greenhouse for native plant species, these aims were brought into direct conflict with the aims of enhancing trade growth and realizing returns on investment for infrastructural financiers. Land use in the development of the Parkway project gave way to land exchange, where value was captured in contracts distilled from the promise of trade growth and returns on infrastructural investments. The promise of this “rising tide lifts all boats” assumption from economic growth by way of infrastructural development is a fallacy, however. In the case of infrastructure and investments in the built environment, the promises of trade growth through infrastructure can at best be temporarily realized. This temporary realization of value through infrastructural investment is
what David Harvey calls a spatial fix to capitalism’s overaccumulation crisis (Harvey, 1981, 2006).

Harvey describes the spatial fix as "capitalism’s insatiable drive to resolve its inner crisis tendencies by geographical expansion and geographical restructuring” (Harvey, 2001, p. 24). Capital must constantly accumulate in order to preserve the social relations at the heart of the capitalist mode of production. The inevitable tendency of overaccumulation, therefore, is frequently resolved by sinking latent capital into the built environment in the form of infrastructural investment; however, this investment into the built environment is only a temporary resolution as over time the capital sunk into infrastructure becomes less productive (Harvey, 2014). In the case of the Herb Gray Parkway, latent capital was sunk into a trade infrastructure project that promised economic growth. The returns on this capital are disproportionately directed towards the Parkway's financiers in the form of a guaranteed 30-year contract for the Windsor Essex Mobility Group to maintain and operate the Parkway. I suspect that by the end of this contract the Parkway’s financiers will have accumulated all of the value they could from this spatial fix and will have leveraged the capital they gained out of the Parkway’s contractual apparatus for further infrastructural investments in different geographic contexts. Meanwhile, WIFN will be required to do the same with their much smaller contracts.

Securing value from infrastructure in a contractual apparatus that can be later leveraged for Indigenous economic development is difficult, however. In the case of the Herb Gray Parkway, one Government representative felt that:

There were so many different companies and moving people and contractors and sub-contractors within the public-private partnership that negotiating the economic needs of the First Nation was not always a priority (Government Official 3, Personal Communication, Interview, August 23, 2018).
For their part, WIFN had been and continues to be interested in experimenting within a PPP framework to secure more beneficial partnership arrangements. As one research participant explained PPPs must make space for Indigenous communities’ unique rights in collaborations.

One of the things missing [in PPP procurement models] is that there’s no equity position for the First Nation. A big rallying cry with Walpole and a lot of First Nations is equity. We want to actually own a piece of something. That doesn’t necessarily mean just give us equity; provide opportunities for us to achieve that equity (Walpole Island First Nation Member 1, Personal Communication, Interview, June 6, 2018).

It is useful to connect WIFN’s aspiration for infrastructural ownership to spatial fixes. In a spatial fix scenario, capital effectively switches to new “distinctive regional, sectoral and organizational configurations” and a radical reconstruction of physical and social infrastructures” in order to temporarily maintain the accumulation of capital (Harvey, 2006, p. 431). WIFN attempts at owning infrastructure assets is a desire to take advantage of these capital switches and the new infrastructural investment opportunities that emerge from them. In order to take advantage of the revitalized accumulation of capital in the built environment of the Detroit River border region, Walpole Island First Nation tried to influence the course of financial distribution by advocating for preferential language for First Nation involvement in the procurement documents of the Herb Gray Parkway (Walpole Island First Nation Member 1, Personal Communication, Interview, June 6, 2018). Walpole Island First Nation continuously leveraged their unique position to try and get closer to the financial mechanisms of infrastructure ownership. Nevertheless, and in spite of the special rights and privileges reserved for First Nations, they were limited in their ability to challenge the dominance of infrastructural financial actors, and provincial and federal government agencies over the direction and flow of financial opportunities and contracts emerging from large infrastructural projects. While Walpole Island First Nation focused its economic development strategy around owning infrastructural assets in
its traditional territory, the external projects of the First Nation have largely been to negotiate subcontract within a larger contractual apparatus dominated by trade growth and return on investment for infrastructural financiers. According to the frustrations of one participant,

We do not have a whole bunch of cash to bid on these projects. It would be nice if the province worked to secure a position for First Nations within these major infrastructure projects within an equity position. It could be a single first nation, it could be a whole bunch. (Walpole Island First Nation Member 1, Personal Communication, Interview, June 6, 2018)

The truth of the matter is that the contractual apparatus and the distribution of benefits and risks within it remained largely in control of the international infrastructure finance. The various actors that controlled different proponent organizations at each phase (e.g., EA phase, alternatives phase, preferred alternatives phase, construction, etc.) were constantly shifting through corporate acquisitions and mergers. For example, URS became AECOM, which handled the Archaeological and Environmental assessment phases. Then the Parkway management team under WEMG consisted of a private consortium that financed the project primarily through European capital. With the Parkway exemplifying how infrastructure planning and development is connected to the global world of finance, it is hard to imagine that concessions within the contractual apparatus of trade infrastructure will become more favorable for Indigenous communities unless there is a major power shift within the trade growth objective at the border.

Relationship Building in a Contractual Apparatus

While the promise of trade growth as a universal good is an illusion and WIFN’s demands were limited to secondary objectives within the contractual apparatus, the outcome of relationship building from the project is more nuanced and in need of further exploration. According to Roberts and Siemiatycki (2015), a meaningful relationship in a public-private partnership requires a “more expansive conception of who constitutes a partner in the
PPP...[and] codified parameters for consultation that include[s] a consensus model” (p. 791).

WIFN did expand the meaning of partner by advocating for full inclusion in the Herb Gray Parkway project. In the basic sense, the willingness to recognize a First Nation (neither a public nor private entity) as a partner in the project is something to commend—albeit that is a low bar for success. Advocates for the decolonization of the planning process set the bar much higher by critiquing simple inclusion as a stakeholder as failing “to appreciate the depth and breadth of aspirations held by Indigenous peoples, and the extent to which an Indigenous domain is always operating…alongside modern legal and administrative processes” (Porter, 2006, p. 388).

Indigenous inclusion as stakeholders in a project, therefore, assumes Indigenous communities need to be part of the formal western planning process in order to be included and does not recognize Indigenous planning of their communities has been happening since time immemorial. Fawcett et al. (2015) instead argue that planning should be a political and cultural project that requires co-production between Indigenous and non-Indigenous partners. The question remains whether or not meaningful relationships were built in the public-private partnership of the Herb Gray Parkway. At first breath, the answer according to all of the participants in this research study was an emphatic “yes”: According to one participant, “The key is the continued and sustained relationship that evolved over time. It starts from understanding our mutual trust and seeing opportunities to achieve those during the project and those opportunities at the beginning we had no idea what they were” (Government Official 3, Personal Communication, Interview, August 23, 2018). According to another provincial official:

We convinced Walpole that they could trust us. That came at a key stage of the environmental approval stage. There was very little time for approval, and [Walpole Island First Nation] didn’t have any defining economic benefits, but we managed to say “we’ve gotten a bunch of contracts that we’ve been talking about and we’re going to continue to work with those.” (Government Official 2, Personal Communication, Interview, July 5, 2018)
Likewise, WIFN participants celebrated the partnership. According to one participant:

> When we came to the table on the Herb Gray parkway we already had a reputation and when they saw us in action they knew that we were serious and they did reciprocate the nature of our involvement and they put a team together to work with us. And I think it was the joint teams that were really successful not just Walpole Island because you need somebody across the table that understands engagement/consultation and making/doing good things. (Walpole Island First Nation Member 2, Personal Communication, Interview, May 17, 2019)

According to another participant, "we just started working together as much that things became a lot more collaborative. To the point where MTO really started to advocate for Walpole Island.” (Walpole Island First Nation Member 1, Personal Communication, Interview, June 6, 2018).

These comments should be taken seriously, and if participants expressed that a positive relationship was built then that should certainly be trusted and acknowledged.

That being said, incorporating critical theory and perspectives from radical geography and decolonizing planning scholars adds a level of critique. For one, this consensus around having built a meaningful partnership also requires a general consensus around a shared objective of the trade growth in the region. This echoes Roberts and Siemiatycki’s call for “codified parameters for consultation that include[s] a consensus model” (2015, p. 791). As discussed above, the consensus according to the government planners was that the Parkway was a “border crossing first” (Government Official 2, Personal Communication, Interview, July 5, 2018). While WIFN engaged with little hesitation in this growth consensus, there is evidence of some conflicting views regarding the First Nation’s commitment to this consensus:

> a lot of the issues that First Nations are grappling with today is collective communal issues versus private interest. That’s been a real struggle for us to try and deal with moving from more collective to more individual rights in our community. (Walpole Island First Nation Member 2, Personal Communication, Interview, May 17, 2019)
This tension between individual and collective rights in Indigenous communities is not unique to Walpole Island First Nation—especially as it relates to the promises of economic development. Pasternak (2015) notes that while some Indigenous people see individual rights through the market economy (i.e., liberal rights of private property) as a potential means of empowerment, others see “Indigenous self-determination struggles—including those for economic rights—as a fight for collective territorial rights” (Pasternak, 2015, p. 180). WIFN’s engagement within the contractual apparatus of the Parkway, however, meant the First Nation tacked into the realm of liberal property rights, and therefore a partnership of individual competition and trade growth consensus.

Finally, while the working relationship between government planners and WIFN was discussed positively by participants, it is worth noting that the relationship was not without its tensions. At times, certain government agencies, whether MTO or the Ministry of Natural Resources, did not know how to respond to WIFN’s clear expression of treaty rights. One research participant wanted to move beyond this dynamic with Walpole Island First Nation, explaining “what I think was interesting was moving from a rights-based discussion with First Nations to a collaborative approach to meeting all parties’ interests and needs to get this project completed” (Government Official 1, Personal Communication, Interview, June 28, 2018). This comment speaks to how in this case, a meaningful partnership required setting aside “a rights-based discussion.” However, as indicated earlier, expressing treaty rights was a huge component of WIFN’s involvement. Vitally, while the answer to the question “was the Herb Gray Parkway PPP a meaningful partnership” was yes according to research participants, critical contributions help explain that the definition of meaningful is somewhat limited within the confines of the Parkway’s contractual apparatus.
Conclusion

This case study shows how financial forces within a border infrastructure project distribute contractual arrangements to various infrastructural actors even within special contexts that include Indigenous participants in the planning and development of major infrastructure projects. The key takeaways from such an analysis demonstrate the ways in which governments invest significant public funds under the promises of trade-derived economic growth into privately-controlled assets that further securitizes infrastructure performance for mobile financial investment entities. The politicians, developers, investors, contractors, and engineering consultants engaged in the planning and development trade infrastructure arrange themselves within this speculative apparatus in the hopes of ever-increasing contractual opportunities.

However, while it is clear that a growth consensus shapes the nature of the planning process of major infrastructure as well as the final outcome, it should not be assumed that this operates automatically and similarly in any given context. In fact, it will be interesting to observe exactly how the financial landscape and the contractual arrangements of border infrastructure will change in light of emerging trends in the global economy. Will major infrastructure investments from China within the global South continue to emerge as part of the Belt and Road Initiative? Will Western governments continue to eschew free trade relations in response to growing discontents of globalization and the right-wing thrust of trade protectionism? Will growing economic conservatism in North America limit the public expenditures mobilized for projects such as the Herb Gray Parkway that show a massive public divestment to the private sector under PPP organizations? Threaded throughout all of these questions are still the unique situation of how Walpole Island First Nation was enrolled into the Herb Gray project.
The engagement of Indigenous communities with the Gordie Howe International Bridge and, at least on the Canadian side, planning with Indigenous peoples remains a particular approach to planning and development of infrastructure within traditional territories of various Indigenous nations. Many of the participants in this study indicated that it would be difficult to emulate the best practices of this project. The possibility of taking up these approaches to planning and development with Indigenous peoples is limited to the unique context of the Herb Gray project. That being said, the spirit of collaboration is rich with possibilities and the interlocutors of this study see those possibilities unfolding between First Nations and government agencies. As these projects do emerge it will be important to link these cases to further study, both from the theoretical perspectives utilized in this paper as well as drawing on more diverse perspectives. There is also the immediate question of what the Gordie Howe International Bridge will reveal about the significance of the Herb Gray Parkway and this paper’s analysis. In many ways, the Gordie Howe International Bridge is a direct continuation of the work done on the Parkway. As such, it remains to be seen how the planning and development of the bridge, particularly in relation to Indigenous communities, will take place.

Finally, it is important to highlight the importance of the persistence of Walpole Island First Nation to their historic and significant involvement in the planning and development of their traditional territory. While the financial and contractual arrangements laid out in the case of the Herb Gray Parkway are potent forces for contemporary infrastructure planning and development, the Windsor-Detroit border region has a much deeper historic significance as the traditional territory of several Indigenous Nations, including Walpole Island First Nation. It cannot be understated that this rich history was brought into the practice of contemporary infrastructure planning and development and will have lasting impacts and consequences on
Western infrastructural planning. Even if the above questions surrounding border infrastructure and trade trends are resolved, future analysis will also have to account for the unique involvement of Indigenous communities moving forward. As indicated above, planning and development literature around stakeholder consultation and participatory planning cannot fully comprehend the involvement of Indigenous communities. As such, alongside this paper’s analysis of economic and trade relations connected to border infrastructure, I hope that is also contributes to an understanding of planning and development with Indigenous communities around major infrastructure projects in general. If infrastructure projects truly capture complex social relations within the planning, construction, and maintenance of their intended uses, then certainly Indigenous presence in these processes will continue to have outlasting influence on the social shaping of future infrastructure projects.
Chapter 6

Conclusion

This conclusion serves to summarize key explorations in the collective study of the theoretical, historical, and empirical linkages of trade infrastructure at the Detroit River, as well as account for certain limitations, and speculate on further areas of inquiry into the study of trade infrastructure. The core argument of this study integrated the theoretical, historical, and empirical elements of the social relations of capitalism in the planning and development of trade infrastructure. This study explored the financialization of infrastructure; the unique characteristics of public-private partnerships, particularly as they relate to Indigenous communities that are also impacted; the maneuvering of individual actors within the contractual apparatus; and the continuum of different contractual arrangements that negotiate the ways in which finance is distributed throughout the life cycle of the infrastructural asset. In doing so, this study offers a unique perspective into the historic and contemporary mobilization of infrastructure for the purposes of trade through identifying the practice of planning as maneuvering through a contractual apparatus dominated by international finance.

Contributions to the Study of Trade Infrastructure

The theoretical contribution of this study is the articulation of a contractual apparatus in the planning and development of trade infrastructure dominated by financial interests. Specifically, I challenge the assumptions made by the World Bank’s efforts to enhance trade corridors around the world that enhancing capitalist trade is universally beneficial to border communities. Beginning with a Marxist critique of capitalist trade, I argue that enhancing trade in a capitalist system simply expands the economic relations of capitalism to a nation-to-nation
scale whereby trade becomes a practice of defrauding one another on an international level (Marx, 1939/1993c). Trade infrastructure’s placement within this global arrangement, therefore, distributes these economic relations within the planning and development context. Through my analysis, I demonstrate that infrastructural finance networks play a key role in securing wealth through the trading of infrastructural assets within the global marketplace. The necessary material investment of this asset trading is consolidated within a complex contractual apparatus, whereby multi-national developers compete in a bidding war to receive large contracts, while local entities tend towards a limited access of smaller contracts. The result of this power-laden and complex contractual apparatus is that very little of the financial leveraging is reinvested in the local communities where the infrastructure is located — and instead the value derived from the infrastructure investment is reintegrated into the realm of global finance (Tricarico & Sol, 2016). In this way, my argument supports what has been seen as the overall financialization of infrastructure (O’Neill, 2013; O’Neill, 2015) while providing insight into the unique characteristics of this financialization within the context of trade infrastructure and suggesting that the planning profession in border communities need not cede the benefits of trade infrastructure planning to a financial class.

The historical contributions of the study explore the theoretical arguments within a historical case study of the Detroit River Tunnel Company and the first successful infrastructural crossing of the Detroit River completed in 1911. Archival analysis of this case study revealed the roots of modern infrastructural financialization in the consolidation of railways and the corporate collusion of infrastructural robber barons in the Gilded Age of the late 19th century. Despite the triumphal narratives associated with the purity of railway engineering in this era, the completion of the Detroit River Tunnel between 1871 and 1911 was one riddled with financial and
contractual intrigue. H.B. Ledyard’s Michigan Central dabbled in the coercive practices of crony capitalism, engaging the State in securing contractual rights to the project and mitigating Canadian and British capital’s investment potential in a major infrastructural network. Benefiting from the Vanderbilt’s rail empire in the northeast, Ledyard’s Michigan Central positioned itself into monopoly control over all rail traffic that traveled across the Detroit River for decades to come. Meanwhile, private engineering firms were made to quibble over the social technologies of infrastructure in order to stake out a claim to the contractual apparatus emerging from the financial network of global railway magnates. The bitterness of Duncan McBean’s denied testimony to the Institute of Civil Engineers regarding the technology used to complete the Detroit River Tunnel in 1911 illuminates the fraught nature of infrastructural contracts and the power that infrastructural finance has to shape them (McBean, 1912).

The empirical contributions of this study draw the theoretical and historical explanations of trade infrastructure into the realm of contemporary trade infrastructure planning. Specifically, I explore the contractual apparatus of trade infrastructure within a new context of planning with Indigenous peoples. In doing so, this research provides nuance and greater subjectivity to the relationships built within the contractual apparatus. I show that, in spite of the complex maneuvering of global finance within the planning and development context of the Herb Gray Parkway, Walpole Island First Nation and the Ontario Ministry of Transportation engaged in meaningful collaboration that resulted in mutual benefit. Still, and as my analysis illustrates, the pitfalls of the financialization of infrastructure meant that Walpole Island First Nation struggled mightily to incorporate their rights within the contractual apparatus through the procurement phase and into the formation of a public-private partnership. Encouragingly, the First Nation has effectively leveraged their experience from the planning and development of the Herb Gray
Parkway, but until greater infrastructure equity is granted to Indigenous peoples from development within their traditional territory, the contractual apparatus of infrastructural planning and development will remain precarious.

**Limitations in Theory and Method to the Study of Trade Infrastructure**

The limitations of theory and the limitations of method are interconnected in this study. To begin, theoretical frameworks are inherently limited in their interpretation, and while I was upfront about anchoring this study within a Marxist analysis of economic relations this means, of course, that the analysis of the data is obviously skewed in that direction. A Marxist framework, in this case, prioritized economic relations of infrastructure. A competing theoretical framework that explored other social relations of infrastructure, especially those relations rooted in colonialism, would have provided space for alternative points of analysis. This is true particularly considering the location of the historical and empirical case studies at the Detroit River. I also did not delve deeply into the historical and ongoing displacement of Indigenous peoples from the land surrounding the Detroit River. This is important because infrastructural development is rooted in the legal and political frameworks of land ownership within a settler colonial context. In order for a financial entity to make infrastructural investments, and a First Nation—in this case, Walpole Island First Nation—to claim rights to engagement and accommodation around those investments, a colonial system of Indigenous displacement from traditional territories needed to be in effect.

While this study did explain this history of displacement through the relations of capital, the opportunity exists to go into greater detail with the colonial relations at play. Interpreting the data from theory and through historical and empirical contexts within a purely critical
Indigenous perspective would perhaps provide an explanation of infrastructural investment as a mechanism for securing State claim over traditional territories. Alternatively, perhaps a framework more informed by the liberal politics of reconciliation would see the steps made towards Indigenous economic development by Walpole Island First Nation in a more transformative light—structurally reforming settler-Indigenous relations. Any of these arguments could be legitimately engaged in; however, they should not take away from the rich analysis allowed by a more strictly Marxist interpretation of the data, as I have presented in this study.

The limitations in method were largely discussed in the Methodology chapter of this study, but deserve repeating here—specifically as they relate to the above theoretical limitations. As discussed in the Methodology chapter, my methods prioritized breadth over depth. I used a diverse set of methods (interview, archival, and document and textual analysis) to gather data for this collective study; moreover, I explored the case of the Herb Gray Parkway across a wide historical and theoretical plane. In doing so, I believe I was successful in gathering enough data to make a general argument for the dominance of finance in the contractual apparatus of trade infrastructure, out of the context of infrastructural planning and development at the Detroit River. Still, in my desire to bring together the breadth of theoretical, historical, and empirical context—and with the breadth of data from a variety of sources—abstraction was necessary to develop a connecting argument. For example, data revealing the ecological and environmental contracts granted to WIFN as part of the collaboration with MTO focused on the contractual relationship and less on the actual environmental deliverables of the project. Abstracting to the level of economic relations prioritizes the ways in which capitalism shaped the infrastructural outcome of this project. This abstraction was present across the broad narrative linking the theoretical, historical, and empirical elements of this study of infrastructure at the Detroit River.
This abstraction is sound within the Marxist tradition (Sayer, 1987), but that does not mean honesty in limitations should be avoided. Exploring greater depth into a singular element of this study (e.g., environmental planning with Indigenous peoples) might achieve a greater balance of inductive-deductive processes and result in less of a reliance on theoretical abstraction.

**Further Relevance and Research Potential**

This study contributes to a broad body of research that features infrastructure as a body of analysis (Anand et al., 2018; Larkin, 2013). Specifically, it is anchored in the traditions within urban geography and planning scholars that focus on the materiality of the global economy expressed in infrastructure networks (Graham & Marvin, 2001; McFarlane & Rutherford, 2008). The aim of this study was to contribute to that research conversation, and I hope its relevance will be clearly seen within that scholarly body. Beyond the academic conversation, this study offers insights into a shifting landscape of global trade and the changing politics of infrastructure, borders, the nation-state as well as the continuing conversations on the financialization of the built environment. I bring attention to the necessity of paying careful attention to the ways in which planning and development of major infrastructure is organized within the political, social, and economic interpretation of current infrastructural moments. At the time of writing, the Covid-19 pandemic has shuttered borders across the globe as well as threatened international supply chains that had become increasingly dependent upon just-in-time processes (Ivanov & Dolgui, 2020). The infrastructural investments that had been made into the global trade networks to create the slippery world of globalized capitalist free trade are under threat, not only by this evolving public health crisis, but by the shifting political winds of the rising nationalist right. Just as the Covid-19 pandemic has impacted global trade, the economic
nationalist ideology threatens the neoliberal hegemony of globalization. The built environment of
the last 40 years has operated under the assumption that removing barriers to global flows of
people, goods, services, information, and capital will universally enhance global wealth. What
will happen to these infrastructural investments if the changing political and public health
landscapes prove to be more than just a temporary deterrence from the grand schemes of
globalization? Moreover, what of the impending climate crisis? Can current infrastructure meet
the needs of mass migration due to climate change? The political, economic, and environmental
tailwinds are already beginning to steer infrastructural investment toward the securitization of
borders (Simmons, 2019). While capital is likely to preserve its global mobility, facilitated by
new trade infrastructures, enhanced security measures will most certainly mitigate the necessary
movement of people displaced by global conflict, environmental disaster, and ongoing public
health crises.

If the bleak outlook painted above is more than just hyperbole, there are some important
and hopeful lessons to be gleaned from this study. For one, Walpole Island First Nation provides
an example of how a First Nation can enter a tightly controlled contractual apparatus in order to
inform a large, capital intensive project. At least in the Canadian context, but perhaps in other
settler-colonial contexts as well, the unique nature of duty to consult and accommodate with
Indigenous peoples’ laws opens up new possibilities for the inclusion of Indigenous perspectives
into the planning and development process of large-scale infrastructure. For Walpole Island First
Nation’s part, they continue to leverage the experience learned from the Herb Gray Parkway
project in order to build greater infrastructural equity, and therefore greater influence over the
built environment within their traditional territory. The context in which WIFN achieved this
may not be able to be directly replicable, but the expertise and Traditional Knowledge regarding
their traditional territory, the emphasis on relationship building at the municipal and provincial levels, as well as establishing clear expectations around engagement and consultation can be generally applied to any planning and development context.

Outside of an Indigenous context, the more general lesson is that communities must look for moderate disruption opportunities in the contractual apparatus to carve out space for community benefits. While contractual concessions may never topple the financial entities that control infrastructural assets, the reality is that finance itself is dependent upon contracts, and subversive approaches to contractual reform may lead to broader systems change (Evans & Clark, 1998). This approach opens up political possibility within the planning and development process itself. Engaging with municipal and regional governments to change the ways in which procurement documents are drawn up, how contracts are awarded, and how risks and benefits are distributed can all lead to new planning and development paradigms that have broader implications outside of infrastructure itself. Social relations, in any historical context including our own, are not naturally embedded in human behavior, but arise out of political planning. The social relations of the built environment, therefore, are carefully planned. Knowledge of the planning process, and the willingness to transform it, can in turn alter our existing social relations into something more just and equitable.
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168


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Appendix A
Timeline of the Detroit River Tunnel Company Project against the Consolidation of American and Canadian Railways

Project Timeline
- 1870 - First Detroit River Tunnel Company Incorporated
- 1872 - Work Commenced on First Attempt - Accident
- 1873 - Panic of 1873
- 1876 - First DRTC Charter Extended
- 1883 - First DRTC Charter Expires
- 1896 - Canada-Michigan Bridge and Tunnel Company Incorporated
- 1906 - Work Commenced on Second Tunnel Attempt
- 1911 - Tunnel Open for Traffic
- 1910 - Work Completed on Second Attempt

New York Central Railway
- 1867 - Michigan Central Purchased by New York Central

Michigan Central Railway

Canada Southern Railway
- 1883 - Canada Southern Leased to Michigan Central

Great Western Railway

Grand Trunk Railway
- 1882 - Grand Trunk and Great Western Merge

1866 1870 1874 1878 1882 1886 1890 1894 1900 1904 1908 1912
Appendix B
General Research Ethics Board (GREB) Approval Letter

July 08, 2020

Mr. John Haffner
Ph.D. Candidate
Department of Geography and Planning
Queen’s University
Kingston, ON, K7L 3N6

Dear Mr. Haffner:

GREB TRAQ #: 6021328
Title: “GEOPL-225-17 Infrastructure as Social Process: The Herb Gray Parkway and the Capital-Colonial Relation in Transportation Infrastructure Planning”

The General Research Ethics Board (GREB) has reviewed and cleared your request for renewal of ethics clearance for the above-named study. This renewal is valid for one year from July 13, 2020. Prior to the next renewal date, you will be sent a reminder memo and the link to ROMEO to renew for another year. You are reminded of your obligation to submit an Annual Renewal/Closure Form prior to the annual renewal due date (access this form at http://www.queensu.ca/traq/signon.html; click on “Events,” under “Create New Event” click on “General Research Ethics Board Annual Renewal/Closure Form for Cleared Studies”). Please note that when your research project is completed, you need to submit an Annual Renewal/Closure Form in Romeo/traq indicating that the project is ‘completed’ so that the file can be closed. This should be submitted at the time of completion; there is no need to wait until the annual renewal due date.

You are reminded of your obligation to advise the GREB of any adverse event(s) that occur during this one-year period. An adverse event includes, but is not limited to, a complaint, a change or unexpected event that alters the level of risk for the researcher or participants or situation that requires a substantial change in approach to a participant(s). You are also advised that all adverse events must be reported to the GREB within 48 hours. To submit an adverse event report, access the application at http://www.queensu.ca/traq/signon.html; click on “Events,” under “Create New Event” click on “General Research Ethics Board Adverse Event Form.”

You are also reminded, that all changes that might affect human participants must be cleared by the GREB. For example, you must report changes in study procedures or implementation of new aspects into the study procedures. Your request for protocol changes will be forwarded to the appropriate GREB reviewers and/or the GREB Chair. To submit an amendment form, access the application at http://www.queensu.ca/traq/signon.html; click on “Events,” under “Create New Event” click on “General Research Ethics Board Request for the Amendment of Approved Studies.”

Note: Due to COVID-19, human participant research policies, in relation to hospital and non-hospital based research, are being continually updated. Many restrictions are now in place with respect to in-person research. For the most current information on the COVID-19 impact on research, please visit https://www.queensu.ca/vpr/covid-19. For information directly related to GREB please visit the Research Ethics FAQs.

On behalf of the General Research Ethics Board, I wish you continued success in your research.

Yours sincerely,

Chair, General Research Ethics Board (GREB)
Professor Dean A. Tripp, PhD
Departments of Psychology, Anesthesiology & Urology Queen’s University

c.: Dr. Leela Viswanathan, Supervisor
Dr. Anne Godlewka, Chair, Unit REB
Joan Knox, Dept. Admin.