

Wasted Potential: A Food Waste Reduction Strategy for Toronto
Restaurants

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Abstract:

Food waste occurs at every stage of the value chain (Lipinski et al., 2013). The issue of food waste within Canada has recently received more attention from policy makers, industry and consumers for its economic, environmental and social impacts (Abdulla et al., 2013; Gooch et al., 2010). Research and policy efforts though have focused predominantly on the household and how to reduce food waste in this location. Research is lacking on how to address food waste at the service industry level.

This research study examines how restaurants in Toronto handle their waste, and in what way current policy encourages or discourages waste reduction by restaurants, in order to propose a waste reduction strategy for the future. Municipalities in Canada currently face serious issues regarding the management of their solid waste, with a general acceptance emerging of the unsustainability of landfills, and with decreasing space for them. Further, with food waste, it is not just the products themselves that are lost; it is the energy, water, packaging and human resources used in production, transportation and food service (Gooch et al, 2010). Finally, we operate within a culture of “disposability” (Evans, 2013) and so education initiatives are needed to gain support of both restaurant owners, workers and the consumer to commit to waste reduction.

There exists a policy vacuum in Toronto, whereby restaurants send their food waste and its associated packaging to landfill, because the lowest cost option is to only pay for garbage pick-up. This research will attempt to answer how municipalities, restaurants, and consumers can collectively reduce the amount of food waste produced, and redirect what remains away from landfill. This research provides suggestions for education initiatives that could be quickly

implemented by the city and restaurants to foster a commitment by restaurant staff and restaurant customers towards the goal of reducing the amount of food waste produced.

This paper uses a mixed-method approach relying on document analysis and interviews with relevant actors in the restaurant industry. The paper begins by exploring issues in the industrial food system that result in the current levels of food waste. It then identifies the current context of restaurants in Toronto. The second part of the paper, using a transition framework, is devoted to offering a mix of policy, regulatory and educational suggestions for reducing food waste in the food service sector. These research findings demonstrate the vital role of the state in guiding industry waste practices, and indicate substantial regulatory changes are required to achieve substantial reductions in restaurant food waste.

Foreword

This major paper is being submitted to partially fulfill MES degree requirements. My learning in the MES program consistently challenged my views and beliefs, and expanded my understanding of the three components of my area of concentration. The interdisciplinary nature of this program allowed me to explore the pertinent issue of restaurant food waste. More importantly it equipped me to make connections across the food supply chain in order to explore broader systemic changes necessary to tackle the enormous food waste issue in Canada. Having worked more than two years at the Works Burger Chain Restaurant this research and its questions are of particular personal significance to me.

The research involved in the composition of this major paper relates to my area of concentration, components, and fulfills a number of learning objectives outlined in my Plan of Study. This research contributes to my understanding of the forces that generate food waste so as to better analyze possible solutions (Learning Objective 3.1). It also explores the current policy

that pertains to food waste at the municipal, provincial and federal level (Learning Objective 3.2). Finally, because this research attempts to design solutions moving forward that align the restaurant industry with goals for health promotion and environmental sustainability, I learnt about community initiatives to mobilize around the food waste issue and address policy gaps (Learning Objective 3.3) Education is a central component to reducing restaurant waste, exploring the connection between food security, food education and food waste (Component 2), and helping to fulfill my requirements for the Diploma in Environmental/Sustainability Education.

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Part I

Chapter 1: Introduction

1.1 Connection between food waste and the industrial food system

Currently, the globalized food system is built on the capitalist growth expectation to continuously increase food production. A significant consequence of this drive to increase output is that an enormous amount of food is wasted. As such, “food waste is the Achilles Heel of the modern food system, revealing many of its structural weaknesses” (MacRae et al., 2015, p.1). The Food and Agricultural Organization (FAO) (2011) estimates that one-third of food produced for human consumption (1.3 billion tons) is wasted along the food chain annually. Food is lost or wasted throughout the Food Supply Chain (FSC), from the initial stage at the farm to the final stage of consumption (Papargyropoulou et al., 2013; Parafitt et al., 2010). Recently, food waste has garnered much more attention in research, the media and government. Films such as “Just Eat It” (Rustemeyer & Grant, 2014) a documentary about food waste, and anti-capitalist actions such as dumpster diving highlight the unfathomable amount of food that is wasted. Many of the reasons for this waste can be attributed to an industrial system of food production and consumption. In addition to environmental and economic impacts food waste also has social implications (Papargyropoulou et al., 2014). There is a moral and ethical dimension of wasting food, particularly in relation to the inequality between, on the one hand wasteful practices, and on the other food insecurity and poverty around the world (Bloom, 2010; Evans, 2013; Stuart, 2009).

The Canadian food system and associated policy does not encourage food waste reduction. For instance, supermarkets demand an aesthetic perfection in produce that is difficult

for farmers to achieve. If fruit and vegetables do not meet these purely cosmetic standards, they are downgraded for processing, disposed of or are left in the field to rot (Stuart, 2009). Stuart (2009) comments, “[T]he size of profit margins and the low cost of food waste disposal influences the amount of waste retailers create” (p.17). The appearance of abundance is believed to be attractive to consumers (Gunders, 2012) and as such they have held an unsustainable aesthetic standard for produce at the supermarkets (Stuart, 2009), a standard partially created by the food industry. It is cheaper to waste than run out of something or put customers off with empty shelves.

What constitutes food system waste and how to define and quantify it for research purposes has been often debated in the literature. Direct food waste is only one part of the resource waste that characterizes the Canadian food system (MacRae et al., 2015). The FAO defines food waste as wholesome edible material, intended for human consumption, that is lost at any point in the FSC (FAO, 2011; Parfitt et al., 2010). Within the general definition of food waste, there is often a distinction between *food loss* and *food waste* (Uzea et al., 2014). Food loss refers to the decrease in food quantity or quality, which makes it unfit for human consumption. Food loss takes place at the production, post-harvest and processing stages (Parfitt et al., 2010). Food waste on the other hand is often used to describe only those losses that occur at the end of the food value chain, such as at the food service or household level (Papargyropoulou et al., 2013). My selected food waste definition is discussed in Chapter 2, Theoretical Frameworks.

In Canada, there is no commonly accepted definition of waste, and therefore no common measures for food waste and its impacts (Uzea et al., 2014). Research to date mostly focuses on avoidable (ex. leftovers), rather than unavoidable (ex. fruits pits or bones) food waste (Gooch et al., 2010). Food waste occurs at all stages of the food value chain in Canada (Parfitt et al, 2010)

and several studies within Canada have identified this as problematic for resource use and water disposal (Abdulla et al., 2013; Gooch et al., 2010; Uzea et al., 2014). Cuellar and Webber (2010) estimate that the energy embedded in wasted food represents approximately 2% of annual energy consumption in the United States.

The current food waste situation in Canada prompts the question, how did we get in this dilemma? Such high levels of food waste in the industrial world are a relatively recent phenomenon. A historical analysis of food waste demonstrates that following the Second World War food in Canada became cheap and abundant. In the prevailing ideology of “technological optimism”, there was no place for waste in the system if founded on productivity, efficiency and excess (Evans et al., 2013). Strasser (1999) identifies that “Western culture has become a throwaway society, a culture grounded in disposability and convenience” (p.18). Waste is now seen as being “out of sight, out of mind”. A major shift in the way food was produced, processed, distributed, consumed and disposed began in the 1950s and 1960s. Abdulla et al. (2013) concluded that total food wasted per capita in Canada increased 40% from 1961 to 2009, outpacing increases in food availability over the same period. A recent study of food waste in Canada, done by Gooch et al. (2010) concludes that approximately 40% of food produced in Canada is not consumed, representing a lost value of \$27 billion annually. The statistics on food waste are astonishing in themselves, but when set against the backdrop of climate change, peak oil and global food insecurity, the topic of food waste takes on a pressing urgency.

Awareness of the loss of nutrients from food waste (Griffin et al., 2008) and its impact on the economy and the environment, is growing nationally (Abdulla et al., 2013). For instance, in the United States (U.S.), the production of wasted food requires the use of over 25 percent of the total freshwater in the U.S, about 300 million barrels of oil and represents two percent of annual

energy consumption (Thyberg and Tonjes, 2016). It is estimated that the waste sector accounts for approximately 3% of global GHG emissions (Papargyropoulou et al., 2014). These statistics reflect how impactful the current global and industrial food system is on the environment; one means of reducing the environmental impact of food systems is to minimize the amount of food that is discarded (Thyberg and Tonjes, 2016). Despite this increased interest and awareness, the Canadian agriculture, food and beverage industries lack a unified strategy for addressing food waste (Uzea et al., 2014).

Only a few studies examine food waste within the Canadian context. Both Abdulla et al (2013) and Uzea et al. (2014) argue there is a shortfall of data to properly address factors contributing to food waste. For instance, it is not clear whether food waste should only include edible parts, or inedible parts too. Equally unclear is the distinction between preventable and unpreventable waste. Uzea et al. (2014) argue that “common definitions are critical to objectively and accurately measure the impact of food waste reduction initiatives on businesses, the home, the environment, and society” (p. 19). Unlike Canada, other countries such as the United Kingdom and the United States have taken more substantial steps to measure food waste. Abdulla et al (2013) argue that research in Canada should try to quantify food waste along the supply chain, from farmer to consumer. Food waste research also suffers from its dependence on self-reporting (Buzby and Hyman, 2012; Monier et al., 2010), which can result in under estimates (Parizeau et al., 2015).

When research, policy and education initiatives have been undertaken, they have predominantly focused on household and consumer waste, even though a number of studies have recognized that food waste occurs at every level of the food supply chain (Evans, 2012; Quedsted et al., 2013; Graham-Rowe et al., 2014). This stems from analyses such as those from Statistics

Canada stating that more than 50 percent of the estimated 27 billion worth of waste that ends up at landfills comes from Canadian homes (2010). The largest contributor to food waste along the food chain is the consumer (Abdulla et al., 2013; Gooch et al., 2010; Griffin, Sobal & Lyson, 2009), and this information taken in isolation has caused researchers and policy makers to primarily focus on household food waste.

Although households are frequently blamed for waste, the high level of waste at the consumer level is the product of “structural problematic relationships within food chains that drive up waste levels” (MacRae, 2015, p.24). Alexander and Gregson (2013), in research on the reasons for food waste, argue that “most policy interventions...ignore the fact that not all wastage in households is caused by the individual consumer. The consequence of this elision is that many responsibilities for dealing with food waste are passed on to the consumer, even if the cause is earlier in the food chain” (p.474). The proportion of food estimated to be lost along the Canadian Food Supply Chain (FSC) breaks down as follows:

- Home 51%
- Field 9%
- Packaging and Processing 18%
- Transport and Distribution 3%
- Retail stores 11%
- Food Service 8%

For this study, the 8% of food waste in Food Service is the most significant statistic.

Although 50 percent of food waste in Canada is occurring in the home, the other fifty percent is occurring elsewhere, and is receiving very little attention by policy makers, NGOs, and consumers. In this paper I attempt to draw attention to the waste that occurs in the food industry, focusing specifically on restaurant food waste in Toronto. Personal, research and policy reasons motivated me to focus on restaurant food waste in particular. My time working as a server in restaurants compelled me to notice the insufficient level of food waste practices within this

industry. Beyond the practical situation, research revealed a lack of study and data surrounding food service waste levels. Finally, restaurant food waste practices can be influenced positively or negatively by current policy, and my initial research revealed a lack of policy that motivated the current circumstance in restaurants.

This paper begins with the current context of restaurants, exploring what factors are constraining or enhancing their ability to reduce their waste. It then outlines how the City of Toronto regulates Solid Waste, and how this pertains to restaurants specifically. Toronto's Municipal Solid Waste policy acts within the constraints of Ontario's Solid Waste policies and so the Province's Waste policy will be explored as it pertains to the issue of restaurant food waste.

My research design is based on a mixed-methods approach, involving document analysis and semi-structured interviews. The foundation for my interviews is a review of the literature. As previously mentioned, the amount of food waste research generally in Canada is deficient, particularly in the context of the restaurant. I will be providing an overview of waste reduction efforts from several municipalities and organizations in order to propose best practices that can be adapted to the Ontario context.

Some important lessons can be learned from the work underway in Europe. Both the United Kingdom and the European Union have conducted research to better understand the drivers of the problem and identify potential solutions. In January 2012, the European Parliament adopted a resolution to reduce food waste by 50 percent by 2020, and designated 2014 as the "European year against food waste" (European Parliament, 2012). In the United Kingdom, the existence of this directive prompted numerous studies and detailed data surrounding food waste to be collected under the "Waste and Resource Action Programme" (WRAP). WRAP is an

independent non-profit organization with an international reputation for its research, expertise and advice in a number of areas including food waste reduction (MacRae et al., 2015). Beyond Figures proposed by Gooch et al. (2010), Abdulla et al. (2013) and Parizeau et al.(2015), are the only estimates on food waste in Canada.

As only a few studies examine food waste within the Canadian context, and there is a shortage of data (Abdulla et al., 2013), I will be considering the WRAP studies to gain a more thorough understanding of innovative approaches to reducing food waste. A large municipality that has undertaken efforts to reduce food waste is New York City. New York City initiated a “Food Waste Challenge” with restaurants to reduce food service waste, providing an example of igniting industry to reduce waste. Finally, very recently the City of Vancouver has partnered with WRAP UK to deliver their own “Love Food Save Waste” campaign and have directly targeted restaurants with a food waste reduction pilot project. The City of Vancouver also banned organics to landfill, a decision that impacts restaurants in Vancouver, and therefore will be considered for this research paper.

For the purpose of this research, only full service restaurants will be considered, including both chain and independents. To define full-service, I borrow the WRAP UK’s definition of full service, or what they refer to as “casual dining”: 24%-75% of food preparation is done on site; “these restaurants provide a table service and serve moderately priced food” (2013b, p.7). In comparison, fast food has less than 25% of food preparation done on site and these restaurants do not provide a table service (WRAP 2013b). The waste dynamics of fast food places are different enough that I decided to focus on full-service restaurants only. In this study, I will conduct an examination of how restaurants in Toronto handle their waste, and in what way current policy encourages or discourages waste reduction by restaurants, in order to propose a waste reduction

strategy for the future. Semi-structured interviews with restaurant owners and managers will focus on their experience with food waste, and attempt to highlight what context restaurants operate within as it relates to food waste. Further, interviews with other relevant organizations focus on their interactions with restaurants in Toronto, and how they perceive their role in impacting restaurant waste. Ultimately the premise of this work is that restaurant waste is an under researched area, and both the city of Toronto, and the province of Ontario cannot afford, environmentally or economically, to continue to ignore it.

1.2 The Specific Situation of Restaurants

In the case of restaurants, Bloom (2010) outlines how waste can be divided into two types: kitchen waste and plate waste. “Kitchen waste” includes foods prepared but not served, inventory casualties, and prep waste or scraps. The other waste, referred to as “plate waste” comes from what diners do not finish. This distinction is necessary for Part Two of this paper, as the location of the waste shapes the delivery of food waste prevention initiatives. In a survey of a range of food service operations, WRAP UK found that 21% of food service waste is from spoilage, 45% is from food preparation and 34% from plate waste (WRAP, 2012). This division of waste within restaurants reflects an opportunity for a combination of education and policy initiatives to collectively reduce food waste, and redirect the rest away from landfill.

Currently, research indicates that a rising portion of meals in North America are eaten “away from home” (Winson, 2013). Since 1981, Canadians have consistently spent about 34.0% of their annual household food expenditures at restaurants (AAFC, 2015). The amount spent on food outside the home has also steadily increased over time: “Expenditures on food eaten away from home increased from about one-third of total food expenditures in 1970 to almost one-half of total expenditures by 2003” (AAFC, 2015, p. 91) It is important when considering restaurant

food waste to note, that “chain restaurants have become the dominant form of restaurant operation in the United States” (Winson, 2013, p.208), and this conclusion can be extended to Canada as well (AAFC, 2015). In the United States, “even though there are a multitude of chains, the ten largest among them control over 50 percent of global sales from chains restaurants” (Winson, 2013 p.209). Most of the major American chain restaurants have expanded into Canada, and this domination of the restaurant scene by chains influences how food waste solutions are designed and impact how they will be implemented. For instance, in Ontario, chain restaurants accounted for 66.1% of restaurants, while independent restaurants were 33.9% of the total (GE Capital, 2015). Gunders (2012) studied where food waste is occurring in the United States and found that increased portion sizes are contributing to losses in food service and generating considerable plate waste. Increased portion sizes in restaurants is also contributing to overeating and associated health problems (Lipinski, 2013; Winson, 2013).

Large portion sizes in Canada can be attributed to a restaurant’s desire to stay competitive. Restaurants use larger portion sizes as a selling point to suggest to consumers that they are a bargain for the food they purchase (Young and Nestle, 2003). Bloom (2010) argues that “[T]he seeds of today’s 1,500 calorie entrées were sown in the 1970s. As fast-food eateries flooded the nation, getting a cheap, quick meal became easy. In the battle for customers, upping the amount served while only slightly increasing prices helped franchises gain attention” (p.128). Nutritionists though have repeatedly written that overeating and the resulting health problems it creates makes these meals anything but a good deal (Bloom, 2010).

The restaurant may share a common characteristic with other food sector businesses in Canada: not knowing the impact of waste on their profitability. Gooch and Felfel (2014) in their report on food waste, remark “How many items must a retailer, manufacturer, distributor, or

farmer sell to cover the costs borne from each item wasted or lost? To our surprise, this is a question that businesses typically cannot answer” (p. 5). A key finding from Uzea et al.’s (2014) report on industry food waste in Canada was that “Food waste is not a high priority for businesses. The primary reason for this is that most businesses do not know the amount of food that they waste and its real impact on profitability” (p.5). This finding reveals the need for both adequate data on food waste to comprehend the reality of food waste levels, and too well-trained owners or management to be able to act accordingly to the information.

One unique feature of the restaurant, in comparison to fast food locations or coffee shops, is that the consumer does not participate in separating waste. Although organics bins for food waste are virtually nonexistent in Toronto’s fast-food restaurants or coffee shops, there are still usually recycling and garbage visible for customers to see and place their waste in. In comparison, the waste bins are out of sight in a restaurant. It is up to the specific restaurant location and its staff to separate the waste. A customer in a restaurant does not participate in throwing out their waste, nor do they have any idea how the waste is disposed of. This adds another dimension to the “out of sight, out of mind” cultural value that is embedded in waste practices in North America.

1.3 Municipal Context: Toronto

I chose to focus on the City of Toronto for several reasons. To begin, my personal experience working in restaurants and observing restaurant waste practices as both an employee and customer has primarily been in Toronto. From my serving experience, I observed a disconnect between the waste policy, and how it practically played out in an actual restaurant. In addition, Toronto is a large metropolitan city in Canada, and solutions proposed for its restaurant waste could serve as an example for other Canadian municipalities, and beyond, looking to tackle industry food waste. Finally, the City of Toronto is heralded for its extensive public organics

waste collection program that started in 2002, and is one of the largest organic waste diversion programs in North America. The City operates substantial garbage and recycling collection, with an emphasis on waste reduction. Despite these environmental achievements, the private sector is primarily autonomous in their waste collection decisions, not connected to these City services. This dichotomy in Toronto provides an opportunity to examine the differences between public and private waste, and the differing policy, program and educational strategies that are needed specifically for the food industry.

In the City of Toronto (2015a), businesses over 500 square feet must arrange their own waste removal, and there are no rules, restrictions or incentives for having all three forms of waste (garbage, recycling, organic) collected. This means that “[F]rom a retailer’s perspective, if you could get your dumpster to get hauled for half the price to go to landfill than to a compost facility, it’s an easy choice. Their business is food, they need to make money to keep their costs down” (MacRae et al., 2015, p.28)¹. Gooch et al. (2010) conclude, “while dumping organic waste contributes significantly to greenhouse gases, current legislation makes it ‘too easy and too cheap to dump, and too difficult to do otherwise’” (p.7). Since businesses primarily arrange their own waste removal in Toronto, there is little data on what volume of waste restaurants dispose of, or how they do so.

The City of Toronto currently collects primarily from single and multilevel homes, some apartment and condominiums and even less so from private businesses. The collection program that the City runs for private businesses is called the “Yellow Bag Program”. The City has certain criteria for participating, and the business owner must submit an application to be considered. The most notable criteria for the program is that commercial establishments must be

¹ Policy analyst, Environmental Commissioner of Ontario, personal correspondence, February 25th, 2011

less than 500 square meters in ground floor space (City of Toronto 2015a). By 2015, in its totality, Solid Waste Management Services' customers included approximately 1 million homes and businesses. Of this 1 million, 461,500 are single-unit homes, and 422,000 are multi-unit homes. In comparison, only 14,000 of the 1 million are small commercial customers (City of Toronto, 2015c). This demonstrates how insubstantial commercial collection is for the city in comparison to the residential collection. If the business does not qualify for the Yellow Bag Program, then the business is on its own for setting up waste collection following certain provincial requirements that will be addressed in the "Ontario context" section of this paper.

Of those who receive City Collection, garbage, recycling and organic waste removal is offered. Garbage collection is a fee per bag system. Alternatively, the business can get bins from the City and pay the associated fees for those. If a business chooses to participate in the City program, weekly recycling and organics collection is free of charge (City of Toronto, 2015a). The waste that cannot be directed away to recycling or organics goes to landfill. Currently the City-owned Green Lane Landfill near London, Ontario receives all of the garbage that the City of Toronto collects and manages. On April 2, 2007, the City of Toronto officially acquired the Green Lane Landfill and by the end of 2010 stopped sending its garbage to a Michigan landfill (City of Toronto, n.d).

In 2013, Toronto City Council recognized the need for an updated comprehensive long term waste management plan and commissioned the development of a Long Term Waste Management Strategy. According to the City, "the draft Waste Strategy recommends waste reduction, reuse, recycling, recovery and residual disposal policies and programs, in that order, that are cost-effective, socially acceptable and environmentally sustainable for the long term" (City of

Toronto, 2016, n.d). The updated strategy is to be presented to Toronto City Council in June 2016.

One of the priorities of the Long-Term Waste Strategy is to maximize the life of Green Lane Landfill. Following the changing nature of the waste stream and reviewing the recent landfill information, the City now estimates that the life of the Green Lane Landfill could be extended to at least 2040. This is a significant extension of the timeline, from the previous estimate for reaching capacity in 2020. The extension of Green Lane relies on the implementation of the proposed recommendations in the draft Waste Strategy coming out this year (City of Toronto, 2016.). The recommended programs in the strategy require minimal capital investment, but have the potential to reduce the amount of material requiring management by the City by more than 30,000 tonnes per year once fully implemented (City of Toronto, 2016).

The draft of the long-term waste strategy puts a strong and clear emphasis on waste reduction. This strategy though is currently only directed at 14,000 of all the businesses in Toronto. The rest, including a significant portion of the restaurants in Toronto, operate within the City, but do not receive directives from them regarding Solid Waste. This relationship, or lack there of is problematic, and how it could be improved will be addressed in Part 2 of this paper.

1.4 Solid Waste Management in Ontario

Toronto's Municipal Solid Waste policy operates within the constraints of Ontario's waste regulations and legislation and so it is necessary when discussing Toronto restaurant waste to consider the waste policy in Ontario and how this influences the municipality and businesses of Toronto. The current Act governing industry in Ontario is titled the "Waste Diversion Act" (WDA) and was passed in 2002, and has not been significantly amended in 14 years. Waste Diversion Programs established under the 2002 WDA cover only 15 percent of Ontario's waste

stream, and no new programs have been established since 2009 (Government of Ontario, 2015). In the province of Ontario, “municipalities of more than 5,000 residents are required to offer leaf and yard waste and composting systems and encourage the use of home composting under the Regulation 101/94 Recycling and Composting of Municipal Waste (Government of Ontario, 2011). However, collection of other organic waste, such as food, is left to the municipality’s own discretion. Likewise, source separation programs for businesses, including restaurants, food retailers and institutions where food is served or produced, focus solely on recyclables. Ontario Regulation 103/94 covers regulations relating to source separation programs from industrial, commercial and institutional premises (Government of Ontario, 2011). Under this regulation, provisions are made for items such as aluminum, and cardboard, but not organic waste from institutions or businesses.

Key to the question of restaurant food waste, is how the province regulates organics waste collection. Any attention given to organics by the government of Ontario has generally been focused on diverting organic residuals (i.e yard trimmings) from landfill, without having a province-wide organics diversion program. At the moment, “there seem to be few, if any government initiatives dedicated to preventing food from being wasted in the first place” (Miller, 2012, p.164).

An additional regulation that impacts restaurant waste is Ontario’s 3Rs Regulations. The province’s 3Rs Regulations are more than 20 years old, and Ontario’s economy has significantly changed since they were introduced. The current provincial government acknowledged in a 2015 report on the circular economy that “changes are required to increase diversion” (Government of Ontario, 2015, p. 23). The 3Rs Regulations were introduced in 1994 and govern non-hazardous solid waste from residential and industrial, commercial and institutional (IC & I) sources.

Designated IC&I organizations are required to identify the amount and source of waste, develop waste reduction work plans and make reasonable effort to separate wastes for recycling and reuse. The Recycling Council of Ontario (RCO) and the Ontario Ministry of the Environment (MOE) give businesses information and advice on how to implement a waste diversion program (MacRae et al., 2015). A part of Ontario's 3Rs Regulations is *Regulation 102/94* that regulates that supermarkets and restaurants, among other businesses, must conduct a waste audit and create a waste-reduction work plan, updating the audit every year (Government of Ontario, 1994). This audit is not required of every business in Ontario, rather there are minimum requirements that govern who qualifies. The businesses required to perform a waste audit in Ontario are as follows:

- Office Buildings-107'639 sq. ft. + (10'000 m² +)
- Retail Shopping Establishments/Complexes- 107'639 sq. ft. + (10'000 m² +)
- Restaurants- Annual gross sales \$3 million+
- Hotels or Motels- 75+ units
- Hospitals- Class A, B or F public hospitals
- Manufacturing Facilities- Total employees' hours 16'000+ per month
- Educational Institution- Annual Enrollment 350+ students
- Construction or Demolition Projects – 21'527 sq. ft. + (2'000 m² +)

While this provides an outline of the regulations that could impact Toronto restaurants waste, the actual impacts as observed by those in the industry will be discussed in Part 2 of this paper.

If there are no specific regulations about organics for private industry, the next question is how much waste is Ontario currently producing? In 2013, Ontario generated nearly 12 million tonnes of waste, close to a tonne of waste per person per year (Government of Ontario, 2015). For the last ten years, the province has been sending 75% of its waste to landfill, and notably this has not changed in almost a decade (Government of Ontario, 2015). This stagnation in the diversion rate has highlighted by the province as especially troubling, since without any

improvement, the province's existing landfills could run out of capacity in the next two decades (Government of Ontario, 2015).

The 2015 provincial report, “Strategy for a Waste Free Ontario: Building the Circular Economy”, reveals that organic wastes make up approximately one third of Ontario's waste stream. The majority of organic waste produced in Ontario still goes to landfill (Government of Ontario, 2015). This revelation becomes especially problematic when considering the environmental effects of having organic waste in landfill. The disposal of biodegradable waste in landfills contributes to the release of gases, most notably methane. According to the Intergovernmental Panel on Climate Change (IPCC), methane is a more potent greenhouse gas than carbon dioxide, with 34 times the global warming potential over 100 years (IPCC, 2013). The province (Government of Ontario, 2015), acknowledges the current missed potential when organics are sent to landfill, stating that: “Data tells us that increasing Ontario's organic waste diversion rate by about 10 percentage points would avoid nearly an additional 275,000 tonnes of greenhouse gas emissions “(p. 6). According to the province, diverting organics from landfill could help save space in the province's limited landfill capacity because increasing the diversion of organic waste from current levels by an additional 50 percent could save up to 414,000 tonnes of landfill space per year, increasing the landfill capacity by almost two years (Government of Ontario, 2015).

In response to a broad consensus among stakeholders that fundamental changes are needed to the legislative framework to move Ontario towards a circular economy, the Liberal government introduced Bill 151: “Waste-Free Ontario Act” (Environmental Registry, 2015). If passed by the Ontario Legislature, it would enact the Resource Recovery and Circular Economy Act and the Waste Diversion Transition Act (Environmental Registry, 2015). The Act is

currently at its third reading debate in the Ontario Legislature, and is slated to be passed in June 2016. According to the Ontario government (Environmental Registry, 2015) the purpose of the proposed legislation is to support a shift to a circular economy by:

- Reducing waste and increasing resource productivity
- Enabling efficient and effective collection and recycling systems, and
- Increasing market value of recovered materials.

The objectives of the legislation appear to have possible ramifications for the restaurant industry, and therefore will be further discussed in Part 2 of this paper.

Chapter 2: Theoretical Frameworks

2.1 Agroecological Interpretation of Waste

According to an agroecological interpretation of waste, the food system is a production, consumption, recycle system (Hill, 1985). In the natural food system, there is no waste, only food for other processes and organisms. This has significant impacts on the waste management framework to follow and how to design food waste strategies. My research on restaurant waste in Toronto will work within an understanding of the need to reorient the current solid waste management paradigm from disregard and disposal to reduction and recovery (Wagner, 2007).

2.2 Waste Management Frameworks

In considering how to develop solutions for restaurant waste, it is important to consider the various waste management frameworks. I will be following a food chain approach to design changes for reducing restaurant waste in Toronto, a departure from earlier waste reduction approaches that tended to focus on individual sectors (Jackson et al., 2006). “While the majority of food waste occurs at the consumer level, improving the management of agri-food value chains would have the greatest long-term impact on reducing food waste, and the resulting economic

and environmental impacts” (Gooch et al., 2010, p.10). Following a food chain approach, waste systems must be managed in a comprehensive interdisciplinary manner, allowing results to go beyond what could be achieved by individual businesses working in isolation (Uzea et al., 2014). This is in contrast to the current food system, where competitive relations create a lack of coordination among the different actors in the food supply chain (MacRae et al., 2015).

Several waste management hierarchies exist to map out priorities for dealing with waste, based on different food system frameworks. For instance, the waste management hierarchy developed by the US Environmental Protection Agency (USEPA, 2014), ranks waste management options from most desirable to least desirable based on their attractiveness from a sustainability perspective (Uzea et al, 2014):

- Source reduction: reduce the volume of surplus food generated
- Feed hungry people: donate extra food to food banks, soup kitchens and shelters
- Feed animals: divert food scraps to animal feed
- Industrial uses: provide waste oils for rendering and fuel conservation and food scraps for digestion to recover energy
- Composting: create a nutrient-rich soil amendment
- Landfill/incineration: last resort to disposal

The City of Toronto (2015d) as a part of developing a long-term waste strategy, included within their Project Update a waste reduction:²

- Reduce: prevent waste generation where possible, conserve resources
- Reuse: Reuse waste for their original or new purposes
- Recycle: Turns waste into a new substance or product (includes composting)
- Recover: Recover energy from waste (includes green bin processing)
- Residual Disposal: safe disposal of residual waste

When applying the agroecological framework to this research, it demands some changes to traditional food waste management hierarchies (MacRae et al., 2015) because otherwise the

² The City of Toronto Waste Reduction Pyramid can be found at:
<http://www1.toronto.ca/City%20Of%20Toronto/Solid%20Waste%20Management%20Services/Long%20Term%20Waste%20Strategy/Pdf/LTWMS-ProjectUpdate5-Oct2015%20FINAL-AODA%20compliant.pdf>

capitalist drive to surplus accumulation captures food waste as energy. This drive becomes prioritized over providing people with access to a nourishing diet. O'Brien (2013) links surplus food with the politics of capitalist production and consumption. With current waste policy, the emphasis has been on questions of governing, of evaluating waste policies and their consequence and assessing the potential of 'recovering' waste materials through recycling. Evans (2013), writes:

“Whilst this is no doubt interesting, it rests on a particular set of (tacit and interrelated) assumptions about how to conceptualize waste. The first is that waste is uncomplicatedly the rejected and worthless stuff that needs to be distanced from the societies that produced it or otherwise converted it into value via technological and organizational innovation. The second is that waste is a fixed and self-evident category – an innate property or characteristic of certain things.” (p. 2).

Evans (2013) provides the assumption underpinning current waste policy to demonstrate that waste is culturally constructed, not self-evident. The same too can be said about how we dispose of waste, i.e accepting all forms of waste disposal to be acceptable is problematic depending on the framework guiding your policy or research.

To showcase that the capitalist drive to surplus accumulation exists, O'Brien (2013) references the example of freegans being arrested in the United Kingdom for “dumpster diving”. In their court case, the judge rejected the freegans' defence that the goods belonged to no-one because they had been placed in a waste disposal container and were therefore clearly unwanted by the store that discarded them. The court, and those involved in the freegan case, did not dispute that the left-over food items were discards from the stores in question. Yet, the freegans were charged with the theft of discarded items. O'Brien (2013) argues that “[T]his fact alone indicates, empirically, that discarded items have not been abandoned; they are not free of relations of private property or rules of ownership” (p. 196). Recently, private food companies at various points in the supply chain have entered into partnerships with waste management firms

to transform surplus food into other commodities such as heat, and by-products of energy generation such as biofertilizer (O'Brien, 2013; Thyberg and Tonjes, 2016). This raises concerns about food waste reduction efforts, for if there is a market to profit from your waste, why would you donate it? Or better yet, why would you put a concentrated effort into reducing your overall waste levels? Waste management is a huge industry. The structure of our economic system is such that the more waste we produce, the more profit there is for waste management corporations.

O'Brien (2013) provides a critique of waste management policy, stating that "In its regulatory specifications and bureaucratic taxonomies, waste policy defines who can and who cannot profit from the surplus that capitalism produces" (p. 206). His critique of waste management practices reflects a wider critique of the current industrial food system. Because of its free-market foundations, the industrial food system is inadequate in addressing the concerns regarding its social and environmental impacts, unless changing practices to accommodate those concerns can mean profits (Knezevic, 2012). An agroecological approach to waste, with its critique of the capitalist drive to surplus accumulation, influences my waste management framework and therefore the food waste reduction efforts I will suggest in Part 2 of this paper.

With the food waste hierarchy I have adopted, the most effective means of mitigating food waste is to focus on preventative actions. Such actions involve preventing food from becoming waste, discouraging practices that lead to waste by seeking to actively change behavior, and most importantly rethinking the current practices and systems in place (Papargyropoulou et al., 2014). My food waste management framework is as follows (From most preferable to least preferable option):

- Waste prevention (non-waste)
- Redistribution: edible food for direct human consumption

- Recycling: Animal feed without human edibles, but includes human inedibles such as corn cobs, skins and husks
- Composting: this would focus on composting and not on transforming food to energy.
- Disposal: landfill is the last resort.

The food waste hierarchy I am following influenced the food waste definition I am using in this paper. I am considering food waste to be any edible material that was intended for human consumption but was wasted at some point in the supply chain. I do not consider creating by-products from food a way to recover food waste, and instead still consider this waste, as it does not create a closed loop cycle. Therefore, I will be followed Stuart's definition of food waste, that builds upon the FAO definition, as it most appropriately aligns with an agroecological approach to food waste. Food waste is defined as:

“wholesome edible material intended for human consumption, arising at any point in the FSC that is instead discarded, lost, degraded or consumed by pests but including edible material that is intentionally fed to animals or is a by-product of food processing diverted away from the human food” (Parfitt et al., 2010, p.2).

2.3 Path Dependency (or lock-in) Model

I employ the path dependent model to situate Toronto restaurant waste within the larger food supply chain. In the path-dependent model, originally developed from the economic history literature, “actors are hemmed in by existing institutions and structures that channel them along established policy paths” (Wilsford, 1994, p.251). Wilsford (1994) argues that “a path dependent sequence of political changes is one that is tied to previous decisions and existing institutions” (p.252). In path dependency, structural forces dominate, therefore policy movement will likely be incremental. WRAP (2011) following their numerous food waste studies, concluded, “the greatest successes so far have come from addressing the whole supply chain collectively, as experience shows that reducing waste in one area may, in fact, create it somewhere else” (WRAP, 2012, p.5) I will be employing the path dependency (or lock-in) model to consider how

food supply chain logistics impact the ability of restaurant owners to reduce food waste. Scott Kantor et al. (1997) found that the increasing complexity of the food system may enhance losses. For instance, a typical food product is handled on average 33 times before a consumer in the supermarket ever touches it (Scott Kantor et al., 1997). In the case of the restaurant, the food may travel from farm to manufacturer to distributor and then to the restaurant depending on the product, revealing that there are several other preceding steps in the supply chain interacting repeatedly with the restaurant level.

In path dependency, structural forces lock-in behaviours and make policy change more incremental (MacRae and Winfield, 2015). This model can help illustrate why a restaurant owner or manager may not be able on their own to significantly reduce their waste levels. Rather systemic coordinated action should be encouraged and overseen by government (MacRae et al., 2015).

2.4 Efficiency-Substitution Redesign Framework

When suggesting policy adjustments and educational initiatives to deal with food waste in Toronto restaurants, I use a transition framework, more specifically Hill and MacRae's (1995) Efficiency- Substitution – Redesign framework. This framework serves as both a guide to action, and an indicator of progress. It allows for the design of short, medium and long-term goals for reducing restaurant food waste in Toronto, permitting the diverse actors involved to incrementally enact sustainable change. In this framework, Stage 1 strategies involve making slight changes to existing practices in order to help create an environment more conducive to change. These changes would generally be fastest to implement and fit within the current policy environment. The second stage strategies would focus on the replacement of one practice for another, or development of a parallel practice in opposition to the one identified as inadequate.

Finally, the third stage strategies are based fully on the principles of ecologies, and take longer to implement. The last stage is unlikely to be achieved until the first two have been attempted. By utilizing this framework, I am working from the presumption that policy change in the Canadian food system is largely evolutionary (MacRae, 2011). Rather, it is more a “long-term reformist approach” (MacRae et al., 2015), with the dominant structures progressively adapting to policy pressures, ultimately leading to a profound redesign of the food system. The redesign stage is visionary, but presumes and relies on continuous layers of transition in order to be realized.

2.5 Sustainable Food System Framework

When considering how to tackle restaurant food waste in Toronto, it is necessary to link the food waste story to the broader food system. Although this paper focuses on food waste, it also serves as a wider critique of the global corporate food regime. The global corporate food system can be understood as “an interdependent web of corporate-controlled activities at the global scale that include the production, processing, distribution, consumption and disposal of food” (Sumner, 2012). The food industry, “has been enormously successful not only in transforming food but, more importantly, in constructing and diffusing an industrial mass diet...[which] impinges, to a greater or lesser degree, on the health of billions of human beings today” (Winson, 2013, p. 1). Instead, I am promoting a sustainable food system, and this guides the kind of recommendations I make in Part 2 of this paper. A sustainable food system entails “a collaborative effort to build more locally based, self-reliant food economies – one in which sustainable food production, processing, distribution and consumption is integrated to enhance the economic, environmental and social health of a particular place” (Hamm and Bellows, 2008, p.5), and maximizes community self-reliance and social justice.

Chapter 3: Methods

This research takes a qualitative approach for several reasons. In Canada, food waste research generally, and restaurant food waste in particular, are relatively new areas of investigation. With time, as research in an area builds, it becomes possible to establish metrics, surveys and other methods of data collection that lend themselves to quantitative approaches and comparison between sites. However, in areas that are not as well understood or researched, such as restaurant food waste, qualitative methods allow new areas of study to be described (Nicholls & Ormston, 2014). Further, a priority of this research paper was to gain rich insight from participants' personal accounts and perceptions of their experience working in the food service industry, a goal best accomplished through qualitative methods such as semi-structured interviews (Ritchie et al., 2014).

3.1 Document Analysis

The foundation for this work was the existing literature. Through a range of academic publications, reports and government documents I ascertained the current approach to restaurant food waste in Ontario. This includes, the statistics available on food waste in Canada, Ontario's current regulations on organic waste, and the City of Toronto's jurisdictional capacity surrounding private industry waste. The amount of data on waste produced by private industry is very limited, and so an effort had to be made to piece together what restaurant waste looks like in Toronto, in order to provide suggestions for the future. In considering how to reduce restaurant food waste in Toronto, I researched other municipalities in order to analyze best practices that could be adapted to the Ontario context.

3.2.1 New York City

The municipality of New York City (NYC) has recently undergone a campaign to reduce municipal waste, and one of their target areas is restaurant waste. The city has undertaken its first ever “Food Waste Challenge”, a program to reduce the amount of organic waste sent to landfills, and greenhouse gases that this waste produces. This challenge was created to help works towards NYC’s goal to divert 75 percent of solid waste from landfills by 2030 (New York City, 2013). There are more than 100 restaurants participating in the challenge. Participation is voluntary for the restaurants, a structural choice that can be problematic for how little results it can achieve, yet there are merits of this format that will be discussed in the solutions section of this paper.

3.2.2 Vancouver

The City of Vancouver, is a Canadian example of a city attempting to tackle food waste. In 2015, Metro Vancouver introduced a landfill organics ban and the city website states that “instead of being thrown away, food waste is collected separately and recycled into compost or biofuel” (City of Vancouver, 2015). Metro Vancouver estimates that 13,000 tonnes of healthy, edible food is thrown out at the region’s transfer station each year (City of Vancouver, 2015). WRAP UK has partnered with the City of Vancouver to help them deliver food waste education initiatives. The city of Vancouver now operates a “Love Food Hate Waste” website, emulating the one started by WRAP UK³. Several of the measures implemented in Vancouver, including one to ban organics from landfill, have been recently implemented and not yet studied for their impacts. The case of Vancouver, as the city shares some common characteristics with Toronto, does provide an opportunity to examine several practices and hypothesize their outcome in Toronto.

3.2.3 United Kingdom

³ Love Food Hate Waste Vancouver details at: <http://www.lovefoodhatewaste.ca/>

In comparison to Canada, there is a great deal more data available on food waste within the United Kingdom, mainly due to the studies undertaken by the Waste and Action Resource Programme (WRAP). WRAP sets out to minimize resource use and direct waste away from landfill. They also work in partnership with numerous retailers and manufacturers to assist them in achieving these goals. Notably, WRAP is funded by government bodies such as the Department of the Environment, Food and Rural Affairs (DEFRA), allowing them to build evidence on how much food waste is occurring and where, in order to design measures to reduce it (MacRae et al., 2015). Their most well-known campaign internationally is one that is directed at consumers titled “Love Food Hate Waste”. WRAP achieved a 13 percent reduction in household food waste from 2007 to 2010 (Lipinski et al., 2013).

Uniquely, WRAP UK has focused on quantifying food service waste, producing reports on their findings. From these findings, they generated toolkits and resources for businesses that provide advice on how to measure and reduce food waste⁴. To direct some research toward businesses may have been motivated by WRAP’s 2009 findings that UK hotels, pubs, restaurants and quick service restaurants disposed of 600,000 tonnes of food waste, of which 400,000 (67%) was avoidable. WRAP’s findings (2009) are based on telephone interviews with 1660 individual business sites, and a site audit of 138 businesses. This is a significant undertaking, with no equivalent existing in Canada. WRAP’s research indicates that by not throwing away good food, pubs, restaurants and hotels in the United Kingdom could save more than £720 million a year (WRAP, 2009). The small amount of information that has been circulated about food waste, such as footage in “Just Eat” with dumpsters full of edible food, created shock and indignation on the part of the Canadian public (Rustemeyer and Grant, 2014). Presumably, following this reaction,

⁴ The numerous WRAP reports can be found at: <http://www.wrap.org.uk/content/supporting-resources-hospitality-and-food-service-sector-4>.

if similar statistics were available about the food service industry in Toronto, or Ontario, there would be media attention and public disapproval.

Particularly pertinent to the question of restaurant waste is WRAP's report, "Research, Hospitality and Food Service, food waste study" conducted in 2012, that highlights opportunities to reduce waste and save money in the food service. Williams et al., (2011) found that recycling is widespread but not universal in the UK. 76% of the businesses they surveyed claimed to recycle at least one material. Glass is the most commonly recycled material. The authors noted that food waste recycling is rare (Williams et al., 2011). Considering that glass is most easily and commonly recycled in Toronto, and food waste is rarely recycled, the WRAP UK study is the most comparable examination of the service industry, and the most comparable data available to use as a rough estimate of what occurs in Toronto. It is important to note that the United Kingdom does have higher tipping fees than Toronto, and this does influence the behaviour of the food service industry within the United Kingdom, when considering disposal options. Importantly, WRAP concluded that "many businesses would like to recycle, or recycle more, but cited a lack of recycling services and space as the main barriers" (Williams et al., 2011, p.4). In the United Kingdom, similarly to the case of Toronto, private businesses must arrange their own waste collection. The waste hauling is charged per volume and not per weight, and the WRAP UK found this distinction impacted how businesses considered waste within their establishment (WRAP, 2009). The numerous food waste reduction efforts spearheaded by WRAP with the food service industry will be adapted to the case of Toronto in the transition section.

3.3 Interviews

A range of relevant actors were interviewed and they constitute a rounded representation of the full-service restaurant industry. One of my research objectives was to gain an understanding

of how restaurant owners and staff perceive food waste within their work context, and so I conducted four interviews with restaurant managers. The restaurants are all located within several blocks of the St. Lawrence Market neighbourhood in downtown Toronto, providing an opportunity to observe how diverse restaurant responses and waste practices can be within a several block radius. In order to comprehend the relationship between restaurants and the City of Toronto, an interview was conducted with a staff member of the City Solid Waste Department. Since I deployed the path-dependent model to situate restaurant waste in Toronto, I interviewed a staff member of Gordon Food Services to inquire about the relationship between food distributors restaurant waste. Finally, to consider the end of life of restaurant food waste, I conducted one interview with a waste hauler, and one with a consulting firm that arranges waste collection for restaurants, to inquire into where restaurant waste goes and why.

During each interview, I catalogued responses using brief point-form notes and recorded the complete interview with an electronic voice recording device. Interviews were conducted in a semi-structured approach, using an interview guide. The interview questions were designed to set the tone of the interview, and not to restrict what was and was not discussed. Interviews were from 15 to 45 minutes long. The interview guide used for each group of participants (depending on their role) is attached as Appendix A. Interviews were conducted between February 24th and May 2nd, 2016 in Toronto, at the respondents' place of employment, or through email correspondence depending on the particular situation of the respondent.

3.3.1 Hot House Café

The Hot House Café is a large independent restaurant established in 1994, and is located on Church street in downtown Toronto. The Hot House can accommodate 150 people on their

patio. I conducted an interview with Andrew and Elinor Laffey who both own and manage the restaurant.

3.3.2 The Works Gourmet Burger Restaurant

The Works Gourmet Burger is an Ontario full service burger chain restaurant in Ontario, that originated in Ottawa. Although there are several corporate locations, including the location I interviewed on Wellington St in Toronto, it is primarily now a franchised chain. I interviewed the general manager at the Works Wellington, Kim McCormack, who has held this position for the past two years.

3.3.3 The FlatIron Firkin Pub

The FlatIron is a restaurant located at 49 Wellington Street East in Toronto, and is a part of the Firken pub chain. I conducted an interview with Evan Laycock, the general manager of the Flatiron.

3.3.4 The Spaghetti Factory

The Old Spaghetti Factory is a fullservice restaurant that has been at this same location on the Esplanade since 1971. It is characterized as a family-friendly chain eatery featuring Italian entrees. I conducted an interview with Graham Hnatiw, the director of operations for the Spaghetti Factory. Graham has been the director for the past six years, and has worked on and off with the company for the past 15 years (Hnatiw, March 24th, 2016).

3.3.5 Gordon Food Services

Since I am using the path-dependant (or lock-in) model to situate restaurant food waste within the food supply chain, I am considering the step in the food supply chain that directly precedes the restaurant: food distributors. Restaurants in Toronto, especially chains, receive their

food through distributors, often utilizing several companies depending on what type of food products they deliver. In my interviews with restaurant owners, two companies were mentioned the most: Sysco and Gordon Food Services (GFS). I was able to interview Brett Meadows, the Sales Growth Manager of GFS, on April 12th, 2016 at the Gordon Food Services main building in Milton, Ontario. Every restaurant that I interviewed uses GFS for at least part of their food order, and this guided my choice to interview a person from GFS that oversees relations with Toronto restaurants. Brett has been with GFS for 6 years, and before that was also working in the food distribution field. GFS has a large list of clients in Ontario, including large chains such as Boston Pizza and Starbucks (Brett Meadows, April 12th, 2016).

3.3.6 City of Toronto Solid Waste Management Staff

I interviewed Michelle Kane from the Solid Waste Department. She has been with Solid Waste since 2006. Michelle is the project lead for Waste Management Planning in Solid Waste Management Services for the City of Toronto. Michelle says about her department “We do all the policy work. We write a lot of staff reports. We do pilot programs. A lot of research” (Michelle Kane, March 12th, 2016). In comparison, other departments are much more operational (i.e collections, processing). Michelle is involved in drafting the Long-Term Waste Strategy that the City is set to release in mid-2016.

3.3.7 Second Harvest

Food recovery is increasingly seen as a means to reduce food waste, and to be a lever for the mitigation of food insecurity (Garrone et al., 2014). Increasingly, organizations in North America are involved in food recovery, where food that would be wasted is redistributed to those in need. Second Harvest is the largest food rescue program in Canada. Started in 1985, Second Harvest collects donated surplus food from Toronto restaurants, retailers, caterers and manufacturers,

redirecting it to community agencies that serve those in need (Second Harvest, 2015). Currently, Second Harvest delivers rescued food to over 220 social service agencies, enough to provide over 22,000 meals a day. Due to their substantial involvement in the food waste situation in Toronto, and interaction with the food sector, I interviewed Lori Nikkel who is director of Partnerships at Second Harvest, on February 24th, 2016, to inquire about what role restaurants play in food recovery in Toronto.

3.3.8 Solid Waste Hauler and Consulting Company

I interviewed the supervisor of waste audits, Nicole Huard, from WasteCo on April 15th, 2016. Waste Co provides garbage, recycling and organic collection services for businesses across Southern Ontario, including restaurants in Toronto. I also completed an interview with Marnie Brown from MASS Environmental Inc., a solid waste advisory company that assists industrial, manufacturing, retail, restaurants, and institutions to complete Ontario waste audits, reduce their waste levels, and make their waste management more efficient. MASS Environmental has 40 restaurant clients located in the Greater Toronto Area.

Chapter 4: Specific drivers of food waste in the restaurant sector

Table 1: Why Does Food Waste Occur in Food Service?

Causal Factors	Sources
Over-serving	Bloom (2010); Gunders (2012); Winson (2013)
Unexpected demand fluctuations	Adenso-Diaz et al. (2002)
Expansive but rigid menu	Bloom (2010); Crowther (2013); Stuart (2009)
Improper Handling & Storage	Bloom (2010); Stuart (2009)
Rigid standardization and uniformity	Bloom (2010); Winson (2013)
Competitive Market and Tight Margins	Thyberg and Tonjes (2014)
Plate Composition	Thyberg and Tonjes (2016); WRAP (2012b)
Preparation Mistakes	Bloom (2010)

Waste Management Policy and Practice	Gooch, M., Marenick, N., & Laplain, D. (2012); Uzea et al. (2014)
Level of Management Training	Bloom (2010); Gunder, (2012)

4.1 Further Explanations for Table 1

Next I will elaborate on several of the drivers of food waste from Table 1. A common characteristic of the full service restaurant is their expansive menu, allowing the customer a great deal of choice when dining out. The expansive menu is particularly true of the chain restaurant, where there is an attempt to create a “catch all” environment, in order to stay competitive (Bloom, 2011). In *Eating Culture, An Anthropological Guide to Food*, Gillian Crowther outlines how there are several characteristics of the restaurant that have significantly shaped people’s public eating culture (2013). At a restaurant, diners can choose according to their tastes and appetites anything on the menu, in comparison to at home where your meal is limited to what you have in the kitchen (Crowther, 2013). Like supermarkets that overstock because they prefer to put out more than run out, restaurants prefer to have a wide array of available menu options (Stuart, 2009). If a restaurant does not perform extensive cost analyses, it may appear beneficial in terms of labour, time and money for restaurants to keep excess food in stock so they avoid ever running short of something, in spite of the fact that this excess is often discarded (Thyberg & Tonjes, 2015).

In connection to the expansive menu, a common characteristic of restaurants, especially chains, is that there is rigid management. Chain restaurants occupy over 50 % of total restaurants in Ontario, (GE Capital, 2015), and common to the chain restaurant is a rigid menu and standardization across all locations. If you go into one Boston Pizza in Toronto, it should be the same as every other location across Canada. In order to provide this level of standardization, the menu can not be changed every week or even every month, for their promise of uniformity

precludes improvisation. For instance, when Evan Laycock from FlatIron, a part of the Firkin chain that has over 20 locations in Ontario, was asked about who sets their menu, he responded that “our menu is set by head office by our corporate chef. On our own level, we do the daily specials.”(March 31st, 2016). This is a common response for chain restaurants, and as Bloom (2010) writes, “New menu items take months of development – from board meetings to test-kitchen tinkering to focus groups to more tinkering. They certainly don’t come from epiphanies had while peering into the walk-in fridge for ingredients and inspiration” (p.141).

The competitive restaurant market, with tight margins alongside rigid management influences how likely restaurants are to subscribe to a waste program. One barrier to implementing a waste program is that participants may perceive prevention as costly (Thyberg & Tonjes, 2015). This can be especially true for restaurants that consider food waste to be inevitable and necessary for profit. It will be necessary to confront this way of thinking in order to see significant change in restaurant waste. The interest by those running a restaurant to reduce waste competes with the desire to never run out of stock in order to avoid displeasing the customer. A concern repeated in the interviews I completed with various restaurant owners and managers is that they do not want to undertake practices if they will effect their ability to deliver excellent customer service (Laffey, February 24th, 2016; Hnatiw, March 24th, 2016). This concern can in part be explained by the competitive restaurant market in Toronto, common to most large cities in North America. Keeping customers happy and returning ultimately trumps reducing food waste in the restaurant industry, and this tension is explored in Part 2 of this paper.

A driver of restaurant food waste that is not often discussed in existing food waste policy, education or programming, is the skill level of management. Voluntary restaurant waste challenges, food waste education, and even waste audits rely on management in place that is

willing to turn waste data into action, or implement suggested practices. For instance, Bloom (2010) writes about restaurant waste that, “kitchen waste includes foods prepared but not served, inventory casualties, and the inevitable ‘prep waste’ or scraps. Fortunately, this waste source is largely in restaurant management’s control and can be reduced” (p.121). Ultimately, to reduce prep waste requires you have the training to do so. WRAP (2013c) argues that “[W]aste monitoring is the first crucial step in unlocking the potential benefits of waste prevention.”(p. 39). Some restaurants, especially chains, have a point of ordering system (POS) that tracks what has been ordered and therefore provides a reference for what was prepped versus what was sold. Nevertheless, it takes time and a certain skill level to monitor this data and make subsequent changes. There is no reason to presume that if you own or manage a restaurant in Toronto, that you have waste management skills because there is no required formal training for this.

Another driver of food waste listed in Table 1, is “unexpected demand fluctuations”. This driver is one that is common among all food service operations. In the interview with Brett Meadows from GFS, he mentioned that one issue with ordering food, as a distributor, is that there is always an element of “chance” (April 12th, 2016). When Brett was asked about some of the barriers to reducing waste at the distribution level (as it connects to the restaurant), he talked about bad luck. He gave the following example:

“It can come from bad luck. We were told this massive festival is in town for the week and they are going to do “X” amount of business. We gotta pre-order produce and then it rains everyday and now we are stuck with all this produce and there is nothing we can do about it.” (Meadows, April 12th,2016).

Brett stipulated that they have a range of relationships with different actors, so they do attempt to sell excess in different avenues. There are many more instances that fit the same pattern Brett is describing. Restaurants usually prep a large amount for a long weekend but perhaps it rains all weekend. Irregular 18 degree weather in the beginning of April can cause restaurants with patios

to get an unexpected high flux of customers. Several of the restaurant owners echoed similar sentiments about there always being unexpected guest fluctuation that causes you to run out of food, or be stuck with too much prep (Laycock, March 31st, 2016; McCormack, March 16th, 2016). For all the algorithms and computer software that track previous sales, and project future ones, there is always an element of unpredictability in restaurants. How much of this represents the unpredictability of a brittle system? Or is there a structural or attitudinal problem? In the transition section of this paper I will explore more thoroughly these two options, and suggest solutions that could address this uncertainty in the industry.

Part 2: Possible Solutions based on Preliminary Analysis

1.1 Introduction to Strategic Interventions

Using Hill and MacRae's (1995) Efficiency- Substitution- Redesign framework, and my proposed food hierarchy, I have designed policy and regulatory initiatives to address restaurant food waste moving forward. MacRae et al. (2015) outline how, to date, the market has proven itself unable to manage food resources consistent with a comprehensive and coherent waste reduction hierarchy. Although restaurants can themselves make improvements in their food waste behaviour, particularly at the efficiency stage, individual restaurants will not be able to identify wider structural problems and coordinate changes within the industry, in order to make dramatic reductions to current food waste levels. As a result, my proposed solutions rely heavily on state intervention, particularly beyond the efficiency stage.

Several frameworks shaped how I structured the strategic interventions. In considering the involvement of consumers in restaurant food waste, I do not shape solutions around the individual responsibility model. Although I do make suggestions for "consumer education"

initiatives, I do think it is important to highlight the complexity of food choices. This avoids the individualization of responsibilities for behavioural change and consumption that often occurs in public debates and policy interventions (Evans, 2011). With the rising interest in food waste, governments and researchers have focused on how consumers can reduce waste, frequently citing that 50% of the food waste in Canada occurs in the home (Abdulla et al., 2013). This focus may be impacting how consumers view the food waste problem. Recent research in Canada focusing on household waste, conducted by Parizeau et al., (2015), found that overwhelmingly respondents felt that individuals were responsible for reducing food waste (Parizeau et al., 2015). Beagan and Chapman (2012) argue that both the public and health professionals in Canada often assume that what people eat is shaped primarily by individual factors such as nutrition knowledge, beliefs and motivations. There is less understanding of how food practices and ideas, and waste are structured by social identities. Lindsay (2010) demonstrates the role of food consumption in performing social identities and social relations, arguing that informational and educational campaigns do not adequately acknowledge the complex and often contradictory concerns that individuals juggle as they make ‘food choices’ in their everyday lives. The individual responsibility model guilt consumers about how much food waste they produce, without acknowledging outside structural forces shaping these choices. Unfortunately, this has been the approach taken by government and industry to date, and instead my research will be focusing on moving away from consumer-focused solutions for food waste.

The lack of research and data surrounding full service food waste in Toronto, and more broadly in Canada impacted how I constructed suggestions for the three transition phases. It is currently unclear which combination of mechanisms to prevent food waste is most effective because there are so few evaluations of food waste prevention policies (Thyberg & Tonjes,

2016). Due to the inherent difficulty in studying and implementing waste prevention, there has been little quantitative work done to assess its environmental impacts. Rather than struggle with the lack of existing data, and concrete conclusions regarding the best policy means to prevent food waste, I will be following the approach by Thyberg and Tonjes (2016) to suggest that “new, well-planned intervention campaigns be initiated, but with mandates for proper monitoring and evaluation. This data can serve as a critical resource for designing future waste prevention programs and improving existing programs” (p.121).

To date, when it comes to food system change impacting private industry, the typical approach is to suggest voluntary measures run by industry themselves. In 2014, the United Nations Environment Programme (UNEP, 2014), produced a guidance document titled “Prevention and reduction of food and drink waste in businesses and households”, and its intended audiences were governments, local authorities and businesses. The authors of this document advise that voluntary collective action is the structure in which to work successfully with businesses (UNEP, 2014). One of the reasons asserted for utilizing the voluntary approach is that “[T]he need for additional regulation or legislation is avoided. Regulation may be perceived as costly for governments and businesses may prefer a voluntary approach” (UNEP, 2014, p.44).

The suggestion for voluntary action is made in light of the fact that the FAO has stressed the importance of reducing food waste. The FAO produced a report highlighting that alarmingly one third of all the food produced in the world for human consumption never reached the consumer’s table (FAO, 2011). The FAO also signed, at the beginning of 2016, a partnership agreement with the International Food Waste Coalition (IFWC) aimed at reducing and preventing food loss and waste at local, national and global levels but also across the entire food

supply chain. Further, reducing food loss and waste is one of the United Nations sustainable development goals. It would appear that in the major international governing bodies, the social, environmental and economical impact of food waste is recognized, and several projects commissioned by the United Nations focus on private industry within both the developed and developing world. For instance, on the website for “Save Food: Global Initiative on Food Loss and Waste Reduction” by the FAO (2016) it is stated that:

“The Private Sector...grows, handles, markets, prepares and serves food at a significant scale and is the main stakeholder within food systems who can reduce FLW at a significant scale. Thus collaborating with such an actor is crucial towards minimizing the global food loss and waste and its negative impacts on people, natural resources and the environment” (n.p).

The FAO is suggesting fundamental, substantial and coordinated changes to the globalized food system. Although there is an acknowledgement by the United Nations of the connection between the current structure of the global food system, that is heavily designed and controlled by private industry, and food waste, when it came time to make suggestions for realizing improvements in the future, the UNEP report offered up “voluntary” measures, and argued this method would be the one capable of achieving success (UNEP, 2014). Voluntary measures appear to be insufficient in light of the environmental, social and economic impacts of the current food waste situation.

The UNEP (2014) food waste guiding document states that voluntary measures are preferable, and more successful because “[I]f key organizations and businesses are involved, it can have a wider reach within the sector as a whole, even if not every organization or business commits to voluntary collective action” (p. 44). While this may sound theoretically plausible, practical experience appears to indicate otherwise. In the case of the restaurants in Toronto, interviewees appeared to describe a gap between “early adoption” and achieving widespread

change (Laffery, February 24th, 2016; Hnatiw, March 24th, 2016). A parallel to the early adopter issue with restaurant food waste can be seen in the way local foods have been procured by restaurants and chefs in particular. Chefs have been recognized as potentially important partners in the effort to promote local food systems (Inwood, Sharp, Moore and Stinner, 2008). Recently, local foods have increased in popularity amongst the culinary community, though the range of restaurants using them is still limited (Inwood et al, 2008). Research has identified a set of characteristics common to early adopters in the restaurant industry (Inwood et al ,2008). The question of how the “early adopter” method can be used to encourage behavioural change can also be applied to food waste. Inwood et al. (2009) in their study on restaurants, chefs and local food, found that chefs can be important actors in helping create a broader appreciation of local foods within communities. The authors stipulate that “[A]number of practical challenges, though, must be overcome to allow for more widespread adoption of local foods in the restaurant community and beyond” (Inwood et al., 2009, p.190). This is a reason for prescribing structural interventions when trying to achieve industry-wide change.

There appears to be a tendency in research and policy work to believe that if there are those who pioneer the change, others will follow. The theory motivating this way of thinking is called the “theory of diffusion of innovation”, that was introduced by Rogers (1962) whose work is the most frequently cited publication in this field. Roger’s conclusions are believed to allow a means of analyzing innovations and exploring the reasons of how food consumption changes (Vindigni et al., 2002). He states that the cumulative number of adopters typically follows an s-shaped curve, meaning that the curve starts to rise slowly when the first innovators adopt the innovation. Subsequently, the cumulative number of adopters rises somewhat faster due to early adopters (Vindigni et al., 2002). I find the theory of diffusion of innovation problematic when

considering restaurant waste in Toronto for two reasons: a lack of incentives in the current system and a disparity between consumers' knowledge and values, and their behaviour.

Firstly, the current system does not encourage restaurant owners to even separate their waste, and do organic waste collection, far less decrease their waste. The city, for jurisdictional, financial and organizational reasons does not get involved themselves in industry waste collection, so restaurants are left to decide on their own how to have their waste collected. From the multiple interviews I completed with restaurants owners and managers, I can infer that there are a variety of factors that influence how restaurant management decides to have their waste collected (Hnatiw, March 24th, 2016; Laffey, February 24th, 2016; McCormack, March 16th, 2016). There are no unifying principles directing restaurant behaviour. For this reason, it is highly variable how environmentally and sustainably focused the restaurants are. For instance, Andrew and Eleanor Laffey, the owners of the Hot House Café, are attempting the most to pursue sustainability initiatives. During the interview, both Andrew and Eleanor voiced concerns about the environment and offered up initiatives they have tried in the restaurant. Andrew acknowledged though that currently they do this because they are trying to pursue a certain environmental ethic, not because someone requires them to do so (February 24th 2016). There are also no incentives for Andrew's behaviour, behaviour that is above and beyond the norm in the restaurant industry in Toronto. For instance, Andrew had a space constructed in their kitchen counter to drop food waste into a bin, making it a lot easier to separate food waste. Andrew and Eleanor decided to do organics waste collection, and so they created an easier system for their staff to follow (February 24th, 2016).

There are countless examples of chefs and restaurants in Toronto taking up sustainable or ethical food practices such as buying local, buying in season, serving vegetarian fare or helping

advocate for reducing food waste, without any support from the City or province. For instance, Brad Long opened Belong Café at the Evergreen Brickworks, a community environmental centre, where he serves a weekly seasonal fare. Numerous chefs in Toronto buy produce through 100km foods, a company that acts as a local distributor for farmers in Ontario (Bowsher, 2014). These initiatives are either directly reducing food waste (by having an always changing menu) or indirectly (by buying directly from farmers, reducing waste within the supply chain). Like Andrew at Hot House, various chefs and restaurants in the city are going above and beyond the status quo, without incentives existing within the current system encouraging them to do so. The restaurant sector is so disaggregated that it is hard to see how the early adopter model would take hold.

A second issue with the “theory of diffusion innovation”, is that it may ignore the disconnect between consumer concerns, beliefs and values, and their behaviour. In trying to change consumer behaviour, research can often end up being ‘methodologically individualistic’, encouraging sustainable behaviour by focusing on consumers’ agency (Welch and Warde, 2015), overlooking the way in which consumption is located in everyday collective actions. A comparable example is that of organic food. There is a growing demand for organic foods in Canada, driven by consumers’ perceptions of the quality and safety of organic, along with the positive environmental impacts of organic agricultural practices (Vindigni et al., 2002). Despite the green trend in consumer values, it is also generally recognized that there are still barriers to the diffusion of organic food. One is consumer reluctance to pay higher costs. This example illustrates that the way consumers make food choices is rather diverse and complex. Vindigni et al. (2002), in their study on organic food, conclude that “even though people may be concerned about the environmental issues, it cannot be assumed that behaviour has changed accordingly”

(p.626). An “attitude-behaviour” gap has been observed in consumer behaviour (Boulstridge and Carrigan, 2000) as such interventions rely on “consumer’s egotistic and altruistic behaviour, with discrepancy between holding green values and acting upon them” (Lazell, 2016). Consumers have indicated that food waste is a pressing issue for them, highlighting it most commonly as a social issue (Parizeau et al., 2015). In research on consumer food waste behaviour, wasting food is listed as the most “guilt-inducing” of all waste practices at home (Parizeau et al., 2015; Quested et al., 2011).

For all the recent media attention, government educational material, and discussion about food waste, do restaurant owners really feel that consumers will pay for food differently in restaurants based on their concern about food waste? The theory of diffusion of innovation presumes that those who are especially environmentally and sustainably inclined will change their waste practices for environmental concerns and others will follow. Currently though the system does not encourage restaurants to do so, at either the municipal or provincial level, nor do they provide a means for restaurants to be recognized by their customer base if they do pursue waste reduction efforts. This lack of governance on industry food waste will be addressed in the following solution sections of this paper.

Solutions: Efficiency Stage

The efficiency stage is characterized by technological efficiencies, but with attention to O’Brien (2013), excluding initiatives that reinforce capital relations and facilitate capitalist surplus management.

2.1 Portion Size Changes

The dominant approach to restaurant portions generates considerable plate waste and contributes to overeating and associated health problems. On average, American diners do not finish 17 percent of the food they buy at restaurants and leave 55 percent of these leftovers behind (Lipinski et al., 2013). The WRAP UK study found in their survey of a range of food service operations that plate waste contributed to 34% of the food waste (WRAP, 2012). The increase of portion sizes over the past few decades is a leading factor contributing to plate waste. From 1982 to 2002 the average pizza slice grew 70 percent in calories, the average chicken Caesar salad doubled in calories, and the average chocolate chip cookie quadrupled (Gunders, 2012). Research in the United States found that “Today, portion sizes can be two to eight times larger than USDA or FDA standard serving sizes” (Gunders, 2012, p.12)⁵.

In addition to the increase in portion sizes, the number of times Canadians eat-out or order take-out from food service locations has increased over time. According to Statistics Canada, on any given day, approximately 25% of Canadians eat something prepared in a fast-food outlet and an additional 21% eat something prepared in a sit-down restaurant or other food venue (Garriguet, 2004). As mentioned earlier, Canadians have consistently spent about 34.0% of their annual household expenditures at restaurants (AAFC, 2015). Anthony Winson (2013) in the *Industrial Diet*, discusses how eating food prepared elsewhere is not in itself a trend that is inherently unhealthy. Unfortunately, eating out or take-out often means “eating industrial food, that is to say, it means adopting the industrial diet” (Winson, 2013, p.208). This becomes especially problematic when both portion sizes and the number of restaurant visits by Canadians are increasing. Today’s giant portion sizes leave us these choices: overeat, waste food, or take the leftovers home (Bloom, 2010). The third option is the most desirable, but there are several

⁵ United States Department of Agriculture (USDA), and US Food and Drug Administration (FDA)

occasions where this is not possible, either because the restaurant does not offer takeaways, or the consumer is not in a situation to take the leftovers home.

Although the innate structure of chains is not conducive to adapting menus to reduce food waste, there are some examples of chains trying new measures to reduce waste in their restaurants. For instance, in the United States, TGIFridays, Au Bon Pain and Cheesecake Factory all now offer smaller-portion options (Bloom, 2010). At these chains, customers can pay less for the smaller-portion option allowing them to save money, the restaurant to cut food costs, and reduce the amount of food wasted. At the moment, none of the chains I interviewed offer the option of a smaller portion, for less money. More commonly, restaurants do offer different portions between lunch and dinner, but typically restaurants in Toronto offer a standard size for dinner. Research indicates that customers are not in favour of the standard portion sizes in restaurants. WRAP (2012b) carried out extensive research in 2012-2013 to identify why people waste food when they eat out in the U.K. From this research, they produced a resource pack to help restaurant managers engage with customers to tackle plate waste. WRAP (2012b) found that “large portions of food are off putting to 44% of people” (p.5). Further, in this resource pack, they reported that 41% of people gave “portion sizes are too big” (p.5) as the main reason for leaving food. They also explored what demographics are more likely to leave food in restaurants. For instance, women are more likely to leave food at the end of their meal⁶. There has not been a comparable study conducted in Canada, yet I think this statistic reveals an important trend in the restaurant industry from the past few decades: one size fits all. Especially true for the chains, and a result of what Anthony Winson (2013) calls the ‘industrial diet’, there has been a standardization within restaurants resulting in a homogenous portion size. Every person certainly

⁶ The exact statistic was 59% women, 41% men (WRAP, 2012b, pg.5)

does not eat the same amount at every meal, nor would health practitioners recommend this. There are a variety of factors that influence how much a person should or could be eating, but this is not accounted for or accommodated in restaurant portion sizes. In part this stems from the competitive nature of the restaurant industry or from the desire to have standardization across chains, including a standard portion size (Bloom, 2010). None of the restaurants I interviewed are currently offering smaller portions. A lack of buy-in for this initiative reflects perverse incentives in the system hindering the ability of restaurant owners to do so, incentives that will be discussed later in this section and reconsidered in the redesign section of this paper. Until the incentives are changed, the behaviour will likely continue.

2.2 Plate Composition Changes

In addition to large portion sizes being a significant contributor to food waste, so too are the undesired accompaniments served in restaurants (Thyberg & Tonjes, 2016). In their study on why people leave food on their plate, WRAP (2012b) concluded that “plate fillers” are the types of food most likely to be left on customers’ plates. This includes chips, vegetables and salad (including garnishes), as most people consider these to be plate fillers, rather than central to the meal they ordered. The “undesired accompaniments” are often what make the standard portion size in restaurants so large. Restaurants could offer a choice of plate fillers to help customers avoid getting something they do not like. When diners leave an average of 17 percent of their meal uneaten in the United States, “partly that’s from the exaggerated serving sizes. But you also get some unwanted side dishes. I wanted the pork chop, but got the cauliflower. Unfortunately, they get thrown away.” (Bloom, 2010, p.125).

While both the suggestion to offer different portion sizes, and a choice of plate fillers seems like a great solution to large portion sizes and plate waste, why then are restaurants in

Toronto not on board? If a few chain restaurants in the United States have tried out these initiatives, why have others not followed suit? Both WRAP UK (2012b) and Bloom (2010) suggest restaurants should offer smaller portion sizes to reduce plate waste, yet this suggestion goes against capitalism's ultimate goal: profit. Bloom (2010) gives the example of how in 2007 T.G.I. Friday's, a chain eatery in the United States, launched a "Right Portion, Right price menu", where they served about two-thirds of an entrée for two-thirds the regular price. Bloom (2010) states that this program "proved so profitable that the chain made the promotion permanent a year later" (p. 130). The company would not reveal specifics about the programs success and Bloom did not comment on why only a select number of chains have done this, and it has not become widespread, even though the data reveals that more than half of consumers find restaurant portions too big (Bloom, 2010).

It is necessary to also acknowledge the tendency in restaurants for servers to be encouraged to "upsell" food items. This is in direct conflict with the idea of serving multiple portion sizes. If a person orders a meal, and pays for it, then the restaurant receives this profit regardless of whether the consumer finishes the meal. Yes there would be the resulting plate waste, but the consumer may take the remainder home in a doggy bag, and the restaurant avoids paying for the waste. Otherwise, the restaurant has to take care of the waste. One of the unexpected findings I had through conducting interviews with restaurant owners, is that plate waste is considered unavoidable, and so they do not consider it waste. In several interviews, the managers or owners said to me "We don't produce a lot of waste", and upon asking further questions about what they meant, it became clear that they meant prep waste. (Hnatiw, March 24th, 2016; Laycock, March 31st, 2016; McCormack, March 16th, 2016). Plate waste is outside of their calculation. All restaurant owners I interviewed, except for Hot House café, did not have

organics collection, resulting in heavy food waste going in their garbage bins. This points to a lack of monetary incentive for restaurants to reduce their waste, with garbage collection and disposal fees not costing restaurants enough for them to consider plate waste worth decreasing. I do not think the individual owners are to be blamed or demonized for their behaviour, for they operate within the status quo of the system. Until incentives are changed, the system encourages this behaviour. Instead, restaurants encourage their staff to ask if you want to add additional items to your meal, or have an appetizer or dessert before or after your meal (items that tend to be high-margin). If you leave it on your plate that is okay because you still paid for it. This perverse way of thinking within capitalism has an impact on the restaurant industry and is addressed in the redesign stage.

2.3 Fees for Unfinished Meals

Another industry-driven attempt to tackle food waste is for restaurants to charge a fee if the patron does not finish their meal. This initiative is especially helpful for a certain type of restaurant, such as the buffet, or when you have an all-you-can-eat option, as in some sushi restaurants. For instance, in London, England, the restaurant Obalende Suya Express charges a £2.50 fee for unfinished food and donates the proceeds to Oxfam (Gunders, 2012). Buffets and all-you-can-eat are a particularly wasteful type of restaurants since they cannot re-use or even donate most of what is put out because of health code restrictions. If people fill up their plates at a buffet, and do not finish, it has to be thrown out as plate waste because it has been served to someone. A switch to a 'pay what you cannot finish' concept, could possibly help tackle this issue. Although there are several examples of it in action, there has not been any study of its effectiveness. There is a question of whether this mechanism would be beneficial for the consumer. One concern could be that people would eat to the detriment of their health in order to

avoid leaving anything on their plate and having to pay for it. On the other hand, the consumer could be motivated to take less on their plate because they know about the fee. I hypothesize that a “pay what you cannot finish” fee could have a similar effect to going trayless at university cafeterias in the United States. Going trayless resulted in students taking less food because they could only take what they could carry, resulting in taking more time to eat, realizing they are full, and not going back for seconds or desserts (the food that would have been left on their plate had there been a tray). Sodexo operates trayless cafeterias on more than 300 college campuses. By discouraging the overloading of trays, it has reduced food waste by as much as 30 percent (Gunders, 2012). With a fee system in buffets or all you can eat, customers could possibly take less on their plate and avoid the issue of “biting off more than you can chew”. At the moment, none of the chains I interviewed for this research paper offered this option, and the examples I did find are located in the United States or United Kingdom (Gunders, 2012). Although this initiative is helpful in the efficiency stage, as it would be easy enough to implement, it will need to be readdressed in the redesign stage where the ideal restaurant will be envisioned.

2.4 Increased Menu Information

One possible option for reducing food waste is for restaurants to provide more information to consumers about the health content of their menu items. In 2015, The Province of Ontario did pass Bill 45: “Making Healthier Choices Act”. Food-service owners and operators are required to post the number of calories in each standard food and beverage items on menus and menu boards in regulated food premises including restaurants and grocery store with 20 or more locations in Ontario (Government of Ontario, 2015). This Act also authorizes public health inspectors to enforce menu labeling requirements. It comes into force on January 1st, 2017.

Menu information has its limitations though. Similar to food labeling, there is a debate in contemporary food studies over how labeling shifts the onus of responsibility (Knezevic, 2012), and whether it is effective in changing behaviour. According to some critics such as Knezevic (2012), “Labels, however, shift all the responsibility to the consumer; moreover, they imply that the industry is quite capable of communicating with the consumer, and that policy change is not needed” (p.254). For instance, New York City recently required fast-food chains to label their items with calorie counts, but this initiative does not necessarily affect what ingredients are in the food items, or the way they are prepared (Knezevic, 2012) The same could be said of the requirement in Ontario for processed foods to be labeled with their calorie count and ingredient list; the actual content does not change. The argument made by the food industry is that if the information is there, then the consumer can choose whether to buy it or eat it, or not. With consumer information, “the current system focuses primarily on product, not the process by which food is produced” (MacRae et al., 2012).

Nonetheless, if restaurants are required to provide information, if an item has a shocking calorie count or very high sodium levels, the restaurant may preemptively change the formula of the food item in order to avoid public outcry. In this way, menu labeling has the ability to change industry behaviour above and beyond what was expected. A single entrée at some establishments pushes the limits of the daily recommended calorie intake (Bloom, 2010). Scourboutakos et al., (2013) found in their study on the nutrient levels of meals at Canadian sit-down restaurants (SDR) that “On average, breakfast, lunch and dinner meals from 19 chain SDRs contained 1128 calories (56% of the average 2000 calorie recommendation), 151% of the amount of sodium an adult should consume in a single day (2269 mg)” (p. 1373). Currently restaurants, when they are not required to disclose their meals’ calorie information, follow a “don’t ask, don’t tell” policy

(Bloom, 2010). This reveals another limitation of menu labeling, and one of the reasons customers give for visiting restaurants: it is a treat. Bloom (2010) comments that restaurants “don’t want to tell us the truth, and frankly, we often don’t want to know” (p.127). A cultural factor embedded within food waste is that the restaurant was launched as a place you went for as a treat (Winson, 2013) with, for example, most American families in the 1960s frequenting a restaurant at most twice a year (Bloom, 2010). Although Canadians have increased the amount of food they eat from restaurants and fast-food outlets (Garriguet, 2004), considering eating out a “treat” still remains intact. The WRAP UK, in their resource pack for the hospitality industry, reveals that customers considering the restaurant meal a “treat” influences food waste reduction efforts: “Having a meal out is often perceived as being a treat, an occasion for people to indulge and a time when they don’t want to have to worry about leaving food” (2012b, p. 5). Although there is room for menu labeling to be helpful in influencing some customers’ choices at chain restaurants, with this cultural consideration of the restaurant as a special excursion remains intact, customers may ignore the information because they would rather not know.

2.5 Customer Education

Although systemic issues within the food system cause consumers to waste food, there is still a need and an opportunity to change consumer behavior within restaurants. Several studies have attempted to map out the behaviors and attitudes leading to food waste (Graham-Rowe, 2014; Parizeau et al., 2015; Thyberg & Tonjes., 2016). It is not the result of a single behaviour, but combinations of multiple behaviours (Quested et al., 2013), related to cultural, political, economic or geographic drivers. Personal preferences, values and attitudes may too influence waste behaviours. There is, though, no clear consensus on attitudes towards food waste, though food waste awareness has been shown to reduce waste (Parizeau et al., 2015).

Ruper Spies, a senior lecturer at Cornell School of Hotel Administration, says that there are certain costs you have to absorb to stay in business and “one of those is having larger portions in order to compete with other businesses. Consumers expect that these days” (Bloom, 2010, p.129) This reveals a paradoxical situation that restaurant management is presented with: consumers claim to be concerned about food waste, and yet there is an expectation that a certain portion size is required to warrant the price consumers are paying for a meal. Some of the interviews I conducted with restaurant owners reveal there is a reluctance to change portion sizes or accompaniments, either due to the established standardization within the chain, or in order to keep up customer satisfaction and a consistency in customer experience. For instance, Graham Hnatiw, the general manager for the spaghetti factory when asked about who sets the menu, acknowledged that the restaurant has been established for 45 years, so “there is a legacy of what we have on the menu. In that sense we don’t change... We wouldn’t take spaghetti with meatballs off the menu.” (March 24th, 2016). Hnatiw explained that they have a recurring customer base, so if you take items off the menu, then there would be an uproar. Andrew Laffey at Hot House Café admitted to a similar situation at his restaurant, commenting that “we have been here 27 years. About 80% of our menu, if we took it off, there would be public outcry” (February 24th, 2016). It is definitely not a bad thing for a restaurant to have a loyal customer base. Yet, it does demonstrate that most restaurants have two competing considerations: to try and tackle plate waste by changing portion sizes or accompaniments; or keeping things consistent for the loyal customer base that is helping their business. The issue of trying to fulfill customer satisfaction over the proper value per dollar spent in the restaurant is not one unique to Toronto, or even Canada. A report by WRAP UK (2009) focusing on the hospitality sector, found that although the prevention of food waste offers the sector a significant opportunity to reduce waste and cut

costs, doing so in practice may be challenging because of the need to ensure that customers feel they are getting value for money.

This expectation for a certain portion size for the price appears to be more representative of the chain, or restaurants modeled after the chain. Kim McCormack, the general manager from the Works explained in her interview that:

“Given our brand specifically, our product is expensive and you want to give people their value for their price. The survey consistently says that the price is high. So we try to meet the standard with portion size and obviously the quality of the product for sure. It is hard cause the consumers have a certain picture in their head of what they are expecting” (March 16th, 2016).

The Works primarily serves burgers and since burgers are heavily associated with a fast food location, when the Works charges \$15, the customer finds this expensive. In response, the Works offers large portions to “make up for this” (Kim McCormack, March 16th, 2016). This “picture in their head” of what they are expecting, is a significant cultural factor contributing to restaurant food waste. It is also more descriptive of the chain restaurant experience. The chain serves the “industrial diet” of large portions, and nutritionally poor food that is contributing to the rise of obesity and associated health problems in Canada (Winson, 2013). The current expectation is that if the place does not serve high quality or unique food, and it is nutritionally poor, then they need to make up for this with the amount they serve. Graham Hnatiw, the general manager at the Spaghetti Factory, when asked if they serve accompaniments with their entrée’s, replied that “[A]ll of our meals come included with bread, salad and soup, an entrée, ice-cream, coffee and tea.” (March 24th, 2016). He acknowledged that customers can, of course, say they do not want one of the accompaniments but he generally finds the attitude of the customer to be “You paid for it, so people want it...you do see people who waste unnecessarily because it is included” (March 24th, 2016). This attitude is pervasive and problematic in the restaurant industry. It also is

exemplary of the broader capitalist system, where you believe that if you paid for it, you need to have it all, regardless of whether you waste it. As this experience is especially prevalent in the chain restaurant, the role of the chain will be addressed in the redesign section of this paper.

2.6 Education Campaigns Moving Forward

Educational campaigns are often a preferred strategy to address consumer food waste because of their political acceptability, low-cost and easy implementation (MacRae et al., 2015). An awareness of the food waste issue though does not necessarily translate into a greater understanding of how consumers contribute to the problem and what they can do to reduce their food waste. In the United States, a survey of households found that 63% of consumers felt food waste was a problem, however only 34% believed that *their* household contributed to it (Watson 2014). Research on food waste has highlighted a lack of awareness of one's own food waste contributions (Graham-Rowe et al., 2014; Watson, 2014).

Educational campaigns can have an impact on consumer awareness, but solutions to the food waste issue cannot only involve educational campaigns if we want to see the substantial change needed to address the social, environmental and economic impacts of food waste. The limit of educational campaigns can be seen through the current suggestions made about food waste by different levels of government, community organizations and industry in Canada. The majority of “food waste tips” are directed at the consumer and household, and it is the same group of suggestions shared by various organizations (Armstrong, 2014; Mayer, 2012) The most common examples are:

- Make a list when grocery shopping
- Eat leftovers
- Freeze it
- Rotate items in your fridge
- Learn about food storage

These suggestions merely touch the surface of the food waste issue and to go deeper requires systemic coordinated changes with strong government support and oversight. It is much easier though to distribute an infographic on tips for reducing food waste in the home, than it is to tackle system change. It is for this reason that education on food waste is helpful for trying to reduce food waste, but is insufficient as an isolated measure.

2.7 Labeling System

Although there may be a disconnect between what consumers' value and are concerned about, with how they act, there is certainly a rising interest in food waste. Parizeau et al. (2015) surveyed and monitored the waste of 68 households in Guelph, and in the survey respondents were asked to rate the guilt that they felt associated with different wasting behaviors. The most guilt-inducing practice was wasting food, with 85% of respondents agreeing that this behaviour made them feel guilty (Parizeau et al., 2015). This study reveals that wasting food is indeed a concern for most consumers. The question then becomes how to take that consumer concern and translate it into a change in restaurant culture? As well, how do you get restaurant owners on board, conveying to them that consumers will act differently based on their concerns about food waste?

A labeling system within restaurants could help restaurant owners pursue waste reduction efforts, with an informed consumer supporting this decision. Although there is labeling on food products from grocery stores, with various levels of success, there is a larger "out of sight out of mind" approach within the restaurant (Bloom, 2010). MacRae et al. (2012), in their research on consumer food messages, writes that "firms have known for some time that consumers are confused about the information provided" (p. 5). If there is no obvious advantage to providing information, then there is no incentive for the industry to do something that could mean

increased product costs and lower profits. Of course, some restaurants are instilling environmental and sustainable practices in their restaurants, but if looking for industry-wide change, then the lack of incentive for regulating food waste behaviour needs to be changed. In the absence of clear information, “consumers may not be able to articulate what they want. In many cases, not enough consumers are vocalizing concerns in a manner that reaches and resonates with food marketers” (MacRae et al., 2011, p.5). Through interviewing restaurant owners and managers, it did not appear that they had received overall strong indication from customers that food waste was an important concern when eating out. Yet, restaurants do respond to consumer trends. For instance, Graham Hnatiw from the Spaghetti Factory acknowledged that he has observed changes over the years in consumer preferences within the restaurant, and that Spaghetti Factory has adjusted accordingly:

“...different trends and you know issues kind of come about. Atkinson came about 6 years ago, and that required us to put more options that were away from too heavy carbs. And then gluten free...became more popular” (March 24th, 2016).

A strong labeling system that has city support could help drive awareness about food waste, and help distinguish for consumers which restaurants are trying to decrease their food waste. For instance in the United States, there is the “the Green Seal Environmental Standard for Restaurants Certification”. To be certified, “restaurateurs must make a waste reduction and management plan, have a waste audit done, reduce their overall waste, divert it from the landfill, donate what’s edible compost what’s not, and recycle fats, oils and greases” (Bloom, 2010, p. 145). Bloom (2010) acknowledges that given how rigorous the Green Seal program is, if it were to become popular, it could really impact the restaurant industry.

Another example is the “Love Food Hate Waste” program in the United Kingdom. WRAP UK (2012b) advised restaurants in their toolkit that the Love Food Hate Waste logo was

one way to convey to consumers that you were following good food waste practices. “Our research shows people like to see the ‘Proud to support Love Food Hate Waste’ logo to show your business is doing something positive to help reduce food waste” (WRAP 2012b, p.10). Both WRAP, and the “Love Food Hate Waste” program are well established in the United Kingdom, with government support backing their efforts, and so the logo brings with it credibility. (Lyndhurst, 2007; Gunders, 2013). The City of Vancouver has followed suit, partnering with WRAP to create their own “Love Food Hate Waste” website, to try and promote the same enthusiasm for waste reduction in their city. At the moment, there are no recommendations for City of Vancouver restaurants to use this logo.

Restaurants and other food service establishments across Canada can receive green restaurant certification, recognizing their use of environmentally-friendly practices from Leaders in Environmentally Accountable Food Service (LEAF) (Gooch et al., 2012). Some of the areas of focus for this program include: energy use, chemicals, waste and recycling, and water use (Gooch et al., 2012). “LEAF” certification does not only focus on waste, and at the moment only has one full-service restaurant in Toronto listed as participating on their website. Balzacs Coffee Shop and Café Belong at the Evergreens were the only two food service locations in Toronto certified in the LEAF program (LEAF, 2016). LEAF appears to be an existing platform that could, if expanded and with an increase in credibility, have an impact on the restaurant industry. Support from the City of Toronto would also be necessary to help the program reach consumers. A strong certification program could help participating restaurants convey to their customers that they are committed to waste reduction.

2.8 Waste Education within the Restaurant Industry

2.8.1 Food Training

At this point in the transition suggestions are meant to be designed that are more easily implementable, without huge costs and efforts, in order to ensure their uptake. Solutions that can be implemented through existing infrastructure are appealing to government and policy makers. The City of Toronto (2016) outlines in their Long Term Waste Strategy draft that a priority is to leverage programs and services already in place in order to further improve waste diversion potential. With restaurants in Toronto, training and licensing requirements already exist that could be adapted to incorporate food waste reduction education. For instance, in 2006, Toronto City Council passed a bylaw requiring Food Handler certification for Food Handlers in the food and beverage industry. The bylaw requires that an owner or operator of a food establishment “ensure that there is, at all times when the establishment is operating, at least one certified Food Handler working in a supervisory capacity in each area of the premises where food is prepared, processed, served, packaged or stored” (City of Toronto, 2006). Toronto Public Health is the City department responsible for offering Food Handler Certification Courses. The City of Toronto website states the Toronto Public Health offers the course, “to provide food handlers with the knowledge of safe food handling practices to prevent food-borne illness” (2006, n.p).

The Food Handling Certificate is an existing mechanism that could be adjusted to address food waste in food establishments. Without immense cost or organization, food waste education could be added into this training, to ensure that staff in restaurants, not just owners or managers are aware of the food waste concerns in Toronto. Michelle Kane, from the City of Toronto Solid Waste department acknowledged in her interview that the City does not have contact with private industry about their waste, unless they participate in the Yellow Bag Program (March 12th, 2016). Even if a restaurant does participate in the Yellow Bag Program, their only contact with the City about waste is comparable to that of a resident: they receive a waste calendar detailing

collection days, some waste reduction and sorting tips, and a link to their website. There is no specific material sent out by the City to private businesses specifically, they receive the same educational material as residents (City of Toronto, 2015a). For this reason, it could be beneficial for the City to provide food waste education during the Food Handling certification, to try and get private business in sync with residential waste collection practices. Ultimately, the owner or manager of restaurants has the final say in food waste practice decisions (especially if it involves spending money), yet it is still helpful to have the staff aware of the issue. Additionally, there is a high likelihood that those who work in a restaurant, may one day manage or own one.

2.8.2 Licensing

Another avenue available to distribute food waste education to restaurants is through the municipal business license procedure. As per Toronto Municipal Code Chapter 545, Licensing, a business license is required for any business “where food is stored, prepared, or sold for human consumption” (City of Toronto, 2015b). The applications must apply in person at the License and Permit Issuing Office. Since an application is required in person, this could be an opportunity to provide restaurant owners, who ultimately have the final say over food waste practices within the restaurant, food waste reduction suggestions.

2.8.3 Waste Hauler Suggestions

Restaurants that do not qualify for the Yellow Bag Program with the City of Toronto must arrange their own garbage and recycling collection. There are numerous waste haulers that collect from the City of Toronto. Restaurant owners confessed to not knowing where their waste was being taken, or if materials were being sorted before landfill (Hnatiw, March 24th, 2016; Laycock, March 31st, 2016; McCormack, March 16th, 2016). Kim McCormack, the general

manager at the Works, acknowledged she knows her garbage and recycling is picked up 3 times a week, but “don’t know if they separate out the organics later” (March 16th, 2016).

On the City of Toronto website, in the section on private business waste collection, the City advises that if you do not qualify for the Yellow Bag Program, you “must find alternative service providers. You may contact the Ontario Waste Management Association (OWMA) for a list of private service providers in your area” (City of Toronto 2015a, n.p). There is no distinction made between private haulers, merely a list presented for restaurant owners to choose from. This is reflective of the current food policy approach “to present a buffet of options from which private landowners choose. The state does not necessarily encourage the most desirable options” (MacRae et al., 2015, pg. 31). MacRae et al. (2015) make an important conclusion about the different levels of government that, I think applies to the current waste policy approach.

Since the province regulates industry waste, it should be the province that encourages the most desirable option for waste haulers. The province does not want to appear to be favouring one company or the other, yet I think there is still room to distinguish those who are following environmental and sustainable practices in line with the province’s waste management objectives. For instance, in the report preceding the Waste Free Ontario Act that is set to pass in 2016, the province outlined their objectives for achieving a circular economy in Ontario (Government of Ontario, 2015). Ontario’s goal is “to move towards zero waste in the Province and zero GHG emissions from the waste sector to support a circular economy. It refers to a new way of approaching waste which emphasizes waste prevention as opposed to the traditional end-of-pipe waste management system.” (Government of Ontario, 2015). If the province is following this mandate for waste prevention and a circular economy, then it should encourage businesses to

meet these principles. If the province set an environmental standard, then it could list the haulers meeting the standard so restaurants and other businesses could have a clearer way to compare. The City could then share this link on their website, or distribute through the licensing procedure required for all Toronto restaurants.

2.8.4 For Staff

From within the restaurant, there is an opportunity for owners and managers to educate their staff about food waste. This could include sharing food waste data with staff, and including them in the design and implementation in a plan to improve the situation. WRAP (2013b) found that “[K]itchen staff are not likely to be aware of the amount of food waste generated if this data is not recorded on a regular basis and made available to the teams involved. In addition, staff may not be aware of what can be done to reduce waste in the first place let alone the impact it has on the wider business in terms of cost” (p.12). If you are not involved in the food ordering, then you may not know the food costs the restaurant is incurring, and how much food waste is costing. Kim McCormack from the Works Gourmet Burger, explains that recently their restaurant began posting food wastage data for staff to see. She says “about 8 weeks ago, we started posting food cost variances, so the staff can see what are top 5 foods we wasted” (March 16th, 2016). Although Kim explained that their food is portioned ahead of time, something like a milkshake involves more estimating on the part of the staff then using a scale and portioning out an item like broccoli would (March 16th, 2016). She said they began posting this information to get staff thinking about what they are wasting most, and what it is costing the business.

WRAP (2012a) recommends to restaurants, “[G]et staff on your side. Engage staff to recycle more by helping them to understand which waste goes in which bin. It is key for staff to “buy in” to initiatives so that they see the benefits. This will encourage participation and help

increase recycling rates” (p. 4). Engaging with staff is definitely helpful to any restaurant owner trying to implement any waste reduction strategy. Of course this solution requires a management that is conscious of their food waste situation, and possesses the food waste data for it to occur. Further, this would be an industry-led approach and does not involve state intervention. Finally, WRAP’s (2012a) recommendation that it is key for staff to “buy in” begs the question, why would staff want to? There are definitely environmentally and socially conscious restaurant staff in Toronto that want to see the food waste situation improved. Above that though, how staff are treated in the restaurant I think would determine how on board they would be for going above and beyond their daily tasks to assist in reducing food waste. The Ontario service industry is one that has recently been plagued with labour infractions and mistreatment of staff. How this labour situation impacts the ability to instill food waste initiatives in restaurants will be discussed in the redesign section of this paper.

2.9 Voluntary Approaches to Involve Industry

A possible first step to get restaurants thinking more about food waste, and in greater communication with the municipality, is for the city to launch a “Restaurant Food Waste Challenge”, akin to New York City. There, the challenge is voluntary in nature, but it can be a way to publicize restaurant waste, and what improvements are happening in the industry, to consumers. In the description of the NYC challenge, it says “participating restaurants will have access to a diverse forum of peers, industry experts, and ancillary organizations that will provide the contacts, best practices and technical assistance needed to realize meaningful reductions in landfilled food waste” (New York City, 2013, n.p). In 2013, 6 months after launching the program, Mayor Bloomberg announced that more than 100 restaurants participating in the Food

Waste Challenge had diverted more than 2,500 tonnes of food waste from landfills (Gregory, 2013).

Metro Vancouver launched a “Food Waste Reduction Pilot”. It developed tools and resources to help both residents and businesses make changes to keep food out of their landfill (City of Vancouver, 2015). One of the tools is the LeanPath system, which helps track kitchen waste sources and reduces purchasing and operating costs at large institutional kitchens. The equipment has been adapted for use in small-scale and independent restaurants, and was tested by the city of Vancouver in a few restaurants in 2014. Now the city of Vancouver is offering a trial use of the system to restaurants to help them understand their food waste. If the city of Toronto were to start a voluntary challenge, perks like access to certain waste reduction measures, or the opportunity to have their involvement publicized, could help increase how many restaurants participate.

WRAP UK also helped launch a food service agreement in the United Kingdom. In an effort to cut food waste in the service industry, 73 hotels, pubs, restaurants, fast food restaurants, caterers and government departments signed the Hospitality and Food Service Agreement, committing to cut waste by 5% by 2015 (Gooch et al., 2012). This voluntary agreement target is 70% of the overall rate of food and packaging waste that is being recycled, sent to anaerobic digestion, or composted (Gooch et al., 2012). Of course in consideration of O’Brien’s (2012) warning of surplus accumulation, anaerobic digestion would not be a solution to food waste in this paper, yet this agreement is useful as an efficiency step to first engage industry. This voluntary agreement has achieved a decrease in CO₂ of 3.6% in 2014, relative to the baseline year (Gooch et al., 2012). The appeal of launching an agreement like this one in Toronto, is that it brought together diverse actors in the food service sector, something that does not happen often

and would be beneficial for food waste reduction efforts. Further, it did achieve some positive results, and therefore could be a solid introductory effort by the state to engage private food industry.

2.10 Increase Tipping Fees

Currently, landfill tipping fees in Toronto are low enough that they do not prompt a change in industry behavior to reduce waste. Stuart (2009) writes that “ideally it is not so much that eating food should be more expensive, but that wasting food should become so” (p.217). As part of a long-term transition strategy, increasing fees is a first step to more significant changes down the road (MacRae et al., 2015). Some evidence from local Canadian jurisdictions suggests fees over \$100/tonne are required to get significant diversion (Anderson, 2014). Restaurant behaviour in Toronto indicates that disposal costs are not high enough for the industry to significantly change. Restaurant managers repeatedly described how customer satisfaction trumps reducing food waste, or other environmental concerns (Laffey, February 24th, 2016; McCormack, March 16th, 2016; Hnatiw, March 24th, 2016). Graham Hnatiw, manager at the Spaghetti Factory explains that:

“Our job is easy. They come in hungry, we have food to provide them. As long as you treat them fairly, they will leave happy... We will take the highroad. We will overfeed people, waste food, to make sure people leave happy. For us the cost of that extra expense incurred for food waste, is cheaper to make them happy then it is to find a new customer” (March 24th, 2016)

Although customer satisfaction is the number one concern for restaurants, restaurants are tied to profit margins. If disposing of waste was expensive enough, this should prompt a change in behaviour. Right now, restaurants can keep maintain the status quo without being penalized. Since private industry waste is not primarily collected by the City of Toronto, it is being sent to private landfill. The Waste Free Ontario Act, set to be passed in 2016, does not mention an

increase in tipping fees, though does suggest that using disposal bans to facilitate resource recovery and waste reduction may be implemented (Government of Ontario 2016)

Solutions: Substitution

This phase involves new organizational arrangements, the substitution of processes and practices and “brings alternative/niche activity into the dominant flow of change” (MacRae et al., 2015, p.32).

3.1 Increase Food Waste Data

Akin to the general food waste data in Canada, I do not believe there has been enough research undertaken to confidently market to restaurants the message that food waste reduction practices will save money. In comparison, in the United Kingdom, the support for reducing industry waste is far more extensive. WRAP UK, with support from the British government, has undertaken multiple in-depth studies on food waste. WRAP concludes that “Identifying the volume of food waste arising per cover can help estimate the amount generated by a venue each day over a year. This can be used to measure the impact from making changes to business practice” (2013b, p.10). WRAP estimates that UK restaurants “produce 915, 400 tonnes of waste each year, including 199,100 tonnes of food waste; and produce 22% of the total food waste across the Hospitality and Food Service sector in the UK” (WRAP 2012a, n.p). These kind of estimates allow for researchers and policy makers to place restaurants within the context of the wider food industry, to comprehend their impacts and what areas need improvement. Further, the data can bolster arguments for regulatory change to produce better system-wide outcomes.

If there were reports comparing multiple restaurants, and more importantly collecting data on the amount of waste at several restaurants, then I think it would be more feasible to draw conclusions on where restaurants will save money if they reduce their food waste. Policy makers

and businesses need reliable information to conduct cost-benefit analyses of specific waste-reducing initiatives (Buzby and Hyman, 2012). WRAP UK has worked with multiple stakeholders to draw conclusions across sectors, and estimate the impacts of change on a variety of actors.

When suggesting restaurant waste solutions, supply chain links will need to be considered. Looking across supply chains is important because the costs of reducing food waste may be incurred at one stage of the supply chain, whereas the benefits may occur at another stage (MacRae et al, 2015). Similarly, costs may be borne upfront, with the benefits occurring later. Several case studies suggest that food waste reductions can, in many instances, produce operational savings, or create new revenue streams. For instance, Uzea et al., (2014) in their report on industry-led approaches to food waste, summarize the experience of a Tim Hortons' supplier that through participation in a waste discharge reduction project, managed by the Bloom Centre for Sustainability, generated savings of \$490, 000 per year and also saved substantially on utilities (electricity, natural gas and water).

Unfortunately, the example used by Uzea et al. (2014), with a Tim Hortons supplier, is an isolated one. The lack of data on food waste in Canada complicates the transfer of these results to other food service providers. The “cost savings” of food waste reduction initiatives are often reported in isolation, without considering other factors that impact the ability of restaurants or consumers to make changes. Evidently Canada needs its own version of the WRAP reports, conducted by government, or by an outside organization with government support and funding.

The province of Ontario has also voiced the need for stronger data on waste. In the “Strategy for a Waste-Free Ontario”, the province outlines how one strategy is to establish performance metrics to ensure that progress in achieving the Strategy's goals of zero waste and zero

greenhouse gas emissions could be assessed (Government of Ontario, 2015). The report states that:

“The province has not been able to collect sufficient data to understand which sources and materials require greater diversion effort. This has led to gaps in knowledge regarding current diversion. Data is essential to developing evidence-based policies” (Government of Ontario, ,2016, p.20).

The Waste Free Ontario Act, to be passed in 2016, should increase data collection on waste practices, and will hopefully aid in the development of policy and programming directed at industry waste in the province.

3.2 Design Standards for Waste Minimization

One opportunity for change within the restaurant industry is through a change to building design standards. Some Canadian cities have now instituted green standards for residential and non-residential building design and construction. The city of Toronto adopted the “Green Standard” in 2009:

“The Green Standard is a set of performance measures that promote sustainable development...The Toronto Green Standard is a key element of the City’s Climate Change Action Plan, an aggressive environmental framework aimed at reducing Toronto’s greenhouse gas emissions by 80 per cent by 2050.” (MacRae et al., 2015).

The standards do not contain explicit reference to building design to minimize waste, but considering the City has developed a long-term waste strategy to prevent and reduce waste, a change to the current standard would be in line with these objectives. The city of Toronto could require that restaurants design proper spaces for both sorting, holding and disposing of their waste. As previously mentioned, the Hot House Café owners Andrew and Eleanor Laffey designed a space in their kitchen and an opening in their counter, to make it easier for staff to separate organics from the rest of their waste (February 24th, 2016). Lack of space is frequently

cited by restaurant owners as a reason for not being able to sort their waste or compost of it (Bloom, 2010; Laycock, March 31st, 2016). In downtown Toronto, restaurants often reside in compact spaces with minimal kitchen and storage space. Changes to the design standards in Toronto could at least ensure that future restaurants are required to build sorting space as a part of being issued a restaurant license. In addition, restaurants could be required to have space to store separately their three types of waste, to account for organic, recycling and garbage. This measure would be in line with and help support the suggestion later in this paper that the province of Ontario require private industry to have organics collection.

3.3 Packaging

Of course food is not the only type of waste within the restaurant. During interviews, several restaurant managers and the City Solid Waste department mentioned food packaging, and raised several concerns about the increase in packaging for food items delivered to the restaurant (Laffey, February 24th, 2016; Michelle Kane, March 10th, 2016). Brett Meadows (April 12th, 2016) from Gordon Food Services, a food distribution company, argued that the big food companies have made an effort to reduce packaging, to cut costs and stay ahead of the game in anticipation of changes by government to permissible packaging. For instance, he says the main large competitors no longer use staples and the packaging is fully recyclable (Brett Meadows, April 12th, 2016). Why is there a disparity between what the restaurants report seeing, and that of the distribution company? Large food distribution companies see packaging as an inevitable part of food distribution. Our current global and corporate food system requires long supply chains, with more and more of our food travelling longer and further. Long supply chains encourage excess packaging.

In the United Kingdom, WRAP also found that there are opportunities to reduce packaging waste in the hospitality industry. The report “The Composition of Waste Disposed of by the UK Hospitality Industry”, examined UK hotels, pubs Quick Service Restaurants and restaurants waste levels (WRAP, 2009). The report concludes that although there were opportunities to reduce packaging waste in this industry, it is not generally in the purview of any single restaurant, and instead needs to be tackled across the industry as a whole, throughout the entire food supply chain (WRAP, 2009).

If the province of Ontario required producers to take responsibility for their waste, this would be one way to reduce packaging and increase recycling levels. Until now, a burden has been placed on the municipalities in Ontario to try and recycle whatever packaging is used for consumer items or food, within their recycling system. The City of Toronto only has jurisdiction over “in store packaging”, anything that is done in house, such as the plastic bags in grocery stores or the take-out containers in restaurants (Kane, March 10th, 2016). Any other packaging falls under provincial jurisdiction.

While recycling is a positive practice that has the capability to reduce significant amounts of waste, it neglects the reality that the vast majority of materials sold in North America are not made to be recycled (Weston, 2012). Producer responsibility will be included in the upcoming “Waste Free Ontario Act”, to be passed in 2016, in order to encourage more conscious consideration for packaging by private industry. According to the province, “Empowering producers with full responsibility would inspire producers to improve how their products and packaging are designed, used and reused, and how their end of life products and packaging are recycled and reintegrated into the economy” (Government of Ontario, 2015, p. 8). This measure by the Ontario government could have an impact on the amount and type of packaging arriving

to restaurants, though it will all depend on how the program is implemented in the upcoming years. An increase in localized supply chains and a reduction in the amount of pre-prepped food ordered by restaurants would assist in decreasing the amount of packaging arriving to restaurants. How to try and encourage both will be discussed in the redesign stage of this paper.

3.4 Food Recovery

Food recovery has been identified as one avenue for redirecting food that would be wasted away from landfill and donated to help those in need (Garrone et al., 2013; Parfitt et al., 2010). Food recovery includes gleaning from fields and collecting perishable, nonperishable, and prepared food from various stages in the supply chain (Gunders, 2013). Some of the identified barriers to recovering food are “liability concerns, distribution and storage logistics and funds needed to glean, collect, package and distribute it” (Gunders, 2013, p.14). Part of the appeal for improving food recovery, is from the acknowledgement that food insecurity is a serious concern and worsening within Canada. Close to 3.9 million Canadians are currently food insecure (Food Secure Canada 2015, p.13), meaning that they have “limited, inadequate or insecure access to sufficient, safe, nutritious, personally acceptable food to meet their dietary requirements for a productive and healthy life” (Food Secure Canada,2015, p.5). Food recovery is ranked second in my food waste hierarchy, with source reduction being the top priority. The responsible management of food is presented as part of the solution to food security, while also making the food value chain more environmentally sustainable and resilient (Garrone et al.,2013).

One of the people I interviewed for this research was Lori Nikkel, the director of Programs and Partnerships at Second Harvest, to inquire about how many restaurants donate food to their organization, what is the nature of their relationship with restaurants, and what are several barriers for restaurants to reduce food waste. For Second Harvest, 80% of their food donors are

static, and 20% are ad-hoc (Lori Nikkel, February 24th, 2016). Second Harvest primarily collects from donors using a fleet of trucks, while some collection in the downtown core of Toronto is done through “Hunger Squads”, that collect and redistribute donated food on foot. Second Harvest has 600 regular donors in Toronto. Of the 600, only 3 are restaurants: the Royal York Hotel, the Hilton hotel and Hot House Café (Second Harvest, 2015).

Jonathan Bloom (2010) argues that perhaps not all restaurants want to repurpose food in their restaurant, but that they could donate it. He claims that “it’s fairly easy for restaurants to donate their edible excess. It is not, however, easier than throwing it away” (Bloom, 2010, p.144). The interviews with restaurants, and with Second Harvest have revealed, though, that having all restaurants donate their food, while certainly a socially and environmentally pleasing idea, it may be more complicated and less feasible than suggested.

On the restaurant side, it may not be that difficult to prepare the food for pick-up from a food recovery agency. Bloom (2010) suggests it would only take a little bit of effort, such as wrapping a tray or setting aside some refrigerator space, to be able to donate this food. For instance, Hot House Café is one of the three restaurants that Second Harvest collects excess food from. Second Harvest and Hot House Café have a longstanding relationship. Second Harvest has been collecting from the restaurant for more than 20 years, and so Lori Nikkel acknowledges that the owners receive special treatment. Second Harvest provides them with trays to collect the food each week (February 24th, 2016). Part of the reason this relationship works so well is that Hot House has two buffets a week, one on Wednesday and one on Sundays. The Sunday brunch sees 800 people throughout that day, with Andrew turning away close to 300 people each week (Laffey, February 24th, 2016). When asked about donating food to Second Harvest, Andrew

Laffey replied, “We are delighted. We have given over 2 million pounds of food to Second Harvest.” (Laffey, February 24th, 2016).

Part of the reason that the relationship between Hot House Café and Second Harvest works so well is that the buffet provides a consistent and large amount of food for donation. Generally, restaurants are not ideal partners for Second Harvest because they do not have a large enough quantity of food to make it organizationally or financially viable to collect from them (Lori Nikkel, February 24th, 2016). Of course, there is food waste being produced in Toronto restaurants, but it is not of the type, or quantity ideal for food rescue collection. Further, restaurants do not consistently produce food waste because of the fluctuation of demand in that industry, making it difficult for Second Harvest to arrange weekly or bi-weekly collection like they can with retailers. Restaurants generally lack the storage to do food donation, and the necessary education piece is also absent. Sometimes hunger squads can collect from restaurants by foot, but the restaurants need to be in the downtown core. Overall, restaurants are not where Second Harvest is focusing their effort, yet this general lack of ability of restaurants to donate food to recovery agencies is not something being discussed in research or policy work.

Consumers consider food waste to be primarily a social issue which aligns with the objectives of food recovery work: to redistribute food to those who are food insecure (Garrone et al., 2013; Parfitt et al., 2010). Several studies on household food waste, in Canada and abroad, have found that, for most householders, food waste is primarily a social issue, and not just an environmental and economic one (Parizeau et al., 2015; Stefan et al., 2013; Watson and Meah, 2013). Parizeau et al., (2015), in their study on Guelph households, asked questions to assess the nature of the responsibility that people associate with food waste. While many respondents

agreed that food waste is an environmental (68%) or economic (72%) problem, the most common response was that it was a social problem (83%).

Bloom (2010) argues that restaurants should donate their food; my research suggests that this is not a viable option for restaurants. Clearly, food waste education should include how little food can be recovered at the restaurant level, in order to convey to consumers that what is currently being wasted at restaurants will not be redistributed, and so other changes are necessary to reduce restaurant food waste. Food recovery is sometimes used as a scapegoat for addressing wider structural changes in the food system. An educational campaign focusing on the situation of restaurants is necessary, to convey that this avenue is not possible on a wide-scale in Toronto. What role food recovery should have in the long-term will be addressed in the redesign section of this paper.

3.5 Food waste audit

One of the important steps for success within Toronto, should be for the province to prioritize the measurement and collection of food waste data. The WRAP UK studies, whether focusing on the consumer or food service level, began with initial assessments of where and why food waste occurs (Uzea et al., 2014). Similarly, the first step of the New York City Restaurant waste challenge is for the government to help participating restaurants perform a waste audit. The waste audit allows restaurants to track and observe what food is being wasted the most and help with intervention design. If one does not know how much or where food loss and waste is occurring, how can one be expected to know what to do about the issue, let alone address it in an efficient manner? In the case of high levels of plate waste, a restaurant following a food waste audit, could examine how much and what types of food tends to be left on customers' plate and

make changes accordingly to the menu in order to cut down food costs and simultaneously reduce food waste (Lipinski et al, 2013).

A waste audit has the potential to clearly quantify food waste for the restaurant owner and staff. This could be helpful in light of tendency for people to underestimate how much food they produce, even in light of knowing about the food waste issue. Several studies examining household and consumer food waste practices have reported that people tend to unknowingly minimize how much food waste is created in their home (Buzby & Hyman, 2012; Monier et al., 2010; Parizeau et al., 2015) An awareness of the food waste issue, though, does not necessarily translate into a greater understanding of how consumers contribute to the problem and what they can do to reduce their food waste. In the United States, a survey of households found that 63% of consumers felt food waste was a problem, however only 34% believed that *their* household contributed to it (Watson 2014). Similarly, Parizeau et al. (2015) found that their average per person of food waste was higher than Statistics Canada reports. A Statistics Canada (2009) report estimated post-retail food waste at 183 kg/per person for 2007. In comparison, through the surveying and food waste weighing of 68 households in Guelph, Parizeau et al (2015) observed 217.4kg of food waste per year. The authors acknowledge that “Our findings...may indicate a more wasteful Canadian populace, but may also support the importance of third-party direct observation of food waste practices” (p.214). Rathje (1992) contends that garbage provides the key to understanding what consumers actually do rather than what they say they do.

Like the household, there appears to be a tendency in the restaurant industry for owners and staff to either not know how much food is wasted, or a tendency to believe they are wasting less food than they actually are. A part of this could stem from a lack of communication between restaurants, resulting in not knowing neighbouring restaurants waste practices, or waste levels.

When Kim McCormack from the Works Gourmet Burger Bistro, was asked if a waste audit would be helpful for reducing waste, she responded that “I think that this location, we do really well at keeping our waste down. I would have to see what they could provide for us, because I think we do a really good job compared to other chains I have worked at” (March 16th, 2016). McCormack also acknowledged that the Works chain serves large portions, resulting in a lot of plate waste (March 16th, 2016). In the former statement, McCormack was indicating a low-level of prep wastage (for instance low levels of spoilage, or over prepping), indicating a separation between prep and plate waste, when in reality they both end up in the restaurants’ waste disposal. When asked about what analytics they use to track waste, Evan Laycock, the general manager at the FlatIron Firken, indicated that their restaurant used a Point of Ordering system (POS) and that “everything is punched through. Any wastage, as in mistakes are tracked as well. Apart from that, in the kitchen we have a book where we write things down in the kitchen if have prep mistakes, spoilage etc” (March 31st, 2016). Laycock concluded his answer about analytics by saying that “we have fairly minimal wastage” (March 31st, 2016).

One of the current concerns with waste audit initiatives initiated by municipalities in Canada, the United States and the United Kingdom, is that they are voluntary in nature. Some restaurants complete an audit to cut costs. A voluntary waste audit would probably not instill change across the sector in Toronto because there are competing interests driving restaurant behaviours. The rhetoric on food service waste often focuses on how restaurants will reduce their waste because it is a “win-win” for them. For instance, Brett Meadows from GFS argues that restaurants want to order better so as to reduce their waste, but also their costs, because it is a “win-win” (April 12th, 2016). Unfortunately, restaurant management behaviour to date has not mirrored the scenario described by Brett. It may be costing the restaurant money to waste food but for a variety of

other reasons the restaurants will not change their behaviour. A waste audit, where you have to properly sort and then weigh your food at the end of each day, is something that would take time, a commodity severely lacking in the restaurant industry. A waste audit also relies on skilled management to undertake the endeavor. Finally, the restaurant management may be interested in the voluntary waste audit, but customer satisfaction likely still trumps undertaking waste reduction efforts, especially if the financial incentive for restaurant owners is not in place to reduce their waste.

There are competing factors that influence decision-making within the restaurant, and may reduce the chances that a restaurant will follow through on a voluntary waste audit, indicating that it might better be conducted by an outside body. WRAP UK assisted food service establishments with conducting waste audits, produced the findings and helped involved parties to implement solutions (2012a). Food waste research in Canada has found that “businesses are not addressing the challenge of food waste as well as they might. Reasons include Canada’s not having a high profile industry-wide initiative such as UK’s WRAP (Waste & Resources Action Programme),” (Gooch and Felfel, 2014, p.34).

In Ontario, the 3Rs Regulations requires that private businesses over a certain size must perform a waste audit, and considering this system is already in place, it could be expanded to include smaller businesses. At the moment, designated organizations are required to conduct a waste audit which must be updated annually (Government of Ontario, 2015). The province states that the waste audit should address:

- the amount, nature and composition of the waste produced in all departments
- how the waste is produced including relevant management policies and practices
- how the waste is currently managed

In the draft strategy for the Waste Free Ontario Act, the province states that the 3Rs will be updated (Government of Ontario, 2015). The waste audit should be expanded to include more restaurants. In the interview with Michelle Kane, from City of Toronto Solid Waste, she explained that for jurisdictional reasons the City cannot duplicate processes that the province are carrying out, but rather could help enforce any of the provincial regulations (March 10th, 2016). An expansion of the waste audit would require an increase in enforcement from the province. The City could offer help by performing the waste audits on behalf of the province. For instance, Public Health officials already visit restaurants to perform health inspections (City of Toronto, 2012). These officials could inspect whether restaurants have performed the audit, are attempting to follow their plan of action, and are updating the plan annually.

3.4 Transparency

When researching the food waste situation in Canada, to find a lack of transparency is the norm. The average consumer is unfamiliar with what happens to restaurant waste in Toronto. This needs to be addressed when proposing solutions moving forward. MacRae et al. (2015) discuss how under the province of Ontario's regulation *102/94 of the Environmental Protection Act*, businesses are not required to include all streams of waste in their action plan, so food waste is often left out of diversion programs. Some supermarket chains, though, have chosen to voluntarily include food waste in their diversion programs for various reasons (MacRae et al., 2015). Regrettably, there is a lack of transparency with these waste audits, so it is difficult for those outside the retail sector to ascertain whether companies are meeting any commitments they have made. Even if a retailer decided to include organics in their waste audit, the results would not be made public. This lack of transparency makes it arduous for the public to understand the

private industry's waste levels, check if they are changing their behaviour, and hold them to their claims to uphold a good public image.

This lack of transparency is commonplace in the current food system (Winson et al., 2012). Stuart (2009) says that self-reporting is unreliable for supermarkets and households, "all anyone has to go on is that which the supermarkets choose to publish" (p.26) To date, industry food waste initiatives have focused primarily on retailers, with drives to increase food donation and the start of "ugly fruit" initiatives (Huffington Post Canada, 2014). Stuart (2009) argues that without transparency, "industry is given license to waste food without hurting their public image" (p.45).

The case of take-away coffee cups in Toronto depicts the standard for government, industry and consumer interactions about waste. The *Toronto Star* ran an article on June 19th, 2016 with the headline "People of Toronto: Stop putting take-out cups in the blue bin" (Powell, 2016). The article reveals that everyday Torontonians throw away hundreds of thousands of used coffee cups, often placing them in the blue bin under the false assumption they'll end up recycled (Powell, 2016). Coffee cups from Starbucks, Tim Hortons and Second Cup should go into the garbage, because they are considered a 'contaminant' in Toronto's Blue Bin recycling program, revealing a lack of understanding by the consumer on where industry waste can go. Furthermore, the food industry is using a cup that is not compatible with the municipal system. 9 years ago there was a proposal to ban paper cups with plastic lids, but "coffee companies said the city was stepping beyond its jurisdiction and they'd do it voluntarily" (Powell, 2016, n.p). The industry did not change its behaviour. Moreover, in 2015, CBC marketplace dropped cups with tracking devices into store recycling bins at 14 Tim Hortons and 14 Starbucks locations in Toronto. Marketplace recovered seven cups from each chain, all in bins for regular garbage pickup

(Powell, 2016). Consequently, consumer felt tricked or duped by the food industry; the recycling bins appeared to be for show to convince the consumer of “good” environmental behaviour. Industry waste is out of sight and out of mind, and yet it is currently difficult for consumers to change the situation.

Similarly, restaurant patrons do not know how restaurants in Toronto handle their waste, and have no means by which to find out more information, unless the restaurant volunteers it. Restaurant managers themselves admitted they did not know where their waste was going (Hnatiw, March 24th, 2016; Laycock, March 31st, 2016; McCormack, March 16th, 2016). The waste hauler I interviewed for this paper would not divulge information about how much their service cost, or what happened to the waste collected from their Toronto restaurant clients (Nicole Huard, April 15th 2016). The province should require that the information from waste audits, that will hopefully be expanded in the future, be made public. An increase in transparency could allow consumers to hold the food service industry accountable for their actions and articulate desired change.

Transparency is also important for the operation of city-run programs. The province of Ontario may be setting the regulations for private industry, but each municipality must bear the consequences of these regulations. City of Toronto, for social, environmental, and economic reasons is heavily concentrating on prevention and reduction (City of Toronto, 2015). Michelle Kane, from Toronto’s City Solid Waste summarized that for the city there is “quite a heavy focus on further up the pipe programming. If we do not have to deal with it in the first place, if we can get people to reduce and reuse, then we do not have to deal with it all. Saves money, it is better for the environment and it costs people less money. A lot of benefits there” (March 10th, 2016). The current waste practices by private industry, and the resulting confusion by consumers

thwarts the City's efforts to run educational programs, and to create a cohesive understanding by residents on how to deal with their waste.

3.4 Waste Disposal regulations for Industry

Currently, restaurants fall within the category of "industry", a sector that the City of Toronto Solid Waste has acknowledged is outside of their control. Although the topic of food waste has garnered increasing attention recently as a substantial social, environmental and economic concern, the majority of food waste research and education has been directed at the individual and has focused on the household level. Even before the topic of food waste gained its current level of attention, consumers in Toronto were quickly socialized to the importance of following the 3Rs. The 3Rs, Reduce-Reuse-Recycle have become "the modern mantra of individualized waste education, focused upon changing the way we organize our waste after it has been created" (Murphy, 2009, p.54-55). Torontonians are well-trained to "sort" their waste. The garbage goes in the black bin and recyclables in the blue bin, and since 2002, organic waste goes in the green bin. The City Solid Waste Department conveys waste information to households through a waste calendar distributed to residents each year that conveys collection dates, as well as what products should be placed where (City of Toronto, 2015d). Further, the city of Toronto utilizes their website to update residents about Solid Waste information, and the "Waste Wizard" is a tool on their website to search for items to find out how to properly dispose of them. As the city was working on the long-term waste strategy, waste education events were held across the city for residents (City of Toronto, 2015d). No events were held specifically for private industry in Toronto (Michelle Kane, March 12th, 2016). The focus of these events was to try and educate residents on waste issues, to try and redirect as much waste as possible away from landfill. In

light of all these efforts, the City willingly admits they do not regulate the private industry, nor are they always able to through the City of Toronto Act.

Although I do not dispute the merits of engraining sorting your waste correctly, it does raise questions about the equity of the current system in Toronto (and Ontario). Or phrased differently, why bother with household waste management and regulations if you are going to let industry off the hook? De Coverly et al., (2008) argue that environmental campaigns can “shift the onus of responsibility for managing waste firmly onto the shoulders of individuals and largely ignore industrial pollution”(p.294). I would argue this has been the case too for waste campaigns, whether they have taken a social angle, an environmental angle, or a combination of the two.

For example, the Long-Term Waste Strategy Update delivered by Solid Waste to the Public Works and Infrastructure Committee, states:

“The draft Waste Strategy minimizes the need for new capital infrastructure investment (such as energy from waste and other emerging technologies) by placing emphasis on residents and non-residential customers of the City to “do the right thing” by reducing the amount of waste they generate and ensuring participation in already existing reuse and recycling programs” (City of Toronto, 2016, n.p).

The province should require restaurants to sort all three forms of waste, garbage, recycling and organics, to ensure that industry is in line with the efforts of the municipalities to promote reduction and recycling, to avoid sending waste to landfill at all costs.

3.5 Update Waste Diversion Act

One of the biggest challenges the City of Toronto faces with Solid Waste Management, is its lack of control over what products industry produces, or how much waste they produce. Yet, the City is responsible for collecting and managing residential waste in Ontario, including

industrial by-products. Collecting and managing residential waste in Ontario has been largely funded by municipal taxpayers (Government of Ontario, 2015).

The Waste Reduction Act was first introduced by the Ontario government to replace the WDA in June 2013. It died on the order at the second reading stage because of an election. Glen Murray, the current Minister of the Environment for the province re-introduced the bill in 2015⁷, as the *Waste Free Ontario Act*. From the language of the Waste Reduction Strategy, the focus remains diversion, particularly recycling (MacRae et al., 2015). Several key sectors are identified for Individual Producer Responsibility programmes “but source separated organics is slated to have a 4-year consultation period, with no date set for implementation of a sectoral programme” (MacRae et al., 2015, p. 29). The province’s consideration for organics is covered under the “Organics Action Plan”, with the purpose of setting a path forward to reducing the volume of organics going to landfill (Government of Ontario, 2016). In the draft strategy that province states that the organics action plan could include: “data gathering, public reporting and performance measures...third-party monitoring, audits and transparency through public reporting...regulatory actions (e.g source separation, disposal bans” (Government of Ontario, 2016, p. 11). All of these measures are in line with the waste reduction framework I am following, and could have an impact on restaurant waste in the province. However, no commitment has been made by the province to implement these programs, and rather they are suggestions of what the Organics action plan “could” look like.

The broad nature of this Organics Action Plan leaves many questions about how exactly it will look, and its impacts (positive or negative) on industry waste. MacRae et al. (2015) state

⁷ The bill can be found at:
http://www.ontla.on.ca/web/bills/bills_detail.do?locale=en&BillID=3598&detailPage=bills_detail_the_bill

that “Given the general reluctance of governments to be specific in legislation, advocates will have to influence how unelected officials write the regulations and design the authority” (p.30).

Solutions: Redesign

The redesign stage of the transition framework requires considering the place of the restaurant within an optimal food system that maximizes our health, and that of the environment. The solutions proposed for the redesign section are influenced by MacRae’s (2011) framework for a “Joined-Up Food Policy in Canada”. Currently, the dominant food system operates in a way that is hurting our health, and is increasingly despoiling the environment. The food system is designed directly and indirectly to encourage people to over-consume, because this contributes to firm profitability, regardless of the waste being produced (MacRae, 2011). In contrast to the current situation, a joined-up food policy would promote a food system “imbued with an ecological and health-oriented paradigm that reflects the most robust thinking about sustainability” (MacRae, 2011, p.428). MacRae and Winfield (2015) state that “A joined-up policy unites activities across all pertinent domains, scales, actors and jurisdictions. It employs a wide range of tools and governance structures to deliver these goals” (p. 2).

In the redesign stage, the “ideal” restaurant is envisioned that would fit within a sustainable food system, where environmental health, human health, and a just system are prioritized. Significant changes would be needed to the current notion of the restaurant in order for these goals to be met. Some of these changes would a change in the culture of what we expect of and how we experience the restaurant. The “ideal” restaurant would have the following characteristics:

- Limited, constantly changing menu
- Portion sizes more in line with Health Canada requirements

- The restaurant to be considered a “treat”, resulting in reduced restaurant visits
- Food ordered from a localized supply chain
- All waste sorted and no organics to landfill
- Prioritizing local composting
- Proper labour conditions

4.1 Landfill Bans

By the redesign phase, it will be necessary to go beyond simply increasing tipping fees, as was suggested in the efficiency stage. As initiated by other municipalities in Canada, Toronto would need to ban organics from landfill in order to see a significant diversion of organics from landfill by industry, and to prompt a reduction of organic waste production. Banning organics from landfill is especially important for the restaurant industry, and the impacts this would have on the industry. Restaurants lack sorting capability, as well as time, and this results in restaurants finding it easier to put things in garbage, even if it is costing them more overall (organics adds a significant weight to their garbage). An increase in the number of waste audits performed by the province, and an organics action plan would likely have an impact on how many restaurants recycle organics. An outright ban, with resulting fines for noncompliance, would be ideal in the long-term to change behaviour.

Both the city of Vancouver (2015), and the province of Nova Scotia (Friessen, 2000) enacted a landfill ban on organics to landfill. MacRae et al (2015) explain that “however, Nova Scotia is currently struggling to send its organic waste to such facilities because the infrastructure was not fully implemented and set up efficiently when the ban was enacted” (p. 37). For this and other reasons, Ontario would have a difficult time implementing a ban in the short term. It would be necessary to encourage the development of more organic waste collection services. However, as a redesign stage strategy, many changes to waste reduction infrastructure and management would have already been implemented, making the implementation of a landfill ban feasible in

Ontario. Andrew Laffey from Hot House Café discussed how an organics collection option is relatively new and now Waste Co collects their garbage, recycling and organics. Andrew says “In the past 5 years, we probably cut our pick-up garbage by about 80%” (February 24th, 2016). He acknowledges that 5 years ago, they did not know anyone collecting organics, and he has been involved in the restaurant industry in Toronto for over 30 years. Waste Co, acknowledged in their interview that they have noticed a rise in popularity for organic programs from private businesses. Nicole Huard, the supervisor of waste audits from Waste Co, explained that for organics collection, “If a client is looking to make an impact to their diversion rate, implementing an organics program can often have a big effect since organics are so heavy. Organics programs have the additional benefit of removing odorous materials from the waste stream” (April 15th 2016). When asked about the upcoming Waste Free Ontario Act, Nicole Huard offered up the following suggestion:

“From participation in consultation sessions, it seems the focus of the regs will be extended producer responsibility – which I feel applies more to products that are difficult or impossible or costly to recycle (e.g. e-waste, batteries, mixed media materials), rather than organics, which is much more straight forward. Personally, I would like to see the government take a firmer stance on the diversion programs that are required in buildings/businesses that fall under the regs”.

As the province is passing the Waste Free Ontario Act this year, and does make mention of an organics action plan, the hope is that organics collection will be required for businesses. Nicole (April 15th, 2016) offers up the suggestion that Ontario could follow Scotland’s lead by requiring that “Food businesses (except rural areas) which produce over 5 kg of food waste per week present that food waste for separate collection from 1 January, 2016” (Scottish Environment Protection Agency, 2012, n.p). Either an organics ban to landfill, or required separation of wastes for businesses would have the desired effects of reducing the amount of

organics heading to landfill. Nicole Huard maintains that “there would also need to be sufficient facilities available to treat organic waste, should such legislation ever be implemented” (April 15th, 2016). By the redesign phase, the expectation is that such facilities would be in place to complement these requirements.

4.2 Localized Supply Chains

Garrone et al.(2014) argue that the recovery of surplus food is one way to provide food to those who need it. While this is certainly true, food recovery can no longer be the focus of food waste in the redesign phase. Firstly, if following a joined up food policy approach, the supply chains should be coordinated, and so restaurants would not be producing immense amounts of food waste. Further, a goal of a joined up food policy is to decrease food insecurity, so fewer Canadians rely on food banks, and can afford a healthy and culturally appropriate diet. Finally, as mentioned previously, due to logistic and volume constraints, restaurants are not ideal partners for food recovery agencies, and so it would be better to focus efforts on reducing waste earlier in the supply chain, than attempt to increase the capability of the restaurants to donate food.

Localized supply chains are important in the long-term, for currently the food supply chains are designed for bigger, standardized chain restaurants. This is exemplified through the ordering system functions for GFS, one of two main food distribution companies in Ontario. Brett Meadows, the Sales Growth Manager from GFS, explains that they need large orders because otherwise “it is hard for us to be profitable. From a business standpoint. We require a minimum order of \$750 and then we will deliver. If it is under that, then they will be charged a delivery fee” (April 12th, 2016). This system is ideal for large chain restaurants that can easily meet the minimum order, while penalizing most independent restaurants that tend to be smaller in size. Another aspect of GFS’ system that is conducive to chain restaurants is the design of

their delivery routes. Brett Meadows explains that “a chain like Burger King or Boston Pizza where we say we are in this geographical location, these days, and your delivery day will be Wednesday. What that does, is anyone else in that area, because chains tend to order because of their footprint, they order a lot more than some independents would. What that does, it helps us with that cost for the day.” (April 12th, 2016). Brett explains that they use software to maximize how many visits in one trip. He argues that this system actually benefits the independents because they can tack on a delivery already going to a chain restaurant. He provides the examples of Timmins, Ontario where he says “We never really go to Timmons too often. But now, they have an East Side Marios, and a few other chains that allow us to go more often, and service the independents at a lower cost” (April 12th, 2016). The large distribution companies and large supply chains require that chains exist to make the system profitable, so they become a symbiotic toxic environment, where yes independent restaurants can exist, but only if chains are close by. This is the trap of the current food system, that it requires both long supply chains and large chains to exist together with their unaccounted environmental and health impacts.

It is necessary, then, for the province and city of Toronto to promote and financially subsidize localized distributors such as 100km foods, and organizations such as Local Food Plus, that are bringing together local farmers, food service establishments and customers to reduce the footprint of a localized distribution system (Knezevic, 2012). By the redesign phase, these supports would need to be in place.

4.3 Community Composting

Following the waste hierarchy I have chosen to adopt, it may be necessary in the redesign phase to bypass “feeding animals” for composting if it were to be local organic composting. Typically, in the waste reduction frameworks suggested today (Gooch et al., 2010; USEPA,

2014,), when composting is listed it refers to an industrial compost process. MacRae et al. (2015) comment that, in Ontario, community and mid-scale composting are essentially blocked by existing regulations. A proposed community composting facility would have to meet the regulatory and structural conditions for a large-scale industrial compost facility approval, and receive a certificate of approval as a waste disposal site (OMOE, 2012). Vidoni (2011) describes how the process to receive a Certificate of Approval from the Ministry of Environment (MOE) is daunting and beyond the scope of many community groups, and therefore presents a barrier to decentralized community-level waste projects that could be beneficial and complimentary to the municipal waste management systems already in place.

This situation exists in Ontario because composting is still viewed primarily through the lens of waste diversion, rather than as an essential part of the nutrient cycle (MacRae et al., 2015). In contrast, several municipalities in the United States have community composting projects, with regulations in place to support and direct these projects. For instance, New York City has within its 5 boroughs some 200 sites, facilitated by the New York City Department of Sanitation's (DSNY) Bureau of Waste Prevention, Reuse and Recycling (BWPRR) (Goldstein, 2013).

I borrow MacRae et al's (2015) recommendations for the Ontario system to permit community composting, as I believe that permitting community composting is a part of the restaurant waste redesign phase, as it could allow restaurants in Toronto to participate in a local closed-loop use of their waste. In their recommendation, in Ontario, community composting should be exempted under the *Environmental Protection Act* if its meets the following conditions:

- the facility only receives residential food scraps and yard waste. For instance, Quebec allows up to 150m³ of off-site waste to community sites at any time provided it does not contain any problematic material (e.g., meat, industrial waste) (Vidoni, 2011)
- only use aerobic composting
- the operation composts less than 14 tonnes / week
- in urban areas, minimum distances of 10 m⁸ to the nearest property line, water body, road or pedestrian walkway

According to the goals of a sustainable food system, food moves as short a distance as possible from its place of origin, to allow for full-circle recycling (Sumner, 2012). This requires, restaurants to participate in local and or community composting programs. One option is to have a local distribution company, like 100km foods, deliver food items from the farm to the restaurant, and simultaneously take food waste from the restaurant to the farm to be composted, closing the loop. Such models have been tried in the United States, typically tied in with Community Supported Agriculture (CSA) programs between farmers and residents, but could in this case also include restaurants (Biodynamic Association, 2016).

4.4 Change in Restaurant Structure

The current expectation of an expansive menu, and large portion sizes catering to each and every customer would not be possible if the restaurant industry were in line with environmental and health promotion goals of a “Joined Up Food Policy” (MacRae, 2011). These menu and portion traits though are most common in the chain restaurant, and so by the redesign phase there would need to be a reduction in the number of chain restaurants in Toronto. Instead, the restaurant would return to the notion of being a “treat” with the goal to impress the customer with a constantly changing menu that is catered to what is seasonally available.

⁸ The MOE states there should be a minimum of 100m between all buildings, processing and storage areas, access roads, the nearest residence, school, place of worship, hospital, and any other public institution, bodies of water. Such distances are not viable in urban areas.

Standardization in the chain restaurants makes them ill-equipped to react and change to significantly reduce waste levels and be in line with environmental goals of the province. For instance, Kim McCormack the restaurant manager at the Works, comments that “We have our specs we have to follow. Even though you can anticipate someone might not eat all those fries, you still have to give it to them”(March 16th, 2016). This rigidity is not conducive to achieving a significant reduction in restaurant waste. If you are an independent restaurant, you do not respond to a higher corporation, and instead have the option to customize your menu, and repurpose food items more readily. This flexibility is central to the redesign scenario.

4.5 Reduced Restaurant Visits by Consumers

In order to achieve the goals of environmental protection and health promotion, a reduction in restaurant visits would be required in the redesign phase of the transition framework. Thyberg and Tonjes (2016) discuss how the industrialization of food systems in the developed world has resulted in an increased frequency of eating at restaurants and consumption of takeout food. As discussed earlier, the amount Canadians are spending on eating at restaurants and consuming takeout has increased significantly. In the early twentieth century, almost all food expenditures were for food consumed within the home.

Adults tend to be less likely to waste food that they themselves prepare, or that was prepared by someone they love (Strasser, 1999). In comparison, if you have not created or prepared something yourself (or watched a loved one do so), you are more likely to throw it away. The latter could describe the restaurant or fast-food environment, where the customer is entirely removed from the preparing, cooking and presenting process. WRAP (2012b), when asking consumers why they leave food on their plate, found that “People who leave food don’t

appear to feel a sense of ownership or responsibility over the food they leave. The amount of food they get is considered to be out of their control” (p.5).

Considering the large amount of food currently being wasted at restaurants, the average number of restaurant visits by consumers needs to decrease. A decrease in restaurant visits can also help to achieve one of the joined up food policy goals of increasing health promotion. An increase in the consumption of industrialized food, what is primarily served at restaurants, especially at chains with their large portions, is having a negative impact on our health. Jonathan Bloom interviews a variety of actors in America involved in the food waste issue. Bloom comments that for many Americans today, eating out is not a treat, it is dinner. He says one household remembers going to a restaurant “just twice while growing up in Sioux City, Iowa, during the 1960s” (Bloom, 2010, p.144).

Further, food waste research (de Coverly, 2008; Parizeau et al., 2015) reveals a disconnect between the “ideal” week envisioned by the consumer, and what actually ends up happening. For instance, consumers may buy certain foods like fruit and vegetables with the desire and intention to eat healthy meals, but outside factors such as time and logistics influence what actually happens, resulting in produce being wasted. WRAP UK found that healthy eating was identified as a motivation for reducing food waste (Quested et al., 2013). Healthy foods typically have shorter lifespans than processed foods leading to Parizeau et al., (2015) to observe that “high volumes of food waste may be reflective of a household’s intention to eat healthy foods gone awry” (p. 215). Additionally, groceries may be bought with the intention of cooking and eating at home, but if the week gets busy, then eating out, or ordering take-in, may become more a part of the reality of the week than had originally been intended. Parizeau et al (2015) found that those who ate out most frequently did not spend significantly less money on groceries

per capita than other households. The hypothesis: although these households ate out frequently, they were still purchasing food with the intention of eating at home (Parizeau et al., 2015).

A reduction in restaurant visits could not happen in isolation. There is a need to acknowledge that the increase in reliance on take-away, fast food and full-service restaurants happened alongside a decrease in food skills. An increase in state-supported programs to increase food skills would be necessary as a contributing factor to the food waste issue within Canada is the “deskilled” population. Gaps in consumer knowledge regarding food preparation, cooking, storage and preservation “impinge on the cost of eating, on nutrition, on health and the environment” (Jaffe and Gertler, 2006, p.148). Jonathan Bloom (2010) highlights the issue by stating “[m]any if not most American consumers have lost (or never acquired) the skills needed to make use of basic commodities in a manner that allows them to enjoy a high quality diet while simultaneously eating lower on the food (marketing) chain, and for less money” (p.155).

In their study on identifying motivations and barriers to minimizing household food waste, Graham-Rowe et al. (2014) stated that “the current research findings also suggest that people may need to be trained in food management skills to empower them to keep household food waste to a minimum” (p.21). WRAP UK found that there was a strong inverse relationship between propensity to waste food and ‘home economics’ skills, such as food planning, storage in the home and cooking skills (Lyndhurst, 2007). As a result, “the more equipped consumers feel in each of the areas the less they say they throw food away” (Lyndhurst, 2007, p.21).

Education campaigns could help consumers improve food purchasing skills, meal planning, and leftover use. Also importantly, a combination of education initiatives and food skills training could help consumers gauge what is safe to eat, and interpret date labeling, reducing the amount of food wasted in the household. Food skills training is necessary above

merely offering educational campaigns because research has found that awareness of food waste does not always lead to a greater understanding of how eaters contribute to the problem and what they can do to reduce waste (Parizeau et al., 2015; Watson, 2014). Respondents from Guelph, Ontario, when asked what they could do to reduce waste, almost 40% responded that they could not think of anything (Parizeau et al., 2015). One suggested solution, “Let’s Get Cooking Clubs” was already trialed in London, England. Twenty-Eight “Let’s Get Cooking Clubs” were set up across West London, engaging 800 people. The purpose of the Clubs is to provide practical cookery skills and information to enable people to make the most of the food that they buy (UNEP, 2013, p. 79). Parizeau et al. (2015) observed “reduced waste production in households that exhibited effective food management” (p.213)

4.6 Reduction of Food Recovery

Food-recovery, albeit a small avenue for reducing food waste right now for restaurants, will also not be necessary once the redesign phase of the transition method is reached. Food recovery’s potential relies on there being hungry people to feed (Parfitt et al., 2010), and therefore there is an inherent problem with trying to solve hunger with corporate food waste (Saul, 2016, Suschnigg, 2012). Nick Saul, the President and CEO of Community Food Centres Canada argues:

“[I]et's not conflate a food waste strategy with a poverty reduction strategy. It's destructive to do so. Are we saying that the poor among us are only worthy of the castoffs of the industrial food system -- the majority of which is unhealthy food, laden with fat, sugar, and salt, which increases the risk of diet-related illnesses?...the new schemes about food waste...to create tax incentives for companies who donate their waste to non-profits working with the poor -- benefit the companies first and foremost” (2016).

Following the goals of a “Joined up Food Policy” by MacRae (2011), the food system would focus on health promotion. MacRae (2011) proposes a food system that supports the goals of health, sustainability, economic viability and human fulfillment. If there was a “Joined up

Food Policy” (MacRae, 2011), then the social supports would be in place to avoid the current situation of many people relying on food banks and other charitable organizations for food. Additionally, food recovery presupposes there is excess food being produced at different points in the food supply chain. By the redesign phase, there would be a coordinated supply chain, and so there would not be this excess of food products as has been documented by Stuart (2009) and seen in documentaries like *Just Eat It* (Rustemeyer and Baldwin, 2014).

4.7 Improve Labour Conditions

The redesign stage would also involve addressing the issues of labour within the service industry, those in full service restaurants, but also fast food chains. The current conditions of restaurant staff, most notably cooks, reduces the ability for food waste reduction efforts to be taken up. In comparison, good labour would be a necessary component of a “good structure” of the restaurant that is envisioned for the redesign phase. A significant issue with the food service industry is that “food service work is viewed primarily as something one does while waiting to establish in another field” (MacRae, 2015, p.5). The food service industry suffers from several labour issues including: shortages, a poor image of work quality, high turnover, poor training program and low skill levels (Verma, 2012).

MacRae (2015) argues that often wage levels can be increased when process changes improve productivity or generate more revenue. MacRae (2015) uses the example of a restaurant that has a skilled chef who can work more with raw materials and design a flexible menu based on ingredients, in contrast to a restaurant that hires a cook with limited training and experience who can only rely on pre-cooked, frozen and packaged foods. The chef is paid more based on their skill set, and staff retention can be higher because of the creativity in the offerings (Rosenblatt, 2009). Similarly, the WRAP (2013b) found that:

“ Most of the fine dining sites reviewed had a good level of knowledge and commitment to sustainable practices in comparison to the other commercial kitchen types; this was often achieved by maximizing the use of any one food item through the implementation of ‘nose-to-tail’ cooking” (p.11).

I do not suggest that the future of reducing food waste includes only fine dining restaurants, eliminating the casual restaurant. Instead, fine dining restaurants often have a higher paid chef, who is more skilled and able to repurpose food and reduce waste. Further, WRAP acknowledged that chefs in fine dining sites seemed to have a food knowledge and commitment to sustainable practices. A more skilled, higher paid and more valued cooking staff appears to translate into a higher ability to repurpose food, but also incorporate environmental concerns into the restaurants’ practices. Although there is little research on this topic, Inwood et al. (2008) examined the connection between chefs and local foods, noting that “chefs have been recognized as potentially important partners in efforts to promote local food systems” (p.177). As previously mentioned, the ability to promote food system change, such as reducing waste, or increasing consumption of local foods, must be supported by policy and regulation (Inwood et al., 2008; MacRae et al., 2015).

The foodservice industry employs a significant portion of the Ontario population. In the restaurant industry alone, there are 458, 100 people, representing 6.7% of Ontario’s workforce, directly employed (Statistics Canada, 2010). Further, 1 in 5 young people between the ages of 15 and 24 are employed in the restaurant industry and 22% of first jobs were in the restaurant business. This is the highest of any industry. The service industry, including restaurants, provides a high level of employment within Ontario, and also executes particular waste practices that are not in-line with an agroecological approach, but rather fit the current capitalist industrial food system. This is significant, because changes within this industry could have a large environmental but also cultural impact.

4.8 Improve Training Programs

Poor management skills can be a driver of restaurant food waste, indicating that simply having the data on food waste is not enough to change restaurant waste practices in Toronto. MacRae (2015) highlights in a piece on labour in the food industry, that Canada is weak on management training. If the government is going to be able to fix a lot of the waste problems in the food industry, then it'll need to come up with more sophisticated training programs. The province may be approaching the time where they must start regulating the food service profession, requiring that the restaurant trade only hire managers with a certain certification. Alternatively, the municipality could say that management training is a condition for licensing of a restaurant.

Conclusion

In the course of my research one quote by Jonathan Bloom (2010) resonated with me: “In a nation with robotic vacuums and phones that can give us directions, we’re essentially using a Stone Age solution – digging a hole in the ground and dumping stuff in it – to handle our waste” (p.18). Industry waste is out of sight and out of mind for most people living in Toronto, and current regulations allow this waste (including organics) to end up in landfill. The high level of food waste in Canada, much of which is readily avoidable, is a significant indicator of food system inefficiencies and the unsustainable character of the system (MacRae et al., 2015). Restaurant waste in Toronto has long gone ignored by the municipal and provincial government, unrecognized by the industry itself, and information about it unknown to the general public. The minimal effort that has been undertaken to address restaurant waste has primarily been private, voluntary and disaggregated. I would agree with MacRae et al.’s (2015) observation that “It would appear that only state interventions can address such problems since reducing them runs

counter to the rules of a capitalist food system” (p.49). Reducing waste is not a simple cost-benefit analysis for restaurant owners, for this research demonstrates there are perverse incentives within the system influencing behaviour.

Moving forward, collecting data on industry food waste should be made a priority. Equipped with information on how much waste is produced by the restaurant industry, the province should design mandatory regulations that reduce the amount of waste produced by restaurants, and what is produced be sorted into the three waste streams. Education campaigns can compliment these efforts by raising awareness of the issue to restaurant managers, staff and consumers.

A transition framework was utilized in this paper, acknowledging that food system change in Canada is largely evolutionary (MacRae and Winfield, 2015), that changes will need to be coordinated across the supply chain, and that existing regulation and programs can be built upon to reduce waste. There is no doubt that achieving significant industry-wide waste reduction for restaurants will be a challenge. Perhaps the most difficult challenge is a cultural one. This stemming from an understanding that culture plays a fundamental role in shaping food, eating and nutrition, *and* waste generation (Thyberg & Tonjes, 2016). How we consider the restaurant and what we expect from this experience will have to change, but it is my hope that the restaurant can come to encompass the environmental and social goals we have for a sustainable food system in Toronto.

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Appendix A: Interview Questions

Interview Questions for Restaurant Management:

1. Who sets your menu?
2. What system do you use to order food?
3. What are the biggest cost challenges with ordering food?
4. Are there any food waste impacts from your ordering system?
5. What kind of analytics do you have for measuring how much and where waste is occurring in your restaurant?

- a. If you don't, would you want to participate in a waste audit?
 - b. If you do, are you using the data? Why or why not?
6. What food waste practices does your restaurant follow?
7. What role do you see for your staff when it comes to reducing food waste?
8. How is solid waste collected from your restaurant?
 - a. What company do you use?
 - b. How did you decide on your current collection arrangement?
9. Do you have any observations about packaging?
10. Does your restaurant donate any excess food for food rescue?
 - a. Why or why not?
11. What interaction have you had with the City about Solid Waste Management or food waste?
12. What interaction have you had with the province about waste?
13. What is the most significant change you would like to see from the City to encourage waste reduction by restaurants?
14. What other levels of the food supply chain are impacting your restaurants waste management?
15. What do you think are the most significant barriers to reducing restaurant waste in Toronto?
16. What do you envision are the characteristics of a waste plan that you think would save your restaurant money?
17. What role do you see the consumer having in reducing restaurant waste?

Interview Questions for City of Toronto Solid Waste Staff:

1. In the long-term waste management strategy coming out this year, what implications does this have for businesses in Toronto, most specifically for restaurants?
2. Does the city have plans to provide waste removal for all businesses in Toronto?
 - a. If not, does the city have plans to regulate what restaurants do with their waste?
3. Does the city currently perform waste audits of businesses in Toronto?
 - a. If no, does the city plan to do so in the future?
4. What interactions does Solid Waste have with the province about their Waste Audit for businesses over a certain size?
5. Has the city received any feedback from restaurants on the challenges or barriers they face in trying to reduce food waste?
6. Does the city run, or plan to run any other programs to encourage waste reduction in restaurants or businesses more broadly?
7. Does the city send businesses food waste info like they do households?
 - a. If yes, then have you considered adding food waste education?

Proposed Questions for Food Distribution Company:

1. How many restaurants do you deliver food to in Toronto?
2. How many times per week can a restaurant have food delivered? Is there a standard amount?
3. Is there a minimum amount of food that must be ordered each time?

4. What happens if food is refused by the restaurant?
5. Has GFS had any interactions with the province about food waste?
6. What do you think are the most significant barriers to reducing waste at the food distribution level? At the restaurant level?
7. Have you made any adjustments recently to packaging?
8. Do you have any relationships with a food recovery agency?

Interview Questions for Food Rescue Organization:

1. How many restaurants do you collect food from?
2. What percentage of your total donors are restaurants?
3. What barriers have you encountered to collecting food waste from restaurants?
4. Have restaurant owners indicated barriers to you for donating excess food?
5. What is the most significant change you would like to see from the City to help encourage restaurants to donate food, and reduce food waste?

Interview Questions for a Waste Hauler:

1. How many restaurants do you collect organic waste from in Toronto?
2. Are the restaurants charged a fee for organic collection? What about recycling or organics?
3. What happens to the organic waste?
4. What have you observed with the organics market with restaurants or other businesses in Toronto? Have you seen an increase in interest and business?
5. Has your company had any interaction with the province about waste?
6. Are there incentives from the province to recycle organics?
7. The province is set to release an update to the Waste Free Ontario Act this. Although it is unclear what exactly is going to be included, what impact do you think this will have on waste collection? On organics?
8. From your perspective on the collection and diversion end of the supply chain, what are the biggest obstacles to decreasing waste?
9. From your interaction with restaurants, what are the biggest obstacles to reducing restaurant waste?