



Exploring the feasibility and desirability of in-house
diversion programs for disposable hot beverage cups
at the store level in Halifax Regional Municipality



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List of Abbreviations

BOD: Bio-chemical oxygen demand

CBRM: Cape Breton Regional Municipality

CFC: chlorofluorocarbon

CH₄: Methane

GIS: Geographic Information System

HRM: Halifax Regional Municipality

ICI sector: Industrial, Commercial and Institutional sector

MWA: Municipal Waste Association

n.d.: not dated

NS: Nova Scotia

PCF: Post-consumer fiber

PE: Polyethylene

QSR(s): Quick Service Restaurant(s)

RRFB: Resource Recovery Fund Board Inc.

USA: the United States of America

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I have conducted this project with the support and guidance of my two supervisors - Dr. Michelle Adams and Dr. Tarah Wright. While they have offered editorial and formatting suggestions, I am the sole author of this honours thesis.

Abstract

Disposable hot cups are associated with various environmental problems including increased pressure on landfills caused by their disposal. The objective of this study is to support decision-making for improved waste diversion opportunities for disposable hot cups in HRM, by developing a better understanding of the drivers and barriers to the implementation of in-house diversion programs. This was undertaken by interviewing ten NS Regional Waste Management Offices' managers/coordinators, six recycling/composting facilities, and twelve purposively selected coffee shop owners/managers in HRM. Both policy and technical issues were identified as exterior challenges, particularly from the operational perspectives. Interior barriers included cost, no control of internal decision-making (e.g., franchisee being directed by head office), not enough incentives, no perceived economic benefits, and limited customer engagement. However, there were perceived environmental benefits (e.g., waste reduction) for those that implemented internal diversion programs. Additional motivating factors included environmental obligations, financial support, corporate initiatives, customers' demand, and public pressure. Ultimately, it was found that it is feasible to divert coffee cups in some regions, but further technical evaluations and policy alignment are needed before they can be easily diverted in HRM.

Key Words

Coffee cups, In-house waste diversion program, End-of-life options, Recycling, Composting, Landfill, Waste reduction.

1 Introduction

While disposable hot beverage cups (hereafter simply referred to as “cups” or “coffee cups” where appropriate) are ubiquitous in our society and are often associated with convenience, they contribute to various environmental problems once disposed of. Instead of being recycled or composted, large quantities of these cups are ending up in landfills. Specifically, for Nova Scotia (NS) in 2011, the disposable cups category (including both disposable fibre cups and disposable plastic cups) accounted for 3.4% (6,034 tonnes) of total landfills in NS from the Industrial, Commercial and Institutional (ICI) sector, and 1.1% (1,457 tonnes) from the Residential sector (RRFB, 2012). Landfills are known to generate methane gas (CH_4) and leachates (i.e., toxic compounds), which contribute to global climate change and groundwater pollution, respectively (Botkin, Keller, & Heathcote, 2006). For example, in the wet environment of a landfill, paper products biodegrade which contribute bio-chemical oxygen demand (BOD) to the leachate from the landfill. This leachate can lead to surface and/or groundwater pollution in poorly designed and controlled landfills (Hocking, 1991). The dominant biodegradable polymers of paper products (i.e., cellulose and hemicellulose) will convert to methane (CH_4) in an anaerobic environment (Barlaz, 2006). Moreover, scarcity of land is also an issue as it becomes more and more difficult to site landfills a safe distance from residents and communities (Botkin et al., 2006). These issues are important to note as studies show that a significant portion of disposable cups make their way into landfills thereby further exacerbating the problem (Fairbairn, Fear, Lyon, & Jakubcik-Paloheimo, 2008; Shauna, 2005; Ziada, 2009). The intent of the research is to investigate both the operational feasibility of implementing recycling and/or composting programs in NS for this waste stream, and the desirability, from the perspective the restaurant owners/managers, to do so as an in-

house initiative within coffee shops and quick service restaurants (QSRs) in Halifax Regional Municipality (HRM).

Generally, poly-lined paper cups are the industry standard and are most commonly used in QSRs and coffee shops (e.g., Starbucks) (Weil, 2007); however, one will also find disposable polystyrene (or Styrofoam) cups (Ziada, 2009) in addition to the polyethylene (PE) lined type. Styrofoam cups are banned in some regions due to chlorofluorocarbon (CFC) emissions, which contribute to ozone destruction as well as other potential threats to human health (Reck, 1990).

There is no universal agreement on a term used for paper cups used to serve hot drinks. For many NS municipalities, such as HRM (2013), Pictou County Solid Waste (n.d.), and Municipality of East Hants (n.d.), “coffee cups” are a general term applied for disposable hot beverage cups with only a slight difference in the written descriptions. In the waste diversion guide for Cape Breton Regional Municipality (CBRM) (n.d.), both “disposable coffee cups” and “hot & cold drink cups” are used. The Resource Recovery Fund Board (RRFB), a non-for-profit corporation working in the province-wide waste management fields, uses “disposable fiber cups” in their 2012 waste audit report (RRFB, 2012). The Environmental Action Association (2011) used “poly-lined paper coffee cups” in their writing. Apart from these three terms, “disposable hot cups” and “paper cups” were also found in many waste management related writings on the Internet.

There are a number of possible ways to divert disposable hot beverage cups from landfills: 1) to encourage consumers to use a reusable mug; 2) to recycle the cups; and 3) to compost them. The first solution requires facilitating consumer behaviour change, a complicated process related to changing consumer psychology (Kelleher Environmental, 2009). In contrast, diversion solutions can be comparatively simple and immediately practical options as long as the

recyclability and/or compostability of the cups can be demonstrated and appropriate management facilities exist.

1.1 Management options

Disposable hot beverage cups are controversial in terms of their recyclability and compostability. Recently, some coffee shops such as Tim Hortons, have announced that current recycling or composting facilities could handle their cups. However, many municipalities continue to treat these cups as part of the municipal solid waste stream (Municipal Waste Association, 2012). In 2011, Tim Hortons Inc. initiated their Cup-to-Tray Recycling Program in NS, but it is uncertain to what extent this program is still underway (a member of staff in the HRM Waste Management Office, personal communication, May 24, 2013). According to Tim Hortons Inc. (2011), they developed partnerships with Scotia Recycling and CKF Inc. to recycle their cups into take-out trays and napkins, which would be used in their stores again. These recycled paper products would be recycled again after use (Tim Hortons Inc., 2011). Even though Tim Hortons Inc. (2012) stated on their website, “the challenge is one of access to recycling programs that accept and process our hot beverage cups, rather than an issue with the composition of the cup itself” (para. 1), the recyclability and compostability of their cups is open for some debate - within HRM at least (a member of staff in the HRM Waste Management Office, personal communication, May 24, 2013).

There is limited data regarding how many towns and/or municipalities in North America who are able to divert disposable from landfill. However, a cursory investigation of the various towns or municipalities websites, turned up only a few that include cups into their city-wide recycling and/or composting programs. Two examples are the Town of Yarmouth (NS), and Seattle, Washington, in the US (City of Seattle, n.d.; Town of Yarmouth Nova Scotia, n.d.). In

Seattle, such materials are accepted by the municipal recycling programs (City of Seattle, n.d.). Similarly, in the Town of Yarmouth, residents are allowed to integrate these cups with unsoiled corrugated cardboard, and other waste paper products. However, it should be noted that only Tim Hortons cups are allowed in the recycling stream in Yarmouth; they are the only cups accepted by the local recycler Scotia Recycling (Town of Yarmouth Nova Scotia, n.d.). Within Canada, the Municipal Waste Association (MWA) (2012) indicated that nine municipalities in Ontario (ON) accepted cups into their compost stream; only two accepted the cups as recyclable. The rest of municipalities in ON all direct their residents to place the cups in the garbage (Municipal Waste Association, 2012).

Within HRM, there are no available numbers related to the percentage of the “disposable hot beverage cups” category in the entire waste stream. However, in an audit of HRM’s landfill, this category accounted for 0.9% of the total waste stream in HRM (a member of staff in the HRM Waste Management Office, personal communication, May 24, 2013). It should be noted that the category used by the RRFB in the 2012 waste audit included both disposable fibre cups and disposable plastic cups (RRFB, 2012), however the ‘disposable hot beverage cup’ category in the HRM waste audit only referred to disposable composite “paper” cups. This is likely the reason for the discrepancy between the numbers reported by RRFB (3.4% and 1.1%) and those by the HRM Waste Management Office (only 0.9%). Even though these cups represent a small proportion of the entire waste stream in HRM, the amount disposed of in landfills is potentially much larger as the unit of measure is by weight. These materials are not heavy but quite voluminous (a member of staff in the HRM Waste Management Office, personal communication, May 24, 2013) and therefore they can occupy a disproportionately high amount of landfill space.

While numerous waste reduction and waste characterization studies have been conducted at various educational institutions (Buglione, 2009; Conlin, Lavalley, Shorter, & Smith, 2013; Felder, Petrell, & Duff, 2001; Mason, Oberender, & Brooking, 2004; Kogler, 2012; Smyth, Fredeen & Booth, 2010; Vega, Ojeda-Benítez, Aguilar-Virgen, & Taboada-González, 2010), few studies exist for coffee shop or QSR business sector related to disposable coffee cups (Czaika, 2010; Hutchinson, Singh, & Walker, 2012; Kamenetz, 2010; Ziada, 2009). Fewer still, have focused on in-house waste reduction/waste diversion strategies (Wright, Gregory, & Kalaian, 2011). Within those studies the primary focus was consumer behaviour change and/or education (Fairbairn et al., 2008; Finlayson-Buck, Janega, Maxwell, Verbeek, & Weddle, 2011; Heathcote et al., 2010; Smyth et al., 2010). Only two cases (one Canadian, one from the US) specifically investigating opportunities for diverting coffee cups from the waste stream (Wright et al., 2011; Ziada, 2009).

1.2 Research objectives

The goal of this study was to support decision-making for improved waste diversion opportunities for disposable hot beverage cups in HRM, by examining the factors that would influence the implementation of recycling and/or composting programs at the store level.

There were two objectives of this study:

- to collect baseline data about the technical, operational and regulatory feasibility of diverting disposable cups from landfills in NS;
- to identify both the barriers and motivators to developing and sustaining an in-house waste diversion program for disposable cups at the store level in HRM.

As such the specific research question reads: “What is the feasibility and desirability of developing in-store recycling and/or composting programs to divert disposable hot beverage cups from HRM landfills?”.

Three hypotheses were made at the initial stage of the study:

- 1) There are available waste management facilities and regional infrastructure in NS which accept disposable coffee cups and are capable of handling disposable coffee cups.
- 2) Both the environmental and economic benefits are supposed to be the motivators to developing an in-house waste diversion program for cups.
- 3) The benefits gained from an in-house waste diversion program for cups are supposed to help store owners or managers to overcome the operational barriers perceived from the store perspective.

1.3 Overview of study design

Three stakeholder groups involved in the value chain of disposable hot beverage cups were included in this study in the interest of time: the retailers of hot beverage products, waste management facilities (i.e., recyclers and composters), and the specific regional authorities that would be responsible for such program implementation (i.e., NS Regional Waste Management Offices). In addition, a small sample of HRM coffee shop and QSR owners and managers were interviewed in order to generate data about the perceptions held regarding the benefits and barriers to developing an in-house waste diversion program for cups.

Specifically, twelve HRM coffee shop owners or managers were interviewed, as were ten NS Regional Waste Management Offices’ coordinators or managers, and the representatives of six NS waste management facilities. Apart from Regional Waste Management Offices’ coordinators or managers, all the coffee shops owners and the NS waste management facilities were purposively selected. Twelve HRM coffee shop owners or managers were selected based

on willingness to participate and availability (i.e., within the study period). Only two HRM facilities and four other regions' waste management facilities identified have being capable of handling disposable hot beverage cups were contacted. Further details for the study design and data analysis will be described further on in Chapter 3 – 'Method'.

2 Literature Review

This section consists of three parts. In first part, the key words and the databases used for literature review in this study were listed in detail. Second part provides a review of the body of knowledge regarding waste reduction programs, where possible, with a specific focus on disposable coffee cups. There were two questions that guided the literature search; firstly, 'what was the focus of past studies and what prompted this focus?' and secondly, 'what solutions were examined and were they incorporated into some kind of operational program?'

2.1 Literature search strategy

The key words were used for literature search included: "disposable coffee cups", "waste diversion programs", "disposable hot beverage cups", "compostable cups", "biodegradable cups", "recyclable cups", "recycling coffee cups", "composting coffee cups", etc. As mentioned in the introduction, different people used different terms for paper cups served for hot drinks, so other analogous names for cups (i.e., hot cups, hot drink cups, to-go paper cups, paper cups, disposable paper cups) were also used for literature search to replace the key words listed above. The databases used for literature search included: "Environmental Sciences and Pollution Management", "ScienceDirect", "Web of Science", and "Google Scholar".

2.2 Diverting ‘disposable’ coffee cups: solutions and complementary actions for success

Everyday large quantities of used disposable hot beverage cups are sent to landfills, which contributes to many environmental concerns such as water pollution and the deterioration of greenhouse effect (Botkin et al., 2006; Fairbairn et al., 2008). Specifically, in the United States of America (USA), an estimated 25 billion cups are sent to landfills every year (Environmental Action Association, 2011). Dunkin Donuts for example serves over 1 billion cups of coffee per year alone (Shauna, 2005). In the City of Toronto, it is estimated that more than 1 million cups are sent to landfill each day (Ziada, 2009). Closer to home, Dalhousie University sends, 370,420 cups to landfills each week (Fairbairn et al., 2008). According to one campus coffee shop (i.e., Second Cup), an estimated 119,200 cups are used per week; all of them end up in landfill (Fairbairn et al., 2008).

Promoting the usage of a reusable coffee cup, and diverting ‘disposable’ coffee cups that can be recycled or composted are two possible ways of helping waste diversion related to cups. However, only the former has been mostly considered the solution for cup issues in the past. A lot of studies focus on the promotion of reusable cup campaigns at the institutional level, namely colleges and universities (Smyth et al., 2010). In the business sectors, many coffee shops (e.g., Starbucks, Second Cup, Tim Hortons) provide a discount on the coffee refilled in a reusable coffee cup for promoting waste reduction in terms of their disposable coffee cups.

The existing uncertainties about recycling and composting programs for hot cups are the reasons why people preferred reusable travel mugs and considered this would possibly the only correct solution for cup issues. First, the recyclability and compostability of cups are still

doubtful to some degree. There is a lack of the standardization of disposable coffee cups in the market, which results in a dispute on the recyclability and compostability of these cups among different stakeholders (Czaika, 2010). Also, there are multiple material choices for disposable hot beverage cups being used by different coffee shops and QSRs. It would possibly be confusing for government waste management offices to distinguish between disposable hot cups and eco-friendly cups (i.e., recyclable or compostable) due to the lack of their definitions in the market. Even though there are usually three kinds of paper coffee cups: recyclable, compostable, and disposable (Oregon Center for Environmental Health, n.d.), all cups are simply categorized ‘disposable coffee cups’ in many municipalities waste separation guidelines (e.g., HRM). The city of Toronto did a pilot test in 2009, which indicated that ‘regular’ disposable coffee cups could not be neither recycled nor composted in their municipal waste management facilities (Ziada, 2009). Due to a plastic liner, cups were considered contaminants in both the municipal recycling and organic streams (Ziada, 2009). Therefore, even though there are already eleven municipalities including cups into their municipal paper recycling or organic streams, Toronto still rejects cups in their streams for recycling or composting (Municipal Waste Association, 2012). This reflects second uncertainty about recycling and/or composting cups – different regions have various available waste management facilities and infrastructure and these local facilities and infrastructures are not easily changed (Aarnio & Hämäläinen, 2008); therefore, the acceptance levels of the waste management facilities for cups are various among different regions, municipalities and towns, such as the cases of Toronto and eleven other municipalities in ON discussed above. Last, personal conveniences contribute to the unwillingness of consumers to place used hot cups into a correct waste diversion container (Czaika, 2010). Therefore, due to these uncertainties, directly pushing consumers to use reusable travel mugs,

changing the consumers' daily routines, and discouraging them from using disposable hot beverage cups seem comparably easier and simpler than other complicated solutions.

The roots of the disposable cups' issue are human consumption activities which are influenced by the unreal prices of disposable hot beverage cups (Alsop et al., 2004). Ziada (2009) stated that there are some direct environmental costs of using disposable hot beverage cups (i.e., in the energy and resource consumption for the production, the transportation pollution from shipping, and the final disposal in landfills) and some indirect social, economic and health impacts caused by landfills. But neither the former nor the latter have been included into the price of a disposable coffee cup. Therefore, consumers perceive these disposable hot beverage cups to be free, which contributes to an increase in human consumption activities related to the cups, and a lack of awareness of environmental and social impacts caused by these cups being disposed of in landfills.

It 'seems' easier to solve a problem or issue by directly addressing its roots, which is consumer behaviour in the case of the disposable hot beverage cups' issue. Some studies have aimed to identify the factors and/or stimulators that have driven consumers to change their behaviours (i.e., use a travel mug instead of disposable hot beverage cups). Ziada (2009) highlighted that educational signs, verbal prompts, and economic stimulators are important factors that might drive consumer behaviours in a sustainable direction. Connolly (2012) considered the lack of an environmental fee or tax on disposable coffee cups as a factor. In addition, Fairbairn et al. (2008) and Finlayson-Buck et al. (2011) have aimed to identify the barriers to proliferating the use of travel mugs in QSRs and coffee shops. All these studies obtained similar results. For example, economic incentives generated a somewhat stimulative effect on the consumer behaviours' change. And, consumers prefer using disposable hot

beverage cups over travel mugs simply because of the convenience of the former (Connolly, 2012). These similar results indicate that consumer behaviour change is a slow and complicated process. In other words, the switch from disposable hot beverage cups to reusable travel mugs would not be as easy as it would seem to be. The gap between them is too big to be filled immediately.

Fairbairn et al. (2008) have demonstrated that, in order to have a significant and quick impact on waste diversion from landfills in terms of disposable hot beverage cups, creating a more realistic objective between the directly switch from these cups to reusable travel mugs is necessary and helpful to some degree. Therefore, they suggested that coffee shop owners and/or managers should use compostable cups to replace current disposable hot beverage cups. However, this study is exploratory but limited because generally, it is hard to say which of recycling or composting is better than the other, as long as there are appropriate, easily accessible facilities existing.

In fact, the roots of the expanding number of used disposable coffee cups not only include consumer behaviours that many studies have focused on, but also business as well (Hutchinson et al., 2012). Clearly, both consumers and business are problem creators as well as problem solvers (Hutchinson et al., 2012). It is commonly recognized that solutions directly coming from business are ‘real’ and ‘rapid’ and many companies are willing to devote themselves into sustainable development for three reasons – competitiveness, legitimation, and ecological responsibility (Bansal & Roth, 2000). Therefore, developing an in-house waste diversion program for disposable coffee cups at the store level is reasonable to consider as one end-of-life option for cups to complement the current mainstream solution for cup issues (i.e., promoting reusable travel mugs). In other words, these two solutions do not contradict each

other, but complement. According to Kamenetz (2010), only a tiny percentage of hot drinks (i.e., an estimated 1.5%) are served in reusable travel mugs in Starbucks restaurants. Starbucks (2012) reported that it aimed to improve this percentage to 5% by 2015. But in fact, the data recorded from 2008 to 2012 showed that consumer behaviour change would be a very slow process because the percentage of beverages served in Starbucks stores in refillable travel mugs just increased by 0.4% during the five years (i.e., from 1.1% in 2008 to 1.5% in 2012) (Starbucks, 2012). These figures prove that there is a dilemma which cannot be solved by simply pushing consumers to replace disposable hot beverage cups with a refillable travel mug. Developing some other solution strategies from a business's perspective is urgent and significant, and diverting 'disposable' hot beverage cups at the store level would be worth considering under current conditions.

Very few studies focus on in-house waste reduction regarding cup issues. In an ambitious and significant study, Czaika (2010) invited many different stakeholders, such as retailers, cup manufactures, recyclers, governments, and waste haulers, to participate in a workshop and share their opinions so that their incentives and barriers to divert cups from landfills by recycling were identified. Czaika (2010) discussed the importance of collaborative efforts from different stakeholders and applied the concept of "systems thinking" to cup issues based on the case study of "Starbucks hot cups". This study tried to analyze cup issues from a holistic perspective, and Czaika (2010) provided a lot of generalizations and trends about various stakeholders' options he recorded from the workshop. Only a few barriers and incentives about diverting hot beverage cups from stores were mentioned and discussed. In one other study, Wright et al. (2011) identified a few perceived barriers for stand-alone coffee shop owners and managers among a small sample in one USA County. But this study is limited to evaluating the desirability of

owners to change from less expensive disposable hot beverage cups to eco-friendly ones. Wright et al. (2011) connected the owners' willingness to change cups in their restaurants with some barriers such as quality of eco-friendly cups, availability of eco-friendly cups, and higher costs generated by these cups. However, only focusing on retailers of hot drink products and driving them to change the types of coffee cups they used are not enough to address cup issues in the landfill. We should also guarantee that cups would be properly collected and separated at the store level, and then be successfully treated in waste management facilities. In the case study of Tim Hortons, Hutchinson et al. (2012) considered these success factors related to diverting cups from the store perspective as: "the reliance on the public to sort the material into the correct bins", and "the availability of municipal diversion programs" (p. 526).

Diverting disposable coffee cups from the waste streams at the store level would be a complement to the solution of customer education related to replacing disposable coffee cups with refillable travel mugs. As discussed above, most customers still use disposable coffee cups for hot drinks and only a tiny percentage of customers (1.5%) use reusable travel mugs (Kamenetz, 2010). Even though 80% of cups would be taken away from coffee shops or QSRs, there are still 20% left in the restaurants (Czaika, 2010). This indicates that there are some gaps about cups issues, which can be filled immediately as long as more coffee shops and QSRs are willing to divert their cups from the garbage stream so that less cups would be ending up in landfills finally.

There are no credible statistical data showing how many coffee shops or QSRs in North America are diverting their cups from landfills. Based on a time limited literature search, only two large-scale companies (Starbucks and Tim Hortons) were located which have already commenced developing an in-house diversion program for their cups in some of their locations.

Specifically, by 2012, there were 859 Tim Hortons' restaurants in Canada diverting their cups from landfills by composting or recycling, and 158 of them were located in NS (Tim Hortons Inc., 2012). That same year, there were 1,843 Starbucks locations in the USA and Canada (24% of total locations) providing customers access to recycling service in their restaurants (Starbucks, 2012). Obviously, having only some locations of two companies participate in diversion efforts for cups is not enough to achieve the goal of removing all the cups left in the coffee shops and QSRs. So in order to reach the success of diverting all cups left in the restaurants (i.e., almost 20% of total hot cups consumed), more coffee shops and QSRs joining to develop an in-house diversion program for cups at the store level would be better. And, identifying the barriers to and incentives for promoting an in-house waste diversion program consequently plays a key role in the process.

Informing customers of the recyclability and/or compostability of the disposable coffee cups they use needs to be included in an in-house waste diversion program; therefore, developing such a program for cups would also help raise public awareness of cup issues and contribute to public education from the store perspective as well (Czaika, 2010). As more customers are aware of the difference between cup materials (i.e., recyclable, compostable, and disposable), it would be easier to raise the customers' attention to the cup issues in the landfills; accordingly, they might more easily accept the change in their consumer behaviour and voluntarily replace hot paper cups with a reusable travel mug. This is also one of the reasons why promoting travel mugs and diverting disposable coffee cups at the store level complement each other instead of contradicting each other.

2.3 Summary

From the literature review, five themes emerged when considering the issues surrounding the management of disposable cups. First, the literature supported the premise that the disposal of this material to landfill is an environmental issue, linking it to issues related to air emissions and leachate. The disposable hot beverage cups' issues also result in some externalities which include many direct and/or indirect social and environmental costs – as noted previously.

Second, most past research studies focus on how to promote customer engagement with the proper management of disposable cups. The literature identified three uncertainties that influenced the success of this: 1) the inconsistency regarding the actual recyclability and compostability of used cups; the facility and regional inconsistencies related to the ability for local waste management facilities to actually divert cups to a recycling or compost stream – thereby causing confusion to costumers who can recycle in one location but not in another; and finally the fact that successful programs depend on the customer cooperation as they are required to sort used cups into an appropriate container.

Third, consumer behaviour change is a slow and complicated process. Developing recycling or composting programs for disposable hot beverage cups at the store level should be developed to complement a program promoting travel mugs for waste reduction so as to address differing needs. Both meet the ultimate goal of keeping this material out of the landfill.

Fourth, the recyclability or compostability of the cups needs to be acknowledged by the local waste management facilities if an opportunity for waste diversion is to exist. Using cups that the manufacture states is recyclable or compostable is moot if there are no facilities willing to take them. .

Fifth, promoting an in-house waste diversion program also contributes to an increase of public awareness around the waste issue and therefore possibly increases the customer use of travel mugs.

The intent of the literature search was to better understand the issues and opportunities that exist regarding the implementation of recycling and/or composting programs for disposable cups. The information gathered was then used to inform the design of the empirical study which will be the subject for the rest of this paper. This study was the first to empirically investigate the operational feasibility of developing recycling or composting programs for ‘disposable hot beverage’ cups in Nova Scotia, as well as the desirability of such programs at the store level.

3 Methods

This section introduces the study design and the relevant scope of the research.

3.1 Study design

This study included the collection of baseline data about the feasibility and desirability of in-house waste diversion programs aimed at disposable hot beverage cups in HRM. The methods comprised of two phases: 1) to investigate the feasibility of composting and recycling disposable hot beverage cups from HRM coffee shops and QSRs, both from a policy and a technical perspective; and 2) to investigate the perceptions of coffee shop and QRS owners/managers in HRM regarding the drivers, barriers and challenges to implementing and/or maintaining an in-house waste diversion.

3.1.1 Phase one: Policy and technical factors

The initial part of the study included an examination of factors that could influence the feasibility of composting and recycling of 'coffee cups'. This was guided by the following questions:

- (1) In general terms, are the recycling and/or composting facilities capable of managing disposable hot beverage cups within their HRM facilities? In facilities in other NS jurisdictions? By specific waste management companies?
- (2) What are the [typical] current practices for managing this waste stream in Nova Scotia, according to the various regional Waste Management Offices?
- (3) To what degree, are there policies influencing the recycling and/or composting of such cups that are not related to the technical/material characteristics of the cups themselves - specifically in HRM?
- (4) Which cups (either brand specific or type) can currently be recycled or composted within the Regional Waste Management program in HRM? In other jurisdictions?
- (5) To what degree are coffee shops and/or QSRs in HRM already operating in-house recycling or composting programs for cups?

The first three questions were explored by contacting all Regional Waste Management Offices in NS. The underlying purpose was three fold: a) to understand their ability and current practices for handling disposable coffee cups in different regions within NS; b) to identify any policies inconsistencies influencing the practices to handle cups in different regions; c) to identify specific waste management companies which had capability of recycling or composting

disposable coffee cups across NS. As such, they were directly queried about their ability and operational policy related to recycling and/or composting these cups in their regions.

There are ten Regional Waste Management Offices in NS; specific contact information was obtained from the RRFB and the offices were contact via email. The Managers at each office were asked the following questions:

- 1) What are the current practices for managing disposable coffee cups in your Regional Waste Management Office?
- 2) Are there policies influencing the recycling and/or composting of disposable coffee cups specifically in your region?
- 3) Does your office have any diversion plans for disposable coffee cups in your region?

For those who did not responded within two weeks, a follow-up email was sent.

To answer question fourth guiding questions (as outlined above), the waste management facilities [those mentioned specifically by regional waste management offices] who process recycling and wastes were contacted (N=5). Each waste management facility was asked to respond to the following three questions:

- 1) What's kind of coffee cups can your company handle?
- 2) Do you distinguish between the different coffee cup brand names (e.g., Starbucks, Tim Hortons) when you collect disposable coffee cups?
- 3) Are coffee cups considered as contaminants in paper recycling/organic stream?

In addition, all HRM waste haulers and waste management companies who provided composting and recycling services in HRM were contacted (N=4). The contact information was obtained from the HRM website (<http://halifax.ca/wrms/collection.html#top>). Specifically, there were four

waste haulers (transportation) and two waste management companies (treatment facility) contacted. However, the waste management companies were also two of the waste haulers. As such, the survey questions used were the same for all:

- 1) Are coffee cups included in the waste materials you collect?
- 2) Are disposable coffee cups typically included with garbage, paper recycling or organics/compost?
- 3) If someone wanted the cups not going to landfills, what are their options?
- 4) Are there some HRM facilities recycling/composting cups?

A follow-up email and/or call was placed after two to three weeks of the previous contact if not response had been received yet.

To explore fifth guiding question (as outlined above) a complete list of coffee shops and QSRs that serve disposable coffee cups in HRM was developed using Geographic Information System (GIS) tools, in particular, drawing a list of these shops and restaurants located in HRM from a list of all shops and restaurants located in NS. An Excel spreadsheet was created containing the address and contact information of each HRM coffee shop and restaurant. Each coffee shop and/or QSR in HRM was contacted via telephone and asked the following question:

Do you have any in-house programs for disposable coffee cups in your store such as recycling or composting, or anything else?

Responses were noted on a spreadsheet; this was used: a) to get a better sense of the existing situation in HRM in regards to the existence of recycling/composting programs; and b) to help identify potential interviewees for phase two of this research. As some coffee shop owners or

managers said they would prefer to talk in person, a number of visits were conducted to generate this information.

It should be noted that at this point some coffee shop owners indicated that even though HRM did not include disposable coffee cups into their recyclable or organic sorting list, the waste haulers and facilities had not rejected their cups when they included the cups into blue bags (recyclables) or green cart (organics). Based on this information, an additional small piece of research was undertaken where the HRM waste management company was contacted again and asked three additional questions:

- 1) Is it correct that as long as the composition of used coffee cups have been identified as recyclable or compostable, they would be sent to recycling or organic stream?
- 2) Are there any strict requirement for used coffee cups to recycle or compost? For example, only the cups which are completely cleaned and removed from lids and sleeves can be handled in your facilities?
- 3) Are these recyclable or compostable cups considered as contaminants in paper recycling or organic stream at current stage?

This information was used to better understand how strict some facilities may be with regards to what they accept and what they do not accept into their various streams.

3.1.2 Phase two: Owner and/or manager interviews

Phase two of this study involved interviews with coffee shop or QSR owners and/or managers in HRM. The interviews were divided into two categories: (1) those with owners and/or managers with existing in-house composting and/or recycling programs; and, (2) those

who had never implemented or had failed to maintain an in-house composting and/or recycling program.

For category one, four participants were purposively selected from the list of coffee shops that reported having an in-house waste diversion program for their cups (as developed in phase one of the research). It was planned to interview five to six owners or managers belong to this category, but due to the limited numbers of those with in-house diversion programs for their cups, only three owners were found that would agree to complete the interview. One other participant in this category was a corporate head office. During phase one, it was noted that many franchisees of larger chains indicated that they would only responded to corporate decisions in regards to waste management issues. Moreover, a number of franchises with existing in-house diversion programs for their cups stated that they were not allowed to take any interviews without permission from their head office. As such, corporate head offices were approached as potential interviewees. One granted an interview. However, the insight from a corporate perspective was interpreted slightly differently from that of individual owners/franchisees. The focus of the interview was on the details of their diversion program and their motivation for the program

For category two, eight participants were purposively selected from the list of those that reported not having an in-house waste diversion program for their cups (phase one). It was planned to conduct interviews with five to six owners or managers belong to this category as well; the increase in the number of category two participants was due to the limited number in category one. The focus of these interviews was to gain insight regarding the perceived barriers and/or motivating factors for implementing diversion programs in their stores, as well as potential benefits. It should be noted that in order to balance the perspectives interviews were

conducted with both coffee shop owners/managers from independent or small business coffee shops/QSRs and franchisees of larger chains. The list of interview questions used for the various participants can be found in Appendix A.

An informed consent letter was provided to all potential interviewees in advance of conducting the interviews, which included the parameters of the study (see Appendix B). The specific interview questions were also included with the consent letter.

The methods of data collection used in this study were flexible and applied according to the convenience of participants. Twelve interviews in total were conducted. Nine interviews were audio-recorded using a hand-held digital recorder and later transcribed verbatim by a professional transcription service. Three interviews were not audio-recorded at the request of the interviewees. One interview was recorded using hand-written notes which were carefully checked with the interviewee for the quality and accuracy of data at the end of the interview. In two other cases, the interview questions were answered in writing and supplied via email.

Using hand-coding techniques, interview transcripts were coded, categorized, analysed, and distilled using an *a posteriori* coding scheme. Specifically, the extensive and varied raw text data include in the interview transcripts were first condensed into a brief summary format. Using the research objectives as a lens, the data was summarized into key findings. Analysis focused on the feasibility of implementing recycling and/or composting programs for disposable hot beverage cups in HRM and the desirability of doing so - on the part of coffee shops and/or QSRs.

3.2 Scope of the study

There are two points to note with regards to the scope of this research. First, only twelve coffee shop and/or QSRs owners/managers were interviewed about the desirability of in-house diversion programs. In other words, this is a non-probabilistic study; no statistical inferences were made about the attitudes of all coffee shop owners or managers in HRM. The study offered observations and generalizations about the trends and themes identified within the groups of the selected interviewees in HRM.

Secondly, this study focused on the physical and operational feasibility of recycling and/or composting hot beverage cups in HRM. Psychological barriers for consumers were excluded from the analysis of this proposed study.

4 Results

Taken together, the input provided by the various participants could be drawn into four general themes reflecting the various barriers and benefits associated with the implementation/operations of an in-house diversion program for disposable cups. Each theme is discussed below, highlighting any nuances or ‘sub-themes’ that emerged and required specific address.

4.1 External barriers affecting the feasibility of diversion programs

Participants identified two main issues when referring to the operational feasibility of recycling and composting cups in NS: policy barriers, and technical constraints.

4.1.1 Policy challenges

In NS, seven regions sort hot beverage cups into regular municipal solid waste (garbage); HRM is one of them (Table 1). Even though some cups are denoted by their manufacturers as recyclable or compostable, HRM waste management operations do not include them in either stream. However, there are some coffee shop or QSR locations that have developed relationships with particular waste management companies, such that their cups are separated from the waste stream. However, this not universal; any existing programs for diverting coffee cups in HRM are not operated in conjunction with HRM’s regional Waste Management office per say and are not consistent across the Municipality.

Table 1: Operational norms in NS*

Regions in NS	Diversion Options		
	Compost	Recycle	The landfill
Region 1: Cape Breton			✓
Region 2A: Antigonish - Guysborough			✓
Region 2B: Pictou County	✓		
Region 3: East Hants			✓
Region 3: Colchester			✓
Region 3: Cumberland			✓
Region 4: Halifax Regional Municipality			✓
Region 5: Annapolis - Kings			✓
Region 6: South Shore - West Hants ¹	✓	✓	
Region 7: Yarmouth - Digby ²		✓	

*

¹ All hot and cold beverage paper cups (excluding Styrofoam cups) are accepted in organic stream throughout the region 6. Hot beverage paper cups are accepted in paper recycling stream in Shelburne County.

² Only Tim Hortons’ hot beverage paper cups are recycled in the paper stream in Region 7 because the Regional Waste Management Office agrees to support an ongoing pilot project between two third party processors (i.e., the Scotia Recycling in Yarmouth, and the Clare Recycling Facility) and the owners of Tim Hortons’ in Yarmouth and Shelburne Counties.

HRM Waste Management Office and their regional waste management facilities said they did not accept cups into their recycling or composting streams. However, some owners or managers noted that cups sorted into blue bags and/or green carts were not rejected by HRM waste haulers, nor did they inform the participants that they had misdirected these materials. As such, these coffee shops and QSRs believe that their cups are acceptable for the compost or recycling stream in HRM even though coffee cups are categorized into garbage in HRM's source separation guide. However, from the HRM waste haulers' and facilities' perspectives, all of them stated that currently there are no other options for individuals who do not want the cups going to landfills in the HRM area. This inconsistency can therefore confuse the owners or managers of coffee shops and QSRs, who are including cups in their recycling or composting stream based on an apparent assumption that the cups will be acceptable. One should reiterate that these same participants admitted that they did not know where the cups ended up once collected.

As for the rest of NS, there are only three regions in NS diverting cups from the landfill: Region 2B (Pictou County), Region 6 (South Shore – West Hants) and Region 7 (Yarmouth - Digby) (Table 1). The first two regions do not distinguish between brands of cups; Region 7 only includes Tim Hortons cups into municipal recycling stream. This was based on an agreement enacted between a private recycler with their own material handling facility and the franchisee for a number of Tim Hortons' locations in the region. However, there are no formal written regional policies for disposable cups in terms of recycling or composting in any region of NS. Even though the three regions already added hot beverage cups to their sort list, cups have not been banned from landfills. Similarly, while regions do not have specific written policies to exclude cups from their recycling and/or organic streams, they reject cups based on a management decision.

Within the regions that categorize cups as regular garbage, three concerns related to recycling or composting cups were identified – operational difficulties at the facilities, low market demand for the end product, and the high volumes of materials present in the municipal waste streams.

4.1.2 Technical issues

One issue – mentioned as an “operational difficulty” – is the plastic liners in many of the cups which result in quality issues and litter in the final recycled and organic products. Small volumes can be accepted, but high volumes cannot be accommodated.

Related issues were re-iterated by the representatives of the four waste management facilities contacted in this study. These include: the Mount William Waste Management Facility, the Lunenburg Regional Community Recycling Center, the Queens Solid Waste Management Facility, Scotia Recycling, and the Clare Recycling Facility (Table 2).

Three facilities recycle paper cups (Table 2); however, only two of them (i.e., Scotia Recycling and the Clare Recycling Facility) responded to the survey questions. Both operators accept all hot beverage paper cups that do not have Styrofoam or wax in their materials and process these cups into paper bales. In Region 7 (Yarmouth), only Tim Hortons’ cups have been included in the municipal recycling stream and as such are accepted by the regional facilities. Cups from other coffee shops are sent to the paper bales for the plant if they show up in residential bags, as long as the cups are easily processed into paper pulps after being treated (i.e., there is a cleaning process for cups needed and approved cups are sent into the mixed paper recycling stream. Cups are not – however - accepted directly from the coffee shops or QSRs in the region.

However, the one paper recycler interviewed do not encourage other coffee shops (especially big chain coffee shops and restaurants) to put their cups in the paper-recycling stream due to potential technical concerns arising from the receipt of large quantity of disposable paper cups. This recycler indicated that whether or not cups are considered as contaminants in paper recycling stream depends on the volume received, even though both the two interviewed answered that cups are currently not considered contaminants. The level at which this stream becomes a contaminant has not been defined by the recyclers. One recycler stated that the current paper recycling program for Tim’s cups is still in the trial stage and that it would take long time to determine the volume at which disposable cups would affect the quality of recycled paper stream produced at their plant.

Table 2: Summary of management practices for disposable cups.

The names of facilities	Regions	Diversion Options		Treated as contaminants?	
		Recycle	Compost	Yes	No
The Mount William Waste Management Facility	Region 2B		✓		✓
The Lunenburg Regional Community Recycling Center	Region 6		✓		✓
The Queens Solid Waste Management Facility	Region 6	✓		Not Available	
Scotia Recycling	Region 7	✓			✓
The Clare Recycling Facility	Region 7	✓			✓

Table 2 summarizes the management practices for disposable cups at the various facilities. Two compost paper cups; while 100% paper cups are preferable, if cups with thin plastic or wax coating/layers are properly tore up and allowed to completely decompose, they are acceptable in the facilities. In both region 2B (Pictou) and region 6 (South Shore) paper cups approved are accepted by the facilities. These facilities do not distinguish between any brand

names; only between cup compositions, which are sorted by their screening machines. Neither composting facility categorized paper cups as contaminants.

4.2 Barriers to diverting cups from the store perspective

Five sub-themes emerged around the barriers experienced at the ‘store level’. These included cost; internal management barriers; lack of incentives, insufficient understanding of program options, low public awareness; and consumer engagement with programs. These will be discussed in greater detail below.

4.2.1 Program costs

Many participants mentioned “cost” when referring to the barriers to developing an in-house diversion program; in particular those associated with small or independent coffee shops or QSRs. A common complaint was that recyclable or compostable coffee cups are generally more expensive; many interviewees indicated that cup costs are a big factor when making their purchasing decisions. Cup costs are embedded in the beverage price so any increases are passed to consumers. Participants suggested this increase could possibly negatively impact sales as customers who are sensitive to the price go elsewhere.

Generally, participants shared diverse opinions regarding operational costs. While, operational costs were a concern to some participants, others indicated that operational costs are not a significant factor when consider diversion programs. This is due to the fact that customers are already used to some level of source separation, so diverting cups would simply require informing customers of what is needed and get them involved. As for those who concerned operational costs, two kinds of operational costs for sustaining such program in their restaurant were listed: a) more labour costs needed for having staff separate cups from other waste streams;

and b) and more recycling or composting service fees. One participant complained that it was unreasonable that they “did something good for the environment” by engaging in more recycling activities, but then were charged higher they had been charged more waste management service fees for their materials. They reported that recycling fees were higher than the fees charged to remove regular garbage.

4.2.2 Internal management barriers

Hierarchy around decision-making was an issue noted when engaging with franchisees. For example, it was noted that the franchisees of coffee establishments generally only respond to their head offices’ decisions. This extended even to the granting of interviews where a number of franchisee locations of chain coffee shops referred even basic questions (related to waste management) to their head office. This suggests that franchisees heavily rely on direction from the ‘head office’ and will generally not implement any in-house diversion programs without that (with only a few notable exceptions).

Many HRM coffee shops are using recyclable and/or compostable cups in their restaurants due to corporate decisions, but they do not have any programs for diverting the cups from the garbage. Referring to the reasons why use eco-friendly cups in restaurants, the answer was simply “it was a corporate decision”. However, responses from head offices of some coffee chain indicated that it is also a challenge to make their recycling and/or composting programs consistent because both the types of materials accepted by waste management service providers and the availability of processing facilities vary depending on geographic locations.

4.2.3 Incentives

Participants noted the lack of any economic incentive as a barrier. Moreover, participants indicated the costs incurred by implementing that they paid a lot for sustaining the program without any financial payoffs or benefits. Of particular note was one participant who indicated they pay higher fees for recycling services than to have their waste go to the landfill; however all participants indicated a lack of incentive or support from either the government or RRFB to implement any kind of diversion programs. Many owners and managers said that very few customers ask to recycle or compost their cups. Participants suggested that while having a diversion program may attract some customers to the restaurant and there may be some level of improved customer satisfaction, the related benefits were not deemed sufficient to motivate them to start a program. Two participants noted specifically that all customers who care about the environment brought their own travel mugs; as for the other customers, most of them appeared disinterested or at least unaware. Many coffee shops provide a discount on customers with a travel mug and they thought this might help in promoting waste reduction at the store level.

4.2.4 Lack of knowledge regarding options

Some owners or managers also indicated that there are some information gaps about recyclable and/or compostable coffee cups. They do not manufacture cups, so they would have to find a source of eco-friendly cups. If they developed an in-house waste diversion program, a prerequisite is that the cup composition is 100% recyclable or compostable. One participant described the ideal eco-friendly cups as “a cup that is comparable in price to the cups I’m using now” with “the same quality” where “people aren’t getting burned when they hold them and they hold up”.

There were inconsistencies in the level of interest of participants regarding the actual ‘end-of-life’ options for cups. Some indicated that they might need more information about other end-of-life options before implementing such a program; others were interested in knowing where the cups would end up but did not suggest it would be part of their decision. Some expressed no interest in the end-of-life options – only if there were options. Instead, the two main considerations were if they would need to replace current cups with eco-friendly coffee cups (either recyclable or compostable), and how they would involve customers in their program if developed in the future. One participant suggested a coffee cup campaign which allows all local coffee shops in HRM to join together so that a handy and accessible platform could be created for sharing information about the program options and raising funds if needed.

4.2.5 Public awareness and engagement

Low public awareness was highlighted by many participants. As indicated above, to date, very few customers requested for eco-friendly coffee cups or expressed concern over a lack of recycling or composting options in the store. So some participants believed that many guests were simply not aware of the waste disposal issue, consequently their participation rate in such an in-house program would be worrisome. They indicated that if customers do not cooperate to sort their cups into the correct bins, using recyclable or compostable cups or even developing an in-house waste diversion program at the store level just wastes money and resources. Almost all participants stated that high customers participation rate is a key success factor to the program. For example, one participant indicated that the contamination of the separate waste stream accessed by the public is the biggest challenge at their locations. Many people just throw anything they want no matter which waste container it is for their personal convenience. Some other participants also complained about the poor performance of customers in terms of sorting

garbage at their locations. One participant emphasized that, even though they have organized everything about waste management practices, many customers generally have not paid any attention to their efforts. It should be noted, however, that some participants who complained the poor performance of their customers in waste sorting were found to not have significant signage in their shops regarding proper waste sorting.

Finally, some participants indicated that educating customers takes time and money. So this ‘public engagement’ issue was also a cost issue. One participant noted that because almost 90% of the customers leave the restaurants with a disposable coffee cup, so motivating customers to engage in the program and put their cups into a proper container could be just a waste of money and resources.

4.3 Perceived benefits of diverting cups from the store perspective

Five sub-themes emerged regarding the perceived benefits associated with diversion programs. While it should be noted that in many cases some of these themes were also captured as ‘barriers’, they also represented the benefits outlined by some participants. As such, it is important to also include them here: environmental impacts; employee satisfaction; customer satisfaction; leadership and environmental reputation; and promotion of education.

4.3.1 Environmental impacts

Many participants referred to the potential positive environmental impacts when listing perceived benefits of a diversion program; the main focus being the reduction of waste going into landfills. Apart from this, less transportation emissions were also significantly referred as one environmental benefit by one participant: “if I could bring a coffee cup into my restaurant that costs me less because it’s made in NS and less transportation costs, there could be a very

positive environmental benefits and more than just the cup itself’. This participant provided an example about a closed-loop of coffee cups in NS, and stated that if local cup manufacturers could use local raw materials to produce cups, and distribute them into coffee shops in the province, and finally collect used cups from the store level and sent the cups to the proper facilities to be used for manufacturing new recycled products such as ‘new’ coffee cups, then less transportation costs as well as less emissions would be generated.

4.3.2 Employee satisfaction

Participants who have conducted a program for their cup at the store level indicated it resulted in a positive reaction from their employees. Many employees at their locations expressed pride in their current diversion programs and in their employer’s efforts. The owners or managers themselves expressed similar sentiments. All participants who operate diversion programs indicated that they are very satisfied with their current practices at the store level. They also stated that they are very pleased to help reduce waste generated by their businesses and save the environment.

4.3.3 Customer satisfaction

Many participants referred to ‘customer satisfaction’ when speaking of potential benefits from the program. However, even though some participants expected an increase in customer satisfaction if a diversion program was implemented, many indicated this was not enough to drive them to change current practices. There were some notable exceptions. In particular, one corporate office for a large coffee chain indicated their customers had expressed an interest in having diversion programs and that it would improve the “in-restaurant experience”. This perception was part of the motivation for developing corporate initiatives focused on implementing store level diversion programs.

4.3.4 Leadership and environmental reputation

This was another theme that emerged in the responses from participants, as some expressed concern around the negative publicity associated with their businesses in this regard. In particular, they noted that the public can often blame them for the litter (i.e., the used coffee cups with their business logo). Promoting diversion programs for cups can make them a leader in the industry and mitigate public outcry.

4.3.5 Promotion of education

Some participants noted that an improved reputation associated with increasing waste reduction activities, allowed them take a lead in educating their industry and the public. One other participant indicated that in their business, all employees at the locations have to receive training about waste management practices. If their employees do not obey the rules of waste management practices at stores, they will be fired. This participant emphasized the importance of education as one success factor for sustaining a diversion program when referring to the training of their employees to properly manage the waste generated from their locations. This participant showed an expectation for their employees and hoped their employees would do the same thing at home as what they do at the stores in terms of waste management practices.

4.4 Potential motivating factors

While perceived benefits could be construed as a motivational factor, this section deals with those issues that participants suggested could motivate them to participate in a diversion program, understanding that these factors do not necessarily exist at the current time. As such, it was separated out of the previous section. The factors outlined include: moral obligation and

business commitment; financial support; corporate initiatives; customers' demand; and public pressure.

4.4.1 Moral obligation and business commitment

This was one of the motivators listed by some participants. They noted a concern about the environmental impacts generated from their businesses, and indicated that they have a responsibility to reduce waste as much as they can. One participant emphasized on the high cost generated from sustaining the program for their cups, but they still insist on operating the program because they believe they are doing a right thing for the environment.

4.4.2 Financial support

Many suggested improved financial support or the creation of an incentive program would spur the development of diversion programs. Many participants said that grants from governments would help them make a decision to change material choices of disposable coffee cups at their locations. Many participants mentioned the significance of the difference between the prices of regular disposable coffee cups and eco-friendly to-go coffee cups, particularly the small business operators (i.e., not franchisees). Franchisees were more inclined to suggest the need for general public education and raised public awareness of the cup issues in landfills instead of monetary compensation reported by many small business owners or managers.

4.4.3 Corporate initiatives

The implementation of corporate initiatives was noted as a motivating factor in both phase one and phase two of this study. As briefly described above, many coffee shops indicated that all diversion programs result from them doing what their head office told them. One corporate office of a coffee chain indicated that, their diversion program developed through a

partnership with their restaurant owners. However, the corporate level did not operate or manage the programs. Many HRM coffee shops noted (in both phase one and two) that they just follow their corporate decisions derived from the head office and that they would not do these things without the decisions of the head office. As such, ensuring corporate buy-in is a key factor in motivating franchisees to participate in any kind of diversion programs.

4.4.4 Customers' demand

This referred many times by participants when talking about the influential factors which would drive them in a sustainable direction. The power of customers was highlighted in many opinions of different participants, such as “It would be probably help if people started asking for such things because generally with our company and with most companies, the more people ask about it the more people think about it. That’s brought to their attention so really if more people would bring it up and talk about it or email like the head office then you might see some change”. Some participants also explained that many existing recycling or composting activities at their locations were mostly attributed to customers’ demand and requests. They indicated that more customers’ requests for other end-of-life options for used disposable coffee cups would push their head office to pay more attention to their end-of-life management of cups, as explained in some words of a participant - “...Sometimes the head office does not really see what the people want if they are not doing more studies on their own so the factor that if they are getting feedback from their customers than they are going to take a look at it more.”

4.4.5 Public pressure

“Public outcry” and “negative publicity” were two terms used by participants, but represent the element of public pressure. These participants were concerned with littering issues, and said they did not want to see their cups on the street or other public areas. This public

pressure was partly responsible for motivating their initial diversion program. They were concerned about the negative publicity of their businesses, so they wanted to do something good for the environment in order to mitigate the negative publicity.

5 Discussion

This research was based on three hypotheses developed at the initial stage of the study; firstly that there are available recycling and/or composting service providers in NS who could integrate disposable cups into their material streams; and secondly, that the motivation for developing a diversion program for cups would include both environmental and economic factors. Thirdly, it was hypothesized that such factors would help owners or managers to overcome the operational obstacles perceived from the store perspective.

This research has identified a number of key considerations but it has not permitted an unequivocal result that supports these hypotheses being accepted or rejected. There are a number of reasons for this. First, there are five waste management service providers existing in NS which accept cups into either a recycling or composting stream. Therefore the first hypothesis is supported; however, there are technical obstacles to recycling or composting cups that exist within the HRM area and certain of technical issues that interfere with the handling of the cups in those facilities that do accept them. Second, there are some perceived environmental benefits, which served as motivation for developing such a program for cups from the store perspective, but there is not any perceived economic benefit reported by participants. Moreover, in addition to these two factors, there are other motivators reported by the participants that were not included in the second hypothesis. So, one cannot answer simply if the hypotheses should be accepted.

There were a number of issues and challenges indicated by the participants which emerged as obstacles to the implementation of diversion programs. Moreover, a host of key conditions were noted by participants that could help drive owners or managers to take the initiative. The balance of this section discusses these issues and factors through two lenses: the first being the structural challenges (e.g., policy, technical, lack of awareness, etc.) to implementing an in-house program; and the second being the relevant motivators that could play an essential role in promoting the initiative if/once the structural challenges were dealt with.

5.1 Overcoming challenges to implementing more widespread diversion programs in HRM

5.1.1 Policy inconsistencies

The inconsistency between the HRM's bylaws and the capability of waste management service providers within HRM have been demonstrated to cause issues for store owners or managers wanting to implement diversion programs. This should be addressed. For example, based on the findings, HRM does not accept disposable hot beverage cups into their municipal waste streams and there are no HRM waste management facilities who responded to the survey questions indicating that they provide recycling or composting services regarding coffee cups in the HRM area to date. However, some owners reported that they included their cups into blue bags (i.e., recyclables) or green cart (i.e., organics) and these cups were not rejected by the waste haulers. This implies a possibility that the HRM waste management facilities have a capability of handling an 'applicable' amount of disposable coffee cups.

As noted by four other waste management facilities in NS, in their facilities a small quantity of cups would be accepted by the plants and would not be considered as a contaminant

in recycling or organic streams. If it were true that HRM waste management facilities could handle some cups, then excluding disposable hot beverage cups from the HRM city-wide waste streams would be an obvious barrier to developing an intermediate solution for cup issues (i.e., promoting a recycling or composting program for cups). As mentioned by many owners, their cups were recyclable and/or compostable. If the facilities could handle some of them, it is unreasonable to deny these eco-friendly cups being added to the municipal sorting list.

The availability of municipal waste diversion programs plays a key role in promoting the diversion rate of recyclable or compostable products, which was demonstrated in the case study of Tim Hortons (Hutchinson et al., 2012), as well as in the findings of this study. For example, many store owners or managers indicated that they would only start sorting cups at their locations when HRM accepts their cups into recycling or organic streams.

Signals embedded in the city's bylaws and regulations have a significant influence on the business sectors. Policy interventions play an essential role in promoting waste reduction which has been proved in many past case studies (Wilson et al., 2012), while lacking policy intervention obviously contributes to less attention being paid to cup issues. For example, the findings of this study indicate that the current HRM by-laws regarding disposable coffee cups provided an excuse for many coffee shop owners and/or managers to pay less attention to cup issues. Some participants did not use effective methods to raise the customers' attention to their eco-friendly cup materials. When referring to the reason why they did not divert their eco-friendly cups from the landfill, they just simply explained that the city did not take them. Therefore, HRM's waste management bylaws should be consistent with the actual recyclability and compostability of used cups which are acknowledged by the local waste management service providers.

5.1.2 Improved technical knowledge

The ambiguous acceptance level for the quantity of used cups by the waste management facilities gives rise to potential technical obstacles that then cause confusion on the part of the owner or managers. It directly determines how easy or difficult it is for owners to find a facility that accepts coffee cups in their recycling or organic streams.

The attitudes of waste management facilities are also a concern. All data collected show the fact that their plants are capable of handling disposable coffee cups as long as the cups are separated from lids and sleeves properly. As for the recycling, an additional cleaning process is required to make used coffee cups a better resource for recycling. Even though there was only one waste management facility that openly acknowledged that they did not encourage recycling programs involving disposable cups, the implication is that this is a waste stream that waste management service providers would just as likely avoid. The barriers would possibly be a lack of willingness of waste management facilities to handle more cups at their plants based on their business concerns, as Regional Waste Management Offices said that the end markets (i.e., consumers of recycled materials) is problematic to some degree. As well, there may be other complicated technical challenges from an operational perspective which were not reported in the facilities' survey answers.

Three other waste management facilities had not indicated whether or not they would be willing to accept more disposable coffee cups in their facilities. So there are two possibilities based on the responses from these facilities: 1) there is no restriction on the quantities of disposable coffee cups accepted in the facilities; or 2) there is an restriction on the quantities of cups accepted in their facilities, but they did not report this limitation in their survey answers. It is plausible that these facilities might have similar conditions to the one noted above - a certain

volume of disposable coffee cups are acceptable in their recycling or organic streams; but there are still some uncertainties in their facilities about how to handle large quantities.

There are some lessons learned from other jurisdictions. Ziada (2009) indicated that even though several municipalities in ON such as Essex Windsor, York, and Owen Sound include used coffee cups into their municipal recycling streams, the cups were still considered contaminants in the mixed paper recycling stream in the local facilities. A small quantity of cups received by the facilities appears fine with their plants, and the recycled paper product could be sold as a paper batch with a low level of contamination (Ziada, 2009). Similarly, Hamilton, a municipality in ON, includes disposable coffee cups in the municipal organic stream. However, the local composting facility of Hamilton reported the fact that the reason why they can accept these cups is simply because the quantity received in their facilities is low enough to be accepted as contaminants. Ziada (2009) also emphasizes that even though some municipalities sort disposable coffee cups into municipal recycling or organic streams, they might be removed from the waste stream at various stages such as screener stages and then would be sent to landfills from the facilities. The city of Toronto tried to divert used coffee cups from the landfill in 2009, and did a pilot test to evaluate the actual recyclability of these cups by their local waste management service providers (Ziada, 2009). However, their results were disappointing because the cups were considered contaminants by the local recyclers (Ziada, 2009).

The acknowledgement of the recyclability and compostability by local waste management facilities and infrastructure is a key factor to promote widespread diversion programs for cups. Therefore, it needs to conduct further evaluations on the recyclability and compostability of cups until the ambiguous acceptance level reported by the facilities is clearly defined. Otherwise, a reported capability of handling disposable coffee cups with an ambiguous

acceptance level by local facilities would not help a lot for promoting more widespread diversion programs for these cups in the future. If HRM imitates some municipalities in ON to include disposable coffee cups in municipal recycling or organic stream and these cups are finally sent to the landfill, then it does not make sense, and might provide consumers and retailers wrong signals about the actual recyclability of coffee cups.

5.1.3 Improved retailer or stakeholder networks

Creating a network linking retailers with other stakeholders could help retailers to raise awareness, obtain more external support, and fill some information gaps regarding end-of-life options for used cups. Sufficient communication between different stakeholders is important for promoting recycling opportunities for disposable hot beverage cups (Czaika, 2010). However, this kind of communication is absent in the reported answers of the participants in this study, which should be addressed.

Better awareness and greater understanding of the potential role a retailer network could play could support better uptake of diversion programs. However, it was found in these findings that many participants lack an awareness of the issue. For example, many participants complained about the poor performance of customers in terms of garbage sorting, and identified customer participation matters as one of the most influential challenges for developing an in-house waste diversion program for their cups. However, these participants did not recognize that the poor performance of customers could possibly be caused by the lack of visible signs attached to their waste containers to inform customers of which container their cups should go in because based on the findings, many of their locations do not have these signs to clarify if their cups can be recycled or composted. An efficient communication method with customers plays an essential role in increasing customers' participation rate in a program (Alsop et al., 2004). If customers are

not well informed, then it cannot simply conclude that low diversion rate is caused by low customers' participation rate.

Czaika (2012) indicates that successfully diverting cups from landfills requires collaboration and teamwork, and retailers need to be involved in the teamwork. However, according to the findings, many store owners or managers obviously lack an in-depth understanding of their role in the holistic network for solving the cup issues. For example, some participants thought one other end-of-life option for cups is simply changing their cup purchasing habits from current disposable hot beverage cups to eco-friendly ones at their locations. Very few participants mentioned a concern about the availability of local waste management service providers to pick up used cups and handle them in order to guarantee the success of diversion programs. Retailers should raise an awareness of the role they play in the whole network of addressing cup issues, and be closely connected with waste service providers.

Improved external support will likely motivate program implementation, particularly amongst those owners or managers who were less inspired by the more altruistic considerations of 'environmental benefits'. For example, cost issues, and the durability of these cups are two concerns reported by some participants. As such, manufacturers or suppliers may need to be part of the solution. Many participants, in particular small business owners or managers, expected financial support from governments, and also eco-friendly coffee cups with a reasonable price and satisfying quality from cup manufacturers or distributors. Wright et al. (2011) suggested that cup manufacturers and coffee shop companies work closely to solve potential quality issues about eco-friendly cups. International Paper (n.d.) provided a good example about the cooperation between cup manufacturers and coffee shops, and proved the used coffee cups from many different brands can be successfully converted into 'new' paper hot cups.

Wright et al. (2011) assumed that if the market scale of eco-friendly cups is expanding due to an increasing awareness of cup issues in the landfill, the price of these cups would drop. However, this may take a long time. Therefore, external help is obviously needed for promoting diversion programs, at least from the short-term perspective. And this help needs to be built on sufficient communication between different stakeholders so that they can understand what they can provide and what they need for promoting diversion programs at the store level together (Czaika, 2012).

Addressing information gaps about diversion options for cups could aid in the implementation of such programs. Findings indicate that many participants did not have a complete understanding of program options for their cups. For example, some participants worried about availability of eco-friendly coffee cups, and showed an interest in obtaining more information about end-of-life options for cups. Wright et al. (2011) also emphasized the role of distributors in educating retailers about eco-friendly coffee cups.

However, based on the findings, applicable eco-friendly cups need to be acknowledged by local waste management facilities. Otherwise, as reported by some participants, their cups are labelled compostable and recyclable, but due to the restriction of HRM bylaws, these cups are finally ending up in the landfill. Therefore, the information gaps should be addressed by more than the communication between two stakeholders. Instead, a large-scale network involving various stakeholders such as cup manufacturers, distributors, retailers, and local waste management service providers should be created. In the case study of Starbucks, Czaika (2010) demonstrated the effectiveness of the network, and proved an increased understanding about the cup issues in landfills as well as filled information gaps between various stakeholders. The purposes of the network are to provide a convenient platform for these stakeholders to exchange

ideas, as well as obtain a more complete understanding of the network and their different roles played in the process of addressing cup issues.

The form of platforms can be various. As suggested by one participant, a coffee cup campaign could be a possible platform which allows all coffee shop owners or managers to join and help each other to promote diversion programs in the industry. However, this platform should not be restricted among only retailers because cup issues are not caused by one kind of stakeholder, and cannot be solved by them acting independently (Czaika, 2010). Workshops are also an option for facilitating the communication between different stakeholders, which was demonstrated by Czaika (2010). Billington, Neeson, and Barrett (2009) also demonstrated the effectiveness of workshops for helping small business owners or managers to alleviate the isolation these small business participants can feel.

Building a network linking retailers with other stakeholders could mediate the isolation they may feel, so that it might increase the willingness of retailers to promote diversion programs at their locations. However, based on the findings, some participants showed a feeling of isolation, in particular small business owners or managers. For example, these owners or managers worry about cost point. They thought governmental support would be helpful but did not believe that would happen. Many other participants also indicated that they did not have any perceived support or help from the government or other external agencies. Developing diversion programs for cups needs the collaboration of different stakeholders (Czaika, 2010). Therefore, there are improvements in external support (e.g., financial support or education workshops) needed for promoting diversion programs in the future.

5.2 Improved support and enhanced program benefits

5.2.1 Appreciating environmental responsibilities and moral values

Positive environmental attitudes and moral values strongly motivate retailers to develop and sustain an in-house program for their cups at the store level. For example, the participants with a diversion program at their locations reported a very high satisfaction level with their programs even though they paid a lot for sustaining the program. Bansal and Roth (2000) developed a model explaining the motives of some companies to voluntarily move toward sustainability. They identified three factors and also outlined the expected benefits associated with each factor. “Social responsibility” is one factor identified in the model and the expected benefits are “feel-good factors, employee morale, and individual satisfaction” (Bansal & Roth, 2000, p.727). Bansal and Roth’s findings concur with elements of this study— some owners reported improved personal satisfaction from the implementation of a diversion program; the owners created an environmental-friendly atmosphere in their restaurants, and employee morale was highly influenced in a positive way through waste sorting training; and the owners who divert cups from their stores ‘felt good’ about it. This could explain why participants were willing to pay a higher cost to sustain their diversion programs at the store level. Furthermore, some studies identified benefits perceived by business owners which would be obtained from the engagement in environmental initiatives, such as high satisfaction from environmentally-friendly programs (Bansal and Roth, 2000), positive reaction from employees and other stakeholders (Campbell, 2007), and greater perceived attractiveness for a high quality workforce (Turban & Greening, 1997), so that the function of costs in business considerations has been partly ignored. Therefore, appreciating and raising environmental obligations and moral values of retailers could contribute to the development of diversion programs for their cups at the store level in the future.

5.2.2 Improved public awareness and education

Improved public awareness/education may be an incentive for some retailers to implement programs as a response to consumer demand. Findings indicate a low public awareness regarding cup issues. For example, many participants indicated the fact that there were very few customers asking about cup issues at their locations. However, the customers' request for recycling was highlighted by many participants when referring to the factors that will drive them to commence an in-house program for cups at the store level. Some studies explained the reason why corporations are generally customer-responsive is because this might help them obtain greater competitiveness, such as a larger market share, higher profits, and a company's reputation (Aguilera, Rupp, Williams, & Ganapathi, 2007; Bansal and Roth, 2000; Turban & Greening, 1997; Waddock & Graves, 1997). Therefore, companies need to raise public awareness and education on cup issues so that this may highly promote diversion programs for cups in the future.

There is a direct relationship between raised public education and awareness regarding disposable coffee cups and more widespread promotion of diversion programs for cups. Based on the findings, some participants reported that diversion programs at their locations promote the public education as well. Their diversion programs raise the public awareness of cup issues when visiting their restaurants, so these customers will possibly query cup materials of other coffee shop brands when they visit different restaurants, thereby driving these stores to pay attention to cup issues. This benefit of diversion programs has also been proven in the case study of Starbucks (Czaika, 2010).

However, as discussed in many past studies, customers' behaviour change is a very slow and complicated process (Connolly, 2012; Fairbairn et al., 2008; Finlayson-Buck et al., 2011;

Ziada, 2009). As reported by the recyclers interviewed, if used disposable coffee cups are sent to a recycling stream, keeping them clean and without plastic lids are the prerequisites of guaranteeing the success of the recycling process for these cups. They did not explain the reason in detail, but this was explained by Czaika (2010) - if the residue of hot beverage is left in cups, bacterial and fungal growth would generate food contamination in the recycling stream which was obviously not a good resource for recycling. Findings indicate that some owners or managers would allocate their staff time to sort these materials into a proper bin, but others just allow customers to sort the waste no matter if there is a cross-contamination in their waste streams. In the latter cases, customers' cooperation plays a significant role in successfully developing diversion programs for cups at the store level. Czaika (2010) indicated that there was a complicated process of customers' behavior change embedded in promoting in-house recycling programs for cups. The complication was explained by three more steps that customers need to complete while finishing their hot drinks and tossing used cups into a recycling container: remove the lid and sleeve, and dump out the residue of his/her beverage (Czaika, 2010). Therefore, in order to guarantee the success of diversion programs, retailers need to facilitate the customers' sorting actions at their locations.

A visual and informative sign might help enhance the customers' sorting performance. However, findings indicate that some participants did not link the poor customers' performance on sorting waste with the availability of clear, visual, informative signs on the different waste sorting containers. Therefore, these store owners or managers should be aware of the interactive relationship with their customers and understand the potential that they can contribute to the raised public awareness and education on cup issues.

5.2.3 Financial incentives

There cannot be an economic penalty for implementing a diversion program – in the long term. Such costs will put off all but the most environmentally motivated owner. The lack of any perceived savings or revenues from developing a diversion program for cups seemed to be a key barrier; taking on additional costs even more so. For example, findings indicate that there were participants who had experienced higher tipping fees for recycled materials than for garbage. This could not be supported with empirical evidence, however this perception denotes one of two possibilities: (1) recycling service fee is higher than landfilling fee in HRM, which is a direct disincentive to any kind of diversion program; or (2) it isn't higher, but other aspects of the diversion process leave the impression of higher cost.

These two inferences suggest something that the government and other external applicable organizations such as the RRFB can do to help promote waste diversion from the landfill in HRM. Specifically, if the first inference is true, then the government and/or the RRFB needs to put efforts on the adjustments of the recycling fee and the landfilling fee. If the second inference is true, then the government and/or the RRFB needs to look into the reasons why these coffee shop retailers think so. As for revenue generation, similarly, there was no one indicating any economic benefits due to increased sales or the sale of recycled cups. It may or may not be true. However, some studies have shown increased loyalty or social and environmental performance would improve long-term profitability, the competitiveness of firms, and their corporate environmental reputation as well (Aguilera et al., 2007; Bansal & Clelland, 2004; Russo & Fouts, 1997; Turban & Greening, 1997; Waddock & Graves, 1997). Many corporate environmental initiatives might stem from their social responsibility and environmental concerns, but for the long-term survival of the corporate environmental performance, the success

of a corporate environmental program needs the support of the perceived long-term economic benefits (Aguilera et al., 2007; Bansal & Roth, 2000). Therefore, increasing economic benefits and incentives play an essential role to promote the development of diversion programs in the future.

Apart from the in-store potential economic benefits discussed above, there are broader benefits related to recycling programs and activities from an external perspective. The potential economic benefits generated from recycling activities (e.g., reduced waste disposal costs, job creation, resource conservation) have been proven in various sectors (Batool, Chaudhry, & Majeed, 2008; Masui, Morita, & Kyogoku, 2000; Williams et al., 2008). Many scenarios indicated that the environmental industry has a big potential to increase dramatically in all sectors, and it would not be a surprise that more and more efficient recycling equipment will occur and grow at a fast pace in the recycling sector in the near future (Masui et al., 2000). Used disposable coffee cups would also possibly become a recyclable material being a source of materials for a recycled fiber product. In fact, International Paper, a business partner of Starbucks, has already proven the successful conversion of the cupstock into recycled paper hot cups which contains at least 10% post-consumer fiber (PCF) (International Paper, n.d.). Tim Hortons' cupstock has also been converted into recycled napkins and take-out trays (Tim Hortons Inc., 2011). All this evidence indicates the potential of used disposable coffee cups being considered as a value-added product. As long as there is a close-loop of fiber products created in NS, this would create some opportunities to earn external economic benefits within the province, such as employment, local revenue generation and economic savings associated with less demand for virgin materials. Moreover, if the market demand for used disposable coffee cups being a new source of recyclable materials, this might influence the government's

management decisions; consequently, some coffee shop owners and managers would be willing to pay more attention to cup issues due to the potential economic opportunities and policy change.

5.2.4 Promoting and supporting corporate initiatives

For franchisees, it was clear that corporate support would be key for all but the most dedicated and environmentally focused owner. While, there was one franchisee that initiated an in-store diversion program of their own accord (with support from corporate but not at the request of corporate), this will not be the case for most. For example, research showed that many stores use eco-friendly coffee cups, but do not operate any waste separation program for their cups and just let their customers throw their cups into garbage. These stores explained the reason why they use eco-friendly coffee cups is simply because of their corporate decisions. This may imply that these coffee shops' head offices actually have some end-of-life management plans for their cups. But due to some unknown reasons, they did not tell these HRM stores that their cups should be collected and sent to the appropriate processing facilities to recycle or compost. This inconsistency of the implementation of end-of-life management plans is also reflected in the answers of the head office which responded to the survey questions. So, if there are some retailers which have an assumed lack of willingness to develop an end-of-life management plan by themselves and just follow what their head office tells them, supporting their corporate initiatives and solving the inconsistency issue from their corporate perspective may promote these owners or managers to develop diversion programs.

5.3 Limitations

There are three known limitations in this study.

First, some coffee shop owners or managers said their cups were accepted by the HRM area because the waste haulers and waste management facilities did not tell them that they were doing something wrong when they included their recyclable coffee cups into recycling bins and compostable coffee cups into organic carts. But they also admitted that they did not know what would happen to their cups after they left their stores. All these owners who diverted cups from the garbage at the store level and sent their cups into facilities which had not rejected the cups would be considered part of category one. However, the HRM Regional Waste Management Office said municipal waste recycling or organic streams rejected to include disposable coffee cups. This information had been also confirmed with the HRM waste management company that disposable coffee cups would be generally sent to the landfill based on the guideline of HRM. Both the HRM Regional Waste Management Office and the waste management company had not clarified if there were any exceptions in the management of municipal waste streams related to disposable coffee cups; therefore, it is still doubtful whether or not the cups included into the municipal recycling stream or organic stream had been diverted from the landfill by the HRM waste management facilities. In this study, as long as owners or managers who were sorting used disposable cups in their restaurants and sent these cups into the recyclers or composters, they would be considered as the interviewees belonging to category one (i.e., owners and/or managers with in-house diversion programs).

Second, due to time constrains, the survey questions were only accepted until February 10th. As such, of the five NS waste management facilities contacted, only four had replied to the survey questions in time. Two HRM waste management companies had replied; both companies have their own facilities and provide waste collection services in HRM. One of them processes both recyclable and organic items in their facilities.

Third, the feasibility of recycling or composting cups was only investigated by interviewing six representatives of NS waste management service providers and ten managers of Regional Waste Management Offices in NS. No technical evaluation regarding the actual recyclability and compostability of disposable coffee cups was conducted in this study.

6 Conclusions and Recommendations

6.1 Overview of the study

This study set out to explore the potential opportunities for promoting other end-of-life options for disposable hot beverage cups. The volume of cups being landfilled is expanding every day (Fairbairn et al., 2008); however, very few people are aware of this issue. Most past studies focus on promoting refillable travel mugs in order to eliminate disposable cups, thereby reducing the number of cups ending up in landfills (Botkin et al., 2006). However, much evidence indicates that this is a very slow process and cup issues are urgent because they create many environmental concerns in the landfill. Therefore, there is a need for re-thinking the end-of-life management of disposable coffee cups. If these cups can be successfully recycled and/or composted, developing diversion programs at the store level will be an immediate option for complementing the solution of promoting reusable cups. The research question addressed in this study was: “What is the feasibility and desirability of developing in-store recycling and/or composting programs to divert disposable hot beverage cups from HRM landfills?”.

Three kinds of stakeholders were included in this study. Interviews with both the Regional Waste Management Offices in NS and the private sector waste management service providers were aimed at investigating the feasibility of developing diversion programs at the store level by recycling and/or composting cups in HRM. The HRM coffee shop owners or

managers were interviewed in order to evaluate their desirability of developing such programs at their locations by identifying the perceived barriers and drivers related to the development of the programs.

6.2 Key findings

This study is the first one collecting baseline data regarding developing diversion programs for cups in the HRM area. Four main findings derived from the results of this study are outlined below.

6.2.1 The feasibility of other options

It is feasible to divert coffee cups in some regions, but further technical evaluations are needed before coffee cups can be easily diverted away from the landfill in HRM. Waste management facilities do not report considering cups as contaminants, however, they do not define the acceptance level in terms of quantity of cups received. Therefore, in order to facilitate diversion programs in the HRM area, more specific technical evaluations are required to clarify the actual capability of NS waste management service providers.

6.2.2 The need for improved education and raised awareness

Improved public awareness and education is needed to disseminate information about end-of-life options for cups. Based on the reported observations of store owners or managers, there is a low public awareness regarding cup issues. Customers' demand is a significant driver for retailers to change their business behaviours because many participants reported that their businesses are very customer-responsive. Due to lack of awareness in the public, the expected

customer satisfaction derived from diversion programs is very low so that store owners or managers lose the interest to pay attention to their cup issues.

Apart from customers, store owners or managers showed lack of knowledge regarding options as well. And, they did not have a full understanding of the role a retailer network could play in the process of addressing cup issues due to lack of connection with other stakeholders. However, some interviewees showed an interest to learn more options for end-of-life management regarding their cups because having more options for recycling or composting will increase their customers' "in-restaurant experience".

6.2.3 The role of corporate initiatives

Corporate initiatives are both enablers and barriers to the implementation of in-store programs. On one hand, the findings indicate that corporate decisions may restrict the development of diversion programs at the store level due to the hierarchy around decision-making within a corporation. On the other hand, the implementation of corporate initiatives regarding diversion programs for cups is also a driver for many franchisees, in particular those without strong intent to develop such a program by themselves. Therefore, supporting corporate initiatives in the region may help promote diversion programs at the store level.

6.2.4 Lack of economic incentive

The cost effectiveness of end-of-life options for cups needs to improve. The findings indicate that participants perceive a lack of financial incentives, and see no benefits in terms of both cost-savings and revenues regarding recycling or composting activities. The relative high cost of eco-friendly cups compared to the regular disposable ones is a significant barrier reported by many interviewees, in particular small business owners or managers. These findings indicate

that if there is a serious interest in developing diversion programs at the store level, a new financial model that supports a more economically viable solution for store owners or managers is needed.

6.3 Future research

This study shows a number of possibilities to promote diversion programs for cups in HRM in the future, which provides a foundation for future studies that could support the development of further solutions. Given the study limitations with regards to time constraints and the lack of a technical evaluation around the actual recyclability and/or compostability of disposable coffee cups, there is room for future work. In addition, this study points out three more directions for future research:

- 1) A network connecting retailers to other stakeholders is necessary for facilitating diversion programs at the store level. Therefore, how to build this kind of network including various stakeholders so as to eliminate the isolation they may feel is important in future research focusing on addressing cup issues.
- 2) Investigating how to create an effective tool to disseminate information about end-of-life options for cups will be helpful to address low public awareness.
- 3) Research on how to improve the cost-effectiveness of - or create a revenue from - the various options for recycling and composting disposable coffee cups in NS will also help draw more attention of retailers to their cup issues.

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Appendix A

Interview questions for the interviewees belonging to category 1

1. When did you start a recycling or composting program for used disposable hot beverage cups at your store?
2. How does your recycling and/or composting program for disposable hot beverage cups work in your store? (i.e., how do you collect used disposable hot beverage cups at your store and where the cups will go after collection?)
3. What motivated you to start commence a recycling or composting program for disposable hot beverage cups at your store?
4. Did you have any challenges at the initial stage?
5. How did you overcome these challenges?
6. Are there still challenges that you face in implementing this program?
7. What do you see as the benefits to your composting and/or recycling program?
8. Are you satisfied with the current recycling and/or composting program for disposable hot beverage cups at your store? Why or why not?
9. Have you had any reaction from your employees about the program? Tell me about those.
10. Have you had any reaction from customers about the program? Tell me about those.
11. Is there any support/help you expect to receive for sustaining the recycling or composting program for disposable hot beverage cups?

Interview questions for the interviewees belonging to category 2

1. Can you tell me how you currently deal with waste management in your store (i.e., separate compost and cups, garbage, collection of wastes, etc.)?
2. Has your store ever contemplated trying an in-house recycling or composting program in the past?
 - 2.1. Tell me about this
 - 2.2. Have you ever tried to conduct a recycling or composting program for disposable hot beverage cups at your store in the past?
3. What do you think would be the challenges and barriers to implementing a recycling or composting disposable hot beverage cups at your store? (e.g., from an operational perspective, and from an economic perspective.)
4. What do you think would be the benefits to implementing a recycling or composting program in your store?
5. What factors would motivate you to start a recycling or composting program for disposable hot beverage cups at your store?
 - 5.1. Prompt: customers asking for it?
 - 5.2. Prompt: help from government?
6. Is there any support/help you wish you could have in developing a recycling or composting program for disposable hot beverage cups?

Appendix B

Consent Form

Project Title: Exploring the Feasibility and Desirability of Recycling and/or Composting Disposable Hot Beverage Cups in HRM

Principle Investigator:

Jie Ma, fourth year undergraduate student studying Environmental Science at Dalhousie University (Jie.Ma@dal.ca)

Supervisors:

Dr. Tarah Wright, Environmental Science Programs (Tarah.Wright@Dal.Ca);

Dr. Michelle Adams, School for Resource and Environmental Studies
(Michelle.Adams@Dal.Ca).

Funding provided by: Resource Recovery Fund Board Inc. (RRFB Nova Scotia)

Introduction:

We invite you to take part in a research study being conducted by Jie Ma who is an undergraduate student in the Environmental Science Program at Dalhousie University. Taking part in this research is voluntary, even if you chose to participate, you can withdraw at anytime. Any information you have already given would be immediately deleted. The information below tells you about what is involved in the research, what you will be asked of you, and outlines any issues that may arise.

Please ask as many questions as you like. If you have any questions later, please do not hesitate contact the lead researcher (Jie Ma).

Purpose and Outline of the Research Study:

The purpose of this study is to better understand the factors that influence the feasibility and desirability (on the part of store owners/managers) of in-house composting/recycling programs for disposable hot beverage cups. The intended outcome is to provide insight to decision/policy makers about ways to support improved waste diversion opportunities for these cups - away from landfill.

This study will examine these factors through the completion of in-depth interviews with owners/managers of such business, both those with existing in-house programs and those without. The timing of the interview and whether it is completed over the phone or in-person will be that which is most appropriate and convenient. If you agree to participate in this study, the steps will be as follows.

- a. You will be called by me to determine a time and/or a location of your choosing to discuss a series of questions about your organization. The interview should take approximately 30 to 45 minutes. Initial and follow-up phone calls and emails are expected to take 15 minutes. Interviews will be transcribed audio recording.
- b. The audio recording will be transcript into text by a professional transcription company. A copy of the interview data will be sent to you for any corrections and comments you feel are appropriate. You will have the opportunity to withdraw your interview responses from the study if you wish. Should you consent to being anonymously quoted a copy of these quotes will also be provided to you to make any corrections/comments. Review of interview transcripts/quotes is expected to take approximately 30 minutes.
- c. The resulting information will be aggregated and assessed for common themes and traits. All identification will be separated from the data beforehand.

- d. Final results will be presented in academic publications and public presentations and other communication tools, such as industry newsletters or policy documents. Results will be made available to participants by email upon request.

Who Can Take Part in the Research Study?

You may participate in this study if you belong to two categories: (1) coffee shop or quick service restaurant owners and/or managers who already have instituted an in-house recycling and/or composting program for disposable coffee cups; and (2) those who have never had such a program or have initiated one but did not maintain its operation.

How Many People are Taking Part in the Study?

10-12 participants will be included in this study.

What You Will Be Asked to Do:

You will be asked to participate in an interview with a time slot that will be no longer than 30 minutes. You will answer a list of prepared questions, but also be assigned the opportunity to add the points you consider as being relevant to the overall study. The interview will focus on the desirability of in-house composting and/or recycling programs for disposable coffee cups, the barriers to and any benefits of developing an in-house composting and/or recycling program for disposable coffee cups.

Possible Benefits, Risks, and Discomforts

Benefits:

You may not experience any direct benefits from participating in this study, but you may benefit from the final results, which could provide insight to more supportive policies and/or programs related to the development of in-house recycling and/or composting programs for disposable hot beverage cups. The creation of baseline data and new knowledge about in-house recycling

and/or composting programs for disposable hot beverage cups are expected outcomes. A better understanding of the drivers and barriers to establishing in-store recycling/composting is intended to help owners/managers of coffee shop and/or quick service restaurant owners establish such programs where appropriate and feasible.

Risks and Discomforts:

This study is expected to involve minimal risk. However, for any reason, you may withdraw from the study at any time. Only the principal investigator and her research supervisors will have access to your specific information – it will not be provided to anyone else.

Compensation/Reimbursement

There will be no compensation for participating in the study.

Privacy and Confidentiality

Your name will not be used in any reporting of the data, nor will any personal information that may be obtained throughout the course of your participation in this study be released.

Quotations from the interview may be used; however, no respondent's name or affiliation will be attached to the quotation. Moreover, you will be given the opportunity to review the quotation in advance of any dissemination. However, at your request, the primary investigator will ensure that none of your responses are quoted from the outset.

All interviews will be audio recorded. These audio files will be destroyed immediately after transcription. A professional transcription service will be hired to transcribe the interviews. Therefore, participants will be assigned a pseudonym in the interview, and this pseudonym will appear on all paper transcripts and on all electronic files. Only the PI and her two supervisors will have access to the full data files; a professional transcription service will have access to the

audio files but these will only be identify numerically (participant 1, participant 2, etc...). On the PI and her supervisors will know the identify associated with each label.

All data will be kept in a locked filing system in Dr. Tarah Wright's office at Dalhousie University. These documents will be kept for a period of at three years before being destroyed.

If You Decide to Stop Participating:

You are free to leave the study at any time. If you decide to stop participating at any point during the study, you can also decide whether you want any of the information that you have contributed up to that point to be removed or if you will allow us to use that information. You can also decide for up to 2 weeks if you want us to remove your data. After that time, it will become impossible for us to remove it because it will already be anonymized.

How to Obtain Results:

We will provide you with a short description of group results when the study is finished. No individual results will be provided.

Questions

During your interview, you will be asking questions about your experience with composting and recycling coffee cups, and your thoughts on the feasibility and desirability of recycling and compositing of coffee cups in your restaurants. The interview questions for two categories of interviewees are attached as Appendix A.

More Information

We are happy to talk with you about any questions or concerns you may have about your participation in this research study. Please contact Jie Ma (at 902-999-2367, Jie.Ma@dal.ca) or Dr. Michelle Adams (at 902-494-4588, Michelle.Adams@Dal.Ca) at any time with questions,

comments, or concerns about the research study (if you are calling long distance, please call collect). We will also tell you any new information comes up that could affect your decision to participate.

If you have any ethical concerns about your participation in this research, you may also contact the Director, Research Ethics, Dalhousie University at (902) 494-1462, or email: ethics@dal.ca.

Research Participant

Date: _____