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GRANDMA IN THE GREENBELT: HOW THE NATURAL DISPOSAL OF OUR DEAD
COULD SAVE ONTARIO'S GREEN SPACE

By

Courtney Elizabeth Heron-Monk

B.A (Honours) Human Geography, Brock University, St. Catharines, Ontario, 2009

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Abstract

Cemetery grounds and sustainable land use practice are rarely used in conjunction however natural burial grounds present opportunities to leverage the land use and environmental challenges associated with conventional cemeteries for the benefit of people and the environment. This paper explores land use planning challenges facing Ontario in planning for the disposal of our dead and the emergence of natural burial grounds as a sustainable alternative to conventional burial. This paper also explores how planning challenges related to planning for the disposal of our dead could be leveraged to produce positive outcomes; in particular the strengthening of Ontario's Greenbelt as a living landscape. This paper argues that Natural burial has potential to be a value added land resource and can mitigate a series of burial related land use challenges currently present in Ontario.

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Dedication

This research paper is dedicated to my late Grandpa, Jim Heron, who always made me laugh. I love and miss you.

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"From my rotting body, flowers shall grow and I am in them and that is eternity."

Edward Munch

1.0 Introduction

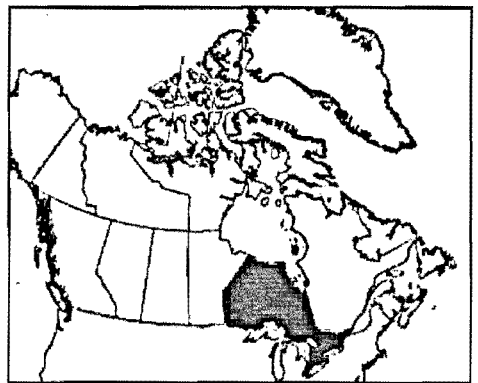
Like many regions, Ontario is faced with several land use planning challenges. One such challenge that often goes undiscussed is planning for the disposal of our dead. Deeply rooted in religion and culture, there is a significant absence of government input and, therefore, decision makers have provided little detail towards developing coordinated efforts regarding how and where our bodies should be disposed of after death (Basmajian and Coutts, 2010).

In Ontario alone, the number of people aged 75 and over is projected to rise from 847,000 in 2009 to almost 2.2 million by 2036. Based on the 2006 Census, the 60+ group will more than triple in size, from 73,000 to 261,000 (Ontario Ministry of Finance, 2010). Approximately 90,000 Ontarians die each year (Statistics Canada, 2011) and although cremation is steadily on the rise,

burial has sustained its popularity in Ontario. With an ageing, growing population, increasing demands for urban space, and a shrinking cemetery land supply; challenges regarding the disposal of our dead are imminent challenges planners will face.

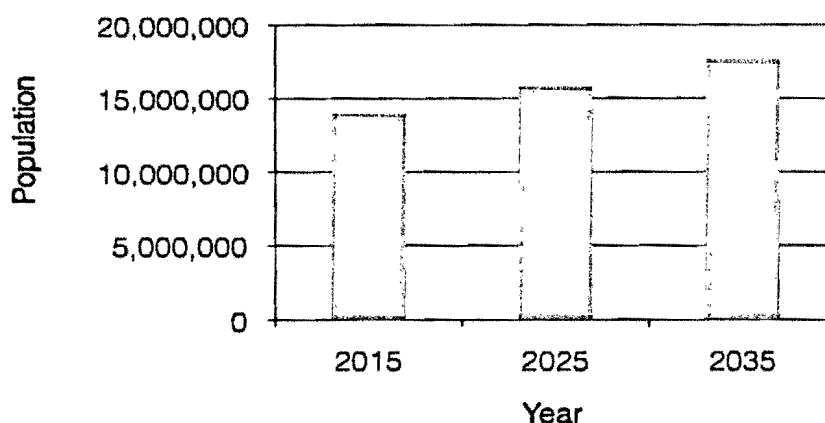
In addition, Ontario's population is growing and existing burial options do not reflect the multi-cultural needs of Ontarians; burial methods typically cater to Judeo-Christian traditions creating growing demands for alternative burial options, which include more basic burial methods (Agrawal and Hathiyan, 2007).

Fig. 1: Key Map of Ontario



Source: University of Victoria (2011)

Fig. 2: Population Projections of Ontario Seniors



Source: Ontario Ministry of Finance (2010)

Despite the known concerns for cemetery land shortage and the known environmental effects of traditional burial methods, planners have largely overlooked the urban spatial issues related to cemeteries. In their article, *Planning for the Disposal of our Dead*, Basmajian and Coutts (2010) notes, "Planners have been conspicuously silent on the issue" (p. 307). Basmajian and Coutts (2010) also notes, "Although there is little scholarly, or even popular, literature focused on the issue of planning for the disposal of the dead, the problem is potentially severe... Yet, unlike many of the things we plan for, mortality is a certainty and the disposal of the dead is an unavoidable task" (Basmajian and Coutts, 2010, p. 307). According to Diang (2004), we are at the cusp of losing command of the situation as he notes, "The lack of planned and affordable land, which is the basic component of cemeteries call for the responsibility of urban planners to address the problem before the situation slips irretrievably out of control" (p. iii). With a burial rate of 56% (Ontario Board of Funeral Services, 2009), a dwindling supply of existing cemetery

space and intensifying demands for urban real-estate; planners are presented with imminent challenges in the planning for the disposal of our dead.

The issues pressure planners to engage in conversations about whether cemeteries and burial grounds could be modified to serve other important ecological and social functions (Basmajian and Coutts, 2010). Basmajian and Coutts (2010) listed alternative burial options, such as natural burial, as a potential driver towards more sustainable burial practice. Based on their multi-performative abilities and the mutual benefit they can provide to both people and the environment, Basmajian and Coutts (2010) note, "...planners would benefit from research that explored how to permit and encourage alternative methods of disposal that would reduce or avoid the toxic chemicals, concrete, and wood used to preserve and entomb a corpse" (p. 315). Basmajian and Coutts also suggest that planners investigate policy modifications that "...restrict land available for embalmed burial while simultaneously expanding space for natural burials" (Basmajian and Coutts, 2010, p. 315). Although there is a cultural aversion toward publically discussing death and burial, the need to address these issues is dire in Ontario.

Unlike conventional cemeteries, natural burial grounds have multiple benefits in that they provide space for the disposal of the dead, help to add nutrients to the earth and create and conserve green spaces in a park-like setting. This research considers the role natural burial may play as a value added land use towards the enhancement and preservation of Ontario's natural heritage lands in the context of Ontario's Greenbelt. This paper will also present Ontario's current planning challenges, both spatially and socially, in association with the disposal of our dead and explores how these challenges may be leveraged to offer further support for the protection and enhancement of Ontario's

Greenbelt. It is my hope that this research will be applicable to various green spaces outside the Greenbelt and across Canada as it is assumed that if the position can be made to locate natural burial within the Greenbelt there also significant potential for natural burial

Fig. 3: Ontario's Greenbelt in Context



Source: Seeley (2008)

grounds to consummate natural heritage goals elsewhere. Moreover, natural burial grounds, in general, are largely understudied; and their potential for enhancing the protection of heritage lands in the context of Ontario is unexplored.

While this paper should not be read as suggesting that traditional disposal methods are wrong, it is my hope that this research generates interest in the potential that natural burial may serve in Ontario's current planning climate and in mitigating current planning issues such as threats to green space, cemetery land shortages and increasing demands for alternative burial methods; all of which are imminent challenges planners will face in the near future.

1.1 Method

This paper is divided into two parts. The first part of this paper will explore the emergence of natural burial grounds as an alternative to conventional cemeteries and will discuss the issues associated with planning for the disposal of our dead. The second part of this paper is more applied and explores the role natural burial can play as a value-added land use within the Greenbelt. Utilizing the applied case study method, I explore how natural burial may be applied to Ontario's Greenbelt and, based on Greenbelt policies, what land use planning benefits may manifest from the establishment of natural burial grounds in the Greenbelt. More specifically the applied case study draws upon how the establishment of natural burial grounds can strengthen the Greenbelt as a living landscape, work to provide permanent protection to the Greenbelt's Natural Heritage System, help expand the Greenbelt's boundaries and lastly, how natural burial grounds may enhance and foster personal connections to the Greenbelt. The applied case study method was chosen based on the fact that a case study is expected to capture the complexity of a single case and interactions within its context (Stake, 1995).

Part I

1.2 What is Natural Burial?

The primary goal of natural burial is to return the body to the earth in a manner that does not inhibit the process of decomposition thereby allowing the body to decompose naturally leading to a burial process with as little environmental impact as possible. As such, natural burial excludes the interment of chemical preservatives and synthetic materials, which often result from the embalming process (the process undertaken to preserve the body after burial). Natural burial also excludes the interment of elaborate caskets, grave liners and vaults; instead, the body is buried in biodegradable materials such as a plain wood casket, often fabricated out of poplar, or a simple shroud or blanket. The grave is dug at a depth that facilitates microbial activity to take place, which is similar to that found in the composting process (Green Burials, 2009).

1.3 What is a Natural Burial Ground?

A natural or woodland burial site is managed for the benefit of wildlife and as such is planted to encourage a diverse range of flora and fauna, ultimately leaving behind a newly created wood, green infrastructure and permanent memorial ecosystem, which in time becomes a permanent self-sustaining woodland. The object then is to create natural woodland with the aim of creating a quiet, unspoilt place to enjoy passive recreation activities and offer a permanent, sustainable memorial to those interred.

Natural burial grounds vary in that there are many different types of natural burial grounds. While many can be large, some being around 15 hectares in size, others are

sometimes less than an acre. Natural burial grounds may take the form of a woodland, meadow, or simple field and are often found within sections of existing cemeteries or have been established as “natural interment zones” or extensions of existing cemeteries. Others have been established outside the confines of existing cemeteries becoming integral pieces of countrysides or nature reserves.

As noted above, maintaining the natural environment is of primary importance during the burial process, thus traditional headstones are rarely permitted in a natural burial ground. Instead, memorialization is often achieved through the planting of trees, shrubs, local wild flowers or simple plaques that do not intrude upon the character or ecological integrity of the space. Where shrubs and trees are planted in memoriam of those interred, the burial ground becomes a new woodlot (Clayden and Dixon, 2007) thereby creating additional woodlands and park space. Put more simply, natural burial grounds work to preserve and enhance the natural landscape and create places where people can engage in passive recreation, in a peaceful setting (Native Woodland Ltd, 2011).

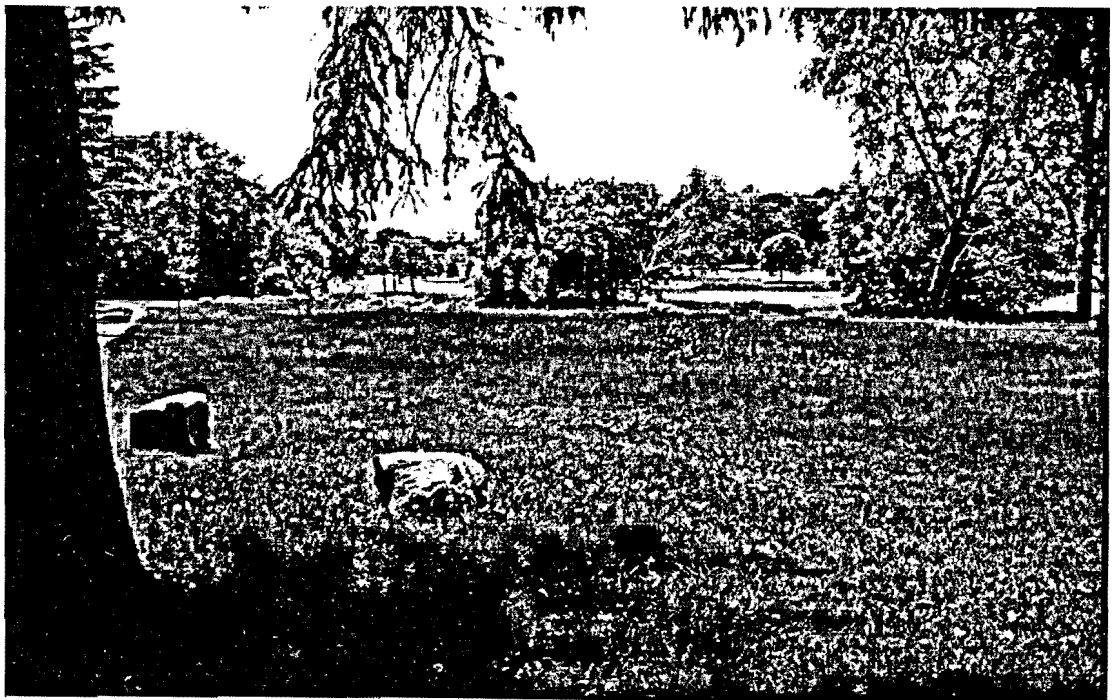
Fig: 4: Micheldever Woodland Cemetery, Hampshire, England



1.4 The Emergence of Natural Burial

Beyond a swath of headstones, nestled between a creek and a simple walkway, lays a modest meadow and Ontario's first and only natural burial ground. Though the meadow is part of the existing Cobourg Union Cemetery, visitors may not realize that human remains are interred in that section of the cemetery. The "green section" is devoid of headstones and elaborate plaques; graves are simply marked by small name-tags which are removed one year after burial to allow enough time for visitors to learn the exact location of a particular grave site. Where name-tags have been removed, clusters of native flowers, shrubs and rocks have been placed to distinguish some of the graves. Since May 2009, eight interments have taken place in Cobourg Union Cemetery's green section and as of late December of 2010, 80 of their 180 plots (40%) had been reserved (Michel Cabardos, Cobourg Union Cemetery, personal communication, December 30, 2010).

Fig. 5: Ontario's first natural burial ground, Cobourg Union Cemetery, Cobourg



Source: Cobourg Union Cemetery (2010)

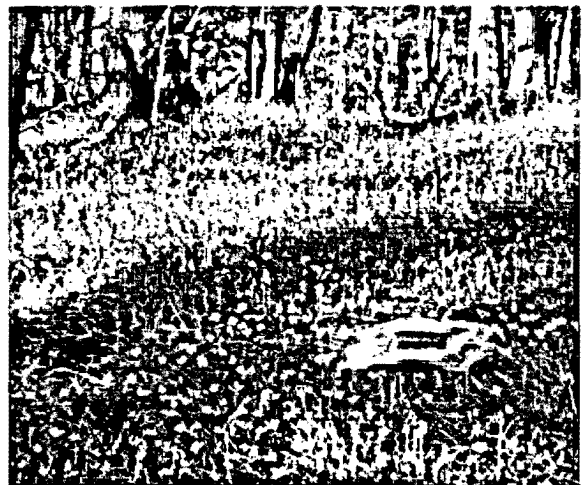
The green burial movement originated in the United Kingdom with the first natural burial taking place in 1993 in Carlisle, England. With 225 woodland cemeteries at present, natural burial has become institutionalized and now accounts for 15-20% of all burials. Canada's natural burial movement began with the opening of a "natural interment zone" at Victoria's Royal Oak Burial Park in 2008 while America's natural burial movement began ten years earlier with the opening of Ramsey Creek preserve. Although natural burial remains a grassroots level movement, natural burial grounds can be found in various states such as New York, California, Texas, Washington and Florida (Natural Burial Cooperative, 2011). Currently, the United States has almost 20 natural burial grounds either in operation, under development or in the planning stages while Canada has just two.

The dynamism of natural burial grounds have allowed for their establishment in various geographies as they blend into natural areas. In Canada, natural burial grounds have been confined to existing cemeteries, however as Figure 6 shows, natural burial grounds have the potential to locate in various natural heritage spaces without compromising the integrity of the site, unlike their conventional counterparts.

Fig. 6: Conventional Cemetery vs. Natural Burial Ground



Source: Wikipedia (2011)



Perfect Memorials (2011)

Glendale Memorial Nature Preserve in Florida, for example, combines a green cemetery and conservation area creating a 140-hectare “memorial ecosystem” which acts as a multi-functioning, hybrid park that offers space for various activities such as nature walks and picnicking. The grounds also operate as an alfresco art gallery (Collier, 2006) with various sculptures placed around the grounds. Like many natural burial grounds Glendale Memorial Nature Preserve is located within a conservation area where the land is held in trust (Collier, 2006). Memorial woodlands, a 20 acre natural burial ground located outside of Bristol, England occupies former agricultural lands which did not have the capacity to support a working farm. Inheriting the land from his father, founder Christopher Baker decided to convert the site to indigenous woodland by transforming the land into natural burial ground thereby adding to the area’s greenbelt (Sevier, 2008).

The UK has acknowledged the potential of natural burial to mitigate various planning challenges associated with burial including land shortages and green space conservation challenges. In its Green Belt policy, England highly recommends natural burial as a way to mitigate cemetery land shortage and a way to promote an alternative to traditional burial (Greenarc, n.d.) Legislation in England has recognized that natural burial can add value to English Green Belt landscapes by making lands multi-performative while maintaining and enhancing the character of the Green Belt. For example, a report to council regarding a proposed natural burial ground in Datchworth County, England notes, “The proposal involves extensive tree planting, and as such is considered to enhance the surrounding landscape and visual amenity of the Green Belt...Overall it is considered that the proposed natural cemetery is an appropriate form of development in the Green Belt and will benefit the character or appearance of the surrounding landscape (Datchworth County, 2008, p.

7). Unlike British governments, Ontario's Provincial government has yet to recognize or acknowledge the differences between a conventional cemetery and a natural cemetery (McKeown, 2010) even though they differ greatly both below and above ground.

1.5 The North American Way of Death

It is important for planners to understand North American funerary customs, why we practice them and the ecological issues associated with such practices. With an understanding of the North American culture of death and its associated geographies, planners can gain perspective on some of the practical concerns linked to shifting our attitudes and choices in our modern death and burial practices (Feagan, 2007) and the way forward in facilitating more sustainable land use as it relates to burial. Taking this into consideration, I now discuss modern North American funerary practices and the social and spatial issues associated with traditional disposal methods, including burial and cremation.

Of the cultures and civilizations that have been studied, the practice of death ritual and rites, in some capacity or another, is universal across human groups both historically and geographically (Feagan, 2007). For the majority of human history, the body was buried in its natural state and returned to the earth: "dust thou art, and unto dust shalt thou return" (The Bible, Genesis 3:19). Up until about a Century ago, the family and the community took care of the deceased, washing, dressing, and eventually burying the body in the village cemetery or in the family graveyard after a simple graveside service (Young, 1994). The simplicity of the death ritual was consistent with the geographies of death. The cemeteries looked nothing like they do now; the grass grew wild, native trees grew tall, and grave markers were crafted from local wood or rock (Stowe et al., 2001). But what we do

with our dead is largely dictated by culture and religion and as time progressed, North American culture changed and with the aid of medical science, new funerary customs such as embalming, elaborate casketing and cremation, developed. As funerary customs shifted, so too did North America's culture of death.

Fig. 7: Brooklyn Cemetery



Source: Sono (2011)

Unlike other cultures, North Americans have an affinity to the idea of perpetual life which has spawned denial and profound fear of death. The fear of dying has become so engrained in North American culture it is considered taboo to even talk about it. When a situation arises where we must confront death, such as an open casket service; the body is modified to appear as if it is simply sleeping. In addition, Lafleur-Vetter (2000) noted that even funerary language caters to our fears about death; for instance coffins are referred to

as "caskets", the hearse is now called the "coach", "loved ones" are used in place of corpses, and the term "memorial park" is often used in place of graveyard or burial ground. North Americans use a special rhetoric so as not to scare one another or make one feel uncomfortable when someone has "passed away". This fear is perpetuated and sustained by the funeral industry and funerary practice. When a death occurs, North Americans turn to the funeral industry to care and dispose of our dead, bringing death care out of the hands of family members and into the hands of "professionals" (Lofland, 1978; Howarth & Jupp, 1996; Moller, 1996; Hockey et al., 2001) allowing us to further detach ourselves from the realities of death.

In our reluctance to accept and speak about death, we have grown largely ignorant against the truths regarding the effects of modern funerary practices on the natural environment both below and above ground. With a burial custom that works to battle against what is natural and inevitable, it should come as no surprise then, that our burial process and the waste it produces is unsustainable, ecologically threatening and a potential risk to public health. Our reluctance to accept simple realities of death, such as the inevitability of human decomposition and the mixing of human remains with the natural world, has led to the institutionalization and ritualization of expensive and ecologically harmful, unsustainable methods of human disposal.

1.6 The Environmental Impacts of Conventional Burial

While cremation leaves a smaller spatial footprint than burial, North American death rituals and rites (including both cremation and burial) have been shown to facilitate significant environmental harms through the mass consumption of resources (caskets, vaults, graveliners) and the release of toxic chemicals caused by the burial or burning of

formaldehyde-embalmed remains (Chiappelli and Chiappelli, 2008; Valigra, 2005; Harris, 2007). National Geographic News reported that every year, North Americans bury enough metal to replicate the Golden Gate Bridge (90,000 tons of steel, 2,500 tons of copper and bronze), enough concrete to build a two-lane highway from Toronto to Montreal and back (1.6 million tons of concrete), and over 30 million board feet of hardwood in caskets, or 60 million trees (Valigra, 2005). In fact, casket manufacturers are listed on the Environmental Protection Agency's (EPA) top 50 hazardous waste generators list due to chemicals such as methyl and xylene which are used in the protective finish sprayed on the caskets' exteriors (Valigara, 2005). In addition, the embalming process is central to North American funerary practice and is responsible for the deliberate burial of 800,000 gallons of embalming fluid each year. When an embalmed corpse is buried, it releases harmful, synthetic chemicals such as formaldehyde (a known carcinogen) and ethanol into surrounding soil and groundwater (Valigara, 2005). The section to follow will explain the environmental effects caused by traditional cemeteries in greater detail and will provide evidence for why planners should begin to consider natural burial as an alternative option to traditional disposal methods.

The modern practice of embalming is central to the burial process as its primary purpose is to retard the decomposition process and enhance the appearance of the deceased, usually for the purpose of an open-casket funeral ceremony. The embalming process works by replacing the blood and infusing internal organs with a mixture of various chemicals which act as a preservative but which are also associated with carcinogenic and other toxic effects, particularly formaldehyde, phenol and methanol. To deliver the mixture to the body, an incision is made above the collarbone or into the inner thigh, a rubber

embalming hose is inserted and the chemical mixture is pumped through the body. The "funeral waste" generated from the embalming process, such as fecal matter, liberated contents of internal organs, excess embalming solution and any pathogens of disease the blood may have been carrying, gets dumped into the area's regular sewer system (Harris, 2007; Chiappelli & Chiappelli, 2008).

The primary ingredient of embalming fluid is formaldehyde, a chemical classified as a human carcinogen by the World Health Organization and listed on the Environmental Protection Agency's list of top 10% worst chemicals for hazardous impact on the environment (Bedino, 2004). It takes roughly 3.5 gallons of embalming fluid to embalm the average adult (Cook, 1999). The Ontario Funeral Services Board (2009) notes that in 2009, 61, 192 Ontarians were embalmed. That figure translates into roughly 200,000 gallons of formaldehyde being deliberately placed in the soil in that year alone. The amount of embalming fluid placed into Ontario's soil each year is enough to fill two Olympic sized swimming pools. Moreover, at least 42 other "dangerous chemicals are also commonly used in embalming and body preparation" (Iserson, 1994) all of which end up in the ground or burned and released into the atmosphere via the crematorium (Chiappelli and Chiappelli, 2008). In fact, embalmed bodies buried at sea take longer to decompose because fish and other marine life are repelled by the strong odor generated by the chemicals (Iserson, 1994). Previous studies on the effects of embalming fluid have focused in large part on the effects of airborne exposure to formaldehyde rather than on groundwater or waterborne exposure. Nonetheless, according to Chiappelli and Chiappelli (2008), "findings suggest formaldehyde is harmful to public health and probably not a good thing to be adding to the environment" (p. 25).

The conventional practice of embalming the body and the use of elaborate caskets and vaults are intended as a means of protecting the body from decomposition. Yet ironically, these scenarios cause a gruesome form of decomposition. When a body is contained in an environment without air (such as a hermetically sealed casket), the production of anaerobic bacteria takes place which causes liquefaction of the body's tissue and bursting of the body cavities (Sehee, 2006). In these scenarios, the corpse is essentially turned to sludge. Regardless of the burial environment type, amount of chemicals and techniques applied during the embalming process; the body and its casings eventually decompose. As sites of concentrated human decay, cemeteries have always posed possible public health risks and thus have been a topic of concern for many years. Human decay, which causes seepage containing bacteria, viruses and chemical products used in the embalming process, is carried by percolating water through soil and into the water table where the groundwater could potentially be serving as a water source.

Current burial standards, such as required depth and appropriate soil type, are intended to protect the public from potential waterborne diseases caused by seepage. However, governments and special interest groups remain cautious regarding the potential of cemeteries as repositories of a variety of contaminants stemming from both formaldehyde based embalming fluid and casketing materials.

Spongberg and Becks (2000) reported that metals, such as arsenic and mercury (once used in past embalming and burial practices), formaldehyde from current embalming, varnishes, sealers and preservatives (used on wood coffins), as well as lead, zinc, copper and steel (from metal coffins), are all possible contaminants within cemeteries. The increasing number of cemeteries (as the population ages and grows) and the possibility

that hazardous chemicals and metals could have a serious impact to surrounding land and groundwater has caused concern in countries where embalming and burial have taken place in the past or still remain common practice. In recent years, this concern has prompted a series of studies which have generated varying conclusions on the possible effects such contaminants have on our human and environmental health and well-being.

In 1980, the White House groundwater task force conducted an investigation on the potential pollution risks posed by cemeteries; however this investigation ceased due to the lack of existing studies on the matter rather than a lack of evidence (Chiappeli and Chiappeli). In 1992, the Water Resources Branch at Ontario's Ministry of the Environment initiated a study on the effect of burial preservatives on groundwater quality. The researches surveyed groundwater from six sites down gradient of cemeteries conducting tests for formaldehyde, nitrates and phosphates. The study was the first of its kind in North America. The water samples found low concentrations of formaldehyde and other contaminants leading researchers to conclude that risks of contamination from cemeteries were low (Chan, et al, 1992). In the same year, Beak Consultants Ltd (1992) undertook a soil and groundwater investigation at a Toronto Cemetery to determine storm water suitability. Samples from selected plots ranged from 1880 to the time the study took place. Groundwater was investigated for traces of formaldehyde, methanol, arsenic, solvents and various metals, all of which are associated with past and present embalming practice and casket materials. The findings of this study revealed that contaminants in soil and water were at or below the required criteria for storm sewer suitability and therefore no cause for concern. However, the suitability of contaminant levels in the groundwater as a source of drinking water was not studied.

Later, Spongberg and Becks (2000) conducted a survey to determine the level of absorption of metals in soil from a large cemetery in Northwest Ohio. Sampling was concentrated around rows of older plots showing signs of subsidence, an indication that the caskets and their contents have broken down. The study revealed several possible sources of contamination. The soil samples turned up results of zinc, copper, lead and iron and that concentrations increased concurrent with proximity and depth to the tested plots. Spongberg and Becks (2000) inferred that concentrations in metal may have been a consequence of the popularity of metal-based caskets. The study also found that arsenic levels also increased, which provided researchers with indication that contamination was a result of embalming fluid or wood preservatives, thus providing clear evidence that embalming had a measurable effect on the environment. It was concluded that the results yielded reasonable concern for the quality of soil, groundwater and nearby water systems (Creely, 2004). In addition, Chiappelli and Chiappelli (2008) confirm that a study in Great Britain found “extremely high concentrations” of contaminants in water collected from freshly dug graves (p. 25).

Canada and the United States are the only countries in the world that still consistently embalm their dead (Welton, 2003). Embalming has become so widespread in Canada that many believe it is against the law not to embalm the body (Smith, 2007). In truth, embalming is not required in Ontario; only rarely does the law require a body be embalmed, such as transportation of the body via commercial airline (Smith, 2007). New knowledge on the harmful chemical, carcinogenic properties of embalming and recent awareness of its irrelevance as a protective tool against disease to the living have prompted many countries in European Union to restrict the use of formaldehyde. In September 2007, after nearly ten

years of deliberations, the European Union banned the import of formaldehyde-based products and their use under the Union's Biocidal Products Directive, due to the carcinogenic properties found in formaldehyde. The primary aim of the directive is to ensure a high level of protection for human, animal, and environmental health and to establish, through systematic evaluation, a list of permitted active ingredients for biocidal products (Parmalee, 2007).

Embalming is so widespread in Canada that many believe it is against the law not to embalm a body before burial or cremation. Despite popular belief, there is no law that requires a body be embalmed. In fact, only rarely does the law require a body be embalmed in Ontario, such as transportation of the body via commercial airline (Smith, 2007). While some skeptics believe a non-embalmed body presents health and safety issues, several experts both in the medical profession and the funeral industry contend that diseases within the body die with the body dies (Chiappelli and Chiappelli, 2008; Hanes, 2009).

1.7 The Environmental Impacts of Cremation

The most common alternative to the burial of embalmed remains is cremation (Prothero, 2001). In 2009, nearly 50,000 cremations were performed in Ontario, a cremation rate of 56% (Ontario Board of Funeral Services, 2009). Cremation is gaining popularity as an alternative to traditional burial for economic reasons and common perceptions that cremation facilitates sustainability in terms of land conservation. In fact, 13% of North Americans choose cremation because "saving land" is important to them (Cremation Association of America, 2005). However, despite the promotion of cremation as a more

ecologically sound alternative to burial, studies have shown that the incineration of an embalmed corpse can have harmful effects to the environment and human health.

Using enough natural gas to drive a gasoline-powered vehicle from St. John's, Newfoundland, to Tofino, B.C per cremation (Hamilton, 2009), the cremation process converts the body and casket into ash by incineration. However, the by-products of incineration include harmful emissions of carbon dioxide (160 kg or 353 pounds), nitrogen oxides, carbon monoxide, sulfur dioxide, particulate matter, mercury, hydrogen fluoride (HF), hydrogen chloride (HCl), and other heavy metals (Stevens, 2011). Due to the fact that all combustion creates some formaldehyde, the contribution of formaldehyde into the atmosphere via cremation is considered minimal. However, cremation of an embalmed corpse would inevitably lead to the release of more formaldehyde into the atmosphere (Chiappelli and Chiappelli, 2008). Once in the air, formaldehyde can last up to 250 hours (World Health Organization, 2002). The most pressing concern associated with cremation has been the release of mercury into the atmosphere from dental fillings used prior to (whatever year they stopped using them). It is estimated that 109 kg to 411.6 kg of mercury in the atmosphere is a direct result of cremation (Memorial Society of British Columbia, 2005). According to Smith (2007) it was predicted that by the end of 2010, cremation would be the single largest contributor to mercury in the air in Britain and in Sweden as one-third of airborne mercury is sourced from crematoriums.

Given the amount of emissions generated through the cremation process, the British government introduced regulations aimed at cutting mercury emissions in half by 2020 (Smith, 2007). North America has not yet issued any form of regulations against

cremation services. Based on research conducted by the Environmental Protection Agency on one crematorium in New York, emissions included particulates, carbon monoxide, nitrogen, sulfur dioxide, hydrogen chloride, metals (cadmium, mercury, lead), dioxins and furans -- the severity of which was determined based on intensity of heat (Smith, 2007). Despite the findings, the EPA was not concerned by the level of emissions and based on the findings of this singular study, ruled crematoria a very low regulatory priority and did not assign any special regulations for crematoria. In Canada, like in the United States, crematoria are considered to be low-risk operations (Smith, 2007).

However, the emissions generated by crematoria have proven to be a problematic externality for nearby residents in urban areas. In 1997, residents of Saanich district in Victoria, British Columbia called on the Provincial government to work towards ceasing emissions from a local crematorium based on concerns from contaminants in smoke (Smith, 2007). Although the company upgraded its equipment at the request of the government, residents were still complaining a decade later. In 2006, the B.C Interior Health Authority made a recommendation against a proposed crematorium in a residential area of Kamloops based on the lack of environmental regulation of the industry (Smith, 2007). In the same year, the Province's Chief Medical Health Officer advocated mandatory licensing of crematoria under the Environmental Management Act, which would require operators to obtain emissions permits (Ward, 2006). Despite growing concerns, the government opted to proceed with caution and, in the meantime, prohibit crematories from locating in residential areas (Ward, 2006).

Although the severity regarding the environmental effects of traditional burial and cremation methods are contested, doubt and concern regarding the effects on cemeteries

to environmental and public health continue to persist (World Health Organization, 1998, p. 1-2). Persisting concerns regarding the unsustainable use of space for burial, growing concern for the health of the environment and the public have generated interest in determining how burial grounds might be designed and operated more sustainably.

1.8 Cemetery Land Shortage Concerns

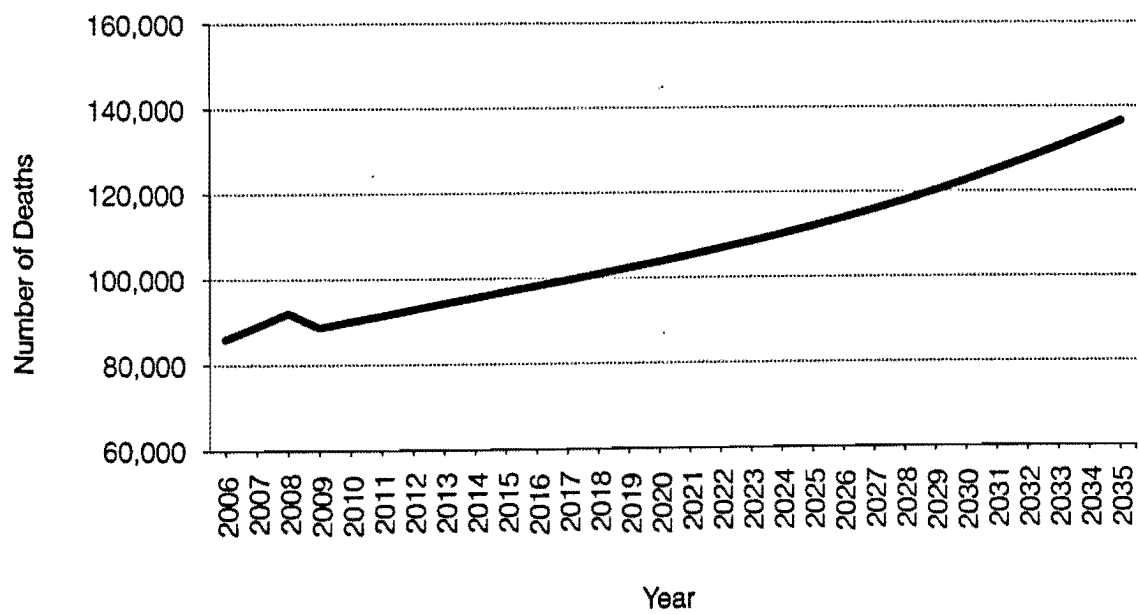
Adding to the complexity of the issue of planning for the disposal of our dead are pressing concerns regarding the lack of available space for burial and a sustained demand for burial space. This issue is exacerbated by the ageing of the baby boom generation - the generations born before and during World War II (1936-1945) and the post-war baby boom (1946-1964). Close to 90,000 people die every year in Ontario (Ontario Ministry of Finance, 2010) and over 3 million of Ontario's baby boomers are ageing closer to mortality over the next three decades. This means, quite simply, that there are and will be more elderly people (aged 65 +) in Ontario than at any other time in history, both in absolute values and proportionally (Statistics Canada, 1995).

The initial impact of the baby boomers are expected to manifest starting at the end of 2011, the year those born in 1946 will reach 65 years of age. As the baby boom generation ages closer to mortality, it is imminent that the number of deaths will soon be at a level unseen before in our history, resulting in an "unprecedented level of demand" for funeral related commodities (Statistics Canada, 1995, p. 18). By 2036, the number of deaths is expected to increase by 65% (Statistics Canada, 2010). The number of people aged 75 and over is projected to rise from 847,000 in 2009 to almost 2.2 million by 2036.

Based on the 2006 Census, the 60+ group will more than triple in size, from 73,000 to 261,000 (Ontario Ministry of Finance, 2010).

In past years, the number of deaths has been relatively stable; however, we are entering the beginning of a steep increase in the number of deaths to come. By 2031, all baby boomers will be 65 or older and the number of deaths will start to increase more rapidly. At the time the Government of Ontario undertook a populations projections update, their report projected that between 2009 and 2028, the annual number of deaths in Ontario was projected to increase from 89,000 to 116,000 (Ontario Ministry of Finance, 2010). Over the remaining eight years to 2036, the Government expects the death rate will increase faster, to reach almost 137,000 (Ontario Ministry of Finance, 2010).

Fig. 8: Number of Deaths in Ontario Actual and Projected (2006-2035)



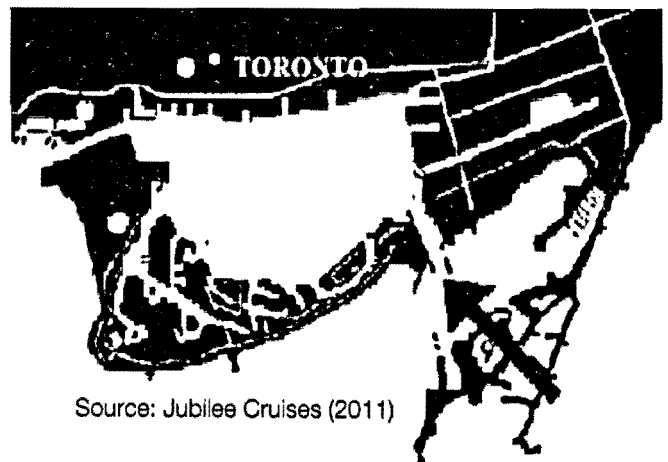
Source: Chart created by data by Urban Metrics (2011)

Based on population projections in the United States, Basmajian and Coutts (2010) notes, "The combined size of these generations, and the sheer number of deaths soon to occur, will likely overwhelm existing internment capacity..." (p. 307). And, even with rising cremation rates, a significant swell in demand for further cemetery space remains imminent (Basmajian and Coutts, 2010) as many individuals expect a traditional embalmed burial within the traditional, spacious cemetery setting (Kellaher, et al.; Prothero, 2001).

Based on current population projections, we can calculate a rudimentary example the estimated amount of land required to bury Ontario's future dead. Based on population projections, it is expected that at least 1,500,000 people will die between 2015 and 2036 (Statistics Canada, 1995). Considering

Fig. 9: Toronto Island Figure Ground Diagram

the average cemetery plot size of 4 by 12 feet and accounting neither for space between plots or the areas dedicated to roads, trees and other landscaping, the American Planning Association notes that 907 plots can be compressed into one acre



(Basmajian and Coutts, 2010). If all of those who died between 2015 and 2036 were interred applying traditional burial plot sizes, this would require roughly 670 hectares of land (1,653.80 acres). When taking into consideration the 25% of land area dedicated to natural features and roads within traditional cemeteries, the amount of land required is raised by 25%; this raises the amount of land required to accommodate traditional burial to 837 hectares (2, 067.25 acres) – the equivalent land area represents enough land to cover the

Toronto Island two and a half times. While the growing cremation rate will alleviate the amount of land needed to accommodate for burial, space shortage in urban areas remains a prime concern as deaths are more likely to occur in urban areas where the majority of people live (and die) and, where land availability for burial is most scarce (Basmajian and Coutts, 2010).

This presents a challenge to planners as sufficient land area for cemeteries is difficult to find in populated areas. The World Health Organization predicts that in the near future, sufficient land area and type needed for cemeteries may not be found at all in urban areas in most parts of the world (1998, p. 1) and in 1995, the Greater Toronto Area (GTA) was already feeling cemetery land shortage constraints. In a 1995 Toronto Star article, it was reported that cemetery space in Toronto was “virtually gone” and that cemetery administrators predicted space would only be available for “a decade or more” (Daw, 1995, p. D1). In the same article, Fraser Vey, senior manager of customer services for Commemorative Services of Ontario (burial space provider for more than 60% of deaths in the GTA at the time) notes, “We’re pushing the envelope now” (p. D1). Cemetery administrators for Toronto’s three largest cemeteries, Necropolis, Mount Pleasant, and Prospect, predicted they would be full by 2001. Scarborough’s major cemetery was predicted to reach capacity by 2000 and North York’s by 2008. London Ontario’s Mount Pleasant cemetery was expected to reach capacity by 2001 and as early as 1997, London’s Oakland Cemetery was redeveloped to make more efficient use of the land extending capacity capabilities for about a decade (Morgan, 1997).

The redevelopment and reconfiguration of cemetery grounds in order to make room for future internments in existing cemeteries has been central to mitigating the need for

further burial space across municipalities in Ontario. In 1995, Commemorative Services of Ontario began their efforts by rerouting roads and paths in various cemeteries across Toronto (Daw, 1995, p. D1). The City of Waterloo has been planning for an expected demand surge for burial plots. In 1999, the City of Waterloo drafted an ambitious Master Plan to expand existing cemetery grounds onto adjacent parkland in order to alleviate capacity pressures; however the proposal has caused controversy within the community providing an example of how cemetery expansion presents significant land use planning challenges.

First, there is such a strong demand for urban space, the real estate values are high and many burial providers cannot afford to expand their lots. Urban cemeteries that do have plot vacancy are largely unaffordable and high urban land costs have forced both burial providers and families to seek plot spaces outside the urban core. Rick Cowan, assistant marketing vice-president for the Mount Pleasant Group, owner of 10 Greater Toronto Area cemeteries, notes that a gravesite in the Toronto core costs about \$5,000, while a plot in the 905 area sells for approximately \$2,000 (White, 2007). In 1998, it was reported that Toronto cemetery operators were forced to look beyond the city's limits to build more cemetery space; Arbor Memorial Services built four cemeteries was forced to develop in Toronto's bedroom communities. In 15 years, Arbor Memorial Services developed cemeteries in Ajax, Brampton, Oakville and Burlington, and in 1998 built another in Whitchurch-Stouffville (Mahoney, 1998).

In addition, lands within urban areas are at a premium thus expansion efforts are met with competing interests between the needs of the living and the dead. The expansion effort in Waterloo is a prefect example: Waterloo's Parkview Cemetery is located adjacent

to Bechtel Park and at more than 40 hectares, Bechtel Park is one of the city's largest and a primary venue for various recreation leagues. The proposed expansion includes the conversion of parkland to burial ground including the conversion of two soccer fields. The proposal has many parents upset who claim that there is already a shortage of quality sports fields and that conversion would add to the issue (McMahon, 2007).

Second, the geography of a site may not allow for cemetery expansion to take place. Specific siting criteria, including suitable soil types in which to bury human remains, must be met so as to minimize the effect of seepage caused by the decomposition process on the environment and public health. Since soil type facilitates the movement of bacteria and viruses through water percolation, cemetery lands must be comprised of a specific soil type that will aid in the absorption of decay products (World Health Organization, 1998). In addition, cemetery lands must be able to mitigate issues associated with hydrological processes; to do this, the base of all burial pits at cemeteries should be above the highest natural water table to minimize seepage directly into the groundwater during and after the putrefaction of human corpses (World Health Organization, 1998).

General cemetery land requirements, such as the above, limit opportunities for cemetery expansion as not all lands proposed for expansion meet cemetery lands requirements. This has become a pressing issue in Welland, Ontario where efforts to expand the City's Doan's Ridge cemetery have been unsuccessful due to "unstable soil conditions"; with limited expansion capacity, Doan's Ridge is expected to face substantial plot inventory reduction by 2017 (Henschel, 2011). The City's other major cemetery, Woodlawn, is expected to reach capacity as early as 2015 and was told by cemetery planning consultants that the site has "limited expansion potential" (Henschel, 2011).

Cemetery planning consultants opined that even with cemetery expansion and the development of above ground burial options such as mausoleums, the City will require between 16 to 24 hectares of land to accommodate the community until approximately 2090 (Benner, 2011).

Another common concern of cemetery expansion and the development of new cemeteries is resistance from potential cemetery neighbours who reject the idea of living next to a burial site (Lewis, 2001; Nurse, 2001). The location of cemeteries and funeral homes can be a culturally sensitive issue. The Chinese believe in distinction and separation of the living from the dead, "One of the most polluted places in the Chinese worldview is the graveyard, home to many wandering spirits" (Agrawal and Hathiyan, 2007, p. 136). In 1998, this became a major issue over a proposed funeral home in a Markham neighbourhood comprised of 50% Chinese residents (Agrawal and Hathiyan, 2007). With much disappointment from the community, the permission was granted by the Ontario Municipal Board to go ahead with development. The Board's decision disappointed many local residents and business owners, and is a timely example of emerging ethno-cultural pressures to the already existing challenges of the planning for the dead (Agrawal and Hathiyan, 2007).

Lastly, cemeteries often blur the boundaries between public and private. While the majority of cemeteries are privately built and maintained, more private cemetery boards are looking to municipalities for financial and labour assistance at an increasing frequency (Dillion, 2010). In the midst of a harsh economic climate, rising fuel costs, and persisting perspectives of what cemeteries should look like, many cemetery boards are no longer able to keep up with the costs accrued from routine maintenance and fertilizers to keep their

cemeteries looking clean and pristine. And while cemeteries are often important elements of a community's green infrastructure (Harnik and Merolli, 2010), and therefore, play a significant role in the public realm; unsustainable cemetery practices have become a burden to tax payers. The problem has become an item of interest in Campbellford, Ontario and has prompted Council to discuss natural burial as a potential option in mitigating rising costs of cemetery maintenance and the potential liability issues cost-saving and environmental considerations for families to discuss (Ethier, 2010).

Like the sprawling suburbs that contain them, sprawling cemetery landscapes have generated interest in high-density development for the dead to facilitate a more efficient use of space. Often included within cemetery sites, the mausoleum is often championed as the answer to shrinking cemetery land supplies. Using the same philosophy behind high-rise developments for the living, the mausoleum houses the dead within a lavish multi-storey structure. While mausolea can create needed internment space more efficiently than ground burial, above ground burial presents challenges of its own. The costs of internment into a mausoleum are very high and facilitate gruesome decomposition as the crypts are closed to air.

Grave sharing has also emerged as a method to conserve cemetery space across Europe. Unlike Canada where your plot is owned, in many parts of Europe, your plot is simply rented for a limited time of about 10-20 years; after which your remains are removed and the grave is re-sold. Canada's grave sharing rules are more traditional in that grave sharing is limited to family members as our current legislation does not permit grave sharing amongst strangers (Inwood, 2010). Even if our legislation changed to match the system practiced in Europe, we might see strong resistance based on entrenched beliefs and

traditions relating to the cemetery as a place of perpetuity; that is, our burial traditions are centered on securing and occupying a final resting place. Grave sharing is unlikely to be widely accepted in North America in the near future (Basmajian and Coutts, 2010).

Based on its minimal spatial impacts, cremation has gained political support and is typically promoted as a sustainable disposal method. From a spatial perspective, cremation can make a positive impact; however from an environmental perspective, I have shown that cremation is not the most sustainable option. Furthermore, cremation presents many social and cultural issues as certain faiths, such as Islam and Judaism, prohibit cremation. Thus, the promotion of cremation as an alternative to burial is a challenge in the multicultural climate of Ontario.

1.9 Growing Demands for Diversified Burial Options

The need for cemetery space and diverse burial options is heightened in Ontario as the Province has many ethno-culturally diverse areas where needs differ from mainstream Judo-Christian practices. The industry overlooks the fact that we live in a multicultural society and that death ritual and rites vary by community. In a recent article titled: Funeral and Burial Sites, Rites and Rights in Multicultural Ontario, Agrawal and Hathiyan (2007) explain that in an urban centre such as the GTA, multiculturalism has presented a serious challenge in terms of available space, ability to fulfill non-traditional burial practice and suitable locations for where the dead are prepared for burial or cremation and where they are laid to rest. For example, similar to the Jewish community, Muslims believe in the resurrection of the body and reject the practice of embalming. As such, their burial

practice entails burying the dead immediately after death. Muslim custom also requires single depth burial, without a coffin, and that graves must face Mecca. These burial requirements are at odds with current mainstream burial standards, which often require a casket and vault, and thus are not able to meet the Muslim community's needs.

In addition to religious communities, the dominance of traditional burial fails to meet burial options and standards that are important to those of the environmental community and overall emerging "green" consumer culture. Those seeking an environmentally friendly form of burial in Ontario are confined to just one cemetery (Cobourg Union in Cobourg) and therefore must seek plots far away from friends and relatives making it difficult for families to visit a loved-one's grave. To date, the lack of a diversity of burial options, especially those that promote sustainable use of land, can be seen as a significant barrier to our emerging culture of sustainability, and in this context, could be interpreted as a failure to meet Provincial planning goals and standards.

It is clear that Ontario is faced with a series of planning challenges in regards to planning for the disposal of our dead. Current population projections reveal that Ontario's baby boom alone will challenge cemetery land resources; what can we expect with a growing, more diversified population in the future? Taking into consideration current population trends and projections, a limited supply in burial space and demands for more sustainable land use practices, we see the importance of exploring new, more sustainable forms of disposing of our dead. Below is a discussion on how natural burial may be applied to Ontario's Greenbelt as a way to not only mitigate the issues I have discussed but also a way to leverage these issues to become opportunities that can work to enhance, protect and restore natural heritage lands within the Greenbelt; helping to bring further

meaning to the Greenbelt. In our socially and physically diverse region of Ontario, we are forced to consider alternatives to traditional burial.

PART II

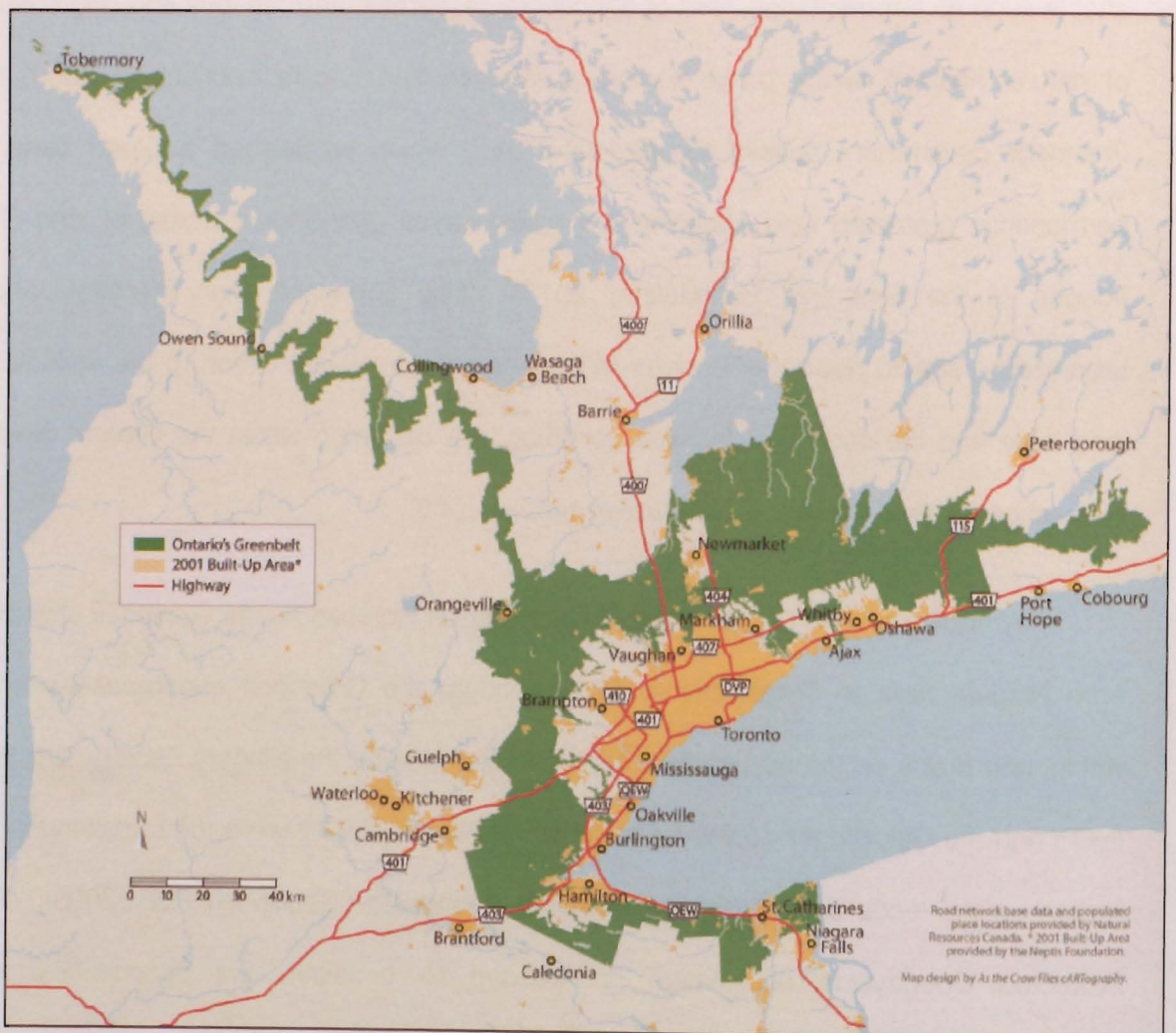
2.0 Natural Burial and Ontario's Greenbelt Landscape

Ontario's Greater Golden Horseshoe is Canada's most populated region. The population of the Greater Golden Horseshoe is expected to increase by approximately 4 million to 11 million people by 2031 (Carter-Whitney and Esakin, 2010). In anticipation of a growing population and increased urbanization, the establishment of the Greenbelt was seen as a necessary step against the prospect of increasing urban sprawl and its related negative effects such as fragmentation, loss of agricultural resources, and the loss and degradation of natural heritage lands, prime ecological features and wildlife habitats. In 2005, the Provincial government passed the *Greenbelt Act*, which established a broad band of permanently protected land spanning 1.8 million acres (728,000 hectares) of land (The Friends of the Greenbelt Foundation, 2011). The Greenbelt Plan identifies where urbanization should not occur in order to provide permanent protection to the agricultural land base and the ecological features and functions occurring within the Greater Golden Horseshoe (Ontario Ministry of Natural Resources, 2008).

Wrapping around Ontario's the Greater Golden Horseshoe, the Greenbelt stretches from Niagara Falls to Tobermory to Peterborough, the Greenbelt encompasses lands within, and builds on the ecological protections provided by the Niagara Escarpment Plan (NEP) and the Oak Ridges Moraine Conservation Plan (ORMCP) while the remaining lands makes up the lands defined as the Protected Countryside (Greenbelt Plan, 2005). The Protected Countryside designation is intended to conserve the agriculturally and environmentally significant lands as outlined in the ORMCP and the NEP while maintaining

and improving linkages between these areas and their surrounding lake systems and watersheds (Greenbelt Plan, 2005). The Greenbelt Plan outlines both general and geographic specific policies in order to address a wide range of land use planning issues that may occur. The Greenbelt Plan's geographic specific policies apply to three types of lands within Protected Countryside designation; these are Agricultural Areas, the Natural Heritage System and Settlement Areas.

Fig. 10: Ontario's Greenbelt



Source: Natural Resources Canada (2005)

Policies within the Greenbelt Plan were formulated based on a vision, which is supported by five primary goals. The vision for the Greenbelt is the permanent protection of land that:

- Protects against the loss and fragmentation of the agricultural land base and supports agriculture as the predominant land use;
- Provides permanent protection to the natural heritage and water resource systems that sustain human and ecological health and that form the environmental framework around which major urbanization takes place; and
- Supports a diverse range of social and economic activities associated with rural communities, agriculture, recreation, tourism and sustainable resource use (The Greenbelt Plan, 2005)

The main goals of the Greenbelt plan are to:

Enhance Ontario's urban and rural areas and overall quality of life by promoting the following items within the Protected Countryside:

- Agricultural Protection
- Environmental Protection
- Culture Recreation and Tourism
- Settlement Areas and;
- Infrastructure and Natural Resources (The Greenbelt Plan, 2005)

Despite the passing of the *Greenbelt Act* and Greenbelt Plan as well as the implementation of Ontario's Growth Plan, which provides policy direction about where and how future growth should be accommodated, report cards generated by Ontario's Greenbelt Council reveal threats of urbanization to the Greenbelt remain such as the development of roads, highways, quarry development, sewers and boundary expansions (Carter-Whitney and Esakin, 2010). The future health and vitality of the Greenbelt will depend on intelligent planning interventions that will work to strengthen the protection of the Greenbelt and enhance it as a living landscape. The Greenbelt Plan is slated for review in 2015, thus providing a prime opportunity to discuss new, innovative ways the Greenbelt

may be strengthened.

Natural burial is one intervention that can add strengthen the protection of the Greenbelt from development and therefore should be considered when reviewing the Greenbelt Plan. Natural burial provides significant opportunities as the principles of natural burial align with Greenbelt planning principles providing further opportunities to implement Greenbelt goals and providing further protection to the Protected Countryside. Natural burial has the potential to protect and enhance the Greenbelt in the following ways:

- Enhancement and permanent protection of natural heritage system
- Greenbelt Expansion
- Foster personal connections to the Greenbelt

2.1 Permanent protection and enhancement of the Greenbelt's Natural Heritage System

One of the geographic specific policy areas within the Protected Countryside is the Natural System. The Greenbelt's Natural Heritage System is comprised of the natural heritage network, water resource systems, key natural heritage features and key hydrologic features in addition to an array of recreation and tourism opportunities such as hiking trails, bike routes and parks (Ministry of Municipal Affairs and Housing, 2011). According to the Ontario Ministry of Natural Resources (2008), "The natural system provides a continuous and permanent land base necessary to support human and ecological health in the Greenbelt and beyond" (p. 3). Lands within the Natural Heritage System identify areas that support natural heritage and hydrologic functions and features which maintain connections to the broader agricultural and natural systems in the Region (Greenbelt Plan, 2005). The Ministry of Municipal Affairs and Housing (2011) defines a Natural Heritage System as, "a system made up a natural heritage features and areas linked by natural corridors necessary

to maintain biological and geological diversity, natural functions, viable populations of indigenous species, and ecosystems. These systems can include lands that have been restored and areas with the potential to be restored to a natural state" (p. 1).

Natural areas are faced with significant threats of various forms of development (Ministry of Natural Resources, n.d.). Natural burial grounds have the potential to enhance the protection of the Greenbelt's Natural Heritage System while building on efforts to permanently protect the system from development. Despite the unique approach to burial exercised with natural burial grounds, they are inherently cemeteries and therefore, have the potential to protect valuable land in perpetuity as contemporary land use policies aim to protect cemetery spaces. Therefore, our cultural aversions against the disturbance of burial sites (Barrett and Barrett, 2001) can be leveraged protect threatened land within the Greenbelt. In these ways, natural burial grounds can support Greenbelt conservation goals relating to the permanent protection of natural heritage sites. The Natural Heritage System would benefit from establishment of natural burial and the perpetual protection they provide especially in areas where the Natural Heritage System is threatened by urban expansion and development.

Figure 11: The Natural Heritage System and Natural Heritage Links



Natural burial grounds also present opportunities to enhance the Natural Heritage System through the restoration of natural heritage sites in that natural burial grounds can work to enhance natural connections to and within the Greenbelt's Natural Heritage System and habitats within it. The Natural Heritage System is also comprised of a series of cores, linkages and river-valley corridors. Natural heritage linkages are important to maintain or establish an interconnected natural heritage system which allows the passage of otherwise isolated plants and animals to maintain genetic viability, health, and diversity within the Natural Heritage System (Regional Municipality of Halton, 2007). Parks, woodlands and vegetated areas provide opportunities for establishing connectivity and linkages within the Natural Heritage System (Ministry of Natural Resources, 2006). Natural burial grounds could exemplify strong additions to the Natural Heritage System in that they support the health and vitality of existing parks and woodlands and can create additional parks and woodlots. In these ways, natural burial can enhance the Greenbelt's systematic capacity (Morrish, 2008) and overall ecological performance.

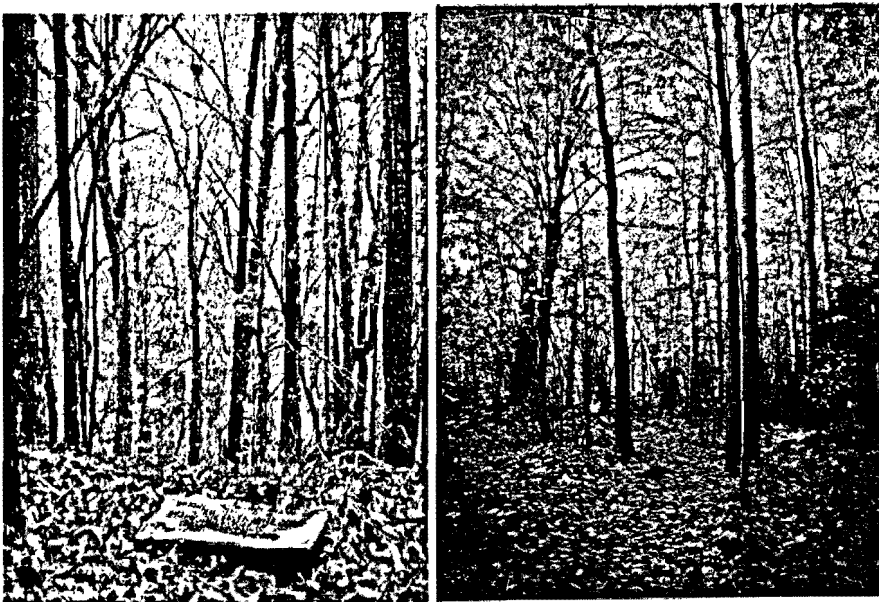


Fig. 12: Example of what Natural Burial (right) might look like in the Oak Ridges Moraine (left)

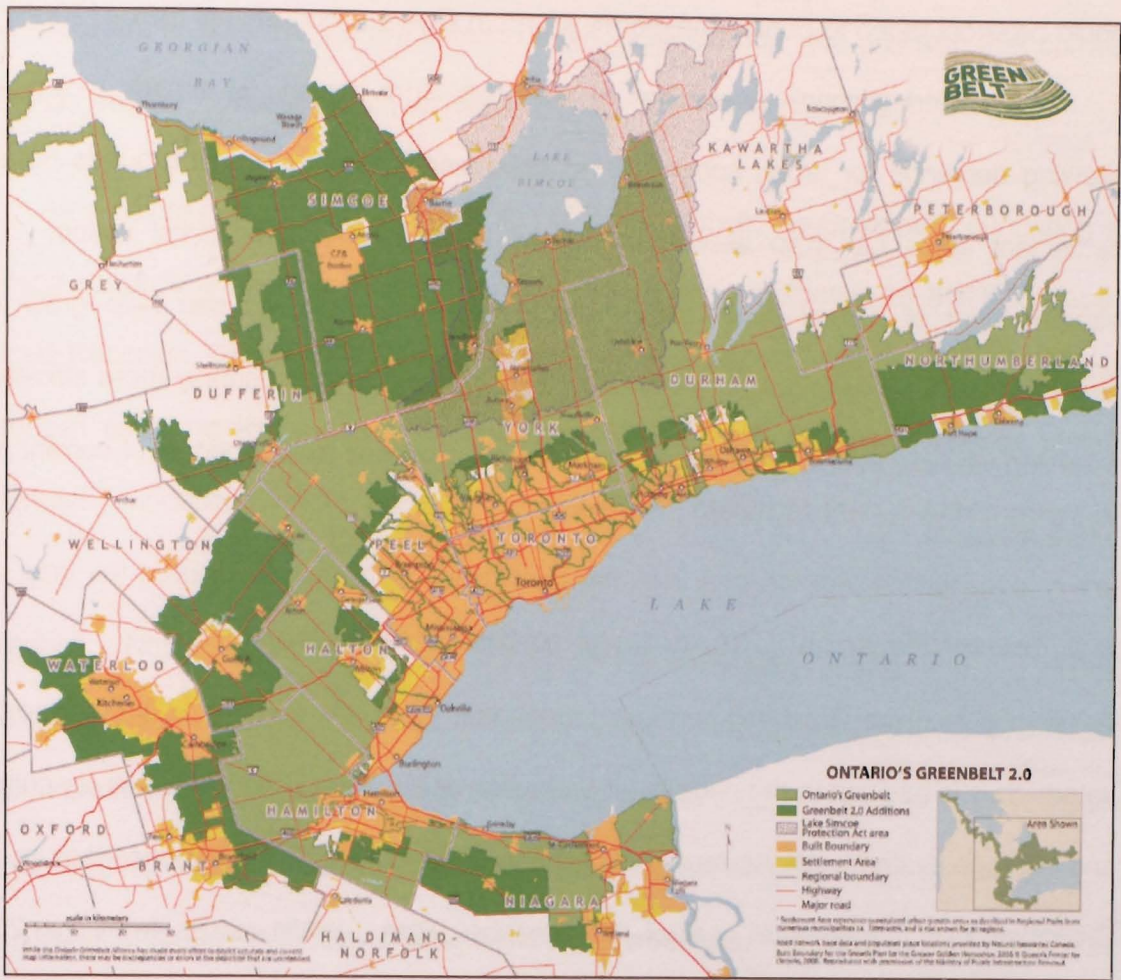
Source: Bloosoot (2011). Ramirez (2011)

2.2 Greenbelt Expansion

Despite the significant amount of land already designated as Protected Countryside under the Greenbelt Plan, many believe the designation must grow to encompass more lands in order to curb sprawl and meet future demands for agriculture, natural heritage lands and water resources (The Friends of the Greenbelt Foundation, 2011). In 2009, the Greenbelt Alliance, a diverse multi-stakeholder coalition of more than 80 organizations with interest to the Greenbelt, created their vision for Greenbelt expansion, which they called Greenbelt 2.0. Expansion efforts are meant to curtail further development and help protect Greenbelt from development by limiting growth within existing settlement areas (The Friends of the Greenbelt Foundation, 2011).

According to the Greenbelt Alliance, Southern Ontario is currently experiencing problematic 'leap-frog' development, just beyond the current Greenbelt lands. Their vision for Greenbelt expansion includes a proposed expansion of the Greenbelt by approximately 60% or 1.2 million acres (480, 000 ha) thereby designating areas as Protected Countryside that were excluded from the original designation. The expansion proposal also including areas facing increasing development pressures within 'the white belt', an area comprised of prime agricultural and green space which is unprotected and threatened by urban sprawl; and include areas with valuable agricultural lands and green space in and around Kitchener-Waterloo, Guelph, Brantford, Simcoe County, the Port Hope area, and the upper watershed areas of Golden Horseshoe rivers (The Friends of the Greenbelt Foundation, 2011).

Fig. 13: Greenbelt 2.0 – Greenbelt Expansion Plan



Source: The Ontario Greenbelt Alliance (2011)

Natural burial grounds present prime opportunities to fulfill goals of Greenbelt expansion. Where it is feasible to establish natural burial grounds within land held by trusts, such as Ontario Nature, revenues generated from natural burial grounds could be used to maintain natural heritage land and can be used to purchase further lands, thus working to create new natural heritage lots (Michael De Pencier, Natural Burial Association Executive Director, personal communication, February 10, 2011). In addition, since the materials

used in natural burial are substantially cheaper than conventional burial containers, people could be encouraged to donate the money saved to save additional lands (Baker, 2006).

Considering shrinking supplies of cemetery lands Ontario is already facing and growing demands for urban space; the establishment of natural burial grounds outside settlement areas can help alleviate pressures to establish further burial space. The establishment of natural burial grounds outside settlement areas can help grow the Greenbelt while allowing settlement areas to use their existing land supply more efficiently; reserving valuable settlement lands for more useful purposes for the benefit of current and future residents.

2.3 Foster Personal Connections to the Greenbelt

The success of the Greenbelt is largely dependent on public buy-in and the support of voters, thus in addition to the permanent protection of Southern Ontario's prime agricultural and heritage systems, efforts to create, enhance and foster personal connections to the Greenbelt is a fundamental goal of the Greenbelt Plan. While results from the 2010 Greenbelt Foundation survey of the Greenbelt Plan show a hopeful level of support for the Greenbelt in Ontario. The results also reveal that certain groups are more likely to show a deeper level of engagement with the Greenbelt. These groups include older residents, residents holding higher income/education levels, and those living in rural areas (Greenbelt Foundation, 2010). Unfortunately, there are many groups who have expressed specific concerns, and in some cases opposition to Greenbelt Plan initiatives (Carter-Whitney and Esakin, 2010). These groups have included proponents of the aggregate industry, developers, and some farmers and landowners within areas designated as the Protected Countryside (Carter-Whitney and Esakin, 2010). Dr. Rick Smith, executive director of

Environmental Defence notes, "As we celebrate the support for growing the Greenbelt, it is also important to note that we are entering a provincial election year and with that comes some uncertainty" (Ontario Greenbelt Alliance, 2011).

As a way to generate further protection of the Greenbelt, the Greenbelt Foundation is working towards enhancing peoples' sense of place and connection to the landscape; Pamela Robinson, Director of the Greenbelt Foundation notes, "We are striving to make the Greenbelt as iconic to Ontarians as Algonquin Park" (Pamela Robinson, Friends of the Greenbelt Foundation Director, personal communication, March 24 2011). Achievement of this goal will require people to establish deep personal and spiritual connections to the Greenbelt. Natural burial grounds can provide an increased incentive for more individuals to visit the Greenbelt which can result in deeper levels of engagement with the Greenbelt. Natural burial grounds can play a role in fostering people's connections to the Greenbelt thereby augmenting the status of the Greenbelt as an iconic landscape.

Burial grounds have many characteristics that work to fulfill a community's social and cultural needs and therefore can work to enhance the Greenbelt as an iconic landscape. Burial grounds can be valuable community amenities and permanent repositories of local natural and cultural diversity and a repository of local stories, which work to contribute to a community's sense of place (Barrett and Barrett, 2001, Lees & Associates, 2006). The establishment of natural burial grounds can help establish physical, emotional and cultural connections to the Greenbelt by offering nearby communities with additional burial space and recreation space within a landscape that holds community meaning and memory while meeting burial and memorial needs of current and future generations. Natural burial can also enhance the Greenbelt's role as a living landscape and can positively influence

Ontarians' perspectives on the intrinsic value the Greenbelt holds. In these ways, natural burial grounds can create and foster deep social and cultural connections to the Greenbelt and thereby generating further attachment the Greenbelt and support for its protection.

3.0 Planning Implications

There are several key considerations that must be addressed before natural burial can be established within the Greenbelt. Firstly, there are significant planning barriers against the development of natural burial sites in Ontario. Secondly, natural burial may facilitate potential policy issues such as inconsistencies between long-term planning policy and goals.

While Canada has been slow to join the natural burial movement with only two sites, demand is high for the development of further natural burial grounds (Lees & Associates, 2006). Proponents such as the Natural Burial Association and the Natural Burial Council have been working to establish more sites. Proposals for natural burial grounds have surfaced in various locales around the Greater Golden Horseshoe in areas such as Paisley, Ajax and Guelph. Despite strong efforts to establish more natural burial grounds, current planning practice has proved to be a significant challenge to the natural burial movement in Ontario.

Some of the current planning constraints include the fact that there is no existing recognition of natural burial grounds within the planning process because a designation for a natural cemetery does not yet exist within planning legislation. Traditional cemeteries are usually permitted within two zones, Open Space and Institutional. Green cemeteries may be proposed and placed in either of these zones, but also within environmental protection zones. Yet re-zoning requires evidence that the proposed use is consistent with the allowances of the zoning by-law. The problem lies in a legal double-bind: It is not currently possible to prove that green burial is a compatible land use because planning law does not recognize the concept or practice of green burial as a land use. Furthermore, cemeteries

are commonly designated "green space" but their necessary infrastructures, such as parking lots and administrative buildings, are zoned as "institutional" uses. This makes efforts to situate cemeteries (of any kind) within lands zoned "natural heritage" a complicated zoning issue (Harvey, 2010)

We must also recognize the fact that proposals for natural burial grounds, like many cemetery development proposals, are likely be met with significant amount of community resistance especially from potential neighbours who retreat at the thought of living in close proximity to a burial ground (Basmajian and Coutts, 2010). Although natural burial grounds do not take the appearance of traditional cemeteries and offer many positive additions to a community, we can anticipate negative attitudes against natural burial grounds and their potential to become locally unwanted land uses.

There must also be consideration of potential threats natural burial grounds may pose to sustainable development. While the perpetual status cemeteries posses can work towards land conservation efforts, the concept of perpetuity can work against principles of sustainability. The Protected Countryside is meant to protect lands for the benefit of current and future generations; while the establishment of natural burial grounds may help alleviate cemetery land shortages, demands for alternative more environmentally friendly burial options and the conservation of natural heritage lands, the establishment of a cemetery restricts the use of a site to a singular use. In this way, natural burial could hinder sustainability in that generations in the future may need the lands natural burial grounds occupy. Our cultural aversion against disturbing burial grounds offer the deceased a final resting place but take away tracts of land that may be needed in the future. However, the Protected Countryside designation is meant to protect Greenbelt lands indefinitely and,

therefore the issue perpetuity may present in the future, perpetuity still provides support for the permanent protection of Greenbelt lands. Further study into these considerations would benefit the advancement further of natural burial grounds in Ontario.

4.0 Conclusion

Cemetery grounds and sustainable land use practice are rarely used in conjunction however natural burial grounds present opportunities to leverage the land use and environmental challenges associated with conventional cemeteries for the benefit of people and the environment. Our reluctance to speak about death has lead to imminent challenges and concerns regarding the sustainable disposal of our dead. Ontario's ageing, growing and diversifying population exacerbates the need for planners to engage in conversations regarding how best to dispose of the deceased in a manner that will uphold principles of sustainability.

Based on their multi-performative abilities and the mutual benefit they can provide to both people and the environment, natural burial grounds have been gaining recognition as strong alternatives to traditional burial grounds, which facilitate the inefficient use of land, mass consumption of resources and the deliberate placement of toxic chemicals into surrounding soil and groundwater. Unlike conventional cemeteries, the objective behind natural burial grounds is to combine conservation with sustainable burial therefore creating a natural area that offers permanent protection to the environment and to those interred. According to cemetery planning consultants Lees & Associates (2006), interest in natural burial is estimated to have doubled in North America since 1995. The need for more burial space and a growing interest in natural burial methods can be leveraged towards more environmentally sustainable burial methods and the permanent protection of Ontario's Natural Heritage System.

Despite the Greenbelt Plan, threats of urbanization such as the development of roads, highways, quarry development, sewers and boundary expansions to the Greenbelt

remain (Carter-Whitney and Esakin, 2010). The future health and vitality of the Greenbelt will depend on intelligent planning interventions that will work to strengthen the protection of the Greenbelt and enhance it as a living landscape. As a landscape already designated for perpetual protection, the Greenbelt offers plenty of opportunities to establish natural burial grounds. In turn, the establishment of natural burial grounds can help implement policy and planning goals of the Greenbelt Plan by providing further protection for valuable agricultural lands, aid in Greenbelt expansion efforts and can help harness personal connections to the Greenbelt as a living landscape.

Sustainable planning practice currently dominates planning efforts for the living but is rarely applied in planning for our dead. Planners need to recognize the importance of planning for the disposal of our dead and gain an awareness of disposal methods that are sensitive to ecological, cultural and social needs. Natural burial, as an alternative to traditional burial, deserves our attention if we are to uphold our ethical duties as planners and as stewards of sustainability. Natural burial has potential to be a value added land resource and can mitigate a series of burial related land use challenges currently present in Ontario.

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