**1.0 INTRODUCTION**

Examining the nature of Windsor’s preparedness for an influx in age related deaths, the following research paper looks at the flaws with the modern burial practices. Using the same system which it has used since the paleolithic people North America’s, and in turn Windsor’s, current burial methods seem rooted in the continents culture. However, due to the modern method of burials in which the land being used is given to the single deceased family member for theoretically infinite time, a clear problem arises. If you were to combine the exponential increasing nature of the human population with the decreasing availability of land, it becomes clear that there will reach a day where no available land remains.

Seeking to answer the questions of what will happen when we run out of land, as well as what can be done to prevent this crisis, this research paper compares three alternative methods of human burial. A shift to complete cremation practices, an introduction of digitizing the human experience, and the concept of a multi-level funeral system are all compared on their core merits. Their positive and negative features are then weighed, and a conclusion is to be drawn on which presents the highest positive | negative ratio. As a general outline, the paper will comment on the overall problem, the baby boomer generational statistics, as well as land usage statistics of the City of Windsor. Alternative burial methods are then proposed and explained, being followed by a comparative analysis of each. Using this analysis, the paper will then draw upon a conclusion for which is the best potential outcome.

**2.0 AN ERROR IN URBAN PLANNING**

There exists a common mis practice of cities, in which the cities fail to outline how they intend to expand cemetery space as the city expands. The pre-existing cemeteries are give far too much reliance, as the city aims for a more economic direction of growth. This is predominantly shown in the Windsor Land Use Official Plan (2007), in which the city government outlines how they plan to develop their urban land. While residential buildings, parks, housing, and high-rises are all listed as focuses, the concept of burial space is not mentioned once during the document. It is this lack of attention which is allowing a key problem to form in the surrounding area. As the population continues to grow, logically so does the need for burial space. For each person who decides to be buried within the city, presuming they require a standard grave of three feet wide by eight feet long, 24 feet2 is required to house them. As shown in figure one, a problem is quickly raised when you fail to consider this space in urban development. Figure one is a visual demonstration of how Windsor has failed to keep up with the trend of age-related deaths in their city. There is no mention of cemetery space within their current plan of action, and if this trend continues the stock of burial space will be empty within the next 40 years. As is when by the green bars, each 10-year increment bring with it a larger jump in burial plots needed, with the demand quickly overtaking the supply.

For the city this means the time frame for action needs to be within the next 40 years, or there is a risk of a backup in the system; this backup will include a body-storage system, which will bring disease and infections transmittable from corpses to the living with it as it occurs.

Figure 1, Amount of Burial Space Remaining in Meters Squared

1. **WINDSOR’S STATISTICAL ANALYSIS**

**3.1 Current Situation of Burials in North America**

Within Windsor, the modern burial is one which seems commonplace. A plot of land, a casket or urn, and a bereaved family are common stone figures. As John Baines (2002) states in his work, the importance of tombs can be seen in each level of society, spanning kings and workers alike. The signs of respect to certain cemeteries in their culture go a long way in support that even before the modern funeral was instated, people sought after a respectful death for their loved ones. He continues that part of this respect was acquiring a tomb which acted as a memorial for the deceased.

While the practice of tombs may have disappeared in Windsor, the concept on inground graves with above ground monuments remains. Now simply a headstone, each grave remains marked and reserved for the one currently occupying it. Differing from Baines documentation of the Egyptians, in the West there is a taboo around reusing burial spaces. As such, there is a system in which each deceased citizen removes a small square of land from the city overall.

**3.2 Impact of the Baby Boomers on Population Statistics**

Following the second world war, there was a major spike in population across North America. The return soldiers began to start abundant families with their loved ones, and the result was a major jump in population demographics. In turn, these children had a series of children of their own which began to create exponential growth. While this may be good for both a nation’s economy and a nation’s urbanization process, this is detrimental for a nation land-usage statistics. As Figure 2 demonstrates, the slope of population increase takes a large turn upwards, which also effects the future of death tolls. Shown in the graph, children born between 1968 and 1978, near the end of the baby boom generation and the start of generation X, drastically out number the previous decade age groupings. Assuming they are to die at the expected age, a spike in the slope of fatalities occurs. Regardless of this fact, cities such as Windsor seem to be oblivious to this factor.

Figure 2, Deaths Per 10 Year Increment Within Windsor Essex

Each family required housing, so cities prioritize their economic and residential builds while neglecting burial space. In theory, for each citizen a city gains they should be setting out a 24 squared foot plot of land for burials, but this has not been the case. As mentioned, in the Windsor Essex 2006 Land-Usage documents, which outline their intended expansion of the city, the concept of cemeteries or burial land fail to be mentioned once.

**4.0 REQUIREMENTS**

For a solution to this problem to be considered sufficient, it must obey a series of requirements. It must address the issue of land usage, with the effects being a decrease in overall land use. This effect must be a prominent result, and should be the key driving factor in the decision. As well, it must not require expensive infrastructure to accomplish. Too costly of a plan would reduce the willingness of cities to participate in the solution, with some preferring to continue their current practices. The result of an overly expensive plan would be more detrimental than good, with cities being both aware of the looming crisis and either unable, or unwilling to prevent it. The willingness of a city also plays a part in the accompanying factor of social impact. AN ideal solution to the problem does not impede on the average public’s life, with the opposite being preferable. If the solution manages to make a positive social impact, such as a superior memorial method, the solution will be given a heavier consideration. Going a long way in cities implementing change, the public’s opinion on the matter is important as the solution will be used by all in that region of society.

**5.0 METHODS OF REDUCING LAND-USAGE**

**5.1 Digitization of Human Kind**

This alternative method of burial bring into consideration a number of modern advancements. Due to programs such as *Ancestary.com*, the average public has become more accustomed to the online-memorial systems. As such, a method for which cities may change their graveyards is to remove the concept all together. Each existing cemetery already contains an office, or main center, in which a series of cremations are contained. If inside each of these buildings a city were to insert a booth, or series of screens, in which people may view their relative’s memorial, the land crisis would be entirely averted. The system would them be a city’s responsibility to maintain, much as their cemeteries are today. Within the files for each deceased person would be their information, images, and potentially videos which the family has chosen to include. As a general format, this would greatly increase the amount of information which one may gain from visiting a grave site. As Doris Francis (2000) remarks, the cause of many people to visit a grave is a combination of obligation, guilt, pressure, and emotional connection. They want to visit the person who they knew, as they feel a connection to them past their life (p. 37). An implementation of a digital system would meet this need by inserting a human side to the visitation.

**5.2 Multiple Level Burial System**

A potential alternative to this could in fact be to reuse the same burial space which has already been used. If the burial sites were to create a second level of burial space, in the format of what would resemble a parking structure, the result could be theoretically massive tracts of available land. Using a series of synthetic lights, the grass and plant life would grow as normal, with the area made to seem as though it were top surface. Families would be able to access thousands of square kilometers of land, with each level added allowing thousands of new graves to be implemented. Opposed to a city having to counter-intuitively add the forgotten land, they would simply be able to monopolize on the already used land.

If a city were to prefer a high-rise solution, this too would solve the solution with a similar set of positives. Opposed to building int the ground, a series of parking-structure-esque buildings would be placed atop of existing burial spaces. These would include similar levels of falsified nature, with the result of which being massive amounts of newly available land. Each level added would double the result in a doubling of burial output compared to the current cemetery.

**5.3 A Shift to Complete Cremation Practices**

A key potential alternative to the land usage crisis is to remove the land all together. If the issue is finding locations for the bodies, the act of cremation stifles the cause. If a city were to increase their cremation practices to near 100%, then no land would need to be allotted to newly deceased people. As a society, this is already a largely accepted methods of dealing with recently deceased family members, so a shift in culture would be relatively small.

As well, this shift would also require stepping away from the current practice of cremation-based memorials, in which plots of land are purchased in memorial gardens to house the urn. By doing so, the amount of land needed for the deceased becomes exponentially reduced as the percentage of those buried declines.

**6.0 A COMPARISON AMOUNGST SOLUTIONS**

**6.1 Cost VS Land Usage Reduced**

The comparison of costs vs land usage reduction is one which is important when choosing a solution. For this requirement, the concept of cremation takes the spotlight. With cremation already being widespread, the facilities to cremate are instituted already in most graveyards in North America. Windsor itself has two cremation facilities in its’ borders alone. As such the cost to shift the mainstream burial process to one of creation alone would be relatively non-expensive. While many burial companies may be affected, those same companies offer the cremation services. As such, the economic output of the funeral business would remain relatively the same. However, if the city of Windsor were to shift to cremation alone, they would require a series of buildings added, at least double their current capacity, to meet the influx in cremations required. Digitization remains the second contender, with the price of technology lowering on a daily basis. Lastly considered is the multi-level burial structure, as the infrastructure for this alone would be astronomical. As stated by Chester et al.(2015) in their analysis on parking infrastructure, the flaw in creating these structures arise with both cost of land, and cost of the materials. For a city to begin a project such as this, they are looking at more than a million-dollar investment.

**6.2 Social Change Required**

A key issue with implementing a change to this crisis is the general publics reaction. If the population f the city does not accept or does not feel the need to use the newly implemented option, then it shall not fix he issue. For this category the concept of digitization of the human experience takes a storing grasp. As L. G. Zucker (1977) remarked, “…explanations for persistence rest on functional necessity … or on self-interested desire for rewards” (p. 726- p. 743). While this goes a long way to explaining why it is our current burial methods exist, it also delves into what is required to encourage social change. In order to incite a movement of people, there must be the potential of personal reward. With Digitization, the memory of themselves, or their loved ones are better preserved with regards to the general public. The concept of being remembered is enough of a drive for humans to encourage such a new practice to begin. As well, Due to websites such as *Ancestary.com,* Online memorials are an already established concept. Cremation falls second in this category, as it allows for families to connect with their family on a personal level. However, cremation removes the personal aspect of the deceased. The Multi-Level burial system takes the lowest rank due to the little personal benefit which it offers, compared to the massive social change required.

**6.3 Environmental Concerns**

A final consideration for the solution to the issue must be the environment which it occurs in. If the solution does not include an environmentally friendly component, it may cause an alternative problem with unforeseen consequences. As such, the city of Windsor would eb best off avoiding a shift to complete cremation. Canning & Szmigin (2010) made a good point on the matter: “High incineration temperatures can reduce the release of some pollutants, with emissions being further controlled via filtering systems. Of particular concern in many developed countries is the release of mercury from dental fillings resulting from cremation” (p. 136). Cremation is given a large penalty, as the effects potentially outweigh the benefits. Digitization must consider the energy usage for their machines, although this is a minimal effect compared to the already existing electrical demand in the country. The Multi-Level Burial system requires extensive UV (Ultra Violet) lights to be implemented, which faces a large setback for the concept, but not as large as that of cremation. As well, while considering the environment one must assure the solution is safe for the users, which the Multilevel burial system fails to be. [Schwarz](https://www.ncbi.nlm.nih.gov/pubmed/?term=D%26%23x02019%3BOrazio%20J%5BAuthor%5D&cauthor=true&cauthor_uid=23749111) (1997) notes, UV radiation is a key danger to those who spend extended time in it, whether it be from the sun or from a bulb (223). By placing the graves, and the families under constant UV light there runs the risk of possible skin damaged for the bereaved.

**7.0 RECOMMENDATIONS**

Upon my research, I have decided that the out of the proposed alternative methods of burial, the Digitization of the Deceased appears to be the most ideal. The environmental impacts are minimal, the social change required is already in motion, and the cost compared to land sage reduced is very economical. The process to add such an institution into society would be as follows.

1. Market the idea as strongly as possible before the release date, with media attention form local Windsor radio stations such as AM800 being preferable. This will create an underlying thought process on the new option. Focusing on talk radio targets an older demographic, which is preferable for the nature of the machines.
2. Enlist local funeral homes to place machines in their homes, using subsidies or grants if they were to do so. Having already been established, funeral homes and crematoriums are an ideal location to connect the previous burial methods with the current.
3. Advertise to the elderly which will be requiring the service. Begins to go to the homes, or places where you would common find the elderly, and make sure they know about this soon to-be-offered service.
4. Commit a full release of the machines, with a large media presence to create a social stir around them. Focus on full blown media attention, with the key spotlight being on how the machines will “Revolutionize” the afterlife.
5. Maintain low prices until machines become widespread. This will bring in a large user base, which is key to instating something within a culture. The more people who join the services, the more families attend to use the machines, which in turn results in more families putting themselves into the machine.
6. Attract the middle-aged citizens to the machines, framing them as a memorial of life as a whole instead of just for the dead. As a concept, people should see the machines as a place to visit throughout their lives, recording messages as they do so. If people feel involved in a movement they are more likely to promote it. This will bring a new social attractiveness to them, allowing for widespread acceptance.
7. Remain in the spotlight until the machines become a household concept. If the attention t this new burial method is removed, then it may not attract a large enough base to solve the land usage issue. As such, the problem will remain and the solution will fail. Do not lose media attention.
8. Begin to raise prices until machines fund themselves or better. This will allow for a self-sustaining system, promoting a new economic realm to emerge around them.
9. Dispose of the bodies as seen fit by the Canadian Government. Current methods include northern forest burial, where as a person is buried under a tree sapling which in turn grown using them as fertiliser.

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