CRISIS OVERSTATED? KNOWLEDGE GAPS AND
THE AGING WATER WORKFORCE

By

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A thesis
presented to the University of Waterloo
in fulfilment of the
thesis requirement for the degree of
Master of Environmental Studies
in
Environment and Resources Studies

Waterloo, Ontario, Canada, 2012

AUTHOR'S DECLARATION

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

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ABSTRACT

Beginning in 1946 fertility in Canada and other Western countries increased to rates unequaled throughout the rest of the 20th century. Sixty five years since the beginning of the baby boom, as this generation was labelled, workers are retiring or nearing retirement on scale not previously witnessed. This workforce exodus has signalled concern among scholarly, professionals and government sources alike.

The public sector has been identified as particularly at risk with both and older average worker age and a low average retirement age. Within the public sector, jobs relating to the Canadian water workforce have similarly been identified for retirement concerns, specifically among senior positions. Retirements have highlighted aspects of concern for the future: knowledge leaving the workplace, and recruiting talent for the future.

Among primary concerns is for knowledge that has no place in traditional documentation methods, tacit knowledge. Although transferring this knowledge presents difficulties, strategies include retaining knowledgeable employees and creating programs that facilitate knowledge exchange. Mentorship programs are one such strategy identified specifically for tacit knowledge transfer.

This thesis considers how retirements would affect the water workforce including positions centred on conservation and policy efforts, as well as the water utilities industry. Although a few studies have focused on water utilities, this area of the public workforce had largely been ignored. Conducting fourteen interviews within three case study municipalities, primary data was gathered to determine how the water workforce would be affected by retirements, if retirements created concerns with respect to inter-organizational networks, and what strategies would be most suited to the needs of participating organizations.

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Chapter One: Introduction

1.0 Introduction

The study of water resources and their management is an ever-changing field, its prevalence ebbing and flowing from one decade to the next. In the mid-to-late 1800s, water infrastructure was promoted by the emerging hard sciences of the day. The development of microbiology expanded general understanding about disease vectors and reinforced water's role in health and well-being. Although health and well-being have remained a central focus in water's social role the twentieth century was dominated by expanding infrastructures and initiatives focused on water supply (Gleick, 2000). Waterworks, along with the other expanding utilities, allowed cities to accommodate growing populations and increased demand. Water supply dominated the early 20th century as chemical treatments provided safer water provision (Benidickson, 2007). The second half of the 20th century saw an increased reliance on wastewater treatment facility development as pollution concerns received a heightened level of scrutiny (Benidickson, 2007). While water science and engineering research continues, recently there is greater consideration of social perspectives.

The progression towards an inclusion of social foci in water research was initiated by policies created during the mid-to-late twentieth century (Dunlap, 1997). Due to growing pollution problems federal and provincial governments created agencies focused on environmental protection. Although significant strides have been made in water protection and distribution, expanding cities and increasing populations have increased demand. As a result, creating efficient and functional policies and conservation programs is becoming increasingly important in water management. Today water governance has taken on a more collaborative approach to

decision making. Water governance was defined as "the range of political, social, economic and administrative systems that are put in place to regulate the development and management of water resources and the provision of water services at different levels of society" (Rogers and Hall, 2003: 7). This concept and the stakeholders involved in decision making are increasingly connected through Integrated Water Resources Management (IWRM) practices (Rahaman and Varis, 2005). The evolution of water governance toward shared decision making has placed a stronger emphasis on cooperation and the need to foster network relationships in water governance.

Concurrently the aging population of 'Baby Boomers' (individuals born between 1946 and 1964) has created unease about workforce demographics within the private and public sectors. Because this generation of workers fills many senior-level positions, concerns centered on losing their knowledge and skills have generated attention. These concerns have extended to include the roles and responsibilities held by water-related professionals. Yet, although retirements have created unease with respect to organizational efficacy and knowledge continuity, it may be the Baby Boomers who are relied on to insure organizational resilience within the water workforce. Despite wariness among employers about retaining institutional knowledge, there has been little preparation for this accelerating exodus (MacKenzie and Dryburgh, 2003). As early retirement is recognized to be prevalent within the public workforce the literature suggested several mechanisms intended to improve employee retention and facilitate knowledge transfer to ease succession. These strategies are aimed to insure knowledge continuity. One example is mentorship, a mechanism that respects and gives credence to senior employees' established expertise (Burke and Ng, 2006). Mentorship programs are notable in addressing both employee

retention and knowledge transfer (Aiman-Smith et al., 2006; Field, 2003). Workers who are expected to create the largest knowledge gaps may also be the best resource to avoid it.

Although the extent to which retirements will cause a disturbance to individual organizations is largely unknown, a precautionary approach seems the most prudent way forward. The literature suggested reason for alarm. While retirements are often the main focus, several studies have simultaneously identified a talent gap in replacing retirees (Gordon, 2009; Kieran, 2001; Stone, 2006). The water contamination incident in Walkerton, Ontario (2000) was an indication for the need to recruit talented and qualified employees in public water positions. Though not directly related to retirements, knowledge, skill and sufficient training were identified among other preventable problems leading to contaminated drinking water in Walkerton (Mullen et al., 2006; O'Connor, 2002). The knowledge gap created by retirements is not simply a retirement and replacement issue. It showcases the benefits derived from organizational history and accumulated knowledge, as well as the need for effective knowledge transfer. Organizations that recognize the barriers presented by an aging workforce should consider their best options for mitigation moving forward.

1.1 Purpose

In this thesis I addressed the following questions:

1. What are the individual and organizational-level effects of retirement trends within public water organizations?

2. Do these retirements impede cooperation or collaboration between organizations and individuals' professional networks?

3. What strategies might ensure knowledge and skill continuity within the water workforce?

Using case studies and interviews, I examined how retirements affect the water workforce. I explored whether upcoming retirements were a serious source for concern among public water organizations and between professional networks. I also uncovered whether the concerns expressed in the literature were mirrored in the cases studied. I justified using various strategies, and mentorship's specific role, to address knowledge transfer and employee retention.

The literature review below highlights public sector demographics in general, but more specifically addresses water agencies. I addressed demographic transitions, retirement trends, integrated water resources management, and knowledge management. Additionally, the historical context is provided to illustrate to readers how the situation evolved.

1.2 Rationale

Since 2001, the aging workforce has generated attention from industry, government and scholarly sources alike. Figure 1.0 illustrates the exceptional increase that the Baby Boom generation represents as a portion of the Canadian population. As the oldest 'boomers' have reached

Figure 1.0

Age Pyramid of Population of Canada July 1, 1901 - 2001
(Shown in 000's)

(Statistics Canada, 2001)
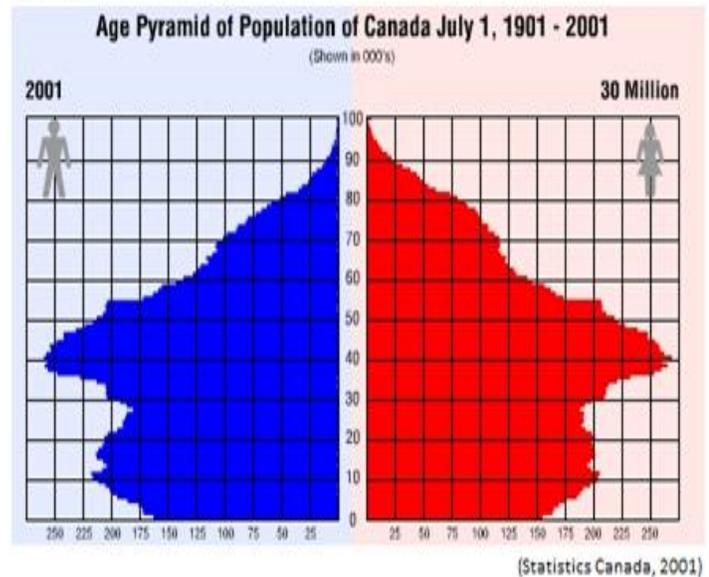
retirement ages, human resources and workforce management related literature suggested reason for concern regarding both outgoing expertise and a limited talent pool for replacement.

The retiring Boomer generation differs from previous generations in scale and kind. The elevated fertility rates from 1946 to 1964 created a natural surge in population which has yet to be

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matched since (Department of Finance Canada, 2008). This generation also saw the widespread incorporation of women into the workforce (Stone, 2006). Not only was this generation larger than the generations preceding and following, but increased workforce participation makes Baby Boomer retirement larger in scale compared to previous generations.

The Baby Boom generation is also different in kind. Boomers are argued to be more formally educated than previous generations (Gordon, 2009); and by extension decreases the replacement pool by increasing demanded proficiencies in replacing outgoing employees. They are expected to live longer, and so require more consideration in choosing when to retire (Gomez and Gunderson, 2011). They also share generational characteristics that suggest they are more interested in leisure and a life/work balance than previous generations (Hewlett et al., 2009). Some Boomer characteristics supported assumptions for longer working lives, while others supported Boomer early exit.

 While aging is expected across public and private workforces, the public sector has been centred out as it is on average older (Bradley, 2010; Kieran, 2001; Statistics Canada, 2004; Statistics Canada, 2008) and has a higher early retirement rate (Kieran, 2001; Statistics Canada, 2004). Moreover, as one segment of the water workforce, utilities have been highlighted as vulnerable to upcoming retirements (Kieran, 2001; MacKenzie and Dryburgh, 2003; R.A Malatest and Associates Ltd., 2003; Schellenberg, 2004). Expectations about the aging workforce are discussed across professional, academic and government publications (see Chapter 3).

While two studies in particular focus on the water utility workforce—ECO Canada's (2010) study and Grigg's (2006) paper—limited research has focused on demographics within water organisations. Additionally, although ECO Canada's study highlights the aging water utilities

workforce, it represents baseline data: it illustrates that the water workforce is indeed aging but does not explore what this means for the industry. Therefore, the retirement implications specific to public water organizations are unknown. I explained in this thesis what retirements may mean for water, wastewater and conservation organizations and help to fill this research gap.

As water issues are fundamental to a sustainable future, maintaining a skilled and knowledgeable staff within public water institutions is important to adapt to future challenges. Increasing municipal demand, industrial and agricultural water use, coupled with the complexities surrounding climate change reinforce the need for effective water management in the coming decades. Addressing aging organizations responsible for water conservation, supply and management, as well as those developing effective policy, municipally and regionally will help to avoid developing knowledge gaps within the field. By concentrating on public water agencies, this study addresses an area undergoing both demographic and institutional change.

Chapter Two: Literature Review

2.0 Literature Review Introduction

Although it is undisputed that the Canadian population is aging, it is important to understand current trends in context. The foundation for today's retirement concerns began over 65 years ago, following the end of the Second World War. Both older and more likely to retire early, the public sector has been specifically targeted as vulnerable to retirements (Bradley, 2010; Kieran, 2001; R.A Malatest and Associates Ltd., 2003; Statistics Canada, 2004; Statistics Canada, 2008). As a result, one must go back further still to look at the development of water as a public good.

In the 1800s, water provision and sanitation was recognized as important and assigned as governmental responsibility. Public control was thought to provide transparency and accountability. The past two centuries have supplied several examples of poor management; however, both science and infrastructural systems have evolved over years to become safer and more reliable. Yet, contamination leading to crises like Walkerton's demonstrated what can occur when knowledge, skill, and proper training are lacking in the workplace (Mullen et al., 2006; O'Connor, 2002).

The following literature review describes the historical context that led to today's concerns about both understanding the past, as well as the concerns presented in more recent publications to appreciate the issues at both a macro and micro level. By using literature from scholarly, professional and government publications I highlighted the public water industry's growth and importance in Canada; the great demographic shift that was the Baby Boom; discussed predicted knowledge gaps and skill deficits; as well as knowledge transfer and strategies to avoid conflict.

Anderson (1988) maintained that despite the intimate relationship people have with water, our care of and attention toward this resource are reactive as opposed to proactive. As consumers most of society sees water only upon turning on a tap, or flushing a toilet. The whole water supply and wastewater removal network is buried out of sight, and so remains out of mind. As a fundamental resource individually, socially and commercially, water's essential nature is often neglected (Barlow, 2001) – until a problem is encountered. Disease outbreaks in the early 1900s led to chlorination. Water contamination and significant pollution mid-1900s supported environmental agency creation. Health issues in two Canadian cities entering the new millennium prompted changes to policy across the country. Reactive instead of proactive approaches have often characterized our social relationship with water throughout history. If retirements are determined to be a legitimate concern, proactive measures need to be implemented to reduce potential drawbacks.

2.1 Early History of Water Works (1800s-1945)

Early waterworks developments in Canada were often controlled by the private sector (Anderson, 1988). Originally, protection from fire created a demand for water infrastructure development. Although incendiary concern was action worthy, it was public health that became the primary target in expanding Canadian waterworks, and has long since remained a primary focus. Reacting to cholera epidemics in the mid-1800s, citizens pushed for public control, beginning a new age of public water infrastructure development, including water supply and sewerage systems (Anderson, 1988; Baldwin, 1988). Canadian infrastructure expansion helped reduce urban mortality, simultaneously inspiring 'long-range planning' for cities (Baldwin, 1988: 235). Boards of health in both Ontario and Quebec, as well as the creation of sanitary engineering divisions in the late 1800s and early 1900s were supported by early successes from

water supply and sewerage systems (Anderson, 1988; Benidickson, 2007). These boards gave some control over the expansion and upgrade of early infrastructure networks (Benidickson, 2001). Yet, while water supply and wastewater removal offered many health advantages wastes were often discharged into the same water bodies used for supply, contaminating drinking water sources. This was particularly the case for municipalities located next to large freshwater bodies.

In the early 1900s typhoid fever became a problem. It was this new health crisis that led to the use of chlorine to disinfect, and represented a major step forward in water treatment (Anderson, 1988; Benidickson, 2007). There were calls to create laws "prohibiting and penalizing the deposition of raw sewage, garbage and factory wastes in the waterways of Canada and in waters tributary thereto" (Baldwin, 1988: 235). These calls were initially addressed by the Public Health Act of 1912 that covered water supply, sewage and associated legislation regarding by-laws (Benidickson, 2001). However, expanding sewage treatment and accompanying legislation were slow to follow for years to come. By 1950, only half of Canadian communities had treatment plants accompanying sewerage systems, most going no further than primary treatment (Baldwin, 1988). According to Benidickson (2007), both the depression and the Second World War were in part to blame for deferred investment for a large portion of that period. Nevertheless, war's end brought with it renewed investment and infrastructural expansion. By 2000, 97% of Canadian municipalities treated sewage, though 19% went no further than primary treatment (Environment Canada, 2003: 35).

2.1.1 Infrastructural Boom and Investment Bust (1945-1999)

While investment in the public water sector received sporadic interest, the end of World War II saw renewed attention to, and need for infrastructural expansion. In 1946 Ontario established the

Conservation Authorities Act, helping to institute regional watershed-based agencies (Shrubsole, 1990: 94). Despite this early attention, the growth in the Canadian population following the War was the real catalyst for change. The returning soldiers and increased fertility rates helped enlarge the Canadian population at an unprecedented pace. This generation born between 1946 and 1964 was termed the Baby Boom generation, creating many social changes and accompanying needs.

One such change was the need to expand Canada's water infrastructure as the growing population began to overload existing sewage plant capacity (Baldwin, 1988). Cities were expanding in both size and infrastructure capacity. This required significant construction efforts, though infrastructure was just one piece of a large puzzle. The growing population demands were coupled with growing concerns regarding pollution. As a result, the post-war period, up until the mid-1970s, witnessed the creation and expansion of government agencies and more stringent legislation. The growing pollution of Lake Ontario led the Ontario provincial government to create "a single authority to co-ordinate water-supply, sewage, and drainage matters" (Baldwin, 1988: 240). By 1957 pollution standards were set by the Ontario Water Resources Commission, and pollution to the Great Lakes was so significant that the International Joint Commission between Canada and the US invested considerably to study Great Lakes contamination (Baldwin, 1988; Benidickson, 2007). Public service expansion and policy creation following the war was in part viewed as a job creator (Shrubsole, 1989):

> The demobilization plans of the Federal and Ontario governments
> in 1941 provided the right combination of circumstances for
> conservation to surface on the political agenda. Both levels of
> government were concerned that the high unemployment and
> drepressed economic conditions which had been experienced after
> World War I would not be repeated following World War II. The
> success of the U.S. Civillian Conservation Corps in creating over

five million jobs for individuals during the Depression acted as an incentive to form a similar Canadian program. (Shrubsole, 1989: 51)

The infrastructural expansion and coinciding regulations were a feature for provincial efforts across the country, creating many jobs.

Federally, the 1970s were significant in creating environmental agencies across the board as a government response to rising awareness for social and environmental concerns (Shrubsole, 1990). The expanding infrastructure along with a "heightened public concern for ecological and social values" helped push for an expanded government role in environmental policies (Shrubsole, 1990: 104). The Department of the Environment (DOE) was created in 1970 under Prime Minister Trudeau, focusing on air and water pollution (Doern and Conway, 1994). This year also saw the creation of the Canada Water Act, legitimizing shared federal-provincial responsibilities (Shrubsole, 1990). The Ontario Ministry of the Environment and the Atmospheric Research Directorate were established a year later in 1971, followed by the Inland Waters Directorate, and the Great Lakes Water Quality Agreement in 1972 – all within the DOE (Boyd, 2003; Doern and Conway, 1994; McKenzie, 2002). Three years later, in 1975, the DOE oversaw the passing of the Canada Flood Damage Reduction Program, the Environmental Contaminants Act and the Ocean Dumping Control Act (Doern and Conway, 1994; Shrubsole, 1990). Stilborn (1998) identified the period between the 1960s and 1970s as an era for rapid expansion of public services, and coincidingly for increased public service opportunities for an inflated Baby Boom generation.

While this early period in the DOE's history saw significant changes, 1975 through 1986 were identified as a poor decade for the agency (Doern and Conway, 1994; Paehlke, 2000). Several factors for the ten-year demise were identified, including: two energy crises; high inflation; high

unemployement; a recession coinciding with significant budget cuts; and nine separate Ministers of the Environment (Doern and Conway, 1994; Mirza and Haider, 2003; Paehlke, 2000; Shrubsole, 1990). Blais-Grenier, minister from 1984 to 1985 was particularly noteable as she willingly volunteered for cuts to her department, "embrac[ing] the cuts both enthusiastically and clumsily" (Doern and Conway, 1994: 47).

The late 1980s represented a new beginning for the DOE as several important acts were passed, including the Canadian Environmental Protection Act in 1987, and a reformulation of federal water policy in 1988 that was described as anticipatory and preventative (Doern and Conway, 1994; Shrubsole, 1990). Despite this push forward the DOE budget continued to decline (Doern and Conway, 1994). Increased social interest in the late 1980s was suspected to be in part due to disasters like those in Chernobyl and Bhopal, bringing renewed concern to the environmental scene (Doern and Conway, 1994). However, through the 1990s water management on a federal level ceased to be a priority (De Loë and Kreutzwiser, 2007). It was simultaneously during the 1990s that the Progressive Conservative government in Ontario cut jobs and funding to major public water agencies (De Loë and Kreutzwiser, 2007).

Despite experiencing its highest budgets under Bob Rae's Ontario New Democratic Party (NDP), provincial deficits in the early 1990s prompted cutbacks to the Ministry of the Environmnet and Energy's budgets (Krajnc, 2000; Paehlke, 2000; Prudham, 2004; Snider, 2003). In 1995 under Mike Harris' newly elected Progressive Conservatives (PCs) these budgets continued to decline. Although funding was cut considerably by both the NDP and PC governments, reductions under the NDP maintained much of the operational budget, preserving core programs (Krajnc, 2000; Prudham, 2004). Under Mike Harris, cuts to environmental initiatives were considerable, including eliminating 750 jobs within the Ministry of the

Environment and Energy (Krajnc, 2000; Snider, 2003) and 2,170 at the Ministry of Natural

Resources (Krajnc, 2000). "Cuts were disproportionately aimed at the Ministry of Environment

and the Ministry of Natural Resources" (Krajnc, 2000: 114). Neo-liberal ideology is attacked as

the main reason for deliberate cuts as the total operating budget during the Harris leadership

increased by 4% while the budgets for the ministries of Environment and Natural Resources

decreased by 27% and 30% respectively (from 1995-2000) (Krajnc, 2000). Although deficit

reduction prompted budget cuts, implemented income tax cuts further increased the burden of

budget cuts (Krajnc, 2000). Various environmental programs and regulation were viewed as a

burden to business interests. Under Harris budget cuts decreased funding for conservation

authorities by 70%, eliminated advisory committees, reduced opportunities for stakeholder

participation, and reduced regulation through anti-environmental amendments (Paehlke, 2000;

Prudham, 2004). Although core programs remained, Prudham (2004: 352) argued that severe

cuts reduced such programs "to a purely rhetorical status". Showcasing the dangers that can

result from such sweeping cuts, along with other direct influences, the Harris government was

ultimately judged to be directly and indirectly responsible for the 2000 Walkerton E. coli

outbreak (O'Connor, 2002).

2.1.2 New Ideas for Water Management (2000-Present)

While public concern for water resources has ebbed and flowed over the decades, any optimism

was tempered by two crises – the Walkerton (Ontario, in 2000) and North Battleford

(Saskatchewan, in 2001) incidents. These contamination incidents brought into question the

security of public water management and overall water quality issues (De Loë and Kreutzwiser,

2007). Water contamination due to poor oversight regarding municipal water inspections in both

these cities left thousands ill, and in Wakerton contributed to seven deaths (De Loë and

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Kreutzwiser, 2007). These events also highlighted the need for accountability in maintaining and regulating municipal water supply, placing renewed focus on water systems, particularly from provincial governments (Boyd, 2003; O'Connor, 2002). The Walkerton outbreak also shed light on the necessity for proper regulation and adequate funding to public institutions whose mandates related to public and environmental health and safety; deficiencies which had been created by the PCs in the five years leading up to the crisis. The five years following these incidents saw new policies and regulations across most provinces. The renewed interest in water management was accompanied by more inclusive approaches, as stakeholders became increasingly involved in water governance through Integrated Water Resources Management. This augmented cooperation between networks of water related organizations was accompanied with both benefits and drawbacks.

2.1.3 Network Relations

There are many literatures that outline the benefits, challenges and successes that networks promote, yet few references about the importance of specific individuals involved in inter-organizational collaboration. Noteable within the governments' (both federal and provincial) expanded control over water resources in the past 50 years was the increasing interconnection and overlap between federal and provincial power and jurisdiction. Shrubsole (1990:88) wrote:

> The provision of water service in Canada has evolved from single criteria, to multiple purpose, multiple means strategies based upon a wider set of technical, economic, social and environmental criteria. The management of water resources has become a testing ground for attempts to co-ordinate various levels of government and user groups through diverse institutional arrangements in order to sustain a high quality of life for Canadians.

Shrubsole (1990) alluded to both growing complexities involved in managing water resources, as well as increasing cooperation and overlaping responsibilities between government branches, as it applied to evolving water governance throughout the late 1900s.

Although, the ability to coordinate between various government branches is indeed necessary based on regulator-regulatee relationships, cooperation between the two levels, be it federal-provincial, or provincial-municipal, can often be contentious. Doern and Conway (1994) differentiated between enabling versus regulatory legislation. Both the Canada Water Act and Clean Air Act were considered enabling acts, in that they paired up provincial and federal powers in joint initiatives, often providing funding to the province as an added benefit (Doern and Conway, 1994). Alternatively, regulatory acts are not well received by provincial authorities in that they place restrictions on provincial powers. This distinction between enabling versus regulatory legislation exists at the municipal level as well. With the hierarchical nature of the political system, municipalities have increasingly complained about having responsibilities downloaded onto local governments (Siegel, 2006). As a result, municipalities have had to do more with less, increasing the workload and dependence on collaborative relationships. Not surprisingly, a push toward cooperative relationships has increasingly become indispensable to water governance in the new millenium.

Heaney and Israel (2008: 190) described social networks as "the web of social relationships that surround individuals ". They identified characteristics within networks of reciprocity, intensity, formality and complexity, all to varying degrees. With growing numbers of expected retirements, particularly at senior level positions, I assumed that not only would individual organizations lose important expertise, but network relations disconnected by retirements may create delays or difficulties with respect to collaborative efficacy. This assumption was based on literature that

identified disadvantages or barriers in creating relationships between organizations, coupled with the fact that retirements would most certainly end individual relationships, requiring new associations to be developed. The difficulties instituting new relationships is addressed by looking at the rewards networking brings participating organizations, while simultaneously considering the drawbacks. Understanding how an individual's retirement may affect efficiency within a greater network is more specifically addressed in Chapter 4.

Mitchell (1974) discussed social networks from two conceptual frameworks: structutral-functionalism versus transactionism. Structural-functionalism held that social networks developed from shared norms or goals directing behaviour. Alternatively Mitchell described self-interested reciprocity when defining transactionism, sharing resources but directing behaiour toward different ends. For this thesis' purpose both frameworks are utilized. When organizations within a formal network are working toward different goals organizational benefits of sharing resources adhere to transactionist principles. However, in many instances when organizations work toward shared goals the structural-functionalist perspective is more appropriate.

Within networks, actors participating in decision-making are likely to bring many benefits, as well as challenges to water management. Among the challenges is adaptation to a new culture. This includes finding commonalities and instituting operating structures between organizations that may not share the same purposes or agendas; organizations that represent different interest groups or groups who use different terminologies (Allen et al., 2001; Atouba and Shumate, 2010; Håkansson and Ford, 2002; Thatcher, 1998). Building new relationships and agreeing or adjusting to common values or a common culture within a network is also seen as a challenge to cost and time (Håkansson and Ford, 2002).

Promoting collaboration through increased stakeholder involvement is likely to diversify existing networks. It is network diversification, highlighted by Thatcher (1998), that can lead to the challenges mentioned above; new stakeholders bring with them new ideas that "can alter the policy process" (Thatcher, 1998: 409). Although many articles promote network benefits, Podolny and Page (1998) wrote that many networked organizations fail, either breaking up, or by not working towards the end objectives they were intended to achieve. The organizational diversification can lead to an over-generalizations that can detract from original goals in creating the network to begin with (Thatcher, 1998).

Despite stated challenges, network creation and extension to stakeholders have many proponents and stated benefits. Atouba and Shumate (2010: 295) believed that creating networks, deriving influence from varied public, private and social organizations, was "the best way to respond to challenges previously relegated to governments". Networks were seen as a tool to promote information exchange. Although creating a common culture among participating stakeholders was viewed as costly and time consuming, information exchange could reduce cost and time constraints over time (Atouba and Shumate, 2010; Podolny and Page, 1998; Thatcher, 1998). Similarly, challenges inherent in creating a common culture were countered by increased trust and reduced uncertainty, facilitating meaningful exchange between collaborating organizations (Podolny and Page, 1998; Thatcher, 1998).

Growing network participation through greater stakeholder involvement was argued to bring more transparency and accountability to decision making, and increasingly viewed as indispensable to the process (De Loë and Kreutzwiser, 2007; Government of Canada, 2005; Rahaman and Varis, 2005). In addition, it was argued to foster community relations, improve social empowerment and education, as well as promote trust between different social actors

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(Government of Canada, 2005; Rahaman and Varis, 2005; Thatcher, 1998). In a review addressing different claims advocating for stakeholder participation, Reed (2008) argued that the evidence suggested stakeholder participation does improve decision-making. However, successful participation is promoted through best practices, which Reed (2008) included: participation that stresses empowerment, equity, trust and learning; participation implemented early in the process; objectives clarified from outset; participation should be facilitated; local and scientific knowledge integration; among others.

Finally, dependence and interdependence, or related wording, appears in journals relating to IWRM and organizational networks. While dependence certainly has some negative connotations, interdependence between networked organizations can be viewed as positive (Podolny and Page, 1998), reinforcing motives for collaboration. For instance, interdependence implies shared goals, and so reciprocity and cooperation within the relationship. However, what is not covered in the literature is how this interdependence and mutual exchange is affected in networks if one or several organizations experience significant organizational change. Should an organization experience the loss of an indispensable employee would partnerships and collaborative efforts be weakened? Perhaps it is just a part of the continual evolution experienced by most formed partnerships.

Discussing dense integration through external ties, McGrath and Krackhardt (2003) identified earlier theories suggesting that change to an organization is threatening as it introduces uncertainty. This uncertainty leads toward commitment to the "local subunit" (organizational level), but creates conflict between subunits (organizations within the network) (McGrath and Krackhardt, 2003: 325). This suggests that a retirement within an organization may not weaken that particular organization's efficiency, but may reduce efficacy within the broader network.

McGrath and Krackhardt went on to discuss the importance of friendships in creating acceptable change within an organization. Strong friendships (relationships) within the network are characterized by increased cooperation (McGrath and Krackhardt, 2003). Unfortunately a retirement would signify a disconnection within the network weakening inter-organizational ties. As mentioned across other literatures (Allen et al., 2001; Millar and Choi, 2009; Podolny and Page, 1998; Thatcher, 1998), McGrath and Krackhardt (2003) discussed the importance of trust in network relationships. Trust enables cooperative relationships. Introducing new actors to a network requires a period to develop a trust upon which future relations can be based. Alternatively, McGrath and Krackhardt suggested that strong relationships across subunits are more important than within subunits for network efficacy. As a result, although retirements will end certain network relations, broader network connections should act as a buffer to losses. However, the demographic forces of aging Baby Boomers and expected retirements may mean broader networks will see simultaneous losses of a different scale than in the past.

2.2 A question of age

Currently, there are two significant concerns about the water industry's aging: infrastructure decline and maturing personnel within the water workforce. The maintenance, rehabilitation and infrastructural expansion of our aging cities will require knowledgeable engineers and technicians. Meanwhile aging demographics within existing institutions will require replacing a mix of positions from operators to regional directors. Mirza and Haider (2003: 44) suggested serious investment is needed for educational and certification processes at technician, undergraduate and graduate levels, pointing out that from 1979 through 1999 Canadian investment in education dropped considerably.

For the built environment, Mirza (2007) warned about the increasing need to focus on Canada's deteriorating infrastructure. As discussed above, the escalation in infrastructural development significantly increased after WWII. The unprecedented growth in population led to expanding cities, and with it, expanding infrastructure development. While cities have continued to expand, increasing infrastructure development to keep pace, the infrastructure built from the 1950s through the 1970s is nearing its expiration and due for replacement (Gagnon et al., 2008; Mirza, 2007). Mirza (2007) suggested that approximately $123 billion ($134.1 billion adjusted for inflation to 2012 dollar value) is required for infrastructure investment in Canadian. In a 1995 report Mirza estimated that delayed investment would balloon infrastructure debt to $1 trillion over 60 years (Mirza, 1995). Under Mirza's (1995) report, worst-case scenario estimates placed the 2020 deficit slightly above $200 billion ($277.7 billion adjusted for inflation to 2012 dollar value) . However, by 2003, Mirza and Haider had revised this estimate to be $400 billion ($473.4 billion adjusted for inflation to 2012 dollar value) by 2020. Investment is important not only to improve existing facilities and utilities, but deferring investment increases potential costs by accelerating deterioration (Canadian Council for Public-Private Partnerships, 2012). Dupuis and Ruffilli (2011) reported federal investments in infrastructure increased to $8 billion from 2010 to 2011, but dropped to $4 billion from 2011 to 2012, and reduced further since (Dupuis and Ruffilli, 2011).

These figures do not include infrastructural expansion in growth regions, but only maintenance and replacement costs for existing systems. When looking at expanding infrastructure, an additional $115 billion is added to the estimated expenses (Mirza, 2007). Water-related infrastructure represents one-quarter of the entire $123 billion estimate (Mirza, 2007). Mirza's assessment is only slightly below the Canadian Water Network's estimate of $39 billion

(Canadian Water Network, 2005). When adding current needs with expansion costs, required investments specific to water services are estimated to be close to $88 billion (Mirza, 2007).

Mirza considered that downloading responsibilities to municipalities along with reduced transfer payments were reasons investments were lagging behind (Mirza, 2007: 5). However, current concerns were attributed to reduced investment. During the mid-century infrastructural investment matched population growth at 4.8%, but from 1978 to 2000 investment averaged only 0.1% (Mirza, 2007: 6). Gagnon et al. (2008) noted that since 2001 the average infrastructure age in Canada has been in slight decline. However, this decline has largely resulted from investment directed toward highways and road repairs in Ontario and Quebec (Gagnon, et al., 2008). Moreover, the bulk (80%) of infrastructure investment was directed at new construction and expansion, while very little was invested in restoration and maintenance (Gagnon, et al., 2008; Mirza, 2007). The Construction Sector Council estimated the need to replace approximately 319,000 positions (Construction Sector Council, 2012). While retirements accounted for just over two-thirds of replacements, anticipated need for growth in the coming years was estimated to create an additional 100,000 positions in Canada (Gritziotis, 2011). According to Gritziotis (2011) large construction projects across several provinces will create workplace vacancies that surpass provincial supply. Upgrades, extensions, maintenance and repairs to Canadian water infrastructure across the country will require filling positions demanding specific expertise. These demands on the water workforce will be encountered simultaneous to the growing concerns of an aging workforce.

2.2.1 Demographics

Along with an aging infrastructure is the ever-aging workforce, stemming from the post-war generation. The Baby Boom years were influential in North American demographics, as this generation represented the largest generational cohort recorded. This sudden increase in population had several consequences. During the course of WWII, 1.2 million women were employed in both

Figure 2.0

Number of Births in Canada

(Department of Finance Canada, 2008)
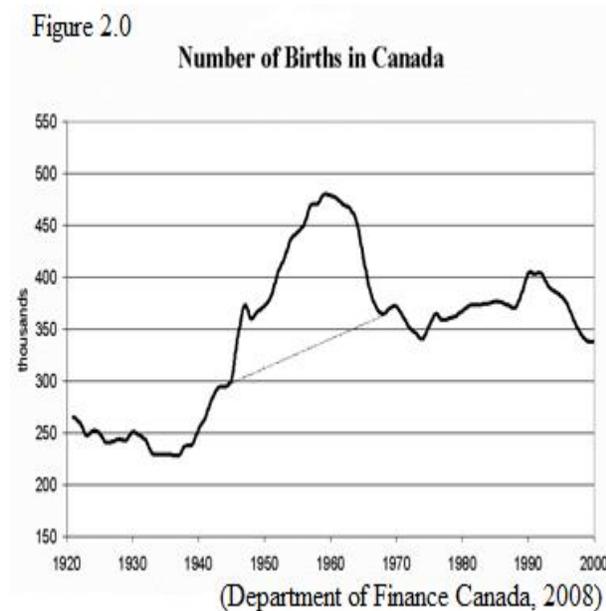
traditional and non-traditional roles (Veterans Affairs Canada, 2012). As soldiers returned post-war, women were expected to relinquish their positions, yet women's war efforts helped prove their capacity in expanded roles within the workforce (Knowles, 2012). Following the War, the growth in population from increased births, shown in Figure 2.0, was unprecedented, and would create unprecedented job demands a few decades into the future. The population growth occurred not only in Canada, but also in the US, Europe and Japan (Rappaport et al., 2003). Fortunately the post-war period coincided with an expansion in the job market, both in the private and public sectors. This cohort also represented a shift to a more trained and educated workforce. For instance, Gordon (2009: 38) wrote that the formative years for the Baby Boom generation were marked by investment in math and sciences, particularly in higher education programs. Furthermore, this generation was among the first to see women incorporated into the workforce on a grand scale (Stone, 2006). The growth in population among many industrialized nations at the time was unique, and by the late 1960s through to the 1980s, this highly educated generation

entered the workforce bringing changes to the working class that had not been seen since the

Industrial Revolution (Gordon, 2009).

The growth in policy development, the expanding public workforce, and growing infrastructure

development were beneficial to the Boomers, providing employment to help meet demand.

However, by employing so many people belonging to one generation a demographic shift was

created in the employment structure. Today this same generation is leaving en masse and their

knowledge, skills and expertise that have been established over decades may be lost. This exodus

has elevated concerns for what has been labelled a 'brain drain' or 'talent gap' (Lancaster, 2004;

Lesser and Rivera, 2007; Salopek, 2005; Stam, 2009). This 'crisis', as it has been branded, is

expected to continue well into the 2020s as the youngest Baby Boomers prepare for retirement

(MacKenzie and Dryburgh, 2003; R.A Malatest and Associates Ltd., 2003; Pignal et al., 2010).

Some researchers have predicted that this employee exodus will create knowledge and skill gaps

across many private and public organizations (Aiman-Smith et al., 2006; Burke and Ng, 2006;

Dychtwald et al., 2004; Lesser and Rivera, 2007; MacKenzie and Dryburgh, 2003; R.A Malatest

and Associates Ltd., 2003; Statistics Canada, 1995; Steiger and Fillichio, 2007). Meanwhile,

there is little evidence that significant efforts are being dedicated toward adressing retirement

concerns in public or private institutions.

While acknowledged as an issue for the private sector as well, a large part of the literature

associated with the new retirement generation has been directed at the public sector. Although

the workforce is aging across all sectors, the public sector is at an increased risk for retirements

(Bradley, 2010; Kieran, 2001; Statistics Canada, 2004; Statistics Canada, 2008). Demographic

studies in the United States suggested that by 2017, 60% of employees within government

agencies will be eligible for retirement (Young, 2008). While this datum represents the U.S.,

these trends extend to Europe, Japan, Canada and others countries and across job sectors, both blue and white collared jobs (Rappaport et al., 2003). Shellenberg (2004) noted that from 2009 through to 2014, more Canadians will be within retirement age than ever before. An article released by Statistics Canada (2008: n.p.) contended that the federal public workforce is on average 5.3 years older, and likely to retire 3.2 years earlier than the general labour force. The same article highlighted Baby Boomers as making up "two-thirds of the workforce and two-thirds of retirements" (Statistics Canada, 2008: n.p.).

Within the public sector, utilities have specifically been identified as a group vulnerable to retirements (Kieran, 2001; MacKenzie and Dryburgh, 2003; R.A Malatest and Associates Ltd., 2003; Schellenberg, 2004). MacKenzie and Dryburgh (2003: 11) described the utilities industry as unique for having an older than average workforce (within the public sector) with a below median retirement age. Schellenberg (2004: 28) showed that 46.5% of utilities and transportation workers plan on retiring before 62 years; meanwhile, the median age of retirement for utilities workers had dropped to 56.6 years (R.A Malatest and Associates Ltd., 2003). Utilities were also ranked last in percentage of youth (15-24 years) within the industry (R.A Malatest and Associates Ltd., 2003). Grigg (2006: 91) argued that these retirement trends should be particularly concerning, describing utility workers as "the brain trust of the nation's water providers". Among other factors Grigg (2006) placed blame on defined benefit retirement programs for retirement trends among utility workers.

While a retirement boom could represent a threat to productivity and efficiency it seems public agencies are well versed on expectations for retirement. For example, in a survey of public sector organizations, Lesser and Rivera (2007) found that 81% agreed that upcoming retirements would have at least a moderate impact on their operations. While this awareness is an asset, MacKenzie

and Dryburgh (2003), as well as Rappaport et al. (2003) suggested that there was disconnect between acknowledging the approaching retirements and preparing for the challenges they could produce. Though most organizations agreed that changes concerning future retirements would impact agency function, many had no plans in place to address the coming demographic reversal (MacKenzie and Dryburgh, 2003). In fact, more than half had no stated goals or planned strategies for the demographic transition (Rappaport et al., 2003). Perhaps by bureaucratic design – or institutional inertia – the public sector was identified as having more difficulty implementing change than their private sector counterparts (Bradley, 2010).

One suggestion to explain the discrepancy in demographic age between the public and private side is that public agencies were found to place greater value on senior employees' knowledge and expertise compared to the private sector (Bradley, 2010; Rappaport et al., 2003). In valuing experienced employees' contribution organizations create an atmosphere of acceptance and appreciation. Alternatively, the private sector encourages acquiring new talent as market incentives promote private industry to seek new and creative ideas; placing less value on experience (Lesser and Rivera, 2007).

Unions may also play a role in maintaining an older workforce. Allen and Clark (1985) suggested that union participation discouraged young talent from entering the workforce if these new professionals did not value pension plans. Unions were also seen to place more value on the opinions of older members (Allen and Clark, 1985). Furthermore, unionism reduces voluntary turnover, particularly among older workers (Blau and Kahn, 1983). These are all reasons that help explain older demographics in public institutions and particularly low levels of young workers in the utilities industry.

While workplace culture could influence an employee's decision to stay or leave, there are certainly more influential arguments. Mentioned above, a large-scale shift of women into the workforce represented a significant change to the workforce during the Baby Boom generation. While this was a notable step forward in women's struggle for gender equality, it helps explain current demographic concerns. By 2004 80% of women aged 45 to 54 participated in the workforce (Stone, 2006: 200). In effect women's involvement in the workforce almost

Table 2.0	Retirement Trend Comparison			
	Near-retirement rate		Median retirement age	
	1987	2002	1987	2002
	%		%	
Employed	11.4	19.8	64.3	60.6
Public	12.7	33.4	62.8	58.1
Private	8.3	15.6	64.6	61.4
Self-employed	19.2	22.6	65.2	64.8

(Statistics Canada, 2004)

doubled participation rates, increasing retirement rates compared to those seen in the past. For several reasons, including becoming caregivers for aging family members, or in an effort to synchronize retirement with their spouse, women also tend to retire at earlier ages than men (Stone, 2006).

Although, more prevalent among women, early retirement has been a trend in the public sector as a whole for years, and was also recognized as a trend among unionized employees (Raymo et al., 2011). Table 2.0 highlights both aspects (high near-retirement rate and low median retirement age) that drive concerns within the literature. Near-retirement describes employees that are within ten years of the average retirement age. High early retirement rates have led Pillay et al. (2010) to suggest a review of early retirement options. Kieran (2001) argued that early retirement compounds difficulties already expected from increased retirements. However, how early retirement explicitly adds to existing concerns is seldom articulated. Streb et al. (2008) and

van Dam et al. (2009) suggested financial considerations when citing the difficulties presented by early retirement. In essence, early retirement equates to a lower return on investment.

While retention factors and a higher than average workforce age helps explain an elevated near-retirement rate, early retirements rates within the public sector were most prevalently attributed to good benefits and strong workplace pensions in the public sector. Workplace benefits may help retain employees who foresee the need to use health plans and top up pensions, but benefit plans in Canada are deemed a major motivator for early exit (Kieran, 2001). The more generous the pension the more likely an employee will take early retirement (MacKenzie and Dryburgh, 2003; Schellenberg, 2004). Almost two-thirds of public sector employees retire before they reach the age of 60 (Kieran, 2001: 8). Kieran (2001) attributed early retirement trends in the public sector to favorable pension plans. An employee's pension is often based on his or her years served to the organization. However, a maximum can often be set around 30 or 35 years of service, after which an employee's payout will not increase further. Under the Ontario Municipal Employees Retirement System (OMERS pension) credited service is capped at 35 years. Once an employee reaches this maximum the incentive to continue working decreases as he or she would now receive a fraction of pay for their input. For example, after 35 years of service an employee could retire and collect 70% of their pay (based on a calculation of top earning years). As a result, maintaining employment would only net that employee the remaining 30%, effectively paying this employee 30 cents on the dollar. Likewise, an employee's pension is usually based on an earnings calculation. So, employees from higher paying positions (senior positions) will receive higher pensions. For this reason it is easy to understand why early retirement increases with high incomes and education (Kieran, 2001; Stone, 2006).

The literature concerned with the ongoing demographic transition is often split. There are papers that look at knowledge loss, and those concerned with replacement. While both sides ultimately study organizational health and resilience, research concentrating on replacement discussed the problem in terms of a talent gap or shortage (Dychtwald et al., 2004; Lesser and Rivera, 2007; Stam, 2009; Steiger and Fillichio, 2007; Young, 2008). This argument suggested that when positions become vacant finding applicants is not the problem, but rather finding qualified, experienced recruits is. It is noteworthy to state that retirement and talent concerns are not solely an issue for senior positions, however, senior positions are disproportionately served by employees nearer to retirement (Stam, 2009). These positions are likely to be secured by older employees who have worked their way up through the organization over several years. Ebrahimi et al. (2008: 129) discussed the value of an aging worker to include:

> Their life experience, their in-depth knowledge of different professional environments (network of contacts, who knows what?), and their knowledge of the culture of these environments (collection of codes, symbols, shared significance, etc., permitting to know how to deal with who?) bestows them differentiated aptitudes to understand issues, interpret information, connect various information and data, integrate knowledge, and finally, connect and coordinate knowledge carriers.

Ebrahimi et al. (2008) highlights the value that senior employees represent to an organization, and likewise the gap that may need to be filled upon their departure. To be discussed later, this passage by Ebrahimi et al. (2008) also alludes to the varieties of tacit knowledge that come along with experience and skill. These are positions that require 'soft-skills'—for example, leadership qualities, management and organizational skills—that are part of an employee's long-term development and tend to be hard to transfer . However, because these positions have higher compensation and require higher educational attainment they are positions that are identified as

likely candidates for early retirement, and difficult positions to replace (Kieran, 2001; Stone, 2006).

The talent gap was argued to have several contributing factors. Looking at the socio-historical context, major growth in the water workforce coincided with the Cold War that represented an era of investment in the maths and sciences. Gordon (2009) argued that decreased investment in the hard sciences since the end of the Cold War has led to reduced talent pools, and is in part to blame for the difficulty in replacing the retiring boomers. McCain et al. (2006) suggested that motivating the replacement generations is among the difficulties. The water and wastewater profession is not one that is glamorized, and so younger generations are not orienting their education or career path toward it, despite the need.

While not denying a talent shortage, others suggested that talent exists, but significant obstacles exist in federal and provincial policies and in recognizing certification. For example, the Environment Careers Organization Canada (ECO Canada, 2010) has critiqued the provinces for creating their own certification programs that prevent importing talent across provincial boundaries.

Similar criticisms were directed at restrictions in recognizing immigrant certification (Burke and Ng, 2006). "It is believed that those growing up outside Canada lack the know-how they need. Even their degrees are questioned" (Salaff et al., 2002: 451).

> Although the government selects immigrants along the human capital dimension, institutional forces isolate these newcomers from the professional labour market. Many of these barriers are symbolic. The institutionalization of credentials is closely linked to the existing social structure of labour markets and to current definitions of requirements and career paths (Salaff et al., 2002: 462).

The difficulties that are discussed by Salaff et al. (2002) exist largely at the professional level, engineering, medicine and accountancy positions noted among careers with the strongest barriers to entry. Meanwhile, the immigrant workforce drives labour force growth in Canada (Burke and Ng, 2006; R.A Malatest and Associates Ltd., 2003). As a result highly educated immigrants are working below their skill level, while many industries, water and wastewater among them, are in need of skilled talent. Different standards from one country to another create difficulties for immigrants. There are reasons for cautiousness regarding certification that does not meet Canadian standards. However, it is recognized that talent (human capital) exists within the immigrant population and is not being optimally used at a time when their expertise, and perhaps fresh opinions, could be particularly valuable (Florida, 2004; Ho, 2001).

2.2.2 Emerging Opportunities

While there are valid arguments for concern regarding the aging water workforce, there are simultaneously many opportunities. Touched upon above, among the most discussed reasons for retirement was financial stability. The more financially stable a person (or household) is, the more likely they are to consider early retirement (Kieran, 2001; Stone, 2006). Equally, people who perceive themselves as less financially stable were more likely to work to an older age, unless they are forced out of the workforce. While the 2008 financial crisis and its continuing after effects have been devastating to the international economy, the financial instability it caused on an individual basis is likely to delay retirements for the time being. For instance, ECO Canada (2010) noted that turnover rates for water/wastewater and solid waste were between 13 and 14% for 2007 and 2008. Yet, in 2009, turnover among water and wastewater facilities dropped to 7.2% (ECO Canada, 2010).

Stone (2006: 26) argued that retirement support programs were "established for a different historical era". Life expectancy has grown and older populations in Canada are experiencing greater mobility and health than they once did. As financial stability is among top priorities in determining when to retire, an increased life span must increasingly be considered. Retirement savings must account for an increased lifespan. While the average retirement age fell throughout the 1980s and 1990s, studies suggested that the trend is reversing (Carriere and Diane, 2011; Lefebvre et al., 2011; Schellenberg 2004; Stone and Nouroz, 2006). Stone and Nouroz's (2006) chart presented in Figure 2.1 demonstrates the slow decrease in retirement age and subsequent rebounding trend beginning in the late 1990s. Gomez and Gunderson (2011) attributed some early retirement in the 1980s and 1990s to downsizing. Within the public sector McMullin et al. (2008) argued that government downsizing in the 1990s is responsible for a significant portion of early retirements. It is worth noting that the lowest retirement age represented in Figure 2.1 takes place in 1998, a year representing significant cuts to environmental programs in Ontario.

Although early retirement trends are reversing, pension programs are strongly associated with early exit (Gomez and Gunderson, 2011; Lefebvre et al., 2011; Schellenberg, 2004). As such earlier than average retirements may continue within the public sector.

While pension programs may support early exit, there is evidence that

Figure 2.1   Average age of Retirement in Canada
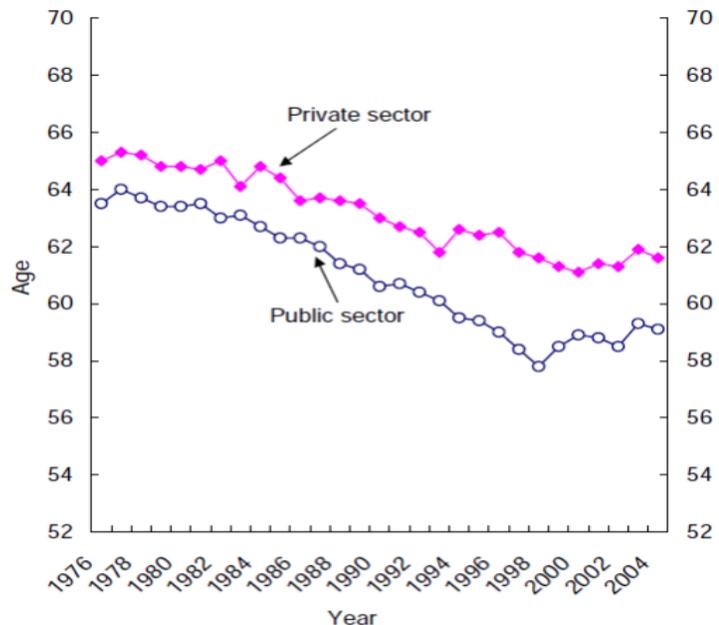
Source: Stone and Nouroz, 2006: 292

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employees who have retired or are near retirement would like to continue working or go back to work (Lefebvre et al., 2011; Morissette et al., 2004). Morissette et al. (2004: 16) reported that 60% of retirees would have been willing to continue working if given the right incentives. Although, Morissette et al. (2004) admit that this is overstated as it includes employees who left for health reasons and would not otherwise be able to return to work regardless of changes made. "One-half of all former employees who did not retire for health-related reasons would have kept working if alternatives had been offered" (Morissette et al., 2004: 17). Almost one-third of all respondents cited pension-related reasons for leaving. Respondents indicated a willingness to remain on the job if they could have done so in a reduced capacity (part-time, shorter days, less days) without pensions being affected. Even accounting for health-related retirements there seems to be a willingness to delay retirements given proper incentives. Although the choice to retire is influenced by a variety of factors, adjusting pension rules may be particularly attractive as a means to retain employees.

Finally, the qualities of Generation Y (born between 1982 and 2000), the generation to replace retiring Boomers, has been discussed with certain speculation (Lancaster, 2004). Burke and Ng (2006) describe the 'Net Generation' (generation Y) in language appropriately labelled 'entitled'. They suggested that members of Generation Y have low patience concerning workplace advancement, high expectations regarding compensation and benefits, while simultaneously being disloyal. Generation Ys are expected to leave their jobs if better opportunities present themselves (Burke and Ng, 2006: 89). Among other names attributed to this generation is the "Trophy Generation" (Crampton and Hodge, 2009). The term trophy generation derives from the generalization that Generation Y was raised in an atmosphere of praise and constant feedback

that, according to Crampton and Hodge (2009), will place increased demands and expectations on workers in management or supervisory positions.

Alternatively, in an increasingly interconnected and networked economy, this same generation is deemed to be technologically literate, more inclined towards collaboration, and more disposed toward diversity in the workforce (Burke and Ng, 2006; Lancaster, 2004). This is also a generation that expects challenging work, and is identified as looking for work with 'meaning' (Crampton and Hodge, 2009; Kofman and Eckler, 2005; Lancaster, 2004). Generation Y is also characterised by their 'work to live' attitude (Crampton and Hodge, 2009). This is consistent with Generation X values, however Crampton and Hodge (2009) suggested that it is more pronounced in Generation Y. While compensation for public positions is limited, they are generally viewed as organizations that offer generous benefits. For any organization, public or private, attracting the most valuable talent may require creativity in how it promotes itself, and the positions that become available.

Emerging retirement trends and mixed interpretations generalizing Generation Y may create optimism for organizations that expect complications due to retirements. Yet having no succession plan beyond delaying retirement and strategic hiring does not directly address reducing knowledge gaps and maintaining organizational continuity. As a result, organizations need to consider how they will manage existing organizational knowledge and skill.

2.2.3 Push and Pull Factors

Developing appropriate succession plans may rely on understanding the various factors that tend to either promote employee retention (pull) or persuade them to retire (push). Push factors are those that promote workforce exit. Some examples of push factors are noted above, for instance,

financial security or generous pension coverage may entice employees to retire before 65. Alternatively, financial insecurity or weak benefits may entice employees to remain on the job longer—pull factors. Among important features determining workplace retention are workplace culture, valued experience, learning and development opportunities, as well as flexible accommodation.

Jeffers et al. (2008) identified several aspects of organizational culture which promote retention including: recognition, autonomy, valued expertise, and work demands. Ageism in the workplace is an example that works against Jeffers et al.'s listed cultural factors and would represent a strong push toward retirement. Salopek (2005) describes a culture of retention as one that fosters learning and cooperation. Rappaport et al. (2003) added to this list a cultural environment that promotes work ethic and shared contribution. Arguably the absence of these factors (cooperation, individual effort, ongoing learning, and valued expertise) would promote a poor organizational structure and so promote retirement for those eligible.

While being valued as a worker is an important cultural aspect toward retention, finding value in the work being done also contributes to retention. Looking to understand mechanisms that promote retention Jeffers et al. (2008) found among nurses that providing challenging work was instrumental. Along with challenging work Hewlett et al. (2009) included adding new experiences and work that employees view as communitarian, or in some way benefits society. Lancaster (2004: 2) goes so far as to argue that "making a difference" is Baby Boomers' primary reason for remaining with an organization or leaving one job for another.

Ongoing learning and development opportunities are very closely associated with challenging work. Without stimulating work employees may become bored or feel they are not contributing.

Job rotation is offered as a mechanism to reduce dissatisfaction, which may encourage retention (R.A Malatest and Associates Ltd., 2003). Similar suggestions for continued learning programs and job rotation (horizontal growth) received mention across academic, industry and government sources (Aiman-Smith et al., 2006; R.A Malatest and Associates Ltd., 2003; Statistics Canada, 1995; Steiger and Fillichio, 2007).

As a strategy for ongoing learning and facilitating a challenging work environment rotational programs are noted as a particularly useful mechanism. Ortega (2001) argued that rotation is an appropriate mechanism to reduce boredom. Campion et al. (1994: 1523) added that rotation is associated with career development and can improve "employee satisfaction, motivation, involvement, and commitment". Job rotation is also linked to an employee's "improved ability to cope with uncertainty and self-insight into strengths and weaknesses" (Campion et al., 1994: 1523). However, Ortega (2001) suggested that more benefits are derived from job rotation earlier in employee's careers. Job rotation is also assocaited with drawbacks including time investment, as well as increased employee errors.

Finally, much like providing challenging work and ongoing learning, facilitating flexible work hours was deemed to be a strong pull incentive for retaining workers. Pignal et al. (2010) identified flexible hours and movement to part-time work as particularly attractive mechanisms for retention. Again, suggestions to increase flexible work hour alternatives was mentioned across sources (Hewlett et al., 2009; Pignal et al., 2010; R.A Malatest and Associates Ltd., 2003; Rappaport et al., 2003; Statistics Canada, 1995). When considering flexibility programs near-retirees also must consider pension. Some pension rules may discourage transitions to reduced hours, of which employees need to be aware. It is noteworth, not simply with flexible work arrangements, but also with providing stimulating work environments and work that employees

value, while these are aspects identified to improve retention for workers contemplating retirement, they are also noted as mechanisms that may help attract new Generation Y professionals (Hewlett et al., 2009; Kofman and Eckler, 2005; Lancaster, 2004)—a pull factor from both ends.

Despite widespread acknowledgement that flexibility programs would be beneficial to retain near-retirees organizational constitution and pension rules may act as a barrier to implementing such programs. For one, Hutchens (2003) described unions as less likely to take up part-time offerings. "Unions may oppose informal mechanisms that permit individual workers to negotiate their own "deal," preferring instead that hours reduction be dealt with in a formal contract that covers the union's full membership. (Hutchens, 2003)". Hutchens (2003) goes on to state that unions may disfavour part-time positions for fear that it may reduce the need and number of full time positions. Concerning pensions, an attractive option for near-retirees is to move to part-time employement, supplementing reduced wages with pension payement, though this option may not be permitted (Hutchens, 2003; Latulippe and Turner, 2000)—and so discourages reducing hours.

2.3 Knowledge Management

"When the objects of an inquiry, in any department, have principles, conditions, or elements, it is through acquaintance with these that knowledge, that is to say scientific knowledge, is attained."
Aristotle, 350 B.C.E

Aristotle's description of knowledge is one that depicts familiarity or understanding of a particular phenomenon. Throughout the literature 'knowledge' as a concept is thoroughly discussed, but poorly, if ever defined. For example, Sveiby (2001: 345) defined knowledge within knowledge-based theory as "justified true belief" and as "capacity to act", which explains very little concerning the explicit meaning of knowledge. While Sveiby discusses this definition

at length the definition as it is stated remains unclear. Discussing higher education, Braxton and Nodrvall (1996) described knowledge as being able to recognize or recall information. They place it at the lowest rank of Bloom's (1956) hierarchical taxonomy behind comprehension, application, analysis, synthesis and evaluation. Although the term knowledge is rarely explicitly defined, knowledge types are well defined; for instance, the differences between tacit (difficult to codify and transfer, often experientially based) and explicit knowledge (easily codified, transferred through common media) are specifically defined (Camison and Fores, 2010; Foss et al., 2010; Joe, 2010; Kang et al., 2010). However, most literature defines these individual concepts without defining knowledge itself. For the purpose of this paper, I borrowed a definition of 'knowledge' from Alavi and Leidner (2001: 109) to include "information possessed in the mind of individuals: it is personalized information (which may or may not be new, unique, useful, or accurate) related to facts, procedures, concepts, interpretations, ideas, observations, and judgements". This defines knowledge beyond basic recall within Bloom's taxonomy, and as such, more accurately describes the term knowledge as it is used in this thesis. Moreover, I feel it covers the basic competencies expected in the workplace that can be strengthened through experience.

Using this definition of knowledge, it is worth visiting related terms. Knowledge management (KM) is an important theme considered in this thesis. KM refers to knowledge building (acquisition), transfer, retention, and documentation. Field (2003: 3) defined knowledge management as "capturing and sharing know-how valuable to colleagues performing similar jobs throughout a company."

Using a definition worded very closely to Field's (2003), Alavi and Leidner (2001) separated KM into six perspectives and their implications: knowledge vis-à-vis data and information; state

of mind; object; process; access to information; and capability (see appendix A). All perspectives presented speak to enhancing organizational knowledge and human capital by sharing and facilitating the spread of information.

As it relates to KM, Pentland (1995) discussed five knowledge processes derived from Holzner and Marx (1979), which included: construction, organization, storage, distribution, and application. Although Pentland concluded that all processes are essential via interlinking connection, distribution was identified as critical. However, a notable absence within Pentland's discussion is the differentiation between how tacit and explicit knowledge function within the five processes.

Among important distinctions in knowledge-based literature was the distinction between tacit and explicit knowledge mentioned above. Sveiby (2001: 345) stated that, "knowledge is dynamic, personal and distinctly different from data and information." Separating knowledge from data and information might be better compared to the differences between explicit and tacit knowledge. Explicit phenomena represent knowledge that is easily explained and can be codified (Kang et al., 2010). Explicit knowledge can be explained in a book or taught in a class. Alternatively, tacit knowledge involves information that is more easily learned through experience; it is knowledge that is difficult to transfer through simple explanation or common channels (Kang et al., 2010). The differences in these types of knowledge should not imply simple versus complex. For example, the theory of gravity can be labelled as explicit, while Polanyi (1967) included facial description as a simple tacit example. "We know a person's face, and can recognize it among a thousand, indeed among a million. Yet we usually cannot tell how we recognize a face we know" (Polanyi, 1967: 4). Polanyi conceded that police have developed methods to elicit such information to identify suspects through delivering a multitude of images

from which people can pick one among many noses or ear shapes to make up a composite. However, this process is still rooted in experiential knowledge.

Like Pentland (1995), Alavi and Leidner (2001) discussed the five knowledge processes, but incorporated tacit and explicit differences in application. With respect to storage and retrieval explicit knowledge (as can be expected) creates less concern as this can be achieved through common channels – documentation, computer databases, and standard operating procedures. Tacit knowledge, though not impossible to document, often is stored within the individual, and is "based on a person's observations, experiences and actions" (Alavi and Leidner, 2001: 118). As a result retrieval is made more difficult. An individual's tacit knowledge is integral regarding retirements effect on knowledge management as amassed undocumented, unarticulated knowledge will leave the workforce over the coming decade and a half. With respect to this exodus, KM should be among priorities in institutions experiencing or expecting retirement; though it is important to note that not all knowledge is created equally.

Within the tacit-explicit dichotomy, soft-skills could rightly be categorized as tacit. Soft-skills include "skills, abilities and traits that pertain to personality, attitude and behaviour rather than to formal or technical knowledge" (Moss and Tilley, 1996: 253). These include interpersonal and intrapersonal abilities (Hurell, 2009). ECO Canada (2010: 14) noted that soft-skills are required among management and supervisory positions, and in losing senior employees through retirements "soft-skills will be at a premium". Identifying this tacit knowledge as a "premium", ECO Canada (2010) alluded to the importance played in tacit knowledge management.

While it was important to distinguish tacit from explicit, explicit knowledge has little relevance to the following conversation. Discussing KM Alavi and Leidner (2001) suggested that tacit

knowledge is more valuable to an organization than explicit, acknowledging that this assertion is generally agreed upon. Given success for conventional approaches to transferring explicit knowledge (books, teaching, e-learning) organizations have less to fear concerning the loss of explicit knowledge. Conversely, tacit knowledge transfer is important regarding retirements. Kang et al. (2010) argued that knowledge is not useful unless it can be shared and spread throughout an organization. While a responsible approach to reducing the 'brain drain' from retirements in water and wastewater related organizations should be flexible and broad, mentorship programs are highlighted within the literature for their efficacy in knowledge transfer. As such mentorship programs help address knowledge management practices.

2.4 Mentorship

"Knowledge shared is knowledge doubled" (Sveiby, 2001: 347)

Concerning the new retirement generation, knowledge transfer needs to become a focus within the broad labour force. Several strategies aimed at employee retention mechanisms, job rotation, documentation, knowledge transfer through e-learning, to name a few, have been suggested to mitigate the knowledge lost through retirements. However, with tacit knowledge as a main concern, implementing mentorship programs may be particularly useful to retain knowledge within the workplace, and perhaps retain experienced employees.

The role of mentor is given as teaching, sponsoring, encouraging, counselling and befriending; nurturing, role modeling, focus on personal and/or professional development, and ongoing care (Anderson and Shannon, 1988: 40). "Formal mentorship is seen to be an innovative means of supporting conventional organizational goals and practices by offering a technique for coping with change" (Samier, 2000: 83). Though mentorship in general is seen to be an effective way to

transfer knowledge, a debate exists within the literature between the efficacy of formal (organizationally arranged) versus informal (individually sought out) mentorship (Allen et al., 2006; Heimann and Pittenger, 1996; Samier, 2000). Allen et al. (2006) suggested that informal mentoring was more effective than formal, but concede that there is scant literature that attested to this belief. Alternatively, Heimann and Pittenger (1996) argued that there was no attributable difference between the two mentorship types. However, they acknowledge forming a mentor-protégé relationship is most influencial upon an employee's immediate entrance to a position (Heimann and Pittenger, 1996). This was less likely in informal mentorship as social pressures discourage new employees from actively seeking guidance (Heimann and Pittenger, 1996). Formal programs may instead facilitate mentor-protégé relationships earlier on. Despite acknowledged benefits and drawbacks to formal versus informal mentorship, mentor-protégé relationship were recognized as a critical tool for development (Hunt and Michael, 1983).

As a tool to manage human capital mentorship programs have many benefits. Aiman-Smith et al. (2006: 18) proposed that tacit knowledge can only be transferred through experience, observation and personal contact. Such is the role of mentorships, "to demystify the more informal and subtle aspects of the organization and field of practice" (Samier, 2000: 88). For tacit knowledge to be transferred interactions between teacher (mentor) and student (mentee or protégé) need to be frequent (Aiman-Smith et al., 2006). Frequency and accessibility are noted by several studies as integral for successful mentorship (Aiman-Smith et al., 2006; Allen et al., 2006; Heimann and Pittenger, 1996). Mentorships are also noted for promoting stronger organizational commitment and socialization, reducing turnover, and are associated with individual achievment toward senior and leadership positions (Allen et al., 2006; Heimann and Pittenger, 1996; Hunt and Michael, 1983; Samier, 2000). Mentorship's capacity to prepare

individuals for leadership should make it an attractive strategy to address current and ongoing retirements as senior positions are the most likely to require replacement.

Despite mentorship's proponents, several factors need to be taken into account in promoting the strategy. Key factors for efficient knowledge transfer are: cultural awareness, distance, organizational objectives, trust, openness and relationship (Duan et al., 2010: 359). Lin et al. (2010) believed cognitive similarity is among the top priorities in productive mentor-mentee relationships. They suggested that the psychological functions promoted by role modelling and friendship lead to its effectiveness (Duan et al., 2010; Lin et al., 2010). Hunt and Michael (1983) suggested that larger age gaps may create issues with communication or value, although they admitted that this was not necessarily the case. As children of Baby Boomers, Generation Y share many generational similarities (Hewlett et al., 2009). Hewlett el al. stated, "Generation Y's motto meanwhile, seems to be 'Trust those over 50'" (5). As a generation identified to seek out guidance, mentorships seem an appropriate strategy aimed toward Generation Y.

While there are many positives to implementing mentorship programs some barriers were identified. Samier (2000) identified reduced organizational support as a major obstacle to success, as it can overtax mentors, leading toward resentment, within and outside the mentor-protégé relationship. Another factor in organizational support was that programs are occasionally considered too short for meaningful initiation into an organization. Finally, Aiman-Smith et al. (2006: 18) list three good strategies: using phased retirement; using (near) retirees effectively; and, implementing mentoring programs. While phased retirement is often mentioned as a useful strategy for knowledge retention, pension restriction may act to severely reduce the pool of potential mentors (Aiman-Smith, et al., 2006), ultimately reducing a program's effectiveness.

However, if properly implemented, Field (2003) believed mentorship programs could facilitate both knowledge transfer and knowledge retention.

2.5 Research Framework

The fundamental question motivating this thesis was how an aging workforce would affect public water organizations. As a result, demographic trends and the socio-political history leading to today's demographic concerns were considered first when presenting the issues, though this background is not essential regarding the research framework. Instead the research framework is predicated upon current and expected retirement trends, difficulties and opportunities that retirements are expected to present, strains to inter-organizational collaboration, and tacit knowledge exchange.

Currently, and over the next two decades, the percentage of retirements are expected to rise resulting from the larger than average Baby Boomer representation within the general workforce. As the public workforce is older than average, concerns with respect to outgoing knowledge are elevated. The ECO Canada (2010) study in particular addressed the aging municipal workforce across Canada. Moreover, ECO Canada's (2010) report specifically addressed water and wastewater personnel, however, it is an area largely underrepresented in the literature. Alternatively, studies concerning the current state of Canadian infrastructure addressed the current and growing need to maintain, update or replace existing water related works (Canadian Council for Public-Private Partnerships, 2012; Gagnon et al., 2008; Mirza, 2007; Mirza and Haider, 2003). These literatures proposed a need to recruit for various water related positions. However, the literature suggested that talented professionals are lacking. Meanwhile, lack of harmonization, inhibiting professional mobility, as well as raising demanded competencies

through policy changes across most provinces in the early 2000s has further reduced talent pools (ECO Canada, 2010). Moreover, though in place for a reason, reduced acknowledgement with respect to immigrant qualifications adds to this issue (Burke and Ng, 2006).

Despite reduced talent pools and imminent retirements some opportunities exist. As retirement was identified as a complicated decision, there are several factors that influence decisions to remain on the job – notably, financial stability (Kieran, 2001; Stone, 2006). Although the economic downturn proved difficult for many, it may act as a barrier to retirement. It has also been noted that in recent years early retirement trends have begun to reverse and this reversal was initiated prior to economic downturn (Schellenberg, 2004) – suggesting that the economic crisis may not be the driving factor.

Another opportunity rests within Generation Y attitudes. Though this generation was described as entitled, they possess many qualities that may positively contribute to the workplace including: willingness to learn; highly motivated; open to diverse work environments and collaboration; and are technologically savvy (Burke and Ng, 2006; Lancaster, 2004). Among other attributes this generation has been characterized as needing attention and seekers of guidance (Crampton and Hodge, 2009), which may suggest that mentorship programs are an appropriate tool to introduce and transfer knowledge to these new professionals.

Although many strategies exist to facilitate knowledge transfer mentorship is highlighted as it is recognized to address tacit knowledge specifically. Tacit knowledge is experientially based and difficult to capture or transfer by more common channels (e-learning, classroom teaching, manuals, etc.). It can represent knowledge such as organizational history, decision making

processes, or developed skills. As such, reductions in tacit knowledge by way of retirements was a central concern in the literature and the focus taken in this thesis.

Concerns regarding retiring Baby Boomers were stated across many literatures as they applied to entire working sectors, but hardly any articles have investigated how tacit knowledge loss might affect inter-organizational capacity. The last few decades have seen increased debate and reliance on expanding stakeholder participation. Expanding networks and relations have received both praise and criticism. While several themes are expressed in the literature (transparency, accountability, power relations, inter-organizational goals), how individual knowledge attributes to network processes is largely neglected.

In developing this framework several themes upon which investigation was based emerged: aging demographics and retirement trends; talent shortages; expected opportunities; network efficacy; knowledge management and tacit knowledge transfer. Within the literature review these themes were fundamental in developing interview questions to elicit information aimed at answering the research questions identified in Chapter One. Based on this framework different strategies aimed at succession were also considered, and helped in developing interview questions. These main themes making up this study's framerwork figured prominently in the development of research questions, and in determining the best methods for investigation.

Using the framework above, interview questions were designed to answer the questions presented in Chapter One. The goal in writing this thesis was to gather and present information regarding retirement concerns as they applied specifically to public water organizations, an area that has received limited focus. I intended to address how retirements may affect inter-organizational cooperation and effectiveness, largely absent from existing literature. Finally, the

goal was to assess succession strategies in an effort to understand which mechanisms might be best adapted to address existing concerns.

Chapter Three: Methodology and Methods

3.0 Purpose

As suggested within the literature review, how retirements affect social institutions is complicated and can be approached by several avenues. Various literatures from academic, professional and government sources supported the premise that Baby Boomer retirements will create skill and knowledge deficits in both private and public institutions. As a result, scholarly insights from the knowledge management literature were central to this study. By examining knowledge loss and skill deficits I highlighted institutional strategies that supported knowledge transfer and retention. As a contribution to the ongoing discussion over generational demographic transitions I addressed the following questions:

1 – What are the individual and organizational-level effects of retirement trends within public water organizations?

2 – Do these retirements impede cooperation or collaboration between organizations' and individuals' professional networks?

3 – What strategies might ensure knowledge and skill continuity within the public water workforce?

3.0.1 Objectives

My research objective was to answer these three questions using primary and secondary data collection methods. It was important to get a clearer understanding of any organizational unease about retirements and demographic transitions, particularly any concerns related to possible challenges to future operations. To answer these questions I needed to understand the extent of expected retirements in the near future, as well as what departing expertise would mean for the future operations within the organization in question. It was also important to understand the types of knowledge loss (tacit versus explicit) that were expected. Differentiating between tacit

and explicit knowledge departure would have strong influence on strategies for recommendation. To understand what strategies might ensure knowledge retention and transfer it was important to understand existing organizational practices that can influence push and pull factors toward retirement and retention, including but not limited to, ongoing training, organizational culture, and work/life balance. Finally, given the existing gap in the literature concerning retirement effects relating to network collaboration it was important to understand the role of networks in achieving organizational goals and what effects, if any, might be anticipated concerning organizational retirements on network relations.

To generate this evidence I used a variety of secondary literature to develop a theoretical understanding of current concerns and developed strategies. I also completed a series of interviews to gather primary data to compare and contrast to existing literature. Interviews were organized as a part of three case studies. The justification for choosing a case study approach using interviews to gather primary data is described in section 3.3.2 and 3.3.3.

3.1 Assumptions

My position was that while institutional concern regarding retirements was justified, expected retirements would not be sufficient to validate the crisis rhetoric found in the literature (Gordon, 2009; Grigg, 2006; Rappaport et al., 2003; Steiger and Fillichio, 2007). While crisis may explain perceptions of specific regional or municipal offices, such labels should not be applied across the industry. Knowledge management should instead be considered at an organizational level.

I took this position for three reasons. First, as acknowledged in Chapter 2, Schellenberg (2004) suggested the trend toward early retirement may be reversing, which would provide more time to adjust to potential losses. Second, Lesser and Rivera (2007) identified a widespread recognition

of impending retirements, while earlier studies by Mackenzie and Dryburgh (2003) and

Rappaport et al. (2003) found reduced organizational preparedness. These studies assessed

organizational capacity in the very earliest transition stages. I assumed that growing awareness

would translate into more focused succession planning, reducing the negative consequences

presented by retirements. Third, the literature posits that retirements would create knowledge

gaps that in turn would affect organizational performance. However, as illustrated by Starke et

al., (2003) research found no evidence to suggest that losing an "indispensable" employee

reduces organizational performance. Contrary to expectation they actually witnessed an

improvement in organizational performance upon the retirement of an experienced employee.

This improvement in performance resulted from the new employee being more conscientious

toward his or her task.

3.1.1 Research Bias

As a federal public service employee (Border Services Officer) for four years (2004-07), I

observed an emerging demographic shift within the workforce. Retirements and an aging

workforce were not, to my knowledge, serious concerns for the organization. However,

introducing a comparatively younger workforce through increased hiring was noticeable,

particularly in my last two years with the agency. In my opinion, the new employees were highly

motivated and responsible. Moreover, despite a significant increase in new employees, the

organization did not seem to suffer any deficits in knowledge or skill as very few employees

retired during that time. This may have been attributed to significant knowledge management

practices in place. Although a more formal mentorship program began before I left, knowledge

transfer was centered on informal mentorship. New employees were paired with experienced

employees, working together for several weeks to develop skills, knowledge and confidence in

new recruits; a process referred to as shadowing. The success of this type of knowledge management was, for me and others within the organization, a useful tool. My experiences may bias my views against the crisis narrative, as well as my attitude towards mentorship as a strategy mitigating the loss of knowledge and skill. However, despite these biases, the literature also suggested strong motives toward creating or incorporating mentorship programs as a tool for knowledge management. Likewise, but to a lesser extent, the literature indicated that including more young professionals could be a benefit, and present opportunities to draw in talent given proper incentives (Hewlett et al, 2009; Kofman and Eckler, 2005; Steiger and Fillichio, 2007).

The organizations within this study have significantly different goals, objectives and responsibilities than the organization I have personal experiences with. Therefore, comparisons of my previous experience to the organizations considered in this study will not be made for they would be anecdotal at best. Given my personal bias I will attempt to remain objective. Conclusions will be based on a comparison between previous studies from academic and professional literature with primary data elicited from semi-structured interview. A frequency of mention table was also constructed to give readers objective information upon which they can determine the validity of my results.

3.1.2 Approach

I approached data from a qualitative perspective. Data were organized using a social constructivist framework to understand how social context –in this case current demographic shifts – was interpreted by individuals within the water workforce (Robson, 2011). According to Robson (2011: 25), "social constructionism indicates a view that social properties are constructed through interactions between people, rather than having a separate existence." This

approach focuses on "an analysis of the meanings people confer upon their own and others'
action" (Robson, 2011: 527). In this case the social constructivist framework is used to address
participants' perceptions of outgoing retirees, what retirements will mean for the individual
organizations, and how it will affect networks and inter-organizational relationships. This
approach was relevant because while high near-retirement rates have been characterized as a
serious concern, individuals within organizations may interpret retirements and associated
workplace changes differently than was proposed in existing studies.

A case study design was used for three municipalities: Guelph, Kitchener, and St. Catharines,
Ontario. The case study approach has benefits and drawbacks; its usefulness is dependent on
how it is considered. For instance, Yin (1984: 13) wrote:

> In general case studies are the preferred strategy when how or why
> questions are being posed, when the investigator has little control
> over events, and when the focus is on a contemporary phenomenon
> within some real-life context.

This study applied all three criteria proposed by Yin (1984). It investigated how organizations
would be affected by retirements and how they would prepare for succession. As a large
demographic phenomenon and general social inquiry, I had no control over events as a
researcher. Furthermore, the retiring generation could appropriately be labelled a contemporary
phenomenon, and, as research suggested, had a real-life context.

Yin (1984: 13) also argued that case studies are often used in:

- policy, political science, and public administration research;
- community psychology and sociology;
- organizational and management studies;
- city and regional planning research, such as studies of plans, neighborhoods, or public
  agencies, and
- the conduct of a large proportion of dissertations and theses in the social sciences.

This study addresses public administration, as well as organizational and management studies. To a lesser extent it discusses the sociological implications regarding demographic shifts, as well as the psychology involved in retirement decisions. The ability to include documentation and interviews within each case study is among its design strengths (Bryman et al, 2009; Yin, 1984).

Case studies have been criticized for their lack of generalisability (Yin, 1984). Robson (2011) and Yin (1984) agree that while case studies are not reliable for statistical generalization, they can be useful in presenting theoretical propositions, sometimes referred to as "analytical generalizations" (p.140: 21). Stake (1995: 8) expanded on this idea by suggesting that case studies are not used to produce generalizations, but rather used to suggest "valid modification" to generalizations. As a result, case studies have the flexibility to be intrinsic, highlighting the qualities of a single case, as well as instrumental, in allowing for valid theoretical propositions to extend beyond the case or cases being examined (Stake, 1995). These qualities were useful for this research because, although I hoped this thesis would be informative, particularly for the organizations involved, general conclusions were meant to inform and develop related conversations within municipalities outside this study's scope; organizations that might identify with retirement concerns or that are looking to implement targeted succession planning initiatives.

3.2 Methods

Integral to any study are the methods used to approach data collection and analysis. I used a case study approach that included interviews as the main tool to amass primary data. Finally, with the help of computer software I transcribed, coded and analysed all interviews, looking for emerging and reoccurring themes. The following section describes and defends the approaches I took toward gathering data.

3.2.1 Methods Considered

The ongoing retirement wave is by no means a new topic being discussed. Certainly statistical trends in the mid-to late1990s indicated reason for concern, but a more critical look at how retirements could affect organizations, both public and private, has garnered significant attention over the last decade. Among important literature concerning an aging infrastructure and workforce were Mirza's (2007) report for the Federation of Canadian Municipalities entitled *Danger Ahead: The coming collapse of Canada's municipal infrastructure* and ECO Canada's (2010) *Municipal Water and Waste Management Labour Market Study*.

For these earlier studies, surveys were the primary method of inquiry. ECO Canada (2010) received replies from 282 water and wastewater related respondents, while Mirza (2007) based conclusions on 85 surveys from across Canada. ECO Canada (2010) also utilized five online focus group and personal interviews, a pre-survey to strengthen and validate content, and a post-survey to explore results further.

The advantages of using surveys included low cost, ease, ability to collect information en masse, and participant anonymity (Bryman et al, 2009; Robson, 2011). Disadvantages included: an inability to investigate nuances or motivations to answers, thus increasing the risk of missing valuable information; inability to clarify if needed; and different response biases (Bryman et al, 2009; Robson, 2011).

Mirza (2007) did not provide details of the survey instrument used, so it cannot be critiqued, but used as reference to the usefulness of surveys in gathering data. The ECO Canada (2010) survey seemed robust. Questions were worded clearly, were designed for a high degree of specificity, and several avenues in relation to the research questions were explored. Approximately seven

pages long, the survey risked losing less motivated respondents. However, the 282 respondents specific to water and wastewater concerns allowed for generalizability as it applied across Canada. To a certain degree the survey did rely on respondents' ability or willingness to follow procedure. One question required respondents to take a random sample of their workforce – the sample size depending on employee population within each facility. How, or if a respondent chose with true randomness, cannot be assessed. Nontheless, the ECO Canada (2010) study reduced limitations presented by any one method by using mixed methods. For example, supplementing surveys with focus groups and interviews allowed a degree of examination not facilitated by the surveys alone.

3.2.2 Methods Not Used

With other studies relying heavily on survey data, I felt that using surveys within this study would bring few, if any, new insights. While using focus groups may have been a useful tool, they require specific time commitments by participants. Given this study's sample size, and participants' varying schedules and locations, organizing a series of focus groups would have proven difficult.

As suggested above, the case study approach can allow for theoretical generalizations. ECO Canada's (2010) study demonstrates how a mixed method study can formulate analytical theories without requiring a large interview sample. Coupled with surveys and focus groups, ECO Canada's (2010) report used five interviews to fill in survey gaps, and make broad suggestions as they applied to Canada. This study expanded on the number of interviews; 14, compared to five from ECO Canada. Moreover, it focused on a narrower scope, Central Ontario, compared to all of Canada. It built on the work of ECO Canada (2010), as well as other academic, professional

and government publications, cited in Chapter Two, to form the foundation upon which the interview analysis was based, and generalizations deduced.

While the literature suggested concern for both private and pubic organizations, there were few studies based on public institutions, and even fewer specific to water and wastewater. I used interviews as a way to develop context and a more nuanced understanding about the needs and concerns of public water institutions as they relate to the coming retirement wave. Much like Baxter and Greenlaw's (2005) study, this study used a qualitative approach, employing semi-structured interviews as a main method for primary data acquisition; focusing on "depth of understanding rather than breadth (Baxter and Greenlaw, 2005: 7)."

3.3 Data Collection

As several methods were purposely avoided I chose to approach data collection with a case study design, applying different methods and tools to gather, organize and assess my data. The literature review (Chapter Two) utilized articles from scholarly, professional and government sources, setting the basic socio-historical context for this study. This thesis included references to 98 academic articles, including 19 books or book chapters, 9 professional sources, and 27 government sources. The collection of sources included topics covering knowledge management and transfer, public administration and managerial issues, demographics, political climate, behavioural science, psychology, infrastructural development, networks and inter-organizational collaboration, integrated water resources management, water resources, and succession planning. (see Works Cited for comprehensive list).

 Building on the foundation literature, qualitative, semi-structured interviews were used to gather primary data. Semi-structured interviews followed a basic list for questions, but allowed the

interviewer to modify or add questions based on the elicited responses or the conversation flow (Robson, 2011). For a full list of interview questions see Appendix B. The interviews were intended to: 1) address the study's research questions; 2) understand the value of near-retirees knowledge and skill; and 3) explore participant perceptions regarding retirements and retirement effects on organizational efficacy and inter-organizational relationships. Questions one through three were developed to address individual and organizational-level trends and expectations. Questions four through seven were designed to address organizational knowledge management, the value of knowledge, as well as the existing setting and culture for knowledge exchange. Questions eight and nine were developed to specifically address retirement effects on organizational networks. Question ten allowed participants to address current and future succession planning. Finally, Question eleven was designed to facilitate discussion regarding retirements. It allowed participants to revisit topics previously discussed, as well as provided an opportunity to explore avenues yet to be addressed.

Interviews were organized using convenience sampling to gather participants from various backgrounds, and a snowball sampling technique expanded the sample beyond the initial candidate pool.

The tools used to review both primary and secondary data included: case studies of the local municipalities of Guelph, Kitchener and St. Catharines; a comparative analysis of case studies; digital recording and transcription of interviews; and a data coding scheme supplemented with NVIVO, a computer program designed for the analysis of qualitative data.

The comparative analysis allowed both associations and contrasts between interviews and participating organizations. Where appropriate the literature was used as a frame of reference on

which to compare interview data. For examples, Pignal et al. (2010) identified an expected

retirement rate approximate to 20%, and associated this rate with concern. In Chapter Four

expected retirement rates for participating organizations were compared to one another, but also

against Pignal et al. (2010). Several themes were extracted (see Section 3.3.2) upon which

interview data was contrasted.

All ethics requirements regarding interviews were completed in September, 2011, through the

University of Waterloo, Office of Research Ethics. Initial emails were sent out in mid-October,

introducing potential participants to the study's purpose and to their role as participants if they

chose to be involved. The interviews began in early November, 2011 and continued until January

2012.

3.3.1 Case Descriptions

Three municipalities were examined as cases: Guelph, Kitchener and St. Catharines, Ontario.

Three cities of comparable size were chosen to allow for comparison, and to allow for more

varied information than would be extracted using just one or two cases. These three cities were

chosen based on geographical demographics and expected future growth. Logistical

considerations were a factor with regards to the researcher's familiarity with the cities chosen as

cases, and accessibility for data collection purposes. Each municipality was located in Central

Ontario, as defined by the Ontario Ministry of Finance (2010). As shown in Table 3.0, Kitchener,

Guelph, and St. Catharines were all cities with populations exceeding 100,000 people.

Table 3.0 City Populations

Municipal Populations	
Kitchener	219,153
Guelph	121,688
St. Catharines	131,400

(Statistics Canada: Census of Population, 2011)

Among the densest populated regions in Canada, Central Ontario (including the GTA) represents more than a quarter of the Canadian population, and over 67% of the population of Ontario (Ontario Ministry of Finance, 2010). Within Ontario, the central region is also expected to grow comparatively quickly in the coming decades (Ontario Ministry of Finance, 2010). Both increased population density, coupled with expected growth in the next decade were assumed to influence complexity within the ability of regional and municipal authorities' capacity to achieve goals and maintain workplace efficiency in the years to come; making for potentially illuminating cases. Within this central region only two other cities fit the criteria of this study, Barrie and Hamilton. Barrie was not included for logistical reasons, whereas Hamilton was omitted as I felt it was less comparable to other cities as its population is over 500,000.

Familiarity with the municipalities chosen as cases and financial limitations were also taken into consideration in choosing case locations. I have lived in Kitchener-Waterloo since 2007, and visited nearby Guelph frequently, so both familiarity and proximity to resources were taken into consideration. Similarly, familiarity and available resources within the Niagara Region was an asset, influencing case study sample decisions. Having a basic geographical knowledge provided context when referenced in interview responses. Likewise, having accommodations in the Niagara region reduced my financial costs during the data collection, and provided time and space necessary for transcription and analysis.

3.3.2 Semi-Structured Interviews

Interviews – specifically semi-structured interviews – were chosen as the most appropriate tool to gather data. Interviews offered both flexibility and adaptability (Robson, 2011). In this study being adaptable was particularly beneficial as participants, despite coming from related fields,

were drawn from various backgrounds in the water and wastewater community – requiring some flexibility in questioning. Opened-ended questions were useful to elicit unique or unrestrained responses, giving the respondent ownership over answers by not being asked to choose among pre-coded or fixed answers (Bryman et al, 2009). The semi-structured format allowed for a consistency across interviews while still allowing for flexibility in interview topics and range.

Disadvantages to interviews are that they are sometimes complicated to schedule, are often time intensive to complete, and require transcription from voice to text and detailed coding (Bryman et al, 2009; Robson, 2011). In this study all interviews were audio recorded, following proper ethics procedures and adhering to Office of Research Ethics Guidelines. Audio-recorded interviews were described by Robson (2011: 300) as a "considerable advantage" when compared to relying on note taking during the interview process. Audio-recording provides the interviewer with a record, and allows for a word by word transcription of the discussion (Robson, 2011). Perhaps more importantly, consistently taking notes during an interview can be a significant distraction for both the researcher and the interview participant. By recording the discussion the interviewer can concentrate on the conversation as it unfolds (Bryman et al, 2009; Robson, 2011) allowing for more informed and illuminating probing questions.

All audio recordings were transcribed within 24 hours after the completed interview. While questions were not necessarily pre-coded, all interviews followed a similar pattern, developing recognizable themes throughout the interview to facilitate coding and analysis. Additionally, NVIVO, a computer program designed to facilitate coding and analysis was used.

NVIVO allows researchers to upload transcripts to a data base and facilitates data organization. The program enables users to select passages from individual transcripts by highlighting and

labelling them into distinct themes or categories or subcategories (referred to as nodes or tree nodes). Upon identifying major themes from individual transcripts the user can separate information into subcategories pertaining to more nuanced information within the theme. Some considerations I made for separating data into subcategories included identifying conflicting responses within a given theme, identifying a range of answers, considering outlying answers, or occasionally separating brief passages that contain specific words or ideas that reoccurred from interview to interview. In essence transcripts are coded by the program user, while NVIVO largely facilitates organization. After the initial coding process the program allowed timely access to specific information and facilitated finding specific data through various search mechanisms and report functions.

While interviews are time intensive and perhaps a disadvantage, time management was considered in the study design. Robson (2011) suggested that in addition to the time required for interviews and associated procedures, cooperation or participation can also be an issue with interviews as well; as it was for this study. Interviews not only demand significant time commitment from the interviewer, but also from the participants. In this study, the workday interruption may have been among factors leading to a lower than expected sample size. I had intended to interview a sample of 20 to 30 participants, but instead interviewed 14. To mitigate workday interruptions interviews were scheduled at the participants' convenience and in their preferred location. No interview required any participant travel, and any time requirements placed on individual participants was limited solely to the interview process itself.

Finally, maintaining consistency and continuity for interviewing and coding can be seen as a hurdle when involving more than one researcher. However, as the only interviewer, a level of

consistency was maintained across all interviews. The only existing variable beyond having different participants was a change location and setting for each interview.

3.3.4 Interview Sampling Procedure and Response Rate

An initial set of potential participants were identified through an internet search of municipal and conservation authority employee directories. If an employee directory was non-existent or inaccessible participants were identified by searching through the most recently available municipal reports and identifying signing authorities on various public documents related to senior water positions. The initial search for participants was completed for each case study. Employees in senior positions or in a leadership capacity (identified by title) directly associated with water and wastewater, water conservation, as well as human resources were contacted via email. Each email contained an ethics approved statement pertaining to the study including general information, intent, and participant role and expectations. The email also encouraged participants to suggest additional people whom they thought might be a benefit to the study as part of snowball sampling. Thirty-two initial emails were sent. If there was no response to the email after two weeks individuals were called during business hours using a script derived from the original information letter. All suggestions of potential participants were pursued if they qualified under the study's scope.

Bryman et al. (2009) suggested that snowball (convenience) sampling is problematic as the sample is not likely to be representative. However, it is defended as an appropriate approach when there is difficulty identifying prospective participants (Gillham, 2008: 20; Robson, 2011: 276). Although this study did not involve a clandestine or difficult to reach population, low participation rates made snowball sampling a useful technique. While a larger sample would

have been preferable, Stake (1995: 6) wrote that in collective case studies, "sampling of attributes should not be the highest priority. Balance and variety are important; opportunity to learn is the primary importance." Though smaller than planned, the sample in this study represented three municipalities, two levels of government, two watersheds, and a collection of water professionals from various positions, fulfilling both balance and variety of Stake's statement above.

As outlined in all ethics forms delivered, all participation remained anonymous. To maintain confidentiality participants were coded as A to N. Participants were referred to by their assigned letter, such as "Participant C said…" In order to ensure quotes and relevant information were not misunderstood, interpretations were sent to individual participants, along with an identification of their assigned letter. All participants were asked to review data attached to their letter to ensure its proper use, as well as to give participants the opportunity to request certain quotations be removed if they were not comfortable with their use in disseminating results.

Chapter Four: Results

4.0 Results

Using the framework outlined in Chapter Two, the literature indicated concerns about organizational retirements and subsequent employee replacements. This chapter presents interview data to compare and contrast results between case studies. The interviews addressed three overarching concerns: first, how ongoing retirements are expected to affect organizational function and collaboration; second, how organizations have positioned themselves for upcoming retirements; and third, how organizations perceive the benefits and barriers to different coping strategies for succession planning. Results in Table 4.0 (see p. 64) are addressed in several of the sections below. This table highlights response frequency to selected interview questions.

The primary data consisted of interviews with 14 participants. Interviews ranged from 12 minutes to 84 minutes, 17 seconds. The average interview time was approximately 48 minutes. Participants represented municipal (5 participants), regional (5 participants), and provincial (2 participants) authorities, as well as conservation authorities (2 participants). The study intent was to interview various senior level professionals, because the literature suggested that these positions are held by employees possessing a high degree of skill and knowledge and are most likely to be vacated in the coming decade (ECO Canada, 2010; Steiger and Fillichio, 2007). Participants interviewed filled the following positions: director of water services, director of water and wastewater services, district supervisor, workforce planning and development specialist, senior planning engineer, manager of human resources, manager of engineering and planning, manager of environmental services, water conservation project manager, corporate planning officer, project coordinator, human resource consultant, environmental engineer, and water resources engineer.

Table 4.0	Frequency of Mention	
Question	**Response**	**# of Responses**
Are retirements likely to affect job efficacy?	No-Low	8
	Yes	3
	No Definitive Response (NDR)	3
What position rank do retirements represent?	Senior level	12
	Mixed position retirement	1
	NDR	1
**Is there difficulty in attracting new talent?	Difficult in general	5
	Difficult for senior positions	5
	Difficult for mid-level positions	3
	Not overly difficult in general	3
**What knowledge will be lost through retirements?	Technical/Operational (explicit)	5
	Soft-skills (tacit)	8
	History (tacit)	9
How important is network cooperation/collaboration?	Critical, important, key	13
	Complicated	1
Will retirements affect networks?	Yes	2
	NDR (they can, it depends)	12
Does this Organization offer flexible arrangements?	Yes	4
	Yes, but limitations based on position	8
	No	2
*Do you view retirements as an organizational opportunity?	Yes	9
	N/A	5
**What are the biggest organizational challenges in the coming decade?	Recruitment	7
	Retention (not specific to retirement)	5
	Budgetary/financial stability	3
	Employee growth and promotion	3
	NDR	2
* Question not explicitly asked		
** Question permitted multiple answers from participants		

Using NVIVO to organize data the following themes were extracted from the amalgamation of interviews (with some overlap between certain themes):

- aging demographics and retirements – average workplace age, numbers expected to retire, age gaps in the workforce
- demographic concern and associated problems – talent acquisition, knowledge (history) loss, reduced capacity
- effects on inter-organizational network – simultaneous loss, rebuilding relationships
- workplace culture – different workplace cultures, benefits and drawbacks to corporate culture
- knowledge management – retaining knowledge, training programs
- mitigation strategies or lack thereof – succession planning, various strategies being implemented

4.1 Demographics and Retirement Rates

Canadian demographic trends showed growing population numbers in older age categories along with an increasing average age in the workforce. As a result, an aging workforce among participant organizations was expected. Although employee turnover (retirement or non-retirement departures) varied from organization to organization, it was characterized by several participants (C, E, F, H, and M) as low, or exceptionally low.

Like anticipated retirements, average employee age varied from organization to organization. Estimated average ages ranged from mid-to-late 40s at the Region of Niagara, to approximately 30 years at the Niagara Peninsula Conservation Authority. Although the literature often used average organizational age as an indicator for concern, it can misrepresent the actual situation. For instance, participant H noted that offering an average age might skew workforce demographic perceptions as the organization had many employees under 35 years and over 50 years, with a gap in the middle.

This gap in the middle was not unique to one organization, but noted at the Grand River

Conservation Authority (GRCA), the Niagara Peninsula Conservation Authority (NPCA),

Ontario Ministry of Environment, and within a division at the Region of Waterloo. As explained

by participant M, it represented what could appropriately be called the Harris Gap—named after

Mike Harris, the Premier of Ontario between 1995 and 2002. Simply put, the Harris Gap

represented the mid-1990s recession and targeted budget cuts to environment related agencies

leading to significant layoffs across many organizations concerned with water management.

Participants F and M stated that this age gap has been very difficult to fill.

> What's impossible to find is the mid-level guys; 10 years of
> experience. They simply don't exist. And that's because, again,
> when those guys came out of school that would have been during
> the recession. Nobody wanted to get into land development or
> water-resources engineering, or anything having to do with civil
> engineering just because there were no jobs. And the outlook for
> that at the time was very bleak. It wasn't many guys going into the
> program. So that's where you get that gap. (Participant M)

This helps explain the mid-career gap in employment. Also addressing this gap, Participant F

suggested that the 1990s technology boom drew people away from civil engineering, helping to

produce a gap in available talent looking to work in this sector.

Nonetheless, while a high average age may represent a cause for concern, a lower average age

should not necessarily imply imperviousness to demographic pressures. Although the Region of

Waterloo, for example, expects high turnover due to retirements, a mixed age range may signify

a protection to knowledge loss if open positions can be filled from within.

With respect to retirements, three of the seven distinct participating organizations expressed

retirement rates equal to, or slightly above the 20% estimate put forth by Pignal et al. (2008).

These included the Region of Waterloo, the Region of Niagara and the City of Guelph

(Participants B, E, and L). Estimating 25 to 30% retirement turnover, the Region of Waterloo had the highest expected retirement-related departures. Alternative to expectations for high turnover, Participants C, D, J, and M, representing municipal, regional, and provincial levels indicated retirements equal to or less than 16% over the next decade. Participant H noted exceptionally low turnover over the last five years, estimating it at 1%; however, H accepted that this was anticipated to climb in the coming years.

Among difficulties in anticipating retirements is that the decision to retire is made on an individual basis, often in private. Consideration to retire may depend on an individual's health, financial security, demands as a caregiver, or as a joint decision with a spouse. For example, an employee may retire at 55 years old if he or she is in poor health or if their level of financial security allows for it; yet they may also continue to work beyond 60 or 65 years old. As a result, participants may have had difficulty, or have been hesitant, to offer estimates given such uncertainties.

While average age and expected retirements in the coming years can vary significantly from organization to organization, participants had clear perceptions regarding Baby Boomer retirements. Although not a pressing issue at select offices, all 14 participants recognized the knowledge and skill that will be lost to organizations from this outgoing demographic. For nine participants, despite recognized drawbacks, retirement related departures were also viewed as opportunities.

4.1.1 Senior Level Exodus

Demographics across organizations showed significant variability suggesting a need for case-by-case analysis when accounting for expected retirements and age distribution. Far less disputable was the expertise held by retiring workers.

Participants all agreed that retirements represented a strong stock of knowledge leaving the workplace. Several respondents identified low turnover within their organizations. As a result, the people retiring from many participating organizations represented 15 years of experience, history, and social networking, or more. Although losses were expected throughout the organizational structure, eight participants (A, B, E, I, J, K, L, and M) mentioned senior positions (e.g. director, supervisor, manager, foremen, and coordinator) as important positions to be vacated. These positions assume additional importance for ensuring procedural and goal oriented continuity. Moreover, these leadership roles are identified as requiring strong soft skills (e.g. defining tasks within broad organizational interests, delegation/leadership skills) for best performance. Consequently, these soft skills are also identified as hard to learn or difficult to transfer from person to person.

4.2 Concerns: Losing Organizational Capacity

As discussed in Chapter Two, there were several concerns associated with Baby Boom retirements. Unease extended beyond skill and knowledge departure to include information transferability, talent recruitment, and fiscal concerns. So while retirements and knowledge gaps may have been considered as main concerns, many aspects needed to be considered in succession planning.

4.2.1 Knowledge and skill

When asked about the loss retirements will bring to each organization, participants overwhelmingly identified historical knowledge. It is not simply improving technical skills and becoming more efficient over time, but rather the "depth of understanding" that is valued (Participant K). Many participants (B, C, D, F, H, I, J, and N) identified that they would be losing employees with 15, 20, 25 years experience. For these departing employees lost expertises includes geographical and hydrological knowledge, interpersonal relationships, network capacities and overlap, as well as, both technical and lived experiences honed over a career. Lost historical knowledge included understanding various organizational changes over decades, the reasons for them, and where the organization's mandate should be directed. Also extremely important, employees near retirement represented a social and political understanding that encompassed historical collaboration and inter-organizational cooperation and how best to approach and foster existing relationships. Time spent within an organization helps individuals understand various personalities and leadership approaches.

> I would say yeah, we're really concerned about knowledge transfer and knowledge loss; especially for people who have been here for 35 years. Their history and memory for events alone, not even how to do their job, but just there's some things you don't necessarily document about your job. But you experience them and it's, for whatever reason it becomes important at some point down the line. (Participant H)

This participant's statement identified the loss that an experienced employee can represent to an organization. It also documents the difficulty in describing with specificity what these employees' experience means to the organization, alluding to the tacit nature regarding valued knowledge.

Participant D characterised knowledge loss as the difference between data and information. For Participant D data represented baseline information that can be documented and retrieved by any employee. Information, alternatively, was how data fit the greater social historical context. It represented the nuances encountered during workplace processes. Documentation works well to capture data, but as retirements remove experienced employees from the ongoing conversation an organization can become data rich but information poor. For example, all institutions have databases to store and file past and present projects. So, in one manner or another, the data are accessible to any employee who requires access or who could benefit from the records. Although records may report decisions made, they may omit the nuances of the decision-making process, unessential to the report. Yet, in making present or future decisions this missing information might prove useful. This information might be easily provided by an employee with a history of past projects, or who was involved in past decision-making efforts.

An employee's history also extends to recurring problems. Participant I contended that there was a cyclical nature to problems experienced. He stated that although processes change over time the infrastructure being worked with – sewage plants, landfills or water treatment plants – basically remained the same over decades. As a result, an employee overseeing or assigned to facilities in the 1980s and 1990s might have an intimate knowledge and strong previous experience if, or when, issues arise in the same facility a decade later. As can be expected, familiarity and experience can also translate into efficiency. Participant I described an employee who was hired on contract after official retirement:

> They were able to handle and carry a lot of work that would take a less experienced person probably twice, maybe three times as long to do. We see that now with the very experienced staff that we still have; same thing.

The value added by an employee's history and developed efficiency was documented across interviews. Participants (A, B, E, L, and M) identified that retirees are strongly represented among organizational leadership. Resulting from time invested in the organization as well as from often being in senior positions, employees near retirement often possess a high degree of tacit knowledge, and as such should be particularly valued within individual organizations. Ebrahimi et al. (2008) discussed the value of developed skill and worker age calling attention to the tacit knowledge possessed by older workers, developed over years. The ability to connect, interpret and integrate knowledge highlighted the difference between data and information. Moreover, the competencies developed over a working-life make it easy to understand why Stam (2009) suggested that aging employees are more efficient and need to be valued within the workforce. It is worth noting that all organizations participating in interviews expressed the significant value represented by near-retirees.

4.2.2 Transferable Skills

When looking at the desired skill sets for incoming employees two general categories were identified – technical skills and soft or interpersonal skills. Technical skills may refer to designations, certification and knowledge specific to the job requirements. Among participants there was strong agreement that technical skills are, at least to a certain extent, transferable or trainable. This is expected since technical skills would more appropriately be classified as explicit knowledge. The case for soft-skill transferability remained less clear.

While discussing necessary skills in the workplace technical skills were identified as a baseline for incoming employees. However, soft and interpersonal skills were identified by many participants (B, D, E, F, G, H, I, K) as the important strengths within a workplace. An

amalgamation of various tacit skills deemed important or integral to the workplace by the study

participants included the following:

- Management and leadership skills
- Negotiation skills
- Creativity and ability to think on one's feet
- Confidence and ability in decision making
- Ability to read people
- Ability to identify problems
- Tact, diplomacy, and conscientious listening in collaborative work
- Demonstrated ability to learn
- Understanding institutional interconnectedness; the ability to think big picture
  (B, D, E, F, G, H, I, K, and M)

In fact, having a broad understanding – the institutional interconnectedness and goals, and the

employee's role within it – was a concept repeated across interviews (A, B, C, K, and M). While

a broad perspective would certainly be encouraged across most industries, statements within

interviews suggested it is a skill highly valuable in the public sector. Participant C stated, "When

you come to the public sector, there's an expectation that your skill-sets need to be a little bit

more broad." Comparing his experience from the private sector to the public, Participant M

addressed the need for broadness:

> We find ourselves Jacks of all trades. We find ourselves pulled in a
> lot of directions. So being asked to do a lot of things with limited
> resources, however we carry out our mandate. So the pressure isn't
> necessarily deadlines. The pressure is to address a multitude of
> tasks.

Though technical skills are important to these organizations participants accepted that these skills

are learnable. With the soft skills, their transferability remained in question. Of eight participants

who assessed soft-skills directly, four (E, F, G and K) identified these skills as difficult to

transfer, while the remaining four (D, H, I and L) deemed them transferable. The literature

suggested a difficulty in transferring soft-skills, as indicative of tacit knowledge. However, tacit does not imply that it cannot be transferred, but more specifically that it is difficult to transfer. Soft-skills can be learned. And in fact all participating organizations directly or indirectly offer courses that pertain to various soft-skills, many offering programmes directed toward teaching or improving leadership and management skills. The efficacy of these programs is unknown.

From interview evidence there was no significant concern addressed to technical skills across organizations. Comparatively, participants' perceptions on soft skills demonstrated strong focus on the many social aspects internally and externally significant to an organization's achievement. Less clear is if a decrease in organizational soft-skills would have an attributable effect on organizational achievement. Losing the detailed information gathered during an employee's tenure and severing inter-organizational ties seemed more likely to influence an organization's capacity to cope with retirements than did losing soft-skills. Although these interpersonal skills were identified as important, particularly for senior positions, rarely were soft-skills explicitly mentioned when participants were asked what effects retirements might produce. However, it is difficult to separate organizational history from soft-skills altogether, as an employee from a senior position has likely practiced and improved his or her soft-skills over a career, perhaps tending to more effective leadership and so a more efficient office staff.

That organizations will lose leadership soft-skills remains important as employees leave senior and management positions. It is not necessarily the decision making, time management or ability to effectively delegate that is lost in the transition to and from senior level positions. Instead it is losing continuity and familiarity with details and relationships.

4.2.3 Skilled talent and recruitment

Beyond retirements and knowledge transfer, recruiting skilled talent for specific positions is identified as a concern among organizations. Participants who specifically addressed entry level positions all agreed that attracting skilled talent was relatively easy. One notable exception was recruiting wastewater professionals for Guelph; participant E stated, "wastewater is a little more tricky to recruit for. I think by virtue of what it is."

Recruitment for middle management and senior level positions was identified as more difficult for participating organizations. Participants offered several reasons for this. As noted above, layoffs coupled with waning interest in water and wastewater in the mid-to-late 1990s created an age gap among several organizations. Consequently there is a shallow talent pool for the senior positions that demand not only technical expertise, but several years experience. Participant A stated that generational retirements span the water and wastewater industry in both public and private spheres. The trouble in attracting talent for mid- to high level positions may be difficult to overcome as competition exists not only between municipalities, but also between public and private spheres. When hiring from outside the organization, talent is often drawn (poached) from other municipalities. Poaching was described by Participant L basically as the difference between investing in educating and promoting from within, versus attracting talent from outside the organization. It is attracting talent who have had the time to develop skill-sets elsewhere.

Geographic considerations also effected hiring and replacement. With difficulties in getting talent to relocate, municipalities within driving distance can be the primary areas to recruit from. While staffing middle to top positions was identified by seven participants (A, B, E, F, I, M, and N) as difficult, it was an issue particularly relevant among participating organizations from St. Catharines. Given St. Catharines' location, Participant A identified regional limits, "We don't

have the bordering municipalities on the other side because of the water and the border. So that's one issue for us, is just the availability of the skilled talent."

Unfortunately for St. Catharines, the draw to the city itself – described by Participant K as "hardly the most salubrious place to be or to be coming to" — is a barrier in attracting talent. Participant J, also in St. Catharines, explained the ease in filling positions when needed, but the difficulty in keeping them, stating that as people gain experience they become valuable to another municipality or contractor.

Several participating organizations identified a municipality's reduced ability to create incentives as a barrier to attract talent. For instance, municipalities have little, if any, capacity to increase a position's dollar value in an effort to attract employees. Higher wages, or more attractive conditions makes some municipalities more attractive to work for; higher salaries in Greater Toronto Area offices were cited by Participant B as an attraction to talent. Despite geographical location, Participant A identified her organization as lucky because its size allowed for some organizational depth. Smaller communities were identified by participants A and M as being particularly at risk from retirements, suffering to a greater extent from a reduced ability to draw talent to their offices.

> The bigger the municipality – St. Catharines, Niagara Falls – the more depth you're able to have. It's the smaller municipalities, Wainfleet, Pelham, West Lincoln that the retirement or the departure of a key individual, a senior individual that will be hardest felt. Haldimand, the County of Haldiman, not a rich county. And it seems to be the place where folks come, spend a couple years, but because the county can't pay them well enough they end up leaving. And that's in senior planning, senior engineering positions. And the county suffers for it because they can't keep and retain these individuals (Participant M).

Employee turnover was not limited to any one particular region, and was discussed by different organizations. With little room to adjust incentives public organizations are at a disadvantage compared to those in the private sector. Within the public sector, although Toronto and the GTA might have a comparative advantage in attracting mid-to-senior level talent, the municipalities and organizations interviewed seemed to be finding talent adequate to fill open positions, whether through outside hiring practices or internal secondments and promotions. However there was some suggestion that stricter regulations since the Walkerton incident do present barriers to filling open positions.

> [In] a manager you're usually looking for someone who has those interesting skills set: they can write, they can talk, their communications skills are good, they can problem solve. But on the flip side, you need that license. So they've had to come up as front line operators through the system…And it's tough because not everyone who comes in as a front-line operator is really interested in proceeding into management. So what ends up is that the pool gets very shallow. And we're not alone in that (Participant A).

Commenting on the increased expectations within water and wastewater positions Participant N added, "I think we'll see the 'ask'. We'll see the bar increase. But whether that position is able to be filled at the end of the day, with those specific wants and desires is another question." Essentially, as requirements for positions are raised, demanding more education and qualifications, the talent pool shrinks, as fewer people meet the necessary criteria.

Another difficulty noted with the talent gap was the barriers to including foreign professionals in the workplace. Four participants (B, E, K, and N) identified foreign professionals as a significant resource. Yet, foreign credentials are not always recognized in Canada (Burke and Ng, 2006). Both the City of Guelph and Region of Waterloo identified programs that allowed foreign

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professionals to come in on a voluntary basis in an effort to help new Canadians gain Canadian work experience. The Region of Niagara described a recently hired foreign employee who was having difficulty finding a job in Canada, and who was characterized as "outstanding" (Participant B).

Similar barriers can exist within the country for Canadian citizens. ECO Canada (2010) highlighted different certification levels across provincial boundaries, which in effect limit talent movements within the country. Participant D questioned the way organizations define job specifications altogether. Having a university or college diploma has become a basic requirement, and while appropriate for many positions, does not need to be applied across the board. "There will be a need for further development and perhaps to open one's perspective of what a qualified individual is; especially in looking to foreign trained professionals and others in filling these roles", said Participant N. Although not referring strictly to immigrants and new Canadians, Participant K believed that what was needed were people with broad perspectives, people "who have seen potential and the way things are done elsewhere".

Although barriers existed and differed by region, or organization, ten participants (A, B, C, E, F, H, I, J, K, and L) identified that opened positions were being filled. Participant B did however draw attention to one specific job opening that remained vacant for two years. Describing the difficulty toward hiring for opened positions Participant F suggested that it is not for lack of applicants but rather limited talent that creates some difficulty. "I have been lucky. Normally of 100 applications you get probably five who kind of would be good for getting through the screening and good for interviews. But normally, I think it hasn't been easy" (Participant F). However, all participants described recently hired employees in extremely positive terms.

It was evident that attracting talent is an issue for participating organizations. The water workforce is not glamorized (McCain et al. 2006). Echoing this sentiment, Participant L stated, "There're lots of shows about doctors and lawyers, sometimes even accountants. But you don't see anyone working in public works working on TV."

Adequate application numbers propose that there is indeed interest; however, reduced talent suggested that younger generations are not directing their career path specifically towards the water sector. One way that all participating organizations were directing learning toward water and wastewater was by offering co-op positions. Participants A and B both stated how impressed they were with the work being done through their co-op program. The Region of Niagara actively engages with high-schools, promoting the water industry and allowing students the opportunity to shadow certain employees. The City of Guelph has also taken to promoting wastewater by going into the public schools and introducing the industry as a "noble profession", identifying its broad importance and connections to environmental health and safety (Participant E). While the program's success is unknown, it represents a novel way to approach a problem. High turnover due to retirement is expected to continue well in to the 2020s. If a program like Guelph's can convince young adults to orient themselves toward a career in water or wastewater services, these young minds could become future professionals whilst retirements continue to be an issue.

4.3 Professional Networks

The demographic literature addressed the challenges that retirements are expected to create for various industries and job sectors. Articles identified the various trends and forecasted concerns at least a decade into the future. However, literature focused on organizational networks

remained limited in addressing how the Boomer exodus would affect inter-organizational

cooperation and interconnectedness. Given growing stakeholder involvement in decision-making

processes, network extensions and increasing inter-organizational collaboration was addressed in

interviews.

4.3.1 Cooperation and Collaboration

For the purpose of this study, collaboration refers to "stakeholders of a problem domain

engage[d] in an interactive process, using shared rules, norms, and structure to act or decide on

issues related to that domain" (Wood and Gray, 1991: 146). Collaboration includes sharing

resources (Mattessich and Monsey, 1992). For the purposes of this thesis cooperation and

collaboration included inter-organizational relationships where stakeholders have an equal voice

in shared decision making, as well as hierarchical relationships where one organization acted as

regulator to another. Using this definition, inter-organizational collaboration was identified as

important in maintaining or achieving mandates and goals across all organizations participating

in interviews.

> To me it's critical. In my opinion it's a key aspect of success for a
> project. It's making the contacts, knowing the people that make the
> decisions, working with them to understand what their needs are,
> what their concerns are, and then trying to work that into your
> project the best you can. (Participant C)

One participant included undertaking partnerships to further conservation and environmental

enhancement as a key organizational mandate for the NPCA.

Many participants listed organizations they cooperated with, working toward successful

resolution or collaborative goals. These included a mix of provincial authorities (Ministry of

Environment, Ministry of Natural Resources), crown corporations (Ontario Clean Water

Agency), regional conservation authorities, municipal authorities, professional organizations, colleges and universities, industry, and the public, although the public or citizens as a significant stakeholder was seldom discussed.

Within existing partnerships, relationship strength was particularly important. Participants mainly discussed the collaborative role toward achieving similar goals and mandates. However, cooperation amongst organizations with conflicting mandates or with competing power structures was equally valued. Participant I discussed the complicated nature within existing relationships and exchanging roles as a regulator, co-regulator, and partner. Participant M highlighted the need for strong relationships, even between organizations with competing mandates:

> Our good friends at the Ministry of Agriculture, OMAFRA, they oversee the Drainage Act. And the goal of the Drainage Act is to drain lands to provide good farm land, good pasture land. When it comes to wetlands, the goal of the Drainage Act, and the folks at the Ministry of Ag and Food, is to drain the wetland. And that piece of legislation is in direct conflict with the Conservation Authorities Act. We still try and work together. The more civil, the more diplomatic one can be…you don't have to agree, but it helps to achieve mandates and goals at the end of the day.

The evidence provided across all interviews suggested that partnerships, collaboration and cooperation were important toward achieving success. This included cooperation between agencies working toward one goal, as well as agencies whose mandates conflict. The recognition from participants that professional networks were important components toward achieving success corresponds with the literature that suggested greater stakeholder involvement is increasingly viewed as indispensable (De Loë and Kreutzwiser, 2007; Government of Canada, 2005; Rahaman and Varis, 2005). It also supports Shrubsole's (1990) notion of complicated,

sometimes overlapping responsibilities within the water industry, from a social and technical standpoint.

4.3.2 Retirement Effects on Networks

Participants were asked if large scale retirements within their broader organizational network could perceivably affect job efficiency or attaining individual mandates. The evidence was not strong enough to support or deny the claim that retirements would affect job efficiency. Two participants supported the claim that such retirements would have inter-organizational significance. The remaining twelve participants argued that inter-organizational disruption might depend on a variety of factors, if disruptions happened at all. Problems or delays presented by retirements depended heavily on the specific position being vacated and how extensive retirements might be. Participant G stated that if someone retired from a position responsible for engineering application approvals, their absence could produce delays down the chain.

Likewise, addressing an extensive loss of personnel, Participant M discussed Hamilton's amalgamation with surrounding townships in 2000. Several employees were laid off while others who retained employment were given responsibility over expanded areas with which they were less familiar, including not knowing where files and certain documentation were located. The loss reduced consistency and corporate knowledge, and had reduced intra-organizational cooperation as departments were not communicating with one another. Participant M labeled the amalgamation a "disaster." "The city of Hamilton is still, in my mind, crippled by that move."

While the examples above highlight specific scenarios, eight participants identified that retirements could disrupt individual inter-organizational relationships that have been fostered over years. Participant C stated, "It's making the contacts, knowing the people that make the

decisions; working with them to understand what their needs are, what their concerns are, and then trying to work that into your project the best you can." All of this takes time. Ending a relationship between cooperating organizations can represent losing mutual understandings and underlying systemic knowledge. It represents a loss for each organization that benefited from the outgoing employee's knowledge and experience. Yet, although the potential for loss was identified, there was little concern about such a scenario. While a brief catch-up period may be required for a new employee to establish a report, organizational depth and proactive management were identified as mechanisms adequate to avoid serious disruptions (Participants E and M).

4.4 Strategies for Succession Planning

With an aging workforce significant attention has turned toward mitigating anticipated concerns. This section addresses existing mechanisms in place to ease succession, as well as what plans participating organizations have in mind moving forward. Currently literature has placed significant concern on retirement numbers and difficulties in talent recruitment. Yet, suitable organizational preparedness and succession planning would limit or reduce detrimental effects that employee turnover might produce, and so it should be considered. When asked outright if retirements will affect productivity and achieving organizational goals, Participant E, a workforce planning and development specialist replied:

> I don`t think it will right now because we are aware of the situation
> that`s coming and we`re taking steps to try and reduce the loss of
> knowledge. So I think we`re in good shape, but we`re taking it
> seriously. It definitely requires intentional energies towards it.

While Participant E`s statement spoke to reduced concern with respect to upcoming retirements, it suggested that proper planning was fundamental to mitigate predicted difficulties. Being aware

of upcoming retirements has allowed a proactive approach that has, in Participant E's case, reduced associated concerns for organizational succession. However, reduced concerns should not imply reason for complacency. Proactive efforts should be maintained. Several strategies exist that focus on organizational knowledge management with respect to succession efforts.

4.4.1 Information Documentation

Increased procedural documentation was noted as one strategy to reduce knowledge loss. Among participating organizations formal mechanisms toward documentation existed, such as standard operating procedures (SOPs) or performance metrics. Referring to office staff, Participant M described the NPCA as a "knowledge-based organization" which described the degree that "a company's products or services have knowledge at their core" (Zack, 2003: 67). As such, capturing knowledge through documentation processes was important to all participating organizations.

As it pertains to documentation, meaningful changes, decisions, processes and activities are filed in reports, work logs, and mapped. Six participants (A, E, H, I, J, and L) identified a movement toward more documentation (codification) over the past two decades. This included a movement toward improved computer-based information storage programs, like the use of GIS at the City of St. Catharines. Increased or improved documentation was seen more as a prudent practice than as a useful mechanism to capture knowledge. Participants E and H identified implementing formal documentation processes as a mechanism specific to capture tacit knowledge from near retirees; neither mentioned any associated drawbacks. Other participants identified standard operating procedures for documentation, asset and quality management programs and GIS-based

systems as formal mechanisms that strengthen knowledge retention (Participant A, B, E, F, J, L, and N) .

Even with formal standards for documentation, several problems were identified. For one, Participant I identified employee diligence as a possible barrier. Despite standard procedure, Participant I referred to a search for a missing document that was to be found in an employee's inbox. "That's not supposed to happen. But it did happen. But you know what? I could see it happening because we do a lot of stuff by email." In this particular example the employee had transferred to a different office. And while the needed document was recovered, it may easily have been lost in the transition, highlighting the importance for formal documentation procedure and compliance.

Although an employee failing to follow standard operating procedure represented one barrier, the documentation system itself can create the setback. Issues highlighted by participants were system attractiveness, usefulness, and effectiveness. Participant D and J both addressed documentation system appeal to the general worker:

> [The] actual system is not a great tool. It's very cumbersome.
> Nobody likes it anyways. (Participant D)

> One of the challenges we had with that is that no one wanted to
> use the new system because it was like the old system. But if there
> was a mistake [with the old system] it wasn't as silly and passed
> on. (Participant J)

Despite acknowledging reservations to changing systems, Participant J recognized benefits that shifting their system would create, including better accessibility and ease to keep up to date.

While being useful and appealing to the general employee is important, the largest deficit

recognized across several interviews addressed retirements. The documentation processes are

simply not effective at capturing fine distinctions in job processes.

> As we're moving ahead we're confronting these pieces. And they
> are available to the city to go ahead and provide input knowing that
> despite best intent, or intents, that really, we're not going to capture
> everything through [documentation]. That's been the approach thus
> far. But I'd argue in any environment that there's going to be a bit
> of a gap associated with someone leaving (Participant N).

In recognizing values of documenting processes Participant J admitted that the system is not built

to catch nuances that are elicited through firsthand experience. Participant F illustrated this point

in describing the organization as a complex system, acknowledging that ample documentation

was available, but documented information did not necessarily facilitate a broader, more familiar

system understanding.

Despite certain criticisms of documentation processes and systems, the procedure was

recognized as important within all participating facilities. It captured historical data and

decisions made, and acted as an institutional encyclopedia. However there was less enthusiasm

for documentation as a mechanism to capture knowledge on the brink of being lost. Instead,

other mechanisms aimed at employee retention showed some promise.

4.4.2 Flex-time and Phased Retirement

The literature suggested that providing 'flex-time' and the opportunity for phased retirement

were strategies that could help attract, transition, and retain employees if adequately structured

(Bradley, 2010; Burke and Ng, 2006; Morissette et al., 2004; Pignal et al., 2008; R.A. Malatest

and Associates Ltd., 2003; Rappaport et al., 2003). Flex-time provides flexibility within a

defined work week schedule, including, but not limited to compressed work weeks, bankable hours, and permanent schedule modifications. Phased retirement entails a transition into retirement, moving from full-time to part-time and reducing the individual's responsibilities. A discussion of flex-time with various participants identified that this strategy was not always appropriate and has varying interpretations. Flex-time was determined to be inappropriate for service-oriented position or in jobs requiring specific oversight (e.g. job site foreman) or 24-hour operations. Beyond these limitations 12 of 14 participants identified some flexibility in relation to work hours; however, this flexibility varied considerably. It was defined variously as being able to: shift work hours from one day to the next as long as total weekly hours were met; to a permanent change in daily work hours, but still working defined hours (e.g. working 10 to 6 instead of 8:30 to 4:30); or, a reduction to part-time employment.

The literature suggested that having flexibility regarding hours worked may attract workers as well as retain workers who enjoy the benefits (Hewlett et al., 2009; Pignal et al., 2010). In some cases the attraction was clear. "We do have that flexibility, and you know, that's really appreciated. Those are our great intangibles that come with the position in my mind" (Participant C). However, with varying programs between organizations it was difficult to adequately assess whether an individual program had any effects on workforce stability.

Unlike flex-time, responses toward a phased approach to retirement were more consistent. Many participants agreed that this option was in many respects attractive (A, C, D, J, H, I, K, and N). Certain respondents likened it to their organizations' rehiring an employee post-retirement for contracted work. Such post-retirement contract work was described as it retained knowledgeable employees often considered more efficient at their jobs. This contract work freed other employees to work on alternative assignments, allowing the organization as a whole to achieve

their mandate more efficiently. Contracted work also could be structured to reduce the demanded

work hours, effectively allowing for a more transitioned retirement process. Although contracted

work had been implemented with successful outcomes no organization had any formal program

in place toward phased retirement options. As 6 of 7 organizations interviewed took part in the

OMERS (Ontario Municipal Employees Retirement System) pension, rules prohibited or

discouraged moving from full-time to part-time as a method to phase into retirement. "It would

affect their pension, because you get your years of service based on the hours. You need to work

full-time hours to get your years of service in," clarified Participant H.

Although current rules discourage a phased transition, opportunities were identified:

> Now the legislation is changing for that where people can actually
> retire and draw their pension for some days of the week and work
> and still contribute to their pension for the other days of the week.
> Our pension, OMERS pension has not bought into that yet…But I
> speak with people in HR from other [organizations] and they're
> talking about maybe approaching OMERS and putting that
> pressure on them to say, you know, well we actually are interested
> in this for these very reasons. (Participant H)

Participant H acknowledged that the request had been made in the past for similar

accommodation, but upon explaining the implications to their pension the employees who made

the request were no longer interested.

While current regulations discourage phasing into retirement, there may be momentum for

change. Past requests by employees indicated interest in such a change, and in stating the

expertise and efficiencies that certain senior employees add, it seems organizations would

similarly have an interest in facilitating phased approaches to retirement. Yet adequate

succession planning needs to consider not just retaining talent, but training new staff and

continuing ongoing education within the workplace for continued future growth.

4.4.3 Training and Programs for Continued Growth

The literature suggested concerns for incoming talent, often mentioning the importance of ongoing training, but seldom suggested successful methods for moving forward (Dychtwald et al., 2004; Lesser and Rivera, 2007; Stam, 2009; Steiger and Fillichio, 2007). Much like flex-time, how different organizations approach training varied considerably. A less hands-on approach was described as, "Learn on the go. Learn by your mistakes. Learn on the fly" (Participant D). Conversely, some offered a more phased approach where after corporate orientation or legislation familiarization, a new employee was placed in his or her working group and assigned to certain tasks or activities that would progress in difficulty as the employee became more familiar with goals and expectations. Training for one organization required fulfilling defined tasks to be accomplished in the probationary period (Participant E).

Various programs identified by participants offered an active, hands-on approach to training. There are stark differences between training and orientation to entry level positions versus senior level positions. There is the expectation that those entering senior level positions are progressing up the corporate ladder and so have received significant training in-house. An alternative expectation was that those acquired from outside are hired based on their proven capacities toward leadership, management, and delegation, and so require less training. Many participants (A, B, E, I, J, L, and N) identified hiring internally as attractive or promoted when possible. Participants A, B and F identified that employees recognized for their capacity and skills or who wish to advance were often encouraged to pursue senior positions. This was sometimes facilitated through secondments or in developing smaller projects for these employees to manage in an effort to develop their confidence and skills suited to a more senior position (A, B, F, and M). Beyond being groomed for future leadership, if individuals felt their skills were inadequate

or require improvement, all organizations provided courses or financial resources to allow employees to upgrade their skills. Although budgetary considerations where noted as a current restriction to training at the Ontario Ministry of Environment.

Ongoing learning was a strategy identified by all participants with the exception of participant K who suggested that, in their office, opportunities to upgrade competencies were not facilitated unless an employee was specifically targeted for succession. When opportunities for ongoing learning were not available it was generally a budgetary issue or course availability conflict. Participant I recognized that in the past the budget allowed for more in-house training opportunities, but fiscal restraint within the past year had reduced opportunities. "All training is off the table since last year unless it's the mandatory health and safety training" (Participant D). Course availability was also an issue highlighted. Participant I identified a specific course that had not been offered in the past six years that would be an asset to his position. He noted that in the last few years continued learning had been increasingly facilitated by e-learning programs, of which program quality was described as "not necessarily up to snuff."

Beyond some existing barriers (budgetary constraint, unoffered courses), 6 of 7 organizations offered strong programs for personal improvement that supported ongoing learning. Municipalities and conservation authorities often covered partial or full cost of courses depending on applicability to a certain job or career path. Participant J stated that the City of St. Catharines will partially cover non-career related courses as well, such as a cooking course. The Region of Niagara not only creates a corporate learning calendar which includes interpersonal and management type courses, but its wastewater division also puts out a learning calendar unique to its needs which includes various training courses. Beyond funding for individual courses, municipal and regional authorities also identified tuition assistance programs, where

employees looking to return to upgrade their degrees are partially or fully funded. Discussing one employee utilising tuition assistance, Participant A explained, "…we're working with him on his project as well. We're giving him a life example that he can use for his masters." The support for ongoing learning extended beyond classrooms, with organizations encouraging employees to attend seminars, conferences, as well as exposing themselves to other municipalities, developing mutual learning and growth.

Where programs existed or are being developed, administrators, directors, HR representatives, managers and supervisors alike described programs fondly and enthusiastically. All participants indicated a strong support for development opportunities, so long as course quality remained high. As far as knowledge management was concerned, training and continued education is among the most conventional means to insure knowledge continuity. However, workplace culture has a defining role as well.

4.4.4 Culture and Engagement

Workplace culture influences knowledge building (Lecroy 2010). Schein (1990: 111) defined culture as a "behavioural, cognitive, and an emotional process" of how a "group solves its problems of survival in an external environment and its problems of internal integration." Schein (1990) elaborated:

> The strength and degree of internal consistency of a culture are, therefore, a function of the stability of the group, the length of time the group has existed, the intensity of the group's experiences of learning, the mechanisms by which the learning has taken place (i.e., positive reinforcement or avoidance conditioning), and the strength and clarity of the assumptions held by the founders and leaders of the group (111).

Schein's depiction described both the internal, external and driving influences of organizational culture. Lecroy (2010) identified openness and constructive critique as important cultural precedents to knowledge building. Among the most decisive findings from the interviews were that public water professionals identify with organizational goals and commitments. Responsible for utilities used by family, friends and coworkers, employees developed a sense of responsibility. Municipal workers' expressed a commitment to the community. "This is their family. This is their friends. There's ownership" (Participant A). Among words used to describe their fellow employee were committed, passionate, motivated, enthusiastic, and professional.

> When we had the hydro blackout a couple of year ago people didn't have to get called in to come into work. They pedalled in on their bikes. They came in because they wanted to make sure that the water was being delivered safely. So they take great pride in what they do. Is that a culture that necessarily comes from the [corporate values]? Maybe it does; but also that culture of respect of what the service they're providing [is]. (Participant L)

When asked about workplace culture several participants reflected on previous experience in the private sector. Participant C discussed how the private sector runs on billable hours, where as a public worker he felt there was more value placed on quality. Reliability is built into the job regarding expected daily hours, expected daily workload, expected yearly workload, and job security. This consistency allows employees a greater freedom in scheduling their lives. Participants C, M, and I alluded to the work-life balance, in part resulting from arrangements like flex-time, feeling that it was a large attraction to the job. And it was suggested that the lifestyle that public service affords its employees may attract a certain type of individual. As stated by Wright and Christensen (2010: 156), "given the pro-social and service function of the public sector, it is also not surprising that the public sector may be more likely to employ individuals

who value helping other and being useful to society." Perhaps this encourages the positive organizational culture mentioned above.

Yet, not all cultural aspects were as welcomed. Some respondents (C, F, K, and N) said that the public sector fostered risk-averse behaviour. Participants consistently extolled the virtues that come with avoiding risk; however, participants F, K and N submitted that a little more risk in decision making might be a welcomed change.

> I think we need are more creative folks, more risk takers, more
> innovators (Participant K)

> The Region is very risk averse. And that's actually one thing, [we]
> are open to changes, we are open to innovation. And sometimes
> you get stuck because of being risk-averse (Participant F).

Despite many complements to organizational culture, some participants (K, F, M, and N) noted that there may be momentum for change. Often it was the most senior employees identified as barriers to change, falling out of sync with broader organizational attitude. Perhaps an indication for change, Participant N remarked, "I would imagine that as we see that transition we might see a larger appetite for some newer direction as to how things are happening." Such a transition does not necessitate retirement. However, providing new opportunities for senior employees may facilitate organizational transition altogether.

4.4.5 Push and Pull

The preceding sections referred to push and pull factors discussed in Chapter Two. Among those mentioned are positive workplace culture, flexible accommodation, valued experience and learning and development opportunities. Both tied to valued experience and increased learning and development opportunities, providing a challenging workplace is also identified as a pull factor. Among notable strategies to promote challenging and learning environments, three

participants (A, B, and J) also noted the use of job rotation; although Participant A identified that barriers limit the organizations ability to provide such rotation. Like the multi-benefits associated with mentorship programs, job swapping promotes learning and development along with providing a challenging work environment which may increase an employee's perception to find more value in the work they perform. Beyond pull factors job rotation has the added benefit of knowledge building and transfer.

Push/pull factors were difficult to assess as they vary based on individual value. For example, for one employee, providing flexible accommodation, valued experience and learning opportunities may not create a pull strong enough to overcome a negative workplace culture; perhaps pushing an employee into early retirement. For another, flexible accommodation alone may be perceived to make up for a negative work environment. As it applies to participating organizations, all offer various strategies to improve pull factors.

By nature of being a public provider participating organizations also encountered limitations concerning their ability to draw in talent. For instance, public organizations have little-to-no room to adjust compensation rates. Despite such challenges several organizations identified clear efforts to increase pull incentives, including: pushing for pension allowances, considering rotational opportunities (periodically changing an employee's role within the organization) and implementing mentorship programs.

4.4.6 Mentorship

Formal mentorship has been recognized as a useful strategy for transferring knowledge (Heimann and Pittenger, 1996; Hunt and Michael, 1983). It facilitates employee growth, as well as retains valued employees; perhaps supplying a role that lets employees ease into retirement

while still maintaining a meaningful function. No participating organizations had a formal

mentorship program, but most participants (12 of 14) recognized informal mechanisms that filled

a similar role. Participants often referred to their open-door policies along with an approachable

workplace culture that promoted asking questions.

Despite lacking formal programs, some employees discussed having a mentor during their

career.

> So he came [to] our department and basically kind of mentored me
> for two and a half, three years on the water side – kind of the
> infrastructure planning side. And that was unbelievable. The guy
> ran a company for 25 years; his own company. Kind of knew the
> industry inside-out and backwards. Could do all aspects of design,
> construction, long-term planning for infrastructure. And a lot of
> what he was doing was all on paper. That was the beauty of it. So
> here we use all these sophisticated computer models now, but he
> was doing stuff and coming up with the same answer and doing
> things on paper – and in half the time too. So there is a really good
> example of having someone come back and mentor your staff, and
> transfer some of that knowledge. It was just an unbelievable
> opportunity. (Participant C)

> And the bulk of knowledge is hard to transfer, right? Because
> that's…with those two individuals in particular that have left in the
> last couple years, I spent time with both of them before they left,
> picking their brains on stuff. And one even left me a fairly lengthy
> list of stuff that he thought I should know about. (Participant I)

Both participants discussed the value that time spent with senior employees provided. Seeing

how things are done and learning from others' approaches to work can be valuable, as it was for

Participant C. Alternatively, the mentorship scenario presented by Participant I alluded to the

fact that even with organizational documentation procedures important knowledge to be passed

on may not have its place in the system, and so, was transferred through a mentorship role.

Being able to transfer organizational knowledge that has no place within the documentation

process speaks to the role mentorship plays, specifically in attending to tacit knowledge transfer.

The nature of tacit knowledge makes it difficult to codify and as such difficult to capture in

formal documentation processes. As a result, conveying tacit information relies more on

capturing this knowledge through personal exchange and first-hand experience. Addressing this

same idea, Participant D accepted that some information needs to be passed through

conversations.

> That stuff would only be passed on in a way like ancient story
> telling; brain to brain, conversation to conversation – people
> remembering it. Because there`s nowhere to really put that stuff.
> And so you rely on that human interaction. (Participant D)

 Participant D acknowledged that as far as information goes, formal documentation is not always

the most appropriate medium to capture knowledge.

Though formal mentorship programs were absent, participants from the GRCA, the City of

Guelph, and the Region of Waterloo all identified plans, or at least conversations in moving

toward formal mentorship programs for succession planning. For the City of Guelph a formal

program may become a reality within a year's time:

> I haven't seen that the greatest amount, basically retaining
> individuals beyond the fact that they may serve their useful career
> and come back in another capacity. You know, I think there's
> certainly opportunity to do so. You know, coming from a
> municipal environment previous to the City of Guelph you saw a
> lot of individuals in turn retire, take a week off, and come back in a
> separate role of a lesser capacity. So I'd say from a human
> resources perspective that there are new policies being rolled out
> currently; looking at either a shared role, such that there would be
> 20 hours per week per individual in a role. So you still have that
> past individual there to mentor and coach and provide context that
> might not be there. But yet, kind of ease that transition. There are

some new opportunities, that being said, to do that. So I think we might see more employment of that. (Participant N)

Providing continuity during a transition could be helpful to phase people into new positions, or into retirement. When asked how long it takes to become comfortable in a new position, participant responses ranged from one year to five years.

Really I'd say from weighing all those options, you're probably looking at the two year mark to where you're really starting to be comfortable in your role. Understanding what flexibility is there; what opportunity is there beyond what is very much defined. Starting you as a leader in the organization, what authority you had perhaps to engage others in the industry structure, and have some confidence that you can go and start to talk about what the city's participation might look like; and not have to worry too much about what's past precedent, or what have you. (Participant N)

It is evident that transitioning into a new role takes time. By retaining experienced employees, mentorship programs provide organizational continuity, and could help facilitate other employees into their new roles. Additionally, experienced employees were identified as particularly efficient at their job. Providing an opportunity for senior employees to remain with the organization not only retains them as a knowledgeable resource, but helps maintain continuity as employees adjust to their new roles. Though mentorship programs can in part be aimed at retaining experienced employees, they more aptly function as mechanisms for succession planning. They not only facilitate introduction and orientation to incoming employees, but help situate the next generation of young water professionals.

4.4.7 Incorporating a Younger Workforce

While participants were aware of concerns surrounding aging workforces many were quick to point out the advantages new employees can bring to a workplace. Advantages mentioned

included creativity and fresh ideas, energy, motivation, drive. Some of these characteristics may simply be a product of excitement that comes along with a change in setting; alternatively, it may result from new employees not being fully aware of the existing corporate boundaries.

Although hiring internally was mentioned at 6 of 7 organizations, Participant M suggested that when an organization hires from within there are both benefits and drawbacks. For instance, organizational knowledge would be an asset; however, hiring an employee internally may come with "baggage" (Participant M). So in some respects hiring new professionals is valued as these employees have not had the time to develop bad habits or become jaded with certain organizational processes. Conflict presented by outgoing knowledge was also considered as an opportunity.

Given positive attitudes directed toward young professionals, how to attract talent becomes central to transition. The literature suggested that young professionals place high value on leisure and lifestyle (ECO Canada, 2010; Hewlett et al., 2009; Kofman and Eckler, 2005), and this has not gone unnoticed by the respondents.

> We're seeing that where the difference is…is that we've been successful in recruiting from consultants, in that young people who are joining us, they want a more balanced lifestyle. And that's what we can offer. You have more control over your work day and it allows you to have more control over you home life as well. So that's where we're able to attract, and we've been apparently successful. (Participant L)

It is clear the opportunities provided by workforce transitions are recognized. Yet, the draw for new employees is one that exists across the public water workforce in general. The workforce involved with water and wastewater was described as a small community (A, L, M, and N). Participant N noted that there was significant movement within the workforce but relatively little

"new blood" entering the field. Noted by Participants E and L, conservation and water/wastewater services are not elicited as exciting professions. With few new entrants into the field, when a municipality or regional authority fills an open position it may very well have resulted in a new position opened at a conservation authority or different municipality. Even as opportunities presented by young professionals are recognized, municipalities, conservation authorities, water utilities and regional authorities may be each other's strongest competition. Though many organizations recognize difficulties in hiring talent they seem to be finding excellent candidates to fill positions.

Chapter Five: Discussion

5.0 Discussion

"Puzzles have solutions, governance challenges only elicit responses." (Paquet, 2006: 39)

This study's purpose was to answer the research questions about how public water organizations would be affected by retirements, and if they differed from other organizations; would retirements affect cooperation or collaboration within the network; and, what strategies are the most appropriate to mitigate expected challenges. The first of these research questions was based on the assumptions from the literature that retirements would create significant concern among varying agencies. Little research has been completed as it pertains specifically to public water organizations. The research that has been done specific to the industry has relied primarily on survey data. It was my hope that this research would provide more insight to the existing opinions within the public water workforce. To address retirement effects on an organizational level I answered: 1) Are upcoming retirements deemed significant by participants? 2) What knowledge will be lost through departures? 3) How have organizations prepared for workplace transitions? and 4) What are the existing attitudes toward the retirement generation?

This chapter discusses interview data as they relate to the existing literature. It responds to the research questions and highlights concerning issues, in comparison and contrast to existing research.

5.1 Are Water Organizations Different?

This study purposely focused on public water organizations to understand if they would be affected differently than other organizations studied within the literature review, and to understand what existing concerns might mean for municipal water and wastewater services and

municipal and regional conservation goals. Using the data attained from interviews, little can be said to distinguish public water organizations from others identified in the literature. There is some expectation that technical and operational expertise will vacate organizations via retirements, yet these areas were not identified as areas of concern. Technical and operational expertise, like other knowledge can certainly be honed through increased experience; however, they could generally be defined as explicit knowledge. Moreover, certifications help define levels of technical and operational expertise. This makes assessing knowledge stocks a less ambiguous process.

Much like the literature senior positions requiring management or leadership roles were addressed as a stronger concern. Participants discussed history, soft-skills and nuanced knowledge gained over a career as important information to be exiting organizations. However, how leadership skills or a history within public water organizations differ from previous studies of other industries could not be distinctly articulated. As such, little could be argued to distinguish public water organizational concerns from other public industries.

5.2 Organizational Expectations

The vast majority of the literature addressed Baby Boomer retirements as they applied broadly across industries both public and private. Very few studies focus on retirement issues at an organizational level. As a result, future expectations attributed toward an industry may not reflect the opinions when the focus is reduced to individual organizations.

5.2.1 Concerns About Aging

Identifying retirement concerns may depend on how the issue is scoped. Identifying trends in a small town may not be representative as one broadens the scope to include the greater region, or

province. A broad picture is often presented when addressing the demographic transition into retirement. As many articles share a broad view, existing nuances regarding industry or organizational structure may be overlooked.

Although concerns for an aging workforce were recognized among interview participants, there was little evidence to support the crisis rhetoric appearing in some past studies. While lost organizational knowledge and experience from retirements were considered to be relevant to workplace capacity, identifying retirements as a source of concern for succession planning largely received a muted response by participants. The two main reasons for such a response were: 1) low retirement forecasts; and 2) organizational preparedness and succession planning.

Several organizations identified low turnover and a young workforce within their organization within the last 10 years. As such, retirement rates simply do not match those identified in the literature. Many participating organizations predicted near-retirement rates below Pignal et al.'s (2010) modest 20% forecast. All organizations were below the rates of 60% for "rank and file" by 2017 projected by Steiger and Fillichio (2007: 77). While the participating organizations will likely witness higher retirements compared to past years, many participants were little concerned.

Organizational depth, job consistency, and predictability were considered as strong assets to mitigate knowledge loss. Details and worksites may change, but organizational mandates, expectations, and general approaches remained fairly consistent. Such consistency rewards organizations during transitions. Positions are not necessarily filled internally, and though drawbacks were highlighted, the attraction to promote from within was mentioned by many. Despite the baggage or bad habits that may follow an employee promoted to a senior position,

prior experience with the organization is for many reasons an asset. Several participants noted actively approaching or promoting skill development by employees within the organization for it the intent on promoting and filling positions from within. This suggested strong perceived benefits to filling positions with existing employees, retaining talent within the organization.

All participating organizations were responsible for municipalities or regions with populations over 100,000; several organizations representing much more. Belonging to a medium to large community allowed for larger organizational representation, and for increased organizational depth. All participants recognized that knowledge will be lost through retirements; however, only three participants believed this loss would be likely to affect workplace efficacy. It was noteworthy that smaller municipalities and townships were judged to be far more likely to suffer from knowledge loss due to retirement, and as a result future studies may need to concentrate on these specified areas.

5.2.2 Knowledge Lost

Despite minimal explicit recognition that retirement would affect individual organizations all participants acknowledged that knowledge and expertise represented within retiring workers would represent a loss for the organization. Consistent with the literature, participants overwhelmingly highlighted senior positions as the most likely to become vacant. Although several participants discussed technical and operational knowledge as important in the workforce, this information was largely regarded as transferable. Soft-skills and historical experience were most strongly identified as important knowledge to be reduced through retirements. This knowledge was simultaneously identified as more difficult to transfer, often based on the nuances of personal experience.

Although being able to preserve such knowledge and information was seen as an asset it appears that retaining such knowledge was not deemed top priority for organizations moving forward. Given the open opportunity to address future concerns, retention ranked second to recruitment. Moreover, retention was rarely specified toward knowledge capture or near-retirees, but instead suggested retaining current and mid-career workers' talent, as the successors to senior positions. While attention was not concentrated on near-retiree retention and knowledge capture, the worth that senior workers represented to each organization was strongly valued among participants. However, succession was the primary focus.

5.2.3 Succession Planning

Three organizations interviewed (Region of Waterloo, Region of Niagara, and the City of Guelph) were at, or slightly above the (modest) 20% retirement rate projected by Pignal et al. (2008). Not surprisingly, these three organizations considered this demographic transition as serious and likely to affect organizational knowledge. However, these institutions support pull incentives with ongoing learning opportunities and were supporting succession planning efforts, considering or working towards implementing mentorship and rotational programs, as well as promoting the water and wastewater industry in public schools in an effort to increase the profile an importance public utilities. One participant identified succession planning as a top priority.

The organizations all identified strong training, ongoing and facilitated learning opportunities, and a proclivity to identify employees who would be good candidates for succession. In some cases employees being groomed for management were made responsible for managing small projects in an effort to develop the skills necessary for future leadership positions. This guided transition is a valuable tool for learning, as well as developing skill sets and a better

understanding for the expectations regarding future projects. Strong succession planning was explicitly identified when justifying reduced concern for retirements.

While aging workforces are particularly relevant within certain agencies, those organizations with turnover rates that might be deemed 'problematic' were taking proactive approaches. The American Water Works Association, Canadian Water and Wastewater Association, and Federation of Canadian Municipalities have all written reports on the aging workforce and municipal infrastructure, and as members of these associations, retirement issues were not new to participating organizations. Perhaps this early exposure to concerns is to be commended for prompting action.

5.2.3 Optimism

Even when retirements were expected to be significant, many organizations expressed optimism about hiring young professionals. In some cases offices were identified as having a younger than average staff, consistently described in positive terms. Moreover, some participants saw benefits to incorporating new blood into the organization. Other participants stated there was room for organizational change that is being stifled by near retirees who might prefer familiarity and consistency as they near retirement.

The literature suggested that Generation Y attitudes interconnect with the benefits offered in public positions. Koffman and Eckler (2005) identified continuous learning, job security and work-life balance as key factors in attracting Generation Y professionals to positions. For most participating organizations, these benefits are something they can offer and promote to attract talent.

5.3 The Talent Gap

When it comes to the talent gap, interview responses tended to match closely with existing literature (Gordon, 2009; Kieran, 2001; Stone, 2006), identifying difficulties to recruiting. When positions became available organizations recorded no issues with applicant numbers, but many identified difficulties finding applicants suited to the position – i.e., a talent gap. When given the opportunity to discuss the future concerns expected by participants in the coming years employee recruitment was atop the list. Given lower workforce entrant numbers the literature suggested that immigrant labour will become relied on to help address retirement concerns (Burke and Ng, 2006; R.A Malatest and Associates Ltd., 2003). Likewise, participants identified immigrant labour as a potential pool for under-utilized talent.

5.3.1 Foreign Talent

Using foreign talent to fill organizational gaps was a theme that emerged from both interviews and the literature. While barriers exist to hiring immigrants and new Canadians, it is suggested that a pool of talented water and wastewater professionals exists. Not only are many foreign professionals fit for employment, but their global experience might be considered an additional asset. Two participating organizations that discussed hiring foreign professionals described these employees as an asset to the organization.

There is no question that many existing barriers were created with safety and precaution in mind. However, as the workforce becomes more dependent on immigration to fill Canadian jobs, it might be worth considering what options exist to facilitate these professionals` entrance into the workplace.

5.3.2 Job Appeal

As was suggested in interviews as well as the literature, the water and wastewater profession may suffer from its muted appeal. As noted by participants, open positions often received many applications suggesting there is indeed interest. However, the talent gap suggested that younger generations are not directing their career path specifically toward water related professions.

Co-op programs, an approach all participating organizations used, were one avenue to promote water related professions. However, to increase job appeal public water organizations may have to change tactics in promoting the industry, or perhaps becoming more innovative. One such innovative approach is the City of Guelph`s engagement in local public schools promoting the water and wastewater profession as a noble career path, and providing its links to environmental health and safety. Although such a program does not address immediate concerns regarding retirement, its long-term approach may serve to reduce waning talent pools in the future. Similar programs adjusted to university and college entrants, highlighting the opportunities in water and wastewater related fields, may also help increase future candidates in the near future.

Alternatively, a more conventional approach might be to promote the benefits of public service. The literature suggested that the benefits that public employment can often coalesce with Generation Y values. Similarly, the benefits offered in the public workforce were described by participants as positive intangibles. Often times participants referred to office culture with the common quote "work to live, not live to work", which, in the literature, was often attributed to Generation Y. Perhaps changing the message may attract more fitting applicants.

5.4 Network Complications

The second of three research questions examined if cooperative or collaborative efforts between organizations might be expected due to increased retirements. Although the literature is rife with examples that highlighted collaboration, retirements' effect on inter-organizational relationships has received scant attention. The increasing emphasis on IWRM strategies suggested increasing reliance on cooperation, and as such it was important to address foreseen challenges. All participants stated the importance of cooperative or collaborative networks in achieving organizational success. However, the idea that retirements at organization 'A' would have a meaningful effect on organization 'B' received a less corroborating response. Participants largely agreed that departures may have an effect, but is largely situational. Further research is needed to determine the extent to which inter-organizational retirements can affect relationships and workplace efficacy in a networked environment.

The literature proposed various benefits and drawbacks that organizational networks can produce. Among advantages were information exchange, saving time and money, as well as increased transparency and accountability (De Loë and Kreutzwiser, 2007; Thatcher, 1998). It was clear from interviews that collaboration was regarded as an asset to all participants interviewed. By sharing procedures, knowledge and challenges encountered, individual organizations are better equipped to respond to challenges they come across in the future. Additionally, individual organizations may be able to make slight adjustments to their procedural approach based on others' positive and negative experiences, making for a more efficient process.

While the Hamilton amalgamation example noted in Chapter Four illustrated a worst-case scenario, it demonstrated how losing employees can affect efficiency within the broader network. Moreover, it is not as simple as losing knowledge, but also having to rebuild relationships for employees replacing retirees.

As can be expected it takes time to find comfort in a new position. Participants estimated, on average, a two-year window to grow comfortable with new roles. This transition time applied not only to individual responsibilities, but also to building and understanding one's role within the network. Understanding your contemporaries, their habits, and approach to work were also skills highlighted that take time to develop. Consistent with the literature, the time required to become familiar with organizational culture, and develop meaningful relationships represents a drawback to network relations.

Concerns about network interruptions remained low despite a clear indication from participants that inter-organizational networks may be affected by retirements. Again, organizational depth was referred to as a buffer against reduced network efficacy. Moreover, strategies like identifying individuals who were likely for succession and incorporating them into discussions and plans prior to turnover in an effort to ease their transition were acknowledged. And while not all issues can be mitigated, it seems forecasting problems has been a significant asset to many participating organizations.

5.5 Succession Planning

The final objective of this thesis was to understand what measures have been taken to address succession planning and what mechanism might benefit participating organizations. Although the benefits of mentorship programs make it an effective mechanism for retention and

knowledge transfer, succession efforts need to consider multiple avenues. Given that participants identified recruitment as the top issue to be faced in the coming years, push and pull factors should be strongly considered.

 Despite discussing succession strategies without framing them as push or pull mechanisms all participating organizations had aspects that could be considered a draw to talent and a mechanism to retain existing employees. One of the more evident push mechanisms within the public workforce was the severely limited ability to affect compensation. Should financial consideration be an employee's strongest motivation public organizations and the water industry along with them might have difficulty retaining talent.

Despite this evident push participants identified a trend toward low employee turnover, with perhaps the exception of the City of St. Catharines' environmental services division. Although decision to retain a job or seek alternatives is largely influenced by individual motivation participating organizations executed several mechanisms to promote pull. Despite being difficult to actively manipulate organizational culture, all participating organizations were identified as having collegial cultures where employees take pride in their work; a large pull. Outside the City of St. Catharines all participating organizations identified some form of flexible accommodation, though often limited based on position. Participants agreed that flexibility was a welcomed benefit of the position, in some cases attributing it to the attraction of the job and positive workplace culture.

Though there might be some flexibility in accommodating modified work hours participants agreed that flexible accommodation remained unsuitable for many positions. Where organizations seemed to have the greatest latitude to affect positive change within the

organization was through ongoing learning. All organizations offered continuous learning options; some mandated, some suggested, and some self-driven—though financial constraint represented a current barrier.

The literature suggested that ongoing learning and challenging (i.e. mentally stimulating) work environments represent a pull (Jeffers et al., 2008; Hewlett et al., 2009; Kofman and Eckler, 2005). Learning programs certainly suggest aspects of mental stimulation; however some participants questioned the quality of current courses. Alternatively, the City of St Catharines executes some job rotation. The Region of Niagara noted self-directed rotation, but identified it as a strategy they would like to see more of given time and resources. As public water organizations are restrained in their ability to increased compensation, and perhaps limited in their ability to promote employees, job swapping (rotation) seems a positive mechanism to promote a challenging environment. It also promotes networking within the organization, as well as promotes increased learning, information sharing and depth within the workplace. Such rotation may be limited by requirements of a position—a position stated to require an engineer could not be rotated with someone lacking those qualifications—but when rotation is possible might offer similar benefits to mentorship programs.

5.6 Mentorship Programs

Although there are numerous strategies aimed at alleviating retirement pressures mentorship received recurring mention as an effective strategy to mitigate knowledge loss. Though pension policy adaptations might encourage implementing such a strategy, mentorship programs are unique in their ability to foster tacit knowledge transfer, as well as encourage senior employee retention (Aiman-Smith et al., 2006; Field, 2003). In effect, mentorships could help maintain

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organizational continuity, retain skill and expertise, in addition to creating a valuable and accessible resource to employees requiring guidance.

5.6.1 Facilitating Exchange

Aiman-Smith et al. (2006) highlighted the difficulty in transferring tacit knowledge, and the need for frequent interactions to facilitate this exchange. As considered by participants, beyond technical skill and corporate knowledge it is historical perspectives and experiences that were identified as assets, but are difficult to document. In fact, documentation was acknowledged as an inappropriate medium to capture certain information. Allowing the time for conversations to take place was suggested, which is ultimately what mentorships provide.

Within the literature there is strong support for mentorship programs. Although no interview participants recognized a formalized program in their workplace, most cited unofficial mentorship roles, acknowledging open-door policies and inter-office cooperation as positive cultural features. Occasionally, participants expressed, always in positive terms, the formative role that a mentorship played in their own development within the organization.

Despite some reservations regarding senior employees dissuading organizational change, the knowledge that their history and experience bring to the workplace was always regarded as an asset. As a mechanism to capture tacit knowledge mentorship programs present an opportunity. As a move toward a formal mentorship program is being planned in the City of Guelph and discussed at the GRCA, it may become an increasingly attractive option to employers. It also demonstrates that implementing such programs is appropriate and leading toward implementation.

5.6.2 Remaining on the Payroll

Beyond knowledge transfer, Aiman-Smith et al. (2006) declared that involving senior employees in a mentorship capacity may also increase retention. Morissette et al. (2004: 16) indicated that many retirees (60%) stated a willingness to remain on the job if given the right incentives. Moreover, they found that retirees who had university degrees were more likely to continue working under different arrangements. Given a stated willingness to remain on the job in a reduced capacity, mentorship programs may double as a strategy to fulfil near-retirees' wishes to remain on the job in a reduced capacity, as well as help organizations retain talent. Retaining employees that are eligible for retirement in a mentorship role would in effect create a transition period within the organization where employees new to positions would have direct access to experienced employees. Creating this overlap would ease new employees into their roles and facilitate experienced employees' transition to retirement, while maintaining a high degree of continuity and knowledge within the workplace.

Chapter Six: Recommendations and Conclusions

<u>6.0 Recommendations</u>

Labelling Baby Boomer retirements as a crisis is overstated. After talking to representatives from agencies in Guelph, Kitchener and St. Catharines, there did not appear to be the same apprehension that existed in the literature. This is not to say retirements are to be ignored. Most organizations identified the current demographic shift as important, and highlighted the knowledge and history that will exit the workforce as a significant loss. As a way to mitigate this loss organizations would be prudent to implement a complement of approaches with mentorship as a staple to a broad approach.

Four suggestions for creating a strong path forward regarding institutional knowledge loss resulted from my research.

1. Use diverse strategies to mitigate losses, with mentorship as a fundamental strategy:
Mentorship and rotational programs are successful at transferring intangible tacit knowledge. However, mentorship programs demonstrate the added benefit of retaining employees near retirement. These two aspects of mentorship explicitly address main issues regarding workplace knowledge gaps. Although mentorships promote continuity in workplace knowledge, they should not be relied on as the sole mechanism to address knowledge gaps. A balanced approach would be more sensible.

Organizations need to be aware of industry influences that attract, as well as those that deter recruiting young talent and encourage workplace departure. All participating organizations offered continued learning programs, although having the workers determine the value of these programs could be instrumental in determining their worth. If educational programs are not

valued or stimulating to the workers involved they may just represent an added cost to the employer.

Other strategies include job rotation, improved job promotion, and allowing for a broader talent pool by concentrating on increased investment in ongoing learning. Like mentorship programs job rotation is considered an attractive strategy to help transfer and maintain tacit knowledge within an organization. Although there are limitations to what positions can be swapped or alternated, job rotation promotes knowledge transfer and intra-organizational networking. It creates knowledge continuity when employees are promoted or leave the company. This continuity creates a resilience concerning knowledge loss. Changing roles within an organization promotes ongoing learning and maintains a challenging environment which has been argued as a strong pull mechanism across workforce demographics.

Rotational programs are argued to be more successful when directed at employees early in their careers. This strategy may be appropriately aimed at incoming generation Y employees who have been identified as motivated, craving challenging work, but also to become bored easily. With their loyalty in question generation Y employees may become increasingly likely to retain their positions within an organization given the proper incentives, challenging work and ongoing learning being strong motivations to stay. However, unlike mentorship programs, job rotation does not address near-retiree retention and the knowledge to be lost in the short term.

Assessing how opened positions are promoted may also be worth reviewing. With a varied ability to accommodate work/life flexibility coupled with fairly generous benefit plans, employers may need to be strong in promoting the organizational advantages. Highlighting the

opportunity for personal growth within the organization by drawing attention to prospects for ongoing learning may also encourage applicants, broadening the talent pool.

Creating learning opportunities and assessing the value of programs needs to be addressed on an ongoing basis. This includes monitoring the perceived effectiveness of programs like mentorship, job rotation, e-learning and course-based learning opportunities. As the literature and interviews suggested, major concerns are being dedicated to a talent gap. Organizations may need to assume more risk in the hiring process. This risk can be addressed by increasing investment for learning opportunities, and addressing retirement and replacement with an inward focus to growing talent within the organization.

Strategies such as rotating jobs or instituting formal mentorship programs should receive growing attention from all organizations involved. These are both programs that involve knowledge building, knowledge sharing, and facilitate organizational networking. They help create depth to knowledge structures within organizations, acting as a buffer to loss. Unlike other strategies mentorship programs can be structured in an effort to retain senior employees near retirement by permitting a phased exit from the organization. This would retain the historical knowledge of near-retirees while providing both time and support to employees that are replacing vacating positions.

2. Adjust pension programs: Barriers exist specific to securing part-time employement and supplementing reduced wages with pension payements. Formerly partial pension allowance was not allowed, however it received strong support by participants interviewed. Although such pension adjustments have since been permitted, the Ontario Municipal Employees Retirement System pension, of which applied to 12 of 14 participants, has yet to allow partial pension

withdrawals coupled with continued pension input. As participant H identified that various organizations support such changes, it would be in the best interest of all organizations under OMERS to push for similar changes. Although the execution of mentorship programs is not dependent on adapting pension regulations, such changes could encourage near-retirees to phase into retirement through reduced organizational roles. The literature suggested that many retirees return to work and many others would have considered remaining on the job if options to reduce their responsibilities existed. However, to date, current pension regulations remain a barrier.

Such a program would work by allowing near-retirees to work part-time, contributing to their pension for days worked, while simultaneously allowing these employees to supplement their reduced income with pension withdrawals. For instance, if an employee works three days a week, 60% of their income would come from their regular pay, 40% from pension supplementation. The premise behind allowing pension supplementation is that pensions have been determined to be a strong motivator for early exit. An adjusted pension plan may incentivize employee retention while simultaneously accommodating worker preferences.

Adjustments to pension plans may retain senior employees for years beyond their originally scheduled retirement. Working in a reduced capacity, this scenario would witness the vacancy of senior positions, but retain the knowledge and experience. These years of overlap would facilitate transitions into senior positions by supplying new managers, and supervisors with a mentor that has direct experience with the position. It would also facilitate a workers transition into retirement, which can be a difficult adjustment for many retirees.

 3. Assess organizations individually: The literature contended that retirements would create considerable upheaval across industries in both the private and public sectors. Others suggested

that the public workforce is at an even greater risk (Bradley, 2010; Kieran, 2001; Statistics Canada, 2004; Statistics Canada, 2008). While participants stated a specific need to address retirements, those organizations seeing the most retirement-related turnover were also the ones with succession planning as a priority. Other organizations identified a relatively young workforce, and while retirements were likely in the next decade, were not a significant concern.

The variation in age structures and succession planning between organizations makes it difficult to generalize about the public water workforce regarding future expectations. As a result, I recommend that to properly assess institutional resilience organizations need to be considered on an individual basis. Individual assessment might be most suitably applied to small municipalities, as is explained below.

4. Future Research to be Completed: Largely absent from the literature was a suggestion on how organizational networks might be affected by retirements. Although the literature highlights both benefits and drawbacks attributed to increased participation in water governance, it is generally agreed that greater participation is a good thing. Given the strong support for network cooperation and collaboration from all participants one would expect elevated or simultaneous retirements to affect efficiency or efficacy. Though participants did not discount the possibility that network relations may be presented with difficulties, results did not present a definitive case to warrant concerns or to discount unease. The less than enthusiastic response may suggest that real challenges to organizational networks are not expected, but more research is needed.

Although interview data suggested that labelling current retirements as a crisis is overstated, this is derived from results pertaining to organizations that responded to constituencies over 100,000. As two participants highlighted, organizational retirements in smaller city centres could

potentially be more concerning as smaller workforces allow for less organizational depth. It was also suggested that small city centres or less populated regions have the added difficulty of attracting talent, an issue highlighted even among participating organizations that have a greater ability to drawn in talent. As a result, more research is required to understand the consequences of retirements specific to smaller organizations.

6.2 Conclusion

There is no question that our population is aging, and with it an increase in expected retirements. As a generation, the Boomers helped oversee considerable expansions in industry and public services. The birthrates from the mid-1940s to the mid-1960s increased the Canadian population, and led to expanding cities and infrastructure. Not only was this generation considered to be well educated, but it also saw women's incorporation into the workforce on a grand scale. Now this educated generation, both women and men alike are looking to retire, expecting to create knowledge gaps within the workforce.

The public workforce, older in average age and often retiring younger, was deemed to be a particular concern. Studies have highlighted the aging infrastructure and workforces among public water institutions, indicating a need for investment and talent in the coming future. However, varying demographic structures and various succession planning approaches demonstrate that organizations need to be considered on an individual basis.

While participant observations reflected many concerns put forward in the literature the organizations seeing the largest losses were also those overseeing serious succession planning objectives. Alternatively, younger workforces and organizational depth were considered as buffers toward knowledge loss, maintaining continuity and organizational resilience.

Among the challenges identified were losing employee history and losing organizational relationships that have been fostered over years. Although documentation was standard procedure across organizations interviewed, tacit knowledge concerning history or relationship dynamics were deemed difficult to codify and transfer. Transferring such tacit knowledge is better fostered through experiential mechanisms like mentorship programs.

Given that attracting talent was also recognized as a difficulty from one organization to the next, mentorship programs cannot be the only strategy toward succession, but rather a staple among other strategies. However, as a resolution, mentorship programs provide added training for employees overseeing new positions, as well as help retain experienced workers, facilitating transition into and out of the workplace.

While mentorship programs were commonly mentioned in the literature, barriers to their adoption were seldom addressed. Among barriers toward a reduced role as mentor is pension structure. Changes need to be adopted in pension regulations to facilitate an employee's movement to a reduced work week. This is particularly the case with the OMERS pension that all but one participating organization was a party to. Current pension rules discourage working in a reduced capacity, and as such, limit mentorship programs' ability to retain experienced workers. It also discourages phased transitions into retirement.

There was a mix of concern and indifference regarding recent and upcoming retirements. The primary data certainly did not show the sweeping concern across the public water workforce that the literature presented. This is not to say it is not being seriously considered by public water organizations. Several participants presented it as a concern. However, most were aware of predicted retirement issues which have led to strong succession planning efforts. Resulting from

early retirements the retirement generation began over half a decade ago and as a result has given organizations time to consider its effects, and time to prepare.

Some concern, however, was directed toward small organizations. Small staffing complements translate into reduced organizational depth, and so the experience lost through retirements is comparatively significant. Coupled with a limited capacity to attract talent, smaller municipalities and regional authorities may encounter the demographic 'crisis' that is supported in the literature. Future research is in order.

Future research is also recommended to focus on retirement effects on organizational networks. Literature suggested a growing trend and reliance on stakeholder involvement. Likewise, interview participants extolled the importance of inter-organizational cooperation in the public water industry. Yet, the data received from participants did not suggest one way or another that retirements' should be a serious concern for network activities.

Given demographic variance between participating organizations, I found that attributing concern to retirements needed to be addressed by individual organization. Some organizations are seeing significantly more departures than others. For the most part, deliberate succession planning existed within organizations at risk. While a varied approach is supported, mentorship programs are recommended for their capacity to facilitate tacit information exchange, knowledge continuity, and employee retention.

Appendix A

Knowledge Perspectives and Their Implications		
Perspective	**Implications for Knowledge Management (KM)**	**Implications for Knowledge Management Systems (KMS)**
Knowledge vis-à-vis data and information — Data is facts, raw numbers. Information is processed/interpreted data. Knowledge is personalized information	KM focuses on exposing individuals to potentially useful information and facilitating assimilation of information	KMS will not appear radically different from existing IS, but will be extended toward helping in user assimilation of information
State of mind — Knowledge is the state of knowing and understanding.	KM involves enhancing individual's learning and understanding through provision of information	Role of IT is to provide access to sources of knowledge rather than knowledge itself
Object — knowledge is an object to be stored and manipulated	Key KM issue is building and managing knowledge stocks	Role of IT involves gathering, storing, and transferring knowledge
Process — Knowledge is a process of applying expertise	KM focus is on knowledge flows and the process of creation, sharing, and distributing knowledge	Role of IT is to provide link among sources of knowledge to create wider breadth and depth of knowledge flows
Access to information — Knowledge is a condition of access to information	KM focus is organized access to and retrieval of content	Role of IT is to provide effective search and retrieval mechanisms for locating relevant information
Capability — Knowledge is the potential to influence action.	KM is about building core competencies and understanding strategic know-how	Role of IT is to enhance intellectual capital by supporting development of individual and organizational competencies

Source: Alavi and Leidner, 2001: 111

Appendix B

Interview Questions

1. How many experienced (knowledgeable, familiar, skilled) staff have left in the last 5 years, or are expected to leave in the next 10?

    What would these retirements represent as a percentage of the current workforce?

    Could you estimate an average age of the workforce?

    Will there be a need to recruit new employees?

    From what positions are these absences most likely?

2. How will retirements affect quality and productivity concerning organizational output?

3. Can you describe the relative ease or difficulty in attracting qualified professionals for positions that have opened in the recent past?

    Have emerging regulations in the past decade affected talent pools?

    Is there a motivation to hire internally when filling a vacant position?

4. Does your organization have a way to evaluate a workers performance or overall value based on knowledge, skill, or productivity?

5. What skills or knowledge are highly valued?

6. Do you feel these are easily transferable?

    How long would you estimate it takes an employee to feel comfortable in a new position?

7. Within this organization would you say there is a defined culture or value-set?

    How does this affect an employee's ability to adapt to the needs or goals of the organization?

    Is there a chance that the integration of young professionals could promote organizational change? Why or why wouldn't such a change be welcomed?

8. Is cooperation between your organization and other organizations and agencies important in achieving organizational goals?

9. How will retirements affect network relation and productivity?

Would you foresee issues if an organization within the network experiences significant turnover?

10. Describe this organizations approach to training new professionals.

Are ongoing training programs mandated, self-driven, or a combination of both? Are they funded?

Are there any strategies aimed at retaining senior employees who might be considering retirement in the near future? How does the pension structure encourage or discourage retention?

Are there other programs that facilitate workplace transitions, knowledge retention, increasing the talent pool (Co-op, flex-time, job-sharing, documentation processes, etc.)?

Can you describe the success of these programs?

Is there any formal mentorship program in place?

11. What are the organizational expectations going forward? What difficulties are expected?

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