



Deferred Hospital Maintenance in Canada:

There is more to ‘a building’ than building it.

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The views expressed in this report are those of the authors and do not necessarily reflect the views of HealthCareCAN.

Key findings

- Deferred maintenance (DM) is the practice of postponing maintenance activities such as repairs in order to save costs or meet budget targets.
- Deferred maintenance is an important if not critical concept that unfortunately gets easily forgotten.
- Deferred maintenance is a large and growing problem in Canadian hospitals.
- Under the context of slow economic growth and tight budgets, the problem will likely worsen further – unless something is done about it.
- Conservative estimates using existing hospital audits of accumulated deferred maintenance peg the problem to be in the range of \$4 B and \$28 B with an average of \$15.4 B.
- Translating university sector evidence to hospitals estimates the DM in Canadian hospitals between \$15.7B and \$18.0B respectively with an average DM of \$16.85 B.
- Estimate of the minimum annual investment required to keep DM in Canadian hospitals flat-lined is between \$2.8 B and \$3.21 B annually.
- For the balance of the study, it uses the average ADM estimated range between \$15 B and \$20 B with a minimum annual investment target between \$2 B and \$3 B.
- Estimates suggest that the current replacement value (CRV) for all hospitals in Canada is approximately \$160 B.
- Investments in infrastructure – which includes deferred maintenance – contributes to better patient outcomes, supports increasing demand, improves work environments, supports efficiencies and innovation and addresses low levels of workforce supply.
- The five suggested elements of a hospital deferred maintenance strategy for Canada includes: *First, Acknowledge That There is a Problem; Make Sure the Problem Stops Growing; Generate New Sources of Funding; Federal Involvement as a Renewed Partner; Sustainable Operations and Strategic Thinking.*
- The report includes a call to action for a new partnership between the Federal and Provincial governments and hospitals. There are the potential to access Federal infrastructure funds and the fiscal room that the Federal government will see in 2017 shows it is time for them to partner with the provinces and hospitals – again.

Executive summary

Deferred Hospital Maintenance in Canada: There is more to 'a building' than building it, reviews the evidence of deferred maintenance in Canadian hospitals. It explores: what is deferred maintenance; why it is important; and what needs to be done about it – if anything.

A literature review and data analysis was used to assess the current status of deferred maintenance in hospitals and create estimates of deferred maintenance – based on the best available information. In general, the data available on deferred hospital maintenance was low with only hospital audits – in a few provinces – benchmarks and good evidence from the university sector.

What is Deferred Maintenance?

Deferred maintenance (DM) – sometimes known as accumulated deferred maintenance – is the practice of postponing maintenance activities such as repairs in order to save costs or meet budget targets. The two basic types of maintenance strategies are reactive – ‘run till it breaks’ – and preventative which seeks to prevent faults from occurring.

There is some debate in the literature about what is the best method for describing deferred maintenance. Studies indicate information about the physical condition of assets and estimates of the cost of bringing those assets to a reasonable condition is the preferred method. It is believed that typical accounting practices do not satisfactorily report deferred maintenance estimates. By far the preferred method is physical inspection or facility condition audits.

The factors that drive maintenance costs are: building condition and age; complaints about building performance; availability of funding; and health and safety requirements – with the most important being the building condition and complaints.

For the purposes of understanding deferred maintenance, three key terms and related acronyms are important to remember: the facility condition index (FCI), the current replacement value (CRV) and the accumulated deferred maintenance costs (ADM). The FCI is simply the ADM divided by the CRV. A low FCI score (0%) indicates a new or like new structure. A high score (100%) is suggestive of a structure in need of demolition. A typical FCI score would be found in the 2-5% range. Usually the ADM and CRV is provided in dollars (\$). It is important to distinguish between annual maintenance costs and deferred maintenance costs. Maintenance is the 'work' of keeping something in proper operating condition. Deferred maintenance is the 'maintenance work' put off until another day. The literature revealed a 'rule of thumb' that 1.5% of current replacement value should be spent on maintenance per year.

Another general rule of thumb in the building industry is known as the 1:5:200 rule. It suggests that over the life of a building the cost of operating a business is 200 times the cost of construction and the cost of managing and maintaining the building is typically five times the cost of construction.

The literature also highlighted the relative value placed on new construction versus maintenance – maintenance invariably taking the proverbial back seat.

Why is DM Important?

Deferred maintenance is an important if not critical concept that unfortunately gets easily forgotten. They are relatively easy to cut during tough budget cycles with the consequences being seen at a later date. Maintenance budgets are typically found in operating budgets – versus capital budgets.

The struggle today is the current economic environment is driving cost containment at the federal, provincial, healthcare and hospital levels. The Conference Board believes that if the provinces froze funding in health, education and social services it would still need to make significant cuts to all other program spending by 12% to balance its books.

Deferred Hospital Maintenance in Canada

Hospitals receive the largest share of health expenditures in Canada, and have not been immune from cost containment strategies. The Canadian Institutes for Health Information (CIHI) 2014 National Health Expenditures Trends report, comments that hospital spending is expected to grow by 2.1% in the year 2014, which is the slowest growth rate since the late 1990's.

With the cost containment strategies cascading to hospital budgets, hospitals have attempted to manage budgets constraints – with very limited influence or control over major expenditures – with the usual result being a growth in deferred hospital maintenance costs. A short term solution with long-term consequences unless additional resources are provided at a later date. The struggle with this type of reactive approach is that it is in the context of an aging population, reduced labor participation rates and Federal government intentions to reduce the growth rate of transfers to provinces for health expenditures. This change may help Federal finances but is definitely 'not good or even acceptable' for provincial governments, health care systems, hospitals – and resultant deferred maintenance increases.

The Federal Government used a similar expenditure reduction strategy in the 1990's leading to significant stress on the health and hospital systems with the consequences still felt today. This type of reactive decision-making is not new. The Ontario Hospital Association (OHA) points out that managing health care is primarily focused on reactive solutions. It believes that this reactive approach has resulted in longer-term, structural issues being 'placed on the back burner'. The OHA points out that in general investments in infrastructure – which includes deferred maintenance – contributes to better patient outcomes, supports increasing demand, improves work environments, supports efficiencies and innovation and address low levels of workforce supply. The OHA concludes that a paradigm shift is required to change the current way of thinking to a longer-term strategic approach in the health care system.

There is good evidence in the literature that deferred maintenance is growing over time. Municipal governments have seen a 10-fold growth since 1985 and the University sector, a more than doubling since 2000. Deferred maintenance has become a strategic priority for Universities and a good case study for Canadian hospitals. They led a major review in 2000 showing the extent of

the problem. The review was led by CAUBO – The Canadian Association of University Business Officers. It found that there was a \$3.6 B ‘conservative’ estimate of ADM in Canadian Universities. It also found that the average Facility Condition Index (FCI) was 11.3%.

Their review led to a Standing Senate Committee examination that found the problem was large enough that it potentially posed health and safety risks to staff and students. They concluded that the magnitude of the problem suggests that government assistance was required. A follow-up study by CAUBO in 2014 showed revised estimate for ADM in Canadian Universities was \$8.4B or \$42/GSF. Interestingly, over 80 percent of the universities used data that was collected through physical audits. It also highlighted that ADM was significantly higher in the Eastern and Western provinces – by almost 20 percent.

For the purpose of this study, a variety of data sets was used from CIHI, Statistics Canada and hospital facility audits to estimate the scale of hospital deferred maintenance in Canada. These estimates suggest that the current replacement value for all hospitals in Canada is approximately \$160 B and the accumulated deferred maintenance costs are in the range between \$5 B and \$35 B with an average of approximately \$20 B. Using the differences in FCI from the university sector the numbers were revised to a range between \$4 B and \$28 B with an average of \$15.4 B.

Translating the evidence from the university sector to hospitals provided estimate for ADM in Canadian hospitals as \$15.7B and \$18.0B respectively with an average ADM of \$16.85 B.

A final approach was used to estimate the minimum annual investment required to keep ADM in Canadian hospitals flat lined – or ‘kept up’. The estimated range being between \$2.8 B and \$3.21 B annually.

For the remainder of this study it uses the average ADM estimated range between \$15 B and \$20 B with a minimum annual investment target between \$2 B and \$3 B.

What needs to be done about deferred maintenance in Canadian hospitals?

The report highlights that solving issues of deferred maintenance are not easy. It requires a substantial commitment of resources and tenacious dedication. It also points out however, that nothing can better state the business case for the investments in the time and resources required than measuring, reporting and managing the condition of assets.

Good practices are identified in the literature and new ways of funding maintenance and deferred maintenance costs are put forward. The report highlights the important role that the Federal government played in the construction of hospitals over 50 years ago. It finishes with a suggested strategy with five elements to reduce or eliminate the hospital deferred maintenance 'problem' in Canada.

The five elements of the strategy include:

1. **First, Acknowledge That There is a Problem:** The averages of the two main methods used to estimate the hospital accumulated deferred maintenance (ADM) costs range between \$15 B and \$20 B in Canada. The literature suggests that the problem is likely growing. One of the other major themes that flowed through the report can be captured in the saying 'what gets measured – matters'. We found that the data and research in the area of hospital deferred maintenance was low. Future data needs to be collected using consistent standards in all jurisdictions and reported publicly. Perhaps there is a partnership opportunity between governments, CIHI and HealthCareCAN – similar to the one used to support the national physician survey.
2. **Make Sure the Problem Stops Growing –** Given the virtual scale of the problem, we need to agree at a minimum – to stop the problem from growing any further. The estimates in this report suggest that the cost to 'keep up' with the problem requires a \$2-3 B annual investment.

3. **Generate New Sources of Funding:** The report highlights a number of funding mechanisms to potentially reduce the hospital ADM problem.
4. **Federal Involvement as a Renewed Partner:** The Federal government has had a history of supporting hospital construction up until recently. Given its history of funding of hospital construction almost 50 years ago, it has a responsibility beyond building it to one of renewal. At a minimum it should partner with the provinces to fund the growing hospital deferred maintenance costs in the range of \$2-3 B per year – at least to 'keep up'. Alternatively, the Federal government can support hospital applications within the \$1.3 B public Infrastructure Investment commitment it made at the 2014 Australian G20 meeting.
5. **Sustainable Operations and Strategic Thinking:** The final element in the Hospital Maintenance and Renewal Strategy is a commitment required from hospitals leaders to use preventative maintenance, ring-fenced funding and making maintenance a strategic function in hospitals.

The report finishes with a call to action for a new partnership between the Federal and Provincial governments and hospitals. There are significant deferred maintenance problems in hospitals across Canada and with the potential to access Federal infrastructure funds and the fiscal room that the Federal Government will see in 2017; it is time for them to partner with the provinces again.

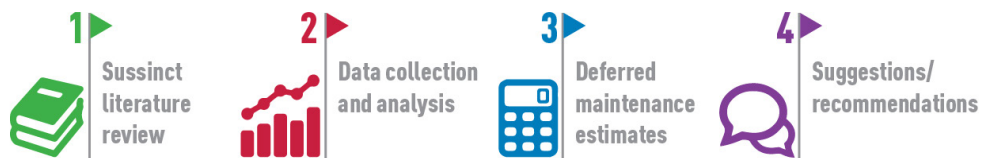
Introduction

The Canadian Institute for Health Information (CIHI) estimates that Canada will spend \$214.9B on health care in 2014 – a 2.1 % increase. After accounting for inflation and population growth, health spending is expected to decrease in this year. Hospitals – representing almost 30 percent of total expenditures – are feeling the ‘pinch’. As well, new structures, funding models, and accountability agreements are adding to the pressure on Canadian hospitals. In order to manage the change and deal with budget shortfalls hospitals are undertaking a number of measures including delaying basic maintenance expenses to maintain quality patient care. But is this a sustainable strategy in the long-term?

Under the context of hospital CEO priority concerns this research project will review the evidence of deferred maintenance costs in hospitals in Canada. It will attempt to explore: what is deferred maintenance; why it is important; and what needs to be done about it – if anything.

Methodology

The methodology used in this report included a succinct literature search, data collection and analysis, deferred maintenance cost estimates and the development of a series of policy suggestions:



Succinct literature review

A Summons search was completed using Western Universities online search tool. Summons includes a broad search of all journals accessible at Western in areas such as Business and Management, Engineering, Health Sciences, Interdisciplinary, Law, Life Science, Medicine and Dentistry and Social Science. The search was completed in April 2015 and included all articles published in the last 10 years in English and peer reviewed.

Key words for the search were a combination of: deferred and hospital and maintenance and costs, hospital stewardship, catching up and keeping up and hospital maintenance, hospital and life cycle and maintenance, hospital and infrastructure and deferred and maintenance, hospital and restoration and maintenance. A web-based search was also completed using the terms deferred hospital maintenance costs and various combinations and synonyms. Article references from the peer review and web-based search were reviewed for relevance and additional articles were included where appropriate. Thousands of results were sorted and reviewed. Twenty-six articles related to deferred maintenance were included in this study.

Data collection and analysis

Initially six data collection approaches were considered for use in this study. They included:

- Collection and use of hospital facility audits across Canada.
- Maintenance costs from P3 hospitals in Canada.
- CIHI maintenance costs of hospitals.
- Estimates of academic health organizations deferred maintenance costs from a 2014 report from the Canadian Association of University Business Officers (CAUBO).
- Scaling the deferred maintenance costs in the University and College sector into health and hospital care.
- The use of various benchmarks to estimate deferred maintenance costs.

After an extensive data analysis only hospital audits – in a few provinces – benchmarks and scaling from the 2014 CAUBO report was used. Much of the P3 maintenance information was considered proprietary and CIHI did not have a full and useful picture of maintenance or deferred maintenance costs in Canadian hospitals at this time. For comparative purposes, the nearest year's data available were used for this study. For example the expenditure data from the university and college sector are not yet available for the 2014 year – in spite of the report from CAUBO being released in 2014. The latest year currently available from Statistics Canada was 2012-13.

What is deferred maintenance?

Deferred maintenance (DM) – sometimes known as accumulated deferred maintenance – was defined by the Senate of Canada in 2001 “as the backlog of unfunded major maintenance and renewal projects that have been deferred to future budgets. It results either from an accumulation of neglected routine maintenance items which evolve into more serious concerns or from failure to carry out major repair or restoration projects on facilities which have reached the end of their life cycle or have become obsolete.”⁽¹⁾

Put in simpler terms, deferred maintenance is the practice of postponing maintenance activities such as repairs on both real property (i.e. land and buildings) and personal property (i.e. machinery, equipment and technology) in order to save costs or meet budget targets. A good example of this would be delaying an oil change in a car leading to premature engine wear or failure.

The literature describes many types of maintenance strategies; with the two most common being reactive maintenance and preventative maintenance. Reactive maintenance is described by K. Khashayar as a ‘run till it breaks’ approach and preventative maintenance as a strategy which explicitly seeks to prevent faults from occurring.⁽²⁾

There is also considerable debate in the literature about what is the best method for describing deferred maintenance. A 2012 study by R. Walker in Australia surveyed public sector managers – including engineers, accountants, finance and active facility managers – and determined that they overwhelmingly preferred information about the physical condition of assets and estimates of the cost of bringing those assets to a reasonable condition as their preferred method of infrastructure reporting practice. Interestingly, typical cost-related accounting received little support from those surveyed. Walker suggests, “contemporary accounting reports fail to recognize commitments arising from deferred maintenance, and the usefulness of descriptions of book values and depreciation charges on those assets is questionable.”⁽³⁾

While there does not appear to be full agreement on the most appropriate tool for estimating deferred maintenance, the literature supports the use of physical inspection – or facility condition audits – as the preferred method for estimating deferred maintenance costs. P. Lufkin believes that “Estimates based on physical inspections are more defensible but are expensive”.⁽⁴⁾

Furthermore the literature suggests that decisions around deferred maintenance costs are driven by a number of factors such as: building condition and age; complaints about building performance; availability of funding; and health and safety requirements. According to A. Ali the most important factors being the building condition and complaints about building performance received.⁽⁵⁾

In a facility condition audit a number of variables are assessed and reported. Three key variables typically included are the facility condition index (FCI), the current replacement value (CRV) and the accumulated deferred maintenance costs (ADM).

The CRV is the current estimated cost to replace a building or related utility systems. The FCI is a recognized measure of the disrepair of a building or utility system. There is a mathematical relationship between the ADM, the CRV and FCI:

$$\text{FCI} = \text{ADM} / \text{CRV} * 100\%$$

Put simply, the facility condition index (FCI) is the Accumulated Deferred Maintenance Cost (ADM) divided by the Current Replacement Value (CRV). In other words the FCI is the ratio of the ADM and CRV. A low FCI score (0%) indicates a new or like new structure. A high score demonstrates a facility in disrepair with potential health and safety risks. A score of 100% is suggestive of a structure in need of demolition. A typical FCI score would be found in the 2-5% range. Sometimes the FCI is shown as a ratio as demonstrated by the table used by Alberta government on the next page.

FCI Value	FCI Description
$FCI \leq 0.05$	Good
$0.05 < FCI \leq 0.10$	Fair
$0.10 < FCI \leq 0.30$	Poor
$FCI > 0.30$	Critical

Usually the ADM and CRV is provided in dollars (\$) or sometimes normalized for comparison purposes as dollars per gross square foot (\$/GSF).

Interestingly, a study in France by S. Slitten showed that operating, maintenance and related staff costs correlate strongly with the square footage of floor space in hospitals.⁽⁶⁾

Maintenance versus deferred maintenance

It is important to distinguish between annual maintenance costs and deferred maintenance costs. Maintenance is the 'work' of keeping something in proper operating condition. Deferred maintenance is the 'maintenance work' put off until another day – likely due to annual budget constraints. The literature reveals a range of estimates of how much organizations should typically spend per year on maintenance costs. For example, data published by the National Research Council and the Civil Engineering Research Foundation suggest that annual expenditures on maintenance costs should equal approximately 2–4% of the current replacement value of facilities.⁽⁷⁾ A 2014 study by the Canadian Association of University Business Officers (CAUBO) reveals a similar estimate. It suggests that as a rule of thumb 1.5% of current replacement value should be spent on maintenance per year.⁽⁸⁾

The value and relationship of deferred maintenance and construction

The literature review highlighted that construction of a building or structure is usually more highly valued than the maintenance of the building or structure. S. Lavy makes this point:

“The initial planning, design, and construction costs of a facility [. . .] consume so much time and labor that the long-term impacts of actually operating the buildings are deferred to a later time and left for others to worry about. Once conceived and built, however, these facilities take on a life of their own – often a very long and even permanent life – which requires costs that far exceed initial design and construction.”⁽⁹⁾

In many instances the difference in ‘value’ between construction and maintenance is ‘political’ in that maintenance activities seldom have the same distinction as ribbon-cutting ceremonies for new construction.⁽¹⁰⁾

Many of the costs related to hospital maintenance are typically spill overs from the construction phase. M. Hassanain points that the top factors driving maintenance costs in hospitals are those problems transferred from the construction phase to the maintenance phase. Intriguingly, construction problems transferred to maintenance were ranked higher than “lack of mechanism to control the budget allocated for maintenance”.⁽¹¹⁾

Although a tremendous amount of effort is put into generating funding and construction of new hospitals, the costs comparison between construction, facility management/maintenance and operations suggest that at least as much time needs to be spent planning for facility management/maintenance and operations. A generally accepted rule of thumb put forward by R. Evans suggests that over the life of a building the cost of operating a business is 200 times the cost of construction and 40 times the costs of managing and maintaining the building (the 1:5:200 rule).⁽¹²⁾ Shown mathematically:

$$1C=5F=200S$$

Where C is the construction cost, F is the facility management/maintenance – comprising ‘hard’ (maintenance and partial replacement) and ‘soft’ (other costs of operating the building, such as security and heating) – and S is the cost of operations (primarily office staffing costs).

The point being that maintenance costs are a critical component of any facility and that there is significantly more to a ‘building’ than just building it. The costs of maintaining, managing and operating a building carry much greater costs over the life of any facility.

Why is deferred maintenance important?

Deferred maintenance is an important if not critical concept that unfortunately gets easily forgotten by funders, leaders and managers. Maintenance and deferred maintenance are a bit like investments in leadership development, health promotion programs or marketing budgets. They are relatively easy to cut during tough budget cycles with the consequences being seen at a later time down the road. Maintenance budgets are typically found in operating budgets (versus capital budgets) and are a common item on the hit list for operational cost reduction strategies.

A. Tsang points out, the emerging trends in operational management in the private sector demonstrates a movement away from a focus on volumes to quick response – likely the result of increasing society expectations and the pace of technological change. As a result, he maintains, “the contemporary business environment has raised the strategic importance of the maintenance function in organizations.”⁽¹³⁾ H. Lind similarly comments that in the manufacturing sector there has been a paradigm shift from seeing maintenance as a necessary evil to becoming a critical component of business process – with a focus on reliability and cost effectiveness.⁽¹⁴⁾

Until maintenance considerations in the public sector are seen as key to the delivery of high quality services, the likelihood is that funders, leaders and manager will continue to rely on historical trends or loose plans to estimate and reduce deferred maintenance costs. Unfortunately this traditional approach has demonstrated shortfalls. H. Myyingo reported that when property managers were surveyed about maintenance costs respondents indicated that around 50 percent of last years plan was actually funded.⁽¹⁵⁾

Trends in government, healthcare and hospital budgets

In 2014 The Conference Board of Canada released a study on provincial budgets. It indicated that for provinces to balance their books by 2017–18, provinces would have to make a number of difficult decisions. The Conference Board study concluded that if the provinces freeze health care, education and social service spending they will still need to make significant cuts to all other program spending – in the range of 12 per cent – to balance their books.⁽¹⁶⁾ To deal with the potential, and in some case structural deficits; provincial governments have made cost containment or ‘bending the cost curve’ a central plank in their plans to balance their budgets.⁽¹⁷⁾

With health care accounting for almost 40 percent of provincial expenditures, it is an obvious target for budget reductions. The focus on health expenditure containment has been challenging but is also showing the desired effect for provinces. M. Mendelson, Director of the Mowat Centre commented recently on this point “It’s fair to say that health care spending in Canada has essentially flat-lined since the economic downturn of 2008-09.”⁽¹⁸⁾

Hospitals receive the largest share of health expenditures in Canada, and have not been immune from cost containment strategies. In the Canadian Institutes for Health Information (CIHI) 2014 National Health Expenditures Trends 1975-2014 report, CIHI comments that hospital spending is expected to grow by 2.1% in the year 2014, which is the slowest growth rate since the late 1990’s.⁽¹⁹⁾

In an earlier hospital cost drivers report, CIHI indicated that between the years of 1998 and 2008 the growth in hospital expenditures average 6.7 % per year. The breakdown for this growth was 2.8% due to inflation, 1% from population growth, 1% for population aging and 1.9 % for volume changes.⁽²⁰⁾

While hospitals have virtually no control over population growth and aging, limited influence over inflation (primarily due to central bargaining of labor) and some control over volume changes – history has shown that the public does not tolerate limiting or reducing hospital services well. Limiting or reducing hospital services usually result in public backlash with resulting funder, bureaucratic and/or political pressure placed on hospital boards and administrators.

With the cost containment strategies cascading to hospital budgets, hospitals have attempted to manage budgets constraints by attempting to increase revenues or reducing expenditures wherever possible. Reducing expenditures typically include such measures as extending accounts payables, reducing receivables, reducing labor costs through retirement or attrition and managing other expenditures such as maintenance costs. The usual result being a growth in deferred hospital maintenance costs over time. A short term solution with long-term consequences unless additional resources are provided at a later date.

The struggle with this approach is that it is in the context of an aging population requiring additional health services coupled with baby boomers leaving the workforce due to retirement. The net effect being reduced provincial budgets, increased health expenditures at the same time that the Federal Government has announced its intentions to drop its funding to provinces for health care from a growth rate of 6% to the rate of nominal GDP growth in each provinces – likely in the 3-4 percent range.⁽²¹⁾

The Parliamentary Budget Office (PBO) believes that the CHT growth rate will be 3.9 percent per year on average starting in 2017-18 and ending 2024-25. This is significantly lower than the PBO's projected provincial health spending of 5.1 percent average annual growth. This will provide the Federal government with significant fiscal room with a corresponding drop in provincial revenue. The PBO believes that if this approach is maintained indefinitely the Federal support for health care will reach historically low levels – from 20.4 per cent in 2010-11 to an average of 18.6 per cent over the years 2011-12 to 2035-36; and then 13.8 per cent over the following 25 years.⁽²²⁾

This approach may be 'good' for Federal government finances but definitely 'not good or even acceptable' for provincial governments, health care systems, hospitals – and resulting deferred maintenance growth. The Federal Government used a similar expenditure reduction strategy in the 1990's leading to significant stress on the health and hospital systems with consequences still felt today. With Canada's GDP at almost \$2 Trillion⁽²³⁾ and health expenditures north of \$200B⁽²⁴⁾ the change and lowering of transfer payments tied to GDP will have significant if not dire effects on health service delivery – and the maintenance of hospital facilities to provide the care.

Any 'reactive' strategy that has the potential to reduce productivity over time will not be a winning strategy in the long run. The three key factors that drive productivity include human capital (people), physical capital (buildings, machinery and equipment) and technology and innovation.⁽²⁵⁾ Reducing investments in maintenance of physical capital – a typical reactive approach – can have dire consequences in the medium to long term. This type of reactive decision-making to funding is not new however.

A 2003 Ontario Hospital Association (OHA) report point out that managing health care is primarily focused on reactive solutions versus longer term strategic approaches. It comments that the:

“modus operandi has, in effect, created a culture of short-term crisis management that guide the planning, financing, and delivery of patient care services. The focus on resolving immediate issues has resulted in longer-term, structural issues being ‘placed on the back burner.’”⁽²⁶⁾

The OHA points out that in general investments in infrastructure – which includes deferred maintenance – contributes to better patient outcomes, supports increasing demand, improves work environments, supports efficiencies and innovation and address low levels of workforce supply. It estimates that the shortfall in hospital modernization and capacity expansion is in the range of \$7B and \$9B. It points out that many hospitals in Ontario are near the end of their useful life and has low confidence that funding to replace them is forthcoming. The OHA concludes that a paradigm shift is required to change the current way of thinking to a longer-term strategic approach in the health care system.

Evidence of deferred maintenance growth

The literature points out that there are considerable reasons why deferred maintenance grows over time. J. McDuling believes that one of the main reasons for growth in deferred maintenance is that it is hard to quantify. It takes considerable time and effort to quantify – even the three data points of ADM, CRV and FCI – across assets: buildings, machinery and technology. It requires information about each individual asset’s size, age, maintenance history, function (usage) and type (basic, simple or complex). This information is created, synthesized, analyzed and reported across organizational assets, across organizations and across sectors or systems. The resulting data is detailed, complex and needs to be comparable.

McDuling believes that this information seldom exists and could take years to collect. He maintains that this work is not particularly glamorous, does not attract much attention and is considered unproductive work by some. He states:

“The sad state of neglect of many public facilities can mainly be attributed to insufficient funds for maintenance work and maintenance budget cuts during the financial year. There is a general belief that preventative maintenance can easily be postponed until financial constraints may be less tight, and because it is difficult to quantify the cost of neglect, maintenance work has always been subjected to under-funding and budget cuts. It is therefore not surprising that maintenance activities other than day-to-day, ad-hoc or emergency work are mostly of an aesthetic or cleaning nature aimed at hiding the damning signs of neglect.

The lack of accurate current information on building conditions and maintenance requirements are the main reasons why maintenance budget allocations are insufficient. If the condition of the building is unknown, the maintenance requirements, cost and timing of the work is also unknown. As a result, maintenance budgets are dominated by contingency provisions for day-to-day and emergency unplanned maintenance, replacements or repairs and are, therefore, normally based on the previous financial year’s maintenance expenditure with an allowance for inflation and some renovations. If there are any funds left, preventative maintenance may be considered.”⁽²⁷⁾

Clearly, a harsh comment on the state of repair of public facilities – at least in South Africa. But there are some similarities to the state of repair of Canadian assets. The Federation of Canadian Municipalities in 2007 reported that they have been caught in a financial squeeze with reduced revenues but increased responsibilities. As a result they have been forced to defer maintenance and infrastructure upgrades to the point of a \$123 B municipal infrastructure deficit in 2007 up from \$12B in 1985. They believe that it has reached a breaking point.⁽²⁸⁾

CAUBO points out that the growth in deferred maintenance in the University sector is the result of: advancing facility age; decreased funding related to cuts in the 1990’s; uncertainty in long-term funding; lack of profile; increased demands for new space; and the need to conform to new building codes and regulations. Obviously there are substantial similarities with the health and hospital sectors.⁽²⁹⁾

Finally it is important to reiterate that prevention is usually the best option for long-term sustainability. J. McDuling points out that it costs less to maintain an asset in a satisfactory condition than it does to repair an asset once it has deteriorated to the point of failure.⁽³⁰⁾

Perhaps the old adage holds true 'an ounce of prevention is worth a pound of cure' or 'don't put off till tomorrow what you should be doing today'.

Deferred maintenance costs in Canadian universities – a strategic priority

In 2000 the Canadian Association of University Business Officers (CAUBO) undertook a strategic review of accumulated deferred maintenance (ADM) costs in Universities across Canada. The report *A Point of No Return: An Urgent Need for Infrastructure Renewal at Canadian Universities* could reasonably be described as an interesting case study for the hospital sector in its approach to deferred maintenance. The report laid out the extent of the problem as a \$3.6B conservative estimate of the ADM in Canadian Universities – with one third of this considered as urgent. It also found that the average Facility Condition Index (FCI) was 11.3% compared with the FCI of 7% found in US universities. It was estimated that the Current Replacement Value (CRV) for Universities in Canada was \$30.7B at that time.

CAUBO made a strong case that investments in ADM were required to keep Universities competitive and deal with expected growth in student enrollment. It believed that the aging of facilities was having a negative impact on its abilities to deliver on its strategic priorities and that educational activities could be disrupted and research could be abandoned or ruined. As well it felt that breakdowns could have an impact on student, facility and staff health and safety.⁽³¹⁾

Following the release of the CAUBO report the Standing Senate Committee on National Finance, chaired by Senator Lowell Murray in 2001 reviewed the role of the government in the financing of deferred maintenance in post-secondary institutions (universities and colleges). A major focus of the committee work related to government budgetary constraints in the 1990's and the results from

the CAUBO report. The Senate Committee believed that the problem was large enough that it potentially posed health and safety risks to staff and students. The Senate Committee also spent considerable time reviewing the role of the Federal Government in post secondary education (PSE) highlighting its investments from 1951 to 1967 to build Universities and Colleges in the form of grants. It agreed with a 1997 Senate study that the Federal Government should begin negotiating with provinces on funding to reduce the ADM in Universities and Colleges at the earliest possibility. It concluded by saying:

“Canadian universities face an enormous financial challenge in dealing with the accumulated deferred maintenance of their facilities. The magnitude of the problem suggests that government assistance will be required. While the Committee acknowledges this need for assistance on the part of post-secondary institutions it also recognizes the new budgetary demands that the federal government is facing. In light of the current situation the Committee has chosen to highlight possible ways the federal government might be able to address the problem of accumulated deferred maintenance at Canada’s post-secondary institutions.”⁽³²⁾

In 2014 CAUBO released a follow-up study in collaboration with a US based consulting firm Sightlines LLP. The revised estimate for ADM in Canadian Universities was \$8.4B or \$42/GSF. The main reasons cited for the doubling of ADM was construction cost inflation, better reporting, the advanced age of buildings and the investments made over the ensuing timeframe.

The method involved in reviewing the ADM in the 2014 study included a survey of Universities of their building sizes in square foot, year of construction of each building, renovation year (defined as 50 per cent of building components), primary usage of the building and the building type.

The report pointed out that major building components usually last 25 years with high risks in reliability after 50 years. In their study, there were significant increases in the buildings in the 25 and 50-year age range and the bulk of the ADM were in mission critical buildings. Over 80 percent of the respondents indicated that the data was collected through physical audits in the last 4 years. The report estimated that Universities are investing between \$500M

and \$750M against an annual target of just under \$1.5B. It noted that almost 80 percent of universities are adding ADM each year. It also suggested that as a 'rule of thumb' that expenditures on deferred maintenance should be about 1.5% of current replacement value. It highlighted that ADM was significantly higher in the Eastern and Western provinces.⁽³³⁾

Data sets and estimates of deferred maintenance in Canadian hospitals

In this section, a range of datasets was used to estimate the ADM in Canadian hospitals. The data included:

- NHEX data from CIHI⁽³⁴⁾
- CANSIM tables from Statistics Canada⁽³⁵⁾
- Hospital audit reports in Nova Scotia and Alberta
- University ADM estimates from CAUBO 2014 Report⁽³⁶⁾
- University FCI estimates from CAUBO 2000 Report⁽³⁷⁾
- ADM benchmarks from the Literature Search

1. Translating from Provincial Audits

The first method used to estimate the ADM in Canadian hospitals was reviewing facility audits in provinces where available. We were able to locate and receive the audits from Nova Scotia and Alberta.⁽³⁸⁾ We then used the information available in the audit reports to estimate what the likely ADM and CRV are in Canada.

**Deferred Hospital
Maintenance in
Canada**

Nova Scotia (2012)		Alberta (2013-2014)	
\$940,183,883	Accumulated deferred maintenance*	\$637,184,601	
divided by		divided by	
\$4,312,465,000	Current replacement value**	\$20,000,000	
equals		equals	
22%	Facility condition index***	3.19%	

Nova Scotia (2012)		Alberta (2013-2014)	
944,800	Provincial population****	4,007,200	
divided by		divided by	
34,752,100	Canadian population****	35,154,300	
equals		equals	
2.72%	Population ratio % (calculated)	11.4%	

Nova Scotia (2012)		Alberta (2013-2014)	
\$6,073,100,000	Provincial health expenditure*****	\$26,711,900,000	
divided by		divided by	
\$205,436,300,000	Canadian health expenditure*****	\$210,406,300,000	
equals		equals	
2.96%	Health expenditure ratio (calculated)	12.7%	

Using the population and health expenditure ratios the ADM and CRV's were calculated for Canada – in effect scaling for population and health expenditures.

Nova Scotia (2012)		Alberta (2013-2014)
\$940,183,883	Accumulated deferred maintenance	\$637,184,601
divided by		divided by
2.72%	Population ratio (%)	11.4%
equals		equals
\$34.6B	Provincial population ratio (\$)	\$5.6B

Nova Scotia (2012)		Alberta (2013-2014)
\$4,312,465,000	Current replacement value	\$20,000,000
divided by		divided by
2.72%	Population ratio (%)	11.4%
equals		equals
\$31.8B%	Health expenditure ratio (\$)	\$5.0B

ADM			CRV	
NS	AB	Province	NS	AB
\$34.6B	\$5.6B	Provincial Population Ratio	\$158.5B	\$175.4B
\$31.8B	\$5.0B	Provincial Health Expenditure Ratio	\$145.7B	\$157.5B
\$19.25B ADM		Simple average for Canada	\$159.3B CRV	

These numbers suggest that the current replacement value for all hospitals in Canada is approximately \$160 B and the accumulated deferred maintenance costs are in the range between \$5 B and \$35 B with an average of approximately \$20 B – although it is important to note that the range for the ADM is large in comparison to the CRV range. It is also important to recognize that these calculation come with the inherent assumption that the facility condition index would be the same in Canada as found in the provincial audit used individually or collectively (as in the average).

Using the available provincial audits; the national level average estimates for deferred hospital maintenance range between \$15 B and \$20 B.

It was indicated in the CAUBO 2014 report on Universities that the ADM was higher in the Eastern and the Western provinces. The average was determined to be \$42/GSF in Canada versus \$52.7/GSF in the East and \$52.6/GSF in the West.⁽³⁹⁾ If we account for this difference in our estimate using a simple ratio it would suggest that the range of ADM's would drop by approximately 20 percent to \$4 B and \$28 B with an average of \$15.4 B.

2. Translating from University Estimates

A second approach attempts to estimate the hospital ADM by using the figures from the CAUBO report and sharing it to hospitals using expenditure ratios. There is an inherent assumption in this that the condition of universities across Canada are the same as hospitals – perhaps not too far of a stretch given that expenditures in health and education track GDP fairly consistently.

The data included in this analysis includes:

- CAUBO Estimates (2014) of DM: \$8.4 B⁽⁴⁰⁾
- CAUBO Estimates (2000) of FCI: 11.3%⁽⁴¹⁾
- Calculated University Sector CRV: \$74.3 B
- Expenditures in the University and College Sectors in Canada (2012-13): \$32,414,094⁽⁴²⁾
- Expenditures in the Hospital Sector in Canada (2012): \$60,580,300⁽⁴³⁾
- Ratio of Hospital Expenditures / PSE Expenditures: 1.87
- Ratio of Hospital CRV (average) / PSE CRV: 2.14

Translating the evidence on ADM in the university sector to the hospital sector provides average ADM estimates that fall within the same average range as those calculated using the provincial audits.

For the remainder of this study we will use the average ADM estimated range between \$15 B and \$20 B with a minimum annual investment target between \$2 B and \$3 B.

Intriguingly, the replacement value of hospitals and the expenditures of hospitals are roughly twice as large as the replacement value and expenditures on PSE – suggesting that there is some relationship between the relative investments in hospitals and PSE. To be more precise, using the DM figure from the CAUBO report and using the two ratios (expenditure and CRV) the estimate for ADM in Canadian hospitals is calculated as \$15.7B and \$18.0B respectively. The average ADM of the two is \$16.85 B.

3. Translating Using Benchmarks

A final set of estimates was made using various benchmarks found in the literature. These include deferred maintenance cost estimates based on a ‘keeping up’ or stewardship approach, the benchmark for annual maintenance costs and a simple equation using the concept of ‘an ounce of prevention is worth a pound of cure’.

Benchmarks and data used in this analysis includes:

- 2014 CAUBO Annual Investment Target (stewardship) “keeping up”: \$1.5B⁽⁴⁴⁾
- Rule of thumb: expenditures on deferred maintenance should be about 1.5% of current replacement value (CRV)⁽⁴⁵⁾
- An ounce of prevention is worth a pound of cure: 1/16
- Ratio of Hospital Expenditures / PSE Expenditures: 1.87
- Ratio of Hospital CRV (average) / PSE CRV: 2.14
- Calculated hospital CRV (average) \$159.3 B

Using the CAUBO annual investment targets and the two ratios suggest that the minimum requirement to ‘keep up’ with deferred maintenance in the hospital sector ranges between \$2.8 B and \$3.21 B. The rule of thumb method suggests that annual maintenance costs should be \$2.4 B or the ounce of prevention ratio (1/16 or 6.25 percent) puts it in the range of \$10 B per year.

Sensitivity Analysis

In the lead up to the 2015 National Health Leadership Conference the Great Canadian Healthcare Debate in PEI, HealthCareCAN created a briefing note that considered hospital or health facility infrastructure broadly defined.⁽⁴⁶⁾ In the briefing note numbers were identified for infrastructure requirements in Saskatchewan and Ontario from various budget documents. We attempt to use these numbers to assess the relative confidence in our ADM estimates. While there are clearly definitional issues in this comparison it is perhaps useful none-the-less.

The HealthCareCAN briefing note found that in July 2014 Saskatchewan estimated that the bill to repair health facility infrastructure was pegged at \$2.2 billion.⁽⁴⁷⁾ In Ontario, the provincial budget committed over \$11.4 billion in major hospital expansion and redevelopment projects over the next 10 years.⁽⁴⁸⁾

Using the national estimated range between \$15 B and \$20 B we then calculated what the numbers might be in these provinces in these years. We used population ratios to scale the national average ADM range. The results are as follow:

Prov.	Population Ratio	Estimate Using \$15 B	Estimate Using \$20 B	Reported Number (above)
SK	.032	\$.48 B	\$.64 B	\$2.2 B
ON	.385	\$5.8 B	\$7.7 B	\$11.4 B

Another comparison is a 2009 study of Canada's academic healthcare organizations. It showed that there were over 400 distinct infrastructure projects valued at over \$20.5 billion.⁽⁴⁹⁾

Looking at these comparisons, it is clear that our national estimated range between \$15 B and \$20 B is likely conservative – as our provincial estimates fall well below those publicly reported in budget documents and also below those of a study on hospital infrastructure needs. Caution in this interpretation, however, must be considered given the potential definitional issues.

A summary table of the national results of each method can be found in the appendix on page 40.

What needs to be done about deferred maintenance in Canadian hospitals?

In *The Seven Habits of Highly Effective People*, S. Covey describes how highly effective people spend more of their time on important but non-urgent matters – apply described as ‘strategic issues’. As mentioned numerous times earlier health care tends to spend much of its time on reactive issues – what Covey describes as urgent and important. Covey believes that ‘effectiveness takes quantum leaps’ when more time is spent on highly important but non-urgent issues.⁽⁵⁰⁾

It is safe to say that deferred maintenance is – or at least should be considered – as a strategic issue that is non-urgent but important.

Solving issues of deferred maintenance are not easy. J. Selman indicates that effectively managing deferred maintenance of assets is easier said than done. It requires a substantial commitment of resources and tenacious dedication. He also points out however that nothing can better state the business case for the investments in the time and resources required than measuring, reporting and managing the condition of assets.⁽⁵¹⁾

There are good practices that should be considered. This includes:

Admitting there is a problem with deferred maintenance.

1. A commitment to reducing if not eliminating it.
2. Ensuring that adequate time and financial resources are available.
3. Considering alternative sources of funding.
4. The development of a well-developed maintenance plan with a focus on prevention to avoid future problems. This should include a long-range maintenance plan that is available – and perhaps publicly accessible.

5. Strategically and consistently considering the ‘life cycle’ costs of all assets during and after construction. Then using this information to fully fund maintenance programs through dedicated reserve funds to ensure assets are ‘sustainable’.⁽⁵²⁾
- 6.

H. Lind suggests any asset or deferred maintenance plan should focus first on core buildings and crucial components and include: detailed information for the first year; somewhat less detailed for the ensuing 3-5 years; and rough details for a 20-year timeframe.⁽⁵³⁾

Funding and Financing Options

R. Deber makes a distinction between health care funding and financing. She believes that funding in health care – the method of payment – is distinct from financing – the source of funds or who pays.⁽⁵⁴⁾

With respect to deferred maintenance payments, the primary source of funds theoretically could be public or private.

The method of payment may be in the form of a global budget with significant discretion or found as a line item that is used for expressed maintenance purposes – with any variations or combinations of the two.

Recently, D. Klein et al and the Canadian Foundation for Healthcare Improvement released a paper on capital spending. They point out that operating funds come almost exclusively from provincial governments but capital are significantly more varied in their source of funds: governments, private sector donations, foundations and philanthropy.⁽⁵⁵⁾ With most maintenance costs being considered as operational in nature; the traditional thinking is that governments cover the costs of maintenance exclusively.

While this is generally true from a financing perspective, the funding method may be different across or even within institutions. Some might outsource their maintenance to a third party and pay them on an ‘as needed basis’. Others may enter into contracts for full coverage with regular but stable payments or have full in-house coverage and pay their employees in the usual way. Still others enter into long-term contracts prior to construction that pays an annual maintenance fee once construction is complete. This is one approach used with the Public-Private-Partnership (P3) models used in Canada.

There are three types of P3's – also known as Alternative Finance and Procurement (AFP) plans: Build Finance (BF), Design Build, Finance (DBF) and Design Build Finance Maintain (DBFM). As the name implies the cost of maintenance is built into the DBFM P3 contract as part of the procurement process. There has been considerable concern raised about the use of P3's in Canada, particularly in the health care industry. A 2010 Conference Board of Canada report attempted to dispel some of the myths of P3's:

“First, P3s in Canada are not about the privatization of public assets. Ownership of the new infrastructure facilities either remains with the public sector or is transferred back to the public sector at the end of the contract term. Second, long-term P3 projects (i.e., those with a maintenance phase) help ensure a satisfactory level of maintenance and upgrade work during the life of the facility. The anecdotal evidence collected in this report suggests that there is little basis for the criticism that service standards suffer under a P3 relative to a conventional maintenance contract or even relative to in-house provision.”⁽⁵⁶⁾

The approach of building maintenance contracts into P3's is a relatively new innovation in health care in Canada and as with any new innovation is likely suffering from 'inertia' as it takes its first few steps.

D. Klein et al points out a number of suggestions to raise capital that may be somewhat instructive in a discussion on financing and funding of deferred maintenance. He argues that innovative approaches to raise funds for capital include: increasing the use of private financing vehicles (for example issuing bonds); developing an appropriate regulatory framework to encourage a focus on value; supporting philanthropy (for example improving tax incentives); supporting organizations that assess the effectiveness of capital investments (for example the Canadian Agency for Drugs and Technologies in Health (CADTH)); improving hospital funding models that reward quality and that provide opportunities to develop new revenue streams; and finally support social finance options through pilot project approval.⁽⁵⁷⁾

The options for generating funds for deferred maintenance in hospitals may include:

- Receiving additional funds from governments – Federal and Provincial governments working as partners to help hospitals ‘keep up’ or potentially ‘catch up’ on its deferred maintenance liabilities.
- Protecting or ‘ring fencing’ a maintenance budget that is based on a fully audited facility with a short, medium and long-term maintenance plan.
- Creating an appropriate mechanism that allows hospitals to fund maintenance through sources other than governments. For example, the issuing of bonds or reverse mortgages, a separate foundation for hospital maintenance or allowing philanthropists to fund operations – including maintenance – where they deem it appropriate.
- Create a structure to support hospital infrastructure modernization and renewal similar to the Canada Foundation for Innovation.
- Supporting a hospital funding system that rewards hospitals that invest in productivity – physical capital (including maintenance), human capital and innovation and technology – or demonstrating strategic thinking and actions. Continue to use and evaluate P3’s in the DBFM model.

The Role of the Federal Government in Hospital Maintenance

The Federal Government in Canada has had a long but dated history – of providing financial supports to provinces to build hospitals. For example, in 1948 the Federal Government created the Hospital Construction Grant Program and in 1966 the Health Resources Fund Act. The 1948 hospital construction program made grants available to the provinces for the planning and construction of hospitals virtually anywhere in Canada. This led to a rapid expansion of hospital capacity and utilization across Canada. The Hospital Grants Program was considered the financial ‘engine’ that built the current hospital infrastructure.⁽⁵⁸⁾

This quote from the Canadian Museum of History is telling:

“(Paul Martin) using his charm to convince Mackenzie King that his legacy as a social reformer required a final show of support for initiatives in health and welfare, Martin persuaded the Prime Minister and Cabinet to approve all of the 1945 health grants and one for hospital construction. The Minister justified his proposals on the grounds that the public was becoming more critical of the government’s failure to assist the provinces by funding medical research, hospitals and free clinics.

That and concerns raised by New Brunswick enabled the second federal Deputy Minister of National Health, Dr. G. Donald W. Cameron, to separate the national health grants from the fiscal requirement that provinces use them to prepare for a health insurance plan. In May 1948, Mackenzie King announced the national health grants in Parliament, and six days later his Minister of National Health and Welfare spoke to the Canadian Public Health Association and the provincial deputy ministers about the measure. He obtained Quebec’s approval through personal diplomacy with its premier, Maurice Duplessis.”⁽⁵⁹⁾

Later, the 1966 Health Resources Fund – valued at \$500 million – was created to help support provinces in the acquisition, construction and renovation of health training facilities and research institutions (teaching hospitals or academic health organizations).⁽⁶⁰⁾

Over time there has been considerable changes in the funding of health systems – and by extension hospitals – in Canada. It includes transferring of tax points, major cuts by the Federal Government in the 1990’s, the CHT and CHST, major national reviews by the National Forum, Romanow Commission and Kirby Commission, Health Accords, a built in 6% Federal escalator, and a soon to be funding formula based on population and nominal GDP.

The partnership struck between the Federal and Provincial Governments with the introduction of Medicare has become a Federal Government with constitutional responsibility for some and little more than spending power – in the words of one ‘all spending and no power’ – for most.⁽⁶¹⁾

Hospital Maintenance and Renewal Strategy

It has been apparent throughout this review that there is a large and growing issue related to deferred maintenance in Canadian hospitals. The issues were numerous – both strategically and operationally. The main issues that surfaced during this review – when taken together – could form a strategy to reduce or potentially eliminate the growing deferred maintenance problem in hospitals. The five elements of the strategy include:

1. **First, Acknowledge That There is a Problem:** The estimates in this review indicate that the cost to replace hospitals in Canada is approximately \$160 B. The averages of the two main methods used to estimate the hospital accumulated deferred maintenance (ADM) costs range between \$15 B and \$20 B in Canada. While the individual estimate ranges are larger – it is important to admit that this is a ‘big’ number with it being a ‘b’ as in billions of dollars. The literature suggests that the likelihood is that the problem is not only large it is growing. One of the other major themes that flowed through the report can be captured in the saying ‘what gets measured – matters’. We found that the data and research in the area of hospital deferred maintenance was low. The literature pointed out the challenges of collecting the data; but also highlighted the power of it when it is available and accessible. It is clear that the data requirements include the ADM, CRV, FCI and GSF for each hospital across Canada and that it should be created using physical audits of hospital assets. While we found a few provinces currently capture this data, its consistency and availability is also low. The data needs to be collected using consistent standards in all jurisdictions and reported publicly. Perhaps there is a partnership opportunity between governments, CIHI and HealthCareCAN – similar to the one used to create the national physician survey. Given HealthCareCAN’s role with hospitals and its Guide to Canadian Healthcare Facilities perhaps adding a few questions to its survey would be the perfect solution to drive the data collection and reporting of the condition of Canadian hospitals.

2. **Make Sure the Problem Stops Growing – ‘Keep Up’:** This review points out the difference between keeping up (stopping the problem from growing) and catching up (eliminating the problem over time). Given the virtual scale of the problem, we need to agree at a minimum, to stop the problem from growing. The estimates in this report suggest that the cost to ‘keep up’ with the problem requires a \$2-3 B annual investment.
3. **Generate New Sources of Funding:** The report highlights a number of funding mechanisms to potentially reduce the hospital ADM problem. Suggestions include the use of DBFM-P3 models, allowing hospitals to issue bonds or use reverse mortgages, the development of dedicated structures to fund hospital infrastructure and maintenance and strengthening supports for philanthropy of hospital operations. There will likely be a requirement to adjust existing rules or create new mechanism such as regulations to permit the use of the new funding sources.
4. **Federal Involvement as a Renewed Partner:** The Federal government has had a history of supporting hospital construction up until recently. Many of the buildings built through direct Federal investments have now past their ‘best before’ date and require considerable maintenance investments or demolition and new construction. The Federal government’s unilateral decision to change the funding structure for health care in Canada provides it with considerable fiscal room to fund hospital renewal starting in 2017-18. Given its history of funding of hospital construction almost 50 years ago, it has a responsibility beyond building it to one of renewal. At a minimum it should partner with the provinces to fund the growing hospital deferred maintenance costs in the range of \$2-3 B per year – at least to ‘keep up’. Alternatively, the Federal government can support hospital applications within the \$1.3 B public Infrastructure Investment commitment it made at the 2014 Australian G20 meeting. (EN62) Paul Martin Sr. and Prime Minister Mackenzie King were able to support hospital infrastructure. Why can’t the Federal government supports hospital infrastructure needs now?

5. **Sustainable Operations and Strategic Thinking:** The final element in the Hospital Maintenance and Renewal Strategy is a commitment from hospitals leaders to use best 'asset management' practices and fund maintenance appropriately. The consistent use of preventative maintenance, ring-fenced funding and making maintenance a strategic function in hospitals will ensure our hospitals can deliver the highest quality health services to Canadians and ensure that the facilities are sustainable.

The implementation and execution of the five elements of the strategy will not be easy. It will require commitments from the public, governments, and hospital leaders to spend more time thinking about important but non-urgent matters. Moving away from the traditional reactive way of thinking to a more long-term strategic way will require thought leadership – and actions. Innovative thinking and LEADS-ership will need to replace complacency and inertia.

Concluding Thought

As the title of this paper highlights – there is more to 'a building' than building it. There are significant deferred maintenance problems in hospitals across Canada and with the potential to access Federal infrastructure funds and the fiscal room that the Federal Government will see in 2017; it is time for them to partner with the provinces – again. And by this partnership it means the Federal Government needs to 'part with its wallet'.

Appendix

The national level results of each method can be found in table format below:

Description of Method Used	National Level ADM Results
Translation from NS Audit	\$31.8 B - \$34.6 B
Translation from AB Audit	\$5.0 B - \$5.6 B
Average of NS and AB Audits	\$19.25 B
Average of Provincial Audits Scaled for CAUBO Regional Variations	\$15.4 B
Translation from CAUBO Study	\$15.7 B - \$18.0 B
Sensitivity Analysis from SK Public Reports	\$68.7 B
Sensitivity Analysis from ON Public Reports	\$29.6 B
2009 ACAHO Study	\$20.5 B

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