

Research Paper

Longevity of Infrastructure – Reserving and Risk Management in Condominium Maintenance in Canada

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Executive summary

This research paper explores the Canadian condominium (condo) industry with an actuarial insight into condominium reserve funds set aside for paying the future repair and replacement costs of common elements shared among condo owners in a building. It focuses on the reserve fund aspect of operating a Canadian community association, including a review of the legislation and available documentation across Canada, the role of boards of directors, the purpose of a reserve fund study, and some of the issues observed in the condo industry. A stochastic model using actuarial techniques was also created to assess the viability of reserve funds, and was applied on two case studies of existing condo buildings, providing results on the evolution of their reserve funds through time. Potential solutions for boards of directors to address the funding uncertainty of reserve funds are also presented.

Based on the extensive literature available, combined with an analysis of real-world, current funding plans for many condo corporations, we believe that the following elements need to be addressed to protect the value of condo infrastructure across Canada:

- **Minimum annual contribution and balances** – As a bare minimum, and in the absence of an up-to-date (not more than 3 years old) independent reserve fund study, the minimum annual reserve fund contribution should be 1% of the full reconstruction cost of the condo building. Also, the reserve fund balance should never be, at any time, below the amount of deductible for property damage on the condo corporation’s insurance policy (possibly several multiples thereof). The reserve fund study (not expired) should dictate the minimum annual reserve fund contribution, and be reviewed and updated by legislative mandate every 3 years to ensure proper funding.
- **Financial cushion** – Legislation should require condo corporations to hold in the reserve fund a financial cushion that would be above what is required by a reserve fund study. That cushion protects corporations from adverse deviations from increased expenditures (among other things), as this component of our stochastic model demonstrated a high degree of volatility. It should be high enough to cover emergency repairs and avoid a special assessment, but not so high that condo owners over-contribute for that financial protection. Since a lot of condo corporations



will be required to increase their reserve fund contributions, and the size of that financial cushion depends on many other factors, we suggest additional research to explore the calculation of an appropriate financial cushion for a reserve fund.

- **Data** – The lack of data in this industry reveals that there is a crying need to know more about this aspect of the industry. Governments should administer a standardized form to condo corporations to gather data so that the situation in the industry can be monitored, and adjusted along the way if necessary.
- **Education** – There is a need to educate directors and condo owners/buyers on how a condo works. More educational material, mandatory training courses, and continuing refreshers should be created and taught by non-governmental entities that should be subsidized by provincial governments. A mandatory training course should also be implemented, and be administered by a governmental entity to all sitting directors, so they undoubtedly understand the importance of their roles and responsibilities as well as the consequences of not performing them diligently according to the legislation.

We found that condo legislation across Canada varies considerably among the provinces and territories regarding reserve funds, and that legislative improvements should be instigated by the respective legislators. We also have documented cases where boards of directors had conflicts of interest and did not fulfill their role to the fullest for the benefit of all condo owners, and worsened the situation of the condo building, leading to cash outflow from the reserve fund. In addition, we identified challenges in repair and maintenance costs of common elements since the increase in costs over time has been higher than inflation and will continue to be an issue for condo corporations in maintaining a healthy reserve fund.

We hope this research paper will have a deep impact in the condo industry with regard to the funding of reserve funds, as condos are more than an investment – they are the beloved homes of many condo owners.



Introduction

The number of condominium properties (condos) has been growing incessantly across Canada since 1966 and markedly since 2000. A condo offers the characteristics of both living in an apartment and owning a real asset like a house. This mix has been growing in popularity for its affordability for the younger generation and as an opportunity for investment. A characteristic appealing to condo buyers is that the maintenance of common elements and areas is taken care of by a governing body (a condo corporation), comprised of a selected group of condo owners (a board of directors), appointed or elected to serve as the representatives of all condo owners.

With the right of owning a condo comes the obligation of owners to pay monthly condo fees to cover recurring annual operating costs and to contribute to a reserve fund that will be used for larger expenses in the future, such as the repair or replacement of common elements (e.g., roof replacement). All provinces and territories in Canada have legislation regarding condos and almost all provinces and territories require condo corporations to have a reserve fund (when using the term “provinces” throughout this research, we shall mean provinces and territories, unless otherwise stated). The overall objective of a reserve fund is to amortize the large periodic expenses over time so that future and current condo owners share the expenses for the common elements. However, some jurisdictions have set minimal or no requirements for reserve funds, and even those that did have not kept the requirements in pace with the growing complexity of the condo market.

Unfortunately, to this day the initial levels of reserve fund accumulations – based on the minimum permissible reserve fund contributions that are determined in accordance with the legislation – are insufficient to result in a reasonably uniform amortization of costs over time, and unsurprisingly (to those informed) this will result in escalating condo fees and/or insufficient funds when required for condo repairs and replacements.

Many condos in Canada are over 30 years of age and have gone through a mature cycle of repairing and replacing some significant and costly common elements of their building. Based on this experience, much of the replacement or major (high-cost) repair work may not happen until a building is more than 20 years old. Ideally, condo corporations would have a healthy reserve fund by that stage to cover the expected high-cost expense. The reality is, however, that as many new condo buildings are being built across Canada (or



have been built), new condo buyers are unknowingly agreeing to condo fees that are artificially low at the time the condo is being sold but will inevitably increase once their first complete reserve fund study is performed and that large expense occurs.

The issue for condo corporations is how to affordably save for repairs and replacement of the common elements by keeping a reasonable level of reserve fund contributions. The contributions budgeted each year for the annual operation of the condo building and the contribution for the reserve fund are in the control of the board that is charged with the fiduciary duty of managing the condo corporation. This fiduciary responsibility is to ensure that the corporation, among other things, collects the appropriate level of annual reserve fund contribution based on an independent expert's opinion about the amount that should go in the fund. That duty transcends personal interest to avoid under-budgeting the required reserve fund contributions simply for the present delight of current condo owners. If the board was to do so, this short-term vision would have adverse consequences in the long run that are yet to be quantified when new condo buyers are entering the market.

This research uses critical analysis to establish recommendations for the condo industry to increase awareness that many condo corporations have low reserve fund contributions, which will likely lead to large annual reserve fund contribution increases and highly probable lump-sum payments (i.e., special assessments) to cover shortfalls. Ultimately, a deferral of reserve fund contributions from now to the next condo buyer will create intergenerational inequity as well as a false overvaluation of condo properties' market value.

The concept of accumulating capital in a reserve fund to cover future expected, but uncertain, payments is similar to other financial reserving situations that actuaries oversee and manage (e.g., life insurance, property insurance, defined benefit pension funds) and are bound by legislation that often dictates minimum reserve requirements, such as minimum funding methods for pension plans. Actuarial techniques used in these contexts are familiar to actuaries of all backgrounds and can extend to the area of reserve funds in the condo industry. Managing the risk with stochastic models, predictive analytics, and other actuarial tools would strengthen the condo industry, benefit condo buyers, and help legislators in this multi-billion-dollar industry.



This research intends to:

- explore the current landscape as it relates to the use of condo reserve funds in Canada
- review and identify available documentation on condo reserve funds and compare legislation across Canada
- identify issues facing the condo industry
- create a reserve fund model that will evaluate the funding status and likelihood of shortfall for condo corporations
- recommend improvements for long-term sustainability, maintenance of condo infrastructure, and funding mechanisms

A glossary of key terms used throughout this research is available in [Appendix E](#).



Understanding condos across Canada

Canadian condos have been creatures of statute since the late 1960s, with the earliest provincial legislation passed in Alberta in 1966. Now, every provincial and territorial jurisdiction in Canada has legislation regarding the ownership and governance rights and responsibilities of co-owned property. While there are subtle unique aspects in each legislation, the over-arching mandate is consumer protection and stability. For the most part, this real property ownership model has been well received and embraced by Canadians. It is now a significant aspect of residential ownership with up to 50%¹ of all real estate transactions being related to condo homes. There are many industrial-commercial condo properties as well.

In these five decades, various lessons learned have come to light and continue to be explored as communities of co-owners develop governance models and influence legislation. In particular, the ability to affordably save for the replacement and major repair of common elements has become among the key governance issues. Almost all jurisdictions have mandatory requirements for reserve funds, except for Prince Edward Island and Nunavut.

What is a condo?

Condos have different shapes and sizes that can range from two to more than 800 residential units. Compared to a home, where the property holder is wholly responsible for property repair and maintenance, condo owners share this cost, and all the risks that come along, with other condo owners. Living in a condo also encourages the development of close bonds with other condo owners as a purposeful community, while single-family home living gives more individual privacy to owners.

We will present the results of our reserve fund model based on two main types of condos, in which common elements vary largely, that will help us shape a reserve fund model distinctively for both. The two types are as follows:

¹ [Building Industry and Land Development Association \(January 27, 2021\)](#). New home market data. Accessed July 2021.



- Townhouses: In terms of type, they will be between a house and an apartment and will usually line up with other townhouses. Sometimes they will be part of an entire neighbourhood as well as a single condo corporation, and sometimes will be simply at the corner of a block. They will have similar characteristics to a home, such as a backyard, a deck, and a parking space with a private garage.
- High-rise: Condos will be stacked one over the other and next to one another, like apartments, and will rise above seven floors for a typical high-rise and be below eight floors for a typical low-rise. They will often incorporate common areas and common elements to be shared among all owners without restriction, such as pools, gyms, hallways, and elevators.

Note that many low- and high-rise condo projects now have a blend of industrial or commercial units typically located at street level, offering convenient service to both condo owners and other people living in the neighbourhood. Usually, commercial owners can rent a space in a building to sell their services or products, but it is now possible, and sometimes more convenient for them, to buy a unit in a condo building that will allow them to possess a piece of real estate property. They will have similar services to condo owners and will have to pay condo fees as well; the difference will be in the designation of their space, which will be dedicated to commercial use. It is sometimes more affordable than buying a whole building requiring large upfront capital.

Private vs common vs exclusive-use

A condo corporation is a complex assembly of different parts. Individuals own and are responsible for the inside of their condo, but it is important to distinguish what will be the responsibility of the owners and what will be paid by the condo corporation through the condo fees. We can identify three different aspects within a condo corporation:

- Private: The private part will be, of course, the condo itself, belonging to the condo owner. Its delineation typically goes from wall to wall and floor to ceiling within the condo unit. It is an envelope that is all under the responsibility of the owner (e.g., bedrooms, closets, living room, bathroom, kitchen).
- Common elements: All elements not located within a private condo and that are available for everyone's usage (i.e., it is not for the exclusive use of a condo owner). Common elements are the property and responsibility of all (e.g., site work,



structural frame, building envelope, mechanical equipment, electrical systems, life safety, elevating devices, amenity areas, and interior finishes). Tables of common elements, used in our two case studies for this research, are included in Appendix C.

- Exclusive-use common elements: They represent specific elements that fall in between common elements and the private part. They are for the exclusive use of an individual condo owner but can either be located within a common area of the condo corporation (e.g., windows, parking, locker) or accessible by a condo owner only (e.g., balcony, patio).

Within this research, we will use the term “common elements” or “common areas” to refer to both common elements and exclusive-use common elements, unless otherwise stated.

Condo fees

As discussed, the convenience of a condo between a house and an apartment lies in the fact that building maintenance and repairs are inherently paid for with the condo fees. Each year a budget is voted for among the condo owners at a general assembly to establish the amount of condo fees per unit for the following budget year. These condo fees go into two different funds:

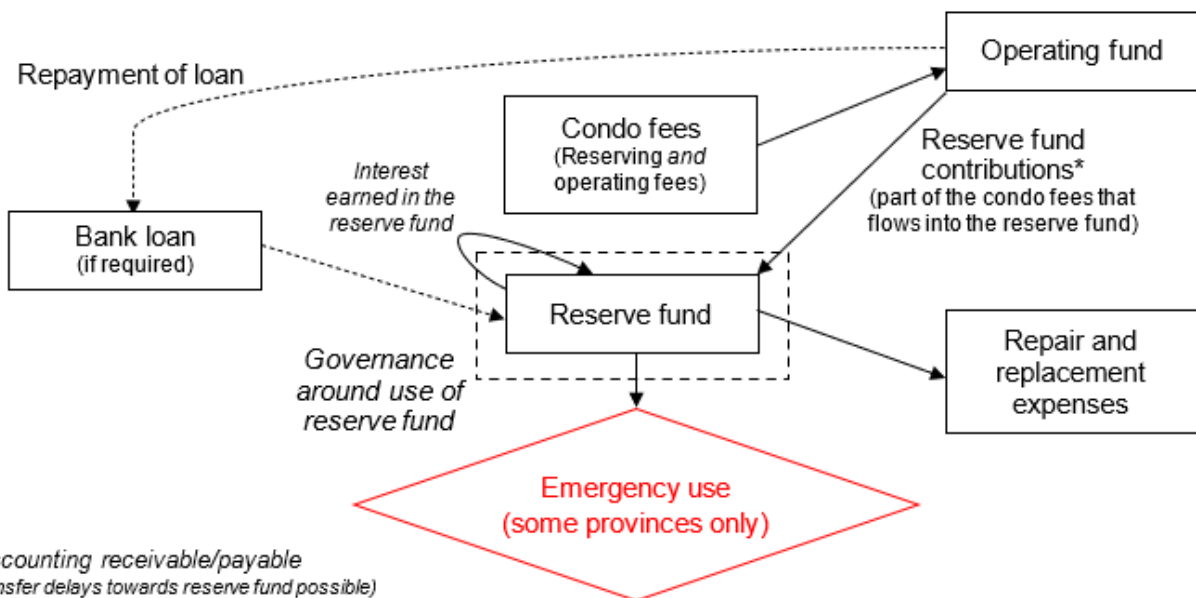
- Operating fund: Part of the condo fees is used towards the operating funds that pay for recurrent expenses through the budget year (e.g., electricity bill, pool, cleaning, small repairs).
- Reserve fund: Part of the fees is set aside in a reserve fund for later use to pay for large planned repairs (e.g., parking garage slab, roof replacement, pool replacement, balcony railing, hallway painting).

The estimation of the condo fees for the operating fund will tend to be straightforward as it looks over a one-year horizon on known recurring expenses. However, for the reserve fund, where expenses are expected to be incurred in the future, sometimes over decades, the importance of planning ahead to contribute the right amount annually is crucial. The only appropriate way to make the right estimation of the future cost is to hire an expert who will assess all common elements' future costs and the required time of replacement. All the common elements that fall under the responsibility of every condo owner will need replacement or repairs in the future.

Reserve fund

Below we present how the mechanics of a reserve fund works for a condo corporation:

Figure 1: Mechanics of a reserve fund



- Condo fees: They are budgeted and voted for each year at a general assembly. They are for the operating fund and reserve fund and are determined independently. The amount going into the reserve fund (i.e., the reserve fund contribution) would typically be based on a reserve fund study performed by a professional authorized under legislation to provide such a service.



- Operating fund: Will be used to pay for day-to-day operations. Sometimes, all the condo fees will be deposited in the operating fund before being transferred to the reserve fund. This may cause the end-of-year financial statement to show the reserve fund with an amount receivable and the operating fund with an amount payable, which may understate the true cash value of the reserve fund until the cash is transferred. Without proper oversight, the amount receivable in the reserve fund can grow larger and cause liquidity issues.
- Reserve fund: The projected cash inflow is already known at the beginning of the fiscal year and should accumulate each month with every reserve fund contribution.
- Interest earned in the reserve fund: The reserve fund can be invested in bonds and other fixed-income assets that legislation authorizes. The amounts of interest earned can be an important source of income for some reserve funds as they help reduce the required reserve fund contributions in circumstances where the reserve fund is of a sizable amount, allowing for interesting returns on investment.
- Governance: The reserve fund is to be managed by the directors sitting on the condo corporation's board using their good judgement and the corporation's declaration and bylaws (see the glossary in Appendix E for more details), and in accordance with the applicable legislation. A certain standard of care is expected from the directors in the use of the reserve fund and the diligence regarding following and updating the reserve fund study.
- Bank loan: Some repairs will require a special assessment due to a shortfall in the reserve fund, for various reasons, and this special assessment can be covered in part or in whole by a loan. Afterwards, the condo owners will be required to contribute and repay this loan through monthly payments.
- Emergency use: Some provinces allow the reserve fund to be used cover the cost of some repairs, deductibles for insurance, or other unforeseen events that cannot wait for a special assessment. Those emergency withdrawals are not planned for in a reserve fund study and are described in more detail in each province's legislation.
- Repair and replacement expenses: The primary use of the reserve fund is to pay for the repair and replacement expenses planned in the reserve fund study. Repairs and replacements can be carried out during a budget year or can be spread though multiple budget years. An example of planned replacement over multiple budget years would be the replacement of window frames for a condo building divided into



different phases/towers, where one phase/tower per year would have its window frames replaced.

Reserve fund study

For a condo corporation to know how much it should contribute into a reserve fund for the repair and replacement of the common elements, it needs to have a reserve fund study prepared by a professional. A condo corporation will need to follow different steps to perform a reasonable reserve fund study, and it is best practice to follow the common key steps below to get the most out of the study. This way, the study will determine the optimal reserve fund contributions required by the condo owners.

1. Select an appropriate provider by requesting quotations from different firms specializing in reserve fund studies. Criteria for selection can be the company size, its history, expertise, references, etc. It is important to select a provider that will understand the condo building's common elements in depth, and its peculiarities.
2. Request and encourage on-site visits from the providers that will allow the reserve fund study expert to assess accurately all common elements of the condo building (i.e., the quantity, their quality, observed condition, etc.).
3. Provide necessary documentation and historical maintenance bills to help the expert in establishing the useful life and timely replacement of all common elements, and their replacement cost.
4. Once the reserve fund study is done, the study expert must present a report to the board for its review.
5. The board must then consider the assessment of the reserve fund study and apply the necessary recommendations to collect the appropriate reserve fund contributions in respect of the legislation, the declaration's requirements, and its bylaws, if any.

The level of contributions going into the reserve fund will depend on the conditions of the common elements when the reserve fund study is performed, the actual balance in the reserve fund, and the risk aversion of the board towards a potential special assessment.



However, the level of contributions could also vary widely depending on the method of funding used. Below we describe four funding methods commonly used for reserve funds:²

- 1. The Baseline or Zero-Balance:** The required reserve fund contributions are kept as low as possible, and the objective is to maintain a positive balance in the reserve fund.
- 2. Threshold or Minimum Reserve:** The objective is to maintain the reserve fund balance above a pre-determined level (e.g., \$100,000) to cover unexpected expenses in a case where some common elements would need repairs or replacement earlier than expected.
- 3. Statutory Funding:** The reserve fund contribution will be the minimum set by legislation, whether it be the amount set in a reserve fund study or determined by a specific formula.
- 4. Fully Funded:** The money required for major repairs and replacement is contributed up front, and the risk of a special levy required when repairs and replacement come due is greatly minimized.

For each method, there is a possibility to pool or not to pool the individual common elements together. The difference is that instead of considering the reserve fund as a whole and using it when repair or replacement of a component is required, each individual common element is accounted for separately and has its own account in the reserve fund. Therefore, if the timing of the repair or replacement of an individual common element is earlier than expected there will be a need for a special assessment to fund the shortfall for that specific individual common element, even if the overall balance in the reserve fund is sufficient.

Although the methods above have been used for a long time, there could be benefits for condo owners if the reserve fund study was performed using actuarial techniques for the funding methods. The disparity in expected reserve fund contributions between funding approaches 3 and 4 is substantial, and an actuarial funding method based on stress tests and long-term projections could bring better stability to the reserve fund study. Condo

² Benum, K., Paustian, E., and Wilson, D. (2015). [Understanding reserve fund studies](#). *Canadian Property Valuation*, Volume 59, Book 4. Accessed June 2021. Appraisal Institute of Canada.



owners will prefer steady and predictable reserve fund contributions as opposed to large special assessments.

Board of directors

Every condo corporation is represented by a limited number of owners, who are called directors. They all sit on a board forming what we call “the board of directors” or simply “the board.” These directors are elected annually when a general assembly is held and will have the responsibility, for a year, to represent all the condo owners in performing the duties of the condo corporation. These responsibilities include:

- hiring professionals to carry any duties related to plumbing, electricity, cleaning, etc.
- consulting with experts on specific matters when necessary (e.g., lawyer, accountants)
- collecting the condo fees
- maintaining financial statements
- communicating important information among owners
- resolving any matters between condo owners
- any other tasks required in the role of director set by the legislation

The role of a director comes with a fiduciary responsibility in which the decisions made by a director cannot be in his or her own interest but must rather be in the interest of all condo owners. The financial consequences of board decisions can harm some condo owners, and they would be in their rights to sue the board for reparation. Some condo owners sitting on the board may take their role lightly, but the consequences can be severe. Directors can face legal action and be condemned to pay large sums of money from their own pockets if found guilty, and ordered to make reparations.

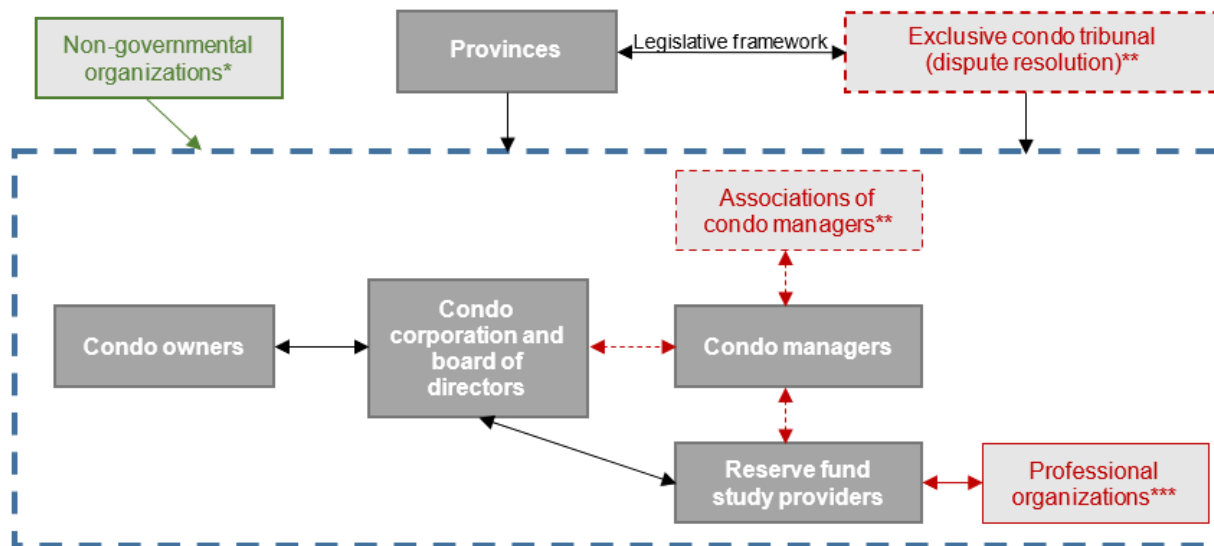
A real example of consequences faced by a board from a condo building located in Ottawa ended with the “court [ordering] a group of condo directors to personally pay costs of almost \$100,000 for acting in bad faith in a dispute over a landscaped courtyard.”³ As mentioned, the responsibility of sitting on a board is not to be taken lightly.

³ Santry, C. (2013, June 10). [Focus: Condo directors to pay \\$100K for bad faith](#). *Law Times*. Accessed June 2021.

Relationships between stakeholders

In Figure 2 we present the different stakeholders involved in the condo framework and how they interact among themselves.

Figure 2: Stakeholders involved in the condo framework and their relationships



*Dedicated to improving condo living and providing useful resources (e.g., Canadian Condominium Institute)

**Not present in every province

***Not all authorized providers that are permitted to conduct reserve fund studies are bound by professional organizations

- Provinces: They establish the legislative framework and may amend the Act and regulations for condos, as appropriate, from time to time.
- Exclusive condo tribunal: If applicable in the province, it will be a separate authority that will resolve disputes among condo owners for many situations. In other cases where that separate authority does not exist or the matter to be resolved is too complex, resolution will be undertaken by another authority falling within the judicial system.
- Non-governmental organizations: These are organizations dedicated to improving the condo industry by providing education and information, as well as access to experts in the field for condo owners or other interested parties.
- Condo owners: Current owners of a unit within a condo building.



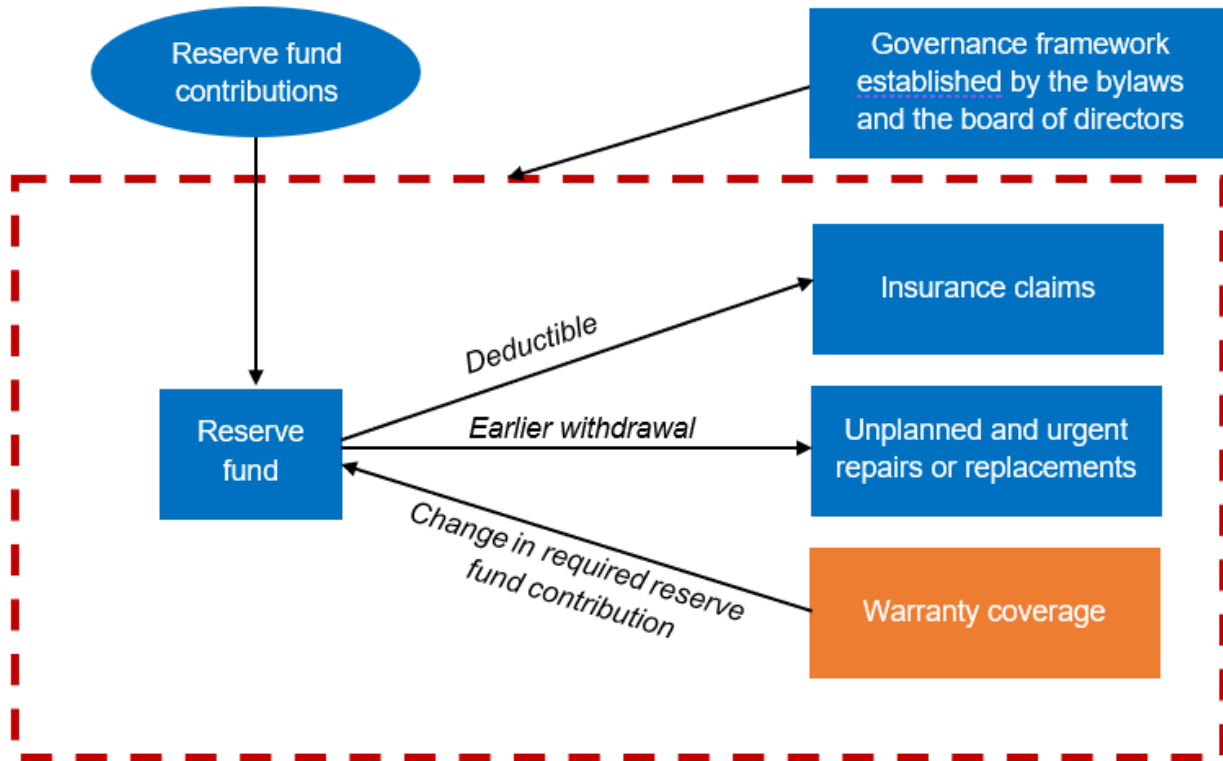
- Condo corporation: A legal entity that is created at the time of registration of the condo building (usually upon final construction), and whose members are the condo owners. The corporation’s property and assets are managed by the board of directors.
- Board of directors: The governing body whose responsibility is to ensure the effective running of the condo corporation. It oversees the operation and uses the reserve fund appropriately. It is responsible for assessing and collecting the necessary condo fees. The directors are elected by the condo owners and are usually condo owners.
- On rare occasions the board will have directors who are not condo owners, if its bylaws allow it.
- Condo managers: A company specializing in managing condo buildings which can take care of the finances, operations, and record-keeping for the condo corporation as well as helping the board in carrying its duties.
- Associations of condo managers: They are non-profit organizations helping condo managers in providing resources and intellectual capital for all.
- Reserve fund study providers: They are qualified individuals authorized by applicable legislation to conduct a reserve fund study to help the board in assessing the right level of reserve fund contribution required.
- Professional organizations: They govern the profession in which qualified individuals render their services to provide reserve fund studies.

Other relevant interconnections

The reserve fund is a simple and straightforward idea in theory, but with it comes a lot of outside interactions that can impact its balance evolution and contribution level, and the purposes for which it is meant to be used.

The following is a representation of some relevant interconnections that can affect the reserve fund:

Figure 3: Other relevant interconnections



- Reserve fund contributions: These are either set by legislation or set following a reserve fund study performed by a professional who has assessed the cost of replacing or repairing the common elements.
- Insurance claims: Under the circumstances where one of the common elements suffers damages that are covered by the condo building's insurance policy, it is sometimes more efficient to have it fully repaired under the insurance policy by using the reserve fund to pay for the deductible. Some condo buildings have so many recurring claims (and some that are almost predictable) that they simply budget for the amount of their deductible in their reserve fund study instead of fully funding the cost of the common elements covered under the insurance policy since they assume it will be claimed using their insurance.
- Unplanned and urgent repairs or replacements: There are two schools of thought about the use of the reserve fund for unplanned repairs or replacements. Some think



that it is a fund for rainy days when surprise expenses arise, and others stand by the idea that the reserve fund is for planned repairs and replacements documented in a reserve fund study. It may be reasonable to use the amount accumulated in the reserve fund to pay for urgent repairs or replacements when the cash flow for that expense is not readily available. However, early withdrawals will lower the reserve fund and jeopardize the expected accumulation of the fund, which will require over-compensation. The board must ask itself how, in the short run, it will refill the reserve fund to the appropriate level to compensate for early withdrawals. The use of the fund in emergencies is not permitted in all provinces; therefore, the reserve fund should not be inappropriately used by the board when it is not permitted.

- **Warranty coverage:** When condo owners take possession of a newly constructed condo, the developer of the condo corporation often subscribes (or must subscribe, depending on the province’s legislation) to an insurance policy that will protect the new owners from defects in the new construction. This protection usually lasts around 7 to 10 years depending on the common elements insured. The reason it has an impact on the reserve fund is because a condo building that has no protection, or for which the protection has expired, will possibly need to use the reserve fund to repair the faulty components that should have been fixed prior to the expiry of warranty coverage. On the other hand, if a condo corporation can use that warranty coverage in the case of common elements’ defects, it will be better off regarding its reserve fund and may save extra contributions along the way.
- **Governance framework established by the bylaws and the board of directors:** The connections highlighted in Figure 3 are all controlled by the board since it is the governing body that decides what to do with the reserve fund in accordance with the legislation. Directors should avail themselves of relevant education and training regarding their role and responsibilities and best practices of condo governance, as is expected of them.

Distribution of condos across Canada

Below is a table providing information on the number of condos as of December 31, 2020. Although some provinces do not provide official statistics or do not track these kinds of statistics, the table aims to provide a reasonable idea of the distribution of condos across Canada based on our estimation.



Table 1: Distribution of condos across Canada⁴

Location	Estimated Pop ⁵	Average Number of People per Condo Household	Estimated Number of Condo Corporations	Average Number of Units per Condo Corporation	Estimated Number of Condo Units	Estimated Number of Condo Residents	Estimated Percentage of Population Living in Condos
Canada	38,008,005	2.0	65,289	43	2,824,277	5,814,000	15%
Ontario	14,733,119	2.1	12,307	89	1,095,323	2,327,000	16%
Québec	8,575,779	2.0	7,160	75	537,000	1,047,000	12%
British Columbia	5,145,851	2.2	32,218	21	671,351	1,460,000	28%
Alberta	4,428,112	2.0	9,000	30	270,000	526,000	12%
Manitoba	1,379,584	1.9	1,140	50	57,000	106,000	8%
Saskatchewan	1,177,884	1.8	1,672	65	108,680	198,000	17%
Nova Scotia	979,115	1.8	800	50	40,000	72,000	7%
New Brunswick	781,315	1.8	640	50	32,000	56,000	7%
Newfoundland and Labrador	520,998	1.7	154	26	4,040	6,000	1%
Prince Edward Island	159,713	1.8	120	50	6,000	10,000	6%
Northwest Territories	45,074	2.2	38	50	1,883	4,000	9%
Yukon	42,176	2.1	20	25	500	1,000	2%
Nunavut	39,285	2.7	20	25	500	1,000	3%

⁴ Data gathered from direct correspondence with legislators and projections by McIntosh Perry based on population. Details available upon request.

⁵ Statistics Canada (2021). Table 17-10-0009-01 Population estimates, quarterly, Q4 2020. Accessed June 2021.



In figures 4 and 5 we summarize some key statistics from the table above in the form of a geographical maps.

Figure 4: Estimated percentage of population living in condos

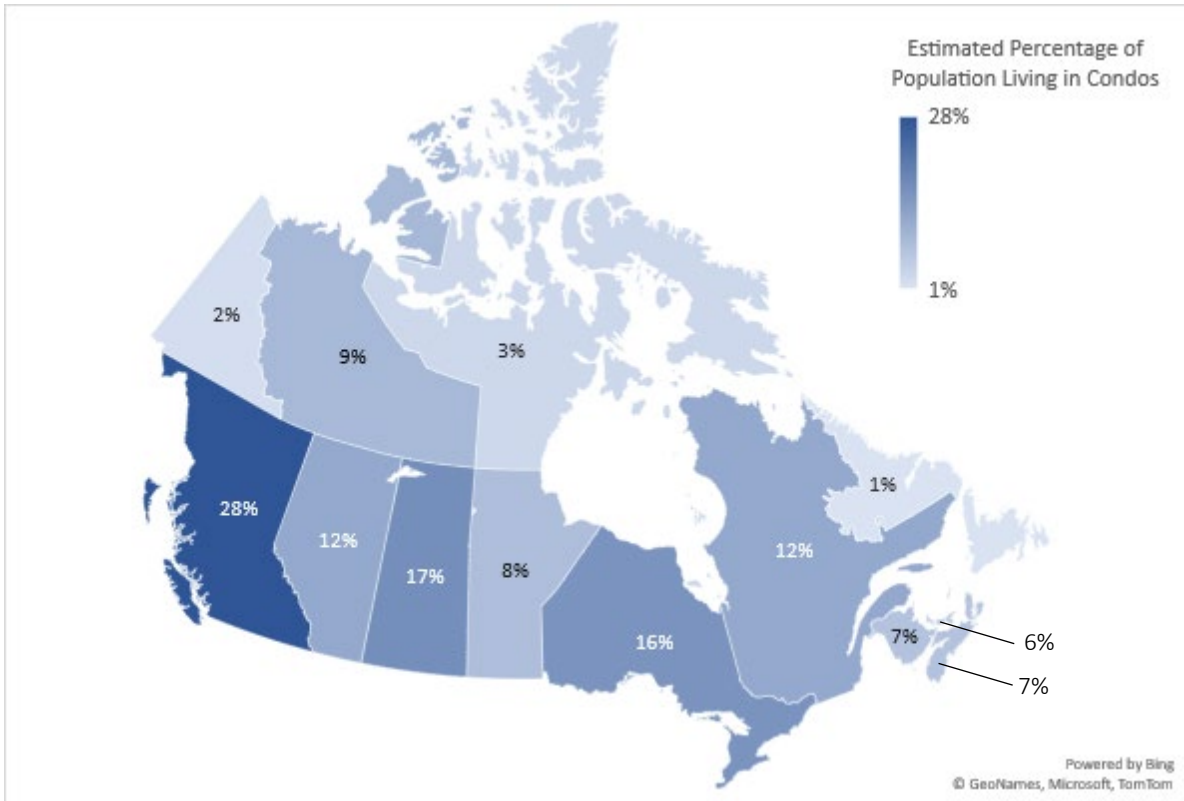
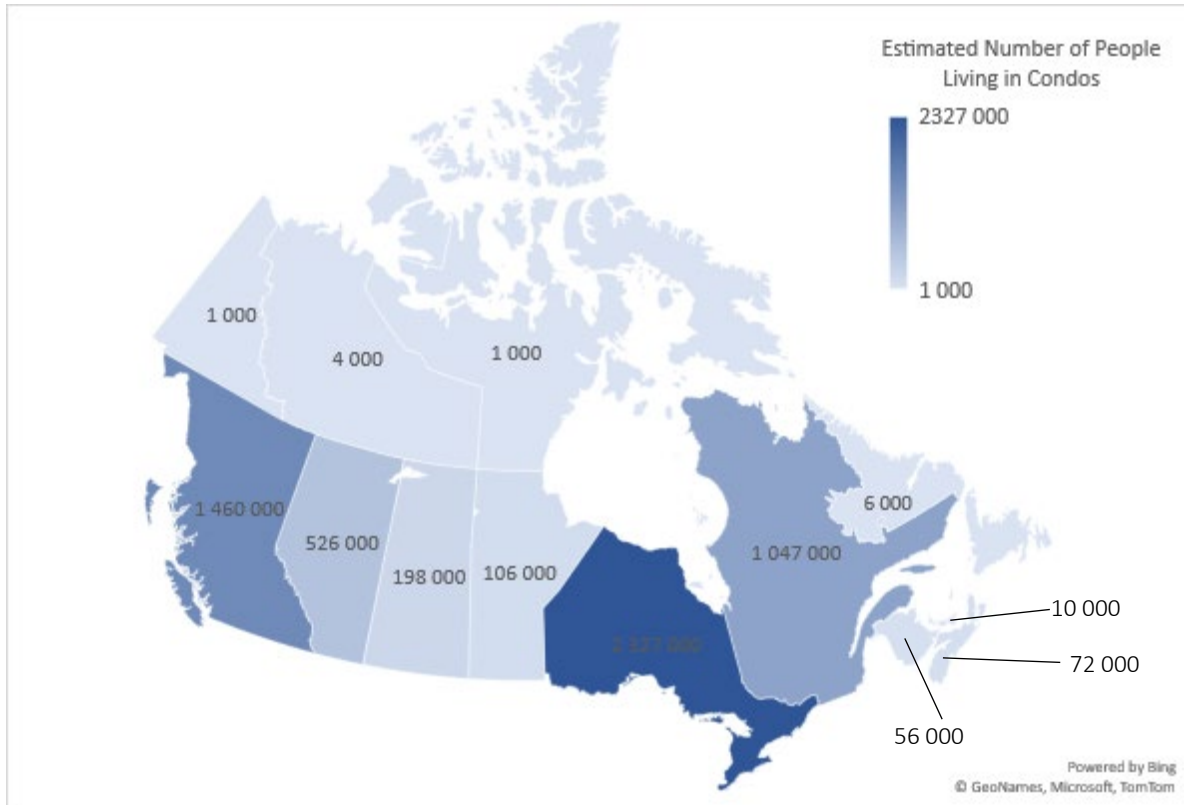


Figure 5: Estimated number of people living in condos



Review of condo literature across Canada

Provinces have enacted legislation through the years to better regulate the condo industry for buyers, owners, constructors, condo managers, reserve fund study experts, and other important stakeholders. We have seen non-governmental organizations formed to help condo owners (e.g., the Canadian Condominium Institute, or CCI) and condo manager companies specializing in the management of small, medium, and large condo corporations. Some professionals, such as lawyers and engineers, have also been contributing to the publication of articles, research papers, summaries of legislation, and other work. In this section we present both a review of legislation across Canada and an inventory of existing documentation, programs, and organizations that provide relevant material for the condo enthusiast regarding reserve funds.



Review of legislation across Canada

All provinces have their own condo Acts and regulations to regulate and oversee the condo industry. The different Acts and regulations for each province are listed below:

Table 2: Acts and regulations for each province

Province/Territory	Act (in force)	Regulations (in force)
British Columbia (BC)	Strata Property Act, SBC 1998, c. 43	Bare Land Strata Plan Cancellation Regulation, BC Reg 556/82 Bare Land Strata Regulations, BC Reg 75/78 Strata Property Regulation, BC Reg 43/2000
Alberta (AB)	Condominium Property Act, RSA 2000, c. C-22	Condominium Property Regulation, Alta Reg 168/2000
Saskatchewan (SK)	Condominium Property Act, 1993, c. C-26.1	Condominium Property Regulations, 2001, The, RRS c C-26.1 Reg 2
Manitoba (MB)	Condominium Act, CCSM c. C170	Condominium Regulation, Man Reg 164/2014
Ontario (ON)	Condominium Act, 1998, SO 1998, c. 19	Condominium Authority Tribunal, O Reg 179/17 Condominium Returns, O Reg 377/17 Description and Registration, O Reg 49/01 Designation of Condominium Authority, O Reg 181/17 Extension of Temporary Suspension Period, O Reg 541/20 General, O Reg 48/01



Province/Territory	Act (in force)	Regulations (in force)
Québec (QC)*	Civil Code of Québec, CQLR c. CCQ-1991	Regulation to establish various measures in matters of divided co-ownership insurance, CQLR c. CCQ, r 4.1
Newfoundland and Labrador (NL)	Condominium Act, RSNL 1990, c. C-29	Condominium Regulations, CNLR 955/96
Nova Scotia (NS)	Condominium Act, RSNS 1989, c. 85	Condominium Regulations, NS Reg 60/71
New Brunswick (NB)	Condominium Property Act, SNB 2009, c. C-16.05	General Regulation, NB Reg 2009-169
Prince Edward Island (PEI)	Condominium Act, RSPEI 1988, c. C-16	Condominium Act Regulations, PEI Reg EC431/97
Northwest Territories (NT)	Condominium Act, RSNWT 1988, c. C-15	Condominium Regulations, NWT Reg 098-2008
Yukon (YT)	Condominium Act, RSY 2002, c. 36	Condominium Certificate of Title, YCO 1977/101
Nunavut (NU)	Condominium Act, RSNWT (Nu) 1988, c. C-15	None

* Following the enactment of Bill 16, regulations are still expected and will provide more details on the funding of reserve funds.

To better understand the differences between provinces, we reviewed the different Acts and regulations and compared them against each other. We focused our analysis on everything that was related to the reserve fund, since our interest is about evaluating the strength of a province in encouraging robust behaviour and long-term horizon habits in setting money aside for future replacement and repairs of common elements. For our analysis, we used a point system to evaluate the strength of requirements towards reserve funds for all provinces' Acts and regulations, which is described below. The following items were evaluated for a total of 28 points:

- description of condo reserve fund (5 points)
- vote required to use the reserve fund (1 point)



- minimum annual contribution to the reserve fund (7 points)
- frequency and coverage period of reserve fund study (5 points)
- professional authorized to perform reserve fund study (4 points)
- circumstances where a condo corporation is not required to conduct a reserve fund study (2 points)
- reserve fund investment (4 points)
- refund of contribution to condo owners (0 point)

Once all items above were evaluated, we ranked all provinces using their total points out of 28 in order to value their Acts and regulations' strength based on the following system, where x is the total number of points:

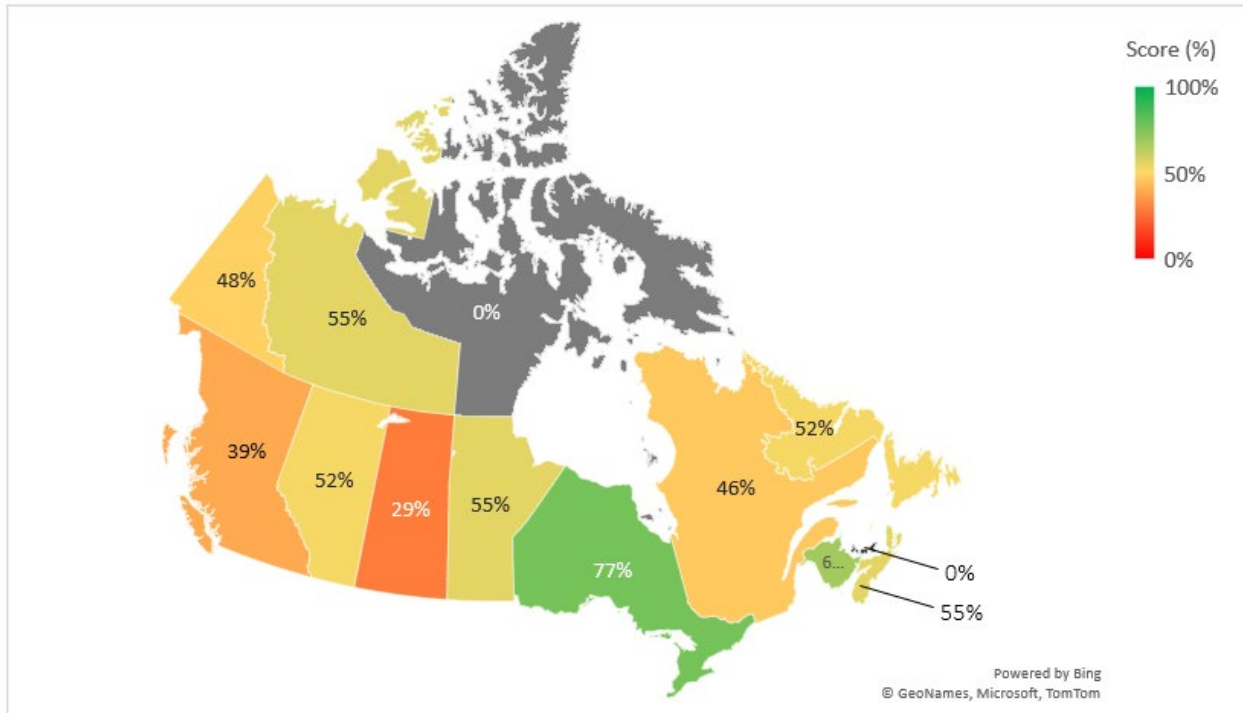
Table 3: Point system*

0	$0 < x \leq 5$	$5 < x \leq 10$	$10 < x \leq 15$	$15 < x \leq 20$	$20 < x$
Non-existent	Low	Low-Moderate	Moderate	Moderate-High	High

* The point allocation in evaluating each qualitative item was performed as objectively as possible. However, as the quantitative evaluation of qualitative items can remain subjective, the results may differ from one's perspective.

The compiled results are presented below in the form of a geographical map and provide a comprehensive contrast between the provinces' Acts and regulations. The detailed analysis can be found in Appendix A.

Figure 6: Legislation strength across Canada



As we can see in Figure 6, despite the enactment of legislation through the years in every province to regulate the condo market, there is still a lot of room for improvement. It is to be noted that Prince Edward Island and Nunavut do not provide any requirements regarding reserve funds. Therefore, we did not provide any analysis for them and noted them as non-existent (score of 0 points).

Yukon has also not been providing any reserve fund guidance until the recent Bill 16, which received assent on December 22, 2020⁶ and which was accounted for in our analysis – but the regulation is still to be released, which might have provided a higher score. This bill “reflect[s] best practices for condo ownership and development in Yukon and [addresses]

⁶ Yukon Legislative Assembly. 34 Legislature – Third Session (2019–2021). [Act of 2020 to Amend the Condominium Act, 2015](#). Accessed June 2021.



the concerns expressed by Yukoners.”⁷ With a population of less than 40,000 people, this demonstrates that even a small province/territory requires regulation in this industry.

As for Québec, a new Act (Bill 16) was enacted to strengthen the condo industry and presented new requirements for reserve funds. However, the new Act provided few details on how the reserve fund is to be evaluated; therefore, details will be published in the form of a regulation in a near future. If a regulation would have been published, the final score for Québec might have been higher given that Bill 16 has strengthened the condo industry in that province.

We can see that Ontario got the highest score, which reflects the fact that the Act and regulations have been updated over time on several occasions to better reflect the condo market’s requirements. Although Ontario has the best score, the Office of the Auditor General of Ontario identified several flaws in the legislation in its report *Value-for-Money Audit: Condominium Oversight in Ontario*,⁸ some of which are:

- Initial developer-set condo fees are typically understated.
- Most condo boards surveyed were required to increase reserve fund contributions by an average of 50%.
- Hundreds of unlicensed individuals and companies provide condo management services.
- Over 6,000 ineligible condo directors, who did not complete the designated training, serve on boards. These individuals ceased to be eligible to remain as directors as per legislation, yet they continue to serve.
- Directors can complete mandatory online training without reading the training materials.
- Information on the interests of directors who serve on multiple condo boards is not transparent.

⁷ Carolino, B. (2020, October 22). [Proposed bill seeks to modernize condominium law regime in Yukon](#). *Canadian Lawyer*. Accessed June 2021.

⁸ Office of the Auditor General of Ontario. (2020, December 7). [Value-for-Money Audit: Condominium Oversight in Ontario](#). Accessed June 2021.



- Condo owners face difficulties and barriers in accessing condo corporation information.

For each of the eight aspects covered in the legislation review, we provide general suggestions to legislators that could improve the quality of legislation and fill the score gap for provinces that scored low. These suggestions are summarized in the table below.

Table 4: Suggestions for improving condo legislation

Items Reviewed in Legislation	Suggestions to Legislators to Improve Their Legislation
Description of condo reserve fund	<ul style="list-style-type: none">• The definition of the reserve fund should refer to a complete reserve fund study. A comprehensive reserve fund study will outline the important common elements that require funds later for repairs and replacement. This will avoid ambiguity as to what can be paid by the reserve fund or should be contributed for in the reserve fund.
Vote required to use the reserve fund	<ul style="list-style-type: none">• Legislation needs to be clear that any use of the reserve fund should be towards repairing and replacing common elements identified in a complete reserve fund study.• The use of the reserve fund for purposes other than repairing and replacing common elements identified in a complete reserve fund study, such as, but not limited to, emergency expenses following a disaster, should be put to a vote at a general or special assembly. Legislators should require a vote from all condo owners when the reserve fund is to be used for another purpose than its predestined use.• Legislation should require that condo corporations outline a policy in their declaration and/or bylaws as to how and when to use the reserve fund, and document decisions leading to payments from the fund.



Items Reviewed in Legislation	Suggestions to Legislators to Improve Their Legislation
Minimum annual contribution to the reserve fund	<ul style="list-style-type: none">• The proxy for the calculation of minimal contribution should avoid referring to the annual operating budget as it is not the most correlated element of a condo building to determine an appropriate level of reserve fund contribution. Instead, a better proxy would be the reconstruction value.• As for the level of reserve fund contribution, there should be two levels. The first level would be applicable before any reserve fund study is performed (which can apply from the first unit delivered until the end of the construction phase) or when a reserve fund study is outdated and in need of an update. The second level would not allow for a reserve fund study to suggest reserve fund contributions under a certain limit. It has been reported that an appropriate level of annual reserve fund contribution would be around 0.85% of the reconstruction value of the condo building.⁹
Frequency and coverage period of reserve fund study	<ul style="list-style-type: none">• The period covered by a reserve fund study should be longer than 30 years, as some common elements have a much longer lifetime. A coverage period of 60 years would be more appropriate as it would allow the repair or replacement of all common elements at least once over that period.• The frequency for updating a reserve fund study (without site visit) should be every three years, and for a completely revised reserve fund study (with site visit) every six years. It is also to be noted that a reserve fund study should be required in the event of unexpected large cash outflows from the reserve fund.

⁹ Grammond, S. (2015, October 8). [Chronique – Avant que nos condos ne tombent en ruine](#). *LaPresse Plus*. Accessed June 2021.



Items Reviewed in Legislation	Suggestions to Legislators to Improve Their Legislation
Professionals authorized to perform reserve fund study	<ul style="list-style-type: none">• Since a reserve fund study can have a significant financial impact, it should be important for the individual performing the reserve fund study to be registered under a recognized organization. Licensed professionals bearing an accreditation from a trusted organization would provide reassurance that they have the skills and resources to perform a reserve fund study. Legislation should authorize a limited number of professionals to perform a reserve fund study. It would be a means of ensuring that only capable professionals perform a reserve fund study for condo corporations.• Actuaries have a large skillset when it comes to long-term financial projection. Moreover, they have the institutional organization to create and standardize around canonical methods for consistency and reproducibility, essential for statistical analysis and risk management. The possibility of credentialed actuaries joining forces with engineering, construction, and maintenance estimators would benefit the condo industry in their risk management of reserve funds and should be considered by legislators. As legislators authorize certain professions or professional titles to perform reserve fund studies, actuaries could have their own accreditation by completing standardized training recognized by the legislator.
Circumstances where a condo corporation is not required to conduct a reserve fund study	<ul style="list-style-type: none">• The benefit of a reserve fund study is too great to exempt any condo building from having to perform one, without regard to their size. Legislation should require mandated reserve fund studies for all condo corporations. However, smaller condo buildings (the definition of “small condo building” would be left to the legislator) could have their reserve fund study updated less frequently to better absorb the cost.



Items Reviewed in Legislation	Suggestions to Legislators to Improve Their Legislation
Reserve fund investment	<ul style="list-style-type: none">Investing the reserve fund is a great advantage for condo owners, but legislation should expand the allowable investments while keeping control of the protection of the capital and the liquidity requirement. If financial institutions were able to offer mutual-fund-like products by pooling reserve funds of many condo corporations, condo owners could take advantage of the economies of scale and risk diversification while gaining better returns.
Refund of contribution to condo owners	<ul style="list-style-type: none">No improvement required

Existing documentation, programs, and non-governmental organizations for reserve funds

Reserve fund studies are typically conducted by professionals who are qualified according to the province’s regulations. Some provinces will exempt small condo buildings, often of fewer than 12 units, from requiring qualified professionals to perform a reserve fund study, and will let the board decide how to conduct its own assessment. Some non-governmental organizations have developed tools to help boards perform their own reserve fund study, and also to help larger condo buildings understand how a reserve fund study is performed. Below are useful resources to better understand how to conduct a reserve fund study in different provinces, and how to interpret it.

We made a general review of the content from the material below, but we do not provide a quality assessment of each or a comparison between them as that is not the objective of our research. Reviewing the documentation below helped us in presenting this research and provided helpful insight into the funding of reserve funds. The material below was all accessed during June 2021.



Manuals and guides to perform or understand reserve fund studies

- Association Reserves
Sample Reserve Study – Do-It-Yourself Kit
www.reservestudy.com/wp-content/uploads/2019/01/12_Sample-DIY-FINAL-1.pdf
- Condo Control
Reserve Study
www.condocontrolcentral.com/template/homeowners-association-reserve-study/
- Canada Mortgage and Housing Corporation
Capital Replacement Planning Manual
https://assets.cmhc-schl.gc.ca/sf/project/cmhc/pdfs/content/en/63171_en_w_acc.pdf
- Centre for Public Legal Education Alberta
Reserve Fund Guide
www.cplea.ca/wp-content/uploads/CondoReserveFundGuide.pdf
- Canadian Condominium Institute
The Reserve Fund Study, by Kevin Dietrich, DK Condominium Management Inc.
<http://cci-sw.on.ca/sites/default/uploads/files/ReserveFundStudy-Kevin%20Dietrich-Mar19-2013.pdf>
- Alwington Communities
The Reserve Fund Study: A Guide for Board Members
www.alwington.com/blog/2020/11/16/the-reserve-fund-study-a-guide-for-board-members

Accredited programs for professionals who wish to perform reserve fund studies

- Real Estate Institute of Canada
www.reic.ca/CRP
- Appraisal Institute of Canada
www.aicanada.ca/become-an-appraiser/why-become-an-appraiser/
- UBC Sauder School of Business (Real Estate Division) – Reserve Fund Planning Program (RFPP)
www.sauder.ubc.ca/programs/real-estate/credit-programs/professional-development/reserve-fund-planning



Books on condo reserve funds

- Oliver, G. D., and Juffs, J. H. (2008). *Reserve Fund Essentials*. 3rd edition. Oliver Interactive
- Duvall, T. (2019). *Condominium Reserve Funds: How Much Is Enough*. 2nd edition. Tommy Duvall

Non-governmental organizations offering resources on reserve fund studies

- Canadian Condominium Institute (it also has many chapters across Canada)
<https://cci.ca/>
- Condominium Authority of Ontario
www.condoauthorityontario.ca/
- Toronto Condo News
<https://tocondonews.com/>
- Canada Mortgage and Housing Corporation
www.cmhc-schl.gc.ca/
- Condominium Home Owners Association of BC
www.choa.bc.ca/
- Regroupement des gestionnaires et copropriétaires du Québec
<https://en.rgcq.org/>

Issues in condos

There are many issues in condos experienced by condo owners or the board of directors. It is an industry that is evolving and changing rapidly, especially with the growing trend of owning a condo, but many issues remain unresolved and without solutions. With the housing market being very expensive right now, a house can become unaffordable for many families, and people are turning to condos instead. However, with all the issues that remain, it would be important to correct them before moving forward in building more and more condos.

Some current issues that we have seen in the condo market relate to:

- bad governance from boards of directors
- directors' skills and training being inadequate
- insufficient reserve fund leading to a special assessment
- a low reserve fund balance raising concerns among condo owners



- incomprehension from condo owners with regard to the management and operation of a condo building
- costs of repairing or replacing common elements increasing faster than inflation
- lack of transparency in the use of condo fees
- asymmetry of information when buying a condo

Below are some real relevant issues that have been documented and discussed by known figures in the condo industry, and journalists who reported news of special situations faced by condo owners. With the growing number of condos being built on the market, it is not expected that we will see a decrease in these issues, as regulators tend to pass bills when problems are already out of hand. The material below was all accessed during June 2021.

- Office of the Auditor General of Ontario (2020, December 7). *Value-for-Money Audit: Condominium Oversight in Ontario*. www.auditor.on.ca/en/content/annualreports/arreports/en20/20VFM_10condominium.pdf
- British Columbia Financial Services Authority (2020, December). *Strengthening Foundations: A Report on the State of Strata Property Insurance in British Columbia*. www.bcfsa.ca/media/1246/download
- Grimes, S. (2020, Summer). Interior design wants versus needs: A study of the discrepancy between reserve fund studies and actual improvements. *Condovoice*. <https://ccitoronto.org/Condovoice/241>
- Insurance Bureau of Canada (2020, June). *IBC National Commercial Insurance Task Force's Midterm Report*. <https://businessinsurancehelp.ca/wp-content/uploads/2020/09/IBC-National-Commercial-Insurance-Task-Forces-Midterm-Report-June-2020.pdf>
- Canadian Condominium Institute (2020, May 27). Webinar: Reserve Fund Pitfalls ... and How to Stay Out of Them. www.youtube.com/watch?v=GfTy7tUPELA
- Thompson, S. (2019, Spring). Reserve fund planning: Not as simple as it seems. *Condovoice*. <https://cci.ca/resource-centre/view/151>
- Antman, B., and Warren, J. (2018, Fall). Reserve fund study accuracy: How accurate are reserve fund studies? *Condovoice*. <https://ccitoronto.org/condovoice/135>
- Bishop, A. (2018, Spring). Financial transparency and building trust with owners: Annual statements represent the primary reporting of the financial affairs that a



board of directors is currently required to provide. *Condovoice*.

<https://ccitoronto.org/condovoice/147>

- El Rafiee, T. (2017, Fall). Expanding reserve fund investment options: an investment expert's perspective. *Condovoice*. <https://ccitoronto.org/condovoice/62>
- Dearlove, K. (2018, January 19). To inflate, or not to inflate? *Condovoice*. <https://cci.ca/resource-centre/view/211>
- Toronto Realty Blog (2014, November 12). How much money should be in the condo's reserve fund? <https://torontorealtyblog.com/blog/how-much-money-should-be-in-the-Condos-reserve-fund/>
- McMahon, T. (2014, April 22). Condo hell. *MacLean's*. www.macleans.ca/society/life/Condo-hell/
- Molnar, John J. *Reserve Fund Study Updates: Prudence and Diligence MUST Govern!* *Link no longer available.*

We cannot stop ongoing and upcoming condo projects from being built as they fulfill buyers' need to own a piece of property and have a roof over their head. However, there are growing concerns about condos that keep low reserve fund contributions which tend to underfund the required amount to repair and replace common elements in the future. These future costs of repairs and replacement are often excluded from the market prices at which condos sell, leading new condo owners to bear the cost later when the repairs come due.

We identified more broadly three categories of relevant issues regarding reserve funds that are summarized below and described in more detail hereafter:



Legislation	Governance	Economic
<ul style="list-style-type: none">• Low reserve fund contributions before first reserve fund study• Inappropriate minimum annual reserve fund contribution set by legislation• Asymmetry of information working against condo buyer• Inappropriate and misunderstood use of the reserve fund	<ul style="list-style-type: none">• Directors lack proper training or skills• Conflict of interest of directors• Under-maintenance and under-repair leading to higher costs	<ul style="list-style-type: none">• Increase in repair and replacement expense higher than inflation• Reserve fund contributions vary widely• Large reserve fund as potential target for taxation

Legislation

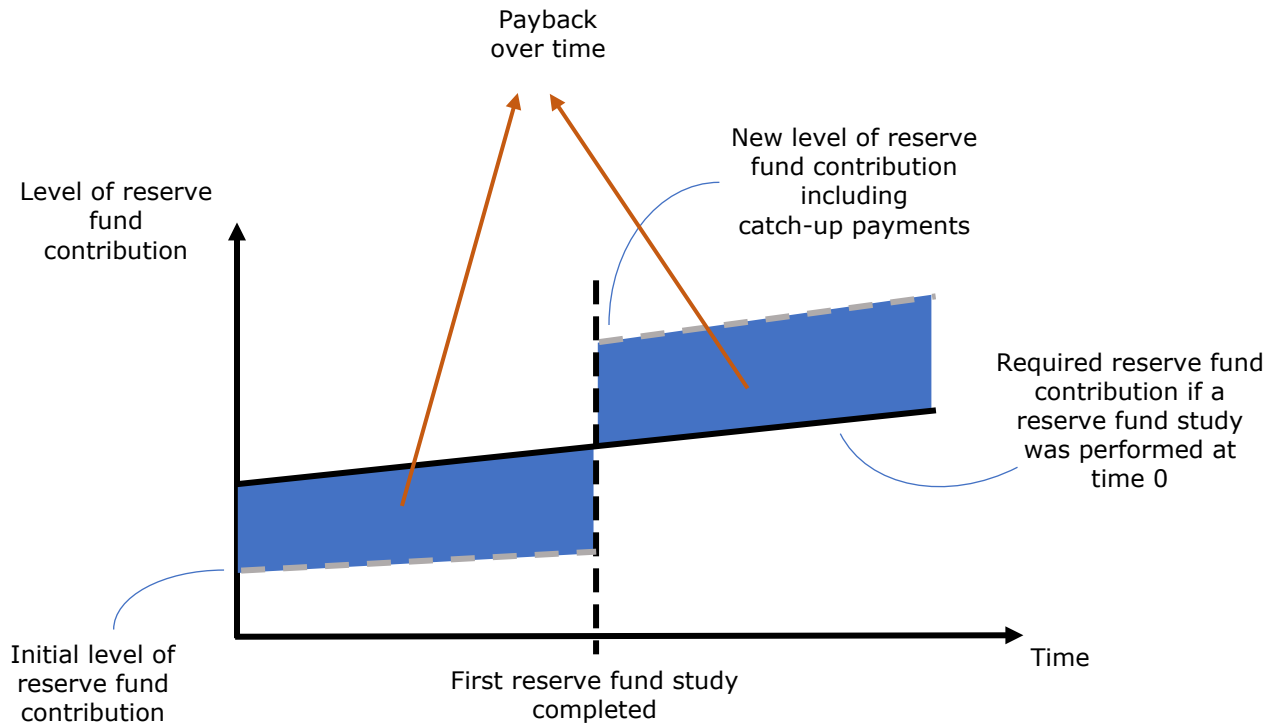
Issue #1: Low reserve fund contributions before first reserve fund study

With a growing number of condo buildings being built each year, builders aim to sell units with the lowest condo fees allowed by legislation in order to attract as many buyers as possible. This means that even a legislation requiring a mandatory reserve fund study once a new construction is completed could see a condo corporation contribute the lowest reserve fund contribution possible for some years, and sometimes longer if the project takes more time to be completed, before contributing an appropriate level determined by a reserve fund study.

This under-contribution that goes on for some years will eventually need to be remedied by either the initial owner (long-term buyer) or the newcomers buying the condo second-hand. Since these reserve fund contributions will be required at some point, the reserve fund will need to catch up at the expense of the current owners, and it will not be possible to collect these reserve fund contributions from previous owners who will have underpaid their fair share.

Simply put, Figure 7 presents the situation of under-contributing at the beginning of the condo building’s existence, and what is required afterwards to catch up the shortfall:

Figure 7: Catch-up payments in low-contribution situation



By under-contributing, the condo corporation will have to catch up later to correct the shortfall in the reserve fund. This will require contributions from all condo owners and even the ones that were not there at time 0, which creates inequality and sometimes intergenerational inequity. Due to inadequate legislation regarding the level of reserve fund contributions when the condo corporation is created, the burden falls back on condo owners in an inequitable way.

Issue #2: Inappropriate minimum annual reserve fund contribution set by legislation

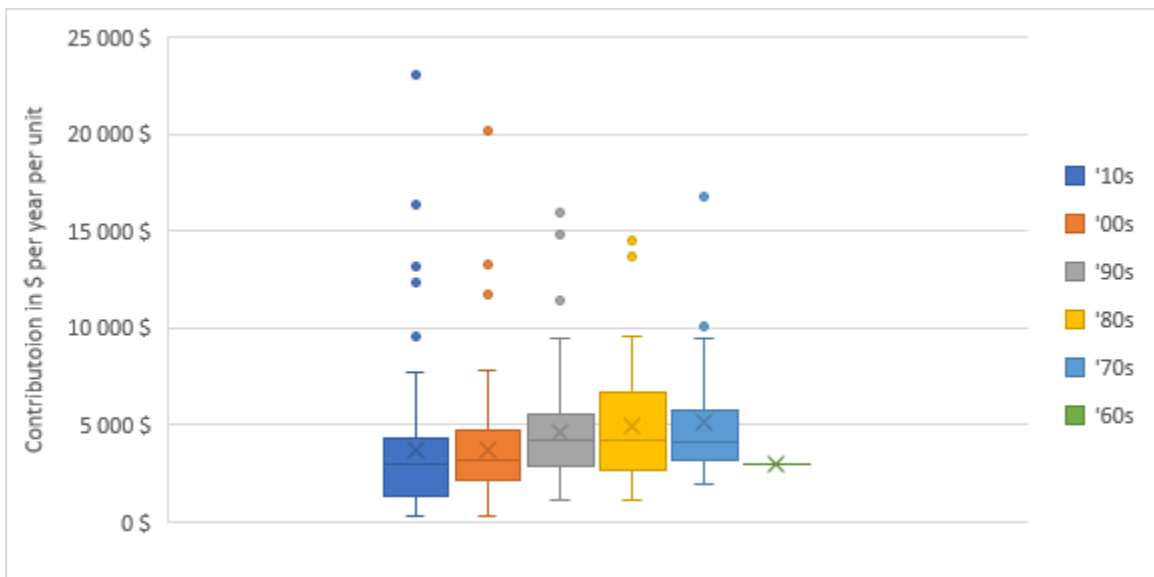
Fortunately, most of the provinces require condo corporations to have a reserve fund, but not as many provinces require a reasonable minimum level of contribution or any requirements to that effect. Therefore, many condo buildings have small reserve fund

contributions in the beginning of their existence but will eventually face large percentage increases afterwards if they tend to follow the minimum guideline set by legislation, thinking it will be enough.

We were able to gather data on condo buildings from around 300 reserve fund studies that were performed over time, and were able to demonstrate that the level of reserve fund contribution for newer condo buildings is too low and tends to increase drastically with time.

Figure 8 presents the result of our data-gathering (more information can be found in Appendix B). We present the reserve fund contribution in dollar value per year per unit grouped per decade of the condo building's registration. Our data set regroups condo buildings that were registered/built from 1960 to 2019.

Figure 8: Reserve fund contribution in dollar value per year per unit grouped per decade registered/built



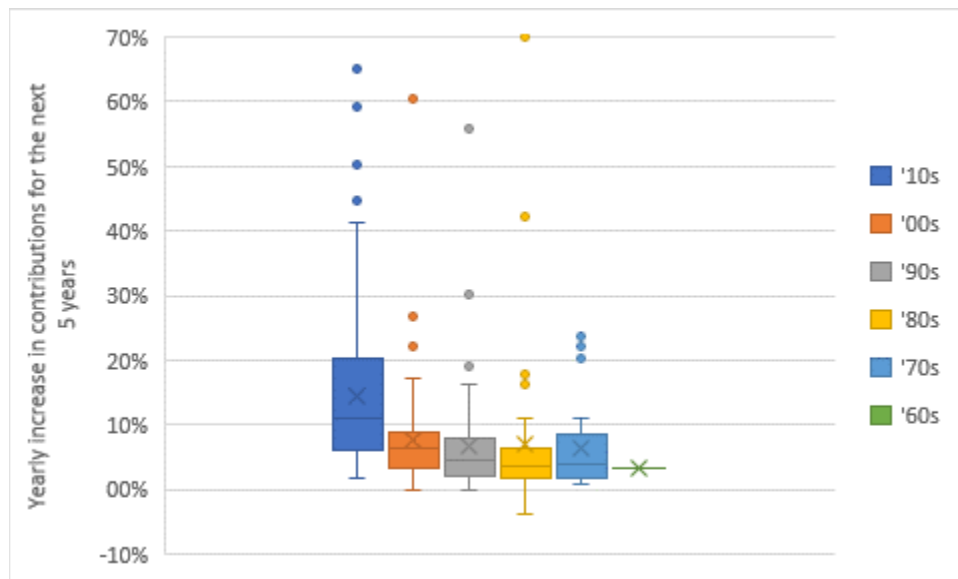
The results are divided per decade and each has a box and whisker divided in four segments representing quartiles. There is also an "X" for each box, which indicates the average for the decades' data subset. Outliers have also been identified by points, and are considered outliers if they exceed 1.5 times the difference between the 1st quartile and the 3rd quartile in distance from either the 1st quartile or the 3rd quartile.



We can conclude from the above that newer condo buildings (from left to right) have lower reserve fund contributions in dollar value compared to older condo buildings. Both the median and the average increase as we move to the right, pointing at under-contribution in the beginning of the life of a condo building.

We could think that older condo buildings are more expensive in terms of repairing and replacing common elements, so that higher reserve fund contributions in dollar value would explain it. However, we can see from the same set of data in Figure 9 that the yearly average percentage increase of the reserve fund contribution over the next 5 years is substantial for newer condo buildings compared to older condo buildings (from left to right).

Figure 9: Reserve fund contribution yearly percentage increase for the next 5 years grouped per decade registered/built



The results are divided per decade and each has a box and whisker divided in four segments representing quartiles. There is also an "X" for each box, which indicates the average for the decades' data subset. Outliers have also been identified by points and are considered outliers if they exceed 1.5 times the difference between the 1st quartile and the 3rd quartile in distance from either the 1st quartile or the 3rd quartile.



We can conclude from Figure 9 that as we move to the right, the quartiles get more constricted, which shows more stability in the reserve fund contribution. Newer condo buildings require large increases in their reserve fund contributions since the dollar value shown in Figure 8 is too low to begin with. As the large increase in reserve fund contributions compounds up for newer condos, the dollar value per unit gets bigger and does not require as high a percentage increase as required for new condo buildings, which explains why the percentage increase in reserve fund contributions tends to decrease with older condos.

It is not a surprise that newer condo buildings must drastically increase their reserve fund contributions as they are often deemed insufficient in light of a reserve fund study or some common elements failing earlier than expected, requiring an immediate large expense for repair or replacement.

Legislation is clearly deficient in this matter, as an appropriate minimum level of reserve fund contribution would reduce the risk of large increases required for condos as they age.

Issue #3: Asymmetry of information working against condo buyer

Unlike a house, where an inspection for any defects or required repairs is usually suggested before finalizing a transaction and helps assess the “net” value of the property, a condo is usually inspected for its own private part only, leaving all common elements out of the inspection. By not inspecting the common elements, the buyer may find himself or herself later paying higher condo fees because the inspection did not value or consider the future repairs or replacements of the common elements in depth, like a reserve fund study does. This situation usually leaves buyers misinformed on possible future costs not being valued in a transaction, and can often be in favour of the seller, who sometimes knows more than what is documented in the condo corporation’s documents or reserve fund studies, forcing buyers to rely on past documents that may not be up to date.

The reason for this asymmetry is a lack of transparency in the buying process, deficiency by the board of directors in keeping concise documentation, and loose or non-existent requirements regarding disclosure in applicable legislation. Knowing that special assessments can come at a hefty price and that increasing condo fees will likely put some financial stress on Canadians who are newly condo owners when we are at a point in history



where the debt-to-income ratio is at its highest, there is a need for improvement in rebalancing information on both the buyer and seller sides.

Issue #4: Inappropriate and misunderstood use of the reserve fund

The conditions under which the reserve funds can be used are based on the Condo Act within the province where the condo building is located. Some provinces will detail the permissible use of the reserve fund extensively, and others will simply leave it to the “good” judgement of the board of directors like a prudent person would do.

The issue of not having a clear framework on what, when, and how to use the reserve fund causes great issues that are left to the interpretation of the directors. When a small group of directors has control over the reserve fund, under legislation that has minimal guidelines in the use of the reserve fund, the utilization can sometimes be inappropriate and unplanned, leading to shortfalls in later years when important repairs and replacements are required.

Below is an excerpt from a letter sent to the Ontario Condo Information Centre highlighting a case of inappropriate use of the reserve fund where the board is not able to understand and/or respect the purpose for which the reserve fund should be used:

We have this situation whereby the board has been spending a lot of money in the past three years renovating or upgrading all of the common elements ... Most of these did not need to be done right away and all of these came way over price according to several owners here that are in the know professionally. [...] I want to add here that our board surrounds itself with managers, solicitor, CCI advisors, and all these contractors. They never consider what our opinion is and even if we make it heard, they just shrug it off. This president in particular just seems to enjoy spending money. So the inevitable happened, our reserve fund fell below its allowed mark because in three years the board has spent \$500,000 in upgrades and I understand that most of this was not only overpriced but also would not have passed the definition of what can go against a reserve fund. As a result, we have just been struck with a huge fee increase in order to refloat the reserve fund.¹⁰

¹⁰ Ontario Condo Information Centre (2013, January). [Wasted condo money](#). Accessed June 2021.



As witnessed from the statement above, the fact that legislation is unclear about the purpose of the reserve fund can lead to situations like this. It can also relate to an issue of governance since the board seems to be acting in its own interest against all advice and opinion from the condo owners.

Governance

Issue #5: Directors lack proper training or skills

The idea of a community of condo owners is to get to use all the amenities the condo has to offer without the incumbent tasks of repairing and maintaining them, and share any risk together. Therefore, all condo owners usually elect from among themselves representatives called directors who will act as the condo corporation, the decision-making body, and management – the board of directors.

With very few exceptions, small condo corporations will have limited numbers of condo owners who can sit (and wish to sit) on the board, limiting the diversity and experience required to fulfill all the necessary responsibilities. However, the responsibilities related to small condo corporations will more likely compare with owning a house, meaning that repairing and maintaining the condo will require skills similar to those a homeowner would need since the common elements will often be similar to a house. Still, directors sitting on boards will be required to fulfill their duties and responsibilities and act with care and diligence in accordance with the condo legislation of their province, their declaration, and their bylaws.

In large condo corporations, a much larger pool of condo owners can sit on the board and offer a larger variety of skills for the good of all condo owners. However, people in certain condo buildings sometimes show very little interest in sitting on these boards, reducing the pool of skilled persons who wish to take on the responsibilities of being a director. Also, large condo corporations will usually hire a professional condo manager to oversee continuity of operations, and advise on maintenance, application of legislation, etc. Professional condo managers are costly but often necessary to navigate through all the legislation and requirements of repairing and maintaining common elements a large condo building may have that no homeowner would have.



As said, many directors do not have the proper training or skills that would be necessary to sit on the board and fulfill the responsibilities that come with it. Such skills can include:

- governance and ethics
- financial literacy
- understanding of laws and legislation
- accounting
- engineering

Below is an excerpt from a letter sent to the Ontario Condo Information Centre highlighting a case of a lack of proper training and skills among certain directors sitting on the board:

All we (they) do at board meetings is sit, gossip, joke and laugh and they dismiss the paperwork that the manager brings and tell her to deal with it. Then they go on about relaxing rules concerning noise, cleanliness, pool hours, proper attire in the common elements and want to upgrade the place to make it look 'cool' and 'with it.'¹¹

This points towards a lack of knowledge of legislation and a disregard of the consequences that can come with that kind of behaviour. Having the skills and training to be a director is important when it comes to the decision to perform a reserve fund study and assess the long-term outlook for the condo building. The board's diligence in following and applying recommendations and, most importantly, maintaining the condo building adequately to avoid earlier deterioration of the common elements is crucial.

The reserve fund study should be enough for a financially sound condo-budgeting exercise, but since it is a tool for the board's use, it is only as good as the interest and/or ability of the directors in using it.

Issue #6: Conflict of interest of directors

The role of directors sitting on a condo corporation is often diminished to a simple volunteering experience. However, the roles and responsibilities that each director carries with them are important, and wrongful conduct can lead to severe and even legal

¹¹ Ontario Condo Information Centre (2009, October). [Issues with boards of directors](#). Accessed June 2021.



consequences. Some condo owners have previously sued directors sitting on boards for wrongful management, abuse of rights, and other circumstances where their decisions were not justified and were not in the best interest of all condo owners.

Below is an excerpt from a letter sent to the Ontario Condo Information Centre highlighting a case of a conflict of interest by certain directors:

Our Board has three directors and two of them are related. In addition, one of these two had caused a lot of damage in the common elements and had been ordered by the previous Board to pay for these damages. [He/she] never did and instead got [himself/herself] elected along with a relative. So my condo corporation is ruled by a Board that has a conflict of interest and one of the first things that this Board did in its first months was to order the [condo] corporation to pay for the over \$12,000 in damages caused by this Board member.¹²

It can be frightening for condo owners to act as directors knowing they can get sued, but boards usually (and sometimes must) have civil liability insurance protecting the directors in their function. If directors act diligently, the chance of being found negligent is low and will be taken care of by the insurance. However, where a director does not act in the best interests of all condo owners and causes financial or other damages, there is still the necessity for a condo owner to start legal proceedings against the board in order to even think of getting reparation from the wrongdoing of its directors. These proceedings require time and money, and therefore it is always better to fix problems before they happen, by emphasizing good governance.

The conflict of interest can extend to reserve fund studies, such that directors that are about to sell their condo may wish to maintain the appearance of low condo fees to attract potential buyers. To our knowledge, no known case of that nature has been documented, but it can still be considered a potential risk for conflict of interest.

Issue #7: Under-maintenance and under-repair leading to higher costs

¹² Ontario Condo Information Centre (2011, February). [Condo fraud, kickbacks and conflict of interest](#). Accessed June 2021.



Condo fees are a necessary evil to collectively accomplish the repair and maintenance of the condo building's amenities without having to be involved directly as a condo owner. In an apartment, the landlord would be responsible for maintaining both the private and common areas, whereas for a private home all the responsibilities would fall back on the homeowner, but in a condo the common elements are the responsibilities of the board of directors and must be repaired and maintained by service providers paid with condo fees.

Along with the mortgage payment and the property taxes that condo owners pay, the condo fees are an additional burden required from them to repair and maintain the common elements of the condo building and contribute to the reserve fund for larger repair and replacement expenses in the near future. However, condo owners rarely understand how these fees truly benefit their condo, especially if they are investors or short-term occupants knowing they will leave in a few years. As such, they tend to see condo fees as a waste of money.

From that point of view, condo owners wish to keep condo fees as low as possible to avoid paying for something they do not value as important. Therefore, boards tend to cut spending on repair and maintenance and wait until emergency repairs are required, or magically think that no problems that arise later will be expensive and unfixable. However, emergency repairs tend to come at a higher price since they never occur at a convenient moment and cannot be planned accordingly in order to avoid hefty costs. The premium paid on these repairs comes at the expense of both a larger-than-expected reduction in the reserve fund and a need to increase the reserve fund contribution to cover the reserve fund shortfall, which can be a special assessment required immediately. Also, if there are early withdrawals from the reserve fund for unexpected or earlier-than-expected expenses, the upcoming repairs and replacements that are still due and planned in the near future will need to be funded, at the expense of higher reserve fund contributions.

Below is an excerpt from a letter sent to the Ontario Condo Information Centre highlighting a case of an inappropriate use of the reserve fund and a disregard of problems that should have been fixed earlier, as well as a case of a conflict of interest with one of the stakeholders:

We just have been told that we would have to pay for a special assessment of around \$27,000 each unit in two instalments, one in two months and the other in six months.



Not only we can't afford this but it is very unfair because it is for the roof and owners have been complaining about leaks for three years now and they have refused to do anything or even never answered us, so they knew about it and could have saved some money; instead they went ahead with stupid expenditures such as replacing gates, doors and repainting the garages and others that could in all cases have waited until there was no emergency such as leaky roofs. As a result our reserve fund was depleted of around \$450,000 in just over two years just for cosmetic reasons that were we all agreed not important at all except for the pride of the board and perhaps the benefit of some of the contractors all good friends of the manager.¹³

When the reserve fund is used inappropriately for aesthetics improvements, disregarding urgent problems, this behaviour tends to postpone issues that require repair and maintenance immediately but rather come back around later with a large special assessment. Condo owners end up paying the price, which can be disastrous.

Economics

Issue #8: Increase in repair and replacement expense higher than inflation

The identification of common elements can easily be accomplished by an expert, but the cost of replacing them in the future will be harder to predict as some common elements are to be replaced 10, 20, 30, and sometimes 60 years later. The major issue is to forecast the expected cost of those common elements in the future with the intention of contributing the right amount to the reserve fund each year until the repairs or replacements are due.

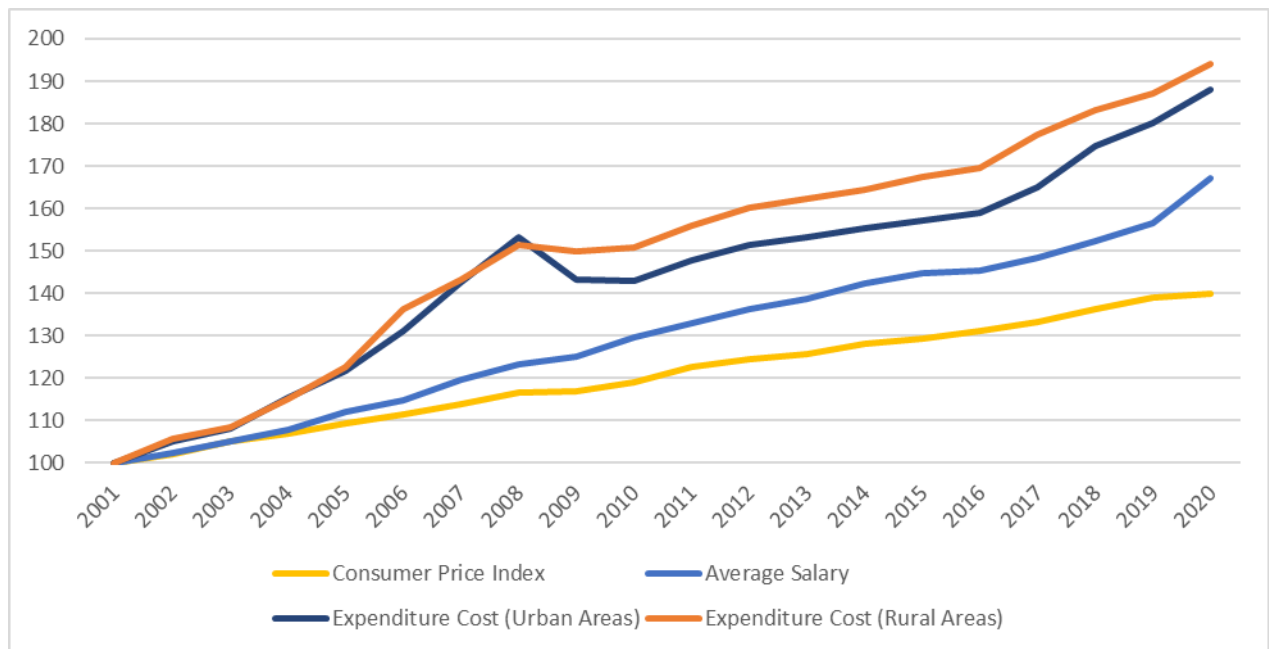
We shall refer to the term "expenditure cost" when we discuss the inflationary price of the common elements. Like any goods and services available in a market, condos have their own goods and services that increase in price, such as engineering services, contractors' services, parts for elevators, fans, etc. As we will see, these goods and services tend to increase faster in price than inflation or even the average worker's salary.

¹³ Ontario Condo Information Centre (2013, September). [Horror stories about Special Assessments](#). Accessed June 2021.



In the following figure we combined the increase in average expenditure cost (divided between urban and rural areas) since the year 2000 with the consumer price index (CPI) increase and the average salary increase, as we think they are relevant metrics to be compared against each other. We created an index for each of them where 2001 = 100 and all metrics pertain to Canada.

Figure 10: Comparison of expenditure cost increase with other economics variables



Sources: Consumer Price Index – Statistics Canada, Table 18-10-0004-01 Consumer Price Index, monthly, not seasonally adjusted; average salary – Statistics Canada, Table 14-10-0203-01 Average weekly earnings by industry, monthly, unadjusted for seasonality; expenditure cost – Statistics Canada, Table 18-10-0135-01 Building construction price indexes, by type of building (Rural and Urban estimate by McIntosh Perry at one half standard deviation from average of all Census metropolitan areas)

From 2001 to 2020, we could have expected expenditure cost to increase by between 40% and 65% in accordance with inflation and salary increases, but the reality is that expenditure cost had an increase well above 65%, reaching almost 90%. The high increase in expenditure cost can be explained by:



1. Material cost increases, particularly where small quantities or unique configurations may be of limited availability or severely disrupted by supply chain issues
2. Material obsolescence or unavailability, requiring a complete re-work from the original design intent and assembly process
3. Labour cost increases, particularly in markets competing with new construction demands for skilled workers
4. Inherent difficulties of working in occupied buildings, especially when most or all the work requires permission to enter private units to access exclusive-use common elements
5. Technical constraints, particularly in dense urban environments where access to exterior surfaces, roof areas, and below-grade structures requires specialized technical acumen
6. Jurisprudence limitations where authorities having jurisdiction over replacement and major repair work apply new construction-related legislative requirements
7. Sustainability initiatives and climate change, wherever matters of energy-use reduction, carbon emission reductions, and responsible resource consumption affect the ways and means of performing the requisite work
8. Risk mitigation, which can require inordinately complex processes and procedures to ensure the overall well-being of people and property near and within work zones

While some of these economic variables may actually decrease the cradle-to-grave life-cycle costs of owning and operating buildings, the immediate needs of replacement and major repairs of common elements are typically escalated at rates greater than the prevailing CPI.

The expenditure cost is also more volatile than the other indexes, as we can see in Figure 11, where the Y-axis represents the standard deviation of the yearly increase in percentage of each economic variable.



Figure 11: Volatility of expenditure cost increase with other economics variables



The expenditure cost increase in rural and urban areas has higher volatility than the CPI and average salary. However, the expenditure cost increase in urban areas has the highest volatility and can be explained by the fact that urban areas have a unique confluence of the eight economic variables noted previously regarding expenditure cost increases.

As seen, expenditure cost can be highly volatile, and it is important for a board to be proactive in repairing and replacing common elements to avoid large expenses at unexpected times. It can also be a good approach to consider a margin for adverse deviation in the expenditure cost by considering a higher reserve fund contribution to prevent a higher-than-expected increase in expenditure cost, as we conclude that it increases faster than inflation or salary.

Issue #9: Reserve fund contributions vary widely

Reserve fund contributions are needed to develop a fund that can be used to pay for the replacement of, and major repairs to, the common elements of the condo corporation. The size, location, quality, age, and definition of those common elements vary from condo corporation to condo corporation. While there are many generic similarities (all condo corporations have roofs, for example) not all condo corporations define their common



property in the same way. Consequently, the future costs vary, and the attendant contribution requirements also vary.

Based on the data analysis, we found the range of contributions to be loosely correlated to townhome and apartment style configurations and age. For example, only properties constructed in the 1960s have contribution escalation rates near the preferred band of the 1% to 3% set by the Bank of Canada for target CPI. That band increases with each decade of construction to the 5% to 15% range for condo properties built in the 2010s. Appendix B contains several summaries of this data.

Issue #10: Large reserve fund as potential target for taxation

Reserve funds are exempt from paying any taxes at the federal and provincial level on the income they make. Money from condo fees is after-tax income from condo owners and accumulates in the reserve fund. Interest earned in the reserve fund from the accumulation of the contribution is not taxable. There are no issues here as the condo owners fully own the reserve fund for its future use and the government has no power to tax the reserve fund, according to the current legislation.

We simply want to emphasize here that with the growing trend in condos, the capital in the reserve fund might grow rapidly in the future and attract the attention of governments. We voice our concern now that taxing reserve funds would cause more harm than good to the condo communities as investment returns on these reserve funds are already extremely low. Boards of directors that manage their reserve fund properly can accumulate a significant amount of money because they are diligent in putting money aside for future use, which is the right thing to do for their communities of condo owners. Taxing it would penalize responsible directors and condo owners who enforce the legislation appropriately.

Model construction and case studies

Condo corporations are required to deal with a lot of unknowns when it comes to planning for repairing their common elements, which can be major assets in the condo building. The planning must consider a long-term horizon and the conditions to which the common elements are exposed. As the demographics of owners will certainly change through the years (making condo fees contributions somewhat dependent on the income of newcomers along the way), low condo fees may potentially mislead new buyers. New condo owners who

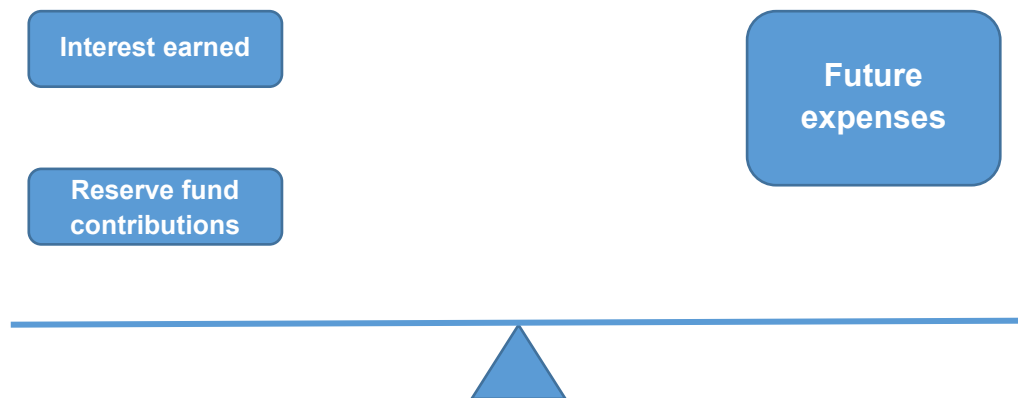
believe the fees are representative of the true cost of repairing and maintaining the condo building may suffer from a special assessment contribution along the way if the condo fees were undervalued when they moved in. Thus, it is important to extend the planning over a long period to really assess the true cost of the condo fees.

The intent behind the creation of our reserve fund model is to provide strong evidence that over a long period of time (a 100-year period):

1. Expenditure cost is extremely volatile, which can easily contribute to the erosion of reserve funds; and
2. Under-contributing to the reserve fund will leave a large special assessment, due to the eventual shortfall, that will have to be paid by possible future owners.

The fundamental equation for our model to be respected through time is presented in Figure 12:

Figure 12: Fundamental equation of a reserve fund model



Future expenses represent the major repair and replacement costs for all the common elements of the condo corporation. These common elements have a finite lifetime but since they are perpetually replaced, the number of times that they will be replaced is unlimited.



Relevant equations for the reserve funds

If we consider a set of common elements that are to be replaced only once after their expected lifetime, we could calculate the present value at time of valuation of the total cost of repairs and replacements for all the common elements as follows:

$$\sum_{n=1}^N E_n \left(\frac{1+r}{1+i} \right)^{(T_n-t_n)} \quad (1)$$

N = Number of common elements within the condo corporation

E_n = The replacement cost at time of valuation of the n^{th} common element

T_n = Expected lifetime of common element n

t_n = Age of common element n at time of valuation

r = Expected expenditure cost increase rate (annual)

i = Expected interest earned rate (annual)

We can extrapolate formula (1) to include additional future repairs and replacements of common elements such that it considers an infinite horizon. This new formula would look like this:

$$\sum_{m=1}^{\infty} \sum_{n=1}^N E_n \left(\frac{1+r}{1+i} \right)^{(mT_n-t_n)} \quad (2)$$

$m = m^{th}$ replacement of the n^{th} common element

From formula (2), we can notice a crucial part, which is the expected expenditure cost increase rate over the expected interest earned rate. In the case where $r \geq i$, we would find that formula (2) would equal an infinite value. Earlier, in the review of legislation across Canada, we discussed how reserve funds cannot invest in risky investments, which leaves them to invest in secure assets. Therefore, these secure assets currently have low return rates, and are not expected to provide higher returns soon.

The conclusion is that no actual amount of money could be held today in a reserve fund and be expected to cover all future costs. That said, there will always be a need for increasing



the reserve fund contributions somehow to repair and replace future common elements. Interest earned will never be enough to avoid increasing reserve fund contributions, at least not in the near future.

Since we need an infinite amount in the reserve fund, there cannot be a perpetuity of reserve fund contributions that will provide enough capital with interest to cover all these expenses, unless we increase the reserve fund contributions at a faster rate than the interest earned. The present value of all future reserve fund contributions at time of valuation, including the balance of the reserve fund at time of valuation, can be formulated like this:

$$C * \sum_{u=1}^{\infty} \left(\frac{1+s}{1+i} \right)^u + V \quad (3)$$

C = Annual reserve fund contributions at time of valuation expected to increase at rate s

V = Balance in the reserve fund at time of valuation

s = Expected rate of increase in contribution (annual)

u = Year u of contribution

Since the present value of the cost of repairs and replacement of all common elements at time of valuation is infinite, we require the present value of the contributions to be infinite as well. Thus, we should require that $s \geq i$ in formula (3), as long as $r \geq i$, and since we do not want any deficit or surplus in the reserve fund, we must then determine the parameter that will hold this formula true:

$$C * \sum_{u=1}^{\infty} \left(\frac{1+s}{1+i} \right)^u + V = \sum_{m=1}^{\infty} \sum_{n=1}^N E_n \left(\frac{1+r}{1+i} \right)^{(mT_n - t_n)} \quad (4)$$

Although we supposed that no interest rate earned will ever compensate for the expected expenditure cost increase of the common elements, if we were to suppose the opposite, we could simplify formula (4) to arrive at a closed form. Therefore, if we suppose that $i > s$ and $i > r$ we would have:



$$C * \frac{1+s}{i-s} + V = \sum_{n=1}^N E_n \frac{(1+r)^{T_n}}{(1+i)^{T_n} - (1+r)^{T_n}} \left(\frac{1+r}{1+i}\right)^{-t_n} \quad (5)$$

What is interesting from formula (5) is that there exists a contribution C increased at a rate s that would provide a finite result and allow a reserve fund to be fully funded.

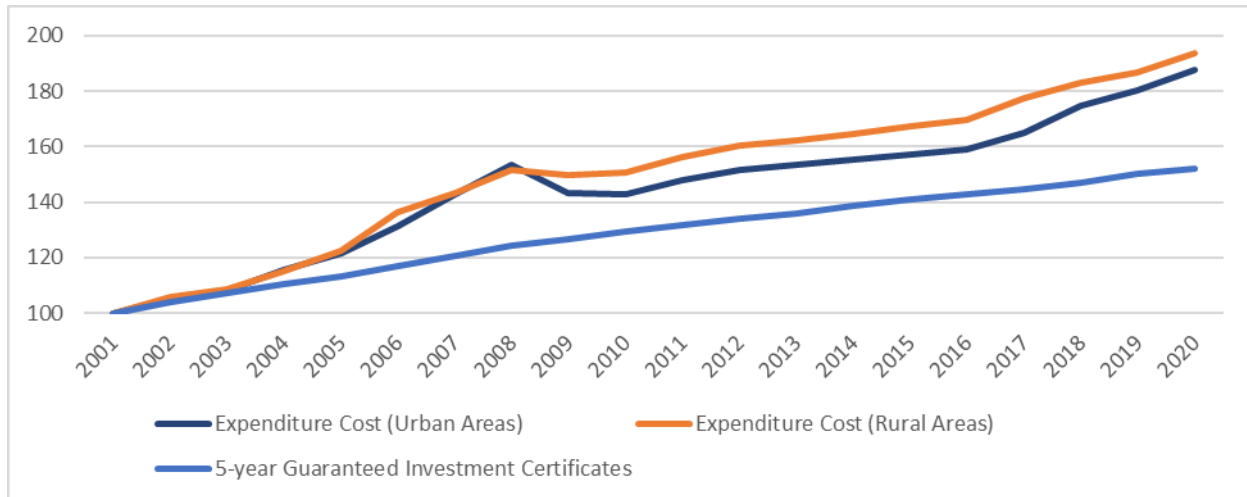
Another hypothetical scenario would be to suppose that $i = r = s$, but that would give the following results:

$$C * \frac{1+s}{0} + V = \sum_{n=1}^N E_n \frac{(1+r)^{T_n}}{0} 1^{-t_n} \rightarrow \infty = \infty \quad (6)$$

which is an undefined solution as both sides go to infinity.

Which bring us back to our initial assumptions that in an environment of low interest rates, there is no possibility for $i > s$ and $i > r$ in the short run, and the long run is not necessarily brighter as historical rates of return have been below the increase in expenditure cost overtime, as we can see in Figure 13. We created an index for each of them where 2001 = 100.

Figure 13: Expenditure cost increase compared with 5-year GIC interest rate



Sources: Guaranteed Investment Certificates, five-year – Bank of Canada, interest rates posted for selected products by the major chartered banks; Expenditure Cost – Statistics Canada, Table 18-10-0135-01 Building construction price indexes, by type of building (Rural and Urban estimate by McIntosh Perry at one half standard deviation from average of all census metropolitan areas)

As we can see from Figure 13, the 5-year Guaranteed Investment Certificate (GIC) has provided low but steady returns over a period of 20 years. The GIC provided an average return of 2.4% overall, which is far from the expenditure cost, which increased by an average of 3.4% and 3.6% for urban and rural areas respectively. The expected returns for the GIC for the coming years are unfortunately not expected to outperform the increase in expenditure cost, leaving condo owners to contribute more to compensate for the lost in interest earned.

Data on common elements

Before going further, there is a need to understand the relationship between the variables listed in the formulas above and their application in the realistic programs of work.

A condo corporation must have a list of all the common elements requiring repair and replacement through the years, with information such as the:

- best estimate of the replacement cost of a common element at time of valuation (E_n)
- age of the common element currently being evaluated (t_n)
- expected lifetime of the common element currently being evaluated (T_n)



- actual balance of the reserve fund, which can easily be accessed in the last financial report from the corporation’s bank account (V)

This information is most likely to be found in a reserve fund study prepared by a suitably qualified reserve fund study provider authorized to prepare reserve fund studies in the province where the condo corporation is located. For our two case studies presented later, we relied on information provided by McIntosh Perry in its own reserve fund study for the information listed above. Complete tables are presented in Appendix C.

Assumptions

Our model relies on three main assumptions:

Interest rate earned

Every reserve fund can invest its money into authorized investments, but every province, through its legislation, will limit the type of investment. The investments considered in our model have the following characteristics to fit the model:

- Assets should be liquid and available at any time.
- Capital should be guaranteed.
- All investments should avoid conflicts of interest.

Given the nature of the reserve fund, the choice of investment is mostly limited to federal and provincial bonds, high-interest saving accounts, and GICs. Being in a low-interest-rate environment leaves us with returns around 1.00% over the short term (5 years) and between 1.00% and 2.00% for medium-term investments (5 to 10 years).¹⁴ Reserve funds can hardly invest in long-term bonds, as many repairs and replacements can be hard to predict and can cause liquidity issues once the time of withdrawal comes. It is unlikely that reserve funds will do better than inflation in the long run, and they might possibly lose bargaining power given the investment available and the actual low-interest-rate environment.

¹⁴ Bank of Canada (2021, June). [Government of Canada benchmark bond yields – 5-year and 10-year](#). Bank of Canada. Accessed June 2021.



To reflect the interest earned in our model, we chose to use a fixed interest rate for simplicity since the fund is supposed to have its capital guaranteed (no return below 0%) and the possible investment is not considered to generate higher-than-inflation returns in the long run (no return above the 2% target rate of the Bank of Canada).

Therefore, in our model we used a fixed interest rate of 1.00% for the first 10 years and 2.00% for later years. Therefore, we expect the low-interest-rate environment to persist for another 10 years and then revert to the target rate of 2.00% of the Bank of Canada.

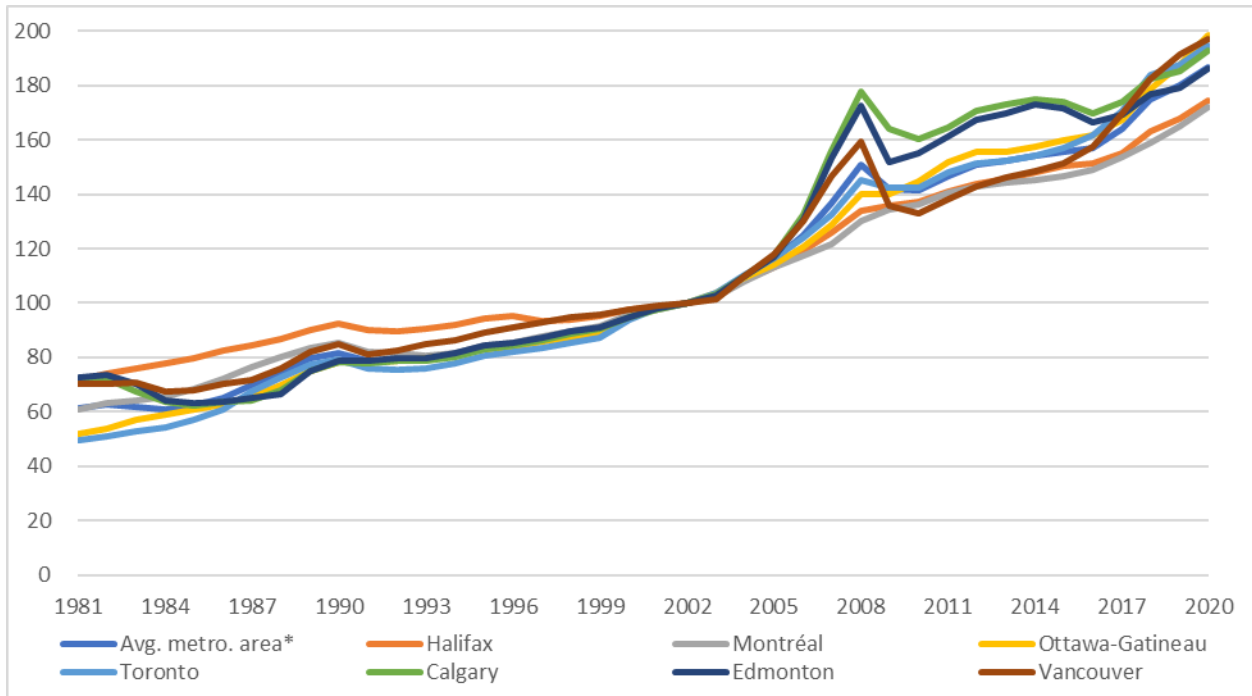
Expenditure cost increase rate

The repair and replacement costs in condo buildings have been shown to be higher than inflation or the average salary increase. Interest earned in reserve funds is already below the inflationary rate, which is leading condo owners to bear the shortfall in their loss of bargaining power as well as the expenditure cost higher than inflation itself or the average salary increase.

We have been able to use the database from Statistics Canada on expenditure cost increases across different provinces of Canada – using main metropolitan areas – for the past 40 years, and we pulled out the mean and standard deviation for some of them to use it in a normal distribution for our model projection. Below is a figure presenting data on building construction price indexes for residential buildings where 2002 = 100.

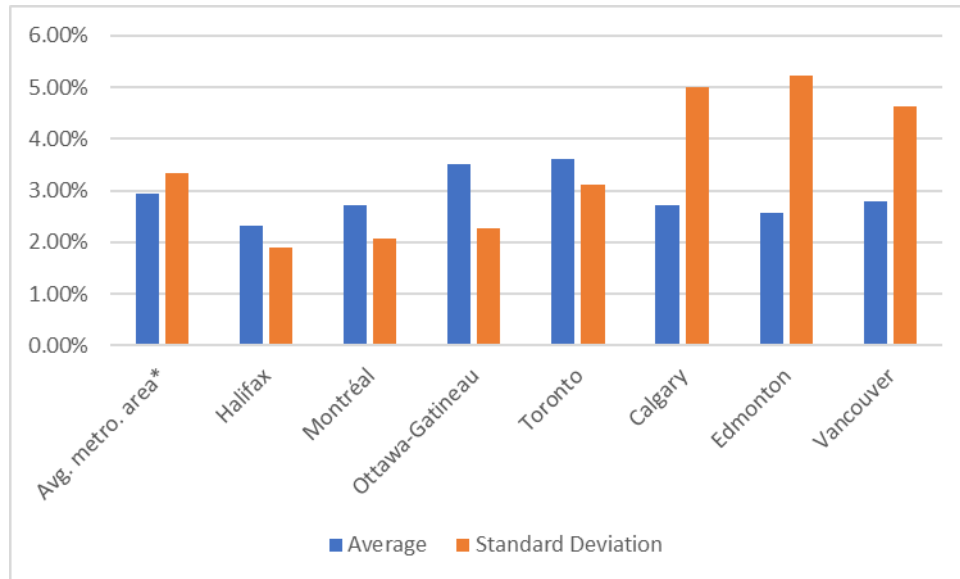


Figure 14: Building construction price indexes for residential buildings from 1981 to 2020



Sources: Building construction price indexes after 2016 – Table 18-10-0135-01 Building construction price indexes, by type of building; building construction price indexes before 2017 – Statistics Canada, Table 18-10-0049-01 Archived – Non-residential building construction price index, by class of structure, quarterly.

Figure 15: Average and standard deviation in building construction price increase for residential buildings from 1981 to 2020



* We provided the major and most common metropolitan areas of Canada above, but we also presented the average of 11 metropolitan areas as the *Avg. metro. area* variable in the figures above. These 11 metropolitan areas are composed of: St. John’s, Newfoundland and Labrador; Halifax, Nova Scotia; Moncton, New Brunswick; Montréal, Québec; Ottawa-Gatineau, Ontario/Québec; Toronto, Ontario; Winnipeg, Manitoba; Saskatoon, Saskatchewan; Calgary, Alberta; Edmonton, Alberta; Vancouver, British Columbia

To build a reserve fund model that would account for the evolution of the expenditure cost increase rate, we chose to model it using a normal distribution in which the mean and standard deviation were taken from the 40-year historical rates above. The choice of the normal distribution is of general application and was an appropriate choice in the construction of our model.

Common elements’ expected lifetime

In the preparation of a reserve fund study, it is imperative that all the common elements that will need repair and replacement, and that will be paid for by the reserve fund, are identified and assessed for their current and expected remaining lifetime. The lifetime of all these common elements can be used to spread the required reserve fund contributions over the remaining lifetime of these common elements. However, the lifetime expectancy is not always as predicted and some common elements will fail before the planned replacement



date (T_n), requiring an early withdrawal from the reserve fund. Some other common elements will last longer for the benefit of all condo owners. Our model considers the lifetime expectancy of each common element using a Weibull distribution to model the time of failure of each common element. The choice of the Weibull distribution comes from the fact that the time of failure of various components has been documented to follow that type of statistical distribution which finds its application in our model.

To determine the shape and scale parameters of our Weibull distribution we relied on a simple assumption highlighted in a study by Dr. D.J. Kelly.¹⁵ This study explains that expected lifetimes of common elements in building will tend to vary at most between 80% and 120% of their expected lifetime under normal conditions when they are brand new. Meaning that for a common element having an expected lifetime of 10 years when installed, we can expect with great certainty that it will fail between 8 and 12 years from initial installation. We may suggest for simplicity that the probability of being outside of that range be 1% such that it occurs once over a 100-year period. With that detail, we shall consider the scale and shape parameters below for the Weibull distribution. We assume that all common elements' times of failure are independent of one another.

$$F(x) = 1 - e^{-(x/\alpha)^k} \text{ for } x \geq 0 \quad (7)$$

where

$$F(0.005) = 1 - e^{-(0.80 * T_n / \alpha)^k}$$

$$F(0.995) = 1 - e^{-(1.20 * T_n / \alpha)^k}$$

Thus, for formula (7) to be true given our assumption, the following parameters should apply in the Weibull distribution:

$$k = 17,17337$$

$$\alpha = 1,088967 * \# \text{ of year of the expected average lifetime of the common element}$$

¹⁵ Kelly, D.J. (2007, January). *BRE: Design Life of Buildings – A Scoping Study*. Scottish Building Standards Agency.



Reserve fund model creation and output

Following the exploration of the equations of a reserve fund, important data, assumptions, parameters, and other elements relating to the construction of an appropriate reserve fund model, we need to use all we learned up to now to have a reserve fund model that outputs relevant results. To provide strong evidence of volatile expenditure cost and the risk of under-contributing to the reserve fund, we shall focus our efforts on calculating the funding status of the reserve fund in fulfilling the promise of providing enough funds to pay for future expenses. That funding status would be the amount accumulated in the reserve fund over the uniformly accumulated liabilities that represent the cost of the common elements (pro-rated on their expected lifetime; see Figure 16 for more details), at any time t along a 100-year period.

With all the information above, we can create a stochastic model such that the result will provide the funding status of our reserve fund through time. That funding status, in a theoretical world, would be aimed at remaining at 100%, but as we will see in our case studies, this is not the case under the current contributions scheme, which will require a major increase in reserve fund contributions.

Our reserve fund model should calculate the funding status based on this formula representation:

$$R(t) = \frac{RF_{t,i_t,C,s_t,spec.ass}}{\sum_{n=1}^N E_n \left(\frac{t - t_{x,n,stocho}}{T_n} \right) \left(\frac{(1 + r_{stoch})^{T_n + \sum t_{x,n,stocho}}}{(1 + i_t)^{(T_n - (t - t_{x,n,stocho}))}} \right)} \quad (8)$$

t = Time in years (from 0 to 100 years)

$RF_{t,i_t,C,s_t,spec.ass}$ = Reserve fund balance at time t , with annual reserve fund contribution C , accumulating at an interest rate i_t , with contribution increasing at a rate s_t , including a special assessment (*spec.ass.*) when required, withdrawals occur at $t_{x,n,stocho}$

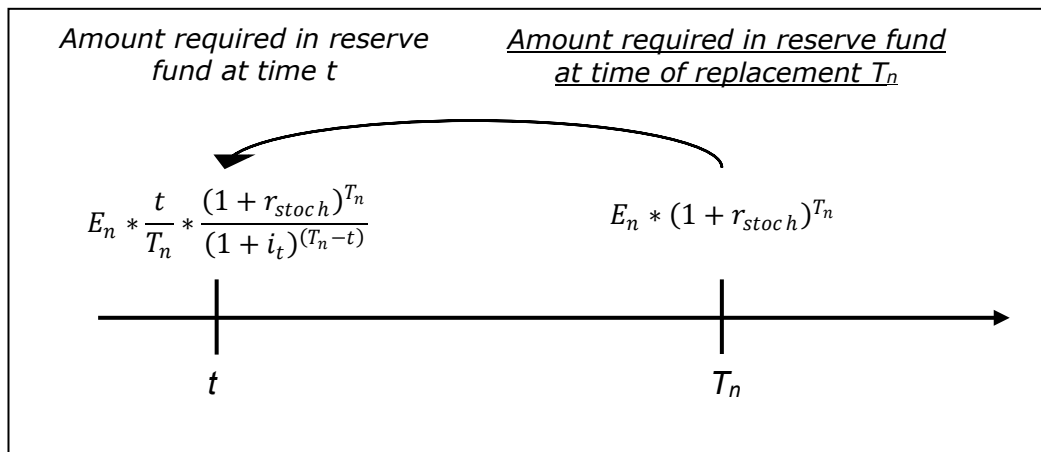
E_n = The cost of the n^{th} common element at $t=0$

T_n = Expected lifetime of common element n

- $t_{x,n,sto ch}$ = Time of last replacement number x at which common element n was replaced based on a Weibull distribution with parameter $k = 17,17337$ and $\alpha = 1,088967 * T_n$
- $r_{sto ch}$ = Rate of increase in expenditure cost based on a normal distribution with mean and standard deviation based on historical increase from 1981 to 2020 (from figure 15)
- i_t = Expected annual interest rate at time t
- s_t = Expected annual rate of increase in contribution at time t

For a better visual representation of how the reserve fund model works, Figure 16 presents the amount that should be in the reserve fund at time t to cover the cost of repair and replacement of the common elements, which also represents the liabilities of the common elements at time t . It is important to note that the liabilities are sensitive to the time value of money and the expenditure cost, but liabilities also accumulate linearly over the expected lifetime of the common elements, which is represented by t / T_n in the figure below.

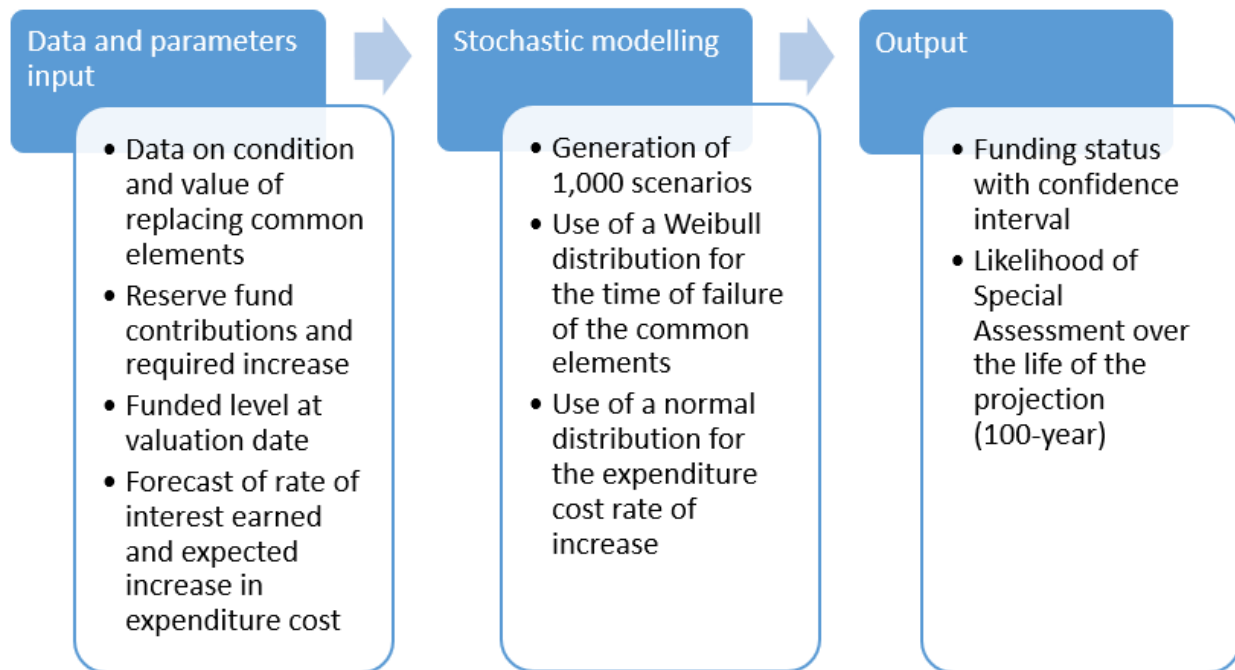
Figure 16: Valuation of common elements in the model



Mechanics of the model

Figure 17 simplifies how the reserve fund model works:

Figure 17: Simplification of the model's mechanics



Townhouse case study

Our model was used on two different case studies for which McIntosh Perry prepare their reserve fund study. The application of our model on these two case studies helped us understands the most important variables impacting reserve funds.

The first case study is based on an existing townhouse condo corporation located in Ontario that we will call “The Hammer”. We have the information below from a previous reserve fund study recently completed by McIntosh Perry:



Name:	The Hammer
Registration date (date the condo building was completed):	December 10, 1990
Valuation date:	January 1, 2020
Reserve fund balance at valuation date:	\$29,700
Number of units:	40
Recommended annual reserve fund contribution in 2020:	\$88,718

For us to generate scenarios and create output from our model, we will use the following assumptions for the deterministic scenario of our model.

Table 5: Economic assumptions for the condo corporation The Hammer

	2020–2022	2023–2025	2026–2029	2030 and After
Expenditure increase rate¹⁶	3.5%	2.4%	2.9%	2.9%
Interest earnings	1.0%	1.0%	1.0%	2.0%
Average contribution increase	8.5%	6.9%	5.5%	1.8%

The list of all common elements that are part of the condo corporation The Hammer is shown in Appendix C in Table C.1, with their respective expected lifetime and replacement cost. They are expected to be changed/repared on their replacement date and the new common elements will then have the same expected lifetime afterwards. It is to be noticed that even though some common elements have a certain life expectancy, some will fail earlier and some others will last longer than expected, which is recognized in the column *Planned Year for First Replacement or Major Repair*, since it is the year identified in the reserve fund study prepared by a qualified expert.

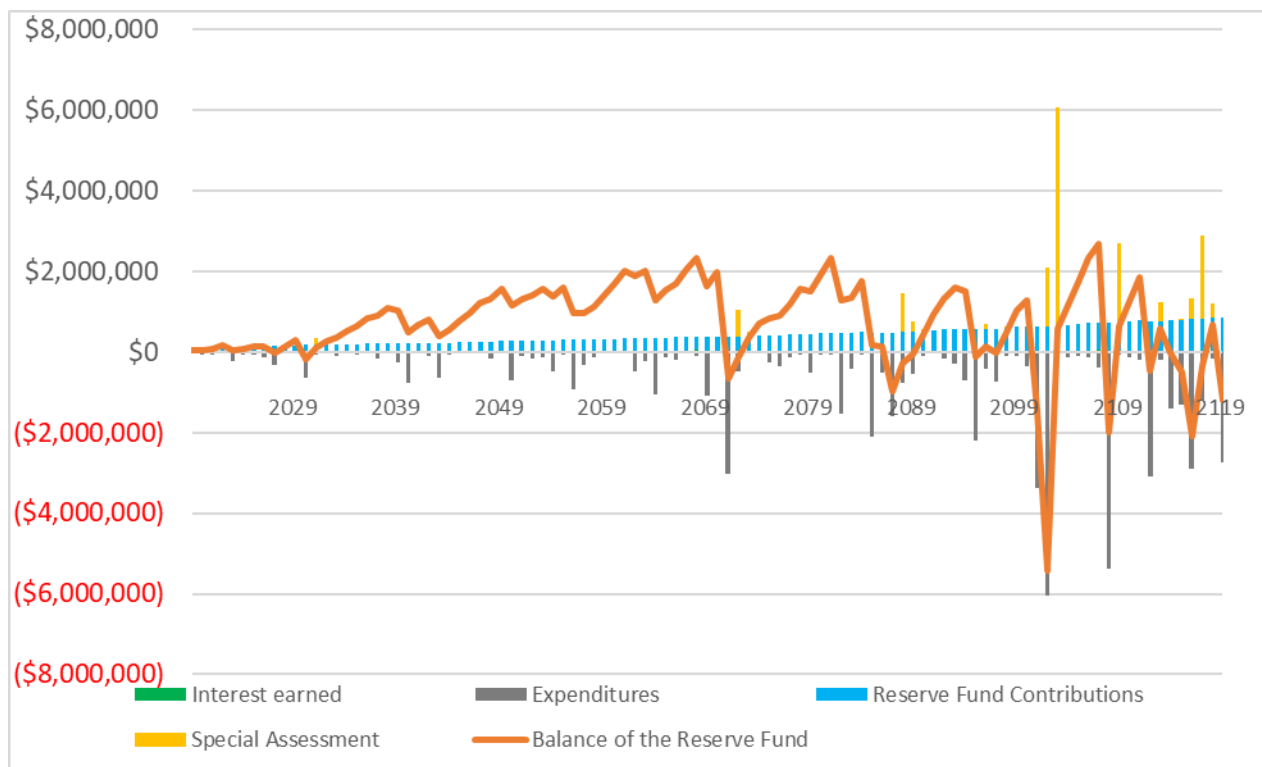
¹⁶ Statistics Canada (2021). Table 18-10-0135-01 [Building construction price indexes, by type of building](#). Accessed July 2021. (The expenditure increase rate is derived from that source of data.)



The first step and intention behind our model is to provide a deterministic approach that will present an evolution of the reserve fund balance without any random variations based on statistical distributions, but rather only on the deterministic assumptions above and the expected time of replacement or major repair of common elements for that case study.

Therefore, the results based on a deterministic approach are presented in Figure 18 and can also be found in a table format in Appendix C in Table C.2. The figure presents the reserve fund balance's evolution with the deterministic cash flow over a 100-year period.

Figure 18: Evolution of the reserve fund for the condo corporation The Hammer



From the previous figure we can conclude that:

1. Interest earned is not a major factor and will not be a major contributor to increase the reserve fund balance for this case.



2. As we can expect, the more time elapses, the more volatility arises and creates a special assessment required to pay for the necessary expenditures. The reserve fund contributions are not sufficient to counter the increase in expenditure cost through the years.
3. Expenditures are not uniformly distributed – some will occur every 5 to 10 years, whereas others will occur less frequently and will be the most expensive of all the common elements.

Given the deterministic projection and the assumptions above, we can run stochastic simulations on the time of failure of common elements and the expenditure increase rate to assess if the reserve fund contributions are at an appropriate level through time. Therefore, the second step and intention of our model is to simulate stochastically the evolution of a reserve fund with the assumptions presented above but with random variation on key variables. The random variation will be on the following key variables:

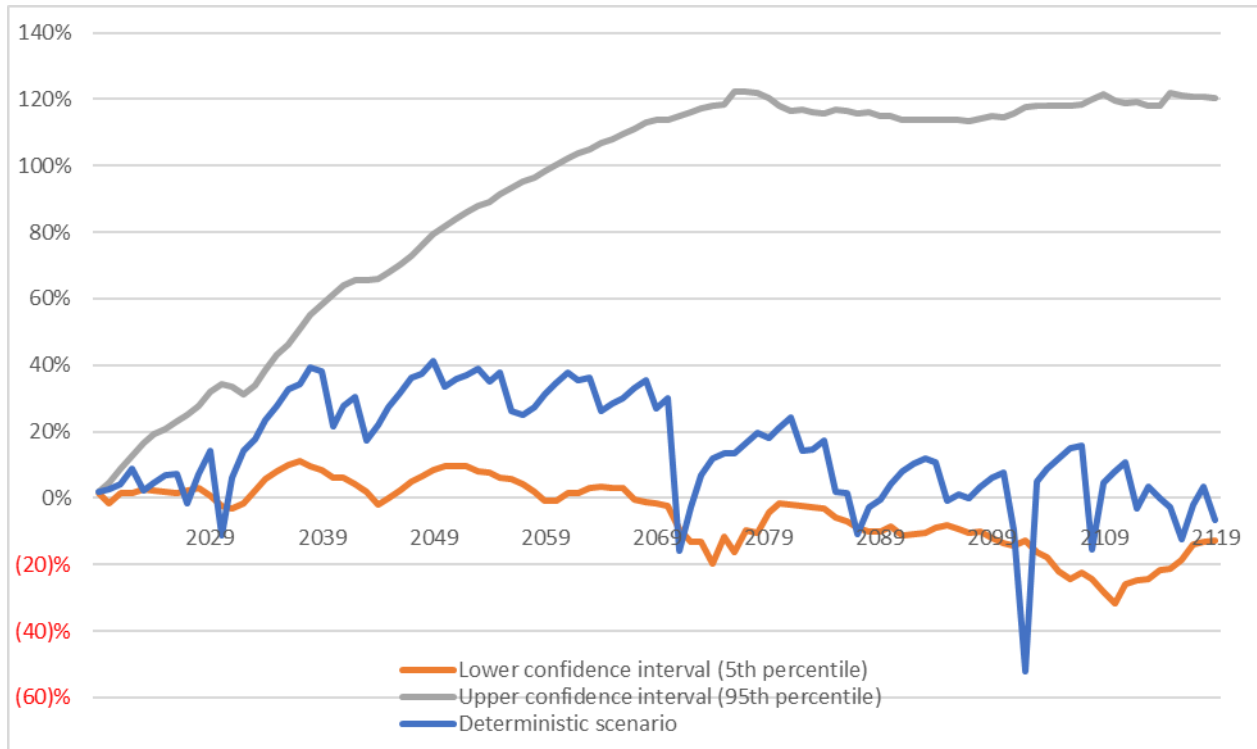
- Time of failure of common elements: Weibull distribution with parameters k and α as presented in formula (7)
- Expenditure increase rate: Normal distribution with a mean of 2.94% and standard deviation of 3.34%

For that purpose, we will output the reserve fund status based on formula (8) derived previously, which represents the expected balance of the reserve fund at a time t over the expected discounted fraction of value of all the common elements that should be funded in the reserve fund at a time t .

We present in Figure 19 the reserve fund status through the same 100-year period but bounded by a 90% confidence interval created with 1,000 scenarios. In our simulation, 5% of the scenarios showed a reserve fund status above the upper confidence interval line whereas 5% of the other scenarios had a reserve fund status under the lower confidence interval line. As seen previously, the actual level of reserve fund contributions is not sufficient to provide for all the repairs and replacement of the common elements through the 100-year period. Also, the upper confidence interval presents a stable reserve fund status but suggests that 95% of the other scenarios have a declining reserve fund status in the long run.



Figure 19: Stochastic simulation of the reserve fund status for the condo corporation The Hammer



From the previous figure we can see that:

1. The deterministic scenario falls below the lower confidence interval because of the non-uniform time of failure for the common elements' replacement.
2. The low reserve fund status at valuation date is a risk factor of a special assessment given the repair and replacement of common elements occurring in the first few years, as we can see with the lower confidence interval going below the 0% reserve fund mark quickly.
3. The low level of annual reserve fund contribution at the beginning coupled with a small balance in the reserve fund leads to a high likelihood of a special assessment over the course of a 100-year period.

However, if we were in the situation where the reserve fund status would be at a 100% at the valuation date and we had an appropriate level of reserve fund contribution so that our

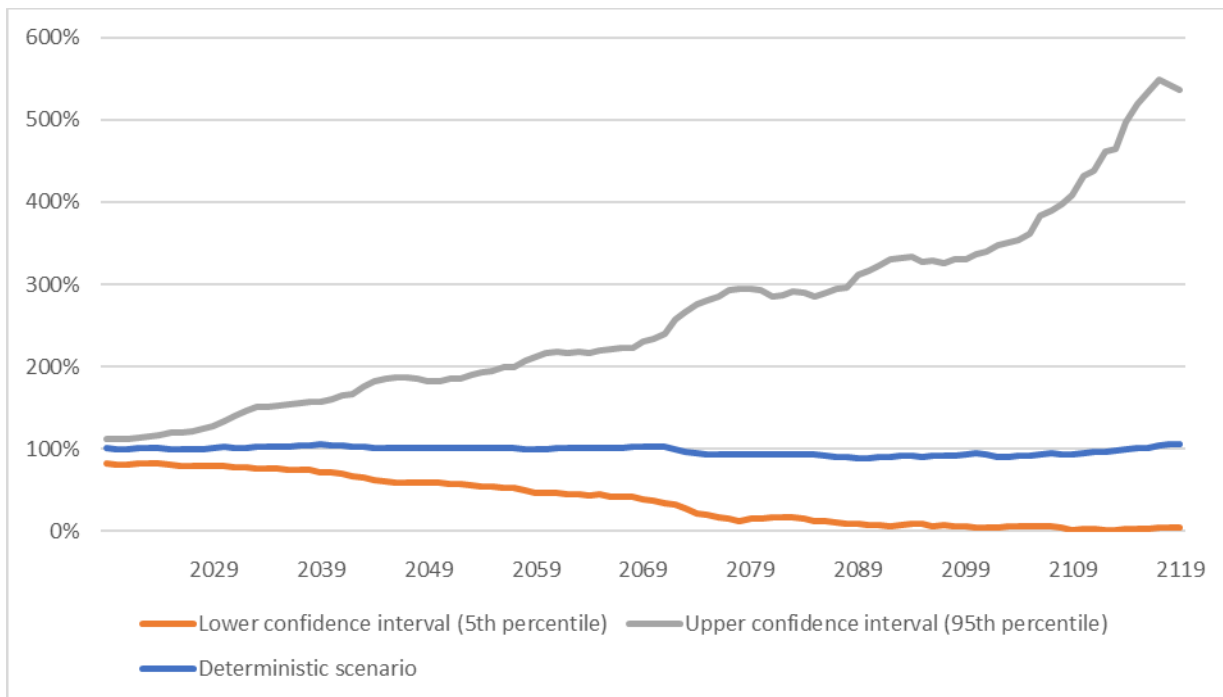


deterministic scenario presents a stable reserve fund status around 100% over the 100-year period, we would require the following:

4. A special assessment at the valuation date of \$1,615,100 (\$40,377.50 per unit owner, which is an important contribution to the reserve fund that may not be affordable for many condo owners); and
5. Start with an annual reserve fund contribution of \$115,000 (\$2,875 per unit owner) and increase the annual contribution by 2.80% per year.

This hypothetical situation would provide the following results:

Figure 20: Stochastic simulation of the reserve fund status for the condo corporation The Hammer with changes in the reserve fund contribution level



From the previous figure we can see that:

1. The deterministic scenario remains stable around the 100% reserve fund status mark.



2. The wide gap in the confidence interval can be explained by the fact that larger reserve fund contributions and higher increases in these contributions will be less likely to result in a special assessment, leaving more room to grow a healthy and sustainable reserve fund.

We also calculated the likelihood of a special assessment from the previous scenarios above, and the results are as follows:

Table 6: Likelihood of a special assessment for the condo corporation The Hammer

Likelihood of a Special Assessment from Valuation Date	Under Current Projected Reserve Fund Contribution	Given the Hypothetical Situation
Within 3 years	10.0%	0.0%
Within 5 years	14.7%	0.0%
Within 10 years	25.7%	0.0%
Within 20 years	47.2%	0.0%
Within 30 years	54.1%	0.0%
Within 50 years	56.4%	0.6%
Within 100 years	85.7%	18.1%

The difference in the likelihood of a special assessment between the two situations is notable. However, in the current situation of the condo corporation The Hammer, the gap between the current reserve fund status and the 100% mark would require a tremendous financial effort from the current condo owners to correct the situation.

High-rise case study

The second case study is based on an existing high-rise condo corporation located in downtown Toronto that we will call “Honesty Residence”. We have the information below from a previous reserve fund study recently completed by McIntosh Perry:



Name:	Honesty Residence
Registration date (date the condo building was completed):	January 15, 1990
Valuation date:	January 1, 2020
Reserve fund balance at valuation date:	\$6,896,847
Number of units:	564
Recommended annual reserve fund contribution in 2020:	\$1,354,452

For us to generate scenarios and create output from our model, we will use the following assumptions for the deterministic scenario of our model.

Table 7: Economic assumptions for the condo corporation Honesty Residence

	2020–2022	2023–2025	2026–2029	2030 and after
Expenditure increase rate¹⁷	4.3%	2.8%	3.1%	3.1%
Interest earnings	1.0%	1.0%	1.0%	2.0%
Average contribution increase	4.3%	3.8%	3.3%	1.8%

The list of all common elements that are part of the condo corporation Honesty Residence is shown in Appendix C in Table C.3, with their respective expected lifetime and replacement cost. They are expected to be changed/repared on their replacement date and the new common elements will then have the same expected lifetime afterwards. It is to be noticed that even though some common elements have a certain life expectancy, some will fail

¹⁷ Statistics Canada (2021). Table 18-10-0135-01 [Building construction price indexes, by type of building](#). Accessed July 2021. (The expenditure increase rate is derived from that source of data.)

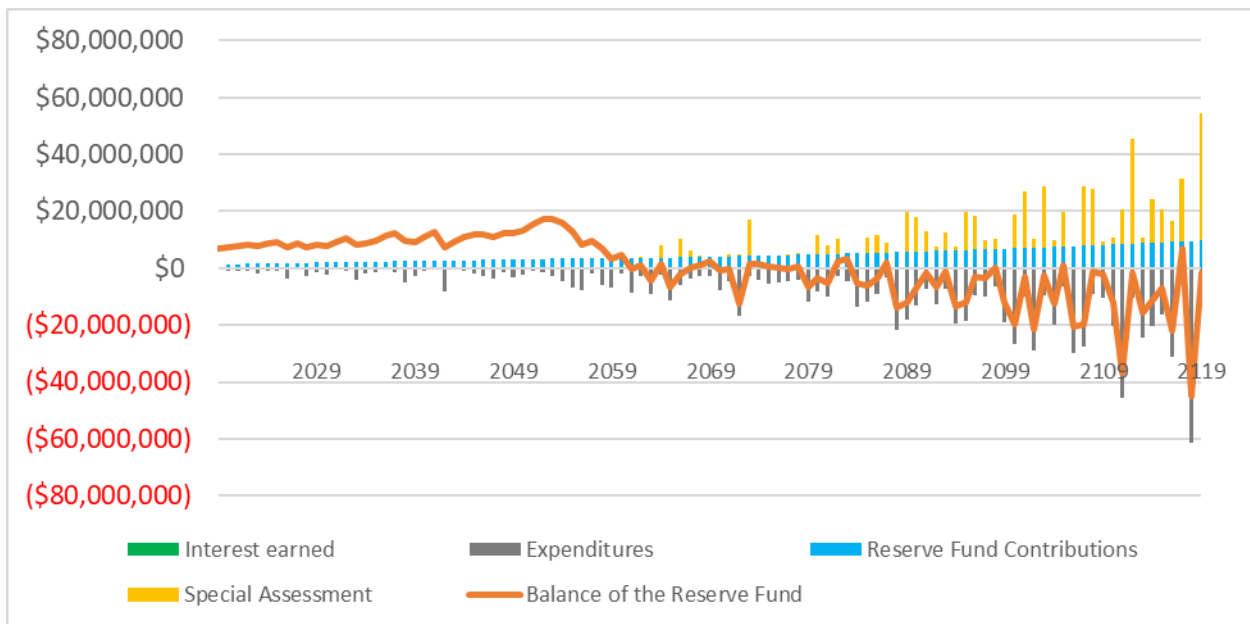


earlier and some others will last longer than expected, which is recognized in the column *Planned Year for First Replacement or Major Repair* since it is the year identified in the reserve fund study prepared by a qualified expert.

The first step and intention behind our model is to provide a deterministic approach that will present an evolution of the reserve fund balance without any random variations based on statistical distributions, but rather only on the deterministic assumptions above and the expected time of replacement or major repair of common elements for that case study.

Therefore, the results based on a deterministic approach are presented in Figure 21 and can also be found in a table format in Appendix C in Table C.4. It presents the reserve fund balance's evolution with the deterministic cash flow over a 100-year period.

Figure 21: Evolution of the reserve fund for the condo corporation Honesty Residence



From the previous figure we can conclude that:

1. Interest earned is not a major factor and will not be a major contributor to increase the reserve fund balance for this case.



2. As we can expect, the more time elapses, the more volatility arises and creates a special assessment required to pay for the necessary expenditures. The reserve fund contributions are not sufficient to counter the increase in expenditure cost through the years.
3. Expenditures are not uniformly distributed – some will occur every 5 to 10 years, whereas others will occur less frequently and will be the most expensive of all the common elements.

Given the deterministic projection and the assumptions above, we can run stochastic simulations on the time of failure of common elements and the expenditure increase rate to assess if the reserve fund contributions are at an appropriate level through time. Therefore, the second step and intention of our model is to simulate stochastically the evolution of a reserve fund with the assumptions presented above but with random variation on key variables. The random variation will be on the following key variables:

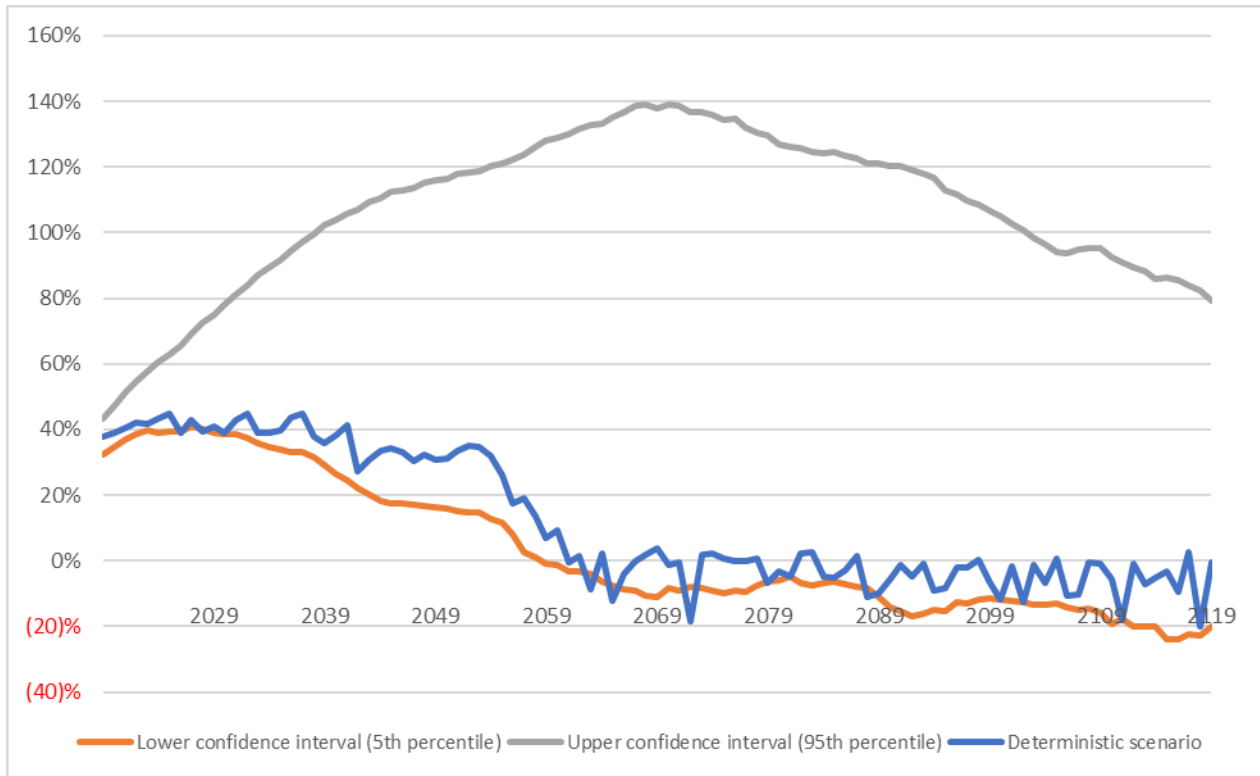
- Time of failure of common elements: Weibull distribution with parameters k and α as presented in formula (7)
- Expenditure increase rate: Normal distribution with a mean of 2.94% and standard deviation of 3.34%

For that purpose, we will output the reserve fund status based on formula (8) derived previously, which represents the expected balance of the reserve fund at a time t over the expected discounted fraction of value of all the common elements that should be funded in the reserve fund at a time t .

We present in the following figure the reserve fund status through the same 100-year period but bounded by a 90% confidence interval created with 1,000 scenarios. In our simulation, 5% of the scenarios showed a reserve fund status above the upper confidence interval line, whereas 5% of the other scenarios had a reserve fund status under the lower confidence interval line. As seen previously, the actual level of reserve fund contributions is not sufficient to provide for all the repairs and replacement of the common elements through the 100-year period. Also, the upper confidence interval presents a declining reserve fund status starting half-way through the 100-year period, suggesting that the actual scheme of contributions is insufficient in the long run.



Figure 22: Stochastic simulation of the reserve fund status for the condo corporation Honest Residence



From the previous figure we can see that:

1. The deterministic scenario falls below the lower confidence interval because of the non-uniform time of failure for the common elements' replacement.
2. The high reserve fund status at valuation date is a great asset for the condo corporation since it can generate returns and protect against unexpected early expenditures; however, the reserve fund is not half funded at valuation date. Therefore, the balance of the reserve fund stays level over 40 years but the reserve fund status declines over that period, leading to a special assessment afterwards.
3. The level of reserve fund contribution as well as the yearly increase in those reserve fund contribution seem to rapidly become insufficient as expenditure depletes the reserve fund.

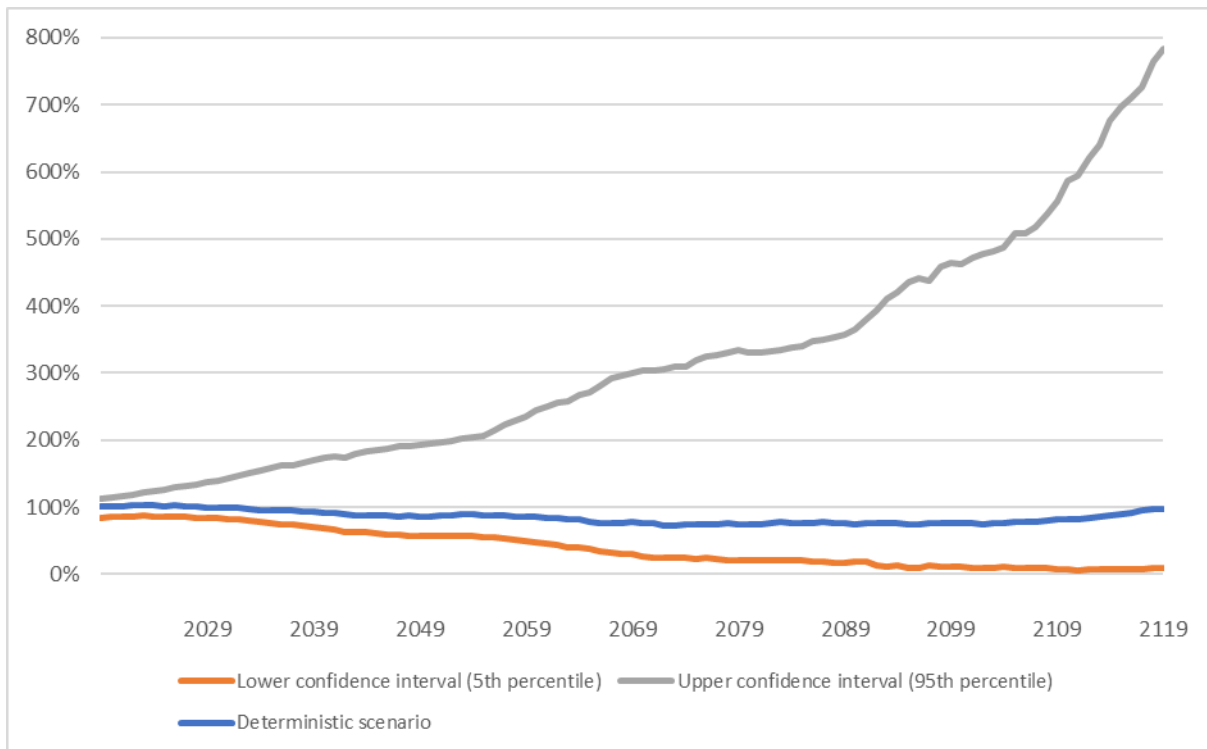


However, if we were in a situation where the reserve fund status would be at a 100% at the valuation date and we had an appropriate level of reserve fund contribution so that our deterministic scenario presents a stable reserve fund status around 100% over the 100-year period, we would require the following:

1. A special assessment at the valuation date of \$11,298,600 (\$20,032.98 per unit owner, which is an important contribution to the reserve fund that may not be affordable for many condo owners); and
2. Start with an annual reserve fund contribution of \$1,354,452 (\$2,402 per unit owner) and increase the annual contribution by 3.20% per year.

This hypothetical situation would provide the following results:

Figure 23: Stochastic simulation of the reserve fund status for the condo corporation Honesty Residence with changes in the reserve fund contribution level





From the previous figure we can see that:

1. The deterministic scenario remains stable around the 100% reserve fund status mark.
2. The wide gap in the confidence interval can be explained by the fact that larger reserve fund contributions and higher increases in these contributions will be less likely to result in a special assessment, leaving more room to grow a healthy and sustainable reserve fund.

We also calculated the likelihood of a special assessment from the previous scenarios above, and the results are as follows:

Table 8: Likelihood of a special assessment for the condo corporation Honesty Residence

Likelihood of a Special Assessment from Valuation Date	Under Current Projected Reserve Fund Contribution	Given the Hypothetical Situation
Within 3 years	0.0%	0.0%
Within 5 years	0.0%	0.0%
Within 10 years	0.0%	0.0%
Within 20 years	0.0%	0.0%
Within 30 years	1.2%	0.0%
Within 50 years	29.8%	1.7%
Within 100 years	88.1%	7.9%

The difference in the likelihood of a special assessment between the two situations is notable in the long run, whereas the short run is well covered and unlikely to require a special assessment. However, in the current situation of the condo corporation Honesty Residence, the gap between the current reserve fund status and the 100% mark would require a tremendous financial effort from the current condo owners to correct the situation.



Summary and conclusions regarding the case studies

Following the two case studies we can draw some interesting conclusions, such as:

1. The likelihood of avoiding a special assessment in the reserve fund will depend on the contribution rate increase, where it should be around the same as the expected increase in expenditure rate. Thus, condo owners will be highly vulnerable to variation in the cost of repairing common elements in the long run.
2. Higher reserve fund status is likely to prevent a special assessment in the short run, as seen in the condo corporation Honesty Residence, whereas the low reserve fund status in the condo corporation The Hammer left it in a difficult financial position and likely to require a special assessment soon.
3. In the case of a low reserve fund status, we can conclude that reaching the 100% funded status mark would require tremendous financial sacrifice, which can be disastrous if required from newly arrived condo owners who did not consider or were unaware of that aspect.

As our stochastic projections can vary widely as we project them further and further in time, the best way to make sure that appropriate measures are taken in properly funding the reserve fund is by performing a review/assessment of the common elements every 3 years through a reserve fund study.

Caveats of the model

The model aims to evaluate the funded status of a reserve fund over a 100-year period and assess the sufficiency of the reserve fund contribution scheme through time. Any model has caveats, and the most significant ones are discussed below.

1. Weibull distribution, correlation of common elements, and external conditions

The Weibull distribution performs well in generating the time of failure of the common elements, but some limitation comes from the generality of application where any common elements with a short or long span of life will be fitted to a Weibull distribution. Short-span elements can be changed with greater certainty or postponed



if they are not threatening the security of the condo building, whereas long-span common elements will likely be better represented by a Weibull distribution.

Also, the choice of parameters is based on a simple assumption that all components will fail within 80% to 120% of their average lifetime 99% of the time because the Weibull distribution is not based on any data on common elements provided specifically from the condo corporation being evaluated, but rather use a simple assumption for the purpose of creating this model.

The model does not consider any correlation between common elements, but in real life it is likely that some common elements will behave together and fail within a reasonable range of each other. For example, we can expect all common elements related to plumbing (e.g., heater, tank, pipes) to require repair or replacement around the same time, but for simplicity we assumed that all components are independent of each other.

It is also important to note that condo buildings scattered around Canada (even around the world) will not have their common elements suffer from the same wear and tear, due to temperature and the environment where they are located. The Weibull distribution does not model for such peculiarity, but the model does allow the increase or reduction in the average expected lifetime to consider adjustments if necessary.

2. Time replacement schedule

The model assumes that at any time in a year when a required expense is higher than what is available in the reserve fund, a special contribution will be made to cover the shortfall. However, in real life some common elements can be changed later or can be changed over more than a year (e.g., changing the windows over 2 to 3 years to amortize the cost).

It is also to be noted that some common elements having a greater certainty in their time of replacement can be scheduled to be changed at time intervals based on



prime numbers, when possible, so as to avoid overlapping expenditure that will drain the reserve fund too quickly.

3. Data on replacement cost and estimation of remaining lifetime of common elements

The model provides some generic common elements with their known expected lifetime that were extracted from a study by BOMA International,¹⁸ but we miss the replacement cost of these common elements, which can vary widely from one condo building to another. Without data available on hand, it is not possible for an ordinary user to generate anything with the reserve fund model unless a previous reserve fund study was performed by a professional, which can then be used to input replacement cost and estimated remaining lifetime based on that study.

As for the assessment of common elements in their wear and tear or remaining lifetime, without proper expertise it is hard to evaluate when they should be repaired or replaced. However, the model can adjust the remaining lifetime, which can be used for stress-test and specific scenarios.

The model also supposes no improvement in the average expected lifetime of the common elements gained by technological improvement, which can most likely reduce cost.

4. Lifetime of the condo building is considered infinite

The model considers that the condo building will be standing forever and that only standard repairs and replacements will be performed. However, there is no possibility of assessing whether the structural integrity of the building will require more than what is budgeted for in a reserve fund study. Therefore, the model does not account for low-probability events that have a high risk profile, such as this one.

¹⁸ Schoen, Lawrence J. (2010). *Preventive Maintenance Guidebook: Best Practices to Maintain Efficient and Sustainable Buildings*. 3rd edition. BOMA International.



Potential solutions for boards of directors

Avoiding risk is not possible when living in a condo, as major repairs and replacements of common elements can arise at any time due to the failure of equipment ahead of time, damages not covered by insurance, misuse of certain common elements/areas by condo owners, etc. However, it is still possible to reduce large cash outflows and build a better framework to set money aside for the reserve fund. In the absence of legislative changes caused by the legislator's inaction or the slow enactment of new pieces of legislation, boards of directors can still implement solutions on their own to build a stronger reserve fund. Below we propose some ideas to help directors improve the governance around their reserve fund and avoid under-contributing into their reserve fund if legislation has their minimum set excessively low.

1. Contribute larger condo fees into the operation budget and transfer any excess surplus at the end of the fiscal year into the reserve fund

All condo owners need to pay annual condo fees that will go towards the yearly operation of the condo building, such as electricity, cleaning, and administration. The board should prepare a more conservative budget of operation for any given year with the intent of transferring the excess surplus towards the reserve fund at the end of any financial exercise. This way, as some years are more expensive in terms of ongoing operations, the budget will be unlikely to end in a deficit (otherwise a deficit would require an immediate special assessment), whereas the years that provide fewer surprises can leave an excess surplus. More conservative budgets can allow for lesser volatility in total condo fees (operation and reserve fund contributions) as future increases will be less sudden and more uniform through the years.

2. Replace older common elements before their most extended due date

Some boards will extend the time until they must replace a common element and will repair it at its latest date so they can avoid withdrawing any amount from the reserve fund. It may look good for the reserve fund but in the meantime the costs of small repairs or maintenance on old common elements pile up and are incurred by the operating fund. The repairs and maintenance costs can amount to large sums over time for these old common elements because they lose efficiency. For example, a water heater running with natural gas can be obsolete and consume more energy



than a more recent model. Therefore, replacing the old water heater earlier could bring economy in the short and medium terms by saving on energy consumption.

All these hidden costs have a present value as of today and may be higher than the actual cost of changing the common element today, so it would make perfect sense to undergo an earlier replacement as money would be saved in the short to medium term. A good analysis is made in a research paper published by Thomas E. Wendling¹⁹ demonstrating that the optimal time to change an asset is not always at the end of its useful life, but rather earlier, when the repairs, maintenance, and efficiency reach a certain point. With proper data and resources, one can find the optimal time of replacement of common elements and use it to one's advantage. Therefore, boards should consider replacing some common elements earlier.

3. Use the reserve fund for the deductible on insurance claims when related to common elements

There has been a large increase in insurance claims in the condo sector in the past few years, as mentioned in an Insurance Bureau of Canada report²⁰ raising concerns specifically in Alberta and British Columbia. It can reasonably be assumed that the same problem arises in other provinces. Combining the use of the reserve fund with the insurance claims made by the condo corporation can help protect against large and unexpected cash outflow. The deductible for a condo corporation's insurance policy is much higher than the deductible on an individual insurance policy for condo owners, and is usually in the range of \$50,000–\$100,000, with some condo corporations known to have a deductible on their insurance policy reaching as high as \$150,000. With a deductible that high, there is a need for a special assessment whenever damages are extensive and need immediate attention.

¹⁹ Thomas, Wendling E. (2014). [Actuarial portfolio management of infrastructure service contracts](#). Accessed July 2021. *Variance*, Volume 8, Issue 2. Casualty Actuarial Society.

²⁰ Insurance Bureau of Canada. (2020, June). [IBC National Commercial Insurance Task Force's Midterm Report](#). Accessed July 2021.



Sometimes, common elements that are close to requiring repairs or replacement are hit by damages that are insured under the condo corporation's insurance policy, and should benefit from the use of the reserve fund for that precise situation. If the insurance claim funds repairs or replaces part of the cost of the common element, the shortfall, being the deductible, should be paid by the reserve fund. Since common elements are to be repaired or replaced later, it can be appropriate to use the reserve fund earlier and avoid a special assessment among the condo owners.

Therefore, boards should lead towards contributing an annual reserve fund contribution of at least the amount of the deductible on the condo corporation's insurance policy, and possibly even twice that amount. The idea is to protect against a shortfall in paying the deductible in the case of an insurance claim, but at the same time contributing for the other common elements less likely to suffer damages and be repaired or replaced by an insurance claim. This way, boards can use the reserve fund to pay for the insurance deductible for such cases.

4. Get a pre-approved loan

Even if condo owners can spread financial risk among themselves, they can still face large cash outflow due to heavy repairs or replacements, especially when a reserve fund is underfunded. There are situations where the amount required can be substantial and can place some condo owners in a tight financial situation. Some condo corporations choose to fund a shortfall in the reserve fund with a loan to avoid directly asking condo owners for a large amount of money and running into the possibility of some of them being unable to pay the amount due. This way, the repayment of this loan by condo owners can occur over a longer period but with the disadvantage of paying interest, which is sometimes the price to pay to avoid the bankruptcy of some condo owners.

Every board should have a pre-approved loan with a financial institution in case it requires an unexpected large cash outlay. A pre-approved loan would also assess the condo corporation's borrowing capacity in advance to avoid a delay in getting the loan, which is also a good risk management process.



5. Directors should seek training to improve their skills

Training will not solve funding uncertainty regarding the reserve fund in the short term, but with the growing requirement to know more and more about how to maintain and operate a condo building, there is a need for directors to get more training. What every province's legislation requires in the condo industry is to have capable and responsible directors sitting on boards. Therefore, directors must seek appropriate training and tools to fulfill their duties to their full capabilities. Whether directors seek training on a personal level or together with other directors, there exist webinars, documentation, and experts offering training through non-governmental organizations and other means.

The decisions that boards make today could have significant impact in the future, when none of today's directors could still be living in the same condo building or even sitting on the board, leaving a whole new group of condo owners with problems made from past decisions. Boards should seek advice on how to know more on subjects such as planning a yearly budget, financial literacy, and good governance. In the end, the training that the directors seek will help raise awareness among them on how they can perform their duties better to make the right decisions with the right knowledge, for the benefit of all condo owners. Too often, there are condo owners joining boards to only perform part of the duties required to sit on the board (the ones they are most interested in and that sometimes put them in a conflict of interest) when their role is essential in every other aspect in order to have a properly working board.

6. Importance of experts and the reserve fund study

As obvious as it may sound, using expert knowledge and opinions will help boards make better decisions. However, boards tend to prefer to avoid extra costs in consulting with experts, when these expenses should be encouraged as being necessary for repairing and maintaining a healthy condo building and avoiding surprises. The cost of consulting experts is usually lower than the true cost of replacing or repairing the common elements. Delaying the use of an expert may well cause additional damage around any common elements, leading to extra cost that could have been avoided if repair and maintenance were performed earlier. Experts



are there to give a clear picture of the situation for which they are hired and help directors carry on their duties. The best example is the case of a structural engineer, who will conduct an assessment on a condo building from the underground garage to the roof and provide a recommendation on how to repair and maintain its condition to avoid deterioration and premature wear.

A great tool that can be used by directors to perform their duty is the reserve fund study, which is a detailed evaluation of the common elements in a condo building, and as such should be given more attention. Making sure that all common elements are repaired and maintained properly by a competent firm of experts will help avoid a large special assessment because of earlier deterioration, and the reserve fund study coupled with the reserve fund study expert can help boards navigate through the necessary requirements to maintain an operational condo building for many decades.

A director cannot evaluate the condition of his or her condo building (especially if he or she is not an engineer or a professional specialized in the condo industry) and therefore make the right decision on how to maintain the condo building structure in its best condition. This is where the experts come in handy, and boards should be encouraged to consult with them.

Some condo owners tend to see reserve fund contributions as a waste of money that they will never have the chance to use elsewhere. However, a well-managed reserve fund that can be reasonably valued and shows a surplus will likely increase the market value of the condo tied to that reserve fund. In contrast, a reserve fund that is not well managed will require a large special assessment later to fund shortfalls, either from the current condo owners or future owners.

Potential solutions for funding the uncertainty of reserve funds require education, financial tools, and the desire of each director to do good for all condo owners. The potential solutions suggested above are a good starting point for boards to improve the current situation across Canada while new legislation is being passed in the hope of improving the lives of Canadian condo owners.



Recommendations

Following our analysis of the condo market from legislation to modelling the evolution of a reserve fund, we conclude that there is a lot of room for improvement. Some elements are critical and require immediate action by legislators to avoid a misevaluation of condos in the market caused by an underfunded reserve fund. Below we present four recommendations to help protect the value of our condo infrastructure across Canada in the long run.

1. Minimum annual contribution and reserve fund balance

There is a need for all legislation to review the minimum annual contribution and impose a clear threshold of what should be the minimum amount contributed annually to the reserve fund. In the absence of an up-to-date (not older than 3 years) independent reserve fund study, the minimum annual reserve fund contribution should be 1% of the full reconstruction cost of the condo building.

Also, the reserve fund balance should never be, at any time, below the amount of deductible for property damage on the condo corporation's insurance policy (possibly several multiples thereof). The reserve fund study (not expired) should dictate the minimum annual reserve fund contribution, and be reviewed and updated by legislative mandate every 3 years to insure proper funding.

2. Financial cushion for emergency and adverse deviation

Legislation should require condo corporations to hold in the reserve fund a financial cushion that would be above what is required by a reserve fund study. That financial cushion protects against unexpected expenses. It should be high enough to cover emergency repairs and avoid a special assessment, but not so high that condo owners over-contribute for that financial protection.

Since a lot of condo corporations will be required to increase their reserve fund contributions, and the size of that financial cushion depends on many other factors, we suggest additional research to explore the calculation of an appropriate financial cushion for reserve funds.



3. Data

The lack of data in this industry requires that condo corporations disclose more information in an annual form administered by a governmental entity. There is a crying need to gather more data on this industry and have a higher degree of transparency.

A governmental entity should require condo corporations to complete a standardized form annually to gather relevant information so that the situation in the condo industry can be monitored and adjusted along the way if necessary.

4. Education

There is a need to educate directors and condo owners/buyers on how a condo works. More educational material, mandatory training courses, and continuing refreshers should be created and taught by non-governmental entities, which should be subsidized by provincial governments. A mandatory training course should also be implemented and be administered by a governmental entity for all sitting directors, so that they undoubtedly understand the importance of their roles and responsibilities as well as the consequences of not performing them diligently according to the legislation.



Appendix A: Analysis of legislation across Canada

The review of legislation across Canada was performed by analyzing the different Acts and regulations that were found on the [CanLII website](#) as of April 26, 2021.

The compiled results of our analysis per legislation are presented below, and all items evaluated per province are found later in this appendix. Our results were presented in Figure 6, but the complete information based on a total of 28 points for every province and territory follows in descending order.

Table A.1: Legislation strength across Canada

Abbreviation	Province/Territory	Points Awarded	Percentage Out of 28 Possible Points
ON	Ontario	21.5	77%
NB	New Brunswick	19.0	68%
MB	Manitoba	15.5	55%
NT	Northwest Territories	15.5	55%
NS	Nova Scotia	15.5	55%
AB	Alberta	14.5	52%
NL	Newfoundland and Labrador	14.5	52%
YT	Yukon	13.5	48%
QC	Québec	13.0	46%
BC	British Columbia	11.0	39%
SK	Saskatchewan	8.0	29%
NU	Nunavut	0.0	0%
PEI	Prince Edward Island	0.0	0%



Description of condo reserve fund

Every province’s legislation describes its reserve fund differently, and can lead to different interpretations depending on in which province or territory a condo is located. The description is important in understanding the purpose of the reserve fund and how it should be spent. Too many directors use it as a rainy-day fund when in fact it should be used for planned replacements and repairs of common elements.

The description of the reserve fund should have the following qualities:

- clear understanding of a reserve fund (2 points)
- leaves as little interpretation as possible for the use of the reserve fund (2 points)
- define the common elements to be repaired and replaced over time (1 point)

Below is a summary table of all these descriptions, with the points awarded per province:

Table A.2: Description of reserve fund

Province/ Territory	Description of Reserve Fund According to the Provinces’ Acts and Regulations	Points
BC	A fund that pays for expenses that occur less often than once each year.	0.5
AB	A fund that is reasonably sufficient to pay for major repairs or replacement of the condo corporation’s real, personal, common and managed property.	3.5
SK	A fund established to provide for the payment of: <ul style="list-style-type: none">• unforeseen common expense;• major repair or replacement of common property, common facilities, services, units or assets of the condo corporation;• major repair or replacement of any condo unit that is the responsibility of the condo corporation.	2.0



Province/ Territory	Description of Reserve Fund According to the Provinces' Acts and Regulations	Points
MB	A fund to provide a sufficient amount to maintain and repair the common elements. Types of repairs and replacements that may be funded by the fund are ones that are expected to be necessary over time but that are not normally required on an annual basis.	1.5
ON	A fund to pay for major repairs and replacement of the common elements and assets of the condo corporation as they age.	3.0
QC	A fund to provide in advance and anticipate the financing of some of the work to be carried out on the common elements. The syndicate is the owner of the fund and its use is determined by the board of directors.	1.0
NL	A fund for major repair and replacement of the common elements and assets of the condo corporation including but not limited to, roofs, exteriors of buildings, roads, sidewalks, sewers, heating, electrical and plumbing systems, elevators, laundry, recreational and parking facilities.	3.5
NS	A fund for major repair and replacement of the common elements and assets of the condo corporation including but not limited to, roofs, exteriors of buildings, roads, sidewalks, sewers, heating, electrical and plumbing systems, elevators, laundry, recreational and parking facilities.	3.5
NB	A fund for major repairs and replacements, such as getting a new roof or painting the exterior of the building.	3.0
NT	A fund that shall be used only for major repairs and replacement of the common elements and assets of the condo corporation.	3.0
YT	A fund for the major repairs and replacement of the common elements where the repair or replacement is of a nature that does not normally occur annually.	3.0

Most descriptions in the legislation mention “major repair and replacement,” some mention a time factor to determine what the reserve fund can be used for, and some descriptions cover



examples of common elements to be repaired or replaced. However, it is to be noted that some descriptions leave room for interpretation. For example, using a time factor to identify expenses related to the reserve fund can mislead boards in thinking that some small expenses occurring every 2–3 years can be paid out of the reserve fund. If a board is not cautious enough in the use of the reserve fund, it could easily deplete it by paying small expenses recurring too often, leading to under-contribution in both the operation fund and reserve fund. The same goes for the expression “major repairs and replacement,” as some small condo corporations will not face the same reality as a large high-rise building with multiple condos.

The province that scored the lowest is British Columbia, as the definition can pertain to a lot of common elements and fail to emphasize that the reserve fund is for important repairs and replacements of common elements. Two other provinces – Québec and Saskatchewan – also scored low as they do not clearly define the common elements that should be replaced or repaired using the reserve fund, and they do not state clearly what the reserve fund is to be used for and what expenses can come out of it.

Vote required to use the reserve fund

The reserve fund is dedicated to the repair and replacement of major common elements, and all provinces are unanimous that no votes are required to use the reserve fund. However, good governance around the purpose and use of the reserve fund would prevent abuse and help directors in carrying out their duties.

In an emergency, a vote would preferably be required to use the reserve fund. If regulations do not allow the use of the reserve fund for an emergency, then voting is not applicable (1 point).

Below is a summary table of the voting requirement, with the points awarded per province:



Table A.3: Voting requirement

Province/ Territory	Vote required to use Reserve Fund	Possibility to Use the Reserve Fund in Case of Emergency	Points
BC	No voting required, as long as the reserve fund is used for one of these uses: <ul style="list-style-type: none"> obtaining a reserve fund study paying for repairs, maintenance or replacement identified in the most recent reserve fund study expenditures in the case of an emergency, if authorised under regulations 	Yes	0.0
AB	No	Yes	0.0
SK	No	Yes	0.0
MB	No	No	1.0
ON	No	No	1.0
QC	No	No	1.0
NL	No	No	1.0
NS	No	No	1.0
NB	No, unless it is to make a substantial addition, alteration or improvement to the common elements and/or a substantial change in the assets of the condo corporation.	No	1.0
NT	No	No	1.0
YT	No	Yes*	0.0

* As the regulations are not yet published, it is not clear if the reserve fund can be used for an emergency under certain conditions. We assume for now that no votes would be required.

The reserve fund is an important asset of the condo corporation and can help pay for emergency expenses required to maintain the buildings. However, there are other ways to afford emergency expenses, such as taking out a loan or asking condo owners for a special assessment. Not all condo owners feel the same when it comes to using the reserve fund, which is supposed to be for later use, as the shortfall will have to be made up anyway.



Minimum annual contribution to the reserve fund

It is not common for the legislation to stipulate a minimum contribution to the reserve fund, but some provinces have set minimum contributions to ensure appropriate funding of reserve funds and avoid delinquency from boards. However, there is no consensus on what this minimum annual contribution should be and what it should be based on.

The legislation should consider these aspects about minimum required reserve fund contributions:

- the requirement for a recurring minimum contribution (2 points)
- the level of minimum contribution that is appropriate (2 points)
- whether the proxy for the calculation of the contribution is suitable (2 points)
- different rules for smaller condo buildings (1 point)

Below is a summary table regarding the minimum annual contribution, with the points awarded per province:

Table A.4: Minimum annual contribution

Province/ Territory	Minimum Annual Contribution required to be deposited in the reserve fund	Points
BC	<p>If the contingency reserve fund at the end of a fiscal year is less than 25% of the operating budget of that fiscal year, the annual contribution to the contingency reserve fund for the following fiscal year must be at least the minimum between:</p> <ul style="list-style-type: none"> • 10% of the operating budget for the following fiscal year; and • the amount required to bring the contingency reserve fund to 25%, or above, of the operating budget for the following fiscal year. <p>Additional contributions to the contingency reserve fund may be made as part of the annual budget approval process after consideration of the Depreciation Report, even if the minimums above are respected.</p>	2.5
AB	None	0.0
SK	None	0.0



Province/ Territory	Minimum Annual Contribution required to be deposited in the reserve fund	Points
MB	None	0.0
ON	For the first year of operation, the amount of contribution to the reserve fund must be at least 10% of the operating budget. The minimum contribution shall be the amount that is reasonably expected to provide sufficient funds for the major repair and replacement of the common elements.	4.0
QC	The contribution to the reserve fund is at least 5% of the operating budget. For new registered condo corporation and in the absence of any reserve fund study, contribution to the reserve fund must be at least 0.5% of the reconstruction cost of the entire condo building.	5.5
NL	For a condo corporation that has less than 10 units, the balance of the reserve fund should be 100% of the annual operating budget within 5 years of the creation of the condo corporation.	2.0
NS	The minimum amount to be contributed is determined by the conclusions of the reserve fund study or by the condo owners at the annual meeting of the condo corporation. For a property consisting of fewer than 10 units, the balance to the reserve fund should be, within 5 years of the creation of the condo corporation, 100% of the annual operating budget of the corporation.	2.0
NB	For condos with 11 or more units, contributions to the reserve fund are determined by a reserve fund study. For a property consisting of fewer than 11 units, the balance of the reserve fund should be, within 5 years of the creation of the condo corporation, 100% of the annual operating budget of the corporation.	2.0
NT	Until the first reserve fund study is performed, the contributions to the reserve fund must be no less than 10% of the annual operating budget.	4.0
YT	A contribution which must be at least equal to 5% of the annual operating budget.	3.5

Minimum contribution is an important part of legislation, since new construction will not have any reserve fund study performed before delivering the final unit, and some legislation will exempt some condo corporations from the obligation of conducting a reserve fund study under specific circumstances. Therefore, to avoid underfunding a reserve fund, especially for



new construction, it is important to set a level of contribution high enough to avoid a large special assessment later but also make sure that this level will eventually account for the true cost of the common elements to be repaired or replaced later.

For mature condo buildings that have been in operation for more than a decade, a minimum contribution is also about making sure that common elements that have a longer lifetime will be capitalized over the course of their use, again to avoid a large special assessment later.

All condos are different in size and quality, and Québec is the first province to base the minimum contribution requirement on the reconstruction cost. It is a relevant indicator considering that the true cost of all common elements is part of that reconstruction proxy, whereas the operating budget is simply the cost of paying professionals to maintain some common elements, and the budget is not all about the common elements but relates also to energy, condo managers, etc.

Frequency and coverage period of a reserve fund study

Reserve fund studies are an important part of condo corporations as they evaluate the necessary contributions to be deposited in the reserve fund to plan for future repairs and replacements of common elements. They are usually prepared by a professional who understands the components making up a condo building, and they assess the components' expected cost and average lifetime. These reserve fund studies should be performed frequently enough that they capture material changes in the aging of the building's components but not so frequently as to create unnecessary cost for a condo corporation.

The frequency, horizon, and method of payment of the reserve fund study should have the following characteristics:

- the appropriate frequency to prepare a reserve fund study (2 points)
- an appropriate horizon of the reserve fund study for the planned repairs and replacements (2 points)
- the reserve fund study can be paid from the reserve fund (1 point)

Below is a summary table of some requirements of a reserve fund study, with the points awarded per province:



Table A.5: Reserve fund study

Province/ Territory	Frequency of Reserve Fund Study	Period of Coverage of the Fund Study (at least)	Use of Reserve Fund for Payment of the Reserve Fund Study	Points
BC	Every 3 years	30 years	No	3.5
AB	Every 5 years (2 years after a condo plan is first registered)	30 years	Yes	4.0
SK	Every 5 years (3 years after a condo plan is first registered)	25 years	Yes	3.5
MB	Every 5 years (3 years after a condo plan is first registered)	30 years	No	3.0
ON	Every 3 years (1 year after a condo plan is first registered)	30 years	Yes	4.5
QC	Every 5 years (not in force yet)	To be determined by regulation	No	1.5
NL	Every 10 years	30 years	No	2.0
NS	Every 10 years (update every 5 years or any time there is a material change in the value of the assets of the condo corporation)	20 years	No	1.5
NB	Every 10 years for condo corporations of more than 10 condos (update every 5 years or any time there is a material change in the	30 years	Yes	4.0



Province/ Territory	Frequency of Reserve Fund Study	Period of Coverage of the Fund Study (at least)	Use of Reserve Fund for Payment of the Reserve Fund Study	Points
	value of the assets of the condo corporation)			
NT	Every 5 years	25 years	Yes	3.5
YT	Every 5 years	25 years	Yes	3.5

The frequency at which a reserve fund study should be performed varies on average from 3 to 5 years per province. As for the period of coverage, reserve fund studies are expected to cover on average the expenses due to occur over the 25 to 30 years following their valuation to determine the right reserve fund contributions.

Nova Scotia finds itself with a very low score as its complete reserve fund studies are reviewed every 10 years but only have a projection of 20 years. Since a lot can happen in a few years, it would not be recommended to have a lengthy frequency combined with a short horizon for the cash flows.

Québec also has a low score since the new regulations for the requirements of a reserve fund study and its period of coverage have not been published yet. Since it is not possible to evaluate it properly, we gave it a score of 0 for the period of coverage.

It is also important to note that not all legislation authorizes the use of the reserve fund to pay for the preparation of a reserve fund study. However, legislation should authorize it since it is not a yearly expense, making the operating budget vary over time, whereas expensing it from the reserve fund would allow for funding the cost of that study over time when it comes due.



Professionals authorized to perform a reserve fund study

Not everyone is allowed to perform reserve fund studies for condo corporations. Therefore, legislation will sometimes list an exclusive number of professions authorized to perform a reserve fund study, and will sometimes qualitatively describe what qualifications are required from an individual to perform a reserve fund study.

The professionals authorized to undertake a reserve fund study should have the following characteristics:

- All reserve fund study experts should bear a professional designation recognized in the industry (2 points).
- All professionals should be bound by a code of ethics (2 points).

Below is a summary table describing the qualifications required to perform a reserve fund study, with the points awarded per province:

Table A.6: Qualification requirements for a reserve fund study

Province/ Territory	Qualifications Required to Perform a Reserve Fund Study	Points
BC	Any person who has knowledgeable and has the expertise to understand the components and complexity of the strata corporation's common property that the strata corporation is responsible to maintain or repair.	0.0
SK	A reserve fund study can be prepared by a person who is knowledgeable with respect to the operation, maintenance and the cost/replacement of the condo corporation's components.	0.0
QC	Will be determined by regulation.	0.0



Province/ Territory	Qualifications Required to Perform a Reserve Fund Study	Points
NT	Any person who his knowledgeable with respect to a particular type of component in regard to its operation and maintenance as well as knowing the costs of replacement or repairs of that particular type of component. Condo corporation with fewer than 13 units can carry out the functions of performing the reserve study if the condo owners authorize it by a special resolution.	0.0

The following provinces list the professionals authorized to perform a reserve fund study with the points awarded per province:

Table A.7: Qualified individuals authorized to perform a reserve fund study

Province/Territory	AB	MB ¹	ON	NL	NS	NB	YT ²
Professional engineer	X	X	X	X	X	X	X
Professional technologist	X						
Certified technologist	X	X	X			X	
Registered engineering technologist	X	X	X			X	
Registered architect	X	X	X	X		X	X
Member of the Appraisal Institute of Canada who holds the designation of Accredited Appraiser Canadian Institute	X	X	X	X		X	X
Member of the Canadian National Association of Real Estate Appraisers who holds the designation of Designated Reserve Planner or Designated Appraiser Commercial	X						



Province/Territory	AB	MB ¹	ON	NL	NS	NB	YT ²
Member of the Canadian Institute of Quantity Surveyors who holds a designation as a Professional Quantity Surveyor	X		X				
Certified reserve planner who is accredited by the Real Estate Institute of Canada	X	X	X	X		X	X
Person who holds a certificate from the Reserve Fund Planning Program at the University of British Columbia	X						
Graduate of Ryerson University with a Bachelor of Technology (Architectural Science) – Building Science Option or Architecture Option			X				
Member of the Association of Architectural Technologists of Ontario holding the designation of architectural technologist, architecte-technologue or registered building technologist			X				
Individual who has successfully completed training recognized or possesses qualifications recognized by legislation	X						
Others							X ³
Points	2.0	4.0	3.0	4.0	4.0	4.0	1.0

¹ Additionally, an individual may conduct a reserve fund study for certain classes of condo buildings under 10 units, so long as the person is knowledgeable – in the board of directors’ opinion and based on reasonable and objective criteria – about the items or types of items included in the component inventory, their operation or maintenance, and their repair or replacement cost.

² In the case of a condo corporation with not more than five-unit owners, a director of the condo corporation can conduct a reserve fund study and must describe his qualification in the report.



³ Any other person who by reasonable and objective criteria is qualified to perform a reserve fund study.

The universal professional recognized in all provinces to provide services on a reserve fund study is the engineer, followed by architects, certified reserve planners, and Members of the Appraisal Institute of Canada. The main idea is to have knowledgeable individuals able to value the actual cost of repair and replacement and assess the repaired/replaced component's relative value over time and their average expected lifetime. The ultimate bearers of the consequences of a reserve fund study done wrong are the condo owners, as they will have to cover any shortfall with special assessments in the future if a reserve fund study under-budgets the required reserve fund contributions.

As we noticed, British Columbia's requirements are very broad and may lead to problems later. As set out in an article by Lash/Condo Law, "This 'do it yourself approach' sets a dangerous precedent by encouraging [condo] Corporations to look for the cheapest alternative and not get professionals to conduct these important reports."²¹ Any province wants to avoid very broad descriptions and rather list professions capable of providing meaningful service in performing reserve fund studies.

Therefore, it is important that the professionals performing the reserve fund study have the necessary ability and knowledge before being given the duty of taking on work of this nature.

Circumstances where a condo corporation is not required to conduct a reserve fund study

Some provinces will ask for a reserve fund study but will not enforce it in specific cases. As it is a central factor in making sure that money set aside in the reserve fund is sufficient or that reserve fund contributions are not excessive, not knowing for what or how much to contribute can lead to inappropriate funding levels. A reserve fund study is a necessary exercise for that purpose.

²¹ Lash/Condo Law (2013, June 2). [Was your condo reserve fund study prepared by a qualified professional?](#) Accessed June 2021.



Legislation should not exempt any condo corporation from performing a reserve fund study since the benefit of it is to the greater good of all condo owners. Therefore, legislation should not permit exemption for any condo corporation, except for specific cases where it would not damage the corporation (2 points).

Below is a summary table describing the circumstances where a condo corporation is not required to conduct a reserve fund study, with the points awarded per province:

Table A.8: Exemption from performing a reserve fund study

Province/ Territory	Circumstances Permitted	Points
BC	A resolution passed by three-quarters of the condo owners at an annual or special general meeting, or the condo corporation has less than five units.	0.5
AB	No exception.	2.0
SK	Condo buildings with fewer than 12 units are exempted from conducting and preparing a reserve fund study report. The only other exception is a condo building that has all condo units reserved for agricultural purposes if it is approved by a special resolution by the condo owners.	1.0
MB	No exception.	2.0
ON	No exception.	2.0
QC	No exception.	2.0
NL	No exception.	2.0
NS	Condo corporation with fewer than 10 units are not required to update any previous reserve fund study or have subsequent reserve fund studies or updates completed, but must perform a physical analysis of the condo building's components and provide some financial budget of coming repairs and replacements.	1.5
NB	No reserve fund study is required for condo corporation with less than 11 condo units.	1.0
NT	No reserve fund study is required for condo corporation with less than seven condo units and the exemption must be authorized by a special resolution voted by the condo owners.	1.5
YT	A condo corporation is exempt if a special resolution is voted by the condo owners (not in force yet).	0.5



Most of the legislation will grant no exemption from performing a reserve fund study, which is a good way to ensure that adequate reserve fund contributions are set aside in the reserve fund. Some legislation will allow a general assembly to vote whether to perform a reserve fund study or not, and other legislation will grant exemptions from performing a reserve fund study for small condo corporations with few units.

It is understandable that it is relatively more costly for a smaller condo corporation to perform a reserve fund study, but it still biases the true value of the condo when valuing it at market value. Most of the time the aging of the common elements will not be considered in the market value since some condo buyers will assume that the reserve fund is fully funded (being unaware of the true funding status) but any shortfall in the reserve fund should technically reduce the property's market value (and an excess in the reserve fund should benefit the market value).

A condo buyer will first look at the value of what he or she is buying but will also consider the cash flow for that property. Therefore, without a reserve fund study there is no possible way to ascertain the future cash flow that will be required for the repair of the common elements, which can account for a large portion of the cash flow required to own a condo.

Reserve fund investment

Condo corporations are allowed to invest their reserve fund to earn interest income. This way, it is possible for condo corporations to require less of a reserve fund contribution from all owners by having another source of earnings. However, since the purpose of the reserve fund is to pay for the repair and replacement of common elements in the long run, all jurisdictions have described and/or specified types of investments allowed for reserve funds that would respect the inherent risk faced by a condo corporation. These investments need to be very liquid on the market and guaranteed by either a government or sufficient collateral. It is expected in some cases that investment choices are left to the trustee, but they must be made like a prudent investor would.

When it comes to investment, the rules in legislation should have the following characteristics to protect the capital in the reserve fund but allow a variety of investment possibilities:



- clear guidelines on authorized investment vehicles (2 points)
- an indication that the capital must be guaranteed (2 points)

Below is a summary table describing the investment vehicles authorized for reserve funds, with the points awarded per province:

Table A.9: Investment vehicle for reserve fund

Province/ Territory	Authorized Investment Vehicle for Reserve Funds	Points
BC	A savings account or chequing account, term deposit, or GIC or treasury bill issued by the Government of Canada. Other possible investments with certain restrictions are bonds, debentures, or other evidence of indebtedness issued or guaranteed by the Government of Canada or a province or issued by a corporation incorporated under the laws of Canada or a province; or a fixed-income exchange-traded fund traded on an exchange in Canada.	4.0
AB	A savings account or chequing account, term deposit, or GIC or receipts of a trust corporation or treasury bill issued by the Government of Canada. Other possible investments with certain restrictions are bonds, debentures, or other evidence of indebtedness issued or guaranteed by the Government of Canada or a province, or issued by a corporation incorporated under the laws of Canada or a province; preferred shares of any corporate body incorporated under the laws of Canada or of a province or territory of Canada; fully paid common shares of a corporate body incorporated in Canada or the USA; mortgages, charges, or hypothecs on improved real estate in Canada; or a fixed income exchange-traded fund traded on an exchange in Canada.	3.0
SK	Any form of property or security in which a reasonable and prudent investor would invest, including a security issued by a mutual fund or a similar investment. Investing the asset of the reserve fund in a manner that is inconsistent with the instrument creating the reserve fund is not authorized.	1.5



Province/ Territory	Authorized Investment Vehicle for Reserve Funds	Points
MB	A savings account or chequing account, term deposit, or GIC or treasury bill issued by the Government of Canada. Other possible investments with certain restrictions are bonds, debentures, or other evidence of indebtedness issued or guaranteed by the Government of Canada or a province or issued by a corporation incorporated under the laws of Canada or a province; or mortgages, charges, or hypothecs on improved real estate in Canada.	4.0
ON	Bonds, debentures, GICs, deposit receipts or notes, or similar instruments that are issued or guaranteed by the Government of Canada or one of the provinces or issued by an institution located in Ontario insured by CDIC or the Deposit Insurance Corporation of Ontario.	4.0
QC	The fund must be partly liquid and be available quickly when needed, and its capital must be guaranteed.	2.0
NL	The reserve fund can invest in any property or securities in which a trustee may invest. The trustee shall exercise the care, diligence, and skill that a reasonably prudent person would in investing.	0.0
NS	The reserve fund must be deposited and maintained in a chartered bank in the province or, where the principal amount is 100% guaranteed, invested in securities in which trustees are permitted by law to invest trust funds. A trustee may invest trust property in any form of property or security in which a prudent investor might invest, including a security issued by a mutual fund.	2.0
NB	Bonds, debentures, GICs, deposit receipts, deposit notes, certificates of deposit, term deposits, or other similar instruments that is issued or guaranteed by the Government of Canada or the government of a province of Canada, or is issued by an institution located in the province insured by either the CDIC or the New Brunswick Credit Union Deposit Insurance Corporation.	4.0



Province/ Territory	Authorized Investment Vehicle for Reserve Funds	Points
NT	A savings account, chequing account, term deposits, GICs, receipts of a trust corporation or treasury bill issued by the Government of Canada. Other possible investments but with restrictions are bonds, debentures, or other investment issued or guaranteed by the Government of Canada or a province, or issued by a corporation incorporated under the laws of Canada or a province. Preferred shares of any corporate body in Canada, fully paid common shares of a corporate body in Canada or the USA, mortgages, charges, or hypothecs on improved real estate in Canada, or a fixed-income exchange-traded fund traded on an exchange platform in Canada are also possible investment but with restrictions.	3.0
YT	Money can be invested in deposit accounts to the extent that the money will be insured by the CDIC. Other investments are also permitted by the regulations.	2.0

Investing can be an additional source of income for the reserve fund, but the investing operation of the fund should be done carefully without having risky investments in an attempt to make a large gain in the short term.

Therefore, it is appropriate that the legislation limit the investment category to mostly bonds, debentures, and other fixed-income assets.

We became aware of a situation involving a condo corporation in Regina, Saskatchewan, that recently invested a portion of its reserve fund in Bitcoin. The condo corporation bought the Bitcoin “in hopes of eventually eliminating fees for residents.”²² It is as yet unknown if the legislator will intervene and whether the investment will be judged as being too risky and not prudent, and therefore against the Condominium Property Act of Saskatchewan.

Refund of contribution to condo owners

All provinces that require a reserve fund, without exception, are clear about contributions made to the reserve fund: they cannot be refunded to any of the condo owners. Instead, they must be used as projected and intended. The only situation where contributions can be

²² Sciarpelletti, L. (2021, March 17). [Regina condo corporation invests in bitcoin; experts warn of risks, but lawyer says strategy is sound](#). CBC News. Accessed June 2021.



refunded is if a condo corporation dissolves, which happens rarely, and mostly in situations involving insolvency of the corporation.

There is one situation where a condo corporation of townhouses in Ontario decided to dissolve because all the condo owners were offered a lump sum by a potential developer that wanted the properties in order to build a high-rise condo building on the corporation's land. Buying out everyone was less costly than the expense involved in constructing and selling condo units from a larger building. In that situation, the reserve fund turned out to be an asset that was redistributed to the condo owners.



Appendix B: Overview of data collected

McIntosh Perry provided access to data from around 300 reserve fund studies that were performed on condo buildings in the province of Ontario.

Below are relevant figures presenting the set of data available on hand from different angles and used in this research paper. We used the same data set to present figures 8 and 9.

Table B.1: Characteristics of the data set

Total number of condo buildings	303
Total number of units	27,885

Figure B.1: Number of condo buildings built, grouped per decade (e.g., the decade '00s is for condos built between the years 2000 to 2009)

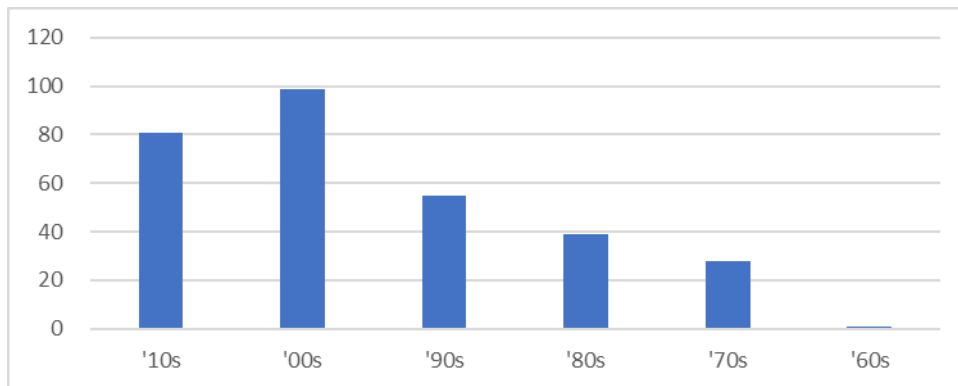




Figure B.2: Number of condo buildings grouped per number of units contributing to the reserve fund

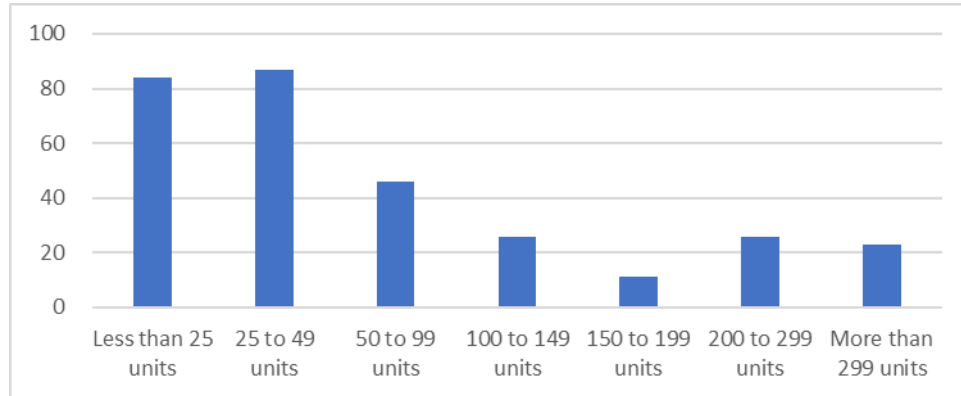


Figure B.3: Percentage of condo buildings per condo type

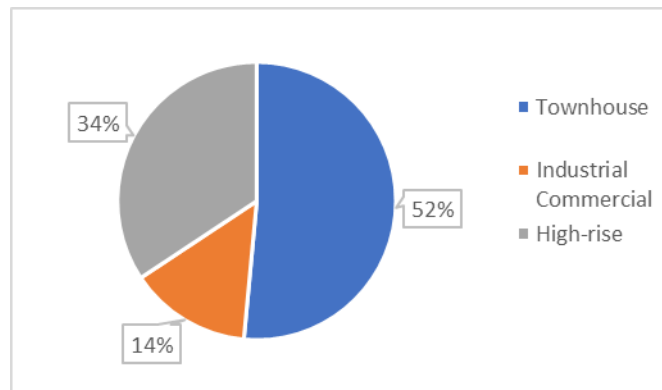




Figure B.4: Reserve fund contribution annual increase per type over the next X years

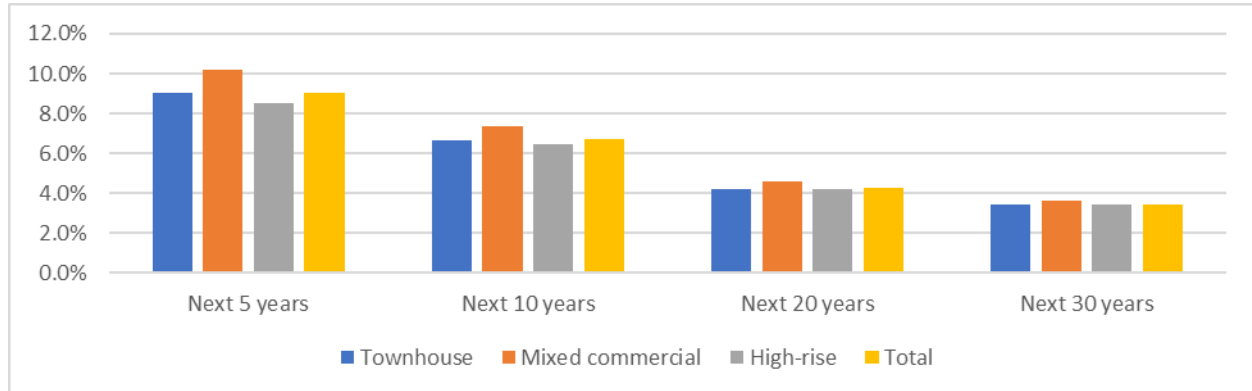


Figure B.5: Reserve fund contribution annual increase over the next X years, grouped per decade (e.g., the decade '00s is for condos built between the years 2000 to 2009)

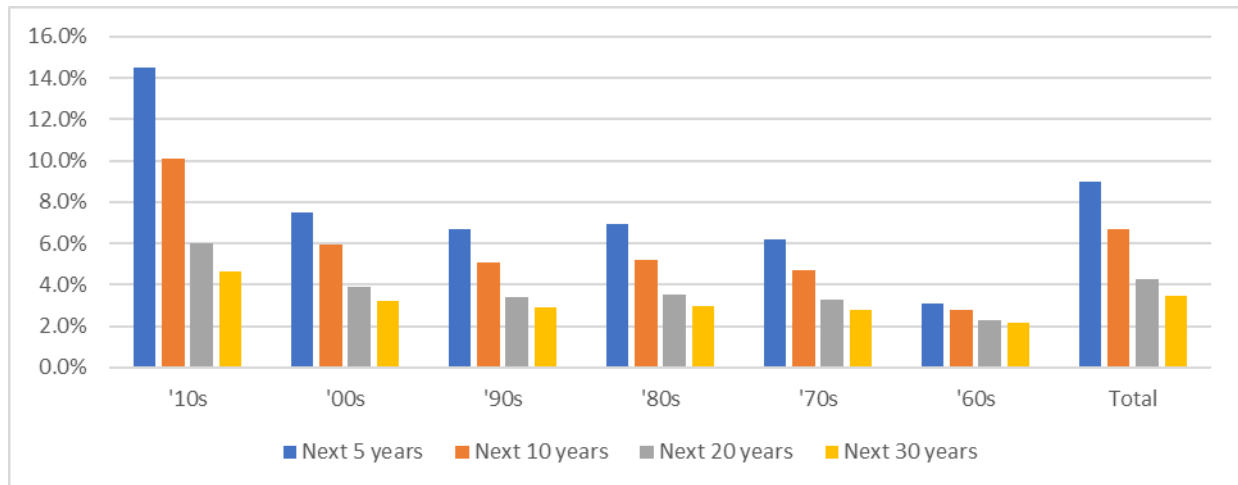
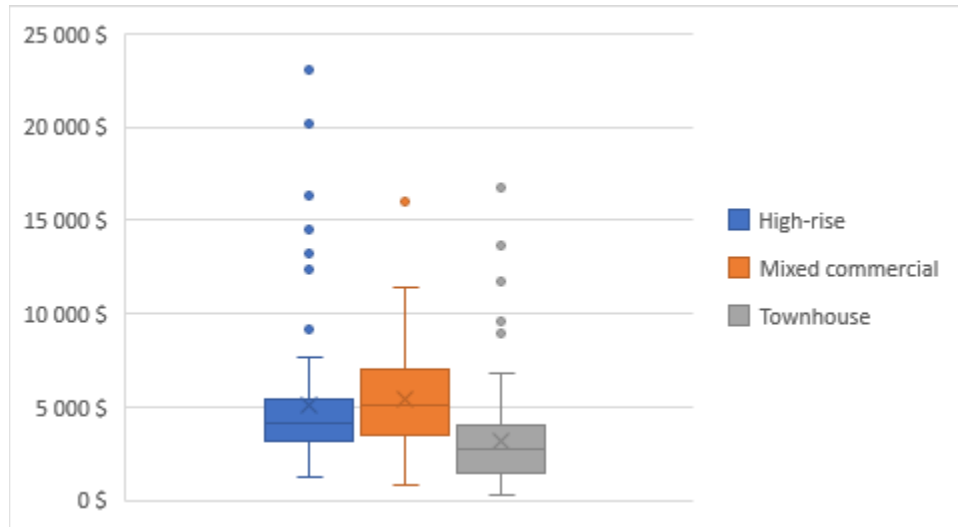


Table B.2: Special assessment in a reserve fund study

Total number of condo buildings with special assessment contributions	12
Percentage of total number of condo buildings with special assessment contributions	4.0%

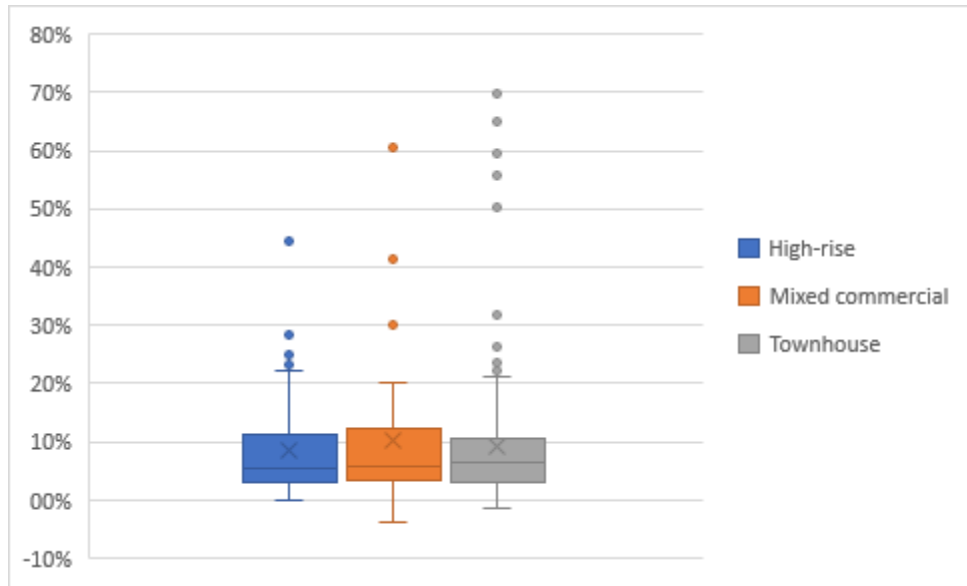
Figure B.6: Reserve fund contribution increase in dollars per type



The results are divided per type and each has a box and whisker divided in four segments representing quartiles. There is also an "X" for each box, which indicates the average for the type's data subset. Outliers have also been identified by points and are considered outliers if they exceed 1.5 times the difference between the 1st quartile and the 3rd quartile in distance from either the 1st quartile or the 3rd quartile.



Figure B.7: Reserve fund contribution increase in percentage per type



The results are divided per type and each has a box and whisker divided in four segments representing quartiles. There is also an "X" for each box, which indicates the average for the type's data subset. Outliers have also been identified by points and are considered outliers if they exceed 1.5 times the difference between the 1st quartile and the 3rd quartile in distance from either the 1st quartile or the 3rd quartile.



Appendix C: data and tables for the case studies

Townhouse case study (40 condo units)

Table C.1: List of common elements with age, replacement age, and cost

Item Number	Common Element Component	Year of Acquisition	Present Age (years)	Normal Life (years)	Planned Year for First Replacement or Major Repair	Current Replacement Cost (including taxes)
Site Elements						
Pavement, Curbs & Retaining Walls						
1	Asphalt – Replacement	1990	30	31	2024	\$174,600
2	Asphalt – Resurfacing	1990	30	31	2036	\$34,400
3	Asphalt – Sealing	1990	30	11	2020	\$12,500
4	Concrete	1990	30	23	2020	\$6,800
5	Unit Stone – Front Entrances	2009	11	23	2034	\$66,200
6	Interlocking – Rear Patios	1990	30	31	2027	\$97,100
7	Retaining Walls – Wood	2019	1	19	2038	\$4,900
Fencing & Decks						
8	Wood – Garbage Enclosure	2013	7	19	2021	\$11,900
9	Decks – Wood	1990	30	37	2028	\$248,100
Miscellaneous						
10	Soft Landscaping – Minor	2019	1	3	2022	\$4,500
11	Signage	2013	7	11	2024	\$1,680
12	Mailboxes	2012	8	17	2027	\$3,500
Exterior Building Elements						
Roofing						
13	Shingles &	2016	4	13	2031	\$232,200



Item Number	Common Element Component	Year of Acquisition	Present Age (years)	Normal Life (years)	Planned Year for First Replacement or Major Repair	Current Replacement Cost (including taxes)
	Sheathing Repairs					
14	Attic Insulation Repairs	2016	4	13	2031	\$15,000
15	Eavestroughs & Downpipes	2012	8	29	2044	\$51,100
16	Soffits & Facias	2012	8	29	2044	\$23,500
17	Skylights	2019	1	2	2020	\$2,500
Exterior Doors						
18	Unit Entrance	1990	30	31	2022	\$38,500
19	Exterior Storage Rooms	1990	30	31	2022	\$20,000
20	Balcony & Patio	2005	15	23	2040	\$131,900
Windows						
21	Total Replacement	2014	6	37	2051	\$224,200
22	Caulking & Glazing Sealant Materials	2012	8	13	2025	\$59,700
Cladding						
23	Vinyl Siding	2012	8	31	2041	\$427,900
24	Exterior Wall Restoration	2014	6	11	2020	\$29,800
Miscellaneous						
25	Painting – Decks	2014	6	7	2024	\$24,900
26	Painting – Doors	2012	8	17	2035	\$13,300
Mechanical Equipment						
Drainage						
27	Sanitary System	2015	5	41	2056	\$25,100
28	Storm System	1990	30	41	2031	\$27,000
Domestic Water						
29	Cold Water/Fire Line Piping	1990	30	41	2031	\$135,700
Miscellaneous						
30	Irrigation System	2005	15	23	2026	\$64,100
31	Natural Gas Piping	1990	30	41	2031	\$41,900



Item Number	Common Element Component	Year of Acquisition	Present Age (years)	Normal Life (years)	Planned Year for First Replacement or Major Repair	Current Replacement Cost (including taxes)
Electrical Equipment						
Lighting						
32	Exterior	2000	20	23	2024	\$9,400
Engineering & Contingency						
33	Class 2 Reserve Fund Study	2017	3	6	2023	\$3,000
34	Large Project Field Review and Contract Administration	1990	30	3	2020	\$3,000
35	Contingency for Partial Replacements/Repairs	2019	1	1	2020	\$5,000



Table C.2: Evolution of the reserve fund for the townhouse case study

Year End	Opening Balance (\$)	Anticipated Annual Reserve Fund Contribution (\$)	Other Contribution (\$)	Predicted Inflation-Adjusted Expenditures (\$)	Estimated Interest Earned (\$)	Closing Balance (\$)	Anticipated Annual Contribution Increase (%)	Average Monthly Contribution Per Unit (\$)	Average Monthly Increase Per Unit (\$)
2020	29,700	88,718	0	-71,500	383	47,301		184.83	
2021	47,301	96,754	0	-70,380	605	74,280	9.06	201.57	16.74
2022	74,280	104,944	0	-11,248	1,211	169,187	8.46	218.63	17.06
2023	169,187	113,246	0	-242,344	1,046	41,135	7.91	235.93	17.30
2024	41,135	121,617	0	-81,403	612	81,961	7.39	253.37	17.44
2025	81,961	130,019	0	-80,334	1,068	132,714	6.91	270.87	17.50
2026	132,714	138,413	0	-132,262	1,358	140,223	6.46	288.36	17.49
2027	140,223	146,763	0	-315,560	558	-28,016	6.03	305.76	17.40
2028	-28,016	155,038	28,014	-13,236	429	142,229	5.64	323.00	17.24
2029	142,229	163,206	0	-10,377	2,186	297,244	5.27	340.01	17.02
2030	297,244	171,242	0	-652,266	1,135	-182,645	4.92	356.75	16.74
2031	-182,645	174,407	182,642	-64,962	0	109,442	1.85	363.35	6.59
2032	109,442	177,630	0	-14,839	3,817	276,050	1.85	370.06	6.71
2033	276,050	180,913	0	-110,084	6,229	353,108	1.85	376.90	6.84
2034	353,108	184,257	0	-38,128	8,524	507,761	1.85	383.87	6.97
2035	507,761	187,662	0	-65,287	11,379	641,515	1.85	390.96	7.09
2036	641,515	191,131	0	-19,013	14,552	828,185	1.85	398.19	7.23
2037	828,185	194,663	0	-154,071	16,970	885,747	1.85	405.55	7.36
2038	885,747	198,261	0	-17,615	19,521	1,085,914	1.85	413.04	7.50
2039	1,085,914	201,925	0	-264,645	21,091	1,044,285	1.85	420.68	7.63
2040	1,044,285	205,657	0	-778,766	15,155	486,331	1.85	428.45	7.78
2041	486,331	209,458	0	-14,623	11,675	692,841	1.85	436.37	7.92
2042	692,841	213,329	0	-102,133	14,969	819,006	1.85	444.44	8.06
2043	819,006	217,272	0	-652,441	12,028	395,865	1.85	452.65	8.21
2044	395,865	221,288	0	-70,502	9,425	556,076	1.85	461.02	8.37



Year End	Opening Balance (\$)	Anticipated Annual Reserve Fund Contribution (\$)	Other Contribution (\$)	Predicted Inflation-Adjusted Expenditures (\$)	Estimated Interest Earned (\$)	Closing Balance (\$)	Anticipated Annual Contribution Increase (%)	Average Monthly Contribution Per Unit (\$)	Average Monthly Increase Per Unit (\$)
2045	556,076	225,377	0	-22,912	13,146	771,687	1.85	469.54	8.52
2046	771,687	229,543	0	-41,964	17,310	976,576	1.85	478.21	8.68
2047	976,576	233,785	0	-17,359	21,696	1,214,698	1.85	487.05	8.84
2048	1,214,698	238,106	0	-169,920	24,976	1,307,860	1.85	496.05	9.00
2049	1,307,860	242,507	0	-11,488	28,467	1,567,346	1.85	505.22	9.17
2050	1,567,346	246,989	0	-696,030	26,857	1,145,162	1.85	514.56	9.34
2051	1,145,162	251,554	0	-116,044	24,258	1,304,930	1.85	524.07	9.51
2052	1,304,930	256,203	0	-172,731	26,933	1,415,335	1.85	533.76	9.69
2053	1,415,335	260,938	0	-129,570	29,620	1,576,323	1.85	543.62	9.86
2054	1,576,323	265,760	0	-494,610	29,238	1,376,711	1.85	553.67	10.05
2055	1,376,711	270,672	0	-82,098	29,420	1,594,705	1.85	563.90	10.23
2056	1,594,705	275,675	0	-927,529	25,376	968,227	1.85	574.32	10.42
2057	968,227	280,770	0	-307,861	19,094	960,230	1.85	584.94	10.61
2058	960,230	285,959	0	-140,564	20,659	1,126,284	1.85	595.75	10.81
2059	1,126,284	291,244	0	-24,463	25,194	1,418,259	1.85	606.76	11.01
2060	1,418,259	296,627	0	-48,773	30,844	1,696,957	1.85	617.97	11.21
2061	1,696,957	302,109	0	-16,189	36,798	2,019,675	1.85	629.39	11.42
2062	2,019,675	307,693	0	-474,443	38,726	1,891,651	1.85	641.03	11.63
2063	1,891,651	313,379	0	-237,244	38,594	2,006,380	1.85	652.87	11.85
2064	2,006,380	319,171	0	-1,061,518	32,704	1,296,737	1.85	664.94	12.07
2065	1,296,737	325,070	0	-119,431	27,991	1,530,367	1.85	677.23	12.29
2066	1,530,367	331,078	0	-198,723	31,931	1,694,653	1.85	689.75	12.52
2067	1,694,653	337,197	0	-25,676	37,008	2,043,182	1.85	702.49	12.75
2068	2,043,182	343,429	0	-94,133	43,357	2,335,835	1.85	715.48	12.98
2069	2,335,835	349,776	0	-1,082,996	39,385	1,642,000	1.85	728.70	13.22
2070	1,642,000	356,241	0	-43,973	35,963	1,990,231	1.85	742.17	13.47
2071	1,990,231	362,825	0	-3,036,375	13,069	-670,250	1.85	755.89	13.72



Year End	Opening Balance (\$)	Anticipated Annual Reserve Fund Contribution (\$)	Other Contribution (\$)	Predicted Inflation-Adjusted Expenditures (\$)	Estimated Interest Earned (\$)	Closing Balance (\$)	Anticipated Annual Contribution Increase (%)	Average Monthly Contribution Per Unit (\$)	Average Monthly Increase Per Unit (\$)
2072	-670,250	369,531	670,248	-494,428	0	-124,899	1.85	769.86	13.97
2073	-124,899	376,360	124,897	-22,815	1,038	354,581	1.85	784.08	14.23
2074	354,581	383,316	0	-49,300	10,432	699,029	1.85	798.58	14.49
2075	699,029	390,400	0	-273,941	15,145	830,633	1.85	813.33	14.76
2076	830,633	397,616	0	-349,001	17,099	896,347	1.85	828.37	15.03
2077	896,347	404,965	0	-119,707	20,780	1,202,385	1.85	843.68	15.31
2078	1,202,385	412,449	0	-72,012	27,452	1,570,274	1.85	859.27	15.59
2079	1,570,274	420,072	0	-520,546	30,401	1,500,201	1.85	875.15	15.88
2080	1,500,201	427,836	0	-58,525	33,697	1,903,209	1.85	891.33	16.18
2081	1,903,209	435,537	0	-54,487	41,875	2,326,134	1.80	907.37	16.04
2082	2,326,134	443,377	0	-1,520,885	35,748	1,284,374	1.80	923.70	16.33
2083	1,284,374	451,357	0	-403,849	26,163	1,358,045	1.80	940.33	16.63
2084	1,358,045	459,482	0	-74,988	31,006	1,773,545	1.80	957.25	16.93
2085	1,773,545	467,753	0	-2,088,546	19,263	172,015	1.80	974.49	17.23
2086	172,015	476,172	0	-514,120	3,061	137,128	1.80	992.03	17.54
2087	137,128	484,743	0	-1,591,173	0	-969,302	1.80	1,009.88	17.86
2088	-969,302	493,469	969,303	-753,853	0	-260,383	1.80	1,028.06	18.18
2089	-260,383	502,351	260,384	-549,200	0	-46,848	1.80	1,046.56	18.50
2090	-46,848	511,393	46,849	-89,020	3,287	425,661	1.80	1,065.40	18.84
2091	425,661	520,598	0	-38,167	13,338	921,430	1.80	1,084.58	19.18
2092	921,430	529,969	0	-156,311	22,165	1,317,253	1.80	1,104.10	19.52
2093	1,317,253	539,509	0	-278,041	28,960	1,607,681	1.80	1,123.98	19.88
2094	1,607,681	549,220	0	-690,311	30,743	1,497,333	1.80	1,144.21	20.23
2095	1,497,333	559,106	0	-2,184,049	13,697	-113,913	1.80	1,164.80	20.60
2096	-113,913	569,170	113,914	-431,512	0	137,659	1.80	1,185.77	20.97
2097	137,659	579,415	0	-740,346	1,144	-22,128	1.80	1,207.11	21.34
2098	-22,128	589,844	22,130	-97,908	4,477	496,415	1.80	1,228.84	21.73



Year End	Opening Balance (\$)	Anticipated Annual Reserve Fund Contribution (\$)	Other Contribution (\$)	Predicted Inflation-Adjusted Expenditures (\$)	Estimated Interest Earned (\$)	Closing Balance (\$)	Anticipated Annual Contribution Increase (%)	Average Monthly Contribution Per Unit (\$)	Average Monthly Increase Per Unit (\$)
2099	496,415	600,461	0	-91,152	15,021	1,020,745	1.80	1,250.96	22.12
2100	1,020,745	611,270	0	-366,099	22,867	1,288,783	1.80	1,273.48	22.52
2101	1,288,783	622,273	0	-3,359,760	0	-1,448,704	1.80	1,296.40	22.92
2102	-1,448,704	633,473	1,448,706	-6,054,008	0	-5,420,533	1.80	1,319.74	23.33
2103	-5,420,533	644,876	5,420,534	-53,787	0	591,090	1.80	1,343.49	23.76
2104	591,090	656,484	0	-116,228	17,224	1,148,570	1.80	1,367.68	24.18
2105	1,148,570	668,300	0	-108,208	28,572	1,737,234	1.80	1,392.29	24.62
2106	1,737,234	680,330	0	-123,067	40,317	2,334,814	1.80	1,417.35	25.06
2107	2,334,814	692,576	0	-396,791	49,654	2,680,253	1.80	1,442.87	25.51
2108	2,680,253	705,042	0	-5,378,616	6,869	-1,986,452	1.80	1,468.84	25.97
2109	-1,986,452	717,733	1,986,451	-63,851	0	653,881	1.80	1,495.28	26.44
2110	653,881	730,652	0	-137,975	19,004	1,265,562	1.80	1,522.19	26.91
2111	1,265,562	743,804	0	-198,497	30,764	1,841,633	1.80	1,549.59	27.40
2112	1,841,633	757,192	0	-3,087,454	13,530	-475,099	1.80	1,577.48	27.89
2113	-475,099	770,822	475,097	-184,692	0	586,128	1.80	1,605.88	28.40
2114	586,128	784,697	0	-1,405,472	5,515	-29,132	1.80	1,634.79	28.91
2115	-29,132	798,821	29,131	-1,303,730	0	-504,910	1.80	1,664.21	29.43
2116	-504,910	813,200	504,909	-2,887,427	0	-2,074,228	1.80	1,694.17	29.96
2117	-2,074,228	827,838	2,074,227	-1,181,402	0	-353,565	1.80	1,724.66	30.50
2118	-353,565	842,739	353,565	-173,430	0	669,309	1.80	1,755.71	31.04
2119	669,309	857,908	0	-2,731,283	0	-1,204,066	1.80	1,787.31	31.60



High-rise case study (564 condo units)

Table C.3: List of common elements with age, replacement age, and cost

Item Number	Common Element Component	Year of Acquisition	Present Age (years)	Normal Life (years)	Planned Year for First Replacement or Major Repair	Current Replacement Cost (including taxes)
Site Elements						
Pavement, Curbs & Retaining Walls						
1	Interlocking Repairs – South-east Courtyard	1990	30	31	2022	\$250,100
2	Unit Stone & Steps Repairs – North-west	2019	1	31	2051	\$182,200
3	Curbs – Concrete – Repairs	2002	18	19	2021	\$14,200
4	Landscaping Renovations – Pool Terrace	2002	18	19	2021	\$188,400
5	Landscaping Renovations – 27th Floor Terrace	2002	18	19	2021	\$135,600
6	Landscaping Renovations – BBQ Terrace	2002	18	19	2021	\$17,000
Fencing & Decks						
7	Metal – Replacement	2002	18	41	2043	\$10,100
8	Metal Bollard – Replacement	1990	30	41	2031	\$8,500
Miscellaneous						
9	Soft Landscaping – Terraces	2017	3	11	2029	\$60,000
Exterior Building Elements						
Parking Garage						
10	Roof Membrane & Expansion Joints – North-west	2019	1	23	2039	\$187,800



Item Number	Common Element Component	Year of Acquisition	Present Age (years)	Normal Life (years)	Planned Year for First Replacement or Major Repair	Current Replacement Cost (including taxes)
11	Roof Membrane & Expansion Joints – South-east	1990	30	23	2027	\$786,000
12	Suspended Slab Membrane & Expansion Joints	2019	1	17	2039	\$1,483,000
13	Localized Repairs	2011	9	5	2025	\$101,100
14	Painting	2005	15	17	2027	\$105,200
15	Access Ramp – Surface	2019	1	19	2038	\$58,300
Roofing						
16	Main & MPH – Repairs/Replacement	1990	30	19	2029	\$175,400
17	Terraces Repairs/Replacement	1990	30	19	2024	\$576,000
18	Terraces – Pavers & Planter – Repairs	2009	11	19	2024	\$89,000
19	Planters – Soft Landscaping	1990	30	19	2024	\$28,300
20	Roof – Metal Railings	1990	30	19	2029	\$26,700
21	Wood Fencing & Screens	2012	8	19	2031	\$22,500
22	Window Washing System	2015	5	13	2028	\$48,800
23	Access Ladder & Hatch	1990	30	23	2036	\$4,800
24	Skylights	1990	30	19	2029	\$116,300
25	Soffits – Gypsum Board	2014	6	23	2037	\$8,800
26	Soffits – Metal	1990	30	19	2028	\$11,000
Exterior Doors						
27	Overhead – Garage Access	2010	10	19	2025	\$8,100



Item Number	Common Element Component	Year of Acquisition	Present Age (years)	Normal Life (years)	Planned Year for First Replacement or Major Repair	Current Replacement Cost (including taxes)
28	Overhead – Loading Area	2010	10	19	2025	\$9,000
29	Main Entrance – North-west	2019	1	31	2050	\$21,500
30	Main Entrance – South-east	1990	30	31	2021	\$21,500
31	Fire Exit & Miscellaneous Exterior	1990	30	31	2026	\$4,300
32	Suite Terrace	1990	30	31	2026	\$49,100
Windows & Sealant Materials						
33	Windows Repairs/Replacement	1990	30	37	2021	\$46,200
34	Windows/Curtain Wall Failed Sealed Unit Replacement	2013	7	1	2021	\$10,000
35	Caulking & Glazing Sealant Materials	1990	30	13	2021	\$58,200
36	Caulking Materials & Gaskets – Exterior Cladding	1990	30	13	2021	\$82,400
Cladding						
37	Metal Siding – MPH & 27th Floor Stairwell	2010	10	31	2041	\$76,700
38	Curtain Wall – Localized Replacement/Repair	2010	10	8	2023	\$210,000
39	Curtain Wall Gaskets – Sealants	1990	30	16	2023	\$422,800
40	Granite Panel Repairs	1990	30	11	2022	\$26,100
41	Exhaust Grilles	1990	30	23	2031	\$126,200
42	Exterior Wall Restoration – Major	2004	16	17	2031	\$156,000
43	Exterior Wall Cladding	2014	6	17	2023	\$78,000



Item Number	Common Element Component	Year of Acquisition	Present Age (years)	Normal Life (years)	Planned Year for First Replacement or Major Repair	Current Replacement Cost (including taxes)
	Restoration & Structure					
Miscellaneous						
44	Painting – Doors & Soffits	2005	15	11	2030	\$10,400
45	Entrance Canopies – Repairs	2016	4	13	2030	\$334,900
Interior Common Elements						
Entrance						
46	Lobby Finishes & Furnishings – Major	1996	24	17	2022	\$211,800
47	Lobby Finishes & Furnishings – Minor	2006	14	17	2030	\$100,000
48	Concierge Desk	2008	12	17	2022	\$11,300
49	Elevator Cab Finishes – Major Refurbishment	2009	11	17	2034	\$215,500
50	Elevator Cab Finishes – Minor Refurbishment	2009	11	17	2030	\$123,100
Stairwell Finishes						
51	Painting	1990	30	13	2029	\$62,400
52	Flooring – Ceramic Tiles	1990	30	23	2036	\$3,800
53	Railings	1990	30	53	2043	\$225,200
Corridor Finishes – 3rd to 35th Floor						
54	Refurbishment – Total	2012	8	23	2034	\$1,384,000
55	Refurbishment – Partial	2012	8	23	2025	\$415,300
56	Suite Entrance Doors –	1990	30	37	2034	\$344,200



Item Number	Common Element Component	Year of Acquisition	Present Age (years)	Normal Life (years)	Planned Year for First Replacement or Major Repair	Current Replacement Cost (including taxes)
	Replacement					
57	Suite Entrance Doors – Refinishing	1990	30	17	2025	\$76,500
58	Suite Entrance Doors – Hardware	1990	30	17	2034	\$337,800
59	Suite Entrance Doors – Thresholds	2012	8	17	2029	\$87,300
60	Make-up Air Grilles	2012	8	37	2049	\$17,600
61	Signage	2012	8	37	2049	\$14,200
Corridor Finishes – 2nd Floor						
62	Refurbishment – Total	2006	14	23	2024	\$40,400
63	Refurbishment – Partial	2006	14	23	2036	\$12,100
Corridor Finishes – Basement Level						
64	Refurbishment – Total	2012	8	23	2035	\$135,900
65	Refurbishment – Partial	2012	8	23	2023	\$40,800
Common Room Finishes – Total Refurbishment						
66	Party Room	2010	10	13	2023	\$158,200
67	Kitchen	2010	10	23	2033	\$59,000
68	Washrooms	2010	10	13	2022	\$79,300
69	Dining Room	2007	13	13	2022	\$39,700
70	Study Room	2014	6	13	2022	\$22,600
71	Management Office	2014	6	13	2022	\$52,900



Item Number	Common Element Component	Year of Acquisition	Present Age (years)	Normal Life (years)	Planned Year for First Replacement or Major Repair	Current Replacement Cost (including taxes)
72	Billiard Room	2011	9	13	2022	\$22,400
73	Health and Fitness Centre	2020	0	23	2043	\$2,242,000
74	Recreation Facilities Equipment Repairs/Replace	2020	0	5	2025	\$201,000
75	Aerobic & Ball Courts	2020	0	19	2039	\$105,800
76	Fitness Room	2020	0	19	2041	\$46,900
77	Change Rooms	2020	0	19	2041	\$91,000
78	Shower Stalls – Major Refurbishment	2020	0	19	2041	\$13,600
79	Sauna Finishes	2020	0	13	2033	\$90,400
80	Swimming Pool Room	2020	0	13	2033	\$323,600
81	Swimming Pool Shell Finishes	2020	0	13	2033	\$46,800
82	Whirlpool Unit	2020	0	19	2039	\$18,700
83	Guest Suites (2x)	1990	30	31	2022	\$60,000
84	Disposal Rooms	2020	0	19	2039	\$50,200
85	Service Rooms – Repairs & Waterproofing	2019	1	5	2022	\$56,500
86	Locker Rooms – Repairs & Waterproofing	1990	30	5	2022	\$22,600
Other						
87	Superintendent’s Suite Finishes & Appliances	2019	1	11	2030	\$22,600
88	Common Doors & Hardware	2019	1	5	2022	\$20,000



Item Number	Common Element Component	Year of Acquisition	Present Age (years)	Normal Life (years)	Planned Year for First Replacement or Major Repair	Current Replacement Cost (including taxes)
89	Mail Boxes & Bicycle Racks – Repairs	1990	30	37	2027	\$73,600
90	Outdoor/Terraces Furnishings	2017	3	7	2021	\$8,100
91	Demising Wall Assembly Repairs	2019	1	7	2026	\$120,200
Mechanical Equipment						
Drainage						
92	Sanitary System	1990	30	41	2026	\$435,600
93	Storm System	1990	30	41	2026	\$243,100
94	Sump Pumps	2020	0	17	2037	\$21,300
Domestic Water						
95	Backflow Preventers	1990	30	17	2024	\$14,400
96	Cold Water Booster Pump System	2019	1	29	2048	\$59,700
97	Cold Water Piping & Risers	1990	30	31	2029	\$1,317,000
98	Hot Water Piping – Amenity Areas	1990	30	31	2027	\$23,400
99	Hot Water Heaters – Amenity Areas	1990	30	19	2028	\$14,700
100	Distribution Systems Valves	1990	30	19	2028	\$26,900
101	Suite Shut-off Valves	1990	30	19	2028	\$100,000
Heating & Cooling						
102	Heating Boilers	2019	1	19	2038	\$532,000



Item Number	Common Element Component	Year of Acquisition	Present Age (years)	Normal Life (years)	Planned Year for First Replacement or Major Repair	Current Replacement Cost (including taxes)
103	Circulation Pumps	1990	30	19	2029	\$155,200
104	System Piping	1990	30	37	2027	\$1,520,000
105	Heat Pump Units	1990	30	19	2021	\$232,100
106	Miscellaneous Equipment	2019	1	5	2024	\$120,000
107	Expansion Tanks	1990	30	37	2027	\$7,200
108	Glycol System	2019	1	19	2038	\$113,100
109	Cooling Tower	1990	30	31	2024	\$500,000
110	Cooling Tower – Major Repairs	2019	1	11	2034	\$13,300
Ventilation						
111	Service Rooms & Garage	1990	30	29	2021	\$60,000
112	Make-up Air Units	2015	5	19	2035	\$476,400
113	Louvres & Dampers	2017	3	13	2021	\$50,800
114	Elevator/Stairwell Pressurization Fans	2019	1	29	2048	\$55,900
Fire Protection						
115	Sprinkler/Standpipe Systems	1990	30	53	2043	\$401,200
116	Fire Water Tanks	1990	30	11	2023	\$29,900
117	Sprinkler/Standpipe Systems – Major Repair	1990	30	17	2024	\$100,300
118	Fire & Jockey Pumps/Air Compressor	1990	30	29	2048	\$144,800
Amenities						



Item Number	Common Element Component	Year of Acquisition	Present Age (years)	Normal Life (years)	Planned Year for First Replacement or Major Repair	Current Replacement Cost (including taxes)
119	Swimming Pool Equipment	2020	0	17	2037	\$23,600
120	Whirlpool Equipment	2020	0	17	2037	\$28,400
121	Pool Dry-O-Tron	1990	30	29	2043	\$67,300
Disposal						
122	Garbage Chute	1990	30	29	2036	\$52,400
123	Garbage Compactor/Sorter	1990	30	19	2028	\$43,600
124	Garbage Compactor Sorter Controls	1990	30	19	2028	\$12,600
Miscellaneous						
125	Irrigation System	1990	30	19	2028	\$50,800
126	Overhead Door – Mechanical/Electrical Equipment	1990	30	17	2024	\$5,400
127	Natural Gas Piping	1990	30	41	2031	\$49,500
Electrical Equipment						
General Electrical						
128	Main Switch Gear	1990	30	37	2027	\$101,000
129	Transformers	1990	30	37	2027	\$232,600
130	Distribution Wiring	1990	30	41	2031	\$65,700
131	Panels & Subcircuits	1990	30	31	2021	\$70,100
132	Pavement Heating – Main Entrance	2019	1	19	2038	\$75,500
133	Ramp Heating	2019	1	19	2038	\$53,300



Item Number	Common Element Component	Year of Acquisition	Present Age (years)	Normal Life (years)	Planned Year for First Replacement or Major Repair	Current Replacement Cost (including taxes)
134	Pipe Heat Tracing	1990	30	19	2028	\$2,700
Lighting						
135	Interior Common Area	2017	3	23	2040	\$279,100
136	Garage	1990	30	23	2036	\$143,700
137	Exterior	2019	1	19	2038	\$10,900
Fire Protection & Emergency Power						
138	Fire Alarm/Voice Communication – Panel	1990	30	23	2036	\$148,500
139	Generator	2015	5	31	2046	\$134,200
140	Generator – Fuel System	2015	5	17	2032	\$190,900
Security						
141	Surveillance System	2019	1	17	2036	\$143,700
142	Access Fob System – Repairs/Replacement	1990	30	17	2022	\$34,100
143	PAR & Intercom System – Repairs/Replacement	2017	3	17	2034	\$24,000
144	In-Suite Alarm System	1990	30	23	2036	\$217,400
145	Repairs/Replacement – Annual Allowance	2019	1	1	2020	\$13,600
Amenities						
146	Sauna Equipment	2020	0	17	2037	\$9,500
Elevator						
147	Modernization	1990	30	31	2031	\$1,105,000



Item Number	Common Element Component	Year of Acquisition	Present Age (years)	Normal Life (years)	Planned Year for First Replacement or Major Repair	Current Replacement Cost (including taxes)
Miscellaneous						
148	Automatic Door Openers	2019	1	13	2032	\$56,500
149	Building Automation Systems	1990	30	13	2029	\$51,000
Engineering & Contingency						
150	Class 2 Reserve Fund Study	2020	0	6	2026	\$8,400
151	Class 3 Reserve Fund Study	2013	7	6	2023	\$5,400
152	Contingency for Partial Replacements/ Repairs	1990	30	1	2021	\$61,500



Table C.4: Evolution of the reserve fund for the high-rise case study

Year End	Opening Balance (\$)	Anticipated Annual Reserve Fund Contribution (\$)	Other Contribution (\$)	Predicted Inflation-Adjusted Expenditures (\$)	Estimated Interest Earned (\$)	Closing Balance (\$)	Anticipated Annual Contribution Increase (%)	Average Monthly Contribution Per Unit (\$)	Average Monthly Increase Per Unit (\$)
2020	6,896,847	1,354,452	0	-1,069,700	70,392	7,251,991		200.13	
2021	7,251,991	1,414,328	0	-1,037,264	74,405	7,703,461	4.42	208.97	8.85
2022	7,703,461	1,474,435	0	-1,120,702	78,803	8,135,997	4.25	217.85	8.88
2023	8,135,997	1,534,676	0	-1,768,769	80,190	7,982,093	4.09	226.75	8.90
2024	7,982,093	1,594,954	0	-1,045,207	82,570	8,614,410	3.93	235.66	8.91
2025	8,614,410	1,655,180	0	-1,134,066	88,750	9,224,273	3.78	244.56	8.90
2026	9,224,273	1,715,264	0	-3,738,809	82,125	7,282,853	3.63	253.44	8.88
2027	7,282,853	1,775,124	0	-513,801	79,135	8,623,311	3.49	262.28	8.84
2028	8,623,311	1,834,679	0	-2,963,492	80,589	7,575,087	3.35	271.08	8.80
2029	7,575,087	1,893,854	0	-1,321,405	78,613	8,226,149	3.23	279.82	8.74
2030	8,226,149	1,952,577	0	-2,546,607	158,583	7,790,702	3.10	288.50	8.68
2031	7,790,702	1,988,661	0	-631,798	169,383	9,316,948	1.85	293.83	5.33
2032	9,316,948	2,025,413	0	-1,112,090	195,472	10,425,743	1.85	299.26	5.43
2033	10,425,743	2,062,844	0	-4,190,028	187,243	8,485,802	1.85	304.79	5.53
2034	8,485,802	2,100,966	0	-1,935,403	171,372	8,822,737	1.85	310.43	5.63
2035	8,822,737	2,139,793	0	-1,573,250	182,120	9,571,400	1.85	316.16	5.74
2036	9,571,400	2,179,338	0	-461,332	208,608	11,498,015	1.85	322.01	5.84
2037	11,498,015	2,219,613	0	-1,615,220	236,004	12,338,412	1.85	327.96	5.95
2038	12,338,412	2,260,633	0	-5,228,441	217,090	9,587,694	1.85	334.02	6.06
2039	9,587,694	2,302,411	0	-2,771,336	187,065	9,305,833	1.85	340.19	6.17
2040	9,305,833	2,344,961	0	-983,915	199,727	10,866,606	1.85	346.48	6.29
2041	10,866,606	2,388,297	0	-744,737	233,768	12,743,934	1.85	352.88	6.40
2042	12,743,934	2,432,434	0	-8,154,562	197,657	7,219,463	1.85	359.40	6.52
2043	7,219,463	2,477,387	0	-749,580	161,667	9,108,937	1.85	366.04	6.64
2044	9,108,937	2,523,171	0	-1,039,748	197,013	10,789,373	1.85	372.81	6.76



Year End	Opening Balance (\$)	Anticipated Annual Reserve Fund Contribution (\$)	Other Contribution (\$)	Predicted Inflation-Adjusted Expenditures (\$)	Estimated Interest Earned (\$)	Closing Balance (\$)	Anticipated Annual Contribution Increase (%)	Average Monthly Contribution Per Unit (\$)	Average Monthly Increase Per Unit (\$)
2045	10,789,373	2,569,800	0	-1,779,368	223,692	11,803,497	1.85	379.70	6.89
2046	11,803,497	2,617,292	0	-2,807,859	234,164	11,847,094	1.85	386.72	7.02
2047	11,847,094	2,665,661	0	-3,761,501	225,983	10,977,237	1.85	393.86	7.15
2048	10,977,237	2,714,924	0	-1,433,450	232,359	12,491,071	1.85	401.14	7.28
2049	12,491,071	2,765,097	0	-3,198,066	245,492	12,303,594	1.85	408.55	7.41
2050	12,303,594	2,816,198	0	-2,320,047	251,033	13,050,778	1.85	416.10	7.55
2051	13,050,778	2,868,243	0	-816,538	281,533	15,384,016	1.85	423.79	7.69
2052	15,384,016	2,921,249	0	-1,483,870	322,054	17,143,449	1.85	431.63	7.83
2053	17,143,449	2,975,236	0	-2,977,949	342,842	17,483,578	1.85	439.60	7.98
2054	17,483,578	3,030,220	0	-4,808,971	331,884	16,036,711	1.85	447.73	8.12
2055	16,036,711	3,086,220	0	-6,808,616	283,510	12,597,826	1.85	456.00	8.27
2056	12,597,826	3,143,255	0	-7,832,265	205,066	8,113,883	1.85	464.43	8.43
2057	8,113,883	3,201,344	0	-2,038,535	173,906	9,450,597	1.85	473.01	8.58
2058	9,450,597	3,260,507	0	-6,107,754	160,539	6,763,889	1.85	481.75	8.74
2059	6,763,889	3,320,763	0	-6,940,172	99,084	3,243,565	1.85	490.66	8.90
2060	3,243,565	3,382,133	0	-1,835,553	80,337	4,870,481	1.85	499.72	9.07
2061	4,870,481	3,444,636	0	-8,600,733	45,849	-239,767	1.85	508.96	9.24
2062	-239,767	3,508,295	239,767	-2,662,537	3,662	849,420	1.85	518.37	9.41
2063	849,420	3,573,131	0	-9,011,417	0	-4,588,866	1.85	527.94	9.58
2064	-4,588,866	3,639,164	4,588,866	-2,363,393	0	1,275,771	1.85	537.70	9.76
2065	1,275,771	3,706,418	0	-11,378,101	0	-6,395,912	1.85	547.64	9.94
2066	-6,395,912	3,774,915	6,395,912	-5,971,166	0	-2,196,251	1.85	557.76	10.12
2067	-2,196,251	3,844,677	2,196,251	-3,897,607	0	-52,930	1.85	568.07	10.31
2068	-52,930	3,915,729	52,930	-2,680,585	11,293	1,246,437	1.85	578.57	10.50
2069	1,246,437	3,988,094	0	-2,654,198	38,268	2,618,601	1.85	589.26	10.69
2070	2,618,601	4,061,796	0	-7,661,101	16,379	-964,325	1.85	600.15	10.89
2071	-964,325	4,136,861	964,325	-4,444,268	0	-307,407	1.85	611.24	11.09



Year End	Opening Balance (\$)	Anticipated Annual Reserve Fund Contribution (\$)	Other Contribution (\$)	Predicted Inflation-Adjusted Expenditures (\$)	Estimated Interest Earned (\$)	Closing Balance (\$)	Anticipated Annual Contribution Increase (%)	Average Monthly Contribution Per Unit (\$)	Average Monthly Increase Per Unit (\$)
2072	-307,407	4,213,312	307,407	-16,763,330	0	-12,550,018	1.85	622.53	11.30
2073	-12,550,018	4,291,177	12,550,018	-2,802,256	0	1,488,921	1.85	634.04	11.50
2074	1,488,921	4,370,480	0	-4,192,808	31,555	1,698,148	1.85	645.76	11.72
2075	1,698,148	4,451,249	0	-5,527,685	23,199	644,911	1.85	657.69	11.93
2076	644,911	4,533,511	0	-5,214,622	6,087	-30,112	1.85	669.85	12.15
2077	-30,112	4,617,293	30,112	-4,800,224	0	-182,931	1.85	682.22	12.38
2078	-182,931	4,702,623	182,931	-4,133,840	2,029	570,812	1.85	694.83	12.61
2079	570,812	4,789,530	0	-11,908,828	0	-6,548,486	1.85	707.67	12.84
2080	-6,548,486	4,878,043	6,548,486	-8,154,357	0	-3,276,314	1.85	720.75	13.08
2081	-3,276,314	4,965,848	3,276,314	-10,076,280	0	-5,110,432	1.80	733.72	12.97
2082	-5,110,432	5,055,233	5,110,432	-2,601,078	0	2,454,155	1.80	746.93	13.21
2083	2,454,155	5,146,227	0	-4,564,810	54,897	3,090,469	1.80	760.38	13.44
2084	3,090,469	5,238,859	0	-13,819,880	0	-5,490,552	1.80	774.06	13.69
2085	-5,490,552	5,333,159	5,490,552	-11,717,290	0	-6,384,131	1.80	788.00	13.93
2086	-6,384,131	5,429,156	6,384,131	-9,064,628	0	-3,635,472	1.80	802.18	14.18
2087	-3,635,472	5,526,880	3,635,472	-3,397,474	0	2,129,407	1.80	816.62	14.44
2088	2,129,407	5,626,364	0	-21,595,252	0	-13,839,481	1.80	831.32	14.70
2089	-13,839,481	5,727,639	13,839,481	-17,946,400	0	-12,218,761	1.80	846.28	14.96
2090	-12,218,761	5,830,736	12,218,761	-12,943,393	0	-7,112,657	1.80	861.52	15.23
2091	-7,112,657	5,935,690	7,112,657	-7,441,685	0	-1,505,995	1.80	877.02	15.51
2092	-1,505,995	6,042,532	1,505,995	-12,534,292	0	-6,491,760	1.80	892.81	15.79
2093	-6,491,760	6,151,298	6,491,760	-7,493,693	0	-1,342,395	1.80	908.88	16.07
2094	-1,342,395	6,262,021	1,342,395	-19,575,409	0	-13,313,388	1.80	925.24	16.36
2095	-13,313,388	6,374,737	13,313,388	-18,494,314	0	-12,119,576	1.80	941.89	16.65
2096	-12,119,576	6,489,483	12,119,576	-9,560,978	0	-3,071,495	1.80	958.85	16.95
2097	-3,071,495	6,606,293	3,071,495	-10,091,067	0	-3,484,774	1.80	976.11	17.26
2098	-3,484,774	6,725,207	3,484,774	-6,424,430	0	300,777	1.80	993.68	17.57



Year End	Opening Balance (\$)	Anticipated Annual Reserve Fund Contribution (\$)	Other Contribution (\$)	Predicted Inflation-Adjusted Expenditures (\$)	Estimated Interest Earned (\$)	Closing Balance (\$)	Anticipated Annual Contribution Increase (%)	Average Monthly Contribution Per Unit (\$)	Average Monthly Increase Per Unit (\$)
2099	300,777	6,846,260	0	-18,976,704	0	-11,829,667	1.80	1,011.56	17.89
2100	-11,829,667	6,969,493	11,829,667	-26,762,137	0	-19,792,644	1.80	1,029.77	18.21
2101	-19,792,644	7,094,944	19,792,644	-9,984,142	0	-2,889,198	1.80	1,048.31	18.54
2102	-2,889,198	7,222,653	2,889,198	-28,839,785	0	-21,617,132	1.80	1,067.18	18.87
2103	-21,617,132	7,352,661	21,617,132	-9,770,718	0	-2,418,057	1.80	1,086.39	19.21
2104	-2,418,057	7,485,008	2,418,057	-19,763,159	0	-12,278,151	1.80	1,105.94	19.55
2105	-12,278,151	7,619,739	12,278,151	-6,367,099	0	1,252,640	1.80	1,125.85	19.91
2106	1,252,640	7,756,894	0	-29,749,239	0	-20,739,705	1.80	1,146.11	20.27
2107	-20,739,705	7,896,518	20,739,705	-27,809,945	0	-19,913,427	1.80	1,166.74	20.63
2108	-19,913,427	8,038,655	19,913,427	-9,105,324	0	-1,066,669	1.80	1,187.74	21.00
2109	-1,066,669	8,183,351	1,066,669	-10,484,336	0	-2,300,985	1.80	1,209.12	21.38
2110	-2,300,985	8,330,651	2,300,985	-20,428,695	0	-12,098,043	1.80	1,230.89	21.76
2111	-12,098,043	8,480,603	12,098,043	-45,449,632	0	-36,969,028	1.80	1,253.04	22.16
2112	-36,969,028	8,633,254	36,969,028	-10,441,201	0	-1,807,947	1.80	1,275.60	22.55
2113	-1,807,947	8,788,653	1,807,947	-24,315,320	0	-15,526,667	1.80	1,298.56	22.96
2114	-15,526,667	8,946,848	15,526,667	-20,555,825	0	-11,608,977	1.80	1,321.93	23.37
2115	-11,608,977	9,107,892	11,608,977	-16,366,360	0	-7,258,468	1.80	1,345.73	23.79
2116	-7,258,468	9,271,834	7,258,468	-31,202,527	0	-21,930,693	1.80	1,369.95	24.22
2117	-21,930,693	9,438,727	21,930,693	-2,342,182	0	7,096,544	1.80	1,394.61	24.66
2118	7,096,544	9,608,624	0	-61,549,542	0	-44,844,374	1.80	1,419.71	25.10
2119	-44,844,374	9,781,579	44,844,374	-11,406,849	0	-1,625,270	1.80	1,445.27	25.55



Appendix D: Bibliography

All relevant sources used throughout this research paper were identified either directly in the text or in footnotes. The following sources were consulted for their relevance in the writing of the paper but were not used directly in the text. Websites were accessed in July 2021.

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Appendix E: Glossary

The glossary below was extracted from the [CCI National Website](#) and was adjusted for this report:

Act: The provincial condo legislation that creates condos and outlines how they are to be administered. The name varies by province (e.g., Condominium Act, Condominium Property Act, Strata Plan Act).

Board of directors/board: The governing body whose responsibility it is to ensure the smooth running of the condo corporation. The directors are generally elected by, and from among, the unit owners.

Bylaw: One of the governing documents for the condo corporation which supplements the declaration or condo plan, covering the day-to-day operational aspects of the condo, and outlining the responsibilities of the board of directors. Bylaws can be created or revoked by a majority vote of the owners; voting percentages are dictated by provincial legislation.

Common elements: Refers to all the property of the condo excluding the units (e.g., recreational facilities, hallways, elevators, roof).

Common property/area: See *Common elements*.

Condominium/condo: A type of property ownership, not a style of building. In a condo the owners own their units/lots or parcel of tied land (POTL), as well as an interest in the common elements.

Condo fee: A monthly payment made by each unit owner to cover the maintenance of common elements and other common expenses, including the contribution to the reserve fund.

Condo plan: One of the governing documents of the condo corporation. The condo plan shows the buildings and land being divided into two or more units, sets out the boundaries of the units, illustrates the common property, and includes a “unit factor” schedule. In some provinces, the description also includes the architectural and structural drawings.

Condo corporation: A legal entity that is created at the time of registration, and whose members or unit owners are the building owners. The mandate of the condo corporation is



to manage the property and any other assets of the corporation, which is done through the election of a board of directors.

Contingency fund/reserve fund: See *Reserve fund*.

Declaration: One of the governing documents of the condo corporation, functioning as the equivalent of its constitution.

Depreciation report: See *Reserve fund study*.

Exclusive-use common element: Exclusive-use common elements are common elements used exclusively by one (or more) designated owners, such as balconies and terraces. In some cases, underground parking spaces are exclusive-use common elements, meaning that only the person assigned to that space can use it, but it is the responsibility of the condo corporation to maintain the whole garage. Referred to as “limited common property” in BC.

Limited common property: See *Exclusive-use common element*.

POTL (Ontario): “Parcel of tied land” – a parcel of land belonging to an owner who also has an interest in a common-element condo (CEC), in Ontario only.

Regulations: Regulations provide the details called for by the relevant Act. Several provinces have one or more regulations related to condos.

Reserve fund: The condo corporation must establish and maintain at least one reserve fund. The reserve fund can only be spent for the purpose of major repairs and replacement of the common elements and assets of the condo corporation. The condo corporation collects contributions from the owners as a part of the owners’ monthly fees to the corporation.

Reserve fund study: A study that recommends the contributions to be collected from owners to adequately fund the cost of future major repairs and replacement of the common elements and assets. A reserve fund study will include a review, by qualified persons, of the common elements and assets, and dialogue with the board of directors. Most condo corporations follow one of the cash flows recommended in the reserve fund study in order to fund their reserve fund.

Special assessment: A fee paid by all owners to cover extraordinary expenditures when the condo corporation does not have sufficient funds.



Strata: Condo in British Columbia.

Strata corporation: See *Condo corporation*.

Strata plan: See *Declaration* and *Unit description*.

Unit description: Survey drawings which set out the boundaries of the condo corporation and the units.

Unit factor: A factor included in the declaration that defines the percentage of the common expenses that are the responsibility of a given unit.



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