Fundamental
Resources for
Asset
Management
Excellence

AMC Asset Management Centre

Acknowledgements

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CHAPTER 1
INTRODUCTION

FRAME (Fundamental Resources for Asset Management Excellence) is a comprehensive resource intended to help housing providers and service managers to effectively manage housing resources they own or administer. Developed by the Asset Management Centre (AMC), FRAME is intended as a basic primer for understanding the business practices and principles necessary for sound asset management.

As an organization comprised of sector representatives, AMC is committed to supporting the following objectives:

- Promoting a mind-set of preventive maintenance
- Fostering effective capital planning and management
- Building a culture of safety awareness among housing providers
- Engraining environmental stewardship and sustainability in asset management practices

AMC supports these objectives by providing tools, templates and technical resources that help build sector capacity and expand the life cycle of building components, while expanding relevant research on best practices.

FRAME is organized into a series of chapters that group relevant topics in a progressive way. While the primary focus is on maintenance and operational practices, we have added connections to information on finance, procurement and sustainability to provide a well-rounded resource from which to expand your asset management knowledge.

In today's ever-changing information environment we recognize that reference material will change over time, as additional and new information becomes available and as legislation and accepted practices change.

As a housing provider, the primary service you provide to residents or customers is accommodation and in this relationship, both parties have expectations. Residents of social housing may have fewer housing choices than their private market counterparts, they are customers nonetheless, and social housing is a business. Much like in the private market, residents have financial obligations and housing providers have revenue expectations.

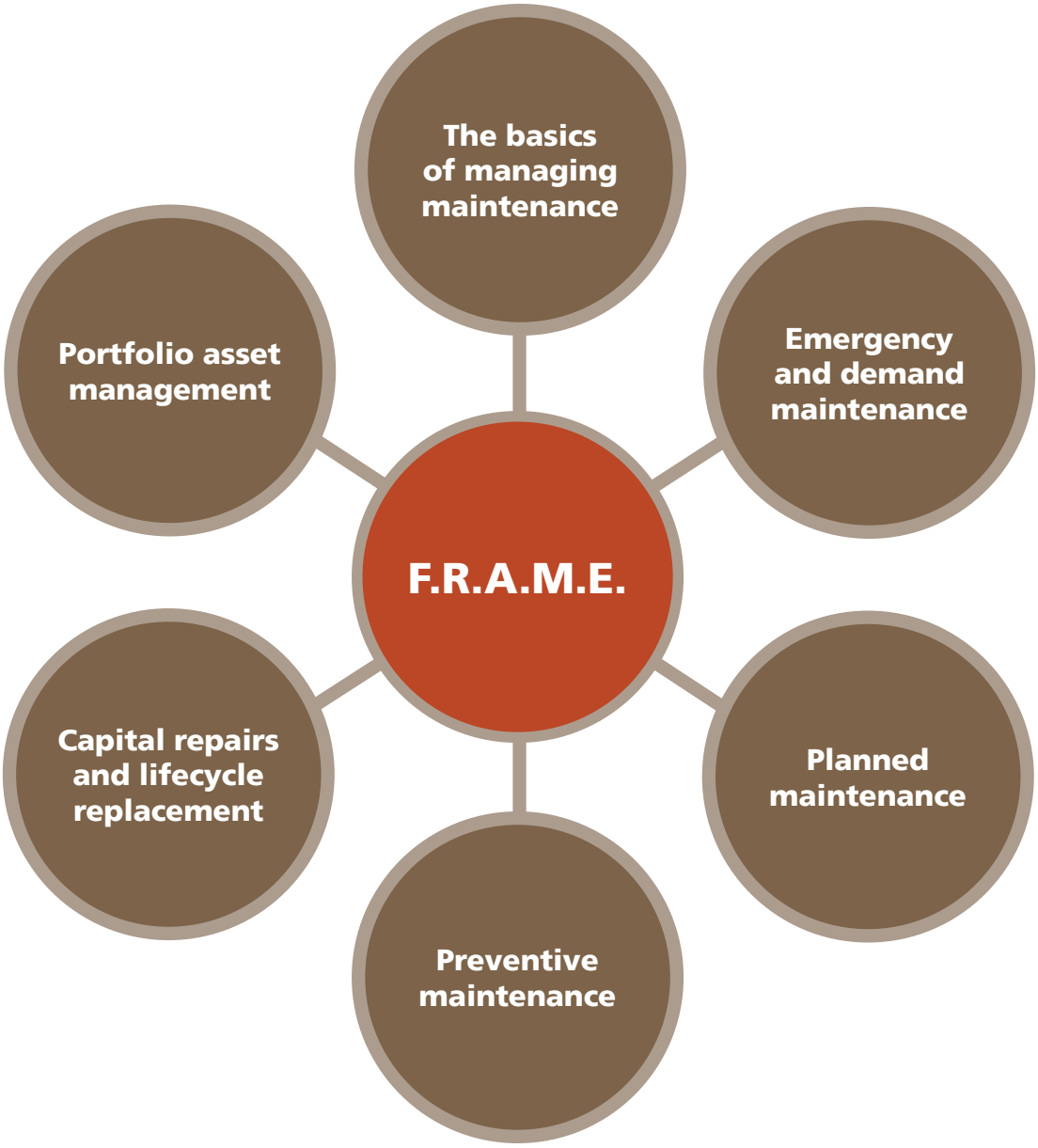
It could be argued that the need to be effective and efficient is actually heightened in social housing, given the lean revenue flows (rental, non-rental or subsidy). The very nature of disadvantaged households adds yet another dimension to this housing provider/ resident relationship that is less common in the private market. By recognizing this environment, social housing providers can better address residents' needs by more effectively managing their properties. Given the significant public investment in these assets, it is important to consider sustainable, strategic thinking and sound planning beyond just meeting the daily demands of a typical housing provider.

FRAME covers key information about all facets of building component maintenance for housing portfolios. After reviewing this information, you will have a clearer understanding of the range of activities involved in maintenance and the practices necessary to support sound decision-making and planning.

Elements of FRAME are shown in Figure 1. Topics are arranged in a progressive way, going clock-wise, starting with a discussion of basic maintenance principles. The chapters that follow graduate from emergency and demand-based maintenance practices – which tend to be more reactive and short term in nature – to more proactive ones that seek to extend the typical lifecycle of building components. Extending the useful life of a component promotes conservation and in the process, helps defer replacement costs. These practices also ultimately support the long-term operational sustainability of the building itself and offer a more efficient way to manage maintenance staff resources.

The latter half of FRAME focuses on capital planning and practices that take a longer view of asset management. Rather than the day-to-day duties, these practices are aimed at extending the useful life of major building elements like roofs or major equipment. By extending the life of the portfolio and using value-based decisions to guide capital investments, building owners can help leverage the life span of existing housing stock. They can also consider opportunities to re-invest equity towards new housing initiatives. As a direct result of maintaining housing assets in sound condition and acting strategically, owners can increase the affordable housing supply by finding creative ways to leverage the substantial public investment made to date. And let's not forget about the effect on residents—sound planning and management of housing assets adds to their safety and quality of life.

Figure 1 - Elements of Frame



CHAPTER 2

The Basics of Managing Maintenance

Maintenance as a broad concept within asset management involves keeping existing buildings, their main components and related sub-systems in good working order to ensure continued service. While this might suggest simple building upkeep, in fact it covers a full range of activities, from replacing a light bulb or repairing a leaky faucet to retrofitting furnaces or reconditioning parking decks and everything in between. These activities require skills and knowledge not always available via in-house staff. Regardless, housing providers have an obligation to have processes and systems in place that ensure the work gets done. Proactive housing providers take this a step further and look for efficiencies and ways to maximize value in maintenance. They help ensure long-term sustainability by extending the manufacturers' estimated lifecycle of various building components and materials.

So why is maintenance so important? Largely because it supports these and other management objectives:

- **Meeting the needs of residents** - As the primary customer, residents provide important revenue streams. Without them, operations are not viable. Besides influencing the overall living environment for residents, poor maintenance can trigger vacancy issues and lead to cascading financial problems over time. Sound management can, by contrast, support a positive relationship with existing residents and promote curb appeal for prospective new residents.
- **Complying with legislative requirements** - In the role of both employer and housing provider, housing providers are bound by a number of legal statutes, each with a range of obligations. Failure to maintain property or conduct necessary work in an appropriate way can lead to fines, legal sanctions or even lawsuits. Housing providers that don't adequately address safety issues affecting employees or residents expose themselves to liability, which can severely impact operations. From this perspective, having sound asset management practices can actually help minimize exposure to risks.
- **Making cost-effective, strategic decisions** - Maintaining assets is a core responsibility for housing providers since it directly influences their ability to provide services to residents (i.e. living accommodations). As a result, maintenance is a foundation for financial well-being and ongoing business sustainability. Having procedures and practices in place means available resources can be allocated more effectively. By contrast, failure to adequately maintain a building can lead to serious financial issues that will challenge your operational capacity as a housing provider.
- **Maintaining the value of the asset** - When your building was originally built, it would have typically cost millions of dollars. In today's market the cost of replacing it would be significantly higher. Real property is a substantial investment, and the cost to maintain a building over its life cycle is cheaper than allowing it to deplete and having to replace it prematurely. As mortgage/debenture costs are paid down over time, the equity of the asset typically increases. Maintaining the building's value helps protect the equity that can, in turn, be used for further social investment purposes.

This last objective has recently emerged as an increasingly important one in the social housing field, given that the existing housing stock is aging and there are finite resources to maintain the stock. The potential to leverage accumulated equity in years ahead becomes vital. This situation has raised the profile of maintenance beyond simple "maintaining" and helps underscore the benefits of more strategic decision-making for the longer term.

In summary, making maintenance decisions in a more strategic way helps:

- Maximize operational effectiveness and minimize operating costs
- Better meet changing needs of residents in a cost-effective way
- Establish long-term real estate portfolio goals

- Make prudent decisions on whether to continue to invest in or dispose of property

In this chapter we will explore the basics of effectively managing maintenance, from lines of accountability and procurement to safety and budget allocations.

Key topics in this chapter:

- Overview of maintenance
- Roles and responsibilities
- Standards of service
- Establishing and maintaining building information
- Procurement and contract management
- Integrating safety management & managing risk
- Addressing resident security and safety
- Working with budgets

2.1 Overview of Maintenance

Basic maintenance involves the day-to-day upkeep of a property and its related components in good working order. This involves a range of necessary functions – either directly or indirectly – each supporting overall maintenance objectives. These functions must be considered along with overall maintenance practices to ensure buildings continue to meet and maintain standards.

Maintenance functions include:

- Cleaning
- Repairs
- Replacements
- Budgeting
- Forecasting
- Planning
- Inspecting
- Monitoring
- Prioritizing work
- Managing risk
- Procurement
- Resident relations

Buildings are enduring and established structures with typical life spans of 50-70 years and beyond, depending on the form of construction, materials used and the environment they are situated in. Their designed lifespan is based on building material composition and the type of building technology used. While enduring, buildings are also dynamic and changing, based on factors like use and durability of components. Maintenance decisions over the life of the building must therefore respond to both expected conditions and unforeseen changes and maintenance practices.

Maintenance activities fall into a number of categories based on the priority of need, frequency and scale of building component or element being considered. The following is one way to classify categories of maintenance:

Emergency maintenance – Time critical activities necessary to reinstate a building or component to a safe or functional level of service (e.g. a broken water pipe that can cause flooding)

Demand maintenance – Time sensitive activities precipitated by move-outs or resident-initiated requests which are required to reinstate a building component to a standard level of service (e.g. element replacement on a stove)

Planned maintenance – Regularly scheduled activities completed at an established frequency and necessary to maintain building components to a standard level of service (e.g. carpet cleaning)

Preventive maintenance - Scheduled activities completed at an established frequency and undertaken to avoid system failure or extend the life of building components and elements (e.g. fan replacement for a furnace, regular inspection and cleaning)

Capital repairs/lifecycle replacement - Scheduled activities completed on an infrequent basis and necessary to maintain or replace major building elements in accordance with anticipated service lifecycle (e.g. window replacement)

Regeneration – Strategic assessment after the building has met its useful life span

To maintain an effective and comprehensive maintenance system, you need:

- **Good base information** – A sound understanding of the building(s) you own, the major component systems and other equipment. Ideally this information will be integrated, can be rolled up at a summary level and is easy to access.
- **An on-going monitoring system with current condition data** – Current information on unit condition, systems status, supply inventories and the overall condition of the building. Information typically comes from regular inspections, inventories and technical reports (e.g. Building Condition Assessments (BCA)).
- **Capacity and technical skills to assume necessary work** – Where people or skills are not available internally, these services would have to be secured externally.
- **Established standards** – Develop stated expectations about level of service, frequency or repairs/replacements, etc. to determine at what point remedial work will be required.
- **Sound policies and procedures** – These are critical for guiding consistent and principal-based decision-making to better manage risks.
- **Links with financial and operational systems** – Connecting with property management and financial information enables more integrated decision-making. Integrated systems also enable more streamlined planning and reporting capability (i.e. generating work orders, inventory tracking, supply ordering, etc.).
- **Flexible planning and forecasting tools** – Ideally, maintenance systems make it possible to compare options and test scenarios with the goal of making more informed choices.
- **On-going awareness of technical legislation and building science trends** – To maintain effectiveness you must stay current with ever-changing technology and best practices and legislative requirements..
- **Key indicators** – The ability to track, measure and evaluate performance supports the practice of continuous improvement.

Buildings and the properties they occupy are fundamental to your business. Maintaining these assets in good order is therefore mission critical, and so is having a sound management framework in place to guide these activities. In the end, good management is good business

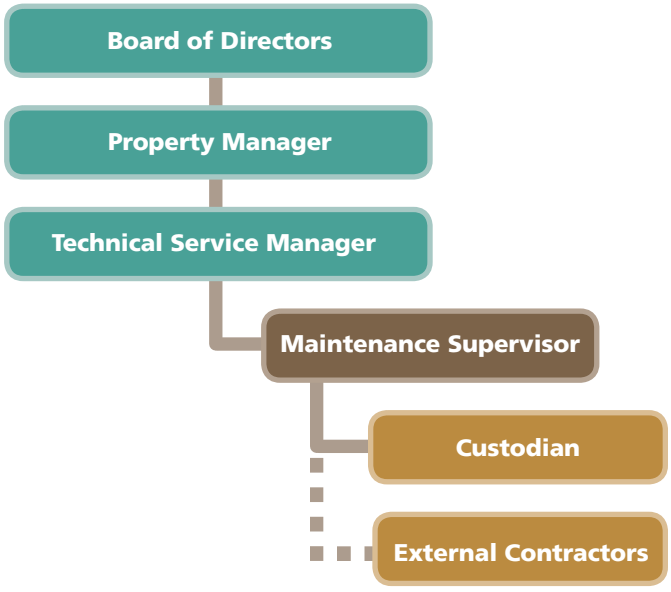
Regularly measuring and evaluating performance is key to sound asset management. As part of a continuous improvement process this evaluation helps maintain service standards over the long haul. First, though, there must be agreed-upon indicators and a commitment to measure, compare and report on results. The results of such an exercise inform decision-making, improve practices and help ensure consistent, ongoing success in terms of finances and sustainability.

2.2 Roles and Responsibilities

Given the size and diversity of housing portfolios, a range of maintenance and asset management decisions must be made over time. The people who must make those decisions have different responsibilities, depending on the management framework within which they operate. While the size of the housing portfolio ultimately dictates what decisions to make, there are some constants in terms of where they are made (see Figure 2.2).

Housing corporations are legal entities, created under statute and governed by legislation. While they vary in structure, by law the Board of Directors appointed for a corporation has ultimate decision-making authority for all matters involving the organization. Decisions they make should be strategic, provide oversight and guidance and set policy direction. It is not the Board's responsibility to manage day-to-day operations of the portfolio – that is the function of the property manager or equivalent. In organizations that have shareholders (i.e. LHCs), they too can have an influence on the organization by setting direction for the Board of Directors, but they are not involved in business decisions.

Figure 2.2



The property manager or coordinator is typically the most senior employee with direct accountability to the Board of Directors. He or she is responsible for ensuring that the corporation's day-to-day operations

are functioning in accordance with the parameters set by the Board and as may exist under legislation. The property manager should have overall responsibility for all functions of the corporation, including property management and maintenance. Depending on the size of the portfolio and the organization, one or more staff may oversee and undertake all maintenance functions and are accountable to the property manager.

In a mid-sized organization, the specific responsibility of property management and maintenance may fall to a technical services manager who is accountable to the property manager. The technical services manager ensures maintenance obligations of the organization are met, whether directly through staff or via external contractors. In the case of large organizations, there may be specific work teams with assigned tasks that are accountable to the manager of technical services. Where responsibilities filter down to staff, so do accountabilities. Job descriptions usually define specific roles and responsibilities for staff and provide clear expectations for both the employee and employer.

It's also important to consider that maintenance is just one of the many functions of an organization. To effectively deliver maintenance services, staff must rely on other internal functions and supports, such as finance and resident services. In turn, these other functions rely on information and resources from maintenance. Because the organization relies on this interdependent relationship, good communication is critical to its success. Larger organizations must balance their tendency to become more specialized with cross-functional communication. Integrated decisions regarding asset management are encouraged and necessary.

Not all organizations have sufficient staff to complete required maintenance. In these instances, they might need external assistance. Even larger organizations with sufficient staff sometimes need to seek out specialized assistance, depending on the nature of the maintenance required. This can include not only technical help, but possibly project management resources to guide the completion of major projects. When using external resources, it is extremely important to define clear responsibilities since these resources fall outside the normal employer/employee relationship. Legal contracts must include accountabilities.

Regardless of the service delivery approach, there must be a clear understanding of responsibilities and appropriate accountability, whether through job descriptions or contacts. This clarity helps ensure that functions do not "fall through the cracks" and that responsibilities are appropriately clear. Clarity also benefits people outside the organization, including residents and contractors, since resolving maintenance issues is primarily a day-to-day function.

DO...

- Establish clear lines of accountability
- Ensure staff are clear on their responsibilities
- Establish 'rules of engagement' for external resources

2.3 Standards of Service

Establishing standards in property management is an important way to benchmark the level at which maintenance is deemed acceptable to the owner. There are also minimum legal standards of service under various statutes and regulations (i.e. Fire Code, Building Code, Residential Tenancies Act, etc.), and industry standards and norms that identify common maintenance conventions based on good practice. Each housing provider must establish maintenance standards that reflect legal requirements and industry standards that are relevant to the portfolio they manage. While these standards may vary from building to building based on major components and systems used, housing providers managing multi-building portfolios should harmonize these standards wherever possible to streamline administration.

Industry standards of practice help establish norms of performance, but remember that how standards are set directly reflects on the costs and resources required for maintenance. Higher standards of service may help reap excellent results, but these results come with human and financial costs. Proactive, regular inspections and preventive measures are some ways to build better standards into regular maintenance practices. The key here is finding a balance – setting standards that exceed minimum requirements and support continuous improvement, and that are realistic and achievable.

Standards can vary depending on the nature of the maintenance work. As noted above, standards established by statute are absolute minimums (e.g., maintaining handrails at stairs or life safety system testing, etc.). In the case of emergency and demand-based management, standards can relate to timeliness of response (e.g. on-site response within x hours, completion of repair within x hours). And in the case of regular or planned maintenance, they tend to relate to frequency of service – that is, work is done at regular intervals.

Standards for capital repairs or replacement also relate to frequency but tend not to be associated with intervals per se. Rather, these standards are based on typical life cycles for major building component replacements after a set number of years, depending on wear and tear.

The practice of maintaining portfolios relies highly on continuing and timely feedback. Many housing providers use standard checklists and inspection protocols to assess the current condition of building components. These are invaluable tools in evaluating the current state of building components. The information must, however, be set against a benchmark to determine if any remedial action is required. Standards establish that benchmark and allow you to consistently determine over time what maintenance activities may be required, and whether or not preventive measures are effectively extending the useful life of building components.

Establishing the priority of maintenance work to be completed is another important consideration in setting standards. The number of maintenance activities, whether required or discretionary, often exceeds the capacity to resource them. Recognizing that certain activities may require more immediate attention than others, priority standards help establish a ranking process based on level of need. Here are four suggested categories of ranking you can use to establish priorities:

Category	Characteristics
Life and safety	• Most urgent, requires immediate attention • Arises from risks to health, safety or potential property loss
Primary need	• Important to basic operations, requires attention in the short term • Arises from need to maintain primary level of service or prevent possible breakdown
Secondary need	• Supportive of regular operations, attentive to needs • Arises from need to maintain standard level of service or support quality of life for residents • Also supports opportunities to minimize recurring operating costs
Discretionary	• Geared to enhancement of core building operations, address when possible • Arises from desire to provide enhanced living environment

Applying standards and priority ranking makes it possible to ensure that those maintenance tasks requiring the most attention are addressed first. It also helps determine tasks that could be deferred, making room for other maintenance priorities.

2.4 Establishing and Maintaining Building Information

Effective maintenance of building portfolios relies on timely and accurate information on building condition. At its most fundamental level, this means having baseline information about the structure, form and composition of the building. This data tends to be descriptive and relatively static, and for that reason is termed "tombstone" data. It typically includes things like year of construction, unit composition/mix and an inventory of major systems broken down by building element (e.g. roof, elevators, HVAC, etc.). The tombstone data enables comparisons with other like buildings to help determine performance level and how the building compares to an expected life cycle.

A second set of data involves current condition information gleaned from regular inspection reports, technical reviews or building condition assessments. This information allows a comparison between the current state of component condition and established standards, noting major repairs, component replacements and remaining useful life. It also identifies lifecycle horizons for upcoming replacement of major building elements and can be used to support maintenance planning and strategic asset management.

A third, more dynamic set of data involves the on-going maintenance and upkeep functions of each element of the building. Maintaining an activity log for maintenance tasks makes it possible to track maintenance requests, responses and recurring issues over time. Apart from tracking work flow and supporting customer service, this type of data should be used to monitor the condition of key building components and equipment and the inventory of supplies.

Collectively, this information provides essential business intelligence for making informed decisions about maintenance, both day-to-day and in planning for the future. Ultimately this information can help determine if it is still prudent to invest in a building component or system.

Why establish and regularly maintain this building information? Because it provides:

- a clear snapshot of portfolio condition at a given point in time

- a basis for measuring component performance against typical standards and warranties
- Better direction of work flow to meet emerging priorities
- a framework for service accountability where maintenance responsibilities are assigned by activity
- the ability to track actual resources against planned resources and provide trending information that helps inform the development of operational budgets, and
- a foundation for making more strategic maintenance decisions over the longer term based on trends and conditions

By gathering this information, you can analyze and identify where resources are best spent. Given this mass of data, however, it must be organized in an effective way for maximum benefit. With the advent of computerized information management systems and increased accessibility to user-friendly software, this information is most effectively stored in an application database format. Given the many tools and software options available, consider those that provide the best value and functionality for the needs of your portfolio, especially given the price and administration that come along with these tools. At the end of the day, the information tools can be an invaluable resource but are no substitute for getting the maintenance work done when needed. Carefully consider the tools that best serve your needs and choose information management software accordingly.

Commercial software applications address a range of asset management needs. These computer applications – called CMMS or computerized maintenance management systems – help organize and sort data into meaningful results. They also provide a consistent and standard way to measure and maintain building condition information. For large providers with multi-building portfolios, the scalability of these systems allows them to identify key information at the building level and roll it up into a portfolio view (e.g. trending in demand maintenance activities, frequency of breakdowns, etc.). This analytical power lets such systems sort and report on data in any number of ways either by system component, by like buildings or by entire portfolio.

Linking related applications to this information also enables the integration of financial and workflow management. For instance, where scheduled maintenance for a smoke alarm inspection comes due, some CMMSs have the ability to generate a work order, triggering the maintenance activity required. Some systems can even generate required resident notices in advance of inspections. In other instances, the same systems can relay resource expenditures to financial tracking systems in real time, so maintenance expenses can be monitored against the approved budget. This relational information is a powerful analytical tool that supports integrated business decisions.

While most current asset management software helps organize portfolio tombstone data, certain systems tend to emphasize specific functions. These include:

- **Facility management** – focused mainly on managing building components and technical systems information, these applications are geared to building sciences
- **Property management** – focused primarily on managing resident information but linked to building information, these applications help support account management and work flow tracking
- **Strategic management** – focused more on long range planning, these applications tend to monitor asset conditions and building valuation in order to support capital planning and investment decisions

Depending on size and scale of operations, housing providers may benefit only from certain functions that these applications offer. Most smaller organizations will require only basic capabilities, whereas housing providers with larger portfolios may benefit from more sophisticated systems. Rather than investing in major software applications, some might choose to maintain base information and outsource more complicated analysis as needed. Ideally, housing providers will find suitable systems that provide blended functionality, are easy to use and provide good value for price.

An excellent example exists on AMC's Resource Kit. Using the *Capital Reserve Forecasting Tool*, when the user enters key tombstone data and identifying lifecycle horizons, this tool generates a replacement schedule for major building components over a 25 to 30 year period. The same tool can also generate financial requirements arising from these maintenance needs. When comparing these requirements against available funding, it can produce a reserve fund forecast for the projected maintenance requirements. It can also test scenarios whereby maintenance activities are deferred or accelerated, and determine what the related impact on reserves would be.

DO...

- Maintain detailed information about your building(s)
- Use information to make more informed decisions about maintenance
- Select information management tools that make sense for your scale of operation

2.5 Procurement and Contract Management

Maintaining buildings requires a range of goods and services, many of which must be sourced outside your organization. Procurement is the process of securing these goods and services. Providers use various procurement practices and protocols depending on the size and scale of the portfolio. In smaller organizations, procurement tends to be more generic whereas larger organizations may have specialized staff to handle this requirement. This flows from a common scale principle in procurement; larger valued acquisitions represent bigger risk and tend to demand more complex rules and requirements. It's also important to note that procurement practices are typically established to govern all organizational functions, not just maintenance. Housing providers should observe organizational practices for procurement when securing goods or services for maintenance.

The process of securing goods and services actually has two components; the first being procurement, and the second being contract management. Both aspects require standard and rigorous procedures to obtain best value for money, and to minimize liability associated with acquiring the goods or services. Both aspects are equally important – getting a lower price is meaningless if the terms of engagement with that vendor cannot be enforced.

For procurement, there are a number of avenues for securing goods and services. The level of oversight required is usually in direct proportion to the value of the good or service being purchased. For example, best practice generally dictates that at least three quotations are necessary to establish the fair market price and allow vendors reasonable opportunity to supply goods and services. In the case of a major capital project where the contract value exceeds $50,000, owners tend to seek bids by a formal public tender process. If the good or service being purchased represents the value of less than $5,000, a written quotation from a minimum three bidders may suffice. A purchasing policy established by the organization should cover the limits and processes for procuring services. These should reflect local market conditions and the number of vendors available to provide services or goods – again, the size and scale of your organization will influence procurement vehicles, contract limits and sign-off authority. However, regardless of the size of your organization, a strong procurement policy should be developed, implemented and monitored.

Some common procurement methods include:

- **Request for quotation (RFQ)** – This process involves an open request to vendors that requests a quotation for specified goods and services defined by a scope of work.
- **Invited bid** – A request to invited vendors to provide a bid price for a specified good or service. This is typically used with experienced vendors
- **Request for proposal (RFP)** – This process involves an open or invited request to vendors to provide a proposal for goods or services. This approach enables the vendor to exercise some flexibility in recommending goods or services that meet the purchaser's needs.
- **Public tender** – An open, public bidding process that formally seeks priced offers to provide goods or services. Tenders are typically geared to larger valued items where multiple vendors compete to provide best value. Tenders have a more formal and competitive level of evaluation than certain other procurement approaches.
- **Standing offer** – A process for securing goods or services at a reserved unit price over a specified period of time. Best suited to goods/services where quantities are not pre-determined and where there are a number of competing vendors.

The procurement process can be more or less rigorous depending on the value of the goods or services being purchased. The following steps help illustrate a generic process for procurement:

1. Determine needs and associated resources
2. Establish procurement method
3. Prepare procurement documents
4. Issue request to vendors
5. Evaluate submissions and select vendor
6. Enter into formal agreement
7. Monitor and inspect work
8. Certify completion and final payment
9. Evaluate service and monitor warranty

While not all steps are applicable for each method of procurement, they help underscore at a high level what tasks are involved. A more detailed discussion of the key procurement activities follows.

Getting Prepared

Before seeking out goods and services you should ensure you have a complete understanding of your needs. Being prepared will save time and money in the long run. Here are some points to consider when purchasing services:

- Define the required scope of work and timing; legislative parameters (necessary permits, inspections, designated substances provisions, etc.)
- Identify alternative solutions to the work

Examples of how procurement methods can be used:

What is being sourced	Examples	Procurement method
Supplies and goods	• Cleaning supplies • Light bulbs • Plumbing cartridges	• Request for quotation • Invited bid
Service contracts	• Elevator maintenance • Snow clearing • Janitorial services	• Invited bid • Standing offer • Invited tender
Minor repairs/maintenance	• Unit painting • Fixture replacement • Door repairs	• Standing offer • Public tender
Major repairs/renovations	• Roof replacement • Window retrofits • Balcony reconstruction	• Public tender • Request for proposal

- Confirm the availability of experienced and qualified staff/vendors/contractors
- Determine if the work will be done internally/externally
- Confirm oversight/accountability requirements
- Establish the available budget/funding source
- Identify schedule and resource impacts
- Identify potential impact on residents that will need to be addressed

Defining Requirements

For work that can be done internally, you can easily define requirements and compete the work using staff. But if the project requires the services of external resources, how you establish and communicate work requirements becomes more critical. Having collected the required information to set a scope of work, you will need to consider a number of factors before you proceed. You will need to:

- determine the procurement approach to be used, subject to the price and complexity of the work required and according to the established internal procurement policies .
- identify how you will seek pricing from interested and qualified vendors – quotation, invited bid, public bid, e-bidding service, etc.
- determine what risk management and security provisions you will need to appropriately protect yourself and your organization – non-acceptance clause, exclusion clause, bid security, performance/material bonds, insurance requirements, WSIB, non-collusion clause, etc.
- determine the form of response and process to follow with vendors – format of reply, timing, submission requirements, etc.
- establish clear instructions to vendors regarding your needs – time, locations, site/information meetings, how vendor questions will be addressed, bid opening process, basis for evaluation of bids

Clearly defining the scope of work is one of the most important ways to ensure successful procurement. This requires a comprehensive understanding of the work and the steps involved in completing it. Where there are questions or knowledge gaps in that information, you may wish to seek input from a technical resource (e.g. experienced contractor, engineering technologist, architect, and engineer) to help you clearly articulate to vendors what you need. Also make sure you plainly identify how and in what format vendors are expected to reply to your request. For larger jobs, architects and engineers regularly provide advice for tendering and procurement as part of their overall design services. For smaller jobs, this technical assistance helps ensure the inclusion of provisions that will adequately protect you and your organization.

Spelling out the key details you require and the pricing you seek will go a long way to ensuring that you

have sufficient information to evaluate proposals. Depending on the scale of the good or service being procured, the range of information will vary. For more straightforward jobs, information required from the vendor will be fairly basic. Complex and higher priced jobs require more specific information to confirm a selected vendor will complete the job on time and within budget. Holding a mandatory bidders meeting is one way to answer technical questions and communicate key information to all prospective bidders in a consistent way. For bigger projects you will want to gather information on bidders by securing references or pre-qualifying them.

Another important area to consider: What form of contract or written arrangement will exist between the successful vendor and you as the purchaser? It may be beneficial to identify the form of contract in the requesting documents. Where possible, use standard industry contracts or template agreements; they simplify this process for both purchaser and vendor. If using customized contracts, have them prepared and vetted in draft form before securing pricing, particularly given the legally binding nature of contracts. As always, be clear and direct about expectations in contract documents for the benefit of both parties.

Evaluation

After receiving the bidder responses, you must follow the process for accepting information in a defined way. Failure to do so can result in legal consequences that have financial repercussions for you as the purchaser – the larger the contract or scope of work, the larger the consequences. Where you have spelled out the evaluation process in your instructions to vendors, follow this process explicitly. Regardless of the evaluation process used, all submissions must be treated consistently and fairly.

It is critical to evaluate submissions against the stated requirements. Where submissions do not meet stated requirements or provide non-specified substitutions, the purchaser must identify any irregularities or variances that materially affect the evaluation (e.g. not submitted on time, missing required security). As a rule, the procedure laid out in instructions to bidders is sufficient to determine if a submission is compliant or not. Where it's unclear, there may be a need to seek appropriate advice including legal counsel if necessary. While this may seem an extraordinary measure, the legal and financial impacts of not following required procedures can have serious repercussions.

After selecting the successful vendor, you are in a position to award the contract. In many instances this award is subject to the successful vendor providing important information (insurance, WSIB clearance certificate, etc.). As soon as this information is received and in proper order, both parties can sign a formal contract in the format specified by the procurement call. At this point unsuccessful bidders should be notified in accordance with your procurement policy.

Contract documents should incorporate any changes made by addendum during the procurement process, and should reflect the actual scope of work and pricing per the bidder's certified submission. The contract forms the legal basis of the relationship between the purchaser and the vendor. You as purchaser should be familiar with all provisions of the contract, as they establish the rights and obligations of both parties.

Managing the contract

The actual contract document should detail the scope of work and how the work will be completed. It is common for the scope of work to require amendment during the course of the job due to field conditions, environmental issues and other unforeseen changes. These changes should be handled through change orders – the formal vehicle for identifying and approving changes to the original contract, including price. Once signed by both parties, these orders become part of the contract documents and remain legally binding. Prior to signing any change orders, purchasers should be satisfied that the required changes and agreed pricing are in line with their expectations and budgets.

Terms of payment are usually specified before the work starts, either in bid documents or in standard contract language. In most cases, payments are made based on the amount of work completed. For smaller jobs, vendors are typically paid upon satisfactory completion of the work. For larger jobs, payments are released based on level of progress (progress payments / draws). For major projects governed under industry contracts, purchasers are obligated to retain certain holdback monies. Despite progress, these holdback monies cannot be paid to the contractor until final completion of the work and expiry of the lien period required by law (see below).

During the course of the work, disputes sometimes arise between the purchaser and the vendor. Most disagreements can be resolved through discussion and mutual agreement. However, if the parties cannot reach a mutual agreement, they must rely on resolution provisions (found in typical contracts). While every effort should be made to avoid escalating disputes to this level, the provisions in the contract are there to protect both parties and provide clarity in the process should the need arise.

It's worth noting at this point that the administration of the contract documents is best governed in a practical way between the purchaser and the vendor. Like any

relationship, things tend to go smoother with a ongoing communication, shared understanding and fairness. At times during the project, issues will favour either the vendor or the purchaser; that's where having a flexible approach will benefit both parties. If there are serious concerns about the quality of the work, provisions in the contract will usually address corrective measures. If serious infractions cannot be remedied, more extreme options may be necessary to ensure completion of the work. In these cases, purchasers should seek legal advice and guidance before taking action.

Where specified in the contract, completion of the work is typically identified by either contract completion or substantial performance. This term has specific meaning under the Construction Lien Act and provides notice for the vendor and sub-trades regarding certification for final payment. This level of completion signals the achievement of a milestone in the project and once certified, initiates the 45 day lien period after which hold back monies must be released (provided no liens are registered). Prior to release of holdback monies, purchasers should ensure they have received necessary drawings, warranties, operating manuals, and associated materials from the vendor.

DO...

- Convey your requirements in a clear and concise manner
- Use procurement methods and agreements that are appropriate for the scale of the work
- Maintain and follow policies/procedures on procurement
- Understand and enforce the terms of your contracts

Following completion of the work, the purchaser should continue to monitor the work in accordance with the warranties provided by the vendor. Where necessary, follow-up and remediation with the vendor under the terms of the warranty may be required. Again, typical provisions in the contract identify the processes and remedies for dealing with these situations.

2.6 Integrating Safety Management and Managing Risk

As an employer, you are responsible for providing a safe and healthy workplace. This is an obligation under the Occupational Health and Safety Act (OHSA) and most employers see this as an ethical responsibility. Also, as a housing provider, the loss of productivity due to staff absence has a tangible impact on your ability to provide core services. It is worth remembering that the proximity of the workplace to residential accommodation means there is more potential for damage or risk to residents and/or their property. Maintaining a safe workplace matters for Boards, staff and residents!

One of your basic obligations as an employer under the Occupational Health and Safety Act is to provide adequate safety training, safety equipment and accident reporting. Depending on the size of your organization, having a joint health and safety committee or appointing a health and safety representative is an added responsibility. The representative/committee should address labour and management considerations regarding safety in the workplace. Legislation governs the rules regarding composition and duties of the committee. The committee must, among other duties, hold regular meetings, conduct workplace inspections, provide necessary follow-up for those issues arising from inspections, and report accidents to appropriate authorities.

One critical responsibility under the OHSA is the implementation of WHMIS (Workplace Hazardous Materials Information System). This legislated system provides a protocol for consistent labeling of hazardous materials and requires up to date Material Safety Data Sheets (MSDS). All individuals who are required to handle hazardous materials as part of their job must have up to date WHMIS training and certification.

A key component of WHMIS training is the identification of product labeling symbols and their associated meaning. Training also covers the basic requirements for handling materials and dealing with spills. Apart from training, legislation also requires that every workplace have MSDS readily accessible. These data sheets provide key information about materials, proper handling and protocols for administering first aid if and when individuals come in contact with the hazardous materials. They also contain emergency spill response protocols when there has been a spill, depending on the volume and severity of the hazard.

The *Occupational Health and Safety Act* also outlines workplace requirements for dealing with designated substances or other regulated/controlled substances. Under legislation, there are eleven (11) designated substances that require specific assessment, care, handling and remediation. While only a few of these may typically be encountered in residential construction (e.g. asbestos, lead, mercury), as a housing provider you have an obligation to meet safety requirements related to these substances. It is also important to note that these obligations do not end when work is

contracted out to a third party doing work on your behalf. As the housing provider, your obligations remain – including the obligation to advise workers when designated substances are present.

While not treated in exactly the same way as designated substances, there are other regulated or "controlled" substances, found in residential construction, that carry legal obligations for assessment, care, handling and remediation. These include mold, polychlorinated biphenyls (PCBs), radon gas, and urea formaldehyde foam insulation (UFFI). As with designated substances, there are health risks associated with exposure to these substances and owners have legal obligations to mitigate risks for staff, residents and contractors. After identifying these substances, there are procedures to follow for their handling, remediation and disposal.

A prudent first step is to have a designated and regulated substance survey completed for the property. This helps identify the presence of any regulated substances and any interim and corrective measures required. The survey is a critical initial step as it establishes where additional care and control is needed during maintenance or capital repairs. It also enables owners to meet their legal obligation to advise staff and/or contractors of the presence of such substances in the work area. The survey allows them to take appropriate care, handling and remediation precautions, to maintain a safe workplace and environment for both workers and residents.

While hazardous materials can present a clear danger in the workplace, there are a number of other safety considerations employers must consider. These can include but are not limited to large mechanical machinery, power equipment or portable tools. Given the day-to-day duties of maintenance staff, the law expects employers to provide a safe workplace by:

- providing necessary protective equipment,
- posting and maintaining workplace safety information,
- providing adequate and accessible first aid equipment,
- ensuring policies and procedures are in place to prevent accidents and
- providing timely guidance on what to do if accidents occur.

In addition, employers must provide training to employees on the use of specific equipment, mechanical systems or cleaning procedures. They must ensure that supervisors monitor and enforce safety policies as part of their oversight responsibilities.

An employer's responsibility does not stop at the front door of the office. While administrative functions may not be exposed to the same types of hazards as staff in the field, there are other workplace safety issues to consider. These include personal safety, environmental air quality and work area ergonomics. Employers must take reasonable steps to orient staff on safety issues and mitigate these safety considerations as part of their overall health and safety obligations. It's important to note that while many of these obligations are legislated and relate to extreme health or safety situations, there are benefits to employers who exceed these standards and provide a safe and healthy workplace. More and more employers are recognizing that wellness is as important as these safety considerations in the workplace.

DO...

- Understand your obligations as an employer
- Identify and address any designated or controlled substances that exist in your portfolio
- Provide necessary safety equipment and on-going safety training to staff
- Make safety an expectation in the workplace

Mitigating risks for staff is clearly a priority for any employer. However, there is also the broader issue of managing corporate risk and mitigating potential property losses. One of the most important facets in managing this risk is having adequate insurance coverage for liability, specified coverage and general risk.

2.7 Addressing Resident Security and Safety

A housing provider's prime function is to provide accommodation for residents – a place to live – and this is a continual responsibility 24 hours a day, seven days a week. As a result, there are a number of legislated safety obligations to which the housing providers must adhere. These are geared towards providing a safe living environment, and range from emergency and fire protection to general resident security. The greater the risk, the greater the obligation for the organization to provide systems, procedures and practices that support a safe and healthy living environment.

Fire protection is one of the most fundamental safety aspects that housing providers must

address. In addition to the various statutes that govern building construction, there are a number of fire safety obligations that regulate building operations. In Ontario, the Fire Code is the principal regulatory framework for fire safety. All housing providers must comply with the Code.

Depending on the size of the building, many housing providers must maintain a fire safety plan for each building they manage. This plan essentially provides protocols for evacuating the building in the event of a fire. As well the fire log book acts as a log for all testing, inspection and system activity related to fire and safety systems in buildings. This would include, for example, fire alarm system testing or annual smoke detector tests.

Fire and life safety systems tend to reflect the form and structure of the building in which they are installed. In the case of town houses, smoke detectors and carbon monoxide detectors may be the only life safety devices installed. For a high-rise apartment, fire and life safety systems may include sprinklers, hose racks, fire alarms, pull stations and annunciator panels among other things. The Code requires frequent checks, tests, and inspections of these fire safety systems. Given the size and complexity of the systems, it is common for owners to retain third party consultants to conduct testing and inspection services. Staff typically conduct the more minor checks required under the Code, like battery life in smoke detectors or the presence of extinguishers in common areas. In the case of other life safety systems like backup generators, third party service contracts are also common with staff handling more routine inspection services (i.e. replacing exit lights). The Fire Code stipulates that certified technicians must be engaged to complete some of the fire system inspections. Any fire system repair and replacement work must also be completed by a certified technician. Ensure you are in compliance with these Code requirements.

Apart from the life safety systems that are installed, housing providers also have a responsibility to keep residents informed on fire safety issues. One way to do this is to provide fire safety plan information as part of the resident move-in package. Another way is to conduct occasional fire drills and provide notices regarding the disposal of certain materials or rules governing storage of personal effects.

Maintaining an effective fire safety plan includes but is not limited to:

- Having and communicating a clear evacuation plan in the event of fire
- Having a series of checklists and protocols in place for regular inspections by staff or
- Third party resources
- Having a comprehensive contract for any required inspection and testing services

While not governed by the same statutes, plans and protocols are equally important for dealing with other emergency situations. Like fire safety plans, these emergency plans provide guidance in the event of dramatic events such as massive power outages, major systems failures (heating, etc.) or inclement weather conditions. While it may not be possible to plan for every eventuality, it is good practice to have procedures in place to help direct staff in dealing with resident safety. An emergency plan is not meant to take the place of civil authorities; rather it is intended to maintain as safe an environment as possible for residents until regular services can be restored. Owners should regularly review and update emergency procedures to ensure they remain current and consistent with business continuity planning.

Resident awareness is another important aspect of managing emergency situations. Ideally, residents should be as prepared as the organization. For example, providing emergency procedures information for residents at move-in helps raise awareness and can help minimize confusion when unanticipated events arise. Another helpful practice is to encourage residents to maintain personal insurance. While this is not meant to replace insurance coverage that housing providers have for property, it will provide residents with peace of mind when it comes to the personal contents in their units.

In addition to emergency measures, personal safety is another area where housing providers can create positive living environments for residents. Housing Providers are expected to provide a reasonable level of safety within the properties they own. In basic terms, this means things like maintaining walkways, having adequate exterior lighting and ensuring controlled entry systems are functioning and stairwells are free of debris. Housing providers that actively maintain buildings tend to have a higher rate of resident satisfaction. For this reason, integrating personal safety objectives within broader maintenance planning can have a positive impact on vacancy management.

Recently, owners and community associations have embraced the concept of Crime Prevention through Environmental Design (CPTED). This initiative aims to reduce the incidence of crime by identifying and minimizing issues evident in the common environment. For new buildings, this initiative reviews building design before construction starts and therefore helps ensure a greater degree of resident safety. For existing buildings, these initiatives typically involve inspections and assessments to help identify areas where remedial

action may be necessary. In most municipalities the local police are engaged in these initiatives and can provide assistance to interested housing providers.

There are local organizations that support public safety initiatives. These agencies undertake safety audits to help encourage safety. Given the prevalence of violence against women and the special priority placement provisions granted under social housing legislation, these audits offer new perspectives for housing providers who are considering maintenance priorities that promote personal safety and a healthier community environment.

DO...

- Understand your legislated obligations as a housing provider
- Prepare for emergencies and unforeseen circumstances through planning
- Communicate safety information to residents
- Make personal safety a community priority through maintenance planning

2.8 Working with Budgets

As a discipline, maintenance essentially ensures that existing building systems and components are operating in good order. The technical processes of defining required work, gathering the material and expertise to complete the work, and physically undertaking the work all require financial support. It's critical to ensure adequate resources are available and sound budgeting practices are used to make that happen. The following section discusses maintenance budgeting processes.

For maintenance activities that typically involve either day-to-day or recurring work, expenses are normally covered through annual operating budgets. These budgets are intended to link with annual maintenance plans to ensure adequate resources address anticipated needs over the course of the year. These budgets are typically funded in-year from operating revenues. However, certain maintenance activities occur over a longer time horizon and tend to involve larger capital projects. In these instances, repairs and major system renewals are generally addressed through capital budgets. The distinction between which activities relate to operating versus capital budgets is defined either in project operating agreements or in policies established by service managers. These distinctions are important because rules governing capital reserves are specific in terms of what they allow.

MINOR VS. MAJOR CAPITAL

Capital costs and the revenues to cover them are categorized based on the scale of the repair required, either minor or major. Minor repairs are typically covered under annual operating budgets and address maintenance issues such as flashing repairs or roof caulking. Major repairs involve lifecycle activities like shingle replacement or re-surfacing in the case of commercial 4-ply roof and are typically funded from capital budgets or replacement reserves.

In the case of operating budgets, annual requirements are based on in-year maintenance plans. Because costs are not static and can change over time, the process of budgeting to meet maintenance needs is a dynamic one. Current costing trends must be monitored along with labour and material pricing. This will help ensure a realistic budget each year. There is, however, a regular constraint on the amount of resources that can be applied to operating costs, despite annual maintenance needs identified. There is often a need to adjust work plans to fit budgetary constraints. Thus it is important to have prioritized and adequately costed work plans. This helps provide suitable flexibility when assessing required maintenance work against available financial resources.

The process for capital budgets is similar, although the planning horizon is usually more like 3 to 5 years. This time frame recognizes that sometimes capital projects extend over more than one budget year and will take multiple years to complete. Like operating budgets, capital budgets rely on the development of a capital work plan. As with any budgeting exercise, it's important to know current material and labour costs to effectively assess financial requirements. In the case of capital budgets, there can also be resource considerations for project management services to provide oversight for capital projects. These costs must be factored into the capital budget.

Having a realistic estimate of capital repair or replacement costs is critical to the budgeting process, given that these tend to require larger financial resources. Understanding the priority of needs and the possible staging of the work over time is

equally important when aligning financial resources with required work. Both capital plans and building condition assessments are key tools for getting this information. By linking these tools with reserve fund forecasting tools, you can identify available reserve dollars at any given point in time based on projected needs. This helps to establish short and longer term capital budget requirements based on available reserves and enables longer term financial planning.

The key goal from a maintenance perspective is to ensure that adequate financial resources are available to complete required maintenance work. This is not to suggest that budget constraints don't exist – because they do – and in these instances work must regularly be adjusted to address revenue realities. But there are ways to supplement financial resources by securing funding through external programs linked to initiatives like energy efficiency or water conservation. To help address maintenance needs and minimize the pressure that already exists on current budgets, housing providers should continually explore these external funding opportunities.

In extreme situations where organizations find themselves without sufficient resources to meet immediate and pressing demands, it may be necessary to approach the service managers for additional financial support. In these situations, support may be available by a loan or advance of subsidy. In either case, there is an enduring financial obligation to repay the service manager and budgets must account for this.

To avoid shortfalls, housing providers must regularly monitor actual maintenance costs versus available budget resources. Staff spending should be consistently monitored and the provision of monthly or quarterly reports to the Board provides necessary oversight. Linking financial and maintenance tracking systems (i.e. CMMS) can help integrate this information, enabling quicker reporting and supporting timely decision-making. This frequent monitoring also helps ensure that work planning can be adjusted in short order, should the need arise.

Given the direct impact that budgeting has in marshaling the financial resources to undertake either operating or capital work plans, there are some consistent key principles to observe. These include:

- Having sound information on the current condition of the housing stock
- Having a clear, cost based and prioritized plan for undertaking maintenance activities
- Maintaining strong financial controls as part of standard project management practices
- Maintaining adequate contingencies to address unforeseen expenses
- Having tracking and monitoring tools to assess actual work against budgets
- Maintaining reporting tools to support information flow to decision makers

CHAPTER 3

EMERGENCY AND DEMAND MAINTENANCE

Emergency and demand maintenance relates to activities that are more responsive in nature and fall outside the sphere of the regular maintenance cycle. These are activities arising from situations where there are urgent maintenance requirements, such as a flooded bathroom or broken window. They can also arise from daily property inspections or as a result of resident requests. In all instances the housing providers must respond, and the timeliness of response is largely driven by the urgency of the repair.

In this chapter, we will explore aspects of maintenance that arise out of specific situations, and that housing providers must respond to. Unlike capital planning and lifecycle management, these activities involve responding to immediate needs. Despite this urgency, the ability to respond efficiently and consistently is highly beneficial.

Key aspects of maintenance that will be covered in this chapter:

- What is emergency maintenance?
- What is demand maintenance?
- Managing resident maintenance requests
- Effective unit turnover and marketing to minimize vacancies
- Case-based remediation

3.1 What is Emergency Maintenance?

Emergency maintenance, as its name implies, must be undertaken immediately as a direct consequence of an emergency situation. Examples include a broken entry door, or basement flooding in the case of a town house. Given that property management is a 24/7 responsibility and that accommodation is the primary service provided by housing providers, they are expected to respond to these issues. The typical steps in an emergency maintenance cycle are shown in Figure 3.1.

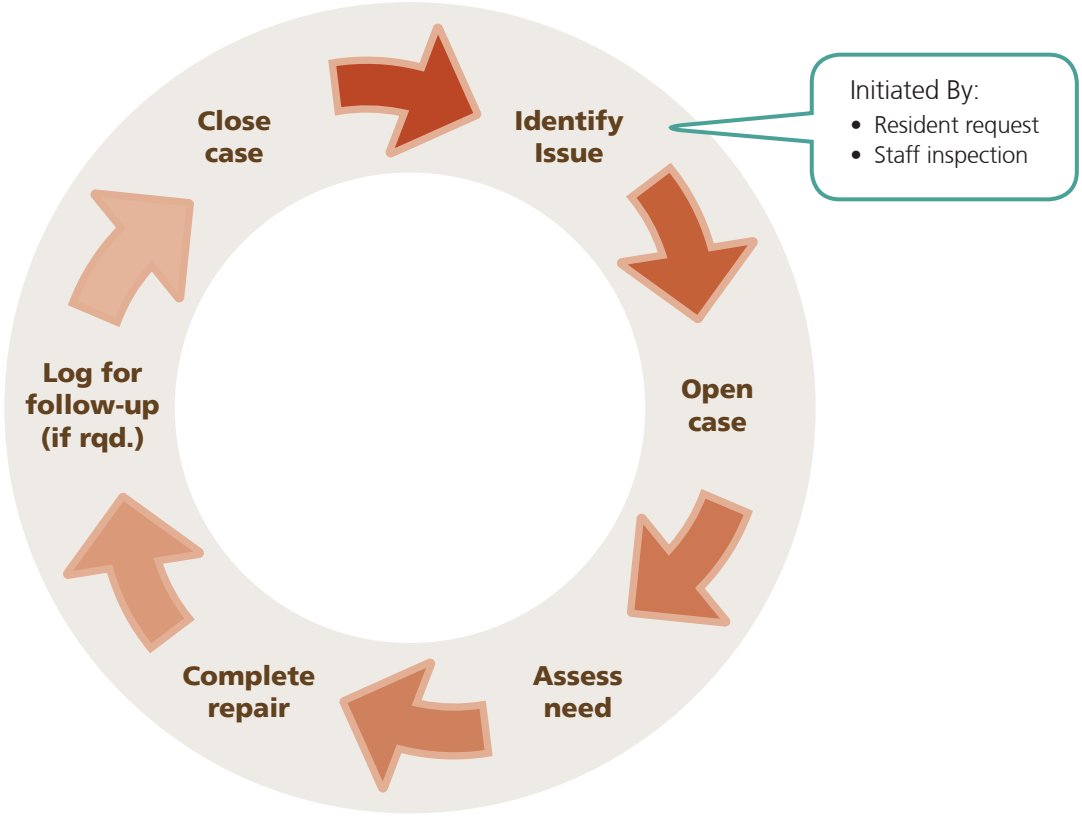
There are two ways to identify the need for emergency maintenance. The first is through daily inspections of the property, and the second is through reports by residents, especially where the need arises after regular work hours. In either instance, the need for maintenance is considered immediate since not addressing it would result in a health and safety risk or a property loss. For consistency sake, there should be a designated point of contact for these maintenance issues. During regular business hours they can be reported via a common maintenance telephone line or through email. After hours, calls should be routed to an answering service or to a call center. In either case, the necessary party would be contacted to do the repair.

During regular work hours, maintenance staff log the request by opening a case and then assess it for action. After regular work hours, these requests are typically logged and forwarded to the appropriate resource for action. Depending on the resources available after hours, the referral could go to an on-call property manager for them to assess and direct work. Some housing providers might have trained staff in a call centre who can do this. Repairs are only deemed an emergency if they fall into the risk or loss category noted above. In these instances, if there is no adverse effect in delaying repairs until regular business hours, they can be scheduled accordingly.

It is important to quickly determine the urgency of the repair and have protocols for making this decision. Fundamental to this question is the ability to understand what constitutes an emergency. This requires an assessment of possible risk. Where there is no clear and present safety risk to residents, staff or the general public, the housing providers might have reasonable grounds to defer the maintenance to the demand maintenance cycle.

While it is clear that emergency repairs will be required from time to time, the cost of these repairs will be impacted by who completes them. Depending on the service delivery model employed by the housing provider, there may be sufficient expertise from staff in-house to complete most repairs. However, to retain staff on call after-hours or to address call-out situations, employers usually incur some form of compensation

Figure 3.1 - Typical Emergency Maintenance Cycle



premium (i.e. on call or overtime). Where this resource is not available, housing providers use third party contractors who have expertise and skills in specific areas, but they too will have after-hours premiums for providing service. One way to control these costs is to use a standing offer process to get best available pricing for the services. In either instance, housing providers should regularly review costs for emergency repairs to ensure they are getting best value.

Once the urgency of the repair is assessed and the resources identified, the appropriate party can be dispatched to complete the repair. In the case of interim repairs, supplementary work is typically logged for follow-up though the demand maintenance cycle. In the case of deferred repairs this work is also logged and a work order established. After the work is done, the maintenance activity is logged and the work order closed.

A key part of the maintenance cycle is record keeping. For emergency maintenance, logging tracks activity and confirms that work has been completed, especially in the case of a third party contractor. Staff can then respond to inquiries about the repair. If this information is stored in a CMMS or similar type system, staff can respond using accurate and up to date information. Having activity data in a system like this also enables the housing provider to better plan maintenance activities. Besides identifying recurring issues, the information helps inform annual maintenance planning where the system is linked to maintenance and repair logs.

Being prepared is an important aspect of handling emergency maintenance. While clearly not every eventuality can be planned for, rapid response procedures for dealing with common issues enables a quicker response. It's also extremely important to have a clear protocol on defining what is an emergency and what isn't. An integrated information management system makes it easier to compile and coordinate information to help support decision-making. Smaller housing providers, however, may not find the same efficiencies in using these systems as those with multi-building portfolios. The same can be said for service delivery approaches, since the level of staffing and a unionized environment will influence how housing providers respond to emergency maintenance issues.

DO...

- Have a clear definition of what constitutes an 'emergency'
- Maintain rapid-response protocols for staff, including on-call support
- Prepare by having contingency plans for managing typical emergencies

3.2 What is Demand Maintenance?

Like emergency maintenance, demand maintenance is typically initiated by a request for service. While the maintenance in question may fall inside the regular planned maintenance cycle, the distinction here is that the maintenance required does not constitute an emergency. Demand maintenance therefore has a lower priority than emergency maintenance but requires more timely action than planned maintenance.

Demand maintenance items may be brought forward in two ways: through daily building inspections by staff, or through requests made by residents. As with emergency maintenance, most requests are routed through a common maintenance contact line or email address. After-hours requests may be routed through an answering service or a call center, depending on the service option used by the housing provider.

As with all maintenance requests, the information is logged to identify the nature of the repair required. An assessment determines the urgency of the repair based on established service standards. The standards would normally consider the useful life of the component as well as prior related repair activity. In some cases, an on-site assessment may be necessary prior to taking action on the request. Once the work is deemed to be required, a work order is created to action the item.

Even if a repair is required, there may be sound reasons for not conducting the work at the time the problem is identified. This is particularly the case for after-hours work that must be completed by a third party, or when availability of parts is a consideration in the timing of the repair. In these instances, if a repair was undertaken immediately despite the fact that there was no pressing need to make the repair, there could be a cost premium for the work. If the need isn't immediate, deferring the work results in standard costs rather than cost premiums. This issue is most common with work undertaken after regular business hours. Whether undertaken by staff or by a third party contractor, these after-hours calls tend to result in higher repair costs. Where it is safe and practical, these maintenance items should be deferred to the regular business cycle.

If the repair can be addressed through the regular maintenance cycle, scheduling of the repair will follow that cycle. If the repair is more urgent according to maintenance protocols, then scheduling of the repair would be actioned on that basis. Housing providers should have established service standards for assessment, scheduling and completion of repairs to support good customer service. This is particularly true for resident requests, as failure to address requests in a timely way can lead to resident dissatisfaction. Where this issue becomes widespread, it can influence the housing provider's ability to attract and retain residents. Deferring necessary maintenance can also have a compounding effect, since delays in certain repairs can trigger the need for larger or more complicated repairs and increased costs.

As with emergency repairs, the work may be undertaken by internal staff or contracted to a third party. In the case of third party contractors, some housing providers use standing offers to procure these services more cost effectively, ensuring that standard rates apply for standard work. When using a third party, housing providers should verify that the work has been completed as specified before making payment. Whether the work is done internally or by a third party contractor, housing providers should ensure that established service standards are being met. This is an important part of complete customer service and in the case of third party contractors, helps ensure the organization is receiving good value. Regular follow-up and evaluation of completed work is good practice for both staff and contracted services.

For any form of maintenance, having a coordinated database of information that tracks maintenance activity helps make sound business decisions. From a customer service point of view, a system like this can help ensure timely responses to maintenance requests. And from a resource management point of view, the same system can help allocate work and track maintenance activity.

Perhaps most importantly, an integrated maintenance management information system can help connect current maintenance activity and planned maintenance activity. This link will ensure that the most current information is being used to shape planned maintenance activities.

3.3 Managing Resident Maintenance Requests

After the move-in, contact between residents and the housing provider tends to taper off. However, the most significant recurring contact will likely relate to maintenance requests. Experience has shown that this interface tends to be an active and sensitive part of the housing provider-resident relationship and as such, is very important to residents. Thus one of the key areas by which residents will measure customer service is responsiveness to maintenance issues.

As noted above, resident requests fall under the demand maintenance umbrella. As such the process for handling requests is to:

1. Identify the maintenance issue and log the request
2. Assess the need for the work and assign a priority
3. Action the work by opening a work order
4. Track progress of the work
5. Confirm completion of the work

Given the sensitivity of residents to maintenance issues, always be clear about customer service expectations. Treat maintenance requests fairly and consistently for all residents. One measure for doing this is establishing standard response times for typical repairs. This gives the resident a reasonable expectation for a response. It also places a reasonable expectation on staff and contractors in terms of completing the work in a timely way. Be clear about what work will and will not be completed, since it's expected that not every resident request may be deemed a housing provider responsibility, and some may be subject to a charge back. Clear expectations provide a fair system for all residents and encourage better service outcomes for them.

Tracking maintenance activity arising from resident requests is a powerful way to manage these demands. CMMS and other software tools help organize and manage the information, especially for housing providers who have multi-building portfolios. The information generated supports customer service objectives and at the same time, helps housing providers better manage maintenance activities by identifying recurring problem areas. Of course these systems require significant upfront investments and on-going maintenance themselves. While they can be extremely helpful for multi-building portfolios, not all housing providers need sophisticated maintenance management software.

Regardless of the size of your portfolio, record keeping and documented maintenance planning is essential. Ensure you have some system of documenting routine, demand and routine maintenance whether by calendar, spreadsheet, CMMS or other record keeping tool.

Resident charge backs are another important aspect of managing resident maintenance requests. While responsive customer service brings real benefits, housing providers must define what is appropriate in terms of maintenance requests. Residents are financially responsible where maintenance is required as a result of their own negligence. Housing providers should provide written policies about charge backs to residents for these types of repairs.

Housing providers have the right to expect from residents a certain level of upkeep for the occupied premises. Many will have standard additional charges for lost keys, unit painting, unblocking drains, etc. and these will be stated in by-laws attached to the lease. Making sure residents receive this information at the time of initial occupancy, and highlighting their information at the initial unit inspection, will go a long way to reinforce requirements to residents.

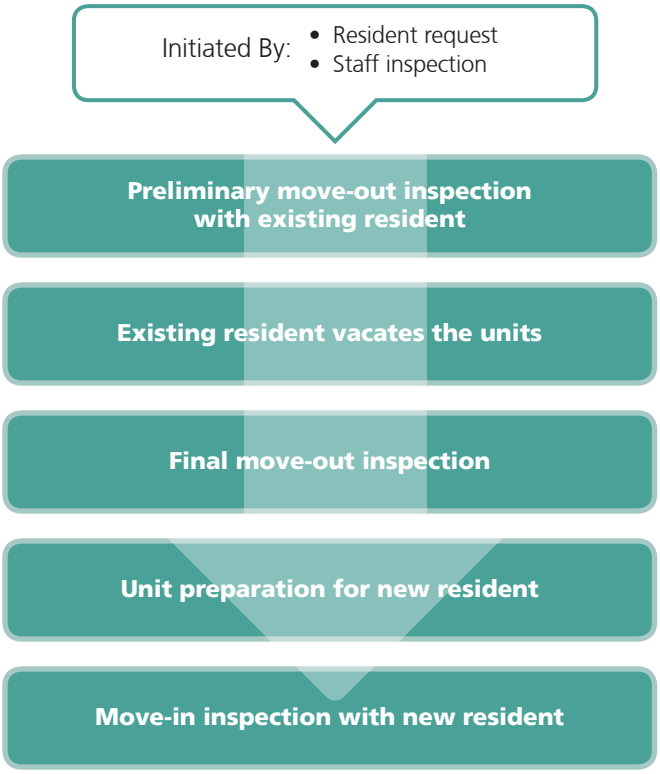
The following are some key strategies for managing resident maintenance requests:

- **Communicate the process** – when residents move in, make sure they are informed about the processes, how they make requests and what is expected from them
- **Recognize that your building is their home** – disruptions affect residents on a 24/7 basis
- **Be accessible** – whether during regular hours or after hours, residents should be able to connect with a live voice wherever possible, not just an answering machine
- **Set service standards and stick to them** – demonstrate your service commitment by meeting or exceeding standards
- **Actively track work and communicate progress as needed** – in the case of more complex or disruptive jobs, ensure residents are updated at key milestones
- **Evaluate work frequently** – meeting standards also means maintaining them over time as part of a continuous improvement strategy
- **Be prudent about the use of charge backs** - apply them consistently and fairly

3.4 Effective Unit Turnover

The cost of unit turnover is essentially lost revenue. Apart from the time the unit may be vacant, there are also costs associated with refurbishing the unit and the administrative costs of preparing and leasing the unit. Because the primary mandate and business of housing providers is in fact to house people, they must minimize the time the unit is vacant. As with most maintenance issues, planning ahead and having policies in place to guide maintenance activities pays real dividends at point of unit turnover.

Figure 3.4 – Typical unit turnover sequence



It is essential to minimize the time the unit is vacant by completing a quick turnaround between the former resident and the new resident. Pre-planning for unit turnaround should commence when notice to terminate is given. As part of this process, a move-out inspection allows the housing provider to assess the current condition of the unit at time of notice. The inspection will identify potential repairs and refurbishments necessary before the unit can be re-occupied. While this is not a guarantee of the final condition of the unit, it at least provides some sense of the probable turnaround time. Reviewing unit maintenance records on file will confirm what work has been done during the past tenancy, and if lifecycle refurbishments are scheduled.

When the unit is vacant, locks are changed and a second inspection will confirm the move-out condition of the unit. The housing provider compares these inspection results with those of the original unit inspection at move-in to determine whether any charge backs to the existing resident are warranted. The housing provider then reviews inspection results to reconfirm turnover work required and timelines for unit re-occupancy. Then it's time for turnover maintenance and any remedial repairs, as well as cleaning to make the unit available for occupancy again.

Doing these repairs in a short time helps minimize vacancy loss on the unit. That's why some housing providers use a blitz approach to do cleaning and repairs in a very short time frame. Some contract out this service to achieve minimal time loss and minimize impact on other maintenance services. To do this, many use a standing offer process to maintain a roster of contractors who can provide quick and effective turnover services. Where there is more substantial damage or where certain lifecycle replacements are required, unit refurbishment may take longer.

Maintenance personnel and leasing personnel must coordinate their efforts through this process to ensure a unit re-occupancy date is set, and to guarantee re-leasing on that date. This is largely to reflect the fact that commitments to move-in dates for new residents must be absolute before anyone signs a lease document. Despite the importance of having the unit physically ready, leasing requirements can be the biggest impediment to minimizing vacancy loss. Pre-planning work in the leasing process can help minimize the time it takes to turn over vacant units.

Key strategies for minimizing unit turnover time:

- Have clear policies and protocols in place to support efficient unit turnover
- Pre-plan for unit re-occupancy, coordinating maintenance and leasing efforts
- Maintain up-to-date unit condition information on file via annual inspections
- Refurbish units with high durability products and materials to reduce the frequency of replacement

While making unit turnover procedures as efficient as possible is a prudent way to minimize vacancy loss, eliminating the need for unit turnover is even more prudent. Residents move for a number of reasons, some of which have little to do with current accommodations. However, in those instances where the level of maintenance or general repair is a contributing factor, turnover costs are an avoidable expense. As part of an overall strategy to minimize vacancies, housing providers should actively evaluate the quality of building conditions. Being responsive to these pays dividends by creating an environment that residents don't feel compelled to leave. This is also important since the curb appeal of the building will influence the ability to lease units to new residents when vacancies do come up.

This underscores the need for a comprehensive approach to maintenance, one that not only addresses basic day-to-day maintenance issues but also considers the overall image the building(s) projects to the community. A well-rounded maintenance program helps minimize vacancy loss by addressing current resident needs and creating attractive living options for households seeking accommodation. In that regard, unit marketing should not be considered

an activity that is isolated to unit turnover. It should instead be considered an on-going opportunity supported by maintaining the property in good order.

3.5 Case-Based Maintenance

Pest control and remediation related to designated substances do not necessarily fall within the purview of planned or preventive maintenance. Instead they fall somewhere in between as they require reactionary response, are hard to plan for in any regular way, and typically require sustained efforts before yielding results. The discovery of these problems requires a planned response.

Addressing these case-based issues requires step by step action.

1. Issue identification
2. Assessment, and
3. Remedial action

Issue identification is a particularly important step in this process. Using bedbugs as an example, it would be important to first verify that bedbugs were the root cause of the problem and to confirm the extent of the infestation. The very extent of the infestation would then determine the necessary scope of response and influence remediation options. Housing providers must also ensure that the problem area does not increase and the infestation doesn't re-occur. The housing provider must be extremely responsive and flexible to changing needs.

Pre-defining solutions to these dynamic situations is almost impossible, but having clear maintenance protocols for addressing these issues is essential. Likewise, it is important to be flexibility to meet rapidly changing conditions. Housing providers need protocols for identifying and establishing the limit of infestation. Having scaled response options for temporarily dealing with personal goods, unit cleaning and garbage storage are also key. Maintenance practices that limit the further spread of the infestation are equally important, as are preventive measures. Together, these practices can help housing providers effectively respond.

While these situations may vary in complexity and dimension, housing providers must have the tools with which to respond. Perhaps most important is the need to plan. In that respect, these demand maintenance situations are not unlike emergency measure protocols – designed for specific scenarios but flexible to changing conditions. From that perspective, it is a good practice to have standard processes for dealing with case-base issues such as pest infestation or mold abatement. Housing providers should also proactively monitor industry trends and other best practices.

Another compelling practice, as noted earlier, is to take preventive measures. While you can't always prevent pest infestations or the presence of mold, you can reduce the incidence and severity. This proactive approach builds these measures into regular maintenance practices.

DO...

- Be responsive to requests and follow-up
- Be cautious about scheduling work if it can be completed during the regular maintenance cycle
- Use past maintenance history to help identify maintenance request "hot spots"

CHAPTER 4
PLANNED MAINTENANCE

Unlike demand-based maintenance, planned maintenance involves the regimented execution of scheduled tasks for maintaining property. This can range from general housekeeping to property inspections and routine maintenance. Activities are driven to a large degree by maintenance schedules and defined tasks, typically based on established industry standards or frequencies. However, as with demand maintenance, it is important to be prepared and having a schedule and formal procedures for maintenance activities.

In this chapter, we will explore the key elements that help ensure that planned maintenance is effective. These elements include:

- **Knowledge** – knowing the building and incorporating good maintenance practices
- **Resources** – staff and contractors, priorities, oversight
- **Schedule** – the written schedule of tasks and activities that guide work
- **Tools** – Inspection check lists , information systems, tracking tools

Key topics in this chapter include:

- What is planned maintenance?
- Developing and using a planned maintenance plan
- Inspections and on-going monitoring of building conditions
- Basic housekeeping and upkeep
- Preventive maintenance for key building components

4.1 What is Planned Maintenance?

Planned maintenance involves the day-to-day upkeep of a property and its related components in good working order, including basic housekeeping, minor repairs and systems monitoring. The principal intent of planned maintenance is to ensure that building components operate and are maintained properly to meet and extend their typical service life and avoid costly and unnecessary repairs.

Housing providers have responsibilities under many pieces of legislation to provide a reasonable standard of property and building maintenance. Given that the building is the primary vehicle for delivering services to residents, having a planned maintenance schedule also helps support good customer service practices. Like any plan, a structured approach to managing the allocation of resources (staff, financial, etc.) improves efficiency and effectiveness.

Having an effective maintenance system requires preparation and relies on a number of key elements. While the scale and scope of your portfolio will determine how sophisticated your planned maintenance system is, the success of the system depends on:

- **Having a sound understanding of your building and its systems** – knowing the key components and how they operate is business intelligence. You must have a clear picture of your building and how it works, and the technical knowledge to identify and address core maintenance issues.
- **Having a plan to guide you** – Due to the wide range of maintenance obligations and the equally wide range of individuals involved in maintaining systems, you need an organized way to manage needs and a detailed plan to coordinate efforts and manage resources.
- **Having established routines to execute** – Much of the work involved in planned maintenance follows set cycles and is repetitive in nature. Establishing standard routines to complete required tasks is an important way to consistently

address regular maintenance needs. Set processes also help standardize maintenance procedures.

- **Having systems to monitor and track** – In addition to coordinating resources, there are clear benefits to using tools that can manage large volumes of interconnected information. A system that monitors activity and tracks maintenance will help ensure that you are meeting standards and completing activities in a timely way. With these same systems you can analyze activities and find additional efficiencies while supporting the principle of continuous improvement.

At the heart of a planned maintenance system is the need for a clear understanding of your building, its components and maintenance requirements. There are different maintenance activities associated with different building components, even though some might share common sub elements. For example, a building component may need electricity to work, but electrical maintenance would be described under the "electrical building" task schedule.

Planned maintenance plans are typically organized by main building component. This table outlines many of the main building elements and provides examples of their subcomponents:

Building Element	Examples of Sub-Components
Site	• landscaping, hard surfaces, driveways, parking areas, walkways, landscaping
Envelope	• exterior wall construction, windows, doors, access ways
Structure	• major load bearing components, concrete/masonry, foundation, underground parking
Roof	• Slopped roof (asphalt shingles), flat roof (inverted roofs, modified vitchumen)
HVAC	• heating, ventilation, air conditioning, air handling
Elevating devices	• elevators, lifts, hoists
Fire & life safety systems	• fire systems, sprinklers, CO systems, security monitoring systems
Plumbing	• water/wastewater fixtures, piping, sump pumps, water quality systems
Mechanical	• boilers, exhaust systems, generators, compactors, furnaces, etc.

Planned maintenance activities will help protect building components from the impact of natural elements. Weather and the environment wear on building components and can cause premature failure if not adequately addressed.

- **Water** – water can cause serious damage to building envelope systems. The effects of freezing and thawing cycles can have serious impacts on foundations, walkways and masonry.
- **Moisture control** – Lack of interior moisture control can lead to mold and rot. Apart from potential adverse health effects lack of moisture control can also, accelerate heat loss and breakdown drywall structures.
- **Heat loss/gain** – In our climate, heat loss is a significant concern; the failure of systems to adequately insulate from cold increases utility costs. High heat gain in summer months has a negative impact on roofing and the exterior building envelope.

4.2 Developing and Using a Planned Maintenance Plan

Planned maintenance is the cornerstone of sound property management. It is a formal schedule of procedures and protocols for inspecting, maintaining and repairing buildings and their components. When coordinated with other asset management tools like capital plans, it helps provide a complete system of maintenance for buildings. These plans are intended to guide activities and resource allocation. Used more strategically, maintenance plans can also support continuous improvement objectives by helping to target areas for greater efficiency. Having sound baseline information is critical in terms of familiarity with the

physical asset and understanding its condition. This same information, when gathered over time, can provide a powerful tool to analyze maintenance trends and the baseline performance of building components. You must have a basic inventory of all building components, systems and equipment. A comprehensive building inspection process, as-built construction drawings, building condition assessments (BCAs) and other technical studies will provide the foundation of this important baseline information.

BCAs also play a vital role in establishing the condition of building components at a given point and time. Service history, operating manuals and warranty information all contribute to a clear picture of building conditions past and present. Technical studies and reviews provide details on the condition of specific building elements.

Maintenance standards are another important element. They may vary from property to property and from portfolio to portfolio but when established, provide an important benchmark for assessing property conditions.

Maintenance plans are normally developed for each building or property, recognizing the unique combination of building components and equipment of each. Plans are typically organized by building element and include inspection tools as a means of gathering information on current condition. They also include customized maintenance schedules to help ensure that requirements are addressed on time, and that resources are allocated for these tasks. Plans also include standard operating procedures for completing routine tasks and managing portfolio needs. By integrating specific types of information into these tools, housing providers can establish very effective maintenance practices to best manage their housing portfolios. Plans are not static. They should continue to reflect changing conditions and how maintenance practices also change to address these conditions.

With the appropriate range of historical information and current building condition, housing providers can start constructing a maintenance plan (see Figure 4.2). You should know typical industry life cycles servicing information, as well as have a complete list of regulatory requirements. A key opportunity lies in gathering input from frontline maintenance staff. This 'on the ground' information helps ensure that planned activities appropriately address the needs evident in the field. From this information, you can develop a complete list of maintenance activities needed in a typical year. The maintenance plan also normally specifies the frequency of these activities and the resources assigned to undertake them.

Figure 4.2 – Steps in developing a Maintenance Plan

Having projected resource requirements attached to the maintenance plan helps ensure that planned activities can happen within available resources. As maintenance plans are typically developed on an annual basis, their resource requirements are tied to the annual operating budget. This same approach to resource allocation enables scheduling of maintenance activity to that staff and contractors are deployed in an effective way.

The required frequency of activities has a strong influence on maintenance priorities but is not the only consideration. Housing providers should also gather information for their maintenance plan from annual unit inspections. This provides a strong opportunity to integrate the in-unit maintenance requirements with those of the buildings common elements.

Once the maintenance plan is developed, it forms a foundation for assigning activities to staff work plans or scheduled duties through procured services. The scale of the organization will largely dictate the number and type of staff dedicated to building maintenance. Where specialized services are needed, you managed to seek out external resources with necessary expertise in addressing these requirements.

Determining what work should be done internally depends on staff skill and capacity to do additional work, and an organization's ability to out-source work. It is wise to consider using external contractors to gain efficiencies wherever possible. Ultimately,

the housing provider will have to determine how to best resource the maintenance plan. Whether resources are internal or external, there is a need to ensure accountability for the activities.

Property managers must refresh and maintain the plan to keep it current. Because the maintenance plan is used to guide annual work plans, there is an expectation that it be reviewed annually. Some practices and protocols may remain fairly constant over time, but the context and priorities shift from year to year and the plan should be flexible. Regulatory changes and innovations also help drive changing needs.

Coordinating the content of maintenance plans with capital plans also ensures a degree of consistency over time, recognizing that capital plans have a longer term planning horizon. Building in feedback loops ensures that maintenance plans reflect current practice and point to areas where greater attention is required. Using this information to apply planned maintenance principles improves the quality of the maintenance plan and supports continuous improvement.

DO...

- Establish a clear baseline of information
- Align resources and practices with work plan priorities
- Keep the plan current
- Be thoughtful about assigning tasks

4.3 Inspections and On-Going Monitoring

Having current information about building components and systems is a critical part of planned maintenance. This information should be gathered through regular inspections. The inspection process generates important information that helps housing providers monitor building components and determine when repairs or replacements may be needed. The inspection process addresses a range of maintenance needs – from daily requirements such as housekeeping conditions to longer term maintenance obligations such as mechanical warranty inspections. The information is also critical to assist in monitoring certain legal obligations associated with the property and with resident safety.

Because inspections are essentially an assessment of operational status, there is an inherent need to have a standard against which to measure this status. Remedial action may be required if the building component does not meet the standard. Building components that consistently fail to meet standards require a more fundamental review. But where the building component exceeds the standard, it may be possible to increase the frequency of inspections or extend the service life of the component. Consistently meeting or exceeding the standards usually indicates that maintenance practices are effective.

In many instances, standards are also a reflection of certain legal or regulatory obligations, published by government agencies (e.g. Technical Standards and Safety Authority – TSSA). This is most common for components such as roof anchors, elevating devices or fire safety equipment. Failure to address these standards can lead to serious consequences and as such, these standards require priority attention. Most of these standards are developed based on historical industry practices and published by sector-based agencies. In some instances, these standards may also be specified by technical agencies such as the Canadian Standards Association (CSA) or the Electrical Safety Authority (ESA). Manufacturers' service guidelines help set standards and provide recommendations on standard maintenance. Some of these guidelines are directly linked with warranty conditions, so it's important to follow them in order not to void warranties. The key to an effective inspection system is to integrate these various requirements into inspection practices, creating a comprehensive approach to gathering current condition data.

A comprehensive approach to inspections requires a range of individuals with various training or skill sets to conduct inspections, though some inspections require the certified experts.

Below are some examples of typical inspection protocols for typical building components:

Inspection frequency	Typical elements inspected	Inspected by	Purpose
Daily	• Main entrance and exits	• On-site staff	• Confirm no hazards or obstructions
Weekly	• Elevator cab	• On-site staff	• Free of debris, operational
Monthly	• Exhaust fans	• Maintenance staff	• Clean and inspect
Quarterly	• Hot water boilers	• Maintenance staff	• Review of basic condition
Semi-annually	• Makeup air systems	• Contractor	• Typical semi-annual inspection
Annually	• Fire alarm systems	• Certified specialist	• Ensure system operating in accordance with code
Annually	• Unit inspections	• Maintenance staff	• Verify unit condition and safety issues, such as electrical, general wear and tear and upkeep. Schedule work based on urgency.
Seasonally	• Exterior hose bibs	• Maintenance staff	• Confirm ready for upcoming season

A number of tools can assist in the inspection process. Perhaps the most important are customized checklists that break down key elements to be inspected and the frequency of these inspections. The checklists often include prompts to ensure the individual doing the inspection reviews all necessary aspects of operation. The prompts target signs of wear and tear or reduced operational performance. Housing Providers should customize checklists to reflect specific building components for each project. As noted earlier, it's also beneficial to embed regulatory requirements and warranty inspections into these routines. Given the accessibility to digital technology, more and more housing providers are using photos to document the inspection process and capture conditions visually. Photos can be inserted in inspection checklists as visual prompts for assessing existing condition.

During inspections, there are a number of warning signs that signal necessary maintenance responses. These might include:

- **Hazards** – obstructed exits, broken glass, icy walkways
- **Moisture** – condensation, leaks, humidity
- **Heat loss** – temperature variations, drafts
- **Mold and rot** – integrity of roof sheathing, diminished insulation
- **Rust** – moisture around mechanical equipment, structural railing
- **Cracks** – foundation movement, pavement heaving
- **Pooling water** – poor drainage, blocked catch basins

Inspections are a good opportunity to integrate early warning systems that support planned maintenance. This is particularly true where inspection practices help identify remaining service life. By using inspection protocols and assessing building component condition trends, housing providers can take proactive steps to keep systems operational and maximize service life of

components. Flagging and anticipating maintenance issues early helps minimize service interruptions.

Since there can be a significant volume of data for every building component, many property managers use computerized maintenance management systems (CMMS). These systems have the added benefit of integrating data across a number of components within a building, or rolling it up at a portfolio level for a broad picture of all maintenance issues.

The automated aspects of these systems are attractive for tracking maintenance needs and for workflow management. For example, building components can be assessed over time to determine their life cycle performance. Maintaining service logs as part of the information system helps ensure that a complete picture of maintenance activity over the component's life cycle can be taken into account. The growing use of wireless technology has made it possible to input inspection data into information management systems in real time. This allows property managers to get a current snapshot of conditions almost instantaneously. Apart from system conditions, these tools are also useful for managing workflow for staff and external contractors. These systems can also generate task lists or work orders to monitor the status of activities and ensure service standards are met with regard to maintenance responses.

Two related inspection types have a bearing on maintenance activity – unit inspections and inspections required by technical agencies or regulatory authorities. While they are not directly related to supporting component maintenance, they influence the business of the housing provider.

As a part of housing agreements/leases, residents are expected to maintain their units to a basic level of repair, primarily with regards to housekeeping and normal wear and tear. Where maintenance issues arise beyond these basic requirements, residents are expected to alert management in a timely way; and it is the housing provider's responsibility to address these issues, also in a timely way. To ensure units are maintained in reasonable condition, housing providers will normally conduct inspections at key times, including:

- **Initial move-in inspection** – Completed with the resident at point of move-in to confirm the status of the unit at point of occupancy
- **Annual unit inspection** – A primary reason for this inspection is to ensure that typical unit components are operating as required and that the unit is being maintained in a reasonable state of repair. This process can act as an early warning system to help avoid costly refurbishments at resident move-out.
- **Move-out inspection** – Completed at the point of vacancy to determine unit condition. Results are compared to the initial occupancy report and annual inspection reports to assess if residents have met their "reasonable state of repair" obligations. Damages to units may result in resident charge backs at this point. This inspection also acts as a catalyst for determining refurbishment work required before the unit can be re-occupied. This work is governed by demand maintenance practices.

While these inspections focus primarily on meeting resident obligations, they also provide important information on the building components related to the interior units. This data, when integrated with maintenance management information systems, can help provide a complete picture of building status.

A second inspection area that has a bearing on maintenance activity involves inspections required by technical agencies or regulatory authorities. These can include the TSSA in the case of pressure vessels, boilers, elevating devices and fuel systems. For electrical systems, this can include the ESA. These inspections are most often triggered by regulatory requirements and tend to happen infrequently. However, the results of these inspections can require immediate maintenance if compliance issues are flagged. Information and remedial actions resulting from these inspections are logged into the maintenance information system.

Because of compliance obligations, it is important to maintain sound documentation on equipment or building components that may be subject to these inspections. Housing providers must be prepared for these inspections when they occur, regardless of whether they are conducted by the technical agency or delegated agents. Of course, maintaining these systems in good order and being aware of changing technical standards can reduce the need for post-inspection remedial action.

DO...

- Monitor and be aware of legal and technical standards
- Use an integrated inspection system as an early warning system
- Use inspection checklists that include visual prompts
- Integrate unit inspection data with your maintenance information system

4.4 Basic Housekeeping and Upkeep

Basic housekeeping and upkeep is an important part of a complete maintenance regimen. It involves the general upkeep and basic tidiness of the property and the common elements of the building. While this form of maintenance is basic and does not require a great deal of technical knowledge, it is an important tool in creating a positive living environment for residents. It also projects a positive image to the community and has a direct impact on curb appeal.

Basic housekeeping generally involves:

- **Cleaning** – sweeping, mopping, dusting, vacuuming
- **Replenishing supplies** – for washrooms, common rooms, amenity areas
- **Refuse removal** – throughout the building where required; includes recycling
- **Inspecting and maintaining interior common areas** – entry ways, halls, elevators, common rooms, laundry rooms
- **Inspecting and maintaining exterior common areas** – basic tidiness only, minor landscaping plus some salt/grit and snow

Because of the amount of use in common areas, housekeeping is a daily requirement. Given the daily nature of the required work and the need to be frequently on site, the work is usually done by a superintendent or custodian.For smaller operations, this approach works well and provides direct accountability for housekeeping tasks. In these situations it's also common to include daily walk-through inspections as an integral part of maintenance responsibilities, since personnel are on site. These functions may also include maintenance associated with unit turnover, again depending on the size and scale of the building.

Larger buildings, or those where the portfolio includes multiple buildings, may have a number of staff responsible for housekeeping; and their duties may span across more than one building. In this instance there might be a maintenance supervisor who oversees housekeeping operations. The need to complete daily walk-through inspections remains, and is an important part of staff duties. Some housing providers may choose to contract out housekeeping services and/or unit turnovers to third party service providers. While there may be practical reasons for using this approach, as with any contracted service there should be accountability protocols in place to ensure timely services that meet appropriate standards.

Like other forms of planned maintenance, housekeeping is a regimented set of activities designed to ensure the on-going upkeep of the building. Scheduling activities, defining resource requirements and assigning tasks are important aspects of delivering housekeeping services. Checklists and activity logs are proven tools for ensuring that housekeeping functions are completed. As with other maintenance activities, the use of maintenance information management systems can help housing providers not only monitor and track building condition but also housekeeping activity.

While housekeeping functions don't all require the same level of technical expertise, they all require care and control. House staff must be trained in safety practices. For example, the use of certain cleaning products may fall under WHMIS provisions and require training on the safe handling or using these products. Documenting procedures and providing staff training are two ways to ensure employees are aware of the importance of their work environment and their responsibilities. As procedures or responsibilities change, appropriate staff will need regular updated training.

In addition to appropriate safety equipment, housekeeping staff will need supplies and work tools to do their duties. Housekeeping staff are usually responsible for maintaining an inventory of necessary supplies and tools on-site. With this responsibility comes the need to store materials appropriately and manage ordering and inventory of these products. In the case of contracted services, contractors are responsible for equipment and materials, and for their staff's performance and behaviour on site. Despite this responsibility, the housing provider must maintain activity logs, verification systems and general oversight to ensure that the contractor and their staff are providing services as expected and contracted.

DO...

- Establish clear housekeeping schedules and practices
- Oversee work to confirm it is completed as required
- Adequately train staff in safety procedures

4.5 Planned Maintenance for Key Building Elements

The planned maintenance of key building elements is the central purpose of an overall asset management plan. It involves the regular and well-organized review of building systems to ensure they are operating in good working order. Where that is not the case, remedial measures are

required to ensure continued operation. Planned maintenance provides a set of standard protocols to help guide these remedial requirements.

Planned maintenance encompasses:

- **The inspection process** – identification of current conditions and whether any maintenance action is required
- **General maintenance** – typical activities required to sustain systems during their useful life (including snow clearing, walkway and parking area maintenance, grass cutting, etc.)
- **Repairs** – remedial activities to restore operation of element or component to a required or appropriate service level
- **Replacements** – planned replacement of components if they are beyond repair or if the repair costs exceed replacement costs (excludes major capital items)

Given the wide range of building components, equipment and materials, it is not surprising that comprehensive maintenance plans require considerable organization. One common way to group maintenance activities is by major building component and then by sub-component. While there may be some crossover necessary to maintain these sub-components, this grouping presents a reasonable way to manage inter-related activities.

The following is a brief review of typical maintenance activities by building element and sub-component. While this list is not exhaustive, it is intended to provide a general sense of planned maintenance duties for main building components. It is recognized that housing providers may elect to have external contractors perform some planned maintenance activities.

IMPORTANT!!

Housing providers have an obligation to follow prevailing building codes, fire codes, municipal by-laws and other regulations when conducting any maintenance work. Failure to do so can result in fines or other punitive remedies. For that reason, housing providers must be familiar with codes and obligations before undertaking any remedial work. They should also secure necessary permits and approvals beforehand, where such approvals are required. Use certified personnel where required by code or statute.

Site Work

Site work involves components that are external to the building and found within the property boundary. Maintenance work involves both hard and soft surfaces as well as open and common spaces. Because of the external nature of these components, maintenance activity is highly seasonal in nature. These external components should be considered a priority since they can potentially expose residents, visitors, trades people and others to hazardous situations while on the property. And, they expose housing providers to issues of liability. For certain items, including lawn care and snow clearing, contracting out is quite common.

Building Element	Examples of Sub-Components	Typical maintenance activities
Site	landscaping/plantings	• lawn cutting • flower bed maintenance • tree pruning
	driveways & parking areas	• snow clearing • pavement patching • catch basin cleaning
	playground structures	• equipment maintenance • adequate lighting

Key considerations when determining maintenance activities for this building element:

- Size and configuration of property
- Seasonality of activities
- Contracting out provisions

Building Envelope

The building envelope is the primary "skin" of the structure, designed to provide shelter from the elements. Maintaining the integrity of the building envelope is the key objective.

Building Element	Examples of Sub-Components	Typical maintenance activities
Envelope	exterior wall construction	• patching gaps • caulking seams • re-pointing masonry
	windows	• ensuring seal is maintained • caulking seams • screen repairs
	doors & access ways	• painting • caulking • weather stripping

Key considerations when determining maintenance activities for this building element:

- Exterior wall composition and materiality
- Seasonality of activities
- Durability of specified products

Structural Elements

The structural elements of the building are critical to its continued service. Given the specialized knowledge required about structural elements, maintenance work is restricted to minor repairs and general upkeep. Contracting out for more advanced inspection and technical services are typically required, even for minor repairs; this is most evident in larger multi-storey buildings.

Building Element	Examples of Sub-Components	Typical maintenance activities
Structure	concrete/masonry	• re-pointing concrete block • repairing chimney stack
	foundation	• wall patching • crack repairs • spot damp proofing
	underground parking	• lining parking stalls • annual cleaning • lighting repairs

Key considerations when determining maintenance activities for this building element:

- Structural make-up of building and materiality
- Contracting out provisions

Roof Elements

Like the building envelope, the roof provides key shelter from the elements. Maintenance activities are largely driven by the design and construction of the roof. For more conventional pitched roofs, asphalt shingles are commonly used and are a fairly straightforward component to work with. Flat roofs, which are typically found in larger multi-storey buildings, require more complex roofing structures that involve multiple layers and specific applications. In the northern climate, maintenance activity is heavily influenced by changing seasonal conditions.

Building Element	Examples of Sub-Components	Typical maintenance activities
Roof	asphalt shingles	• repair of damaged shingles • sealing at ridge line
	flashing and venting	• caulking around step flash • repairing leaks at vents • painting exhaust hoods
	roof anchors	• inspection and certification of anchors

Key considerations when determining maintenance activities for this building element:

- Roof construction/composition
- Changing seasonal conditions
- Contracting out provisions

Heating, Ventilation and Air Conditioning (HVAC)

HVAC systems are integral to internal building climate control. While a significant component of HVAC work relates to specialized skills, there are a number of more straightforward activities that can be performed by maintenance staff.

Building Element	Examples of Sub-Components	Typical maintenance activities
HVAC	heating	• annual boiler maintenance • radiator cleaning
	ventilation	• exhaust duct cleaning • changing air filters • lubricating dampers
	air handling	• changing air filters • thermostat checks • service motorized dampers

Key considerations when determining maintenance activities for this building element:

- Configuration of heating, ventilation and air handling systems
- Warranty obligations
- Contracting out provisions

Elevating Devices

Elevating devices are elevators, lifts or hoists. Because of the highly regulated nature of these elevating devices, most maintenance activity requires specialized training and certification. For that reason, maintenance of these devices must be contracted out to certified technicians.

Building Element	Examples of Sub-Components	Typical maintenance activities
Elevating devices	elevators	• annual inspections • emergency call testing • seasonal cab cleaning
	lifts & hoists	• annual inspections • access door testing

Key considerations when determining maintenance activities for this building element:

- Warranty obligations
- Contracting out requirements
- Proximity to service providers

Fire and Life Safety Systems

Like elevating devices, fire and life safety systems are highly regulated building components. Building construction and size have a significant bearing on the types of fire and life safety systems that must be installed and maintained. This building category also includes security systems. Most system maintenance must be done by certified individuals with specialized training and certification, which is why related maintenance work is contracted out.

Building Element	Examples of Sub-Components	Typical maintenance activities
Fire & life safety systems	fire alarm system	• annual system testing • enunciator panel repairs
	sprinklers	• annual system testing • pressure monitoring
	security monitoring systems	• security system testing • system repairs

Key considerations when determining maintenance activities for this building element:

- Type of system installed (as required by building code)
- Contracting out requirements
- Proximity to service providers

Plumbing

Plumbing systems include those components responsible for moving or storing water and wastewater. While plumbing can cross over into other building component areas in the case of air conditioning equipment or boilers, these systems are fairly discrete and do not always require specialized skills for maintenance purposes. Some repairs can be completed by trained staff rather than contracted out.

Building Element	Examples of Sub-Components	Typical maintenance activities
Plumbing	water fixtures	• fixing leaky taps • toilet repairs • repairing showerheads
	piping	• fixing leaky pipes • replacing valves • repairing drain stems
	sump pumps	• annual pump testing • regular GFCI testing

Key considerations when determining maintenance activities for this building element:

- Complexity and scale of systems installed
- Public versus private systems (i.e. potable, storm, wastewater)
- Mix of materials used (copper vs. cast iron vs. PEX)

Mechanical

Mechanical systems include equipment situated within the building and designed to support physical plant operations. They require a fair degree of regular maintenance to stay in good working order. While certain aspects of these systems can be maintained by staff, larger and more complex equipment typically require specialized technical services that must be secured externally. As with most equipment, warranty provisions play a significant role in determining required regular maintenance.

Building Element	Examples of Sub-Components	Typical maintenance activities
Mechanical	generators	• annual technical inspection • monthly startup testing • regular fuel inspection
	make-up air units	• regular unit cleaning • performance inspection • belt replacement
	space heaters	• unit cleaning • fan replacement • control checks

Key considerations when determining maintenance activities for this building element:

- Complexity and scale of systems installed
- Contracting out provisions
- Warranty obligations

Electrical

Electrical systems distribute electricity to key building components via primary and secondary systems. They also connect components through control wiring, ensuring that system control devices can function properly. While staff can perform some basic maintenance and inspections, more recent changes to the electrical code require certified individuals to undertake most maintenance and repair work. ESA inspections or certification are now also required in most instances. There may also be an occasional need to coordinate repairs with primary electricity providers.

Building Element	Examples of Sub-Components	Typical maintenance activities
Elevating devices	lighting	• replacement of ballasts • switch repairs • bulb replacement
	power distribution systems	• receptacle replacement • panel breaker replacement
	communication systems	• enterphone system inspection • component replacement • access card reader repairs

Key considerations when determining maintenance activities for this building element:

- Configuration of electrical system
- Contracting out requirements
- Coordination with utilities

Interior – Common Elements

Maintenance of interior common elements generally involves areas of the building where residents have shared access. Generally, staff can do this work, but it can be contracted where size and scale dictate.

Building Element	Examples of Sub-Components	Typical maintenance activities
Interior - common elements	meeting rooms	• painting • blind repairs • furniture repairs
	laundry rooms	• graffiti removal • lighting replacement • ceiling repairs
	hallways	• carpet cleaning • light fixture repairs • painting

Key considerations when determining maintenance activities for this building element:

- Size and configuration of building
- Durability of common area finishes
- Volume of foot traffic in common areas

Interior – Unit Elements

Unlike interior common areas, unit elements involve spaces that are leased to residents and must be maintained in a reasonable state of repair. Under the terms of thehousing agreement/lease, housing providers have restricted access to the premises and must give notice, except in emergency situations. Given these restrictions, maintenance work is typically geared to situations where units are vacant. This helps minimize disruption to residents and provides a dedicated window of access to complete important regular maintenance tasks.

Building Element	Examples of Sub-Components	Typical maintenance activities
Interior - unit elements	appliances	• replacement of stove elements • refrigerator repairs
	fixtures	• leaky toilet repairs • replacement of kitchen or bathroom faucets
	flooring	• linoleum repairs • carpet cleaning • spot repairs to parquet floor

Key considerations when determining maintenance activities for this building element:

- Access to the unit
- Service standards for unit turnover
- Durability of unit finishes

As previously noted, when in-house staff complete maintenance tasks, housing providers must ensure that they have adequate safety training as well as proper tools and equipment to do the work. In the case of basic maintenance, there's also the opportunity to provide training for staff in the field, to prepare them for the work that will be assigned to them. Where staff are assigned maintenance responsibilities on-site, these responsibilities may also include ordering and monitoring supplies and equipment for maintenance tasks. Activities should be initiated by work order, which allows work processes to be monitored and documented.

In many instances, specialized services may be required to help properly maintain the building. These services are contracted to address specific maintenance requirements. The process of procuring goods and services is defined in more detail in section 2.5. As noted in that section, there is an on-going need to ensure that the housing provider receives best value – accountability mechanisms must be built into contracts.

DO...

- Adhere to codes and local regulations
- Maintain safety protocols and train staff
- Use certified contractors to complete more complex repairs/maintenance
- Use accountability mechanisms to ensure contracted work is completed to standard

CHAPTER 5
PREVENTIVE MAINTENANCE

Preventive maintenance establishes a sound framework for undertaking repairs and in so doing extends the service life of building components. Preventive maintenance is proactive. It can result in efficiencies and cost-savings that might not otherwise be realized.

In this chapter, we explore how taking a preventive approach to maintenance can pay dividends in terms of operational management efficiencies. We also look at examples of where you can apply preventive approaches in the maintenance of key building systems. The same can apply to energy management, designated and regulated substances and warranty monitoring, making maintenance practices even more effective.

Key topics in this chapter:

- What is preventive maintenance?
- Taking a preventive approach to maintenance
- Preventive maintenance program for key building systems
- Supporting energy management
- Designated and regulated substances programs
- Warranty monitoring program

5.1 What is Preventive Maintenance?

Preventive maintenance is a series of planned activities and protocols designed to prevent breakdowns or extend the useful service life of building components. As with other maintenance work, there are specific inspections and maintenance routines that help support preventive practices. Some of these practices are driven by warranty obligations since they sometimes require certain levels of maintenance if the warranty is to remain valid. However, preventive practices can help foster overall improvements in the building by enhancing operational effectiveness, reducing operating costs and supporting energy management.

Another key distinction for preventive maintenance is the value assessment it requires. While other forms of maintenance identify when tasks must be completed, preventive tasks are more elective in nature. Under a preventive maintenance plan, there must be compelling justification for proceeding with the work or the work won't get done.

For example, duct cleaning in forced air heating systems can be seen as an added maintenance expense that is hard to justify in the face of other competing needs. However, if analysis showed that not cleaning ducts led to a premature failure of blower motors, and the cost of completing the duct cleaning was less than the cost of replacing blower motors, the expense of proactively cleaning ducts could be justified.

Figure 5.1 – Steps in developing a Preventive Maintenance Plan

Inspections are an essential prerequisite in determining the condition of the building element and the need for repair or replacement. In the case of preventive maintenance, inspections are perhaps more important because they involve a higher level of scrutiny. This is largely driven by the need to actively seek out and identify opportunities that can result in downstream cost-savings. At the same time, during inspections, housing providers should take into account the expected service life of the building component to determine the possibility of legitimate cost savings.

Where opportunities are identified, an evaluation process weighs costs against benefits. At the heart of this evaluation is a fundamental question – is it really worth pursuing this preventive measure? In the case of larger capital items, this is a question of payback period – the length of time it would take to realize savings and justify the added remedial expenditures. This approach is similar for maintenance work, although on a shorter time scale. While one might assume that more regular maintenance will help extend the life of a given building component, this does not always hold true. The key here is finding that balance where a bit more maintenance results in substantially more cost savings over time.

It's worth acknowledging the challenges that preventive maintenance can pose as part of this evaluation process. Implementing and maintaining the plan can incur added costs and resources. There will be other impacts, including more time required to perform the preventive tasks and an increased workload. However, the benefits of extended useful life for building components and continuous service without breakdown will pay tangible dividends in terms of long term cost savings and fewer service calls due to breakdowns. For that reason, the evaluation of cost versus benefits is a critical step in the preventive maintenance plan development process.

5.2 Preventive Maintenance Program for Key Building Systems

While there are a number of preventive maintenance opportunities, these tend to be situational and vary from building to building. As part of the inspection process, there are usually prompts that help identify problem areas. Of course the most basic preventive maintenance strategy is ensuring that planned maintenance gets done as scheduled and is not deferred.

The following table shows examples of preventive maintenance measures by building element. While this is not an exhaustive list, it shows the kinds of measures that can help minimize downstream maintenance.

Building Element	Examples of preventive maintenance measures
Site	• Ensure weeping channels in brick veneer are kept clean and free of debris • Seal or regularly wash interior parking decks in winter to minimize corrosion due to salt
Structure	• Ensure weeping channels in brick veneer are kept clean and free of debris • Seal or regularly wash interior parking decks in winter to minimize corrosion due to salt
Roof	• Ensure cracks in caulking and gaps in flashing are promptly addressed to reduce risk of water penetration • Clean out roof drains to avoid water ponding
HVAC	• Seasonal balancing of heating systems to ensure optimum efficiency • Regular changing of filters to ensure peak effectiveness and reduce wear on equipment
Plumbing	• Regular flushing of drain lines to minimize risk of damage through back-ups • Seasonal service for sump pumps to avoid untimely breakdowns

Mechanical	• Maintain appropriate air flow in mechanical rooms to address equipment cooling/heating requirements • Duct cleaning to maintain efficiency of the air circulation systems
Electrical	• Maintain and test all back-up systems for operational readiness • Regularly clean light fixtures to maintain operational effectiveness
Interior - common	• Provide appropriate seasonal elevator mats to protect finished floor of cab • Ensure laundry exhaust venting is maintained to limit cold air backflow in winter
Interior – units	• Use of highly resilient paint finishes to minimize repairs (and therefore downtime) at unit turnover • Install tamperproof aerators on fixtures to ensure water efficiency

5.3 Supporting Energy Management

Finding ways to better manage energy resources helps minimize costs and maximize building benefits. Given the increasing costs of energy, there is a growing demand for asset management strategies seeking to minimize energy consumption through design. Changes to the Ontario Building Code only serve to underscore the importance of this issue, recognizing that building-in efficiency at project design can have a profound effect on reducing energy reliance over time.

For housing providers, there are clear benefits to managing energy costs, given their sizable share of overall operating costs. These costs relate not only to hydro or gas consumption but also include water and sewer charges. It's important to understand the "building as a system" concept wherein energy costs have secondary influences on many other costs. Every dollar saved on energy can have a multiplying effect for savings in other areas.

Achieving savings in energy management can be driven by conservation practices or by efficiency practices. The most common approach to conservation is to change behaviour and reduce consumption (i.e. resident education). Other measures aim to increase the efficiency of systems that rely on energy, a more common approach especially where utilities are included in rent.

It's important to caution here that while energy efficient features can certainly help improve savings in terms of consumption, these features can be costly to implement depending on the initiative. Housing providers must therefore assess costs versus benefits in order to realize actual savings. For example, the concept of simple payback is a powerful tool. It effectively measures the energy cost savings projected over the useful service life against the full cost of installing and maintaining the feature in question for the same period. The shorter the payback period, the sooner the owner will save. By contrast, where the full cost to install and maintain the feature cannot be recouped within its useful service life, there is little benefit in pursuing this alternative. This is particularly true when considering that replacing the component at the end of its useful life will come with associated capital costs.

One of the most effective ways to generate energy savings opportunities is to target high consumption, high energy cost building components. A key tool for identifying these opportunities is an energy audit. Using historical consumption data, component equipment information and building condition data, technical experts can develop a priority plan that identifies the most effective energy efficiencies to pursue, based on volume of savings and payback period. For more information on energy audits and how findings can be integrated with capital planning, see Section 6.4.

Examples of possible energy management opportunities are listed on the adjacent page by building component. This is certainly not an exhaustive list but it does indicate the types of measures that, when implemented, can improve energy management and reduce operating costs.

Building Element	Examples of energy management measures
Site	• Planting trees as wind blocks adjacent to lot lines that face prevailing winds
Envelope	• Increased insulation and sealing of leaks to minimize cold air penetration
Roof	• Increased insulation and sealing of vent joints
HVAC	• Insulating and sealing ductwork
Plumbing	• Insulating hot water supply lines
Mechanical	• Using high efficiency equipment
Electrical	• Using low voltage systems where practical
Interior	• Using compact fluorescent light bulbs (CFLs) and motion sensors in common areas
Interior – units	• Using ENERGYSTAR® rated appliances

While implementing energy management measures is best addressed at the time of construction, the next best opportunity is usually at the end of the service life of the component. Other opportunities are offered through grants and retrofit programs. While these may be enticing, they still require a cost-benefit analysis to ensure they are in the long-term interest of the organization.

Apart from repairs and replacements, energy management is also part of the broader sustainability approach to property management. It can benefit both the environment and the organization's bottom line. Energy management may include:

- Taking a preventive approach to maintenance
- Preventive maintenance program for key building systems
- Supporting energy management
- Designated and regulated substances programs
- Warranty monitoring program

By using a "green screen" approach, organizations can help make informed decisions about how they contribute to a healthier environment. As part of this broader perspective, organizations can take advantage of opportunities in the maintenance area. For more details on energy management, and renewable energy see section 6.4. on energy audits and conservation.

5.4 Designated and Regulated Substances Programs

Another area linked to preventive maintenance involves the management of designated and regulated substances. The Occupational Health and Safety Act lists 11 designated substances that require specific care, handling and remediation by certified experts. Besides your obligations to your residents, you also have responsibility under the Act for workplace safety for both staff and on-site third-party contractor employees. (For a more complete discussion on safety in the workplace, see Section 2.6.)

Of the 11 designated substances regulated under the Act, only a few are commonly found in residential construction or renovation (e.g. asbestos, lead, mercury). However, because of the health impacts of these substances, they are highly regulated and must be addressed. There are other regulated or controlled substances found in residential construction that carry legal obligations for assessment, care, handling and remediation. These include mold, polychlorinated biphenyls (PCBs), radon gas and urea formaldehyde foam insulation (UFFI). For all designated or regulated substances, you must follow established procedures for handling, remediation and disposal.

IMPORTANT!!

There are significant health risks associated with exposure to designated and regulated substances. Housing providers have an obligation to audit their facilities to assess the presence of these designated substances; and to immediately mitigate risks for residents, staff and contractors once a determination is made that substances exist on-site. Where these substances are suspected or identified on-site, owners should take immediate precautions to limit exposure and engage certified personnel to assess and undertake remediation, as necessary.

As an important first step in meeting safety obligations, housing providers should have a certified professional complete a designated and regulated substance survey for their property. This will identify the presence of any regulated substances and determine the risk they pose. The survey is a critical initial step. It identifies interim care and management procedures and establishes a basic scope of work for remediation requirements. It also enables the housing provider to meet the legal obligation to advise staff and/or contractors of the presence of such substances in the work area when conducting necessary maintenance or capital repairs.

Managing risk of exposure to substances involves the same steps as other risk management processes. Where it is determined that designated or regulated substances exist on-site, the housing provider must have an established program to manage and mitigate them. Even if an initial survey does not find these substances, they might still be discovered at a later date; or regulations could change and include additional substances to their "designated" or "regulated" lists. For these reasons, it's important for all providers to establish a program that can be updated or modified as needed.

Because of the specialized nature of identification and remediation services, assessments must be completed by a certified third party agency. You can then develop a risk management strategy based on the findings. Some findings will require immediate action, others a staged multi-year remediation plan. Develop your designated and regulated substances program with the help of a certified professional to make sure you fully address regulatory obligations and follow prescribed protocols.

The development of a designated or regulated substances program involves a number of key steps:

1. Identify the extent of the risk(s)
2. Assess options to address the risk(s)
3. Develop a remediation plan with clear protocols
4. Execute the plan
5. Monitor to confirm and document that the risk is fully resolved

The level of risk identified under the program will dictate the scale and urgency of any necessary remediation. Obviously, high-risk issues will need to be addressed immediately and must be treated in the same manner as emergency maintenance. For substances that don't pose an immediate risk, it may be possible to schedule them in the same manner as demand maintenance activities – having some priority but not categorized as an emergency. Where materials can be contained or the contamination threat is low, you could use a staged strategy to address the issue. A remediation plan can require more than a year to complete and can proceed in multiple stages. Linking it to the preventive maintenance plan is one way to ensure tracking and monitoring through the remediation process.

5.5 Warranty Monitoring Program

The final component in preventive maintenance planning is a warranty monitoring program. Contractors and vendors that provide goods and services normally include a warranty for materials and workmanship. These ensure that the purchaser gets full value for goods/services provided. However, those warranties typically require certain standards of maintenance in order to remain valid. By integrating warranty obligations into preventive or regular maintenance plans, you can schedule necessary maintenance while still observing those obligations. The maintenance management information systems offer monitoring and reporting provisions that address these kinds of tracking needs.

DO...

- Explore opportunities to extend service life and realize savings though preventive maintenance practices
- Integrate energy management practices into preventive maintenance planning
- Align designated substance programs and warranty monitoring programs with preventive maintenance practices

CHAPTER 6

Capital Repairs and Lifecycle Replacement

Lifecycle replacement and the repair of major building systems play a pivotal role in overall maintenance. While not as visible or frequent as demand or planned maintenance activities, the cost of these asset management activities are significantly larger in comparison. Major systems ensure that the building – the housing provider's primary asset – can continue to function and serve the needs of residents. Failure to replace or repair these major systems in a timely way puts the value of the asset at risk and creates potential liability for the owner. Deferred repairs can also impact on quality of life for residents and negatively influence the marketability and attractiveness of the property.

In this chapter, we will explore the concept of capital replacement tools that help support the process of major system renewals. We'll also outline how to develop plans that will strategically guide decision-making.

Key topics in this chapter:

- What is capital replacement?
- Building Condition Assessments (BCAs) – what they are and how they link to other inspection processes
- Reserve Fund Forecasts (RFF)
- Maintaining reserve funds
- Conducting energy audits
- Building and prioritizing a 5 year capital plan
- Annual capital work plans
- Executing capital projects
- Deferring projects – risks and remediation

6.1 What is Capital Replacement?

Basic maintenance involves the day-to-day upkeep of a property and its related components in good working order, including basic housekeeping, minor repairs and systems monitoring. Major building components like roofs, exterior wall systems and elevators tend to have a longer useful life, but they degrade over time. Planning to maintain major systems in good order requires a long term perspective and significant coordination given the costs and impacts involved.

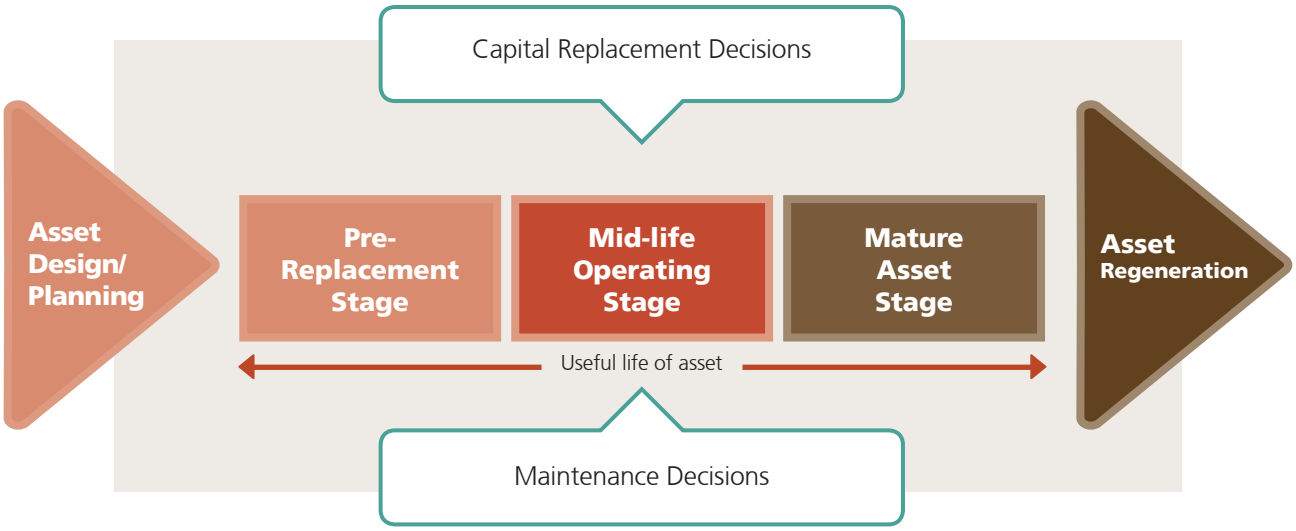
Making informed decisions at the right time – whether for one-time capital items or on-going maintenance – can have positive financial impacts and help ensure operational sustainability. As shown in Figure 6.1, capital replacement decisions are made over the life of a typical building. These decisions tend to have the greatest impact on the building as it matures. But there are also prudent capital decisions to make at the design stage and proactively thereafter; these, too can have a meaningful impact on extending the building's overall useful life. Given the substantial cost of building replacement and scarce resources available for renewal, making informed decisions through its lifecycle is the next best opportunity to ensure that housing facilities continue to serve community needs.

CAPITAL VS. OPERATING

Capital funds are generally used for the major repair, upgrading or replacement of original or existing building and site components. Operating funds are typically used for day to day maintenance of the property.

For example, the useful life of a building may be 50 to 70 years depending on its design and upkeep. The designed lifecycle of the roof component may be 20 years and as such, a major roof replacement could be necessary at least three times during the building's useful life. If the roof is not regularly maintained or fails prematurely, replacement may be required more than three times during the buildings useful life. System failure can also trigger repair needs in

Figure 6.1 - Making Decisions During a Building's Lifecycle



other systems, resulting in a cascading cost impact. On the other hand, if the roof were proactively maintained as part of a preventive maintenance program it might last beyond its 20-year design, resulting in fewer major replacements over the course of the building lifecycle. Given that a single roof replacement could cost more than annual deposits into a building's capital reserves in any one year, there are clear advantages to being more proactive in addressing capital repairs and lifecycle replacements.

Every housing provider should have an organized approach to addressing capital replacements. Similar to other maintenance functions, this approach includes gathering baseline information, establishing on-going conditions, and mapping out and prioritizing required action where the condition is not satisfactory. Given the sizable financial impact of these actions, housing providers also need financial planning for capital replacements to ensure resources are available to meet needs as they arise.

To better understand how these elements work together, let's examine a typical decision-making process for capital projects. The model illustrated in Figure 6.2 is a standard approach to developing annual capital work plans – although each organization may have different approaches. Besides identifying inputs into the process, this example also flags decision points for addressing capital needs that are identified. This chapter discusses the various steps and decision points with reference to this diagram.

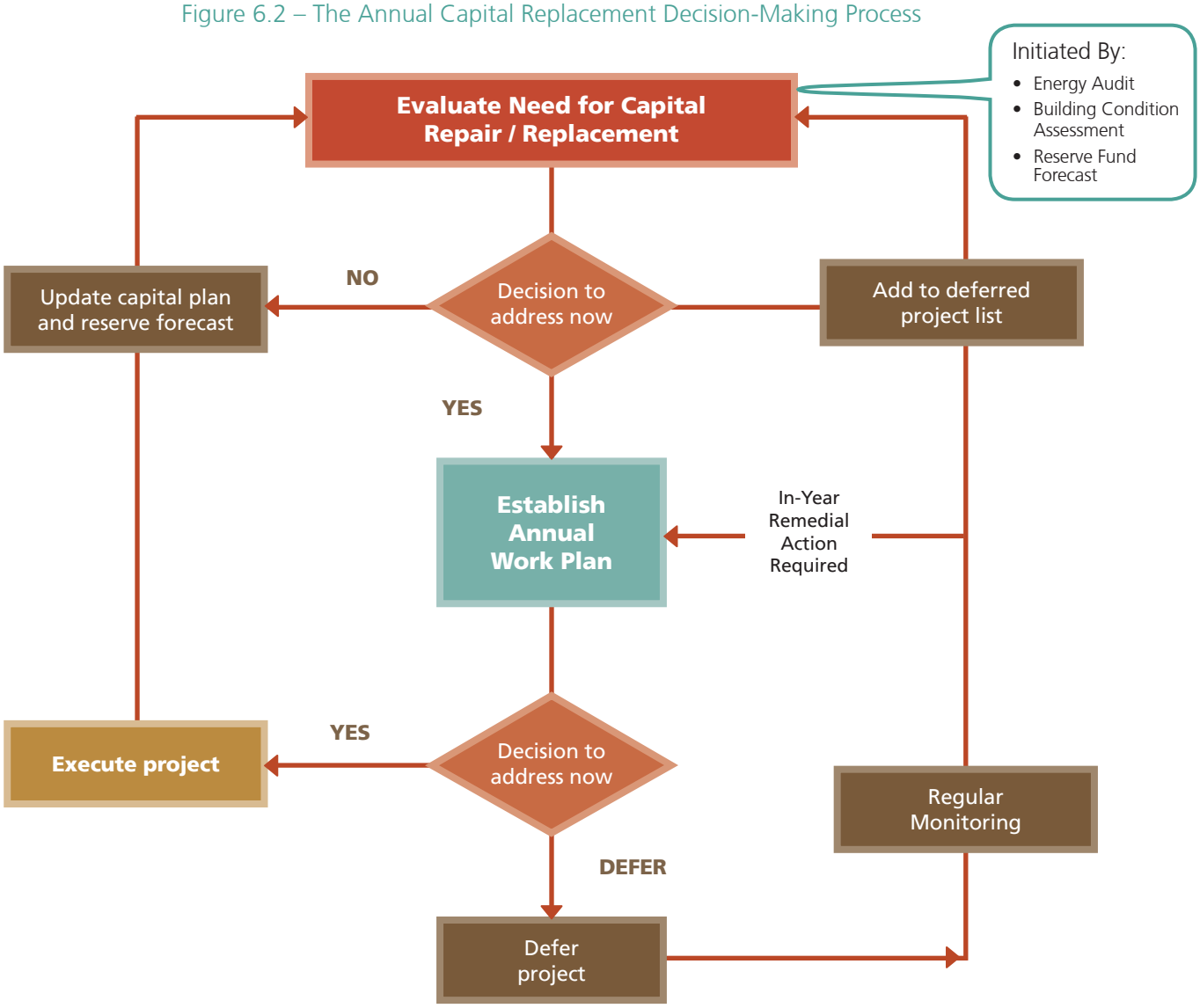
Based on the model, annual capital decision-making involves three main steps, each with associated decision points:

- **Step 1: Evaluate capital needs and priorities** – assessing planned and unplanned capital needs based on building condition, prioritized by capital project
- **Step 2: Establish an annual plan** – taking long-term plans, assessing in-year capital project options and developing a formal plan with regard to available funding, risks and capacity
- **Step 3: Implement the plan** – moving forward with execution of projects or if necessary, deferring capital projects and revising capital plan requirements accordingly.

The initial step in the process relies heavily on input from a capital plan where building lifecycle needs have been assessed and projected chronologically, along with associated costs (see Section 6.5). Recognizing that conditions change from year to year, these identified needs are then assessed against current conditions to develop a priority list reflecting "actual" work required – whether planned or otherwise. Without a formal capital plan, work in any given year would be largely demand-based, driven by inspections and resident complaints. This approach is ineffective in terms of planning and tends to be more expensive.

With a more complete sense of capital need requirements over the lifecycle of the building you can be more proactive, make more effective decisions and better align resources with capital needs. Capital resources are limited, so you must make value-added decisions when determining what projects to undertake and when. Consider that doing nothing can also have a financial impact – costs associated with liability and risks dramatically increase when health and safety issues are not addressed.

Figure 6.2 – The Annual Capital Replacement Decision-Making Process



DO...

- Establish and maintain a capital plan
- Maintain key baseline information to assist in decision-making
- Ensure necessary tasks are not deferred

6.2 Building Condition Assessments & Reserve Fund Forecasts

Sound capital decisions should be based on a comprehensive assessment of capital needs. Most property managers – both in and outside the public sector – rely on a variety of sources to get the information they need to develop capital plans. One of the more fundamental tools used is a Building Condition Assessment (BCA) and a Reserve Fund Forecast (RFF).

The assessment gives the owner a clear picture of capital needs both today and looking ahead, based on the current condition of the building.

As a result, the BCA and RFF process is specifically intended to:

- Determine the condition of each major building component through investigation and to estimate the remaining useful life of the component based on industry standards
- Identify the projected replacements/repair needs as well as the timing and associated cost for each over the planning period (30 years)
- Summarize the replacements/repairs and associated costs for the building for

A BUILDING CONDITION ASSESSMENT (BCA):

- Is a rigorous evaluation of the current condition of your building, which usually involves:
  - a walk-though of the building and property
  - a review of maintenance history & drawings
  - discussions with key staff
- It covers all major building components and forecasts replacement needs over the extended operating period of the building (up to 30 years) using standard useful life estimates

each year during the planning period and for the total planning period

- Provide assumptions regarding repairs and cost estimates
- Provide recommendations on how to extend the useful life of key building components

Using the cost estimates generated by the Reserve Fund Study and plugging in model assumptions about cost escalators, you can better align resource requirements to meet projected needs The BCA and RFF are complimentary and usually happen at the same time.

BCAs are designed to take into account current condition and past replacement work as part of the useful life analysis. However, cost estimates generated are typically only valid for up to 5 years from initial inspection. With that in mind, it is generally recommended that BCAs be updated at least every 5 years to ensure they continue to reflect current conditions. If you manage more than one building, by using the same standard electronic templates for your BCA process you can roll up the information into a portfolio summary. Use the same standard templates over time to get a consistent framework for updating and managing condition information beyond the 5-year "refresh" period. When you regularly log the actual replacement and repair activity against estimates over time, the templates can also generate a more accurate forecast of needs.

Most owners will not have the necessary qualified technical staff in-house to complete BCAs. Consultants knowledgeable in building systems should complete BCAs on your behalf. You will want to ensure that:

- Work is undertaken by qualified and experienced individuals;
- Existing condition documentation is reviewed as part of the process, including past BCAs, inspection reports, etc.;
- Inspections provide sufficient coverage of the building and form a reasonable opinion of condition – for larger buildings, unit sampling should represent a cross-section;
- Information is collected and captured in a consistent manner using electronic templates;
- Assumptions are well documented;
- Preliminary findings are reviewed and necessary adjustments made prior to finalizing.

For more information on retaining consultants see the AMC's Resource Kit.

Given the continual change in building technologies and increasing impact of energy costs, targeting energy efficiency in BCAs is one way to capture cost savings though lifecycle replacements. Where an energy audit has been completed, you should factor results into BCA background work. If no energy audit has been completed, the BCA process is a timely opportunity to get an audit and integrate the results. For more information on energy audits, see Section 6.4

AMC'S RESOURCE KIT

The Asset Management Centre has developed a Resource Kit that provides helpful information and BCA tools. The kit includes BCA capital forecast templates and replacement scheduling software, as well as a user's guide. A separate set of templates integrates energy audit obligations into the BCA template. The kit also includes a Request for Proposal (RFP) template to help owners secure professional BCA services. For more information on the Kit contact the AMC.

A Building Condition Assessment and the Reserve Fund Forecast give you a fundamental understanding of your capital needs and a way to focus efforts that extend the useful life of building components. BCAs and RFF can help you plan for major capital replacements and repairs in terms of both timing and resources. When you maintain the BCA / RFF with current information on an on-going basis, it will continue to provide an up-to-date projection of future needs. Using the BCA/RFF template capabilities can also help you strategically manage capital work plans by accelerating or deferring planned work to reflect real world conditions. An up-to-date BCA / RFF provides key information to help make capital planning decisions.

It's worth noting that the BCA / RFF as a tools provide only one dimension to capital planning; you'll need other complimentary tools to effectively plan for capital needs. For instance, completing a companion energy audit as part of this process adds value by identifying real opportunities to reduce energy costs and maximize savings. And a financial analysis of the funding required to address identified needs through a RFF provides a strong fiscal foundation, helping you to meet planned needs throughout the forecast period. The sections that follow discuss each of these tools in detail.

DO...

- Maintain a current BCA
- Link the BCA with RFF to have an on-going perspective on resource requirements
- Use available BCA & RFF templates
- Integrate energy management into BCAs

6.3 Maintaining Reserve Funds

Capital reserves set aside resources today for tomorrow's expected capital replacements and repairs. This approach also recognizes the very real cost of replacing these assets. It's more cost effective to extend the useful life of the building through timely and appropriate maintenance than to build new. In general, the lifecycle of major building components can last many years, but the costs for refurbishment or replacement at the end of their useful life are also significant. From a cash flow perspective it's easier to accumulate regular resources over time than to directly fund major capital items as needed (i.e. installments versus the whole payment). Using roofing as an example, replacement could cost $100,000 in year 25; but if lesser funds are regularly deposited on reserve from day one and allowed to compound through sound investment, the capital outlay at time of repair is significantly smaller.

Debate continues about the sufficiency of community housing reserve contribution amounts, but it's clear that when contributions fall short of requirements, necessary capital work gets deferred. Where the gap in unfunded liability increases over time, there is a real risk that the value of the building will be diminished because work has been deferred. Maintaining adequate capital reserves is essential to mitigating this risk.

To maintain adequate replacement reserves, the owner must actively manage resources using key information. You can help ensure that resources are available as needed by following these principles:

- Understand the magnitude of need
- Make regular contributions to reserves
- Do long range financial planning via a RFF
- Manage reserves to maximize investment income
- Spend on priority replacement as needed

To plan for needs, you must establish what the need is and how it may change over time. In the case of capital needs, the BCA is a primary tool in establishing the need both now and in future. Maintaining the BCA in good order helps ensure a realistic picture of capital needs as conditions change over time. Today's electronic template tools make it easier than ever to maintain current information and building needs.

In many programs, social housing providers are required to deposit minimum amounts into their replacement reserves. This amount is often prescribed by legislation; in other cases, it is specified in Project Operating Agreements. While most providers meet this obligation, some exceed the annual deposit amount to help enrich funding. Others may not meet the minimum deposit level, besides not meeting their legislated obligations, these providers may also be contributing to their own capital funding deficit.

Owners who are not required to maintain reserves can opt for a pay-as-you-go approach or voluntarily establish a reserve and fund it annually. In these cases, having a BCA is essential to understanding needs. The RFF can help determine what level of contribution is necessary to meet capital obligations over time. Where opportunities exist to enrich annual funding or make one time contributions, the RFF can help determine the downstream impact of investing today to plan for future obligations.

A RFF lets you establish a financial plan that responds to capital needs and corresponding costs identified in the BCA.

By plugging in the current reserve balance and applying informed assumptions about costs escalations and investment returns for the reserve, you can project fund balances for any given year if capital work is completed as scheduled. The forecast establishes a reserve balance at any point during the planning period by accounting for projected annual infusions and withdrawals. In this first instance, the RFF may indicate negative balances at points during the period that should be planned for. By changing assumptions, the RFF also enables the testing of scenarios that determine the conditions required

RESERVE FUND FORECAST (RFF):

- is an integral companion to the BCA that helps quantify the financial impacts of doing the required work envisioned in the BCA
- accounts for capital reserve/funding activity (ie. inputs/outputs) over time, enabling providers to plan forward for major projects on a rolling basis
- uses base assumptions for cost escalations and reserve returns to enable more accurate projections
- lines up projected needs with projected resources and illustrates where gaps or shortfalls may exist over time

to avoid a negative balance (through injections of funding, deferred work, higher-than average returns on investment, etc.). In this way, the RFF provides a powerful tool for financial management.

Most housing providers do not have the in-house technical staff to undertake RFF analysis. If you retain external expertise to conduct BCAs, you should definitely include an RFF component in the scope of work. Then you will have a complete picture of what you need and what it will cost. Where RFF is included in the scope, you should also review preliminary findings and assumptions with the consultant and make necessary adjustments prior to finalizing the RFF. In this way, you as the owner will have established a forecast that fits with your expectations and resources.

Another important facet of planning to meet capital needs is ensuring that funds deposited to reserves accumulate maximum returns when they're not being spent. For many social housing providers, contributions to capital reserves are a mandatory expectation based on funding rules. A further expectation under social housing legislation for some housing providers is that these funds will be "pooled" via SHSC Financial Incorporated – recognizing of course that not all providers fall under these provisions. The intent of this central pooling structure is to garner higher collective returns while still providing individual investment flexibility.

Bringing in additional funding can help alleviate pressures on existing reserves, either by accumulating surplus or more commonly, deferring capital projects that would otherwise have to be undertaken. Some examples of funding include:

- Grant programs for capital and energy energy initiatives such as SHRRP – Social Housing Renovation and Renewal Program, NRCan., Trillium Foundation
- Municipal energy rebate programs (i.e. local utilities)
- Residual surpluses from operations

Maximizing returns on reserve fund investments is an important part of addressing capital needs over the long term. The key is to balance investment strategies that maximize returns while meeting on-going obligations.

A final consideration in managing reserves is spending. Making regular reserve deposits, maximizing investments and having a long term funding plan are important to sustaining financial resources that will address capital needs over time. However, while resource accumulation is essential, so is sound management – especially when it comes to spending. With capital requirements and reserve fund forecasts in place, providers have the basis to make informed decisions about what to replace and when. By keeping these plans current, providers can equip themselves with the most current information on which to make these decisions. Spending faster than planned will deplete reserves sooner, resulting in a shortfall for covering future expenses. Deferring necessary work to enable fund accumulation may help improve reserve balances but can prove detrimental to building systems and, left unchecked, can result in additional repair needs and increased costs as well, spending on non-priority capital projects can also unnecessarily deplete a reserve. Prudent spending of reserves is an important part of capital planning. Providers need to find a balance between saving and spending.

DO...

- Track financial resources along with BCA requirements as they change
- Fund repairs when required, use reserves as planned
- Maximize returns on investments to hedge against future cost increases
- Actively seek out other capital funding opportunities

A Building Condition Assessment and the Reserve Fund Forecast give you a fundamental understanding of your capital needs and a way to focus efforts that extend the useful life of building components. By using BCAs and RFF effectively, you can plan for major capital replacements and repairs in terms of both timing and resources. When you maintain the BCA / RFF with current information on an on-going basis, it will continue to provide an up-to-date projection of future needs. Using the BCA/RFF template capabilities can also help you strategically manage capital work plans by accelerating or deferring planned work to reflect real world conditions. An up-to-date BCA / RFF provide key information to help make capital planning decisions.

It's worth noting that the BCA / RFF as a tools provide only one dimension to capital planning; you'll need other complimentary tools to effectively plan for capital needs. For instance, completing a companion energy audit as part of this process adds value by identifying real opportunities to reduce energy costs and maximize savings. And a financial analysis of the funding required to address identified needs through a RFF provides a strong fiscal foundation, helping you to meet planned needs throughout the forecast period.

6.4 Conducting Energy Audits

The use of BCAs in the social housing sector has become more common as a standard method for capturing capital lifecycle needs. More recently, the value of incorporating energy audits with BCAs has been recognized as a way to complete priority capital projects while realizing energy savings that improve the operating bottom line. This supports the concept of a building as a system, recognizing the links and interconnected benefits of reducing energy consumption.

An energy audit involves the following basic steps:

1. Assess the energy profile of the building based on current costs and consumption
2. Identify key systems that use energy and quantify how they contribute to overall consumption
3. Identify opportunities and options to realize energy efficiency measures and the associated costs for implementation
4. Quantify the anticipated energy savings and associated financial savings, assuming the measures were implemented
5. Calculate the payback period – the length of time it would take to recoup implementation costs using the anticipated annual savings the measure would generate

Armed with this information, housing providers can make key decisions regarding which measures offer the most energy savings and which offer the best return for dollar invested. The concept of good value is important in considering capital replacements that are energy-related. Generally speaking, the financial rewards accrued from implementing the energy measure should clearly outweigh the costs to implement and maintain the measure. This is especially true of high-efficiency replacement technology which tends to come with a big price tag. Energy audits help determine which energy options represent the best value to the owner.

ENERGY AUDIT

- a comprehensive evaluation of your building geared to assessing energy efficiency of building components
- the level of assessment can range from basic to highly technical
- the general intent is to identify opportunities where energy efficiency may be gained through remedial capital measures and,
- it an evaluation of the payback period for implementing these measures

Before conducting an energy audit, building owners should consider the following factors:

- The scope of work for energy audits can vary considerably, from high level cursory reviews that help target general areas of improvement to detailed mechanical testing and assessments which provide comprehensive energy savings calculations.
- The cost of energy audits will also vary widely depending on scope and, generally speaking, the more detailed technical work required for the audit, the higher the cost.
- Energy audits are typically required to access financial grants and resources for energy efficiency. While programs offer potential benefits, these should be measured against costs to ensure the level of audit conducted represents good value.
- Energy audits tend to have a shorter planning horizon than BCAs, given the rate of change in building and mechanical technologies. For this reason, audits may have to be refreshed more often.

Energy audits are recognized as a legitimate capital expense and as such, can be funded from capital reserves. They are also eligible for full cost funding

under some energy efficiency programs, although these programs have rules (including who can do the audit) that owners should carefully evaluate. In most instances, owners will not have the necessary technical staff in-house to do energy audits and should retain consultants knowledgeable in building systems and energy efficient technologies. When tendering for these services, ensure:

- Work is done by qualified and experienced professionals
- Energy consumption and costing information is reviewed as part of the scope
- The current energy consumption patterns for each major system are identified
- The projected payback period for recommended measures is clearly identified

Wherever possible, energy audits should be directly integrated with BCAs or have regard for BCA results. In this way, planning for capital renewals can benefit from energy saving opportunities. This is an integrated way to leverage capital dollars and provides opportunities to realize energy cost savings though replacement cycles.

6.5 Building and Prioritizing a 3 to 5 Year Capital Plan

Building owners usually operate on annual cycles for business planning purposes, largely in response to typical budget, funding and reporting cycles. When it comes to capital planning, work plans should align with the annual budget. However, given that capital projects can extend over more than one year and the fluctuating nature of financial resources to execute them, more and more providers are establishing capital work plans on a rolling 3 to 5 year horizon. This is especially true of providers with multiple buildings who benefit from planning on a portfolio basis. Having 3 to 5 year plans is of particular significance, because it gives more flexibility to stage work and take advantage of bulk tendering opportunities.

To better link long term forecasting like that provided by BCAs with annual planning, a 3 to 5 year capital-planning horizon offers sufficient planning room to execute multi-year projects while still allowing for a fairly constant work environment. Extending timelines makes work planning more susceptible to changing conditions whether economic or in the building itself.

When developing a 3-5 year plan, the basic process is to:

1. Chart capital needs for the time horizon based on most up-to-date BCA information by using the schedule of replacement/repair projects and create a multi-year project plan that includes general cost estimates.
2. Review inspection reports and supplementary information to refine the base project plan (i.e. deferred projects, unplanned priority projects, designated substances plans, strategic initiatives, etc.).
3. Identify possible revenue sources available through the planning period (both internal and external).
4. Rank projects based on a priority system (i.e. life & safety, structural integrity, legislated, etc.).
5. Schedule projects across the planning period with regard for projected resource envelope, priority ranking and project management capacity.
6. Track actual project activity annually against the Plan.

Figure 6.5 – Building a Capital Plan

Apart from capital projects, plans should integrate financial figures to establish funding envelope parameters. This is key, since planning on a 3 to 5 year horizon is an opportunity to establish a level of financial commitment that can exceed the immediate needs of an annual budget while still providing a reasonable planning horizon on which to make firm commitments.

6.6 Annual Capital Work Plans

Annual capital plans are traditionally aligned with the annual budget cycle. While similar in structure to longer term plans, annual capital work plans have a clear operational focus, laying out a detailed project plan with associated costs and completion timelines for the fiscal year. They provide direct operational authority to commission work since they are attached to budget approvals.

When developing an annual capital work plan, the basic process as shown in Figure 6.2 is:

1. **Define capital projects** for the current year based on the capital plan or if not available, use the most up-to-date BCA information. The schedule of replacement/repair projects for the current year is a solid base on which to create a project plan that includes refined cost estimates.
2. **Review inspection reports** and supplementary information to refine the base project work plan (i.e. deferred projects from prior year, unplanned priority projects, etc.).
3. **Identify preferred approach** for project execution and refine project cost estimate. For more complex projects, first define project options and then undertake a cost-benefit analysis to find the best approach.
4. **Assess the risk of not proceeding** with the project in-year – can it be deferred and if so, what is the risk of doing so?
5. **Re-confirm rank of projects** based on priority system (life and safety, legislated, etc.) as well as projected funding envelope for work plan.
6. **Schedule projects** with regard for priority ranking, seasonal conditions and necessary staging. Identify projects that fall beyond the funding threshold as pending – that way if planned projects come in under budget or need to be deferred, you can advance the pending projects within the overall approved envelope.
7. **Confirm capacity to execute projects**, whether in-house or with the assistance of project management resources. Managing external resources takes time – don't discount this!
8. **Track actual project activity** quarterly against annual work plan and approved budget.

Having a standard approach to creating an annual work plan will greatly help minimize the effort and time needed to develop the plan each year. The following measures can help standardize the process:

- **Start the work planning process early** enough in the year to align approvals with your budget cycle – for larger projects, consider starting a year ahead of actual work.
- **Maintain good historical project records** to enable sharper cost estimates for future projects.
- **Establish a cost-benefit template** that enables straightforward project assessment.
- **Define a risk management template** to provide a consistent way to rate and mitigate risks.

6.7 Executing Capital Projects

With an annual work plan in place and an approved budget, you're ready to put your capital plan into action. The overall process of moving each capital project from concept to reality is illustrated in Figure 9. Once a decision is made to proceed, the process typically involves:

1. **Develop a scope of work and/or technical specifications** – A descriptive outline of the capital work required, how it should be executed and the timeline in which it must be completed. Creating a clear scope helps ensure that potential contractors are fully aware of the building owner's expectations regarding the capital project.
2. **Tender to attain best value** – Many procurement processes set out the purchasing rules that will govern the work and provide a legal framework for receiving and selecting bids. Holding competitive bidding helps secure that best value for public money for all reasonably sized jobs.
3. **Finalizing and executing contracts** – Once a successful bidder is selected, a formal contract is signed outlining the rights and obligations of both parties based on terms identified in the tender. The contract becomes the primary tool for managing this relationship, especially where there are any disagreements regarding terms and conditions.
4. **Monitoring and project management** – Coordinating timelines, managing issues and monitoring budgets through the process takes vigilance and is often under-resourced by owners, despite the fact that it is a critical phase in all projects.
5. **Reviewing and closing projects** – Evaluating project success on completion is an effective way to maintain and continually improve processes.

For additional information on procuring goods and services and contract management, see Section 2.5.

Given that the number and cost of priority projects will typically exceed available resources, there is a real need for capital projects to be completed on time and on budget with minimum disruption to residents. Consistent under spending of capital budgets or continued project carryovers from year to year may put budget allocations at risk with funders despite all of their good planning to that point. That is why execution of capital projects is so important to the capital planning process. To promote greater effectiveness in project execution, providers will want to consider:

- Maintaining standard specifications for typical projects

- Having sound procurement policies and practices in place
- Establishing standard tender documents and processes
- Pursuing bulk tendering and purchasing opportunities with other providers or as part of sector initiatives
- Establishing standard contract documents and security provisions using legal assistance wherever necessary
- Maintaining a project tracking system that promotes direct project management accountability
- Obtaining additional resources for project management where the volume of capital projects warrant it
- Updating capital plans and forecasts as work is completed

Owners may not have the necessary staff in-house to develop technical specifications or oversee complex projects. As a result, consultants knowledgeable in building systems and contract management are regularly retained to oversee major capital projects on their behalf. When tendering for project management services, owners should make sure that:

- Work is done by qualified and experienced individuals
- The roles and authorities of staff and consultant are clearly articulated, recognizing that sound project management ensures success budget-wise and time-wise
- The scope of the work is sufficiently defined and includes inspection/monitoring of contractor performance when necessary
- Requirements or obligations stipulated for the work reflect the scale and complexity of the work being sought (i.e. security obligations, bonding, insurance, etc.)

6.8 Deferring Projects – Risks and Remediation

Capital projects regularly exceed the resources or capacity of owners to deliver in any given year. In these instances, owners must make reasoned choices as to which projects should proceed, based on their value and urgency. While ranking projects provide some sense of priority, the risk of not completing higher priority projects is a real concern. To manage this risk, owners should use a consistent way to address deferred projects by (see also Figure 6.2):

1. **Reviewing options for mitigating risk** – Where a risk exists (or is believed to exist), appropriate options for managing the risk will have to be identified and assessed.
2. **Establishing a strategy for remedial action, should it be necessary** – Developing a secondary or back-up plan is always prudent, as long as it's in scale with the complexity of the capital projects.
3. **Regularly monitoring conditions to ensure they do not deteriorate** – Managing risk for deferred capital projects means consistently assessing status with a particular emphasis on monitoring conditions. Typically this monitoring is handled through a regular inspection process.
4. **Being prepared to take remedial action to address, where warranted** – Using regular inspections and having a remedial plan are strong foundations for signaling when to take further action, where necessary. Depending on the scale and complexity of the issue at hand, securing legal advice may also be prudent to make a formal decision. If remedial action is required, one would then follow the decision tree in Figure 6.2.
5. **Where no action is required, retain the project on a "deferred project list"** – Deferred capital projects not requiring remedial action in-year should be reviewed and reconsidered at least annually as part of the Capital Repair/Replacement evaluation process.

Keeping systems operational and replacement costs low is a key objective. An important part of this concept is actively managing building systems to ensure they remain reliable and minimize risk for owners. While having a remediation plan is a useful tool for planning, being more proactive on the maintenance side is an important part of any risk management strategy. For this reason, having a preventive maintenance plan is one of the best ways to manage system risks.

DO...

- Maintain an on-going snapshot of capital needs vs. resources
- Fund replacement reserves to at least the minimum required level annually
- Maintain a current capital plan
- Actively manage risks arising from deferred projects

CHAPTER 7

Strategic Asset Management

Much of the discussion to this point has been focused on addressing maintenance demands, dealing with regular maintenance and planning for capital needs. Planned maintenance provides a more proactive approach to anticipating needs to extend useful life and manage costs. The next level of asset management involves a more strategic perspective and requires some forethought on buildings and property as a long-term investment.

This chapter explores high level concepts related to asset management planning. To make strategic decisions, you must understand the factors to consider and the tools that help with those decisions. This chapter discusses the concept of continuous improvement, particularly with regard to measuring and monitoring performance over time.

Key topics in this chapter include:

- What is strategic asset management?
- Making value-based decisions
- Facility condition index (FCI) – an effective tool for decision-making
- Managing performance – tools for continuous improvement

7.1 What is Strategic Asset Management?

While other maintenance activities are geared to addressing the day-to-day operational requirements of the project and capital replacement needs, strategic asset management takes a longer term view regarding the building and its value. It takes the perspective that the building is a real estate investment, and that maximizing investments made in it over time should ultimately contribute to sustaining its value. This is important given the significant public investment in social housing assets that have been made over the last 40 to 50 years. It's even more important when one considers the replacement cost of providing that same housing today.

Over time, as mortgage or debenture debt is paid down, buildings accumulate equity. Provided the building has been maintained in good order and the owner has made timely capital replacements, this equity should continue to grow. Where maintenance or capital replacement investments have been deferred, there is a very real potential for the value of the building to decrease, which would in turn erode any built-up equity. As the building approaches the end of its useful life, important decisions will be required about how best to protect and leverage the equity that has accumulated. In the case of housing facilities, the primary goal is to use that equity to continue providing affordable housing. This can be accomplished through renewal, re-purposing or redevelopment. To decide at what point this decision must be made, you need key information regarding building condition and asset value.

In the shorter term, managing assets strategically can help retain project value and ensure that investments made in repairs and replacements are directed in a manner appropriate to the long-term interests of the asset. The principal focus in this regard is to ensure that the building is maintained in good working order over the course of its life cycle, and to maximize opportunities to extend the useful life of major building components. Taking this longer-term focus helps owners achieve operational savings today by deferring the obligation for major asset replacements. Where assets have been maintained in good working order and equity has accumulated to a sufficient point, the property owner is then in a beneficial position to make strategic decisions about how best to leverage this equity.

Note that shorter-term principles apply to all housing providers regardless of size. This is because the financial well-being of the organization is intrinsically tied to the condition of the asset as it ages. The ability to use accumulated equity as assets mature gives organizations a few choices. Larger portfolio owners may have greater flexibility as a direct

result of the value of assets under their control. They might be able to pool resources in order to leverage investment. Strategically managing assets is important to all housing providers. However, those with larger portfolios are able to pool resources and distribute risk more broadly.

The shorter-term focus is on maximizing efforts to extend the useful life of the asset. The accumulation of equity and depreciation of the asset will require consideration of how best to use equity prior to the end of the building's useful life. These decisions have serious impacts for residents and housing providers alike. The following sections discuss the nature of these decisions and some of the tools that support them.

7.2 Making Value-Based Decisions

In commercial real estate, the motivation of asset owners is largely driven by the principle of return on investment. This may be a foreign concept to social housing providers. Just like in the private sector, significant investments have been made in the construction and operation of these assets over time. The main distinction for social housing organizations is how best to reinvest returns to sustain or increase the supply of affordable housing. For social housing providers, it's more important than ever to maximize the potential of accumulated equity by helping to sustain the value of buildings as they age.

From this longer-term perspective, you can think and act strategically by making value-based decisions over the life of the asset. But what does it really mean to make value-based decisions? In the case of maintenance and asset management this fundamentally boils down to maximizing returns based on investments made. There is a need to identify and evaluate the relative benefit of making maintenance investments. Maintenance and replacement decisions that maximize available benefits help organizations ensure they get best value for their investment. These strategic decisions can enhance the value of buildings by generating better returns on maintenance investments over the life of the project. By taking this perspective over the building life cycle, the asset condition at the point of debt retirement can be much more attractive than other buildings where no one has made these strategic decisions.

To help illustrate this concept, the following case study is provided:

A proposal is brought to the Board to install solar panels as a means of promoting energy efficiency. The cost to supply and install the solar panels is $125,000 and the useful life is projected to be 30 years. It is also assumed that it will cost $1,000 annually to perform regular maintenance on the system during its useful life.

Annual energy savings are projected to be $6,500, so the simple payback period for the total capital cost over the lifecycle is 23.84 years. If a capital grant from NRCan is secured for $75,000, the payback period gets reduced to 12.30 years but there is no certainty they will get the grant. Even with the grant, there will be a requirement to replace the panel system at the end of the 30 year period, so unless annual reserve contributions were otherwise being made for the panels along the way, the organization will face the prospect of having to seek out new capital for panel replacement in 30 years' time (assuming no premature failure).

Based on this information, the Board must decide if it is willing to proceed with the panel proposal and on what terms. In the end, they decide to only proceed if the NRCan grant is secured, primarily because of the shorter payback period. While the system could pay for itself without a grant, there would be only a minor opportunity to accumulate energy savings to put towards system replacement at the end of its useful life. By securing the grant and directing all energy savings to the replacement reserve fund, the Board would be in a better position to replace the panels at the end of their useful life without having to incur significant new costs.

Value-based decision-making over the course of the building life cycle helps ensure investment in maintenance and capital replacement for best outcomes. Taking this approach also helps maximize the useful life of the asset. Ultimately, when the useful life of the asset has been reached, these same decision-making principles can leverage the equity accumulated through sound asset management.

7.3 Facility Condition Index (FCI): An Effective Tool for Decision-Making

Maintaining asset value throughout the building life cycle is a key but challenging principle in strategic asset management. With regular maintenance, preventive maintenance and timely capital repairs, it is possible to extend the life of a building. Inevitably, though, there will be a point at which these strategic measures can no longer sustain value. The key

question then becomes: At what point does it no longer make sense to keep investing in this building?

Facility Condition Index (FCI) is a widely used industry indicator that helps organizations answer that very question. It allows owners to make informed decisions about the appropriate level of investment by assessing the ratio of repairs to the current value of the building. While this powerful tool helps determine when to consider reinvestment, re-purposing or redevelopment options, FCI can also help track the performance of a building over its lifecycle, not just at the end of its lifecycle. From this perspective the FCI ratio can be a comparative metric, tracking performance over time or against other buildings. For managers of multi-building portfolios, this is helpful in supporting decisions on where to best to allocate maintenance resources.

FCI is essentially the ratio of total repairs and capital replacements required for a building at a given point in time versus the full cost of replacement for the building at that same point in time. It is calculated as follows:

$$\text{FCI} = \frac{\text{Costs for Repair \& Capital Replacement for Asset}}{\text{Costs to Replace Asset}} \times 100$$

The calculation of FCI requires two main inputs. The first is the total cost for repairs and capital replacements for the asset. This figure is established through building condition assessments at a given point in time. The second input is the total cost to replace the asset at that same point in time. This is generally derived through a valuation exercise that accounts for current replacement cost. CMMS systems have built-in tools to help calculate FCI. There are also technical resources that can help providers calculate FCI results.

Depending on industry standards of performance, results of this formula have different meanings to different housing providers, largely based on their investment motivations. Essentially the higher the ratio of repairs to replacement value, the less justification there is to continue making investments in the asset. By contrast, having a lower FCI ratio tends to support continued maintenance investment in the asset. For comparative purposes, an FCI of less than 10% is generally considered reasonable while an FCI over 30% signals serious problems. For FCI ratios in this range, the overall benefit of continuing to invest in the asset becomes very questionable. In general, FCI scores fall into the following general categories:

- < 10% = good
- 10 to 20% = average
- 20% to 30% = below average
- >30% = very poor

While FCI is an important decision-making tool when considering building renewal, re-purposing or reinvestment, it is also an effective monitoring tool over the life cycle of the building. It can help providers with decision-making in several ways regarding level and timing of maintenance investments. In particular, FCI can be used to:

- Calculate the maintenance funding needed to maintain or stay within a certain FCI limit
- Conduct sensitivity analysis to determine the best constant investment rate for maintenance/repairs
- Determine maintenance funding deficiencies if funding investments are not changed

Through continual monitoring of FCI and modeling of investment outcomes, it is possible to help predict when organizations should reconsider investing in the existing building and instead turn their minds towards renewal, re-purposing or redevelopment options.

DO...

- Incorporate strategic asset management principles in long range planning
- Support value-based decision-making throughout the building lifecycle

Building On The Basics

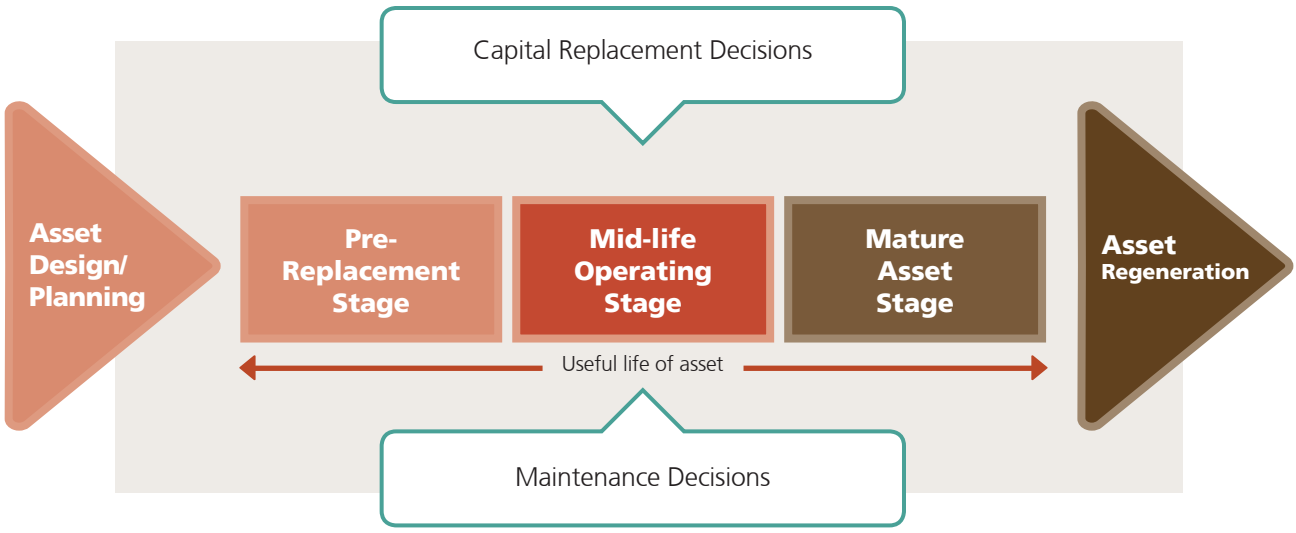
Your organization has developed its capital plan by completing each of the 3 subcomponents – now what? While capital repairs and replacements are a very significant consideration in terms of asset management, they don't account for all key decision areas. Apart from having a capital project decision making framework in place, there is a need to consider appropriate standards, inspection protocols, reserve investment strategies and alternative funding mechanisms. On the operational side, maintenance decisions also require confirmed standards and inspection protocols, a maintenance plan and preventive maintenance strategies to really provide a rounded asset management approach.

As shown in Figure 7.3, there are a range of typical work and financial tools which your organization could use in making both capital replacement and maintenance decisions throughout the lifecycle of your asset. As noted earlier, these decisions range from day-to-day maintenance issues on the ground right up to strategic capital funding issues and all points in between.

Figure 7.3 – Tools and resources to support asset sound management decisions

CAPITAL PLANNING

Work Tools	Financial Tools
• Comprehensive inventory • Building Condition Assmt. • Prioritized Capital Plan • Building standards • Standard tender documents • Inspection/review protocols	• Annual capital funding • Capital reserve fund • Capital reserve forecast • Reserve investment strategy • Alternative funding sources/mechanisms



OPERATIONAL PLANNING

Work Tools	Financial Tools
• Prev. Maintenance Plan • Maintenance schedule • Maintenance standards • Technical specifications • Annual inspection protocols	• Annual operational funding • Operating reserve fund • Surplus retention policies • Alternative funding sources/mechanisms

Conclusion

This document of best practices demonstrates that asset management is a business discipline for managing community and social housing infrastructure life cycles – from a single house to a portfolio of multiple buildings. Managing infrastructure life cycles is a discipline that the community housing sector has not always practiced but one that must be embraced to protect the housing stock into the future.

In addition to physical assets, asset management encompasses management practices, financial reporting, customer service, engineering and other business processes that directly and indirectly affect reliability, total cost of ownership and quality of life for residents; therefore, life-cycle cost. True asset management isn't a system you can buy. It's a business discipline that is enabled by people, processes, data and technology working together.

We've heard from many service managers and housing providers about the need to raise asset management standards in community housing. Funding shortfalls continue to be a concern over the medium and longer term. As the primary source for advancing asset management objectives for community housing in the province, AMC has set out to provide information, training, tools and templates to assist housing providers in better managing their assets. At the end of the day, however, it means we need to apply what we know and learn and commit to the principles of sound asset management.

AMC Asset Management Centre