



Image 1: Building revitalization project in progress.

Building Revitalization

A Proposition to Add Value Through a Holistic Approach

By Sathya Ramachandran



Sathya
Ramachan-
dranner

Residential properties are an important asset, whether owned as a primary residence or an investment. When they are condominium properties, several people with varying interests influence the decisions to maintain the common elements that impact the asset's value.

Given the extreme climatic conditions and constant challenges from the weather, the buildings in Canada consistently experience aging and a need for ongoing maintenance, mid-life service repairs and renewals, and end-of-life replacements to their elements. Inadequate maintenance and failure to repair, renew and replace aged

components contribute to depreciating property values. Reserve Fund Studies, as mandated by Ontario's *Condominium Act of 1998*, provide a streamlined process involving an engineering firm advising condo boards to anticipate the need for repairs, renewals and replacements and an estimated capital cost for each of the required measures. Benefits of a reserve fund study, whether in projecting the anticipated capital expenses for several years down the line, establishing the annual contribution to the reserve fund from unit owners, monitoring the cash flow and initiating a capital project, are critical. Nevertheless, beyond its ability to forecast significant expenses and facilitate capital projects, Reserve Fund Studies are often used as a planning tool that

may inadvertently limit the potential of a property to increase its value.

Checklist Approach

An essential stage for any capital project is planning, which includes the review of the needs, feasibility, timing, impact, and value addition. A common approach with condo boards in planning a capital project is based directly on the forecasted expense in the Reserve Fund Study tables and cash flow models. Depending on the type, magnitude and scope of work, a condo board may decide to engage a consultant with a request for proposal to develop a design or obtain a quote from a contractor. This approach addresses the identified requirements in the reserve fund study, somewhat like tick-

ing boxes in a checklist. Through the years, however, the outcome of such an approach may be a patchwork final product. This is particularly unfavourable in the case of building envelope assemblies, where the patchwork is highly visible and may contribute to poor curb appeal.

Holistic Approach

A revitalization requires a holistic approach by taking a step back to evaluate and strategize options by combining, sequencing, and phasing various projects. For instance, as with every property, the joint sealant, doors and windows, roof assembly, waterproofing membrane, traffic coating, and certain types of cladding require a mid-service life renewal and replacement within the 30-year projection of a reserve fund study, in addition to the periodic repairs and maintenance activities. Instead of dealing with them as individual components, the projects can be combined or phased and sequenced through multiple years by staggering the timing of the work. For example, building envelope assemblies experience varying levels of aging depending on their exposure to elements depending on the building elevation. Phasing the building envelope projects with similar jobs can provide an opportunity for a revitalization that can add value in terms of long-term durability, improved

aesthetics, energy conservation, user experience, occupant comfort, cost savings and possibly climate resilience.

Aesthetics

The architectural style of buildings consistently evolves, influenced mainly by the cultural and technological changes that shape our world, leading to new designs. Such changes have been rapid in recent times due to the swift evolution of technology. Now, the immediate need is for curbing and adapting to climate change. Buildings that are at mid-life no longer reflect the current trends in design, which, when combined with aging, appear outdated, especially amid new developments. A significant benefit of a building revitalization, particularly that of a building envelope, is to update and elevate its aesthetics, which can immediately increase the property's value. Such projects can benefit immensely from visualization techniques using computer-aided 3D models and graphics during the conceptual phases.

Energy Conservation

In this era of climate change, the need for decarbonization and energy conservation plays a primary role. One of the main contributors to energy consumption in a building is spatial heating, which, when improved by reducing the heat loss through the building

envelope, can directly impact energy conservation. Traditionally, the focus has been on energy efficiency measures in generating and distributing heat to reduce energy consumption within buildings. Lately, the focus has been on the deep energy retrofit of existing buildings, with building envelope retrofits at the epicentre. Such retrofit provides an opportunity to reduce heat loss during the winter months by increasing insulation, thermal bridges, and air leakage.

On the other hand, it also provides an opportunity to reduce the energy consumption for spatial cooling during summer months by reducing the heat gain through glazing assemblies. In addition, other systems can be implemented when the projects are planned with a holistic approach. For example, using building solar panels can help supplement the energy demand.

Occupant Comfort and User Experience

Another significant benefit of retrofitting the building envelope is the associated improvement in occupant comfort. For instance, when adequate retrofitting measures are taken to reduce air leakage through the building envelope, residents experience fewer cold drafts during winter, reduced outside pollutants, and overall indoor air quality improvement. In addition, the ventilation and cooling, supplemented with the proper choice of glazing and solar control, can limit overheating issues during summer. Limiting solar heat gain also provides a benefit in reducing solar glare during summer months.

Long-Term Durability and Resilience

Regardless of the challenge posed by the extreme climatic conditions in Canada, it is paramount that the long-term functioning of a building and its components are achieved to reduce the impact on the environment. Replacing a structure or its components means a significant addition to the carbon emission, regardless of the extent of sustainable measures taken during its construction. Extending the life of a building is the better solution. A holistic approach can best achieve this, as a checklist approach results in patchwork

Images 2-3: Visualization of a building envelope revitalization project aiding in updating the architectural style.





Images 4-5: Deep energy retrofit project targeting 60% energy use and 85% greenhouse gas emission reduction nearing completion.

and a continued cycle of repairs, renewals and replacements.

From a layperson's perspective, the building envelope may seem like a composition of individual assemblies and components arranged and secured to one another that can be removed and reinstalled without affecting the integrity of the adjacent components. In fact, they are overlapped and are tied to each other for multiple layers of a critical barrier separating the interior from the exterior. The interface details connecting two different assemblies or assemblies that penetrate another assembly tend to cause premature failures and aging issues. To avoid issues related to inadequate tie-ins, considering the other benefits discussed above, a holistic approach can significantly improve long-term performance.

With the changing climate, more extreme weather patterns are expected, requiring a more robust performance of building assemblies and components. The current industry practices have rapidly evolved toward achieving climate change resilience. A holistic building revitalization project would allow capturing the recent change in industry practices, whereas a checklist approach may restrict employing such practices.

Cost Effectiveness

Embarking on a building revitalization project with a holistic approach

may appear costly, but in the long run, it may cost less when several factors are considered. Building revitalization projects, when targeted to improve energy conservation, will pay off through reduced energy demand and operational costs. In addition, construction costs can be reduced by approximately 20% in a building revitalization project when the number of phases is reduced from three to two.

Informed Decision

The buildings built in the 1980s and 90s are no longer suitable for current

needs, not just from an architectural style perspective but also from their performance standpoint. Continued operation of the low-performing buildings is detrimental to the environment and does not support the climate action plan. Operating and maintaining old and aging buildings with poor performance characteristics can be challenging to manage, particularly when employing the checklist approach. Residents may feel like they are constantly in a construction zone, dealing with constant repairs, renewals and replacements. A building revitalization project can significantly enhance and update a building, thus adding significant value. Taking a step back to evaluate and make an informed decision in choosing a building revitalization project versus ticking the checklist off the reserve fund study is the preferred path. ■

Sathya Ramachandran, OAA, AAA, AANB, NSAA, AAPEI, B.Arch., M.A.Sc., is a registered Architect with advanced education in building science and over 21 years of experience in research and consulting for projects built across North America. He is the Director of Building Science practice in the Greater Toronto and Hamilton area at EXP Services Inc. He has extensive experience providing consultation and adding value to condominium properties across Canada. exp.com

Image 6: Partial but holistic approach to building envelope retrofit updating the architectural style and improving the user experience by increasing daylight through the balconies.

