

## Growing Old: Six Risk of Aging Facilities

By Kyle Christiansen



### **US Facilities are entering the Renovation Phase. The average facility age is 50 years old.**

According to the 2022 census, the average age of a US resident is 38.5. According to the U.S. Department of Education, the average school building is 42 years old. October 12, 2022. According to research by SMR, the average age of US commercial buildings, at the end of 2021 was 53 years. This average age has stayed relatively stable in studies in 2011, 2014, and 2017 where the average age was 50. In 2018, the average age began to increase slightly.

For many facility managers, the risks and costs of facilities entering mid to old age, is new territory. Facilities that are reaching 40 to 60 years old are facing a new stage of capital investment that many are not prepared for. Hidden systems are often referred to as infrastructure, including plumbing, electrical, elevator, live-safety, and HVAC distribution systems. Systems that are hidden in the plenum spaces of walls and ceiling could be ignored for a generation. Data now shows that the average age of facilities in US is around 50 years old. In life we call that middle age. Historically, younger facilities typically are managed by replacement of individual systems or cosmetic remodeling during the first 40 years. At 40, buildings become candidates for major renovation, additions, structural changes that were previously out of site and out of mind. At 50, hidden distribution systems start to fail, and comprehensive renovation is getting hard to ignore. Not only are hidden systems coming due for replacement, but there are also many other risks and costs that are associated with buildings that were constructed in the 1970's and 80's. The

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process of replacing major infrastructure systems triggers issues with code compliance, energy performance requirements, ADA compliance, red flag systems such as aluminum wiring and faulty electrical panels, and environmental contaminants like asbestos and lead-based paint which were out of mind during remodeling and system replacement efforts. To add to the renovation pressure, many manufacturers have historically stopped making replacement parts at 40 years. In today's world, that has often changed to 30 years, making maintenance of large-scale equipment like elevators, boilers, chillers, and electrical components without excessive down-time from getting parts fabricated. To further compound the problem associated with buildings 40-60 years old is the complexity of changes required by code conformance, ADA conformance, Energy code and legislation conformance, and changes in cultural uses of buildings and spaces that can make facilities space utilization a significant issue for consideration.

Buildings go through a life cycle and budgeting for the cost of each decade of use is the purpose of Facility Condition Assessment reporting. This is also referred to as capital planning. Asset inventory has become the tool by which centralized facility management is managed. Using a centralized maintenance or capital planning software can help prepare facility managers and Asset managers with the cost and priorities of Facility maintenance and management.

Facilities have a cycle of capital investment that is predictable. The painting and carpeting renewal runs on a 10-year cycle. The remodeling cycle runs on a 15-year cycle. HVAC, Roofing, Control Systems, and Pavement follow a 20-year replacement cycle. Doors, Windows, and Cabinetry follow a 25-to-30-year replacement cycle. Whatever your age, you can relate to issues of facility aging that are closely aligned with issues of human aging. Each decade has it's own set of issues and risks, here is a summary of decade-base risks for facilities:

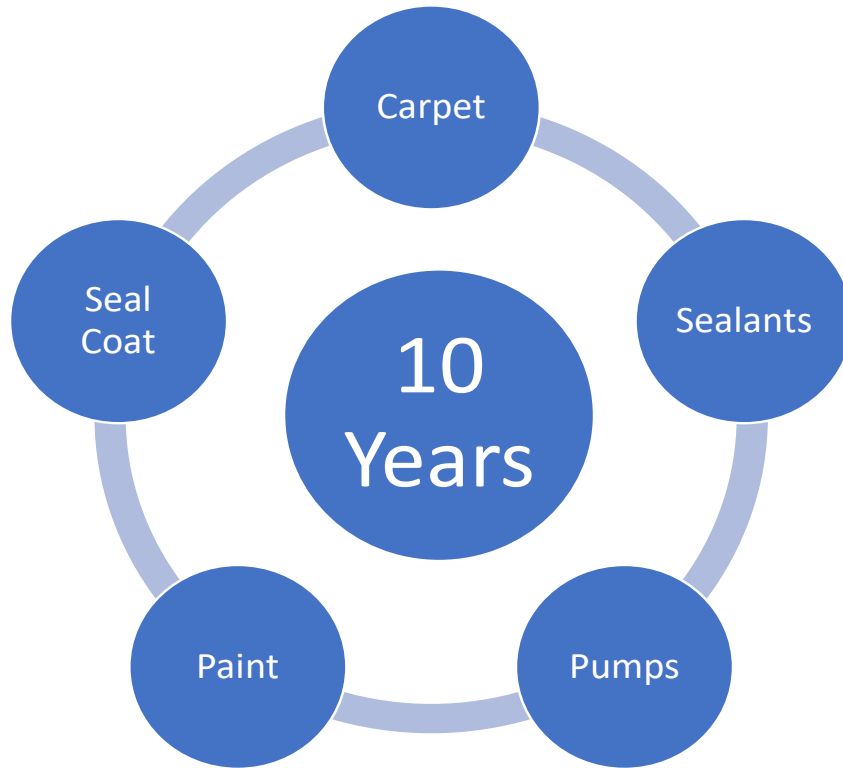
**Risk 1 - Years 1-10:** In the first 10 years, building owners are typically lulled to sleep as buildings require little to no significant maintenance. Cosmetic issues such as painting, caulking, or carpet replacement may be necessary. Many building owners sell their buildings at 10 -15 years, because maintenance and capital investment is beginning to increase

### Risk One

- Painting
- Caulking
- Sealants
- Carpeting

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**Risk 2 - Years 11-20:** In the second decade, buildings require increasing maintenance and attention. Building owners are rudely awakened by the need to replace or overhaul costly systems like roofing, asphalt, cooling equipment, heating equipment, water heaters, and anything with moving parts such as pumps and valves. Remodeling, including painting and flooring is also in need of another replacement cycle.



### Risk One Repeats:

- Painting, Caulking
- Carpeting

### Risk Two:

- Roofing
- HVAC
- Valves and Pumps
- Pavement Restoration
- Waterproofing
- Furnishings
- Remodeling

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**Risk 3 - Years 21-30:** In the third decade, buildings require more maintenance and investment. Building owners are now forced to consider the first level of infrastructure replacement, including doors and windows, restrooms, cabinetry, and terminal HVAC units. Control systems for elevators, fire alarm panels, and HVAC equipment typically require replacement in this decade as well. Cosmetic painting and flooring occurs again, every 10 years. This is a decade of additional remodeling with the added cost of doors and windows. Issues of poor construction may occur due to lack of weep holes, water proofing, or flashing.



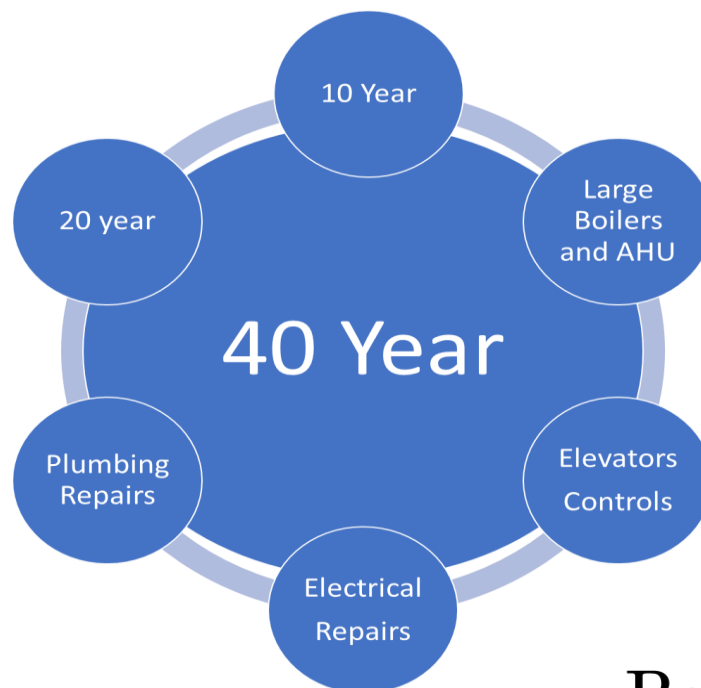
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- **Risk One Repeats**
  - Painting, Caulking
  - Carpeting
  
- **Risk Three**
  - Doors
  - Windows
  - Masonry Pointing
  - Cabinetry
  - Waterproofing
  - Restrooms
  - Control systems



**Risk 4 - Years 31-40:** In the fourth decade, buildings require even more maintenance and investment. In the 4<sup>th</sup> decade, the risks of the 1<sup>st</sup> and 2<sup>nd</sup> decades are revisited with another cycle of roofing, pavement, and HVAC equipment. Remodeling, painting, and flooring are revisited as well. ADA conformance is typically missing as design requirements were started in 1992. If remodeling turns to renovation, ADA conformance may be triggered. 20% of renovation costs for lobbies and restrooms may be required to be set aside for ADA conformance. As larger systems are replaced or structural changes are made, code conformance becomes an increasing issue. Energy performance issues are also triggered by new codes and legislation.



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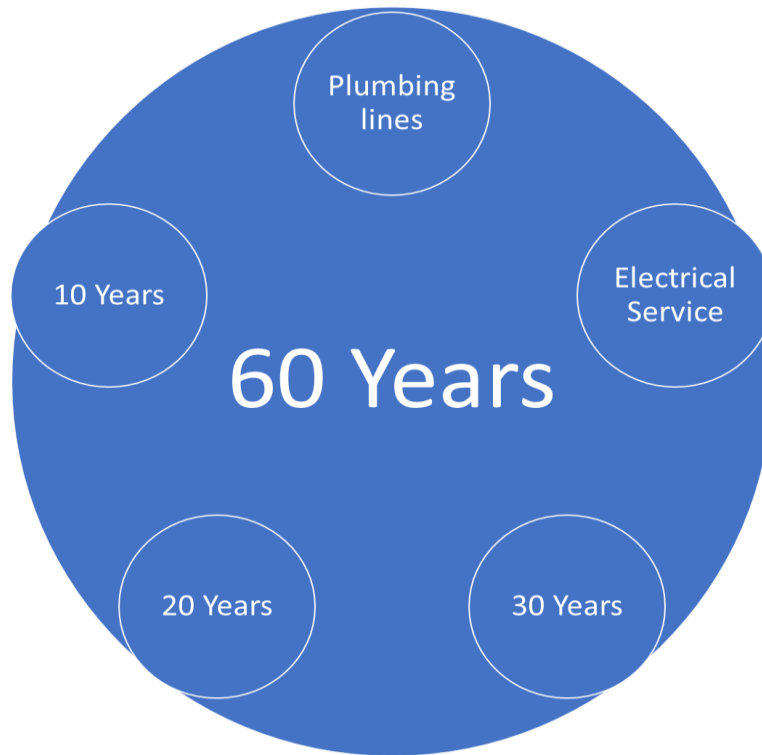
- **Risk One Repeats**
  - Painting, Caulking
  - Carpeting
- **Risk Two Repeats**
  - Remodeling
  - Roofing
  - HVAC
  - Valves and Pumps
- **Risk Four**
  - Large HVAC Systems
  - ADA, Energy, and Code Conformance



**Risk 5 - Years 41-60:** As buildings require a lot more attention and investment. In the 5<sup>th</sup> and 6<sup>th</sup> decades, hidden systems start to emerge for study and maintenance. Plumbing, electrical, elevator, fire alarms, and façade issues start to become prominent. Major renovation starts to be necessary as hidden infrastructure starts to rear their ugly head. So, in this decade, comprehensive must be considered. A 2<sup>nd</sup> cycle of doors and windows and a 4<sup>th</sup> cycle of remodeling is met with the 1<sup>st</sup> cycle of renovation.

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- **Risk One Repeats**
  - Painting and Carpeting
- **Risk Two Repeats**
  - Roofing, Pavement, HVAC
- **Risk 5**
  - Renovation with Code Conformance
  - Ceilings and air distribution
  - Plumbing
  - Electrical and Fire Life Safety
  - Elevator





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**Risk 7 – Years 50-60:** Buildings could be in good condition if they have kept up with remodeling and renovation cycles. Some maintenance may be necessary or extreme renovation may be necessary if renovation has been delayed. However, if capital investment is delayed to long, the extent of renovation may become too extensive to consider and adaptive reuse or other major changes may be necessary. On top of the risk of delayed action is the unique set of issue that pertain to buildings constructed in the 1970s that included environmental and red-flag issues. Unfortunately, buildings constructed in the 1970's were subject to a variety of experimental systems that have become known in the industry as red flags. Lead based paint and asbestos were finally outlawed in 1978 and 1979 but buildings built before this time are subject to the special pains of cleaning up these issues. Plumbing systems such as galvanized and polybutylene were problematic and short lived. Electrical panels manufactured by Federal Pacific and Zinco were destined to fail early. Aluminum wiring was used as an inexpensive alternative to copper, but became a fire hazard. Buildings of this age are typically short on fire safety systems and are not adequately braced for wind or seismic activity (depending on location).

- Red Flag Issues
- Environmental Issues
- Windows and doors
- Remodeling
- Renovation deferred with Code Conformance

Many of us have committed our careers to maintaining, renovating, repurposing, restoring, and remodeling existing buildings. With such a large number of older buildings in this world, there is no end to maintenance and capital renewal. As such, you may be interested in the overall condition of our US facilities and found the following research by SMR Research Corporation to be helpful.

“According to research completed by SMR Research Corporation, the average age of US commercial buildings, at the end of 2021, was about 53 years old (53.03 years). This finding is a slight increase over prior years. Similar studies on building age completed in 2011, and in 2014, and again in 2017, the average was almost exactly 50 years old. But beginning in 2018 the average age began to increase. **So, new buildings pop up, while all others get older – and the net result had been no real change in average age. In the last four years though, the percentage of older buildings has crept up.**

**Chain drug stores (Walgreens, Rite-Aid, etc.) had the lowest average age in our analysis at 24 years.**

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This underscores the rapid recent spread of chain drug stores; good news for them, not so much for the independent drug stores these chains are gradually replacing.

**At the other end of the spectrum, our two categories for mixed-use buildings had averages of 65 and 82 years.** This means the average mixed-use building was built all the way back in 1940's. By “mixed use,” we mean single buildings that have stores and apartments above them, for example.

**The more recently constructed buildings by type also included the commercial condo buildings now so familiar in so many places.**

Both commercial/industrial condos and commercial office condos had an average age below 35 years.

**Airports** are not generally new — but the buildings on airport property often are, with an average age of only 32 years. More in tune with the common wisdom, **medical office buildings** (a huge category) also are relatively new.

### Values of commercial buildings

The average market value of a U.S. commercial building was \$1.4 million at the end of 2021, up from \$1.27 million when we did similar research in 2014.

**If \$1.4 million seems surprisingly low to you, it may be due to what comes rapidly to mind when you think of a “commercial building.”** You may think of a landmark like the Empire State Building.

But the more typical commercial building is like the dozens you pass on your morning commute — most of them small and unremarkable. For every Empire State Building, there are thousands of local gas stations, beauty parlors, karate dojos, convenience stores, and small shops.

**Indeed, the \$1.4 million figure is a mean average. A median (midpoint) value would be lower.**

These conclusions flow from a study of market values of 9.1 million U.S. commercial buildings where values were available to us. The values do include land value. All 9.1 million properties had a combined value of \$12.7 trillion, an impressive number.

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**What is the actual split between modest and expensive buildings in terms of quantity?**

**Of the 9.1 million buildings, fully 8.7 million were worth \$5 million or less. The other 442,530 had a value of more than \$5 million.**

Looking at aggregate total values, California tops the list with New York as a close second. This is a change from 2020, when New York was slightly ahead of California. Commercial buildings in California had a total value of \$1.9 trillion at the end of 2021, or 15% of the value of all U.S. commercial buildings.

New York is not far behind at \$1.7 trillion. Back in 2017 it was California in the lead, as it is now. Rounding out the top three states with more than \$1 trillion is Texas, with close to \$1.1 trillion in aggregate total value for commercial properties.”

Roth IAMS is uniquely positioned to assist with capital planning and Facility Condition Assessment Services. Our integrated asset management approach is focused on Consistent and Defensible Data that allows you to tell your Facility Condition story and to obtain necessary funding for your risk management objectives. At Roth IAMS, our experience in a number of different sectors provides us with the unique skill set to tailor our solutions to meet a client’s specific needs and objectives. Our team of experienced project managers and site assessment professionals have unparalleled expertise in delivering consistent and defensible condition assessment data that has assisted our clients in securing over \$5 Billion in additional renewal funding for their existing buildings. From Preventative Maintenance Planning to Building Condition Assessments and beyond, Roth IAMS takes a data-driven approach to ensure we are providing our clients with the right tools and information to make informed decisions when it comes to renewing the built environment.