

# Preventive **vs.** Predictive Maintenance

How to reduce costs, mitigate risk and maximize parking structure service life with a proactive approach





# Large. Solid. Imposing.

**Parking garages may appear strong, nearly indestructible buildings. Yet they're subject to the same harsh conditions as any road, highway or bridge. From UV exposure to vehicle impacts to deicing chemicals, your parking garage is exposed to stresses that take a toll on its structural health every day.**

That toll starts on day one and — if left unaddressed — can have a significant impact on your customers, employees and business. To provide safe conditions and protect your investment, it's important to take a strategic approach to maintenance.

This guide will help you better understand the difference between preventive and predictive maintenance, as well as the three types of maintenance and the roles they play in your structure's life span and your budget. You'll also learn how a well-planned, regular predictive maintenance program is the key to managing your parking garage's structural health.

# The **3** Types of Parking Structure Maintenance and Repair

When it comes to structural upkeep of your parking garage, the ongoing management of structural health falls into three categories.



## Interim maintenance:

This is often called routine maintenance because it improves general conditions to keep your garage structure healthy over time while mitigating risk and cost.

**Examples:** General housekeeping (sweeping floors, emptying drain strainers, etc.), power washing, routine & engineering inspections, corrosion inhibitor application



## Service life replacement:

Some systems in your garage have a service life that's shorter than the life of the structure itself, like a waterproofing system or roof-level sealants. The system's manufacturer likely provides a recommended timetable for replacement before underlying damage happens.

**Examples:** Joint sealants, membrane waterproofing, expansion joints, post tension anchor termination patches/plugs



## Repairs & restoration:

Large-scale structural repair projects can become a costly priority when hazardous conditions develop. Repairs of this magnitude and their cost are often avoidable, resulting from neglecting the first two maintenance categories. What's more, major [repair and restoration](#) typically require the shutdown of all or part of your parking garage. When a structure reaches this state, it can pose safety hazards and reduce the parking garage's service life, in addition to being in visibly poor condition.

**Examples:** Concrete repair or replacement, structural connection repair or replacement, bearing condition failures, structural steel repair or replacement

# The Difference in Maintenance Approaches

**In a traditional preventive approach, you might rely on a checklist for recommended interim maintenance and service life replacement that dictates when, for example, to replace sealants and expansion joints. And while that might properly address some issues, it doesn't fully account for the unique conditions that take their toll on a specific structure.**

For example, if a manufacturer recommends floor coating replacement every seven years, that recommendation doesn't factor in that your [parking garage floor coating](#) was heavily damaged last year during a winter storm cleanup. In this situation, the surface was exposed to water damage before the coating's service life was complete — and now you're exposed to an increased cost for repairs plus the cost of coating replacement.

Predictive maintenance is more than a checklist. This approach goes beyond using historical data or service life recommendations and instead also considers the conditions

and stresses unique to a particular structure to anticipate what will happen if the situation isn't addressed.

Consider the previous surface coating example. Predictive maintenance observes and assesses the coating damage and gives you the opportunity to schedule coating replacement before water can deteriorate the surface underneath. In a preventive approach, you may have left the damaged coating in place through two more winters until the recommended replacement time. The result of earlier replacement is a more efficient, more cost-effective approach that optimizes maintenance and reduces the need for significant repairs. It's also possible that a predictive maintenance approach finds the service life will be longer than the manufacturer's recommendation, allowing you to defer replacement for a year.



## Garage A Poorly Maintained

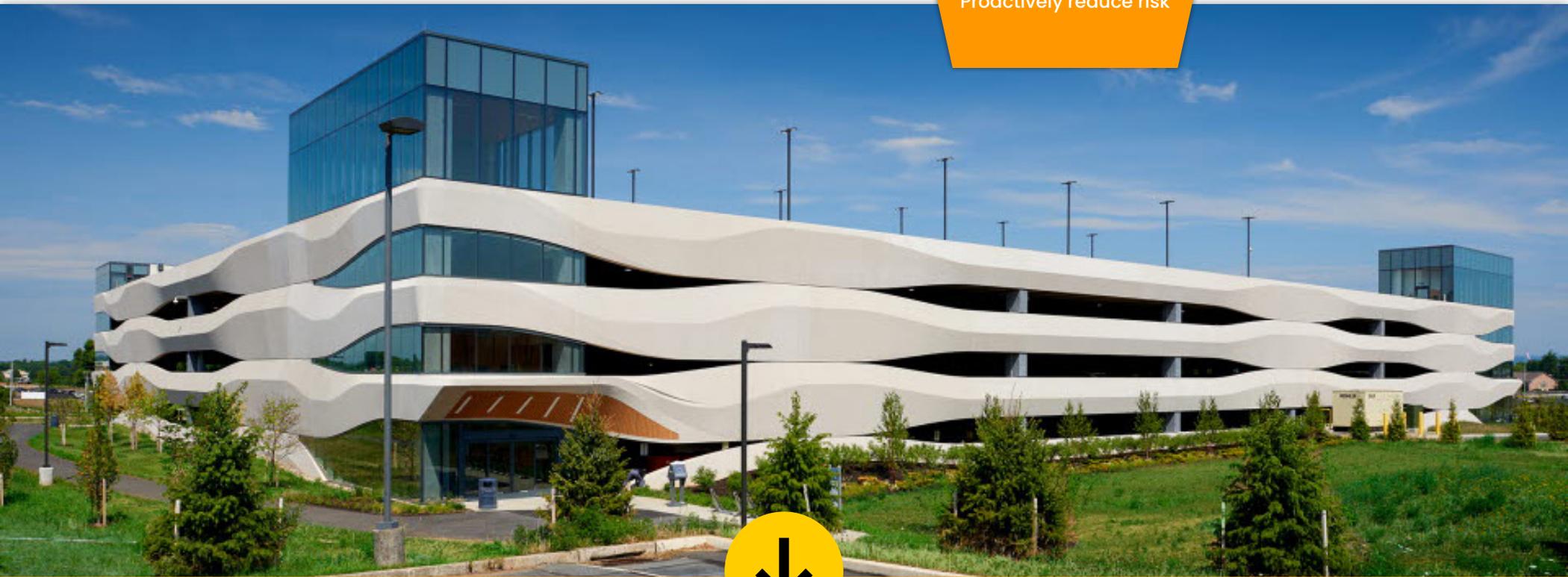
- ✘ Neglected service life replacement and maintenance make restorative repairs necessary
- ✘ Hazardous conditions develop throughout garage
- ✘ Poor aesthetics
- ✘ Service life dramatically cut
- ✘ Potential liability to ownership



## Garage B Proactively Maintained

- ✔ Safe conditions for patrons, employees and vehicles
- ✔ Good aesthetics
- ✔ Structure meets its expected service life
- ✔ Annual expenses are uniform, predictable and planned for

# The Predictive Approach to Maintaining a Parking Garage's Structural Health



## 1 Assess

**Robust inspections followed by expert analysis are key to a predictive maintenance approach.** An assessment by a structural engineer trained to look for an issue's source can help you make more informed decisions about the most effective way to upkeep your garage. It's the difference between using a patch for concrete repair or finding out why the concrete is damaged so you can tackle the problem at its root.

This assessment process should factor in the type of parking garage structure: Was it cast in place or built with precast components? Each structure type has different challenges, and the structural engineer must consider these nuances during the field assessment. No matter the type of parking structure, a [predictive maintenance assessment](#) should include a methodical, detailed inspection, diagnostic testing and a photo record of observations that includes environmental factors unique to your structure.

The frequency and type of assessment can vary depending on your structure and its condition, but inspections will ideally occur several times a year and include a spring inspection to assess winter damage.



## 2 Prioritize

**The next step in a predictive approach is to create a strategic plan.** A priority analysis factors in how a repair impacts safety for patrons and employees, the structural integrity of your garage and how repair costs might escalate if not immediately addressed. Sometimes the question is: What happens if we do nothing? If the analysis predicts the answer is a safety concern, a structural issue or cost escalation, then the problem needs to be handled as a priority.

A probable cost analysis is also an excellent tool that will help prioritize repairs. By showing the potential cost for issues, it can anticipate that a repair will cost \$500 and require little downtime if handled now. The analysis may also show that the same repair, if delayed for three years, could cost up to \$15,000 and shut down part of the garage for an extended period.

## 3 Implement

**After assessment and prioritization, it's time to execute the strategic plan.** From tackling necessary structural repair to developing an annual maintenance plan to continual monitoring and reprioritization, putting the plan into action will help you proactively reduce cost and risk.

Education is another important aspect of predictive maintenance implementation. Even the most effective solutions have a more limited life span if not properly maintained. Use maintenance standards to guide proper structural care, from the correct process for power washing in spring to the least-damaging way to plow snow in winter.

[Ongoing maintenance education](#) helps ensure that proper structural care is regularly reinforced and that new employees get the critical training they need to become an effective part of your team.





Predictive maintenance is not a one-off project. Instead, it's a comprehensive program that requires regular assessment, prioritization and implementation by a team of structural experts. Expanding your approach from preventive tasks and reactive repairs to a predictive approach can help you reduce costs, mitigate risk and maximize your parking structure's service life.

Choose the partner who can help you create a predictive maintenance program tailored to your facility. Talk with a StructureCare® expert about protecting your parking garage's structural health.

### **Get in touch:**

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