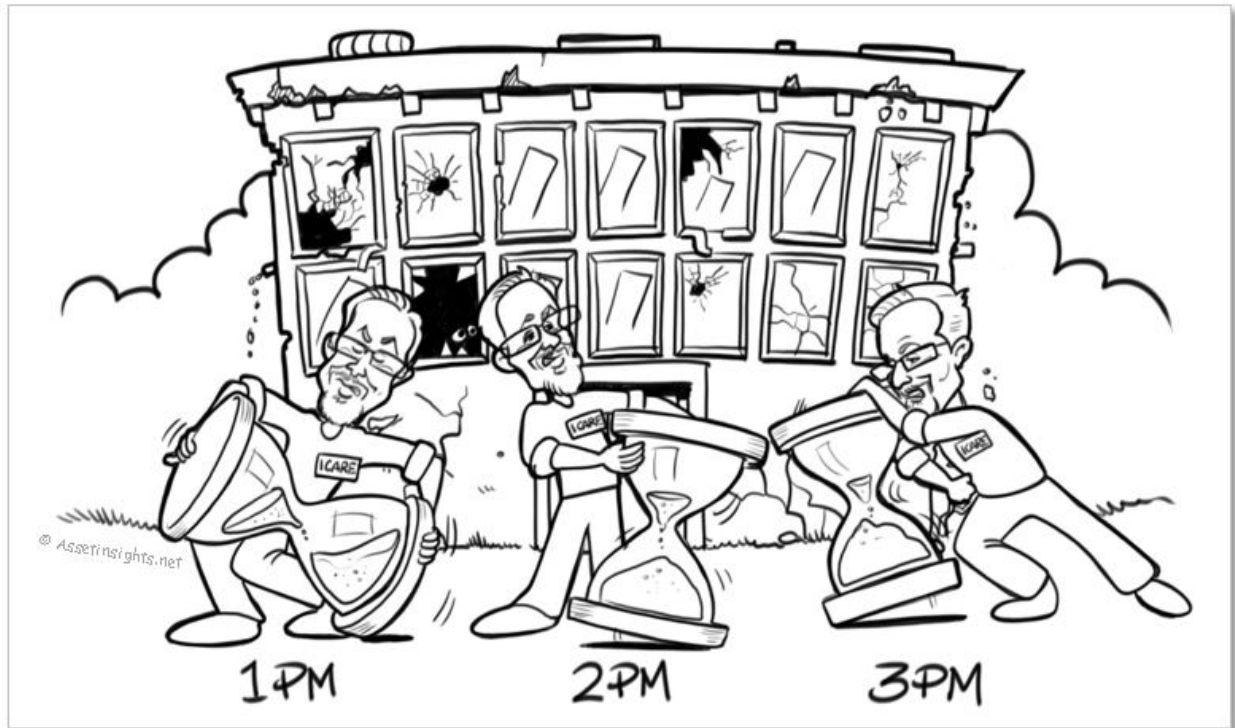


The Grasshopper's Lesson on Asset Management

David Albrice, April 25, 2015



"Some people are making such thorough preparation for rainy days that they aren't enjoying today's sunshine" - William Feather.

One fine summer's day a Grasshopper was hopping about chirping and singing. An Ant passed by carrying a large bag of corn husks on her back.

"Come and dance with me" said the Grasshopper, "Why not peel the husks off that corn and we can both use it to sit comfortably and enjoy the glorious sunshine"

"I'm using the husks to build a shelter for the winter," said the Ant, "and recommend you to do the same."

"Winter?" said the Grasshopper, "It's summer now!" But the Ant went on her way and continued her toil.

When winter came, the Grasshopper found himself shivering from cold while he peered through the window of Ant's energy efficient home.

The Ant saw the hypothermic Grasshopper through her insulated window and invited him inside on the condition that he listen to a story about the five ways to prepare for the end-of-life replacement of assets (such as roofs and boilers).

The Ant thought it would be good to use human beings as an analogy to help educate the Grasshopper and impress upon him the importance of planning and preparation.

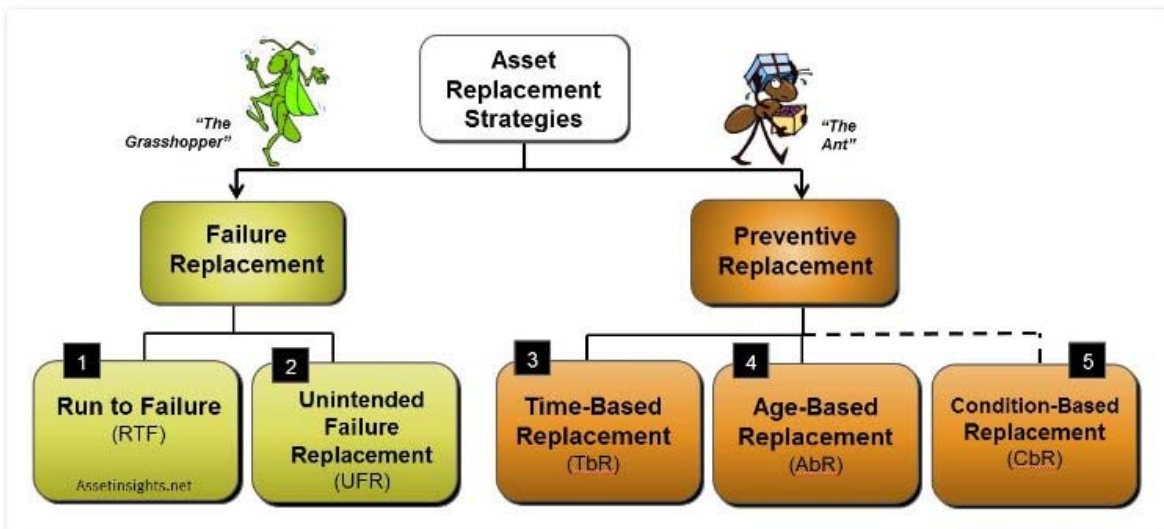
The Ant began: "Most humans wait for their assets to fail before doing anything; but some humans do try to plan ahead". She continued, "For example, they often let their roofs leak before they start fixing them."

The Ant explained to the Grasshopper that there are two asset replacement paradigms:

- Failure Replacement (Grasshopper-style) - Replacement of an asset after it has failed. Sort of like party in the summer and then freeze and starve in the winter.
- Preventive Replacement (Ant-style) - Replacement of an asset before it has failed. Work in the summer and then relax and stay warm in the winter.

"There are further variations of these strategies," said the Ant. "I want to tell you about five different approaches to the end-of-life of assets... and here is a picture to illustrate".

The Ant handed the Grasshopper a network diagram of asset replacement strategies.

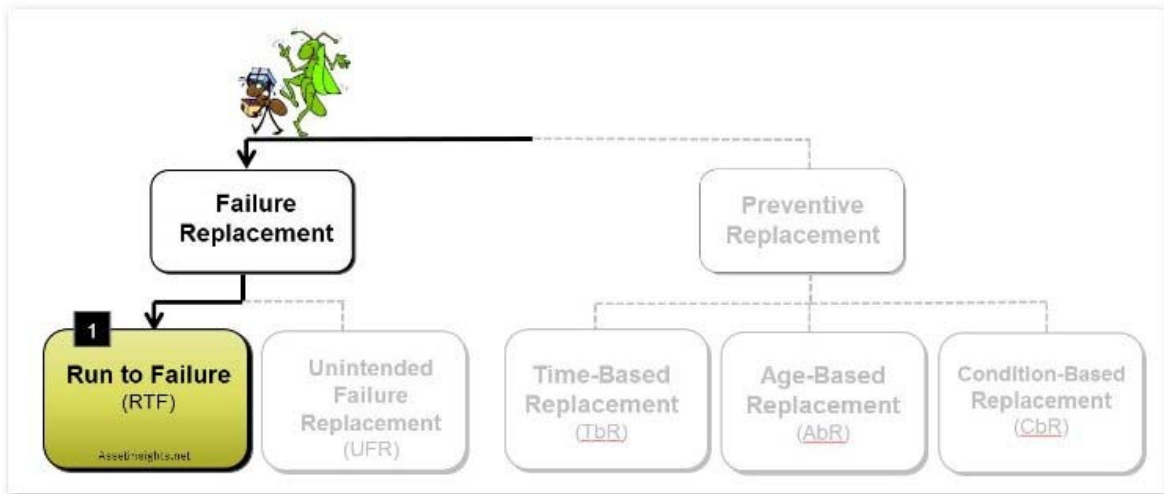


The Ant and Grasshopper sat comfortably in the warm and dry living room and pondered the diagram.

1. Run to Failure (RTF)

A conscious decision is made by the owner to neglect the asset until it fails. The owner understands and accepts the consequences of failure. There are many different [types of consequences](#) that may arise when assets fail, some being more severe than others.

An example. A professional assessment informs owners that their roof is very likely going to start leaking within the next five years. The owners understand the eventual consequence and decide not to spend any money on repairs or mitigation in the meantime. They wait for the leaks to start.



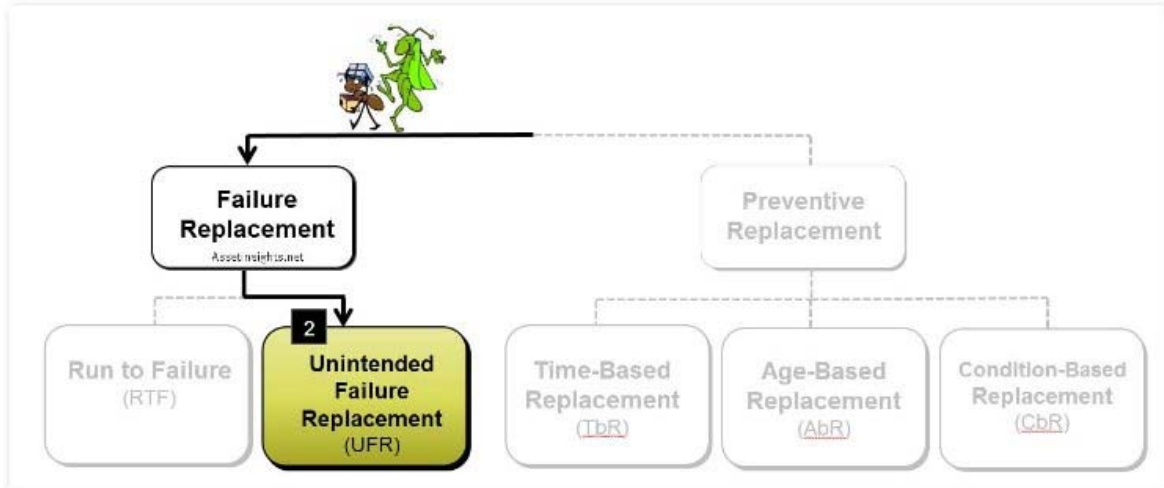
The Ant said. "You see, Grasshopper, the road leading to RTF is somewhat like you and I spending the summer singing and dancing while at the back of our minds we know that winter is coming. We have both agreed that when winter does arrive we will pull up our sleeves and together get down to some serious business."

The Ant passed the Grasshopper a hot water bottle and said: "Continue listening closely".

2. Unintended Failure Replacement (UFR)

The owner makes no plans and simply reacts, with surprise, once failure has occurred. Failure was not anticipated. This is an unintended consequence of factors such as poor planning, ignorance and inadequate maintenance budget. [Ignorance is the first domino](#) in the chain reaction leading to asset failure.

An example: The owners are angry and pointing fingers at each other when they suddenly discover that their roof is leaking and nobody was aware that this was about to occur. Things are heated and emotions are running high as a result.



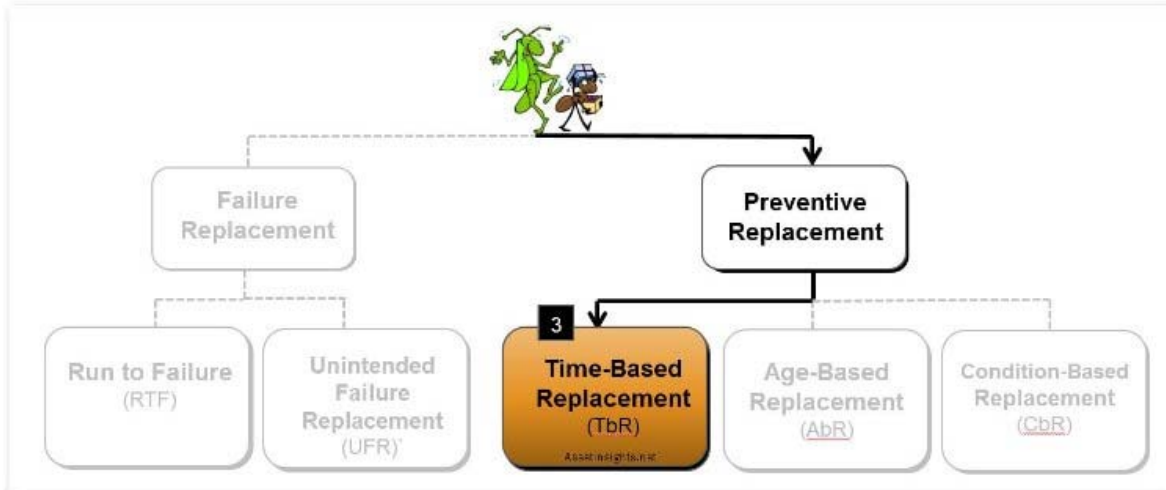
The Ant turned to the Grasshopper and said, "You see, if we spend the summer singing and dancing together oblivious to the fact that there is a winter ahead, we will find ourselves faced with the harsh reality of winter. When it sets in, we may both die from exposure."

The Ant now had the Grasshopper's attention.

3. Time-based Replacement (TbR)

Replacement of an asset when it has provided a certain amount of in-service value to the owners, but the owner's needs are changing and there is pressure to consider alternatives. Some assets degrade physically while others simply become obsolete even though they may be in good condition. The question is whether they [degrade or fade over time](#).

An example: the owners are informed that their boiler is working but it is not energy efficient. They are faced with the decision to continue with the existing boiler until it reaches the age where it is completely worn out or to advance the replacement schedule in order to leverage the benefits of a more efficient one sooner.



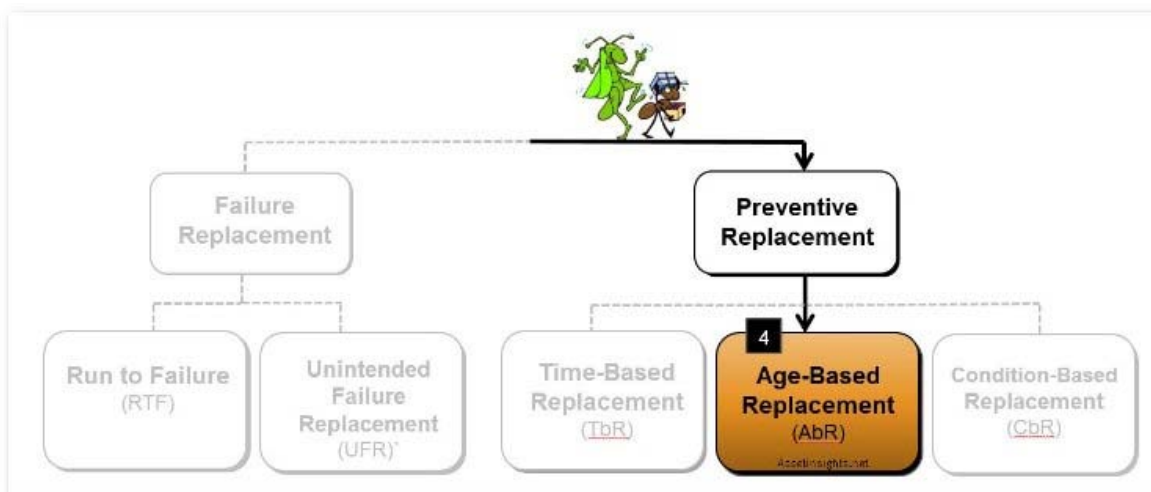
"You see," says the Ant, "the road leading to TbR is like us spending a few hours working each day during the summer because we know that the shorter days of winter will make it harder for us to work as much. We must always be open to new ways of doing things."

The Grasshopper was starting to feel his toes again. He leaned in more closely to listen to the Ant ongoing lesson.

4. Age-based Replacement (AbR)

Replacement of an asset when it reaches a certain age, which is usually defined as calendar age. This approach relies heavily on statistical data on the average service lives of assets. Owners need to know [how long assets last](#) in their local climate zone and based on their local exposure conditions.

For example, a published table indicates that a certain type of roof has a typical service life of 25 years. Therefore, at year 24, the owners get themselves ready to replace the roof.



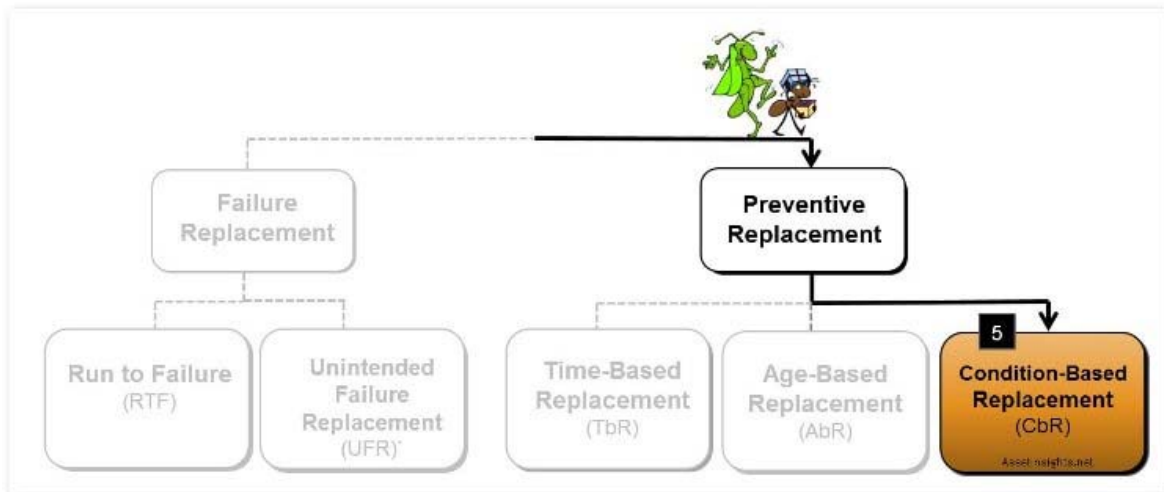
The Grasshopper chirped "Ah, I think I understand. The road leading to AbR is somewhat like us spending the first 60 days of the summer singing and dancing. On day 61 we put on our work clothes and start preparing for the winter."

The Grasshopper was warming up to the Ant's stories.

5. Condition-based Replacement (CbR)

Replacement of an asset when its performance deteriorates below a certain observable/measurable threshold. CbR requires a good history of measured conditions in order to identify trends and patterns in the data and establish when replacement is more appropriate than continued repair and maintenance.

For example, the owners commission a thermographic scan on their electrical panel boards every three years to detect hot spots which will establish when to replace the asset. It is only through deliberate inspections and/or diagnostic testing that owners may find some of the things that are [hiding in their building](#).

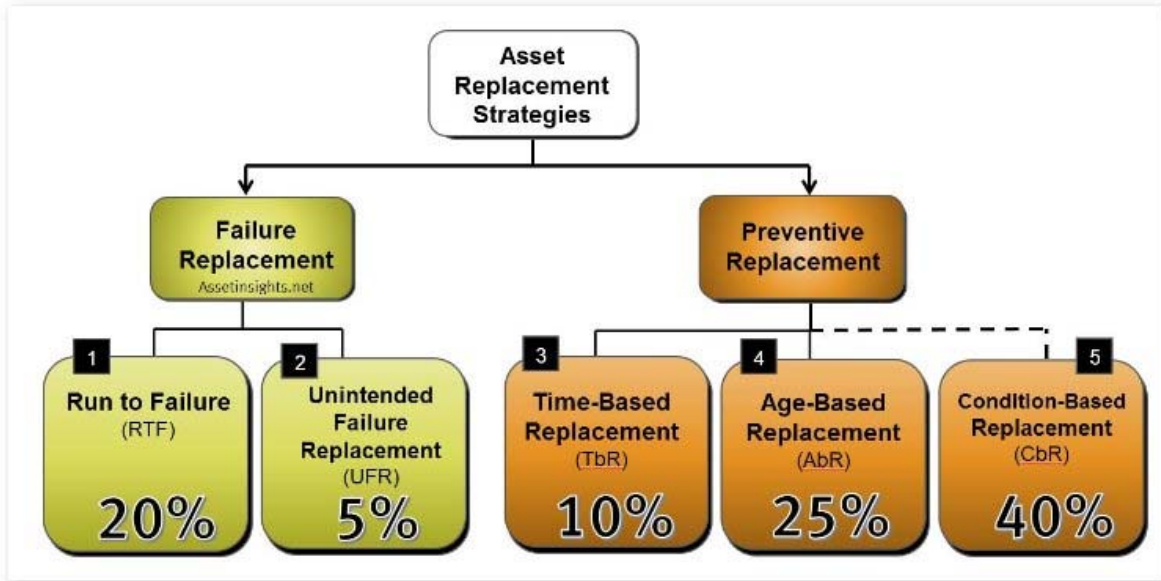


The Grasshopper said "I'm starting to get it. The road leading to CbR is somewhat like us spending the summer thinking strategically about how much work is needed on different days in order to prepare for the winter. On rainy days and towards the end of the summer we must start to work harder. On the sunny days we can sing and dance together."

So where does this insight take the Ant and Grasshopper?

Buildings are made up of many assets that require different strategies. Often the Ant's approach is the best while other times the Grasshopper's take on things is okay.

The final diagram that Ant passed to Grasshopper summed it up nicely. It is important to align a strategy to the personality of each asset in order to ensure responsible stewardship.



Ant turned to Grasshopper and said, "So, Grasshopper, would you agree that we need to work together?"

"Yes," said Grasshopper, "I can see that your approach should be taken for about 75% of the assets which still leaves about 25% room for us to play."

They had hatched a great plan for next summer.

Do you know which of your assets are being managed Grasshopper-style?

This blogpost was adapted from the Aesop's Fable of the Grasshopper and the Ant.

David Albrice is a Senior Asset Management Specialist. His experience with insects comes from time weeding during the summer months. David can be followed on [Twitter](#).