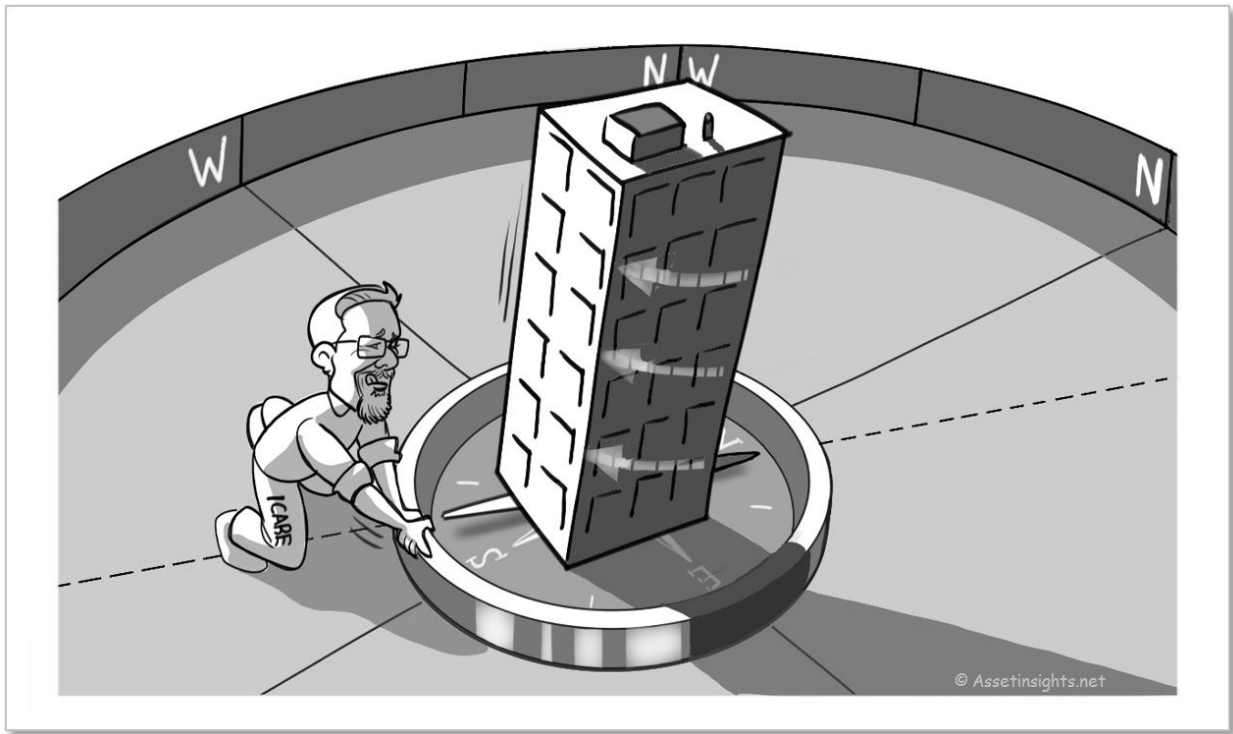


# The Frogs' Guide to Critical Decision-Making

David Albrice, May 9, 2015



*"There is no decision that we can make that doesn't come with some sort of balance or sacrifice" - Simon Sinek*

Two Frogs lived together in a pond. But one hot summer their shallow pond dried up. In a panic, they left the pond to look for another damp place to live. They came upon a deep well and the first Frog (named, 'Yay') peered over the edge, and said to the other, "This looks like a nice cool place. Let's jump in and settle here."

But the other Frog (named, 'Nay') had a wiser head on her shoulders and replied, "Not so fast, my friend. What if this well dried up like the pond, how will we get out again?"

Yay and Nay hopped along and continued with their search for a safe place to live. Soon they came to realize that they would have to travel a very long distance on small legs to find another good source of water and would perish on this quest.

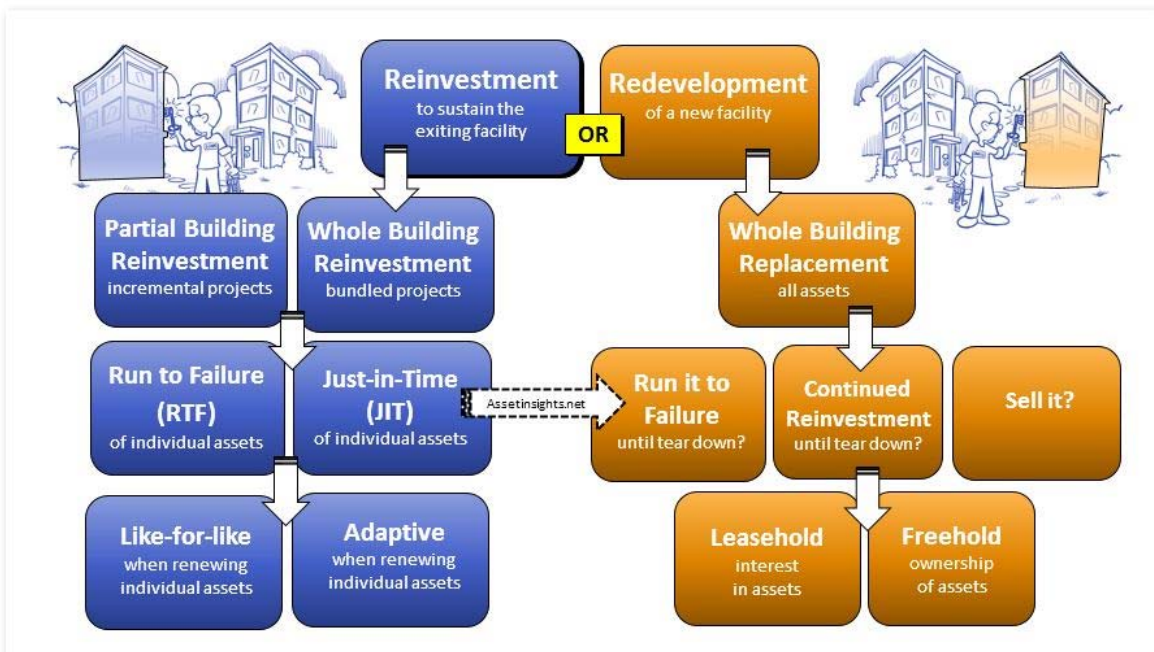
They were confronted with a dilemma. They were forced to backtrack and find a solution that either enabled them to continue using their dry shallow pond somehow or relocate to the dangerous well.

Humans face similar problems in managing vertical assets (buildings), linear assets (infrastructure) and portable assets (equipment/fleet).

Just as ponds can dry up and wells can present hazards, so too can assets lose value (dry up) and present dangers (cracks, corrosion, blisters, etc). While the challenges for asset managers are many and varied, there are essentially four types of decisions:

- Reinvestment vs. Replacement
- Run to Failure (RTF) vs. Just-in-Time (JIT)
- Like-for-like renewal vs. Adaptive Renewal
- Freehold Ownership vs. Leasehold Interest

These four decisions are embedded graphically in the following decision tree.



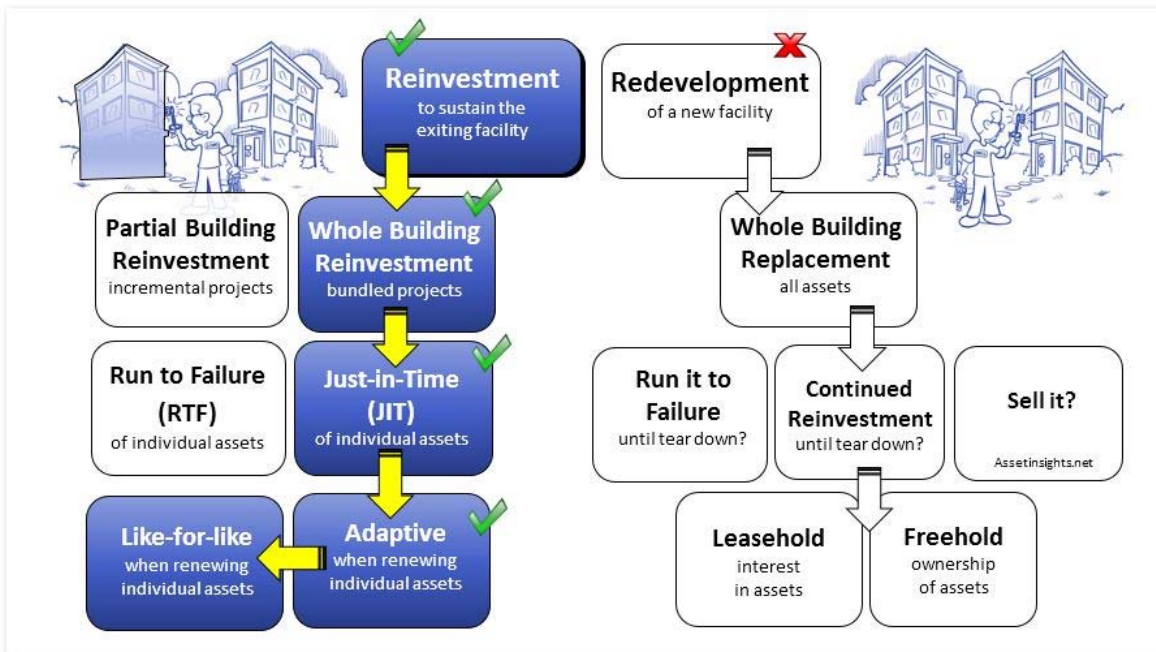
*How did the two Frogs approach their dilemma?*

## Decision 1. Re-investment or Replacement

When an asset is young it is obvious that we simply spend money on maintenance to sustain its ongoing performance. As the asset ages we start to also spend money on repairs. As it gets even older we may find that the maintenance-to-repair ratio (MRR) has shifted and it no longer seems to make sense to keep repairing it. At some point we start to think about the need for a shiny new asset.

One of the key decisions arising in older facilities, particularly those that are suffering from an extensive backlog of deferred maintenance and/or becoming functionally obsolete, is whether to continue to reinvest in the sustainment of the aging facility by renewing major components, such as roofs and boilers, or to completely reconstruct that facility.

This is referred to as the “Reinvestment-Redevelopment” problem. Reinvestment is the obvious choice with most young assets and becomes complicated as they age.



***The two frogs had a choice...***

Yay suggested, "We could dig some holes in our existing pond in order to get down to the water table to release some moisture. This way we don't have to move." Nay replied, "Rather than put the effort into digging holes, let's spend our time finding a new pond that already has water in it."

Yay favoured reinvestment while Nay thought they would be better off with redevelopment.

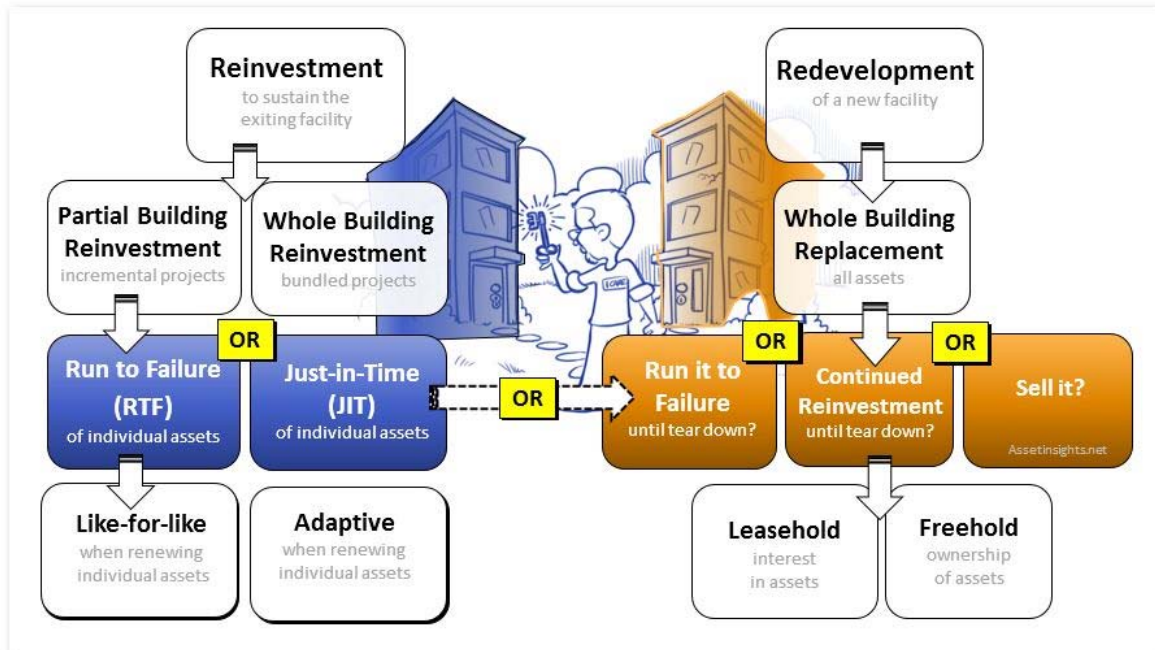
**Decision 2. Run-to-Failure or Just-in-Time Replacement**

Run to failure (RTF) is a conscious decision to neglect an asset, or facility, with full knowledge of the consequences of such inaction. Sweat-the-asset (STA) is a colloquial expression for extracting more value from an asset beyond its original intended value exchange.

While these approaches are not permitted with statutorily-regulated assets, such as fire safety equipment, there are some assets that are acceptable candidates for RTF or STA -- but only under controlled conditions and with sophisticated knowledge of the leading indicators of asset

deterioration and failure. This is the art and science of Just-in-Time (JIT) replacement where an asset is replaced just before functional failure occurs.

The navigation of the time periods leading up to these failure points is referred to as the Risk-Threshold problem.



***The two frogs considered their options...***

After thinking for a while, Nay said: "The pond is going to dry up anyway so we may as well just have fun until that day arrives. Let's allow it to Run-to-Failure (RTF)."

"Or... we can take steps to keep the pond moist by placing leaves over it to prevent the water from evaporating in the hot sun," suggested Yay. "By covering it with leaves we will have some control over the rate of evaporation and can then plan when to leave the pond when the leaves no longer help. Sort of like the Just-in-Time (JIT) approach."

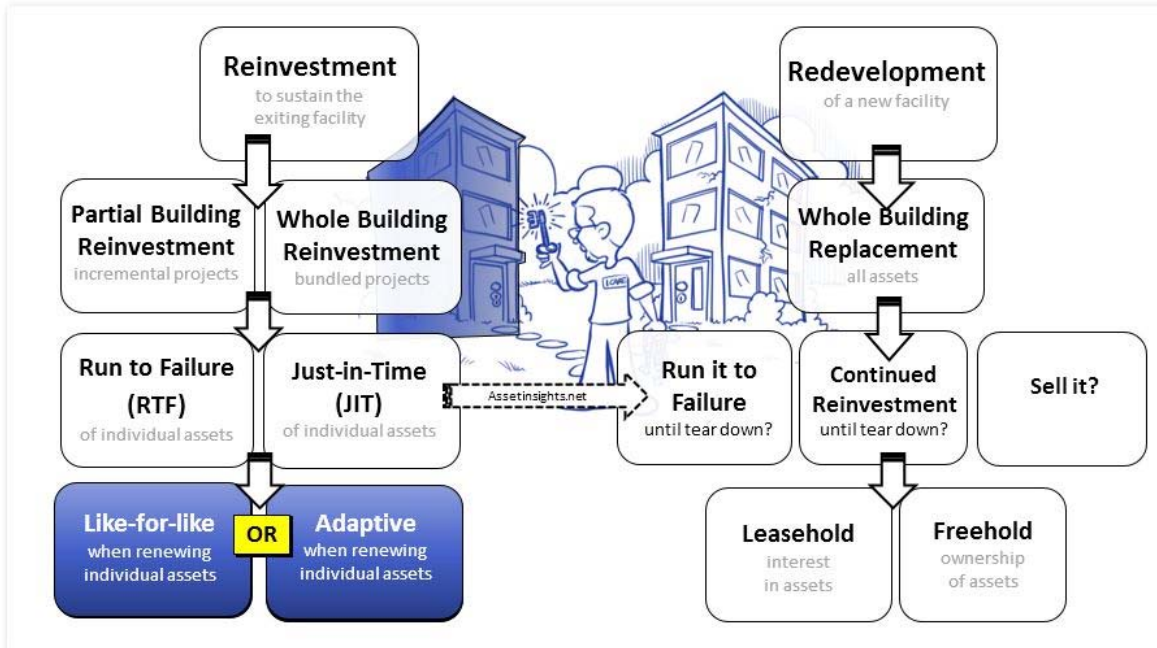
**Decision 3. Adaptive Renewal or Like-for-Like Renewal**

When it comes time to replace an asset, we are presented with a new set of choices. We can replace with the same thing but new or take this opportunity to introduce some improvements.

Adaptive renewal opportunities - arising from new products and technologies - pose a challenge for the decision makers. One of the most common examples is energy efficiency measures, such as the replacement of a mid-efficiency boiler with a new high-efficiency condensing boiler.

The decision makers are tasked with having to evaluate the costs and benefits of either leveraging the existing boiler while it continues to fulfil its remaining service life (which could be many years or decades) or invest in the upgrade now with upfront incremental cost but also paybacks through reduced energy consumption.

This is referred to as the “Defender-Challenger” problem.



### ***The two frogs evaluated their options...***

"Let's find another pond exactly the same as this one." said Yay, "While we know that it will also dry up one day, it will still give us a few years of good service."

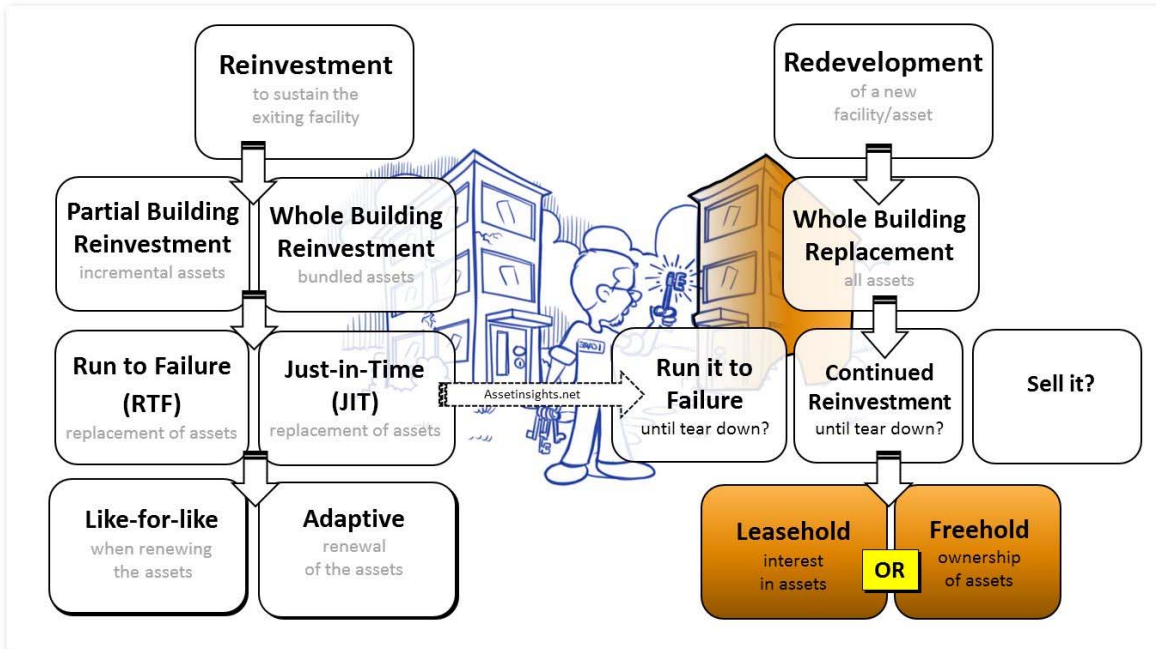
Nay thought about it for a while before responding, "I prefer that we look for something better to improve our odds. Why don't we install a step ladder at the deep well so that we can get out if it dries up?"

Yay was favouring the like-for-like approach whereas Nay wanted to consider adaptations and upgrades.

### **Decision 4. Freehold or Leasehold Acquisitions**

A fourth decision facing the asset management team is whether to satisfy an emerging need by constructing a new facility (freehold) or entering into a lease agreement (leasehold) on an existing property. Each portfolio owner will find an optimal freehold:leasehold ratio that complements the balance of assets and interests under their stewardship.

This is referred to as the problem of “Assets vs. Interests”.



***The two frogs have a choice...***

Nay said, "We can construct another pond for ourselves and be the joint owners. We can design the layout of our new pond and we are only limited by our imagination...and budget."

"Or..." Yay croaked, "We could go out and rent some water space from the local beavers who have already created a nice dam upstream. Since we know from experience that ponds have a habit of drying up, I think we would be better off renting space."

***Look-before-you-leap or Paralysis-through-analysis?***

The four decisions presented above are multi-faceted and require insight into the correlations between many attributes of assets (physical, financial, legal, political.) They also require an appreciation of the consequences of action or inaction.

Understanding the cascading impact of decisions is not a straight forward exercise, particularly since we often operate with limited information and have to make assumptions. It is this ambiguity that can lead decision makers down the path of wanting more and more...and more information before they feel comfortable that they can then make the "right" decision.

***Closing Question: If you had to make a choice, would you rather be criticized for failing to "look before you leap" or for "paralysis through analysis"?***

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*This article was inspired by the Aesop's Fable of the Frogs and the Well.*

*For more details about these four decision points, please read the [paper](#) presented at the 2014 joint conference of the Institute of Asset Management (IAM) and Institute of Engineering Technology (IET).*

*David Albrice is a Senior Asset Management Specialist at RDH Building Engineering Ltd. His experience with finding ponds for clients comes from his research interests in decision-theory. David can be followed on [Twitter](#) and his other asset management articles can be read on [LinkedIn Pulse](#).*