Slide 1

Adaptation pathways: structured decision-making for a changing world.

This presentation introduces the general principles involved in the adaptation pathways approach, while a following presentation presents a case study of an adaptation pathway in action. The presentations and a set of accompanying fact sheets have been created by partners involved in the Thames Estuary 2100 Plan.

Before we start, Kristen Guida of the London Climate Change Partnership explains why we need the adaptation pathway approach.

"*Even as we work to reduce our carbon emissions, we know that some amount of climate change is inevitable – it's already affecting us and we need to adapt. But the uncertainty about how much change we can expect in the future can make adaptation seem really daunting. Using adaptation pathways can help us manage that uncertainty and work around it, to time our decisions as we need them – that way we can plan effectively to adapt and avoid making decisions that are expensive or difficult to reverse later.*"

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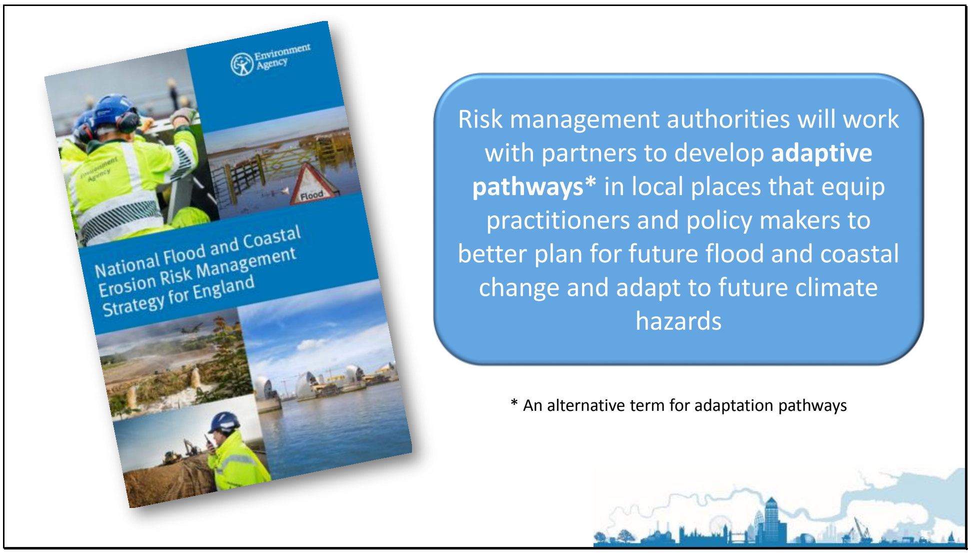

The adaptation pathway approach that Kristen has just described is central to the Government’s strategy for how England will manage risks from flood and coastal erosion in the future: ”Risk management authorities will work with partners to develop adaptive pathways in local places that equip practitioners and policy makers to better plan for future flood and coastal change and adapt to future climate hazards”

The strategy marks a significant change from the traditional approach. This presentation is intended as an introduction for stakeholders who are getting to grips with what adaptation pathways mean for their own flood and coastal erosion projects.

However, the principles can be applied to other types of climate change adaptation projects, too.

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One of the earliest and classic examples of an adaptation pathway in action is the Thames Estuary 2100 Plan - the plan for managing flood risk from rising sea level in the Thames Estuary up until the year 2100 and beyond. But it is now only one example of how the adaptation pathway approach is being used for climate change adaptation.

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Across the globe, the approach is increasingly being adopted to plan how we adapt to the effects of climate change. There are case studies of adaptation pathways in practice in 4 continents, on different spatial scales, and in locations varying from major cities - like Melbourne, New York and Shanghai - to rural areas in Portugal and South Australia.

Adaptation pathways are most often used to plan for flood management and coastal erosion management, but they are also in use to plan for adaptation to changing urban temperatures and dwindling water supplies.

[See fact sheet 1 for more about international case studies of adaptation pathways.]

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What is an adaptation pathway?

An adaptation pathway is a flexible, long-term, collaborative plan for **adapting** to an uncertain, and changing, situation (like climate change), by

- identifying **pathways** - sequences of potential actions - to cope with a range of possible futures,
- monitoring to understand how the future is unfolding,

and

- investing in the most appropriate sequence of actions at the right time.

So what is an adaptation pathway?

This is our definition: a flexible, long-term, collaborative plan for adapting to an uncertain, and changing, situation (like climate change), by identifying pathways - sequences of potential actions - to cope with a range of possible futures, monitoring to understand how the future is unfolding, and investing in the most appropriate sequence of actions at the right time.

In other words, it's a flexible way to make decisions to manage the impact of a changing situation (like climate change), where we don't have all the information yet…

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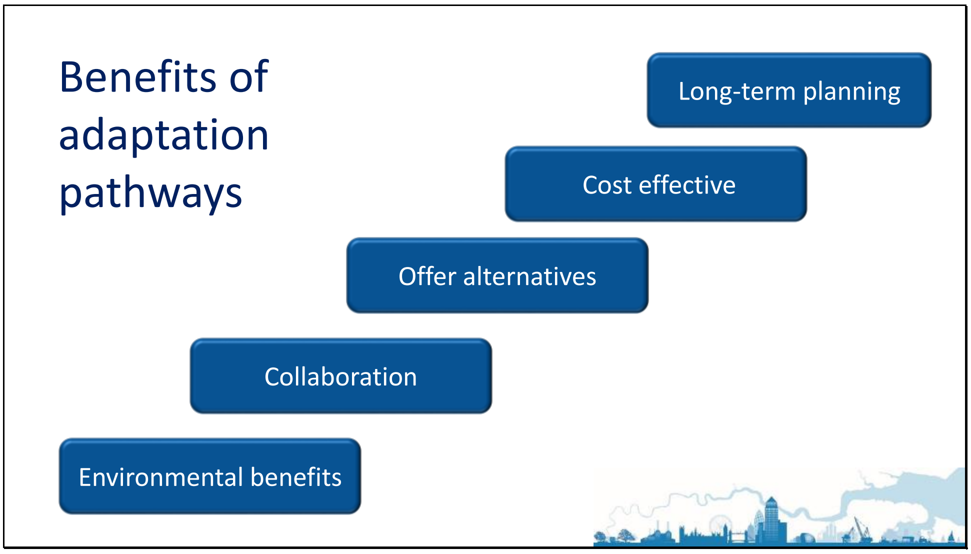

… and this brings a number of benefits.

First, adaptation pathways facilitate long-term planning rather than short-term decision-making. Too much uncertainty can paralyse decision-making, but adaptation pathways help us to understand the uncertainties of climate change, what action to take under different conditions, and plan confidently, while keeping options open longer and modifying plans as needed.

They have been found to be cost-effective. Investment decisions can respond to changes in climate conditions, and to changes in social, environmental and economic needs. Investment can be made when required, avoiding over- or under-investment at the wrong time.

And adaptation pathways   offer alternatives – making it easier to avoid inappropriate or inadequate adaptation. Decisions can be made according to the acceptable level of risk; and because evaluation and assessment are built in, decisions are always based on the most up-to-date knowledge.

Adaptation pathways also bring the benefits of collaboration – successful plans have good governance and stakeholder engagement up front and throughout. Stakeholders understand the risks and options better when knowledge and experience is shared, and communities have a better understanding of decisions that affect them.

And finally, adaptation pathway projects often have environmental benefits that go beyond reducing risks – creating places that better serve communities, and benefit ecology and biodiversity.

[See fact sheet 2 for more about the benefits of adaptation pathways.]

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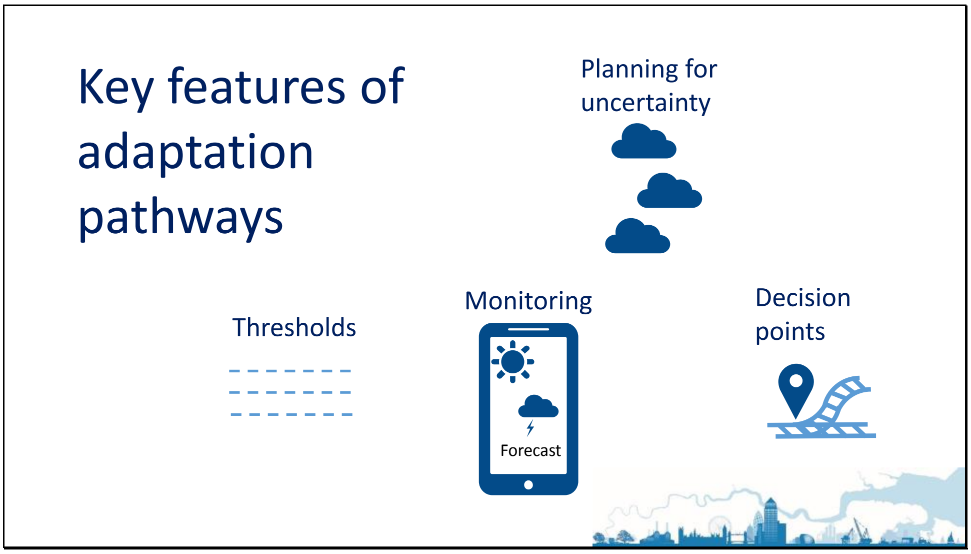

Now we will look at the key features of adaptation pathways, which are:

planning for uncertainty,
using thresholds,
monitoring,
and decision points.

We'll start with an analogy and then move on to looking at how adaptation pathways work for rising sea levels.

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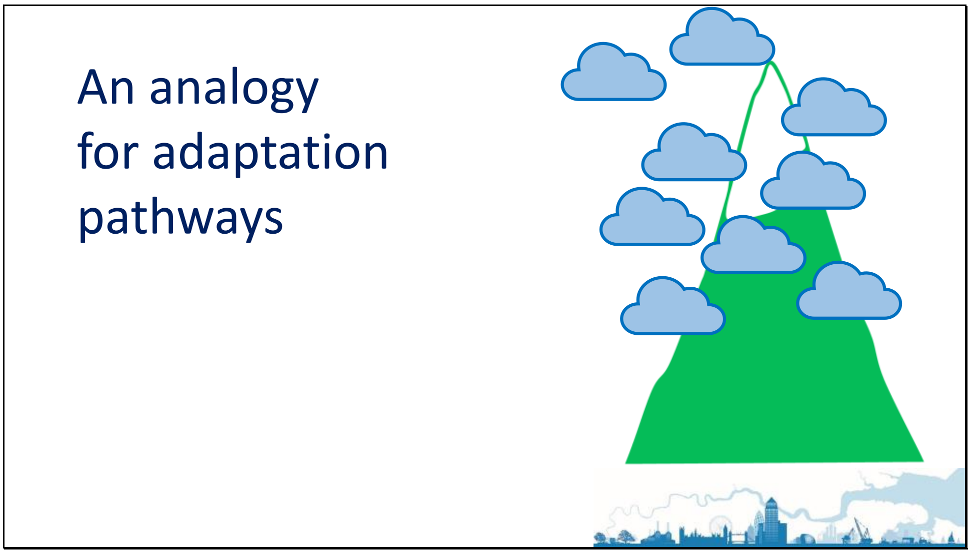

So, imagine you’re planning a trip to visit a mountain.

You want to go as high as you can, to get the best view possible. But it's important not to end up in the clouds.

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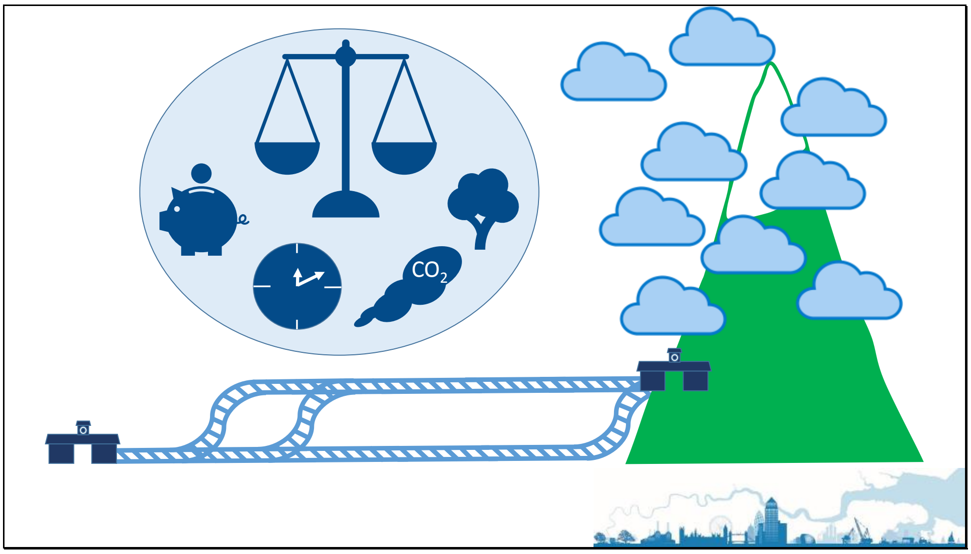

It’s a long journey, and you’re going to take the train to get there.
The weather is predictable, and the station is below the cloud level.
You have a choice of routes to get to the station. Your decision on which route to take will involve carefully weighing up the costs and benefits. For instance, the financial costs, how much time you have, and other considerations like carbon emissions, or the enjoyment of taking a scenic route.

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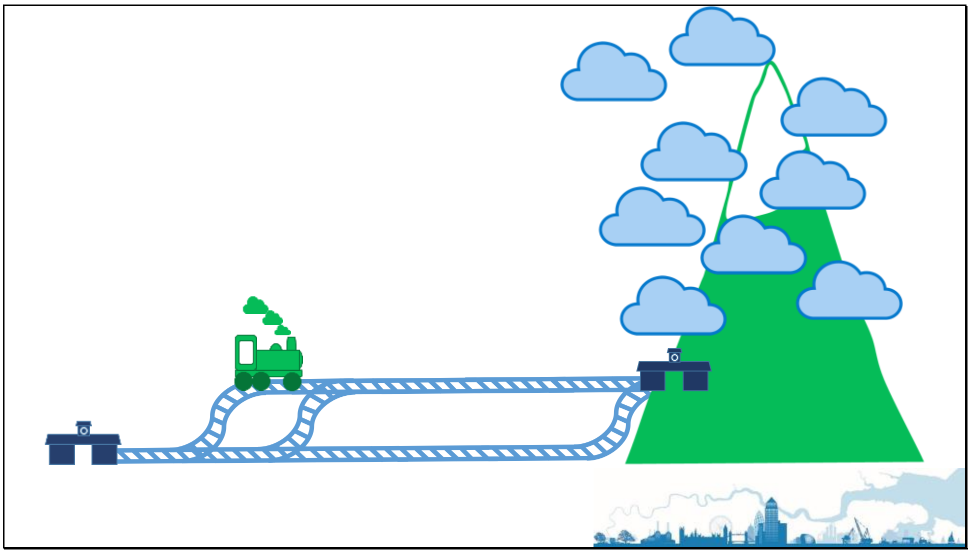

You decide which route you are going to take, you buy your ticket, and you make the journey.
Deciding your route and investing at the start of the journey makes sense, because you know where you are heading for. There is no uncertainty about your destination.
This is what traditional project planning is like.
You know what conditions you are planning for, you look at the possible options, and you decide which is your preferred one. Then you stick with it.

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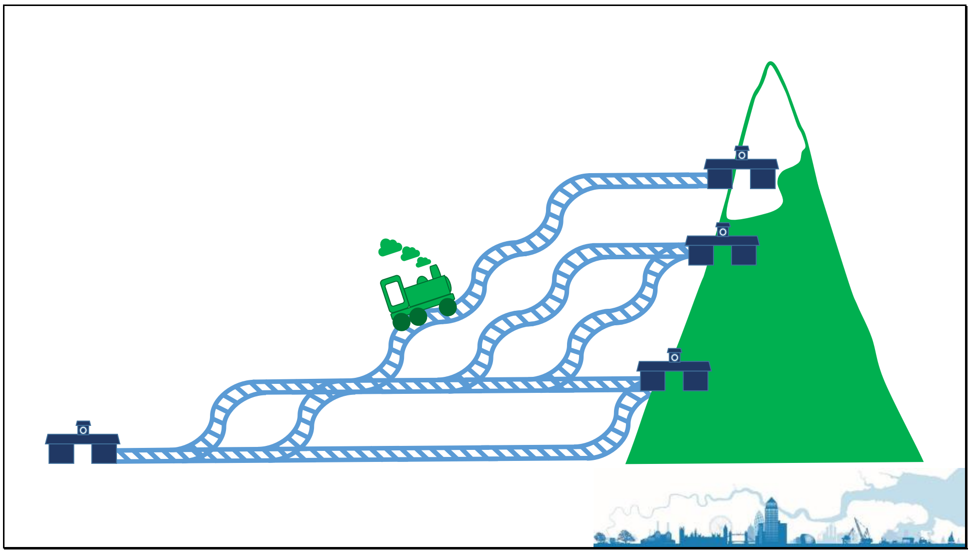

But what happens if you don't know your exact destination?
Let's think of a situation where there's a lot more variation in the weather, and more than one station to choose from. You want to head for the highest station that’s still going to give you a view when you get there, and there are different routes to get to each one.
In this case you have to decide on the destination, not just on the route.
If you decide on your route and buy your ticket right at the start of the journey, you risk ending up in the wrong place.
You could decide to aim for the highest altitude…

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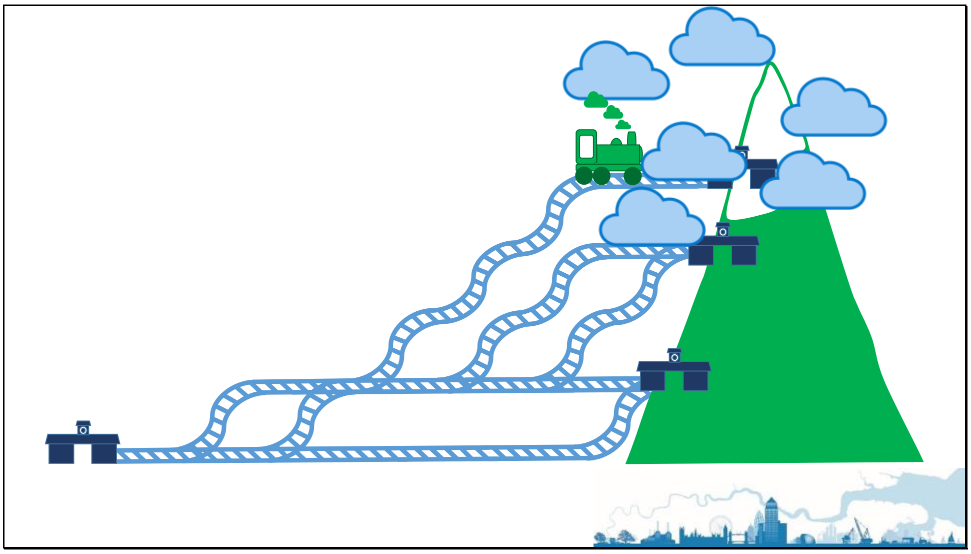

……and end up surrounded by clouds.

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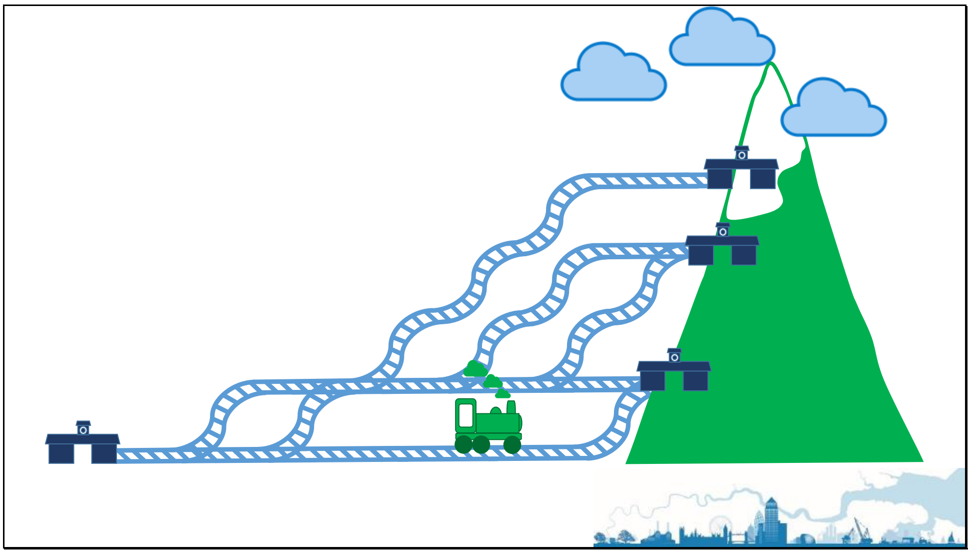

Or you might aim low, but if the cloud level is high, then you'll have failed in your objective to get the best view.
In both cases, because you chose your route right at the start, it has turned out to be the wrong choice. Train tickets are expensive! You'll have wasted your money.
Wouldn't it be better to have some flexibility?
You can buy a flexible ticket and start the first leg of the journey while keeping an eye out for changing weather, so you can decide on your final destination later on, when you have a better idea of the weather.
This is like the adaptation pathway approach.

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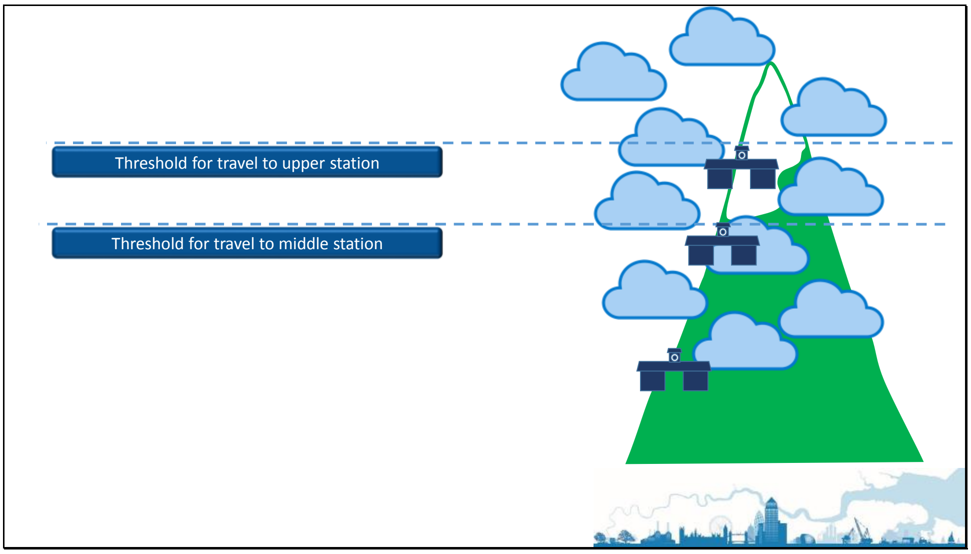

To end up with the best, or optimum, result, you need to plan when and how you will make decisions during your journey.

First of all, you'll need to know what predicted cloud level is appropriate for a journey to each station. The clouds could be at any level, but there are threshold values for cloud level that mean you will change to a different destination.

Here, your destination will change if the cloud level is predicted to lift above the level indicated by the dotted lines.

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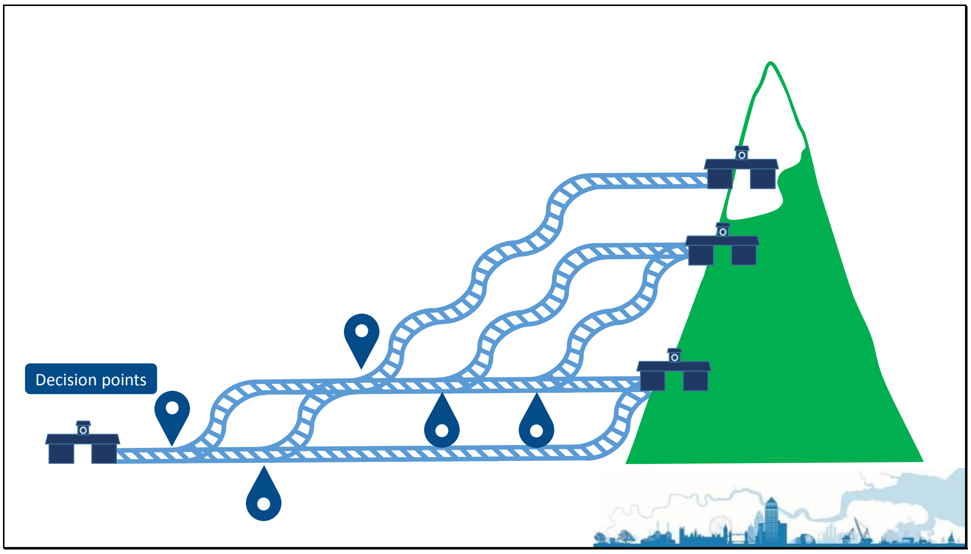

You also need to know when to make the decision to change track, by identifying the decision points that, once passed, close off certain destinations. You can't decide to journey straight to the top of the mountain if you have already passed the junction that leads there!

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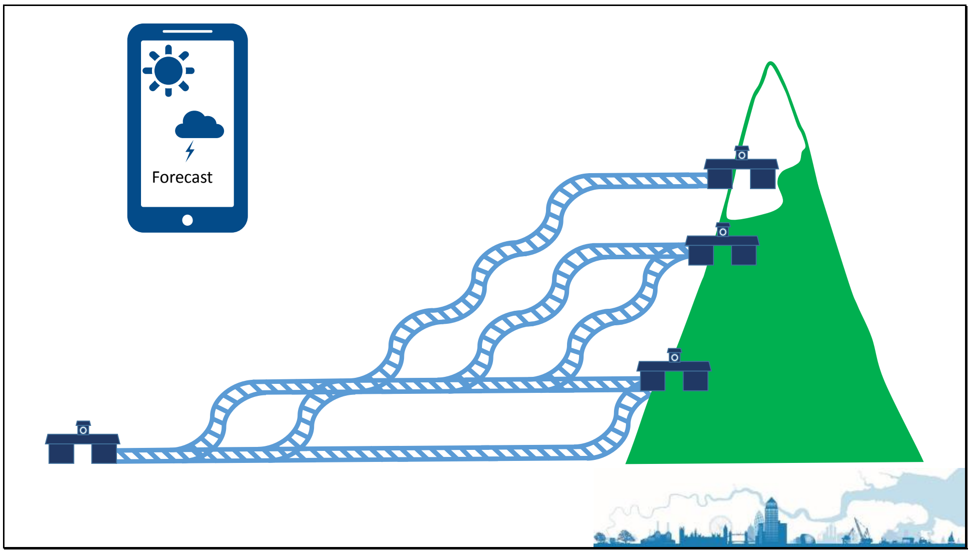

And as you travel, you will want to base your choice upon the best available evidence. So you'll need to keep monitoring the changes in the weather in order to predict cloud conditions, and which station you want to arrive at.

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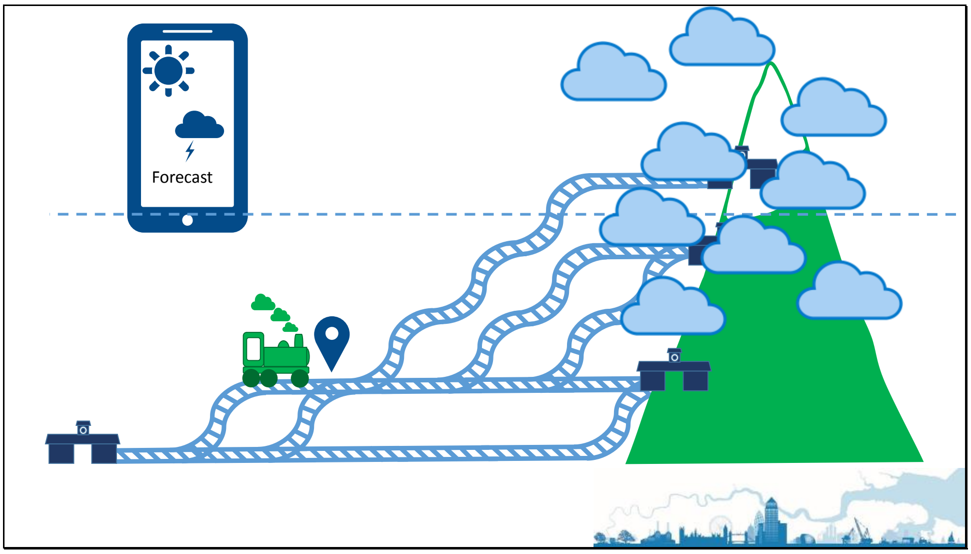

So, when you approach a decision point, you will consider the results of your monitoring, and if the forecast predicts that the cloud level will cross one of the thresholds, you will change your pathway.

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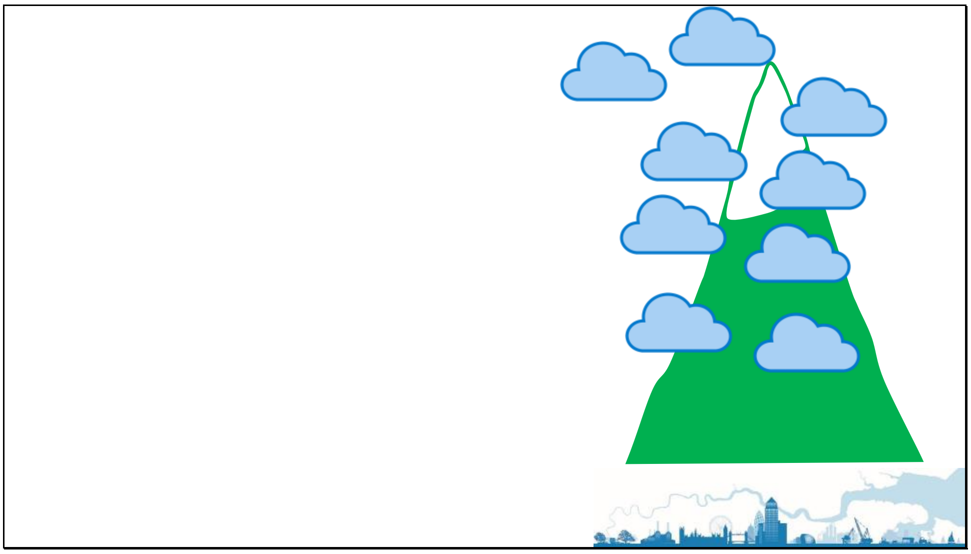

Now let’s look at a real-life situation involving project planning.
Instead of cloud levels on a mountain, you might be planning for …

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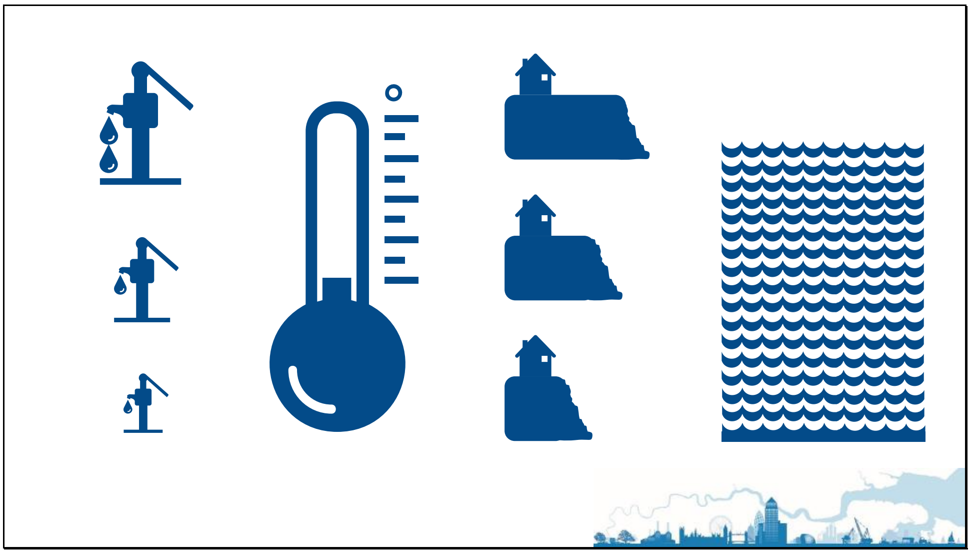

…decreasing water supplies, or temperature increases due to climate change, coastal erosion, or sea level rise.

In all of these cases, although we know that change will happen, and the direction of the change, there is a great deal of uncertainty about how much change there will be and how quickly it will happen.

Let's take the example of sea level rise due to climate change. Bear in mind that this is a generic example for illustration – it’s not based on a real-life project.

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A traditional approach to flood risk planning would involve knowing what sea level you're planning for, considering the options, selecting a preferred option, and then putting it in place. In this generic example, that means choosing between building a flood wall and a flood embankment – but both would be designed to cope with the same sea level.

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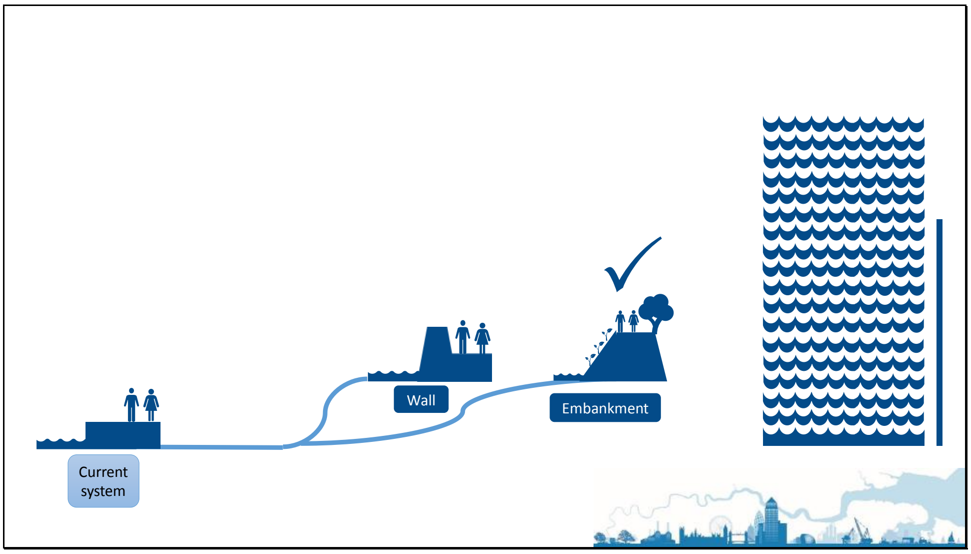

This is like our first example of the train journey, where there was one destination and you decided which route to take to get there.

One route is the sequence of actions that would be involved in building the flood wall, the other is the course of action needed to create a flood embankment. You have weighed up the options and decided to take the route to building an embankment. Once the embankment is in place, it will protect you from flooding up to the water level indicated by the blue bar on the right. As long as water levels stay within this range, you'll have achieved your objective.

However, with climate change, since sea level is rising, eventually you'll be forced to start again and repeat the process at a later date. So the traditional approach isn't adequate.

And because of climate change, there's much more uncertainty about sea levels in the future. The adaptation pathway approach can help us deal with these uncertainties by identifying suitable alternative options for each of the possible scenarios.

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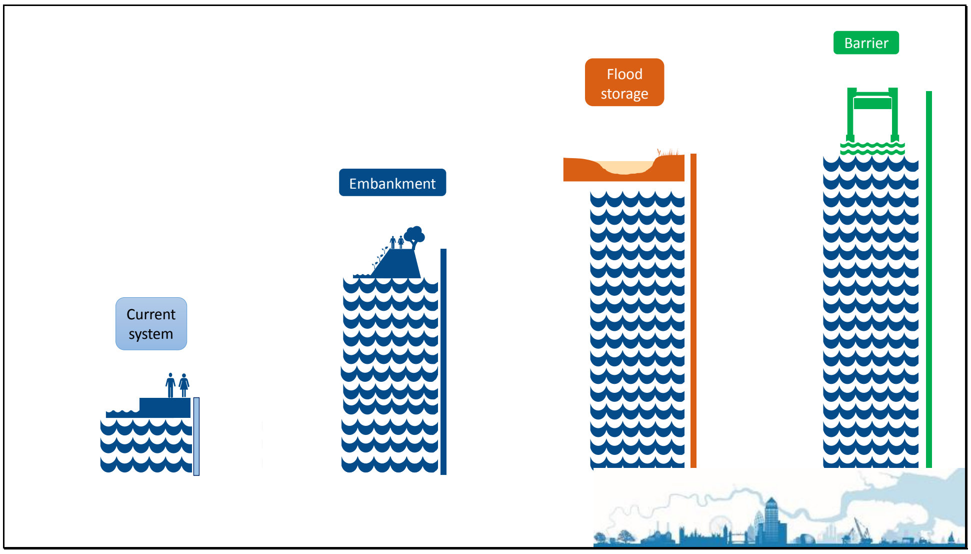

In this example, the current system protects us against a modest increase in sea level. Beyond that, there are 3 options for flood defences that we could build. A flood embankment, a tidal flood storage area, and a tidal barrier. Each would protect us across a range of sea levels, indicated here by the coloured bars, up to a certain threshold of sea level rise.

Beyond that level, we need another option. An immediate decision, before we are confident about how far or how fast sea level will actually rise, could mean that we end up with a flood risk scheme that is not able to cope with what actually happens.

Or, it could mean that we invest in one that is far beyond what we actually need for many decades.

Flood risk schemes require very high levels of investment, so it's important that we get it right.

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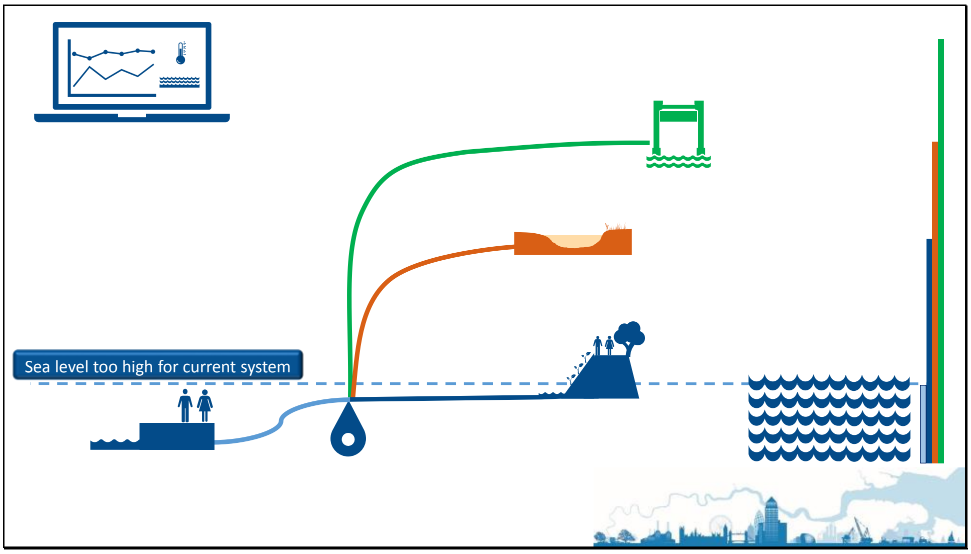

The situation we're in is like the choice between train journeys to stations at different levels of the mountain, to account for different cloud levels.

The current system is like the station where we start the journey.

As sea level rises and approaches a threshold, we make the decision over which is the best route to take – the best sequence of actions - basing the decision on our monitoring of how the environment is changing, and modelling of what we expect in the future. We will need to put a new flood protection system in place before the existing system stops being effective. Then the new system will protect us against further sea level rise up to a higher threshold.

Here, as we approach the threshold sea level where the current system reaches its limit, indicated by the top of the pale blue bar on the right, we reach a decision point. The decision point is in advance of sea level actually crossing the threshold, so that we have time to take action on the ground - the new flood defences need to be completed before sea level gets too high for the current system. Building new defences takes time, and we can't do everything at once.

If monitoring tells us that sea level rise will be fairly low overall, or is rising only slowly, then we would follow the low level pathway here, in dark blue, and put an embankment in place. It will protect us up to the level indicated by the dark blue bar.

On the other hand, if sea level rise is in the mid-range of predictions, or rising more quickly, we'd choose to construct a flood storage area instead of an embankment, following the middle pathway here, in brown. It would protect us up to higher levels – the top of the brown bar.

And if sea level rise is found to be at the high end of the scale, and rising rapidly, the best option would be to go for the tidal barrier without implementing the other options – along the high level pathway in green. The barrier would protect us in the most extreme sea level rise scenario that is likely to happen.

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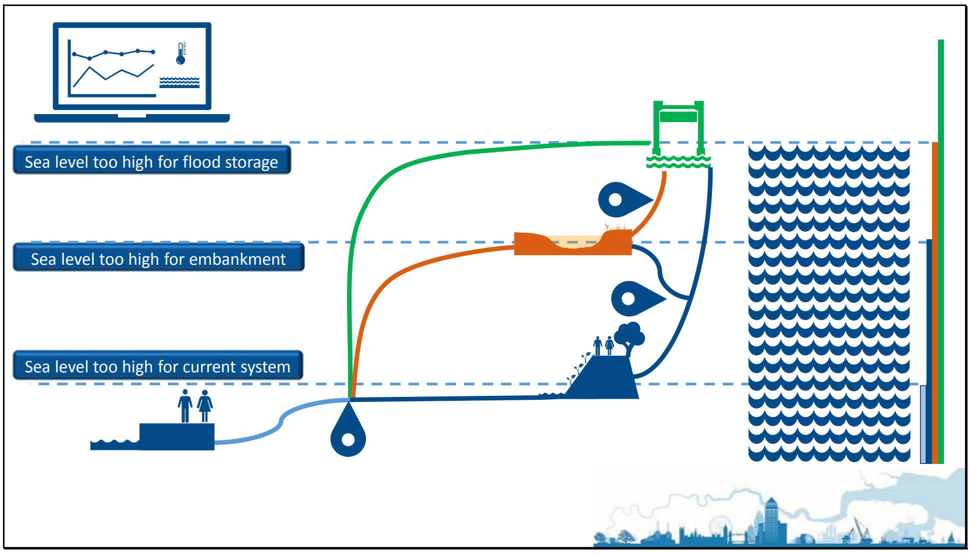

If sea level exceeds higher thresholds at a later date, we are prepared to implement other options when we know they will be needed.

For instance, if we initially go for the embankment, then at a much later date if sea level approaches the threshold where the embankment will no longer be effective, we'll reach another decision point and choose the best option for flood protection at that time.

Similarly, if we choose the flood storage area, our ongoing monitoring will tell us if we are approaching the stage where we need to move on to building a tidal barrier.

By planning for different scenarios and continually monitoring how conditions are changing, we will be ready to implement the most appropriate option when we have more confidence about future conditions.

In the meantime we can take 'no regrets' actions that will protect us against current flood risk.

Slide 24

This presentation has looked at the principles involved in the adaptation pathways approach, and how the approach would work for a generic example involving rising sea levels.

The accompanying presentation will look at a real-life case study - an adaptation pathway in action: the Thames Estuary 2100 Plan.

[See fact sheet 7 for links to more resources about adaptation pathways]