SCOTTISH WATER CASE STUDY

Start Construction Faster

Get to Site in Half the Time

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Background

Scottish Water is a public corporation owned by the Scottish government, responsible for the provision of water and sewage services in Scotland. Regulated by the Water Industry Commission for Scotland, it operates as a monopoly and is accountable to the Scottish government through a Cabinet Secretary. Scottish Water's services are funded through a combination of customer revenues, reinvested surplus and loans from the Scottish government.

Scottish Water serves some 2.6m households and 150,000 businesses with a daily volume of 1.52bn litres of clean drinking water, removing and treating some 1.1bn litres of waste water. In 2021/22, the organisation's regulated revenues and expenditures were £1.52bn. Of that amount, £621m was allocated to capital investment, and £152m to capital maintenance.

What struck VISION about Scottish Water was the sheer number of passionate and committed people working for the organisation. The deep care for service delivery manifests in a consistent priortisation of water quality, health and safety. Their customers recognize and appreciate this.

Challenges and Opportunities

In this context, the organization continues to be challenged – as are many water utilities in the UK – with the fact that it must accelerate modernization of infrastructure that often dates back to the Victorian era.

For the period 2021-2027, the mandate is to invest £4.6bn in capital projects. This means that annual capital investment needs to ramp up from roughly £600m in 2020 to over £1bn by 2024/2025. Doubling staff was not an option. At the same time, recognizing that its costs were on average higher than that of their industry peers, the organisation set a goal to reduce non-direct construction costs from £0.78 per £1 construction to £0.65 per £1 direct construction costs.

All of this must occur in a highly uncertain world, buffeted by rapid onset of a rising number of extreme weather events, inflation, supply chain challenges, population changes and net-zero and other environmental mandates.

The pressure to do more with less is ever-present. Scottish Water saw a need to transform the way it delivered capital programs, because only with significant time- and cost-savings could it achieve what it has been asked to do.

VISION and Scottish Water

VISION first introduced Scottish Water's Mark Dickson, Director of Capital Investment at Scottish Water to one of the world's largest semiconductor companies, to show how they had previously delivered a transformation at a manufacturing site in Ireland and to demonstrate the magnitude of improvement possible within Scottish Water.

Before VISION began working with this high tech client, the spiralling cost of semiconductor fabrication factories threatened to price them out of the market. Budgets were in disarray, talented staff were leaving, and there was a growing culture of mistrust and hostility around the construction of the site. The work that VISION delivered resulted in an overall reduction in construction costs of 30%. The client also reported an increase in value-added work productivity from 17% to 57%.

These were the order of magnitude impacts required to transform Scottish Water's capital investment operations, and to enable its people to rise to what needs to be done.

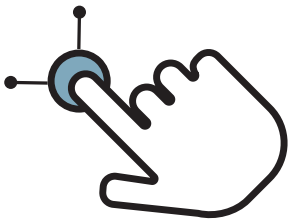
Working for a high tech Semiconductor Fabrication client, VISION delivered:

Construction Cost Reduction

30%

Increase work productivity from

17% to 57%



What Vision Did

To bolster the Project 13[1] -like use of a single shared risk and reward contract for suppliers, VISION and Scottish Water agreed to improve the time - cost aspects of capital project operations, while maintaining a tight focus on quality, customer care, and environmental commitments.

It might seem like an odd place to start in the hard-nosed business of construction and infrastructure, but VISION brings a particular way of assessing operational efficiency, grounded in the insights of modern philosophy and cognitive psychology. Where others apply a recipe-book approach of process rationalisation and change, VISION identifies and tackles collaboration waste - what the Lean tradition calls "Unused Talent" – to drive out other wastes, and implements teaching/coaching/mentoring practices that improve the effectiveness of conversations for action. This sounds simple in principle but is not easy to implement, however it delivers big results.

Known for their Commitment-based Management™ programme, VISION amplifies and intensifies the power of lean construction principles to transform leadership, governance and cultural behaviour. They firmly believe that, in most organisations, more than 50% of the opportunity to improve productivity lies not in process and tools but in behavioural change.

By implementing a combination of Commitment-based Management™ and lean construction principles to transform leadership and collaboration practices in a series of early demonstration projects, VISION and Scottish Water produced project time savings of up to 72%, and cost savings of up to 66%. Across the demonstration project programme of work, cost savings averaged 36%.

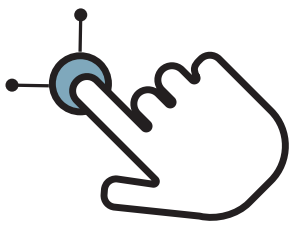
The critical benefit and possibility? Reducing the amount of time and money on projects frees up those people and budget to take on new work, meaning that ultimately, customers of Scottish Water get new and better infrastructure faster, and greater value out of capital investment.

> "In most organisations, more than 50% of the opportunity to improve productivity lies not in process and tools but in behavioural change"

Transforming leadership and collaboration practices in early demonstration projects. VISION and Scottish Water delivered:

Cost Savings up to
66%

Project time savings of up to
72%



Improving productivity

The remainder of this paper discusses key aspects of how this was achieved.

[1] www.project13.org

Start with Collaboration Waste

At a high level, Scottish Water understood its challenges to include:

- **Regulatory Risks**
  Failing to deliver regulatory investment commitments, risking fines and reputational damage.

- **Cost Management**
  Capital and Maintenance projects consistently missing cost- and schedule targets, with management finding out too late to intervene.

- **Over-Production**
  A culture of developing more detail than necessary, combined with a "one size fits all" compliance approach that interfered with flow, increased costs and extended timelines.

- **Resource Use**
  Departments and project teams operated in silos, resulting in inefficient use of resources.

- **Decision Making**
  A one size fits all approach to decision-making, regardless of the size, cost or complexity of projects slowed commencement of work.

- **Difficulty Moving**
  The organization seemed to be unable to identify possible practical solutions to these issues.

> "VISION discovered that many of the compliance processes included in the design and planning of capital projects were unnecessary"

One of the biggest drains on time came from compliance. Many employees reported that a significant portion of their work was dedicated to meeting compliance standards. This issue was related to several other identified weaknesses. It was seen as a major obstacle to improving efficiency and productivity.

Working with the compliance team at Scottish Water, VISION discovered that many of the compliance processes included in the design and planning of capital projects were unnecessary. That revelation was symptomatic of the siloed character of the organisation, and low levels of trust, relationships, and communication between teams. VISION calls this "collaboration waste," which they believe is a clearer articulation of what goes on in what the Lean tradition refers to as Unused Talent. Collaboration waste is typically at the root of other Lean Wastes.[2]

[2] See "An Introduction to Waste"

Build a powerful story: 50:30
Get to Site in Half the Time

The solution was designed to complement Scottish Water's focus on customers, the environment, sustainability, cost savings and reduced cycle times. It involved declaring clear project outcomes that everyone could understand and support. This included an original rallying call to 'cut the time to get the first spade in the ground by half', and a strong commitment by senior management to achieve this goal.

Formally called 50:30:5, but colloquially known as "50:30", senior leaders created an initiative that called for a 50% reduction in time to site, a 30% reduction in cost, and a 5% gainshare improvement for partners.

Within the targeted demonstration projects, these objectives were surpassed. To make all of this happen, VISION designed five critical levers for Scottish Water to tackle Lean wastes, in particular: defects, waiting, unnecessary motion, over-processing, and unused talent.

The big difference from typical lean initiatives? A tailored implementation of Commitment based Management (CbM) to super-charge lean principles and agile techniques, and shift people into a mood of ambition: *I want to make the changes that are needed.*

Lever 1: Collaboration and behaviour

This involved establishing dedicated teams across companies and functions; enabling co-location where possible; a strong customer focus; and, introducing the language of action and commitment with clear practices and procedures for decision-making and coming to resolution.

Co-location[3] (and during COVID, easy and frequent video calls) obviously enabled cutting wastes from waiting (just walk over and talk), motion (all nearby), and unused talent (easier to get insights from colleagues). A strong focus on internal Customers, and more/better conversations between Performers and Customers[4] about evolving Conditions of Satisfaction, drove a significant reduction of defects.

Underpinning all of this? The strong focus on **Commitment based Management**, which sensitizes everyone to the way work actually gets done. When people make assessments, they disclose their concerns and what really matters to them. When requests are negotiated face-to-face, understanding increases, and the need for rework fades. Most importantly, people begin to realize that making offers and promises is the way to drive action.

CbM[4] is a powerful response to the eighth Lean Waste - Unused Talent - by systematically addressing the underlying causes of that waste: poor listening and speaking, mistrust, and anything that reduces the capacity to maintain relationships. Originally introduced in the form of workshops and consolidated into practice and behaviour through in-project coaching and what VISION calls "mobilisation", CbM can then be sustained in Learning Teams that meet weekly, rise above the fray of daily activity, and engage in conversations for continuous improvement.

[3] "Making Virtual Work a Success Webinar" [4] "An Intro to Commitment based Management"

Lever 2: Quick Wins through Simplification

VISION identified significant opportunities for improvement in this area, helping Scottish Water to categorize projects by size and complexity, and establishing appropriate sets of deliverables for each. This resulted in a significant reduction of over-processing and the waste of time driven by over-estimation of compliance requirements. Once Scottish Water started working with this leaner process, they quickly realized that there was much more opportunity to lighten the load of producing deliverables, an initiative that continues to this day.

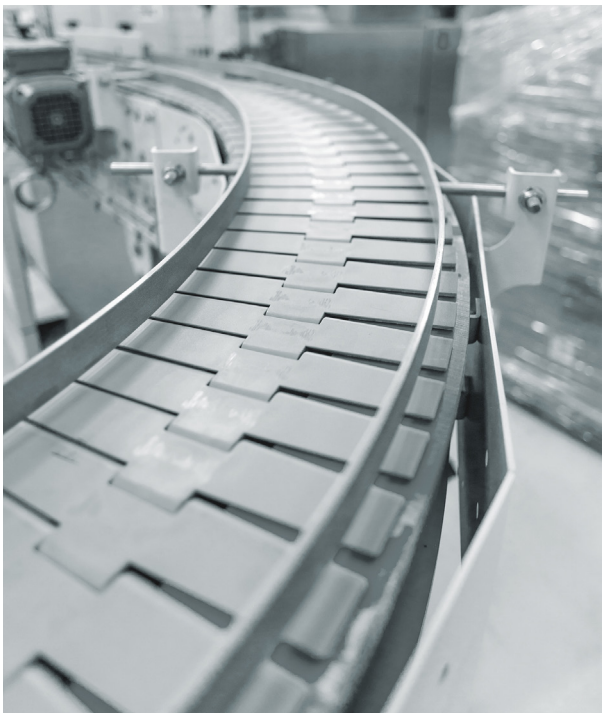
CbM practices focus on improving communication and collaboration within an organization to build shared assessments of what generates value and what does not. Having the right kind of conversations – particularly between Customers and Performers - is critical to this process.

Lever 3: Production lines

In another drive to simplify procedures, the team took low-risk, low-complexity projects and put them through a standard, productionised process that saved significantly on unnecessary time and costs. These were called 'conveyor belt' projects. Higher complexity projects were handled differently through what was called a "factory" process. These changes reduced five Lean wastes: defects, waiting, unused talent, motion, and over-processing.

Exercises like this benefit significantly from CbM's focus on making assessments, and distinguishing assessments from assertions. Assertions are statements of fact about the world; claims that can be independently verified. Assessments are professional opinions or judgements about what matters in a particular situation. When assessments are (mis)treated as statements of fact about the world, they come across as unchangeable, and thus limit or constrain what is possible.

> "When assessments are (mis)treated as statements of fact about the world, they come across as unchangeable"



Lever 4: Rolling planning

Rolling planning is a process where people at various levels who will execute the plan review and revise it with the planner before taking any action. This approach identifies all the necessary preliminary steps for future work, and finds filler work when people would otherwise be idle. It increases productivity by reducing Lean wastes such as defects, waiting, and unused talent. Additionally, this approach helps to reduce inventory by getting input from middle management and field workers, resulting in the purchase of only necessary materials. Rolling planning was not initially a focus for the team, but has proven to be a valuable tool for increasing efficiency and reducing waste.

Here, CbM's skill-building shifts the planning process from one of project management prediction to a negotiation of promises. Conversations begin with aligning the team around what matters, for example: *Get this project completed by a specific date, to a specific set of Conditions of Satisfaction.* Then work backward from the end-state, declaring what needs to be accomplished by when, making requests of Performers, negotiating the Conditions of Satisfaction for specific elements of work and outcomes, and cultivating promises between Performers and Customers.There is an important shift here from project team members being assigned tasks as though they are machines, to negotiating mutual Conditions of Satisfaction around a commitment that binds the Performer and the Customer into co-creating the future. People learn to say *"if you need X completed by this date, I need your commitment to doing X or Y, or providing Z."* Or to decline requests and instead make counter-offers to demonstrate a commitment to driving progress, albeit in a way different than the Customer first imagined.

> "Rolling planning... has proven to be a valuable tool for increasing efficiency and reducing waste"

Lever 5: Declaring Objectives, Making Big Promises and Measuring Results

VISION helped Scottish Water to focus on timelines and costs to define productivity more effectively, anticipate breakdowns, and bring projects alive with daily and weekly assessments of progress. This regular review of projects against expected numbers reduced numerous lean wastes: defects, waiting, motion, over-processing, and unused talent.

Scottish Water's declaration and commitment to cutting timelines by 50%, and reducing costs by 30% were critical to the success of the program. Making a big promise is something people shy away from because traditional ways of thinking lead them to worry about control. If they can't control every step of the way to achieving the promise, they don't want to make a promise. As a result, the promises that are made are small. CbM highlights what is missing in the traditional way of thinking, which is the amazing human capacity to set big goals and achieve them through listening and speaking with care, and coordinating our actions.

> "we thought that was impossible, and would never happen"

And it is as appropriate to big picture scenarios like capital project portfolios, as it is to individual projects.[5] In a recent initiative to advance a group of four "factory" projects, managers set the ambitious 50% target date, and project managers who had not yet been exposed to the new way of working responded with a mood of skepticism. Several months later at a team retreat reflecting on success - three of the four projects had hit their 50% target – these same project managers smiled as they reported to their colleagues: *"we thought that was impossible, and would never happen."*

[5] **Peter Luff**, "How to Make and Secure Reliable Promises"

Outcomes:

The implementation of CbM and lean-based practices in a set of demonstration capital projects by VISION and Scottish Water led to significant time and cost savings.

By the end of 2021, a set of pilot projects across 4 new categories of capital project production lines (Lever 3) produced the following results:

In one set of pilot projects, VISION delivered **cost savings of 30%** on average across all workstreams

Conveyor belt water projects:

- Time saving: 67%
- Cost saving: 48% (£2.8m)

Conveyor belt waste projects:

- Time saving: 72%
- Cost saving: 60% (£350,000)

Non-infrastructure water projects:

- Time saving: 51%
- Cost saving: 21% (£2m)

Flood management projects:

- Time saving: 53%
- Cost saving: 66% (£1.5m)

While there was no expectation of maintaining these extreme (72% and 66%) levels of savings, the underlying message was well understood by Scottish Water at both leadership and front-line levels: *We are capable of driving big productivity improvements, and we are confident we can do it.*

The zeal and ambition that produced a great track record on health and safety has begun to show up in capital projects. By September 2022, Scottish Water reported an average 23% time-saving across 29 active "Factory" projects (ranging in value from £.5M to £75M), many of which had not completely implemented new ways of working. Cost savings were on target at 30%, as was the expected 5% gainshare improvement. Most importantly, Scottish Water noted strong positivity about new ways of working, with people excited and energized about generating results they had thought impossible.

Scottish Water continues to advocate the 50:30 mission, and has taken on the challenge of making the new ways of working demonstrated by VISION into a new business as usual.

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For nearly 40 years, VISION consultants have helped companies like CEMEX, IBM, Warner Brothers, Impellam, and SSE resolve conflicts and transform their industries.

To find out more about VISION's research and how the team is supporting water transformation,
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