

United Utilities Water

DRAFT Drainage and Wastewater Management Plan 2023

Ribble DWMP

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Acronyms

For a list of acronyms, refer to document C0003.

1. Introduction to the DWMP

The Drainage and Wastewater Management plan (DWMP) is a long-term plan setting out how we intend to maintain robust and resilient drainage and wastewater systems, now and in the future. This is the first time that we are developing the plan and we have taken a comprehensive approach as we recognise the importance of long-term planning.

The heart of the plan will be built around collaborative and innovative working whilst encompassing all activities relating to drainage, flooding and delivering a wastewater service that protects the environment. We have led on this plan, but have developed it in consultation with our partners as we will be delivering the DWMP in partnership with other organisations such as the Environment Agency and local councils.

By developing the DWMP, we have an opportunity to:

- provide a basis for more collaborative and integrated planning alongside stakeholders across the region to tackle shared and interrelated risks relating to drainage, flooding and protecting the environment;
- strengthen partnership working with all key stakeholders to drive integrated investment in the environment and communities;
- develop a plan that will help address the increasing environmental expectations from customers and stakeholders and work towards the ambitions set out in Defra’s 25-year plan;
- collectively explore innovative solutions such as Sustainable Drainage Systems (SuDS) and nature-based solutions to understand what is best for the North West; and
- embed Systems Thinking to better understand drainage and environmental interactions, and to maximise the potential for integrated solutions.

Throughout the DWMP process, we have engaged with stakeholders to share our data and findings, to ensure that the solutions delivered are co-created, drive efficiencies and will benefit the communities and environment that we live and work in.

The plan will be set out at three levels (Figure 1) to maximise the potential for partnership working and for effective engagement between regulators and stakeholders at both company-wide level and more locally.

Figure 1 Geographical scales applied for planning and collaboration within DWMP



The plan is made up of five main stages (Figure 2) which each contribute to developing the most sustainable and effective future for the North West. These stages include setting out the long-term ambition for the region, identifying risk and understanding the possible interventions and solutions that could be developed.

Figure 2 Five Stages of the DWMP



Across the North West, there are 14 Strategic Planning Areas (SPAs) and the purpose of this document is to share local, place-based information.

We will share the results from the different stages of the DWMP and how the DWMP plans to make a difference in the Ribble SPA.

2. Background to the Ribble catchment

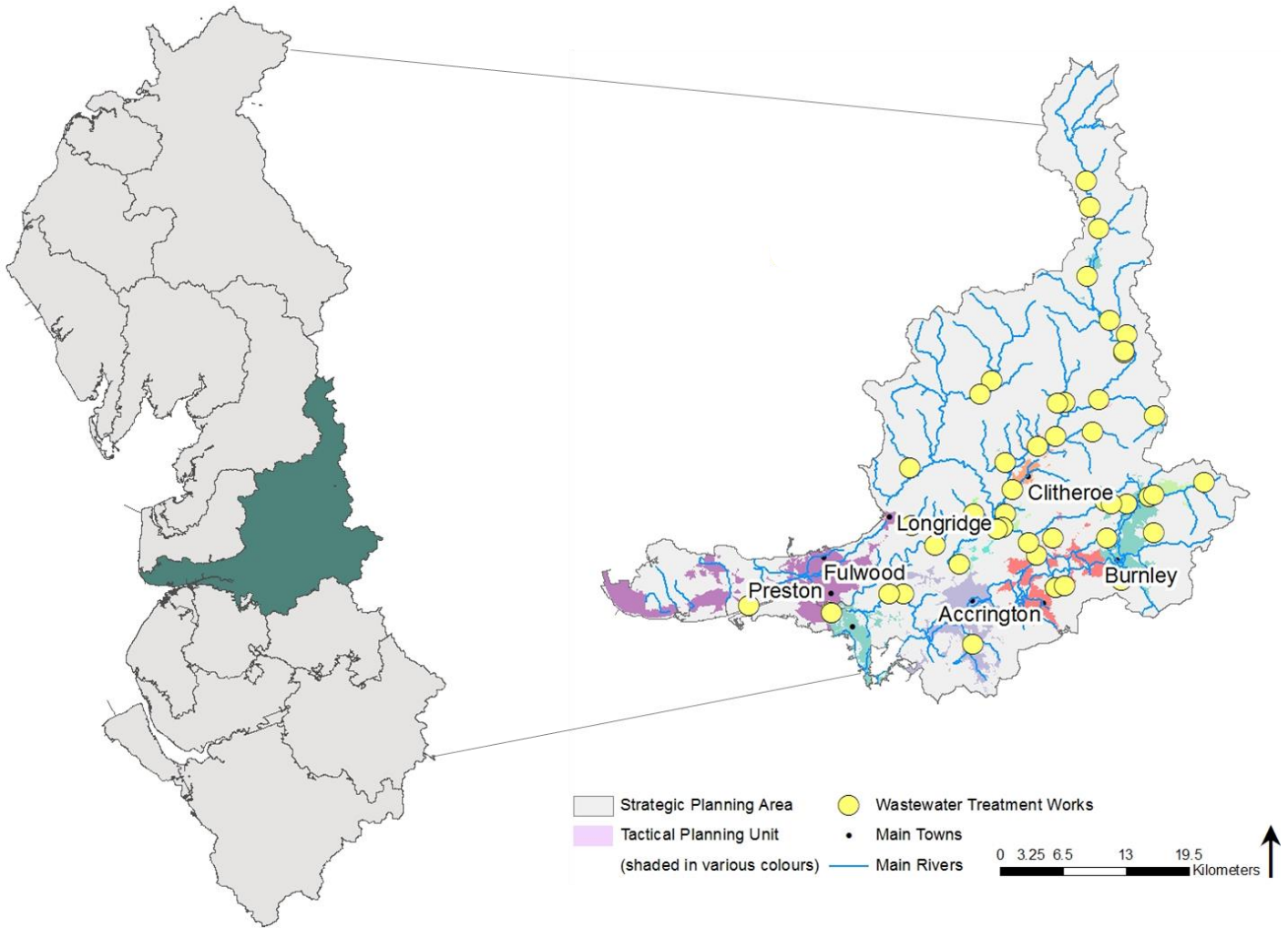
The Ribble catchment area covers approximately 1477.7km² and it is located through the Bowland Forest which is a popular tourist destination. This catchment consists of the Ribble Estuary which is classed as a Special Protection Area and is one of the largest estuaries in the United Kingdom ^[1].

There are eight main sub catchments:

- The Big Ribble – Located downstream of the Calder, this sub catchment is a mostly urbanised and industrial area ^[2].
- Calder – This sub catchment includes the River Calder that is located in the surroundings of Nelson, Burnley, Colne and Accrington and it joins onto the Ribble below Whalley. This area is mainly a combination of urban and industrial ^[3].
- Colne Water – Located partially in the Forest of Bowland, this sub catchment is a heavily farmed and urbanised area ^[4].
- Darwen – This sub catchment includes the River Darwen that flows through Darwen and the urban areas located in Blackburn. It is a heavy industrialised area ^[5].
- Hodder and Loud – This area is located south east of the Forest of Bowland and it is responsible for the drainage ^[6].
- Limestone Ribble – Located to the west of the Yorkshire Dales National Park, this catchment is dominated by agriculture ^[7].
- Ribble Middle – Settle to Calder – Located south of the Yorkshire Dales National Park and east of the Forest of Bowland, this catchment is mostly urbanised with numerous market towns such as Settle, Clitheroe and Barnoldswick on Stock Beck ^[8].
- Savick Brook and Fylde South Drains – Located south west of the catchment area, this sub catchment mainly consists of rural areas with a focus of dairy farming. Savick Brook was canalised in 2002 and it now provides a link between the Lancaster canal and the Leeds Liverpool canal ^[9].

There are 47 wastewater tactical planning units (TPU, also known as wastewater treatment work (WwTW) drainage catchments) within the Ribble SPA. A TPU is the drainage catchment area encompassing all the sewers and wastewater assets e.g. pumping stations, which drain into the associated wastewater treatment works. The TPUs within the SPA vary in size from larger catchments such as Preston and Blackburn to smaller, rural catchments such as Barnside and Holden. The TPUs are highlighted in Figure 3.

Figure 3 Map of the Ribble SPA



There are numerous strategic management plans within the Ribble that are owned by various other organisations. Within the Ribble catchment, there are active management plans such as:

- The Environment Agency River Basin Management Plan (RBMP) and Flood Risk Management Plan (FRMP);
- Lead Local Flood Authority (LLFA) Surface Water Management Plans (SWMP); and
- Local council plans.

Each of these strategic plans focuses on managing particular risks and links to programmes of work. A high level summary of these management plans is shown in Table 1.

The DWMP aims to collaborate, share best practice and to align with other strategic plans throughout the SPA. This will help to highlight common challenges, ambitions and goals where there are shared or interconnected risks and opportunities.

Table 1 Summary of stakeholder management plans

Management plan	Overview	Key aspects for the Ribble catchment
River Basin Management Plan (RBMP) ^[10] Owner: Environment Agency	A river basin district covers an entire river system, including river, lake, groundwater, estuarine and coastal water bodies. The RBMP aim is to improve the quality of our water environment to best support wildlife, agriculture, and businesses, and to boost regeneration and recreation.	The main reasons for not achieving good ecological status are physical modifications and pollution from abandoned mines, rural areas, towns, cities, transport and wastewater. Future challenges predicted by the Environment Agency include physical modifications, invasive non-native species and pollution from a range of sources.
Flood Risk Management Plan (FRMP) ^[11] Owner: Environment Agency	The FRMP is a strategic plan, which reviews and develops measures to manage the risk of flooding from rivers, the sea, surface water, groundwater and reservoirs. The plan outlines flood risk areas, hazards, and sets out measures and objectives to manage flood risk.	Within the Ribble catchment, there are over 32,000 people (4%) and 5,500 non-residential properties that are at risk of fluvial and coastal flooding. Approximately 16% of agricultural land and 7% of SSSI sites are also at risk. The main risk in the upstream catchments is fluvial flooding, and the lower reaches around Preston are at risk of both fluvial and coastal flooding. The December 2015 floods affected numerous areas of the catchment such as Preston, Whalley, Billington, Ribchester and Clitheroe. Since the floods, a programme of recovery is in place which includes a review of potential options to provide mitigation. Across the Ribble catchment there are 41 measures from earlier plans to manage flood risk.

<p>Surface Water Management Plan (SWMP) ^[12]</p> <p>Owner: Lead Local Flood Authority (LLFA)</p>	<p>A SWMP is a plan which outlines the preferred surface water strategy for a location. Although owned and led by the LLFA, a SWMP is produced in collaboration with other drainage owners, water companies included.</p> <p>Partners work together to understand the surface water flood risk in an area and agree an approach to address these issues innovatively and in a cost-effective way, and where appropriate, in partnership.</p> <p>A SWMP is a long-term plan and should influence development.</p> <p>The decision on whether a SWMP is appropriate is down to the LLFA, generally they are produced for areas considered to experience a high flood risk.</p> <p>United Utilities Water (Uuw) continues to work closely with LLFAs and supports the development of SWMPs where required, and the delivery of SWMPs where they are published.</p>	
<p>Catchment Based Approach (CaBA) Catchment Plan ^[13]</p> <p>Owner: Ribble Life Catchment Partnership</p>	<p>The aim of the partnership is to bring together stakeholders to create and deliver a focussed, sustainable and collaborative action plan to deliver benefits within the catchment.</p>	<p>The vision of the catchment partnership to collaboratively create a thriving land and water environment within the Ribble Catchment that will bring economic, health and social benefits for all. Which will be achieved through the following goals:</p> <ul style="list-style-type: none"> • Supporting a vibrant and resilient economy and creating a great place to live by improving the rivers, estuary and other water bodies in the Ribble catchment. • Deliver greater impact through collaborative projects. • Enhance the amenity value of the water environment within Ribble catchment. • Work collaboratively to mitigate the causes of climate change and ensure that the natural capital of the catchment are valued and protected. <p>Challenges in the Ribble catchment include pollution from a variety of sources, invasive non-native species and physical modifications.</p>

2.1 Strategic Planning Group (SPG)

We appreciate that there are many organisations with formal roles and responsibilities relating to drainage, flooding and protection of the environment. By participating in the creation of a DWMP much more can be achieved compared to working on our plans in isolation.

Within DWMP, SPGs have been a key form of engagement with stakeholders across the region. SPGs have operated at a local, catchment scale to allow stakeholders to input into the identification of priority and shared risk locations, and develop an understanding of potential collaborative solutions to tackle shared risks. The SPGs have covered a wide range of issues including reducing flooding and improving water quality. A key driver is understanding where there may be potential to achieve multiple benefit through solutions.

Through the SPGs, we have been able to consult with strategic partners on the various stages of the DWMP (Figure 4) and share outputs as and when they become available. This has been a two-way process and stakeholders have had the opportunity to share information with us such as action plans, confirmed projects, priority areas and ambitions for the future which could be developed and delivered in partnership. We have been able to review and incorporate the information shared during the different stages of the DWMP process.

Within the Ribble SPA we have engaged with stakeholders such as:

- The Environment Agency;
- Lancashire County Council;
- Fylde Council;
- Blackburn Council; and
- Ribble Rivers Trust (host of the Ribble Catchment Based Approach (CaBA) partnership).

More information on co-creation activity undertaken with the SPG can be found in Technical Appendix 2 - Stakeholder Engagement (TA2). The outputs from this activity in the Ribble catchment are outlined in Section 4.

Figure 4 DWMP framework for engagement

A framework for engagement in the North West



3. Risk identification

A key component of the DWMP has been around risk identification. This has been a mixture of both historical risk and forecast risk. Activities to understand this were completed through the Risk Based Catchment Screening (RBCS) and Baseline Risk and Vulnerability Assessment (BRAVA) stages. We have also undertaken numerous additional assessments to understand wider resilience and catchment risks.

Further detail on the approaches can be found in Technical Appendix 4 - Risk Based Catchment Screening (TA4) and Technical Appendix 5 - Understanding Future Risk (TA5).

3.1 Risk Based Catchment Screening (RBCS) and Horizon Scan

The RBCS stage is a series of high-level assessments that are used to review and screen each TPU to determine whether a more detailed assessment is required during the Baseline Risk and Vulnerability Assessment (BRAVA) stage.

The assessments are designed to span the key aspects of a wastewater company's responsibilities: from the network, to the treatment works, to its interaction with the environment. Examples of the assessments considered are internal sewer flooding, storm overflow performance, and pollution incidents. The assessments typically used three to five years of historical data.

Additional assessments termed 'horizon scanning' were undertaken to understand wider exogenous factors and opportunities that could inform future investment e.g. major infrastructure projects, private septic tank locations and potential major infrastructure projects (HS2 etc). Areas with potential future developments were also considered and further information on projected growth areas can be found within the associated Local Plans.

Within the Ribble SPA, the RBCS stage identified 35 out of 47 TPUs that required further investigation and therefore passed onto the BRAVA stage (outlined in Section 3.2).

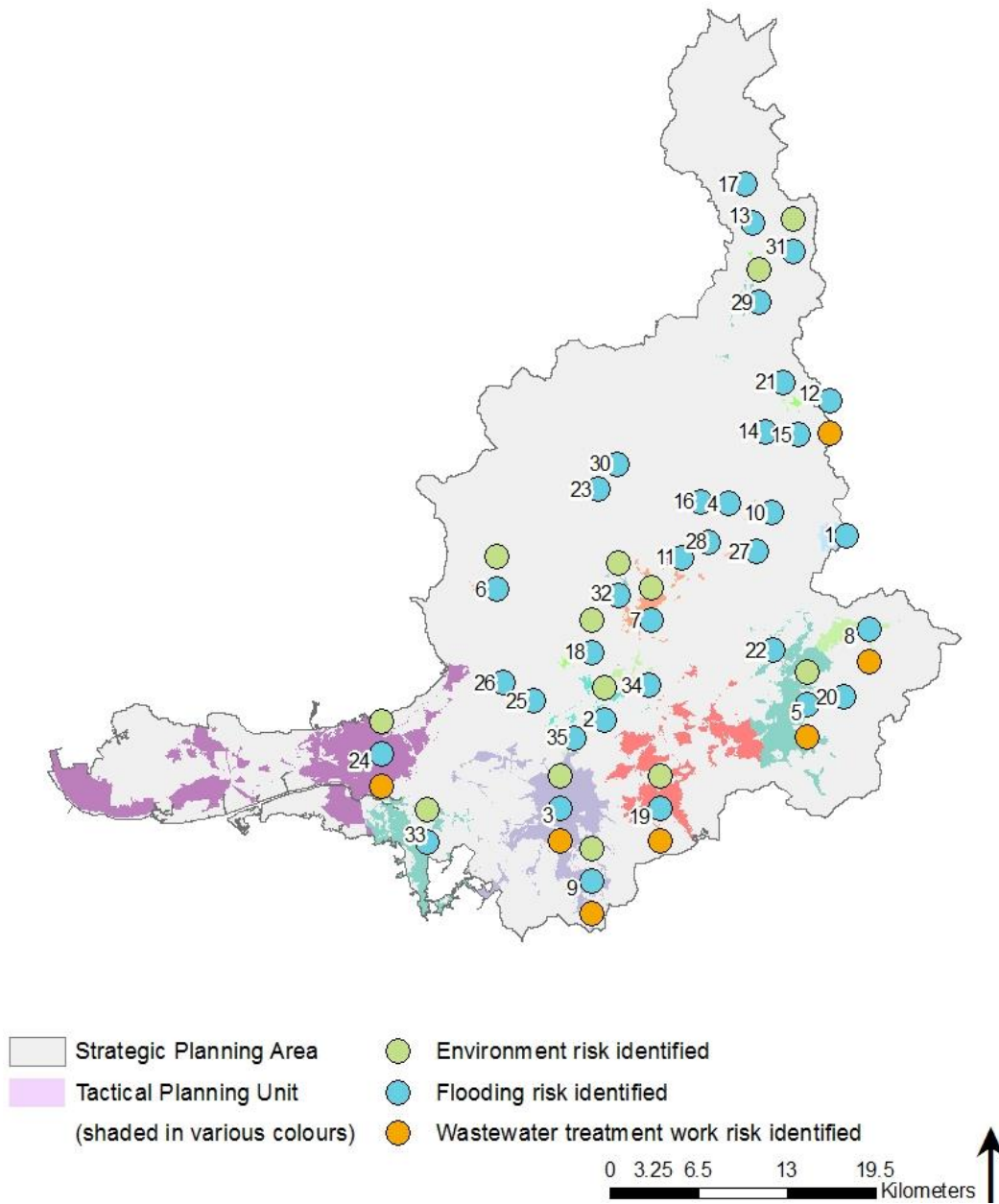
Figure 5 indicates which of the RBCS categories (environmental, flooding and wastewater treatment works capacity) have triggered within each TPU. There are numerous TPUs which did not trigger for RBCS across any of the categories and are therefore not shown in Figure 5. A list of these TPU's can be found in Table A.2 in the Appendix. Environmental and flooding categories are the most common within the Ribble SPA, which is supported by the highest triggered RBCS assessments which are:

Storm Overflow Assessment Framework - (13/47) – Environment; and

- External Sewer Flooding - (35/47) – Flooding.

Further detail on the approaches and assessment results can be found in TA4.

Figure 5 Map of the RBCS results for the Ribble SPA. Risk categories indicate areas triggering further investigation following RBCS. The TPU names corresponding to the numbers in the map can be found in Table A.1 in the Appendix. Those not triggered in RBCS can be found in Table A.2 in the Appendix



3.2 Baseline Risk and Vulnerability Assessment (BRAVA) and Resilience

The TPUs that were identified during RBCS were then taken forward into BRAVA, which aims to assess the baseline and future position of system performance against the DWMP planning objectives, to understand where there may be issues. It is also to understand wider resilience issues that could also impact upon the DWMP planning objectives. This stage considers risk at 2020, 2030 and 2050 design horizons.

In addition to BRAVA, a range of resilience assessments were undertaken and will have been incorporated throughout the plan to allow us to expand our understanding of wider core risks, such as how the water quality of rivers may change as a result of climate change. We have also assessed risks such as fluvial and/or coastal flooding and fluvial and/or coastal erosion and land stability.

Further detail on the approaches and assessment results can be found in TA5 and Technical Appendix 6 – Resilience (TA6).

The BRAVA and resilience results for the Ribble catchment are outlined in Table 2 to Table 5.

Table 2 Environmental BRAVA results

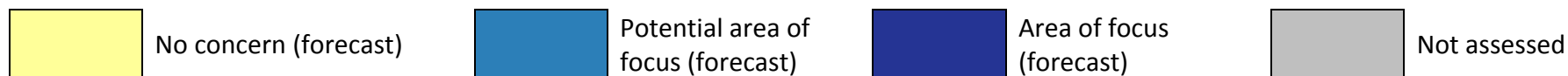
Tactical Planning Unit	Environmental					
	Pollution Assessment	Storm Overflow Performance		Bathing and Shellfish Spill Assessment		
	2020	2020	2050	2020	2030	2050
Barnoldswick						
Billington						
Blackburn						
Bolton-By-Bowland						
Burnley						
Chipping						
Clitheroe						
Colne						
Darwen						
Gisburn						
Grindleton						
Halton Place						
Halton West Ribble						
Hellifield						
Helwith Bridge						
Holden						
Horton-In-Ribblesdale						
Hurst Green						
Hyndburn						
Lanebottom						
Long Preston						
Newchurch-In-Pendle						
Newton-In-Bowland						
Preston						

BRAVA	
	No concern (forecast)
	Potential area of focus (forecast)
	Area of focus (forecast)
	Not assessed / not applicable

Tactical Planning Unit	Environmental					
	Pollution Assessment	Storm Overflow Performance		Bathing and Shellfish Spill Assessment		
	2020	2020	2050	2020	2030	2050
Ribchester						
Ribchester Hospital						
Rimington						
Sawley						
Settle						
Slaidburn						
Stainforth						
Waddington						
Walton-Le-Dale						
Whalley						
Wilpshire						

Table 3 Flooding BRAVA results

Key



Tactical Planning Unit	Flooding												
	Internal Flooding Risk			External Flooding Risk			Sewer Collapse Risk	Risk of flooding in a storm (1:50yr)		Flooding of open spaces			Blockage Assessment
	2020	2030	2050	2020	2030	2050	2020	2020	2050	2020	2030	2050	2020
Barnoldswick													
Billington													
Blackburn													
Bolton-By-Bowland													
Burnley													
Chipping													
Clitheroe													
Colne													
Darwen													
Gisburn													
Grindleton													
Halton Place													
Halton West Ribble													
Hellifield													
Helwith Bridge													
Holden													
Horton-In-Ribblesdale													

Table 4 Wastewater treatment works BRAVA results

Tactical Planning Unit	Wastewater treatment works		
	Risk to wastewater treatment works (WwTW) capacity		
	2020	2030	2050
Barnoldswick			
Billington			
Blackburn			
Burnley			
Chipping			
Clitheroe			
Colne			
Gisburn			
Hellifield			
Hurst Green			
Hyndburn			
Long Preston			
Newchurch-In-Pendle			
Preston			
Ribchester			
Sawley			
Settle			
Stainforth			
Waddington			
Walton-Le-Dale			
Whalley			
Wilpshire			

BRAVA	
	No concern (forecast)
	Potential area of focus (forecast)
	Area of focus (forecast)
	Not assessed

Table 5 Environmental and flooding resilience results

Tactical Planning Unit	Resilience Assessment		
	Environmental		Flooding
	Potential for changes in the water quality of rivers as a result of climate change	Potential for changes in catchment contributions as a result of climate change	Outfall locking
	2050	2050	2020
Barnoldswick			
Barnside			
Billington			
Blackburn			
Bolton-By-Bowland			
Burnley			
Chipping			
Clitheroe			
Colne			
Colne Greenfield House Farm			
Darwen			
Gisburn			
Grindleton			
Halton Place			
Hellifield			
Helwith Bridge			
Holden			
Horton-In-Ribblesdale			
Hurst Green			

Resilience	
	More resilient
	Less resilient
	Not assessed

Tactical Planning Unit	Resilience Assessment		
	Environmental	Flooding	Outfall locking
	Potential for changes in the water quality of rivers as a result of climate change	Potential for changes in catchment contributions as a result of climate change	
	2050	2050	2020
Hyndburn			
Kingsmill			
Lanebottom			
Laund farm			
Long Preston			
Newchurch-In-Pendle			
Newton-In-Bowland			
Portfield Bar			
Preston			
Ribchester			
Rimington			
Sawley			
Settle			
Slaidburn			
Stainforth			
Waddington			
Walton-Le-Dale			
Whalley			
Wilpshire			
Wood Cottages			

3.3 Problem characterisation

3.3.1 Complex catchments

Complex catchments were determined through problem characterisation using a combination of a complex and strategic catchment scores based on strategic need (largely derived from growth and climate forecast models) and modelled risks in each of the TPU (largely based on BRAVA). Within the Ribble SPA, two TPUs were identified to be 'complex' based on problem characterisation, these were:

- Preston; and
- Blackburn.

3.3.2 Strategic catchments

Through the various risk identification assessments, a number of locations were identified through opportunity workshops that require more strategic analysis. These are areas with high growth, a high number of risks and multiple potential scenarios. Different bespoke scenarios are applied to strategic catchments based on the needs and drivers of the catchments to understand the variability of risk as a first step for optioneering, so that the range of options developed can mitigate a different range of scenarios.

As a result of this assessment the Preston TPU has also been identified as having 'strategic growth'.

Note: Water Industry National Environment Programme (WINEP) and storm overflows guidance are still being developed. This could lead to significant changes in preferred options and could result in large-scale, short and long-term investment needs. This will be fully reviewed between draft and final DWMP publication, in addition to other aspects such as nutrient neutrality, bathing waters and shellfish water expectations. Between draft and final DWMPs the impact of storm overflow requirements will also require optimising against the other needs and opportunities.

3.3.3 Preston

Preston TPU is to the south west of the Ribble SPA (Figure 6). The sewer network is over 2,600km long, and serves over 105,000 properties and a residential population of approximately 240,000 people. The watercourses in the area are all classed as 'moderate' under the Water Framework Directive (WFD) 2019.

The TPU is considered both a strategic and complex catchment. It is of strategic interest due to both its unusual network design with five distinct drainage areas, and also population growth, with a projected 13% increase in residential population by 2050. This could drive a significant amount of further development to meet housing need, and increase pressure on the network and wastewater treatment works.

Preston is a complex catchment as there are a number of storm overflows within the area, and uncertainty around medium and long term performance, particularly with regards to meeting future new targets. Alongside this the BRAVA process identified risks for internal flooding, external flooding, flooding of open spaces, pollution, sewer collapse, and blockages by 2050, with areas for further investigation highlighted in Figure 7. As the Water Industry National Environment Programme (WINEP) and storm overflows guidance are still being developed, this could lead to significant changes and investment to both wastewater treatment works and the drainage network, to ensure protection of the environment and water quality.

Figure 6 Map of the Preston TPU

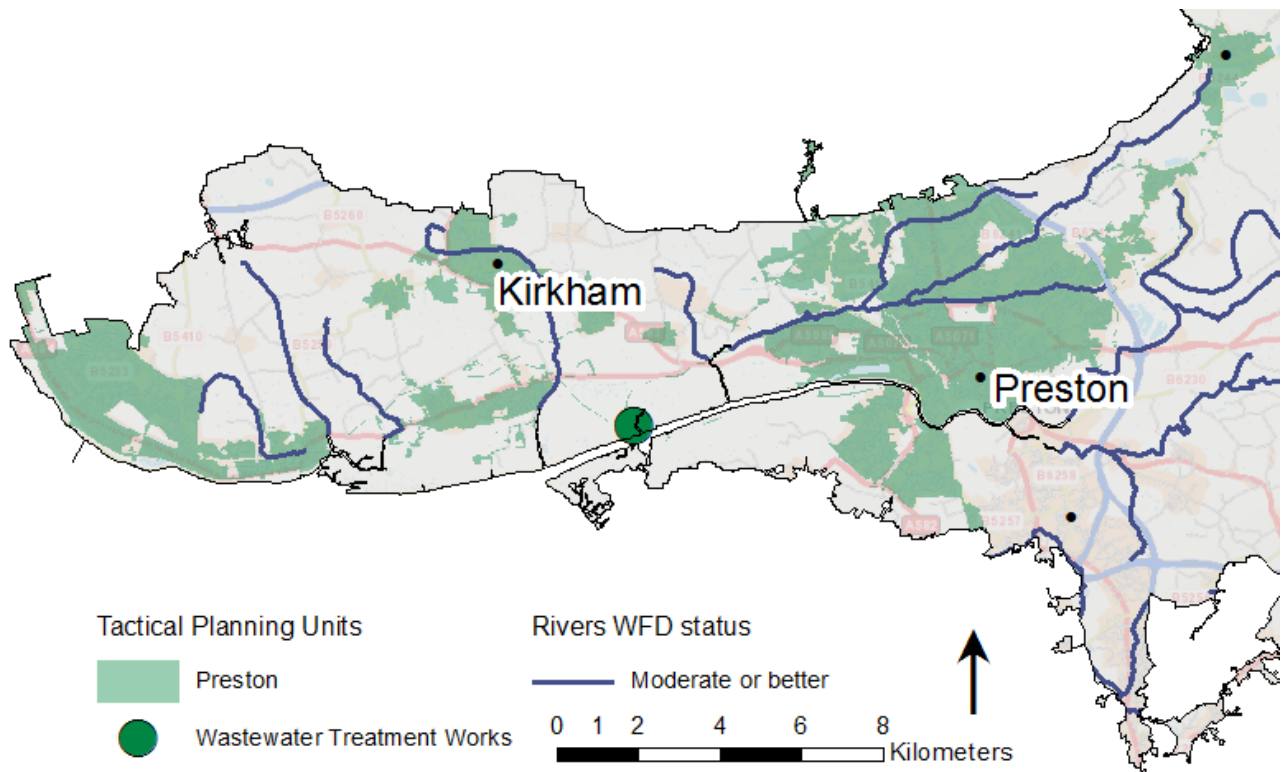
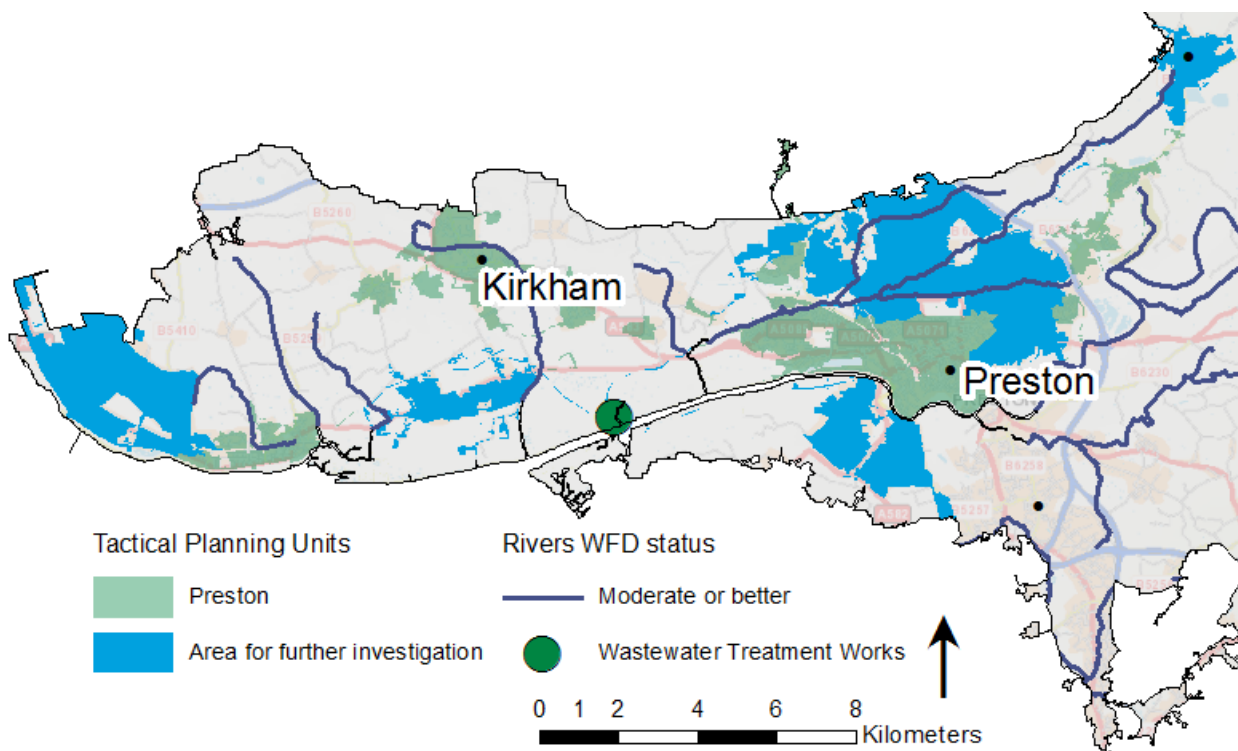


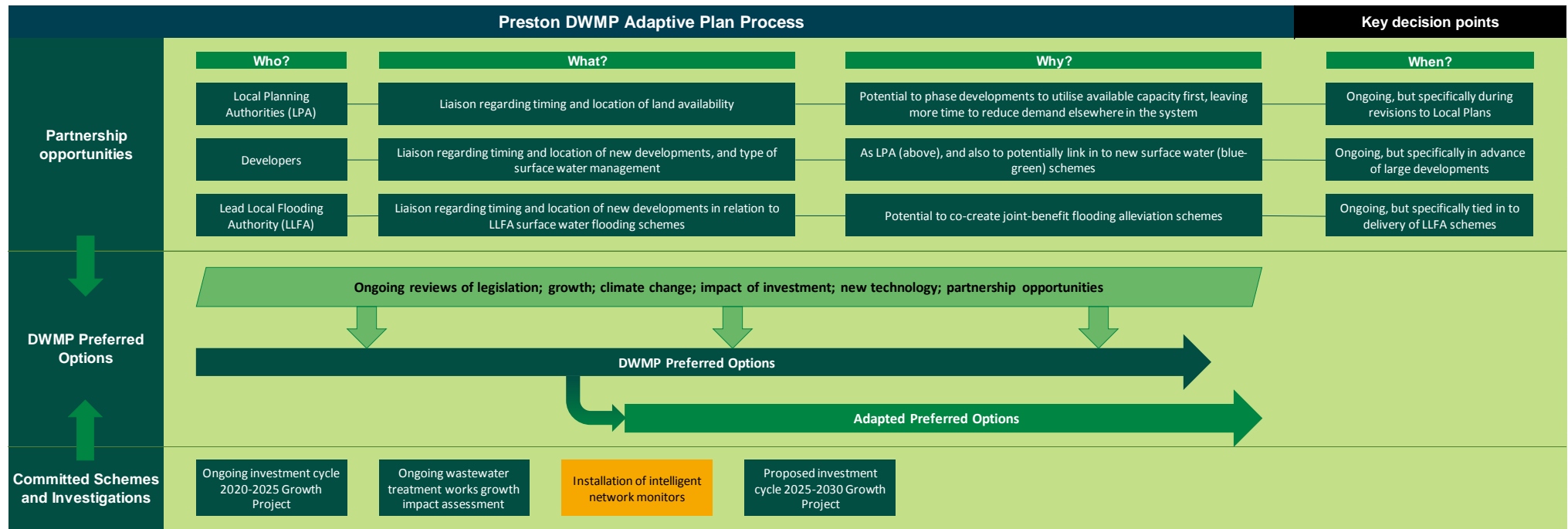
Figure 7 Map of the Preston TPU with areas for further investigation highlighted in blue



3.3.3.1 Preston adaptive plan

The first part of the Preston adaptive plan process (Figure 8) highlights the importance of partnership working and regular data reviews.

Figure 8 Preston adaptive planning process



Partnership working

In a catchment where growth is a significant factor in future performance, it is key to maintain regular conversations with those stakeholders that have knowledge about future developments and can potentially influence their impact. Key organisations include:

- Local Planning Authority;
- The Environment Agency;
- Lead Local Flood Authorities; and
- Housing developers.

The DWMP plan for each TPU is developed based on a number of data sources. Some of these are prone to change over time, which means that original assessments can become out of date. As data from these sources change, it makes sense to re-evaluate the DWMP plan to check the impact on the plan. Examples of data that change over time are shown in Table 6.

Table 6 Examples of data that change over time and can impact upon the plan

Type of data or information	Possible impacts of changes
Government legislation	More or less stringent requirements or regulations, which may require different levels of investment, and policy changes that may drive better or worse incentives on demand.
Development growth projections	These will vary with time in line with economic conditions, changing demographics, or government policy. This can result in the number of new houses and businesses growing at a different rate than originally forecast.
Climate change projections	As more climate data becomes available, climate projections are modified, which may indicate changes to temperature and rainfall patterns.
Impact of investment	As new drainage schemes or new strategies are implemented, we will continue to evaluate their performance. If they turn out to be more or less successful than anticipated, this may allow the extent of another option type to be reduced or increased accordingly.
Development of new technology	Over time, new technology provides opportunities to address and resolve risks differently, or more efficiently.
Partnership opportunities	We will work closely with key stakeholders to address risks jointly. Over time, these stakeholders may see changes in their own risks and funding levels, which may present opportunities for greater collaboration.

Figure 9 shows the second part of the Preston adaptive plan, reflecting the different option types identified as being appropriate for Preston. Each line represents a different option type – e.g. schools education programme. The plan shows that each option type will be regularly reviewed in line with the method described in part one. This allows new information and opportunities to be used to adapt the plan by either increasing or reducing the extent of some option types.

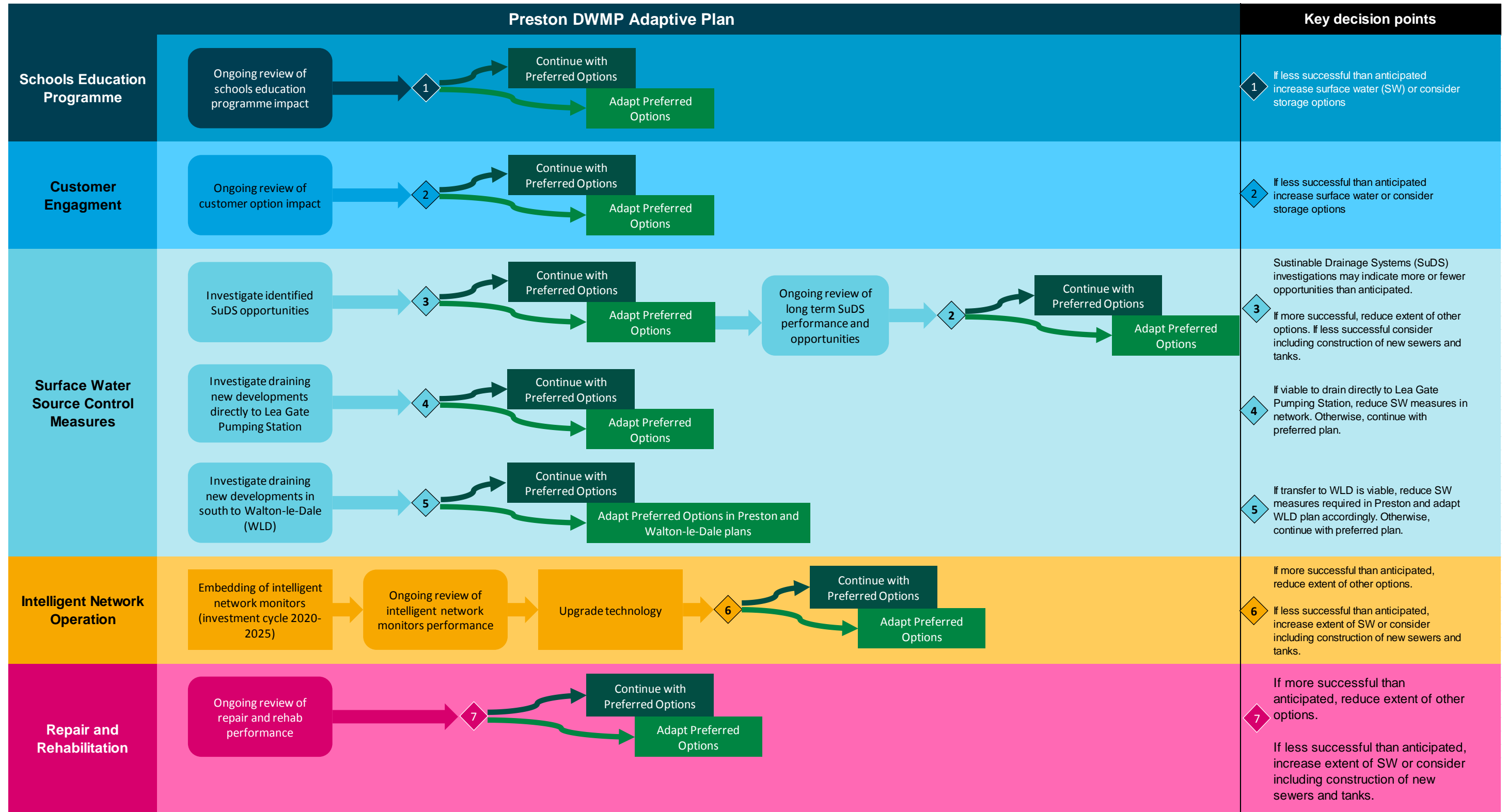
Within Preston, there are opportunities to carry out investigations before making final decisions on the final strategy. This means that we can properly evaluate options before committing to significant investment. These investigations will take into account things such as:

- Technical feasibility;
- Benefit of the work;
- Customer impact;
- Environmental impact; and
- Cost.

The adaptive plan below demonstrates multiple potential scenarios and pathways, and should be read in conjunction with the optimised DWMP plan for the relevant TPU (refer to Section 5.3).

The adaptive plan should be reviewed regularly in order to incorporate potential changes in key factors such as legislation, population growth and climate change, which could impact standards or targets, as highlighted above in Figure 8. The adaptive plan may contain potential investigations which are currently excluded from the optimised DWMP plan (refer to Section 5.3) until there is more certainty. It is therefore important that both the adaptive plan and the optimised plan are developed together.

Figure 9 Preston Adaptive Plan – Possible adaptive pathways as knowledge and opportunities change over time



3.3.4 Blackburn

The Blackburn TPU is to the south of the Ribble SPA (Figure 10). The sewer network is over 1,300km long, and serves over 50,000 properties and a residential population of approximately 128,000 people. The watercourses in the area are all classed as 'moderate' under the WFD 2019, apart from a section of the Darwen (between its confluence with Blakewater and its confluence with Roddlesworth).

The TPU is a complex catchment, with a number of storm overflows within the area, and uncertainty around medium and long term performance, particularly with regards to meeting future new targets. Alongside this the BRAVA process identified risks for internal flooding, external flooding, flooding of open spaces, flooding from 1-in-50-year storm events, pollution, sewer collapse, and blockages by 2050, with areas for further investigation highlighted in Figure 11. This is against a backdrop of a projected residential population increase of 12% by 2050, which could drive a significant amount of further development to meet housing need, and increase pressure on the network and wastewater treatment works. As the WINEP and storm overflows guidance are still being developed, this could lead to significant changes and investment to both wastewater treatment works and the drainage network, to ensure protection of the environment and water quality.

Figure 10 Map of the Blackburn TPU

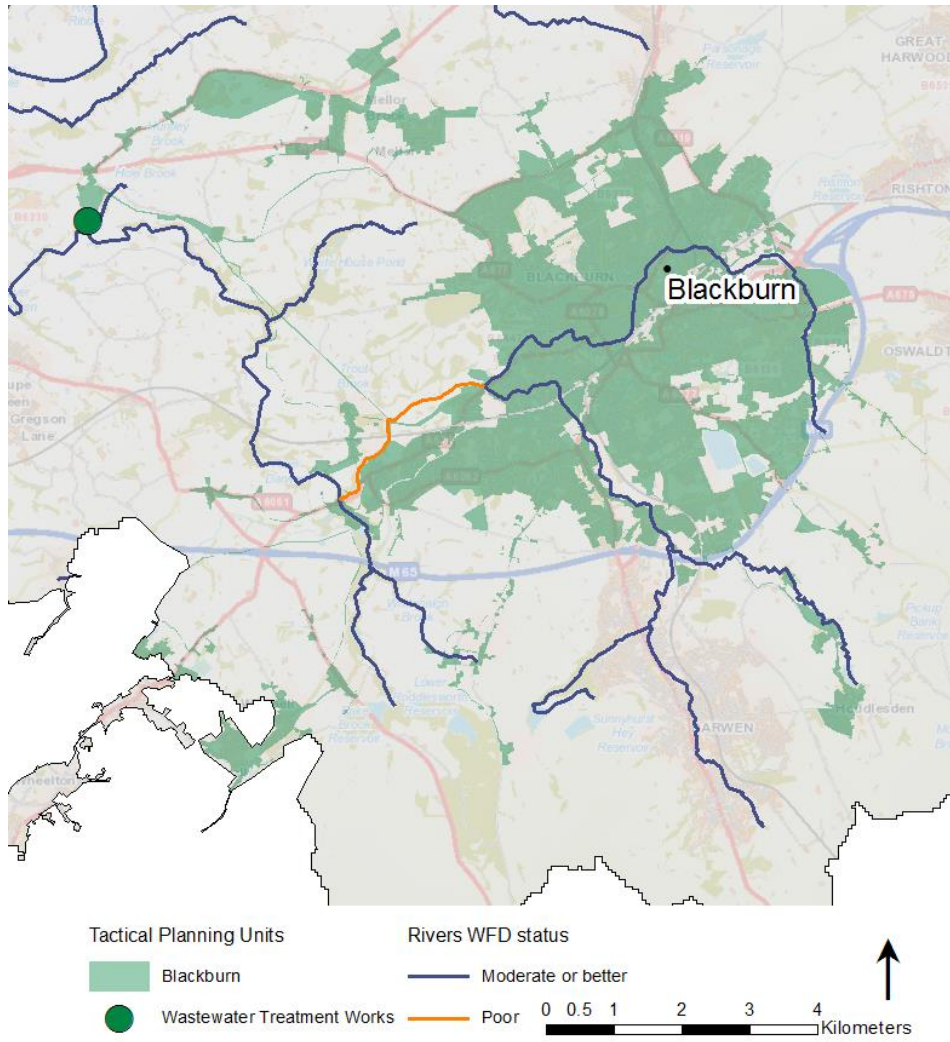
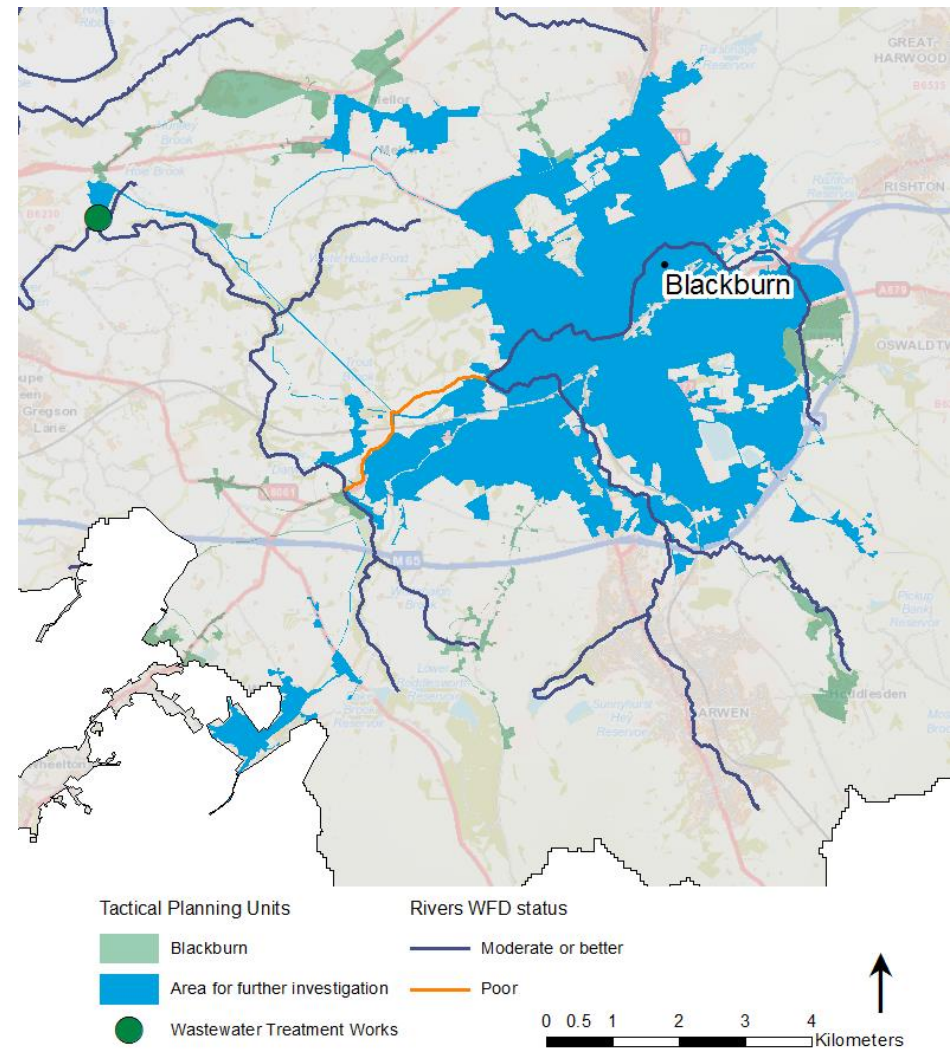


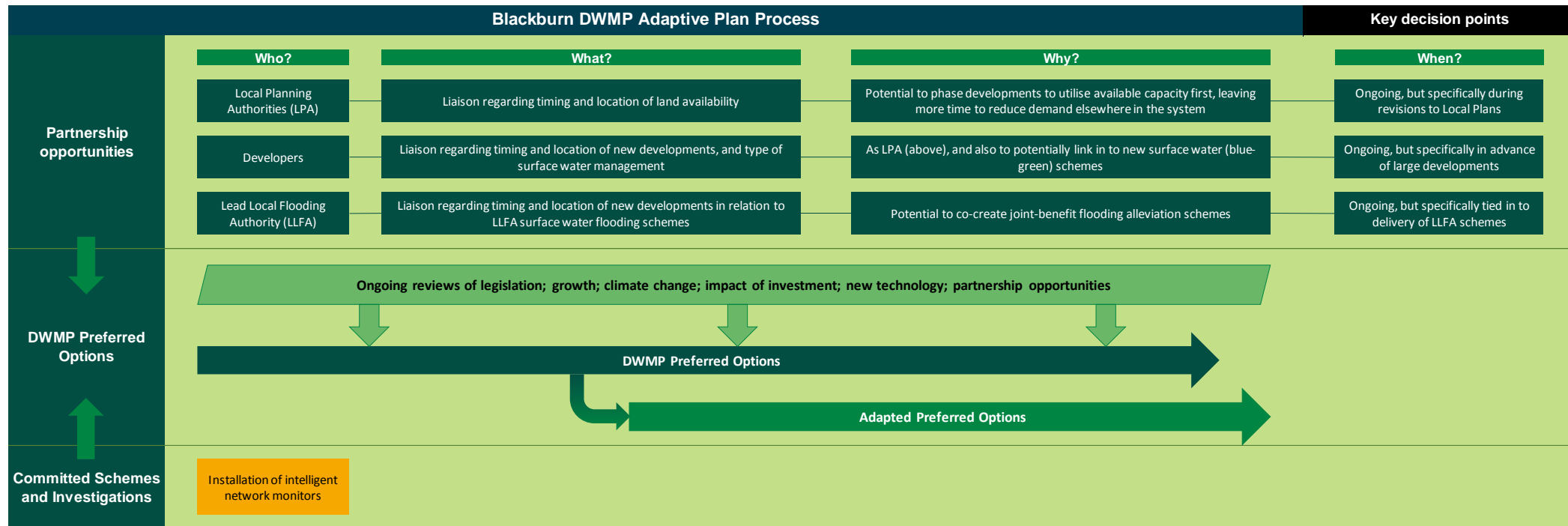
Figure 11 Map of the Blackburn TPU with areas for further investigation highlighted in blue



3.3.4.1 Blackburn adaptive plan

The first part of the Blackburn adaptive plan process (Figure 12) highlights the importance of partnership working and regular data reviews.

Figure 12 Blackburn adaptive planning process



Partnership working

In a catchment where growth is a significant factor in future performance, it is key to maintain regular conversations with those stakeholders that have knowledge about future developments and can potentially influence their impact. Key organisations include:

- Local Planning Authority;
- Housing developers;
- Lead Local Flood Authority; and
- Regular data reviews.

The DWMP plan for each TPU is developed based on a number of data sources. Some of these are prone to change over time, which means that original assessments can become out of date. As data from these sources change, it makes sense to re-evaluate the DWMP plan to check the impact on the plan. Examples of data that change over time are shown in Table 7.

Table 7 Examples of data that change over time and can impact upon the plan

Type of data or information	Possible impacts of changes
Government legislation	More or less stringent requirements or regulations, which may require different levels of investment, and policy changes that may drive better or worse incentives on demand.
Development growth projections	These will vary with time in line with economic conditions, changing demographics, or government policy. This can result in the number of new houses and businesses growing at a different rate than originally forecast.
Climate change projections	As more climate data becomes available, climate projections are modified, which may indicate changes to temperature and rainfall patterns.
Impact of investment	As new drainage schemes or new strategies are implemented, we will continue to evaluate their performance. If they turn out to be more or less successful than anticipated, this may allow the extent of another option type to be reduced or increased accordingly.
Development of new technology	Over time, new technology provides opportunities to address and resolve risks differently, or more efficiently.
Partnership opportunities	We will work closely with key stakeholders to address risks jointly. Over time, these stakeholders may see changes in their own risks and funding levels, which may present opportunities for greater collaboration.

Figure 13 shows the second part of the Blackburn adaptive plan, reflecting the different option types identified as being appropriate for Blackburn. Each horizontal line represents a different option type – e.g. schools education programme. What the plan shows that each option type will be regularly reviewed in line with the method described in part one. This allows new information and opportunities to be used to adapt the plan by either increasing or reducing the extent of some option types.

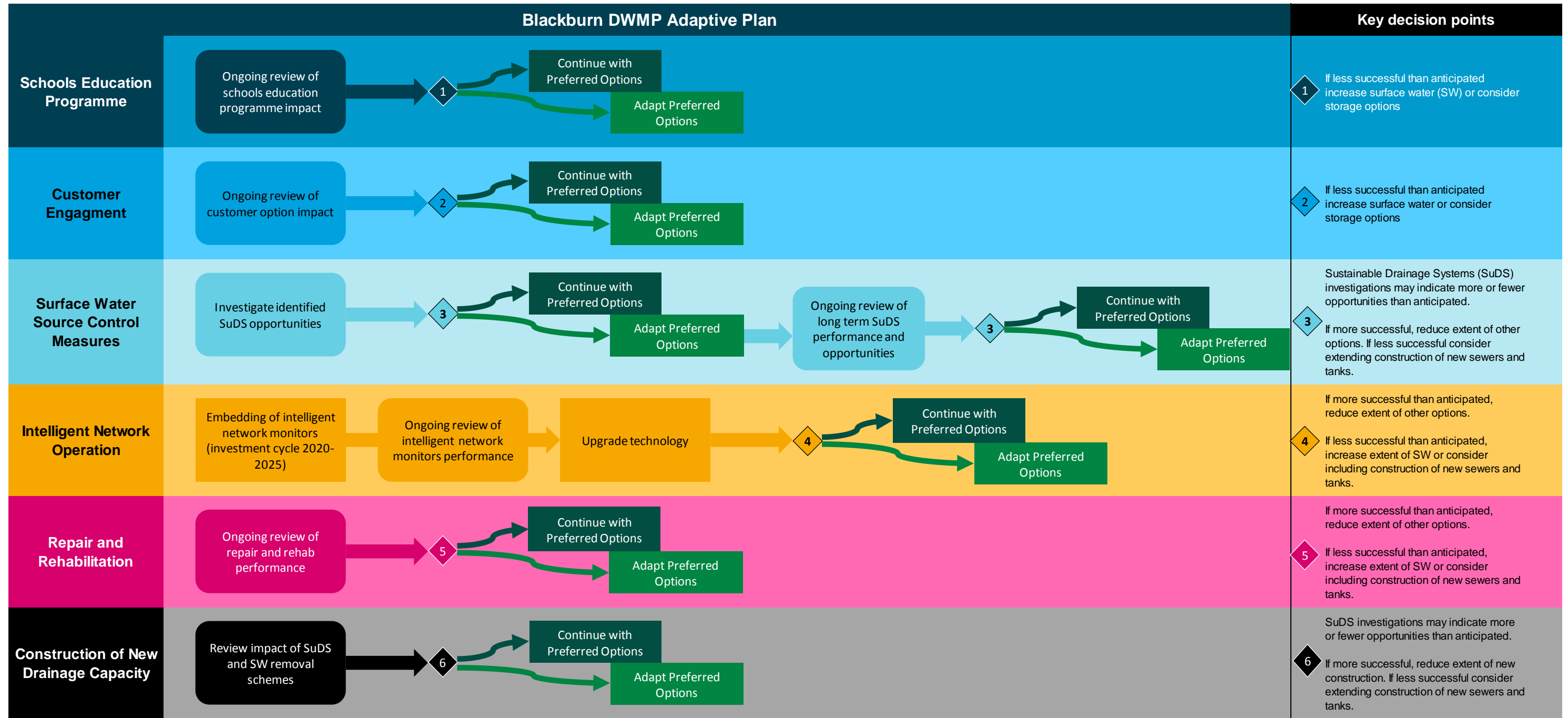
Within Blackburn, there are opportunities to carry out investigations before making final decisions on the final strategy. This means that we can properly evaluate options before committing to significant investment. These investigations will take into account things such as:

- Technical feasibility;
- Benefit of the work;
- Customer impact;
- Environmental impact; and
- Cost.

The adaptive plan below demonstrates multiple potential scenarios and pathways, and should be read in conjunction with the optimised DWMP plan for the relevant TPU (refer to Section 5.3).

The adaptive plan should be reviewed regularly in order to incorporate potential changes in key factors such as legislation, population growth and climate change, which could impact standards or targets, as highlighted above in Figure 12. The adaptive plan may contain potential investigations which are currently excluded from the optimised DWMP plan (refer to Section 5.3) until there is more certainty. It is therefore important that both the adaptive plan and the optimised plan are developed together.

Figure 13 Blackburn Adaptive Plan – Possible adaptive pathways as knowledge and opportunities change over time



4. Options development

The approach for options development is an iterative screening process to identify most appropriate solutions for issues in each TPU. These solutions were taken forward for a best value assessment which will select the preferred option (Figure 14).

An options hierarchy was then used which has been endorsed by customers and stakeholders from across the North West to select preferred solutions (Figure 15). The hierarchy covers a range of option types from behavioural, to blue-green solutions e.g. SuDS and traditional grey solutions e.g. storage tanks across benefits such as reducing demand, better system management and creating capacity.

A key element to this has been built around co-development, co-funding and co-delivery through partnerships and third parties (for instances where a specific skill set is required).

Figure 14 Options development process

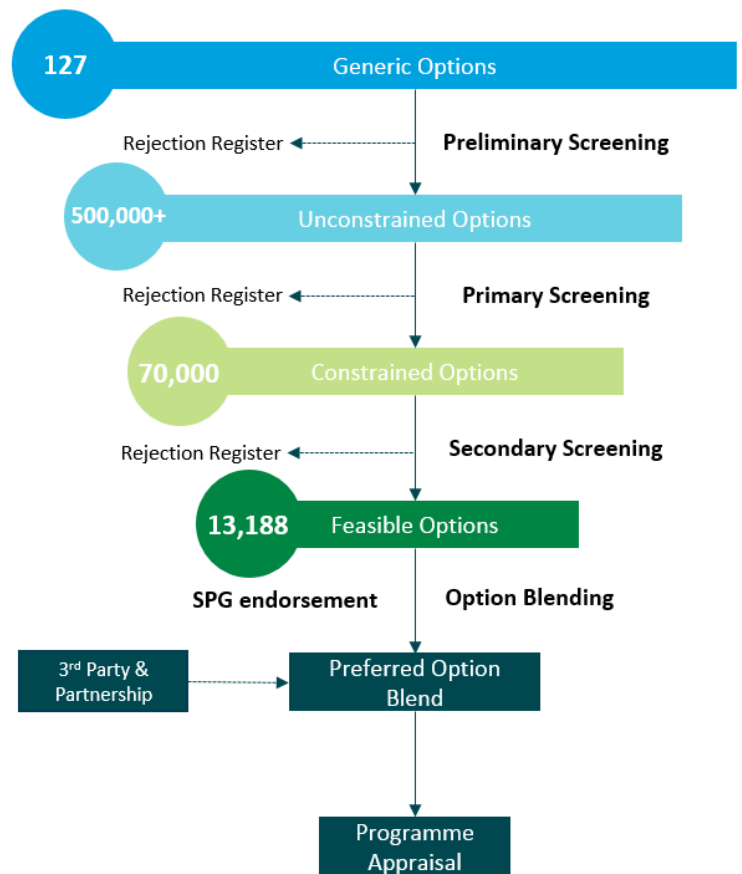


Figure 15 Options hierarchy



4.1 Ribble partnership options

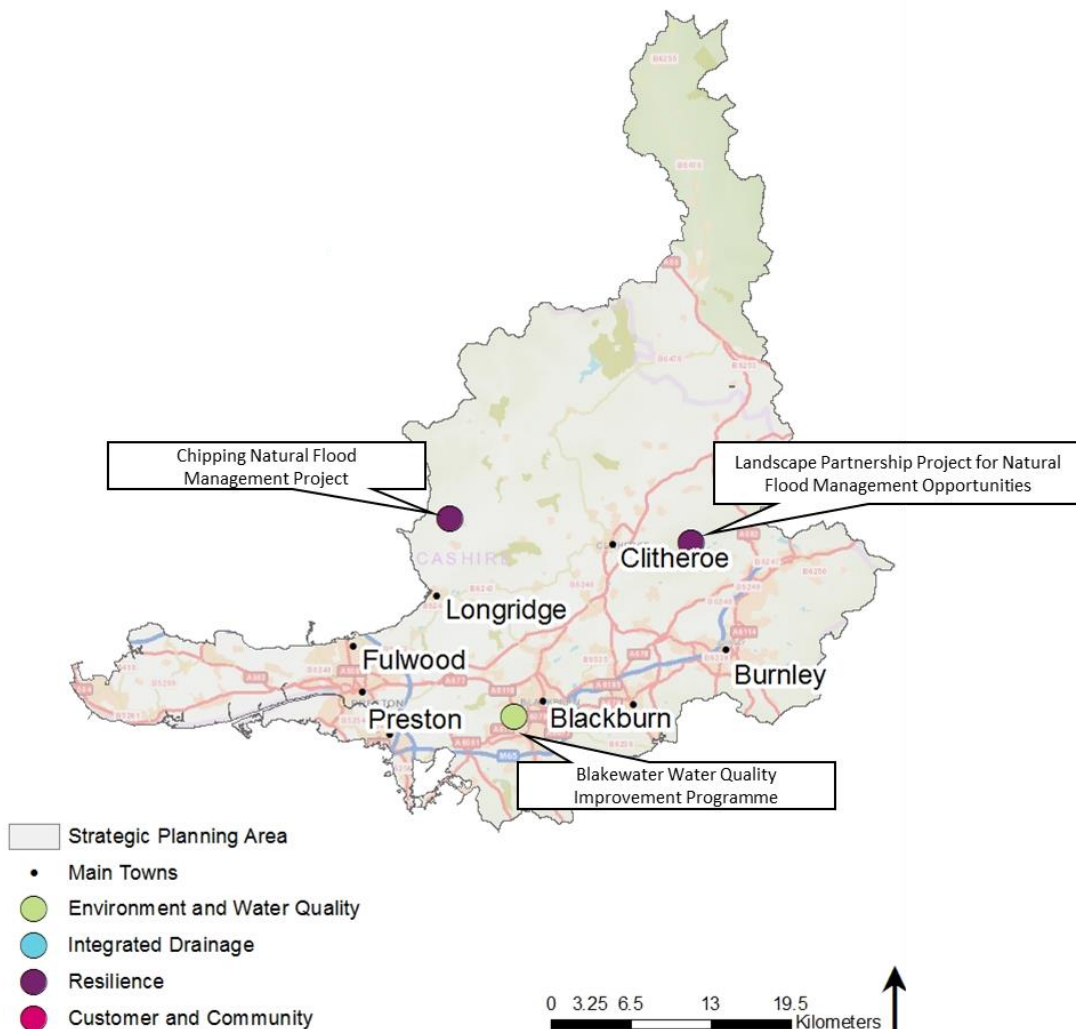
In order to identify and develop potential partnership options in the Ribble catchment, through the SPG we have shared the results from the risk identification stages such as BRAVA. This was done through a series of workshops and the purpose was to identify areas of shared risk and partnership opportunities which have been reviewed against the wider DWMP options development process (refer to Section 5.2).

The options shared were reviewed by the DWMP team and a second SPG workshop was held to gather additional information regarding potential partnership opportunities. This allowed us to understand timescales, likelihood of investment and potential organisations involved. An opportunities pipeline was consequently created using the outputs of this engagement. The pipeline includes opportunities at a range of different levels of maturity and confidence in development, as such these are not confirmed or necessarily funded schemes. However, they provide an indication of areas where we may be able to work collaboratively with partners in the future when more certainty is ascertained about need and funding. Examples of potential partnership locations are shown in Figure 16.

We have actively engaged with our SPGs to ensure that this is a collaborative process. Moving forwards, we are currently developing our Partnership Framework for the investment cycle 2025 – 2030 and beyond. The DWMP partnership opportunities pipeline will feed into this, forming an initial view of partners and opportunities. When developing the business plan, further engagement will be undertaken to where an opportunity is aligned to a 2025 – 2030 investment need. In addition to scheme specific collaboration opportunities, we recognise the need for more strategic partnerships and we will build on successes from historic partnerships in the North West.

For further information on our approach to partnership working, refer to TA2.

Figure 16 Overview of the potential partnership opportunities in the Ribble SPA



5. Options for the Ribble

5.1 Options considered

Following a number of iterative screening processes outlined in Section 4, a list of feasible options was developed for each TPU within the Ribble catchment. Options can be categorised into a number of categories:

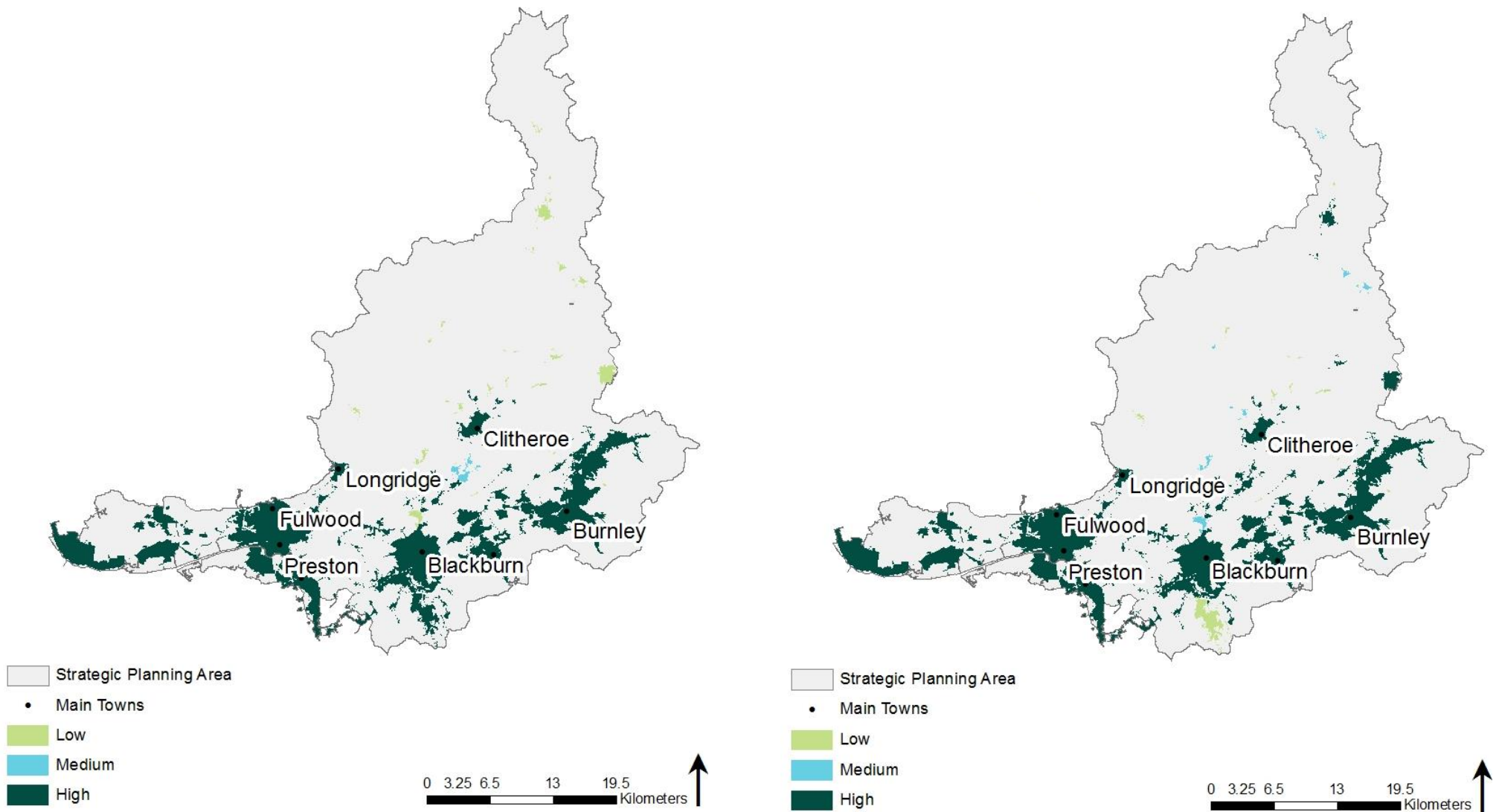
- Customer engagement;
- Monitor and investigate;
- Upstream management;
- Catchment management;
- Operational enhancement;
- Optimisation;
- Refurb/New asset (blue/green); and
- Refurb/New asset (grey).

Of these options a number can be considered regional options – those which could be implemented across the North West but may bring tangible benefits in some areas more than others. These can be investigated further ahead of investment cycle 2025 – 2030 where viable.

Across the Ribble SPA customer engagement options (Figure 17) comprising of options to work with customers to reduce demand and increase awareness of ‘what not to flush’ have been identified as having the potential to deliver the highest benefit in Preston and Blackburn TPUs.

Sustainable Drainage System (SuDS) options have been assessed, these form a key part of the strategy to manage rainwater from entering the sewer system in Blackburn, Walton-le-Dale and Burnley TPUs (Figure 17).

Figure 17 Maps show the benefit of implementing regional customer engagement (left) and sustainable drainage solutions (right) options across the Ribble SPA



5.2 Preferred options

Note: Water Industry National Environment Programme (WINEP) and storm overflows guidance are still being developed. This could lead to significant changes in preferred options and could result in large-scale, short and long term investment needs. This will be fully reviewed between draft and final DWMP publication, in addition to other aspects such as nutrient neutrality, bathing waters and shellfish water expectations. Between draft and final DWMPs the impact of storm overflow requirements will also require optimising against the other needs and opportunities detailed in this section to assess synergy/conflict and best value.

The data below do not include planned investment in addressing storm overflows. The future standards for overflows are currently the subject of the Government’s Storm Overflow Discharge Reduction Plan Consultation, and the outcome is not yet determined, so it has not been possible to include these in the screening process described below.














A high-level regional assessment has been carried out to estimate the likely investment requirements to address all overflow risks, but due to the uncertainty described above, this has not been broken down by Strategic Planning Areas. This information can be found in the DWMP main document.

Utilising data collected at the various stages of developing the DWMP (BRAVA, partnership opportunities and the data in Figure 17), preferred options were selected using a decision support tool and following the hierarchy principles. We have also included in this plan high confidence schemes that we believe are likely to have secured investment.

In addition the partnership opportunities highlighted in Section 4.1 are considered key for delivery of the options set out below. These will be investigated in detail in preparation for the investment plan for the period 2025-2030.

The following colour schemes are used for all charts and graphs in this section to represent each option type (Figure 18).

Figure 18 Option types

Reduce Service Demand		Schools Education Programme
		Customer Engagement
		Surface Water Source Control Measures
		Modification of Permits
Better System Management		Intelligent Network Operation
		Enhanced Operational Maintenance
		Repair and Rehabilitation
Create Additional Capacity		New 'Green' WwTW Capacity (e.g. Reedbed)
		New 'Green' Overflow Treatment (e.g. Reedbed)
		Separation of Combined Sewers
		WwTW Transfers
		WwTW Improvement
		Construction of New Drainage Capacity

The first four option types are all grouped under the strategic heading of 'Reduce Service Demand', and are options that focus on either reducing the amount of wastewater that is produced, or preventing it from reaching the sewer network.

The second strategic group is 'Better System Management' and looks to try and manage and operate the existing assets in a more efficient or effective manner.

The final group is 'Create Additional Capacity'. This is about building new assets, for example storage tanks or new treatment work process units, where it is not possible or economical to reduce demand or improve operations any further.

Across the Ribble SPA, the outcomes seen as a result of investment and benefit in each option type are shown in Figures 19, 20, and 21 respectively.

Figures 19 and 20 show how potential investment could be split between the three high-level option strategies – reduce demand, system management and new capacity – and then further sub-divides these into the individual option types.

Figure 19 shows potential options that could address environmental planning objectives, which incorporate:

- Wastewater treatment work permit compliance;
- WINEP compliance; and
- Pollution of watercourses.

Figure 20 shows potential options that could address flooding planning objectives, which incorporate:

- Internal flooding;
- External flooding;
- Highway and open space flooding; and
- 1 in 50-year flooding.

Note that the percentages shown in Figures 19 and 20 are the proportions of investment within each planning objective type (flooding and environmental), but the total values of flooding and environmental investment are not equal. This split can be seen in more detail for each TPU in Section 5.3.

Figure 21 shows how these options could contribute to addressing the planning objectives – environmental and flooding.

Figure 19 Ribble Strategic Planning Area: Distribution of environmental investment by option type

This is an example of how investment in different options types may be used to address the environmental planning objectives. The vast majority of potential investment could be through improvements in wastewater treatment works. This chart does not show planned investment in improving overflow performance as these are not based on cost beneficial assessments.

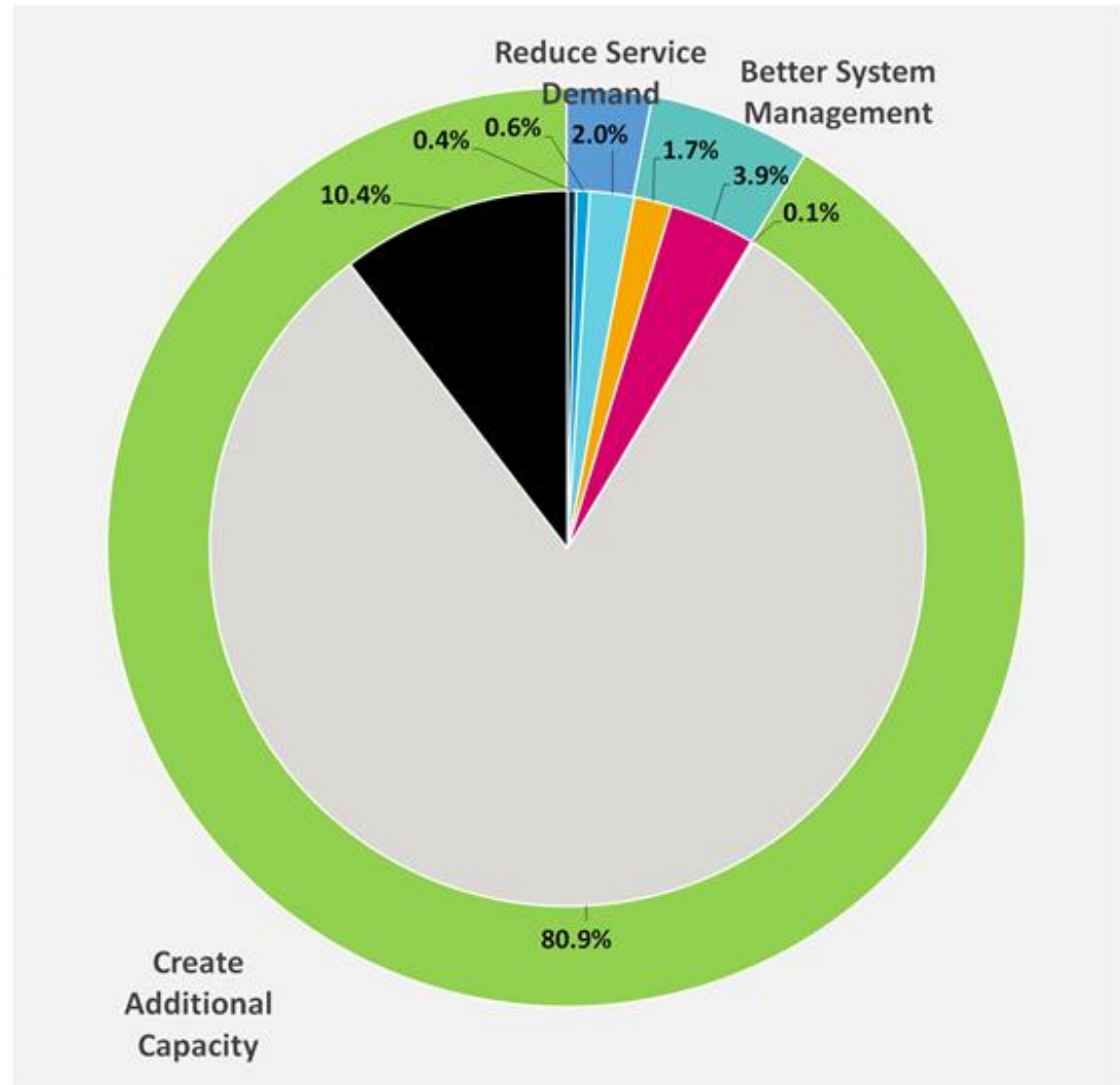
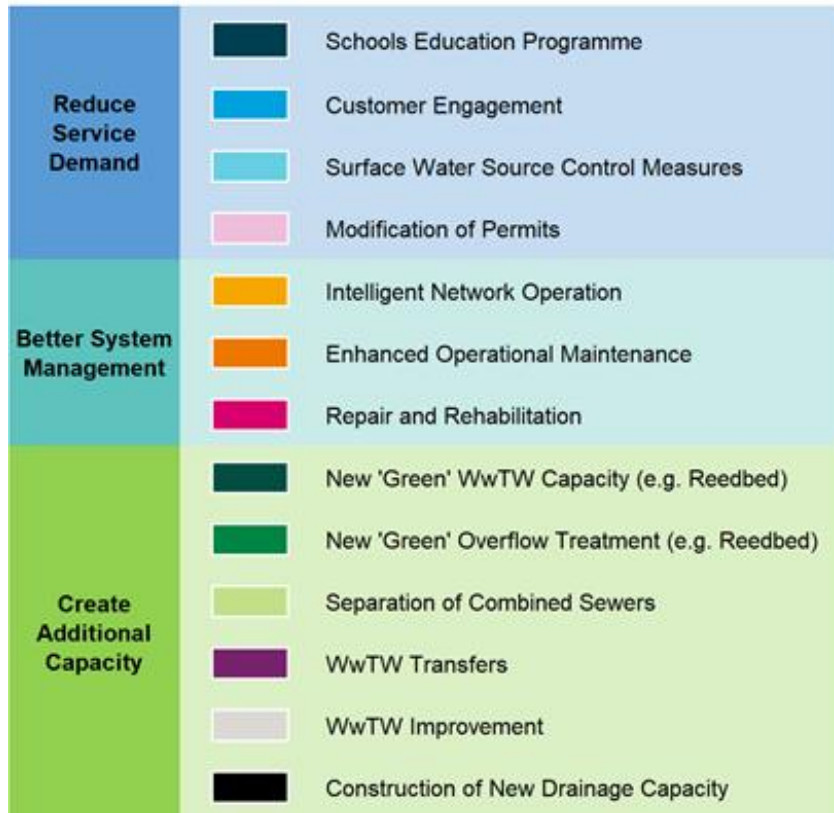


Figure 20 Ribble Strategic Planning Area: Distribution of flooding investment by option type

This is an example of how different options types may be used to address flooding planning objectives. Two thirds of the potential investment could be through a strategy to reduce demand on the sewer system. This potential investment could be through surface water source control measures such as SuDS and schools and engagement programmes.

Around 18% of potential investment could be in the construction of new drainage capacity and the separation of combined sewers. Around 14% could be used to improve existing system management with options such as enhanced maintenance and repair and rehabilitation.

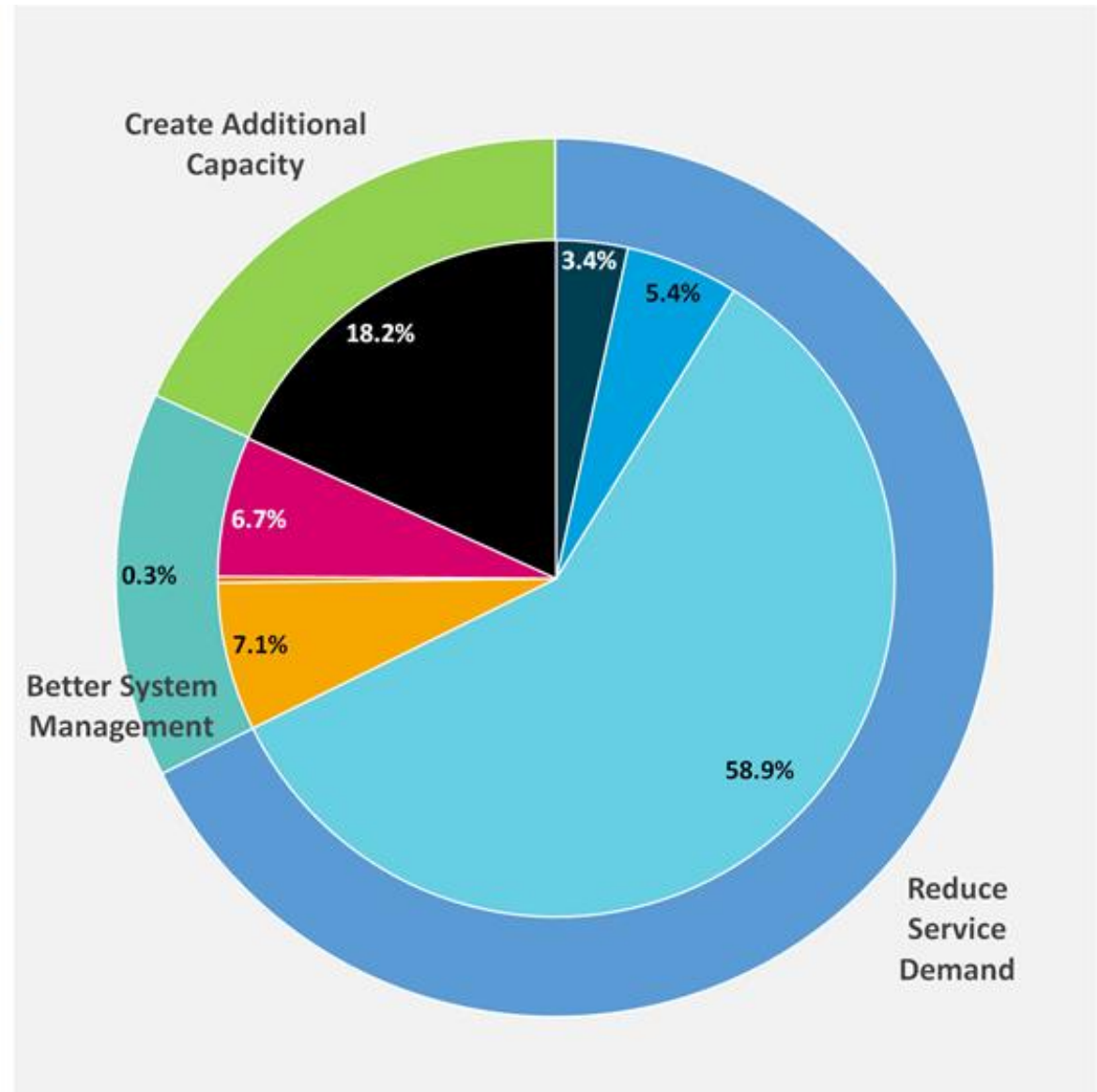
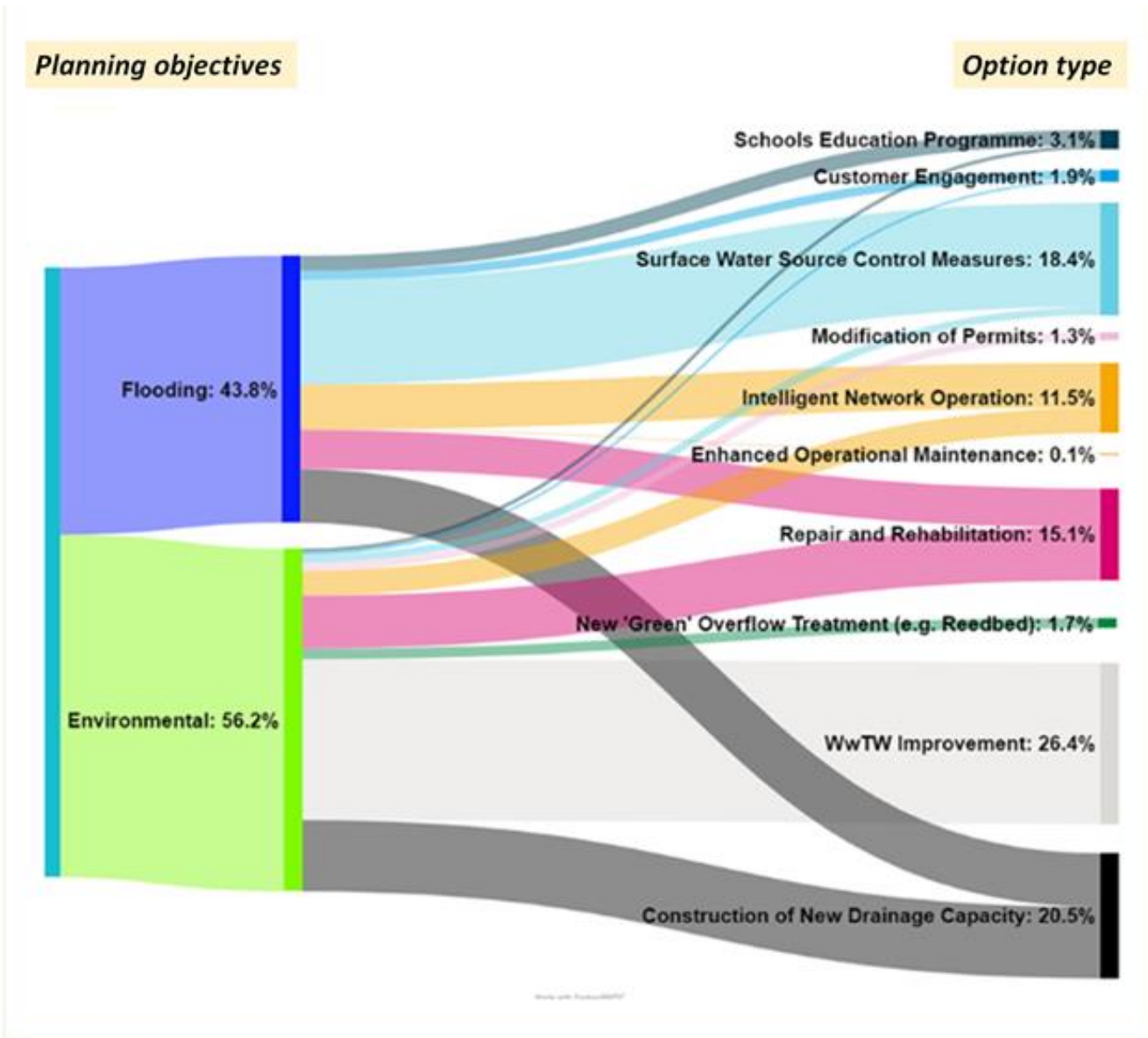
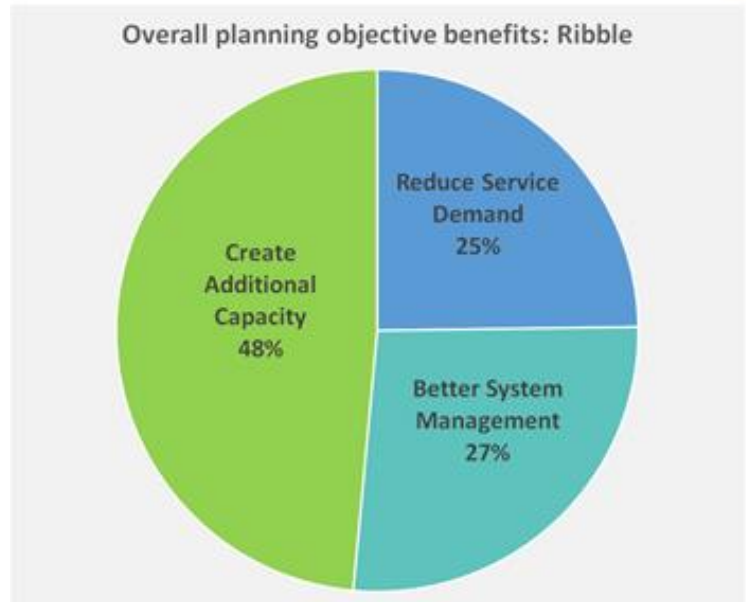


Figure 21 Distribution of benefit by option type within the Ribble SPA

This is an example of how different option types may be used to demonstrate potential benefits against different planning objectives within the Ribble SPA.

United Utilities Water (UUW) commitments to improving flooding performance could be met through the reduction of surface water flows, construction of new stormwater drainage capacity, installation of intelligent network and repair and rehabilitation of existing network, supported by schools and customer engagement programmes.

Environmental planning objectives could be met mainly through the repair and rehabilitation of existing network, improvements to wastewater treatment works, construction of new drainage capacity, new 'green' overflow treatment, modification of permits and improved operational maintenance.

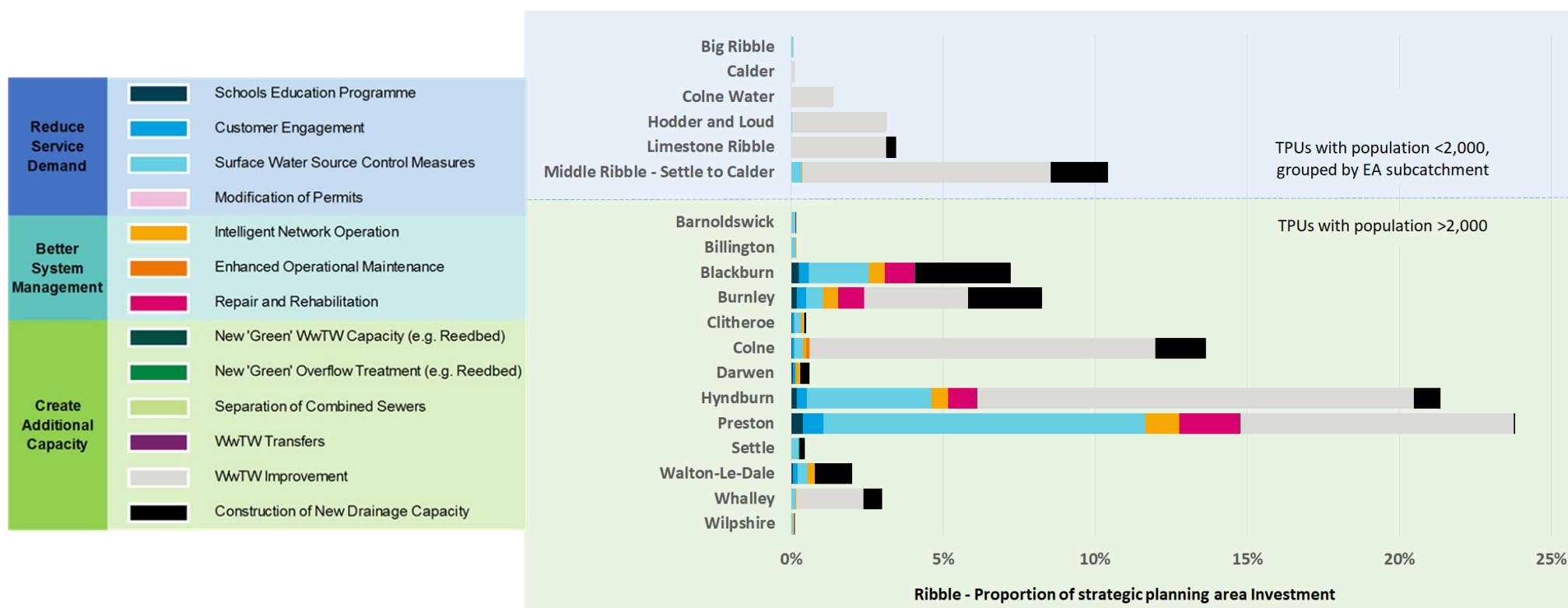


5.3 Overview of preferred options in each TPU

Figure 22 shows the proportion of Ribble SPA potential investment in each TPU, split up by option type. Note that the smaller TPUs within the catchment (those with less than 2,000 population) have been reported together at the top of the chart, grouped by SPA sub catchment (Environment Agency Operational Catchment boundaries).

It can be seen that in the Ribble SPA, the largest TPUs see the largest potential investment, which is split predominantly between surface water control, improved system management, and construction of new storm water storage tanks.

Figure 22 Proportion of investment seen in each TPU within the Ribble SPA



The following sub-sections show how investment could be split between different types of options to bring benefits to each TPU over the short, medium and long term. Some options, such as construction of new storm water storage tanks, occur at a single point in time; however the benefit of reduced flooding may be seen long into the future. Other options such as schools education, are continual programmes that will help to encourage long-term sustainable behaviours, such as reduction in water use.

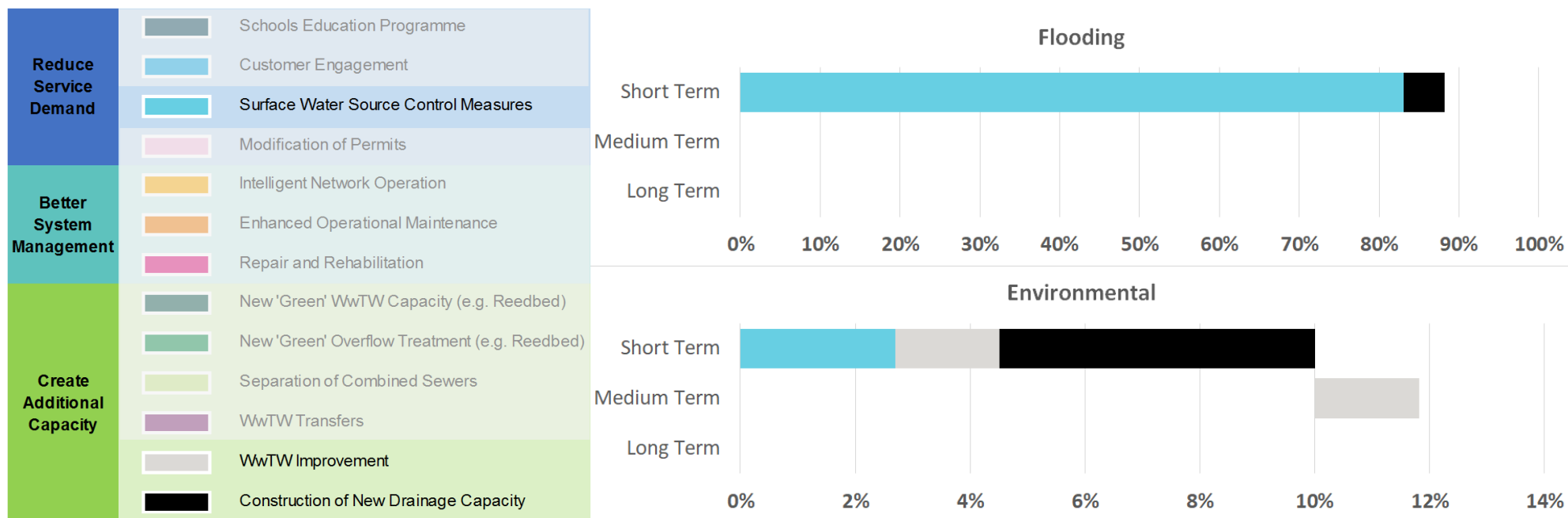
5.3.1 Barnoldswick

The results from the DWMP show that if we were to invest in Barnoldswick over the next 25 years, around 88% of the investment in could be to address flooding risks, and around 12% of investment could be to address environmental risks (Figure 23).

In the short term, potential investment could be through surface water source control measures and construction of new storm water drainage capacity, with some wastewater treatment works improvements to ensure permit compliance.

In the medium term, the work at the wastewater treatment works could continue.

Figure 23 Short, medium and long-term investment in the Barnoldswick TPU, distributed by option type



5.3.2 Billington

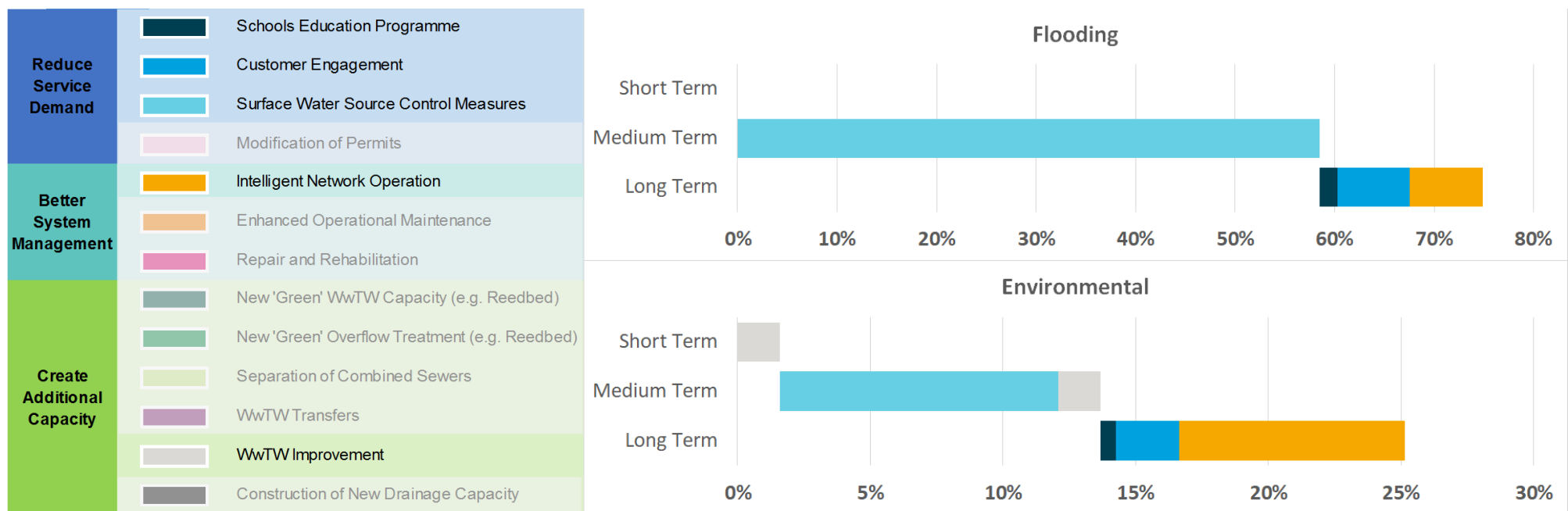
The results from the DWMP show that if we were to invest in Billington over the next 25 years, around 75% of the investment could be to address flooding risks, and around 25% of investment could be to address environmental risks (Figure 24).

In the short term, potential investment could be in wastewater treatment works improvements to ensure permit compliance.

In the medium term, investment could be mainly through surface water source control measures, with continuation of the work at the wastewater treatment works.

In the longer term, intelligent network monitoring systems may be introduced, and schools education and customer engagement programmes could be implemented.

Figure 24 Short, medium and long-term investment in the Billington TPU, distributed by option type



5.3.3 Blackburn

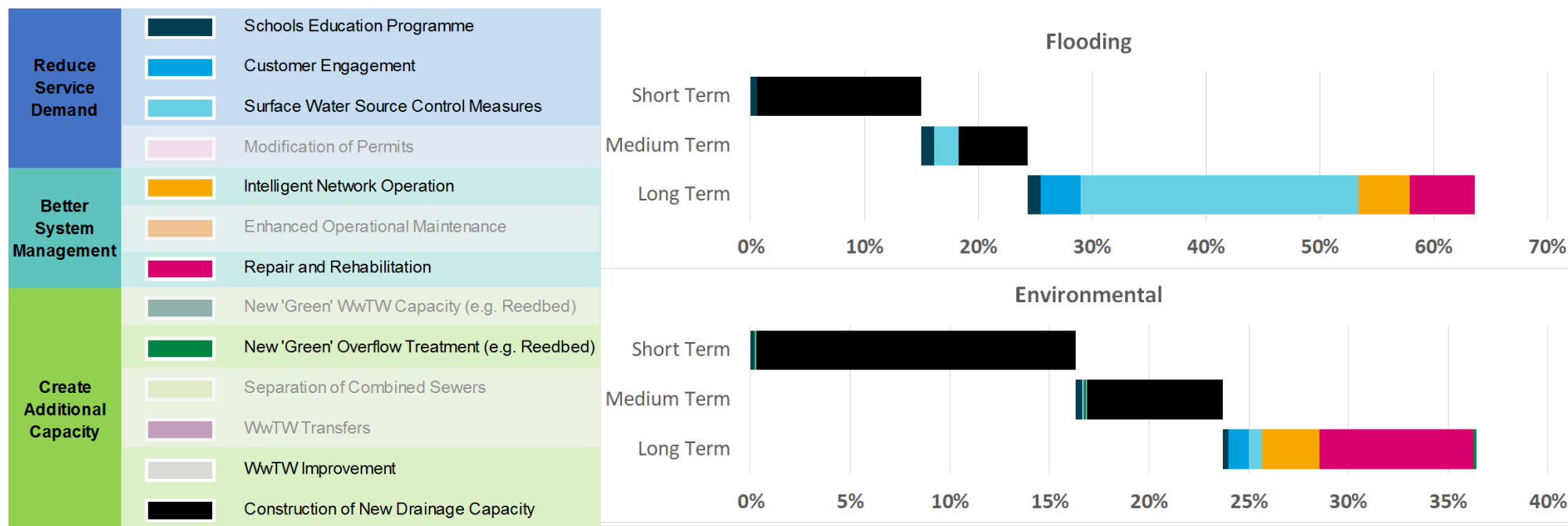
The results from the DWMP show that if we were to invest in Blackburn over the next 25 years, around 64% of the investment could be to address flooding risks, and around 36% of investment could be to address environmental risks (Figure 25).

In the short and medium term, potential investment could be the construction of new storm water storage capacity.

In the medium term, there could also be investment in surface water source control measures, and schools education programmes.

In the longer term, in addition to the above, there could be significant additional investment in surface water schemes, and also investment in intelligent network monitoring systems and sewer repair and rehabilitation programmes.

Figure 25 Short, medium and long-term investment in the Blackburn TPU, distributed by option type



5.3.4 Burnley

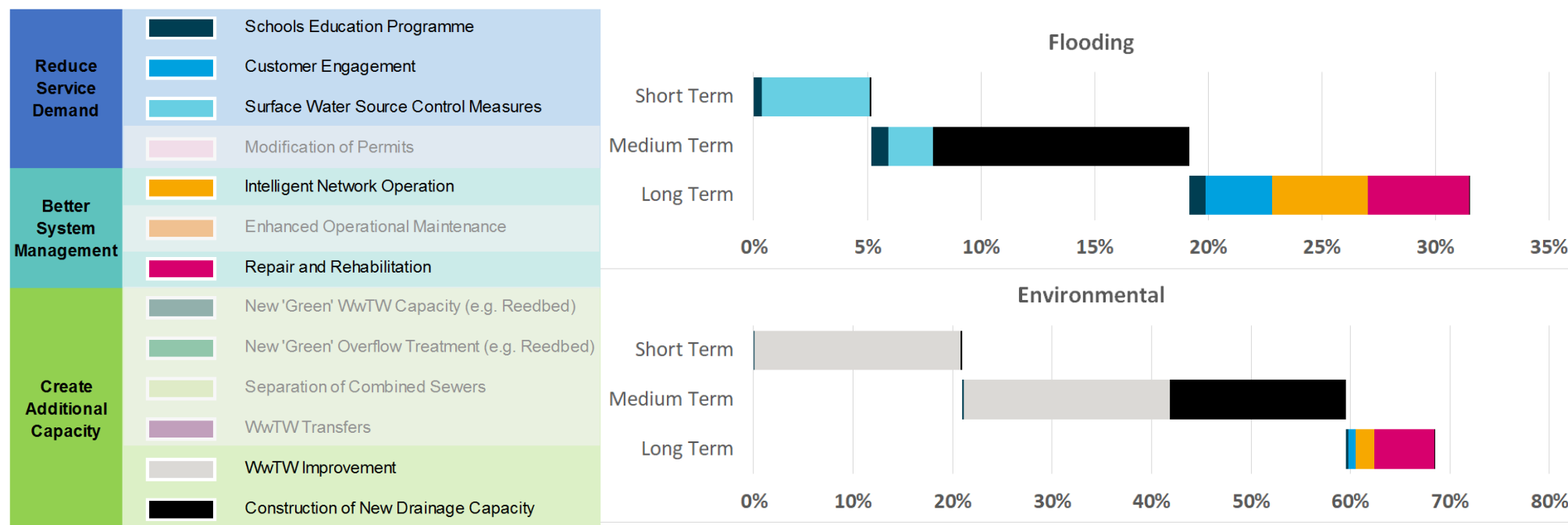
The results from the DWMP show that if we were to invest in Burnley over the next 25 years, around 32% of the investment could be to address flooding risks, and around 68% of investment could be to address environmental risks (Figure 26).

In the short and medium term, potential investment could be in wastewater treatment works improvements to ensure permit compliance, with some investment in surface water source control measures and schools education programmes.

In the medium term, in addition to the continuation of the above, there could also be investment in the construction of new storm water drainage capacity.

In the longer term, we could replace or update the existing intelligent network monitoring systems that are already in place, and undertake sewer repair and rehabilitation work, as well as customer engagement programmes.

Figure 26 Short, medium and long-term investment in the Burnley TPU, distributed by option type



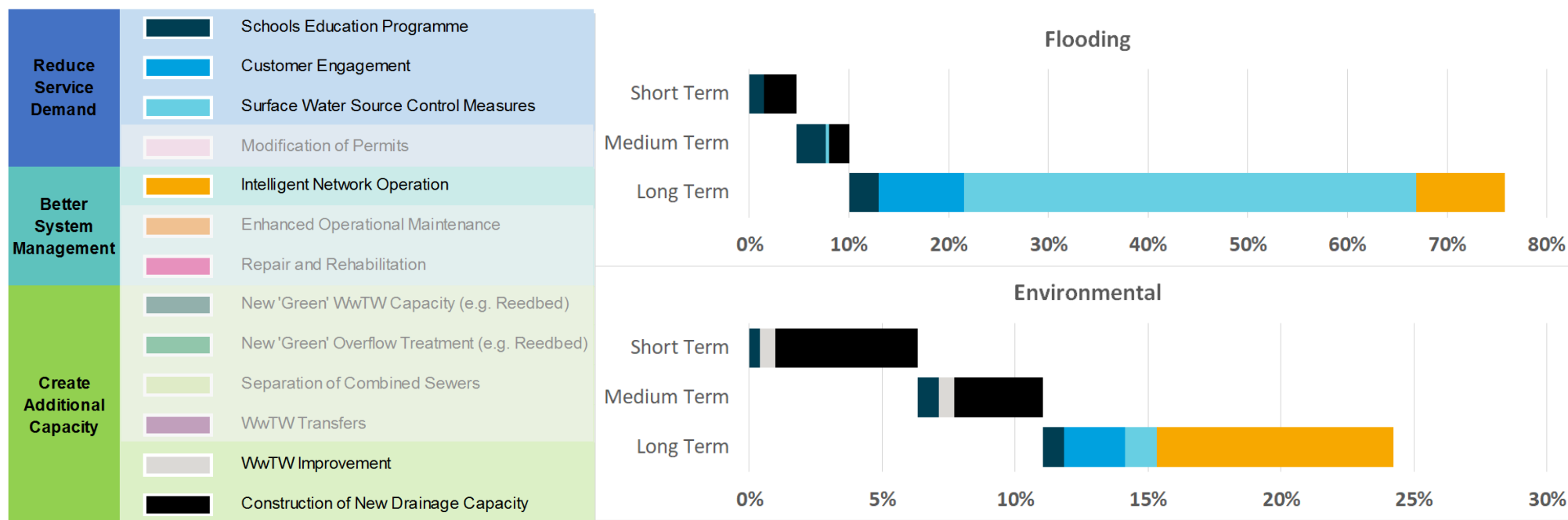
5.3.5 Clitheroe

The results from the DWMP show that if we were to invest in Clitheroe over the next 25 years, around 76% of the investment could be to address flooding risks, and around 24% of investment could be to address environmental risks (Figure 27).

In the short and medium term, investment could be in wastewater treatment works improvements to ensure permit compliance, construction of new storm water drainage capacity, and schools education programmes.

In the longer term, we could invest in surface water source control measures, install intelligent network monitoring systems, and undertake customer engagement programmes.

Figure 27 Short, medium and long-term investment in the Clitheroe TPU, distributed by option type



5.3.6 Colne

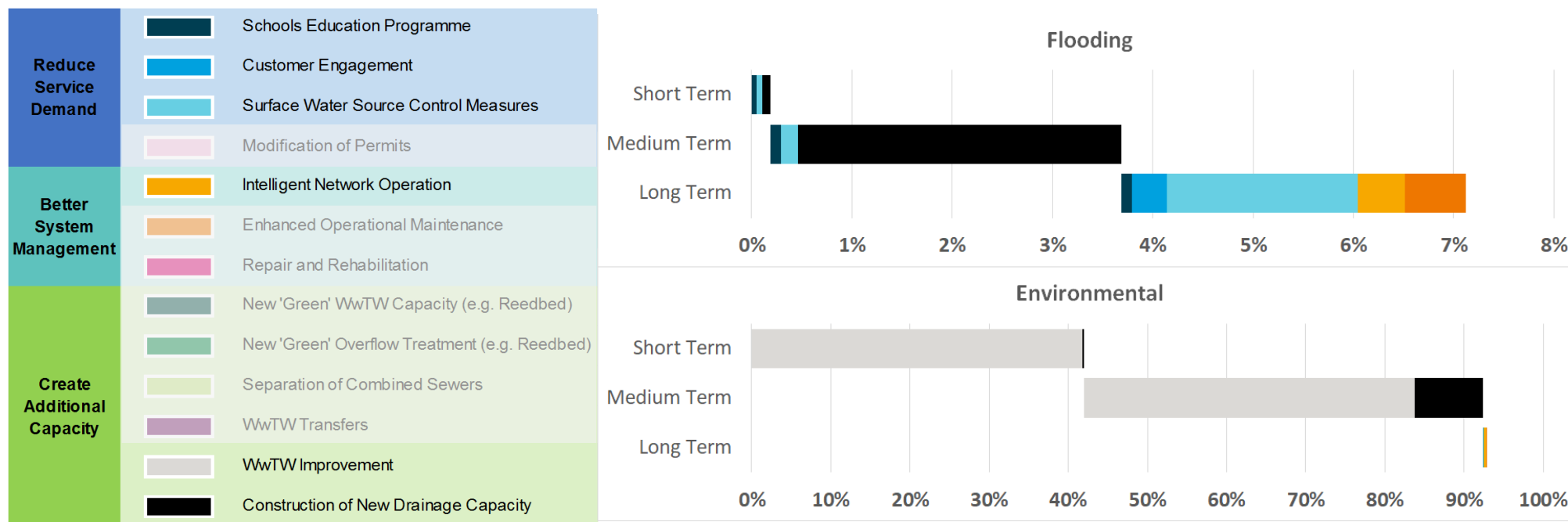
The results from the DWMP show that if we were to invest in Colne over the next 25 years, around 7% of the investment could be to address flooding risks and around 93% of investment could be to address environmental risks (Figure 28).

In the short term, potential investment could address environmental risk, through the provision of wastewater treatment works improvements to ensure permit compliance.

In the medium term, investment in the wastewater treatment works could continue, supplemented by the construction of new storm water drainage capacity, surface water source control measures, and schools education programmes.

In the longer term, we could continue to invest in surface water source control measures, install intelligent network monitoring systems, implement enhanced operational maintenance and undertake customer engagement programmes.

Figure 28 Short, medium and long-term investment in the Colne TPU, distributed by option type



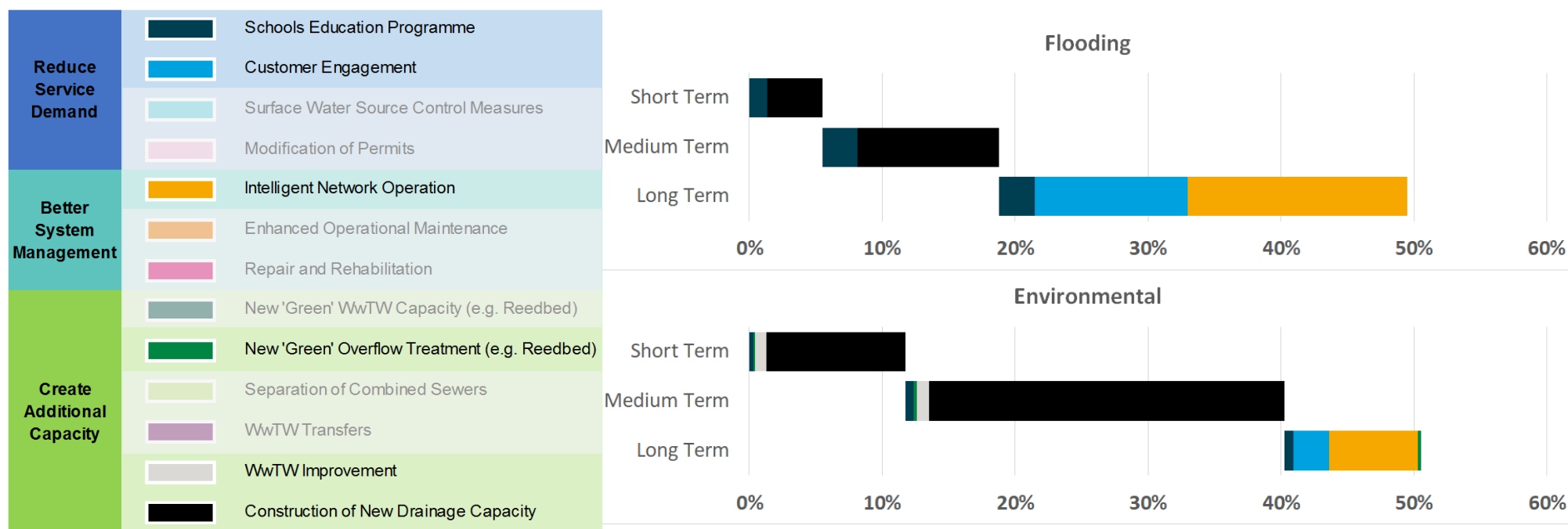
5.3.7 Darwen

The results from the DWMP show that if we were to invest in Darwen over the next 25 years, around 49% of the investment could be to address flooding risks, and around 51% of investment could be to address environmental risks (Figure 29).

In the short and medium term, potential investment could be in the construction of new storm water drainage capacity, with additional investment in the provision of wastewater treatment works improvements to ensure permit compliance.

In the longer term, we could install intelligent network monitoring systems and undertake customer engagement programmes.

Figure 29 Short, medium and long-term investment in the Darwen TPU, distributed by option type



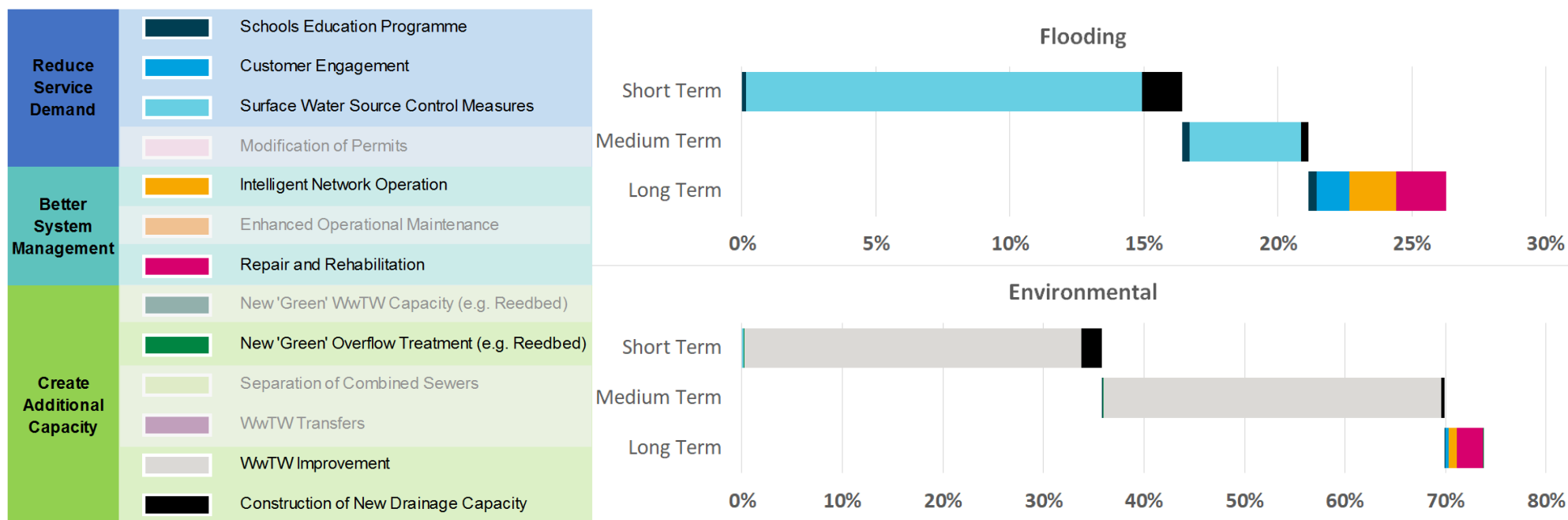
5.3.8 Hyndburn

The results from the DWMP show that if we were to invest in Hyndburn over the next 25 years, around 26% of the investment could be to address flooding risks, and round 74% of investment could be to address environmental risks (Figure 30).

In the short and medium term, potential investment could be in the provision of wastewater treatment works improvements to ensure permit compliance. Additionally, there could be investment in surface water control measures (e.g. SuDS), in the construction of new storm water drainage capacity, and in schools education programmes.

In the longer term, we could replace or update the existing intelligent network monitoring systems that are already in place, and undertake sewer repair and rehabilitation work, as well as customer engagement programmes

Figure 30 Short, medium and long-term investment in the Hyndburn TPU, distributed by option type



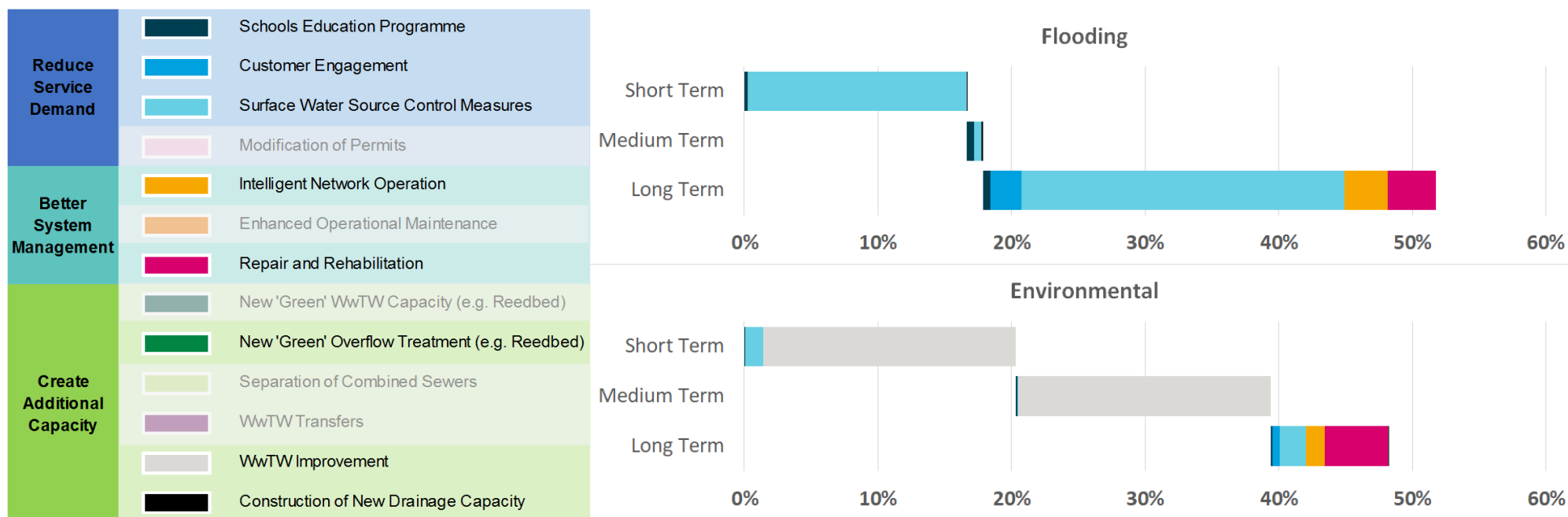
5.3.9 Preston

The results from the DWMP show that if we were to invest in Preston over the next 25 years, around 52% of the investment could be to address flooding risks, and around 48% of investment could be to address environmental risks (Figure 31).

In the short and medium term, potential investment could be in the provision of wastewater treatment works improvements to ensure permit compliance, and in surface water control measures (e.g. SuDS).

In the longer term, in addition to the above, we could replace or update the existing intelligent network monitoring systems that are already in place, and undertake sewer repair and rehabilitation work, as well as customer engagement programmes.

Figure 31 Short, medium and long-term investment in the Hyndburn TPU, distributed by option type



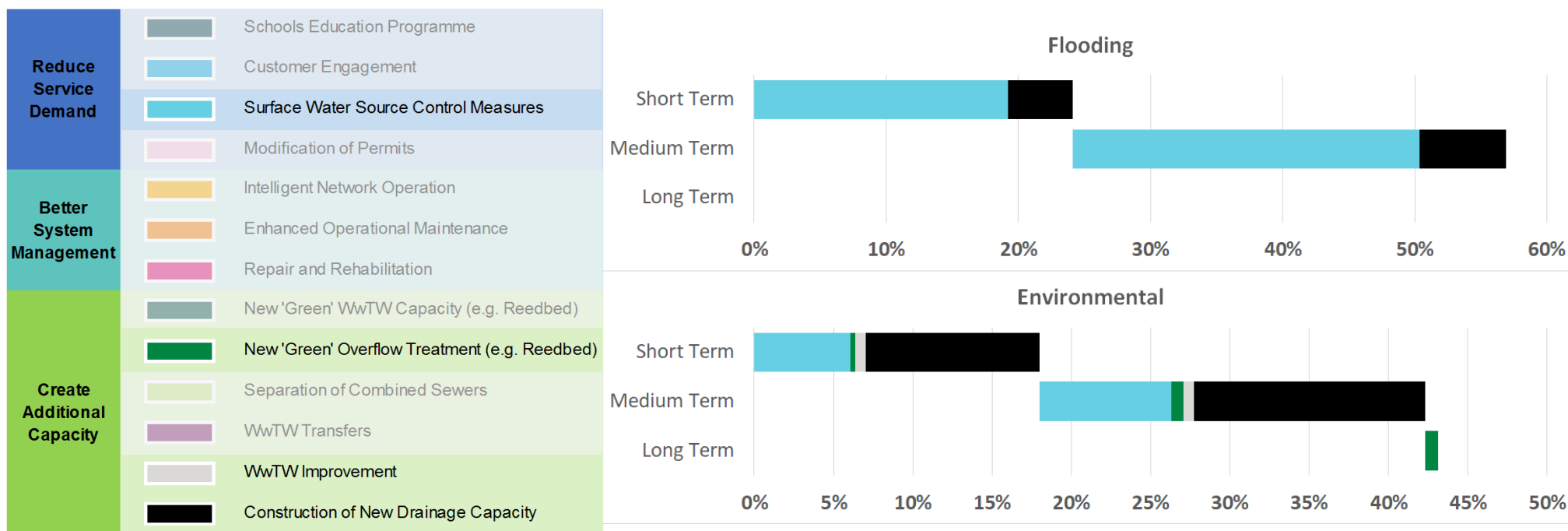
5.3.10 Settle

The results from the DWMP show that if we were to invest in Settle over the next 25 years, around 57% of the investment in Settle over the next 25 years could be to address flooding risks, and around 43% of investment could be to address environmental risks (Figure 32).

In the short and medium term, potential investment could be in surface water control measures (e.g. SuDS) and the construction of new storm water drainage capacity. There could also be investment in ‘green’ overflow treatment (e.g. reed beds) and in the installation of wastewater monitoring systems to ensure permit compliance.

In the longer term, in addition to the above, we could continue investment in ‘green’ overflow treatment.

Figure 32 Short, medium and long-term investment in the Settle TPU, distributed by option type



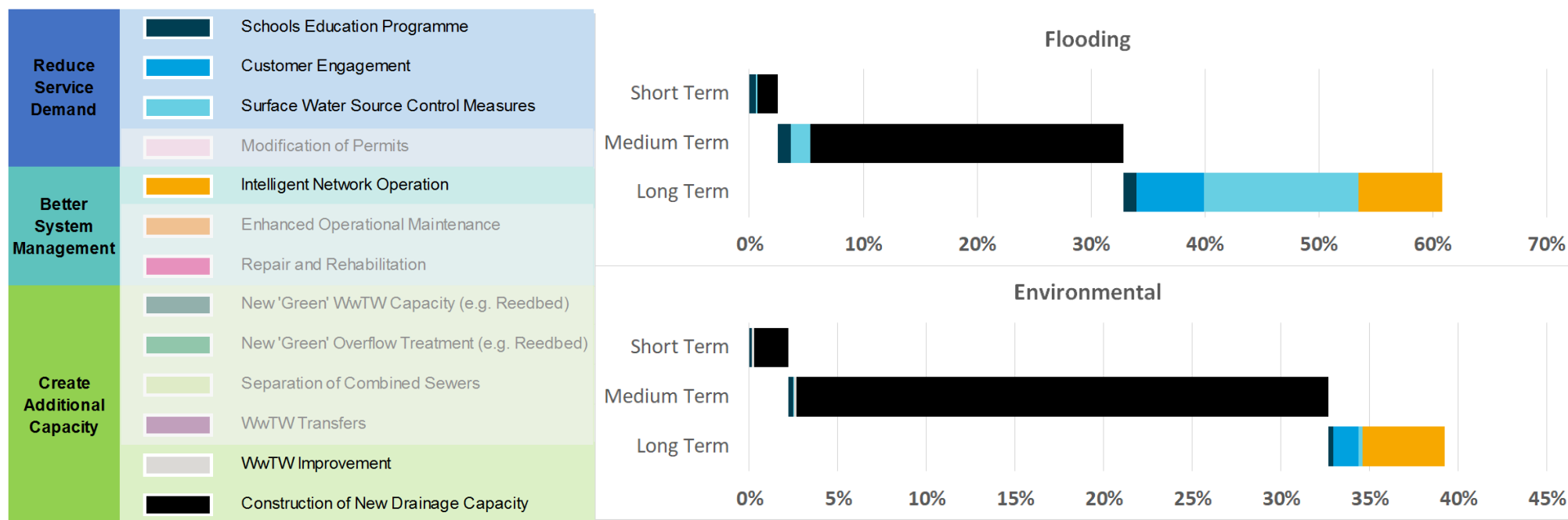
5.3.11 Walton-le-Dale

The results from the DWMP show that if we were to invest in Walton-le-Dale over the next 25 years, around 61% of the investment could be to address flooding risks, and around 39% of investment could be to address environmental risks (Figure 33).

In the short and medium term, potential investment could be in the construction of new storm water drainage capacity, with additional investment in surface water control measures (e.g. SuDS) and schools education programmes.

In the longer term, we could replace or update the existing intelligent network monitoring systems that are already in place, continue SuDS investment, and undertake customer engagement programmes.

Figure 33 Short, medium and long-term investment in the Walton-le-Dale TPU, distributed by option type



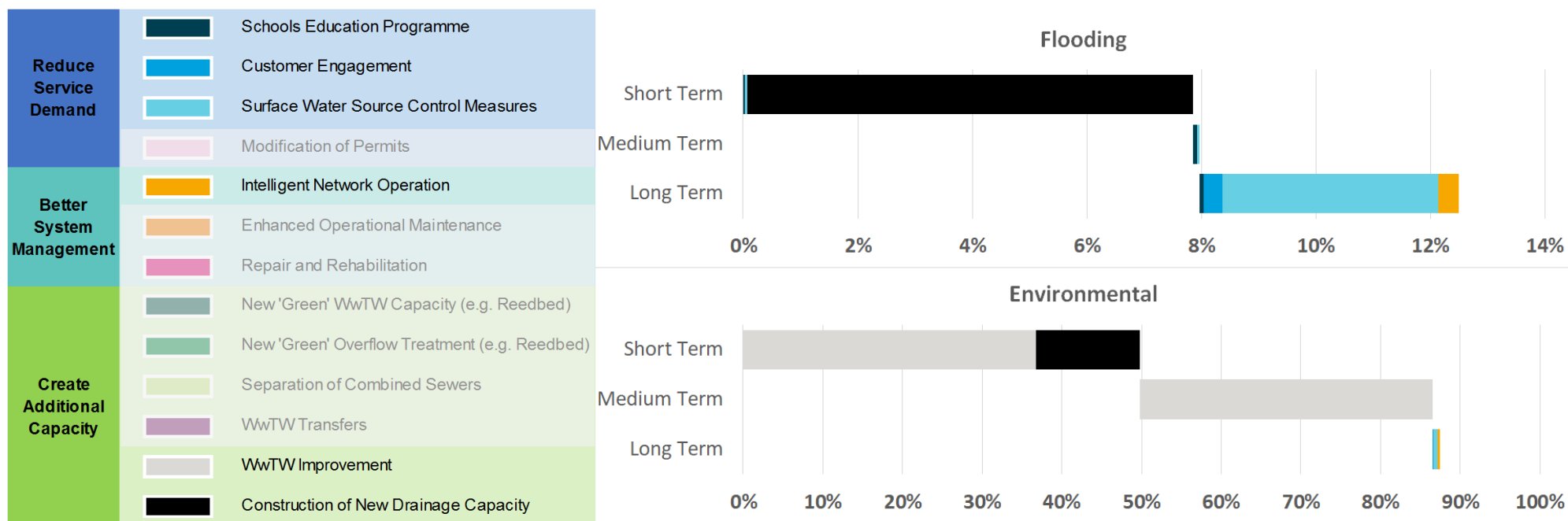
5.3.12 Whalley

The results from the DWMP show that if we were to invest in Whalley over the next 25 years, around 12% of the investment could to address flooding risks, and around 88% of investment could be to address environmental risks (Figure 34).

In the short and medium term, potential investment could be in the provision of wastewater treatment works improvements to ensure permit compliance and the construction of new storm water drainage capacity.

In the longer term, we could invest in surface water control measures (e.g. SuDS), install intelligent network monitoring systems, and undertake schools and customer engagement programmes.

Figure 34 Short, medium and long-term investment in the Whalley TPU, distributed by option type



5.3.13 Wilpshire

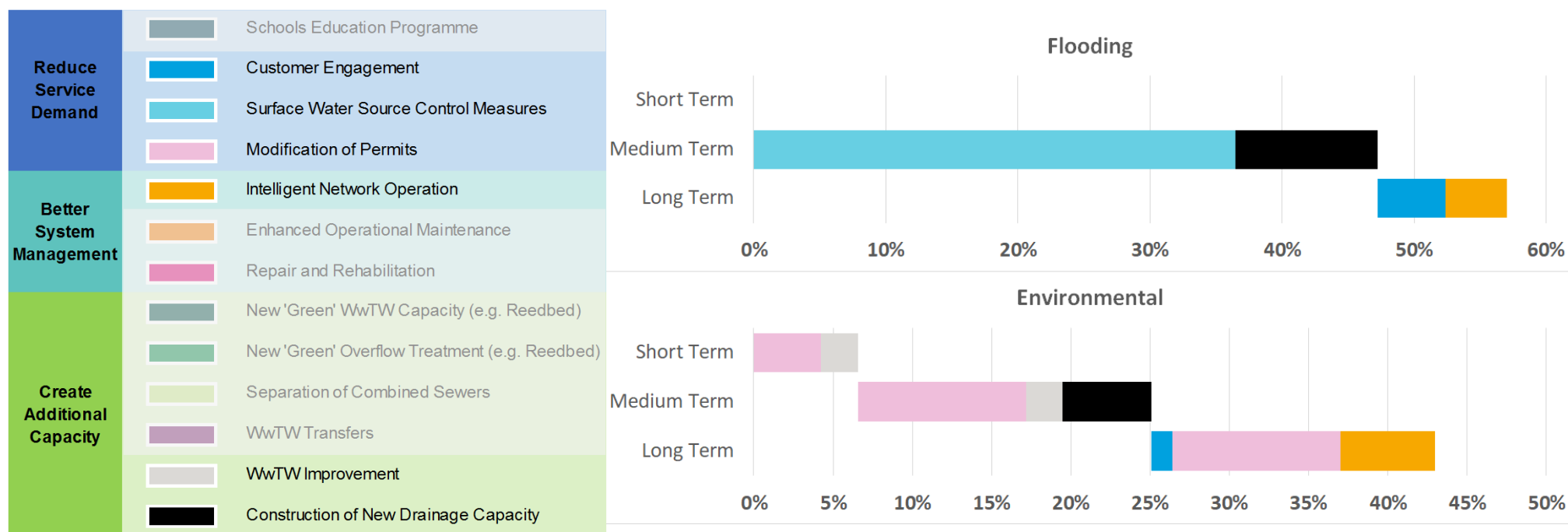
The results from the DWMP show that if we were to invest in Wilpshire over the next 25 years, around 57% of the investment could be to address flooding risks, and around 43% of investment could be to address environmental risks (Figure 35).

In the short term, potential investment could be to address environmental risk through the modification of permits and the installation of wastewater monitoring systems to ensure permit compliance.

In the medium term, we could continue to address environmental risks as above and also through the construction of storm water drainage capacity. Flooding risk could be addressed through new storm water capacity and surface water control measures (e.g. SuDS).

In the longer term, we could invest in install intelligent network monitoring systems, and undertake customer engagement programmes.

Figure 35 Short, medium and long-term investment in the Wilpshire TPU, distributed by option type



5.3.14 TPUs with population less than 2,000: Big Ribble sub catchment

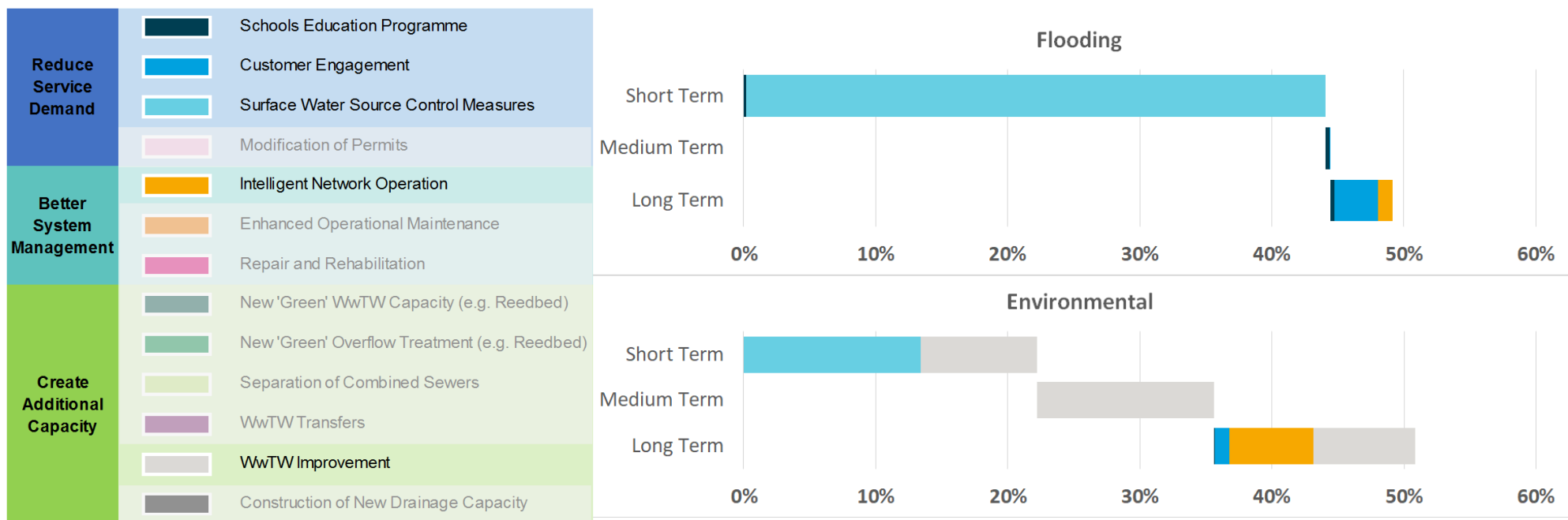
The following TPUs each have a population of less than 2,000, and have therefore been grouped together:

- Hurst Green
- Ribchester
- Ribchester Hospital

Short and medium term potential investment in these small TPUs will be through the provision of surface water control measures and wastewater treatment works capacity improvements to ensure permit compliance (Figure 36).

In the long term, we could introduce intelligent network monitoring and schools and customer engagement programmes.

Figure 36 Short, medium and long term investment in TPUs with population less than 2,000 (Big Ribble) distributed by option type



5.3.15 TPUs with population less than 2,000: Calder sub catchment

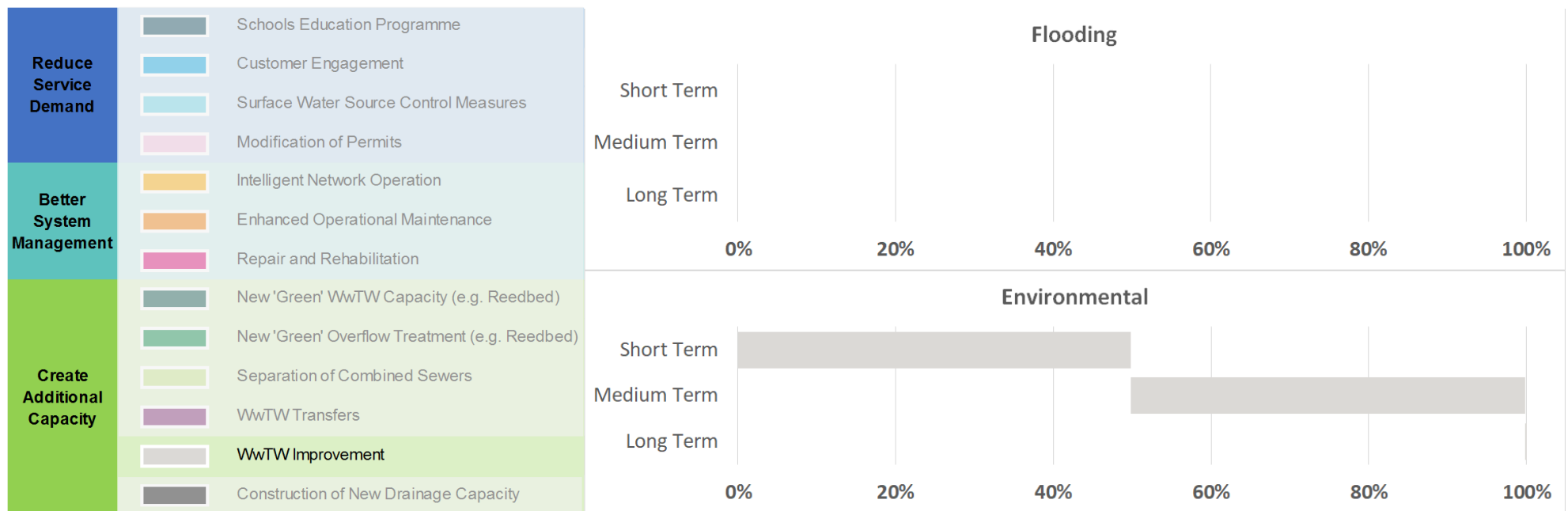
The following TPUs each have a population of less than 2,000, and have therefore been grouped together:

- Burnley Higher Timberhill
- South View
- Hapton
- Spouthouse Lane
- Ouzel Rock
- Wood Cottages
- Portfield Bar

All potential investment in these TPUs could be to address environmental risks (Figure 37).

Short, medium and long term potential investment in these small TPUs could be through wastewater treatment works improvements to ensure permit compliance.

Figure 37 Short, medium and long term investment in TPUs with population less than 2,000 (Calder) distributed by option type



5.3.16 TPUs with population less than 2,000: Colne Water sub catchment

The following TPUs each have a population of less than 2,000, and have therefore been grouped together:

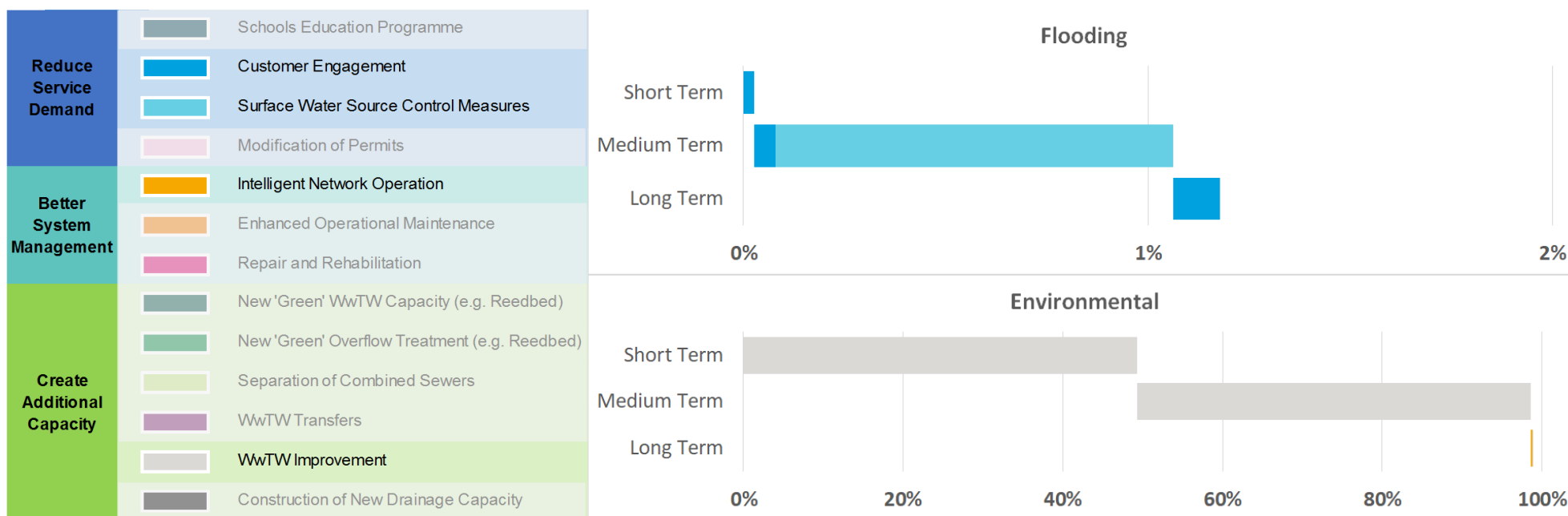
- Barnside
- Colne Greenfield House Farm
- Lanebottom
- Laund farm
- Newchurch-in-Pendle

Around 99% potential investment in these TPUs could be to address environmental risks (Figure 38).

Short, medium and long term potential investment in these small TPUs could be through wastewater treatment works improvements to ensure permit compliance. In the long term, we could additionally install intelligent network operation systems.

Additionally, flooding risk could be addressed through surface water source control measures (e.g. SuDS) and through customer engagement programmes.

Figure 38 Short, medium and long term investment in TPUs with population less than 2,000 (Colne Water) distributed by option type



5.3.17 TPUs with population less than 2,000: Hodder and Loud sub catchment

The following TPUs each have a population of less than 2,000, and have therefore been grouped together:

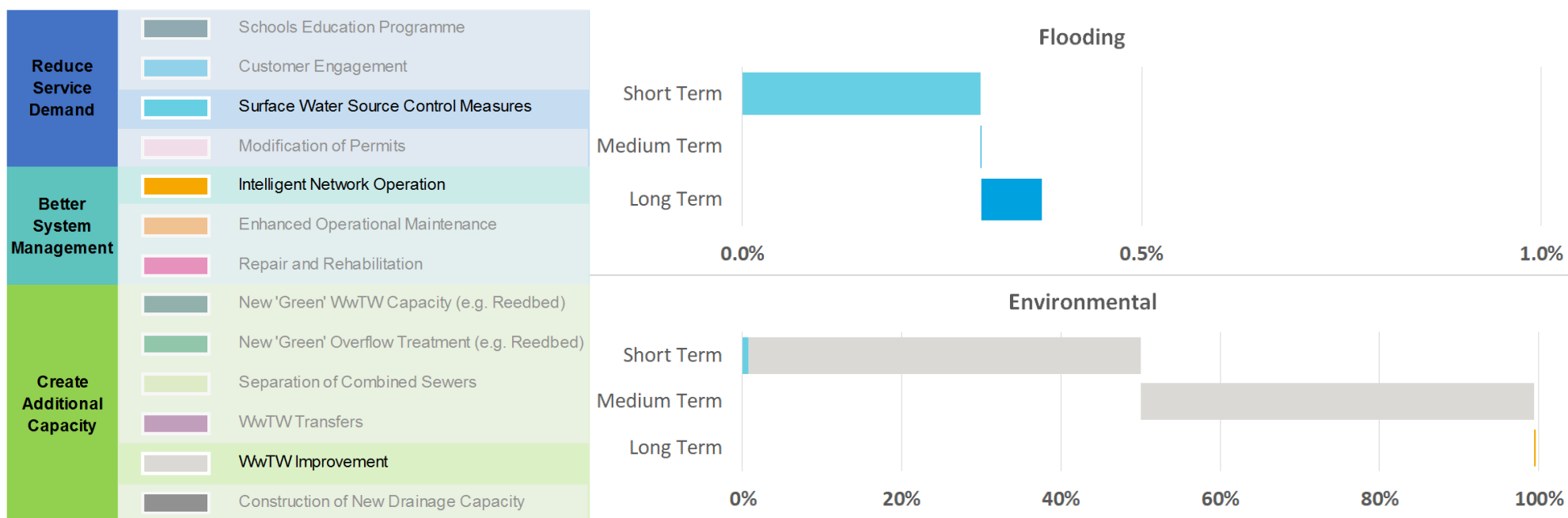
- Chipping
- Newton-in-Bowland
- Slaidburn

Over 99% potential investment in these TPUs could be to address environmental risks (Figure 39).

Short, medium and long term investment in these small TPUs could be through wastewater treatment works improvements to ensure permit compliance. In the long term, we could additionally install intelligent network operation systems.

Additionally, flooding risk could be addressed through surface water source control measures (e.g. SuDS) and through customer engagement programmes.

Figure 39 Short, medium and long term investment in TPUs with population less than 2,000 (Hodder and Loud) distributed by option type



5.3.18 TPUs with population less than 2,000: Limestone Ribble sub catchment

The following TPUs each have a population of less than 2,000, and have therefore been grouped together:

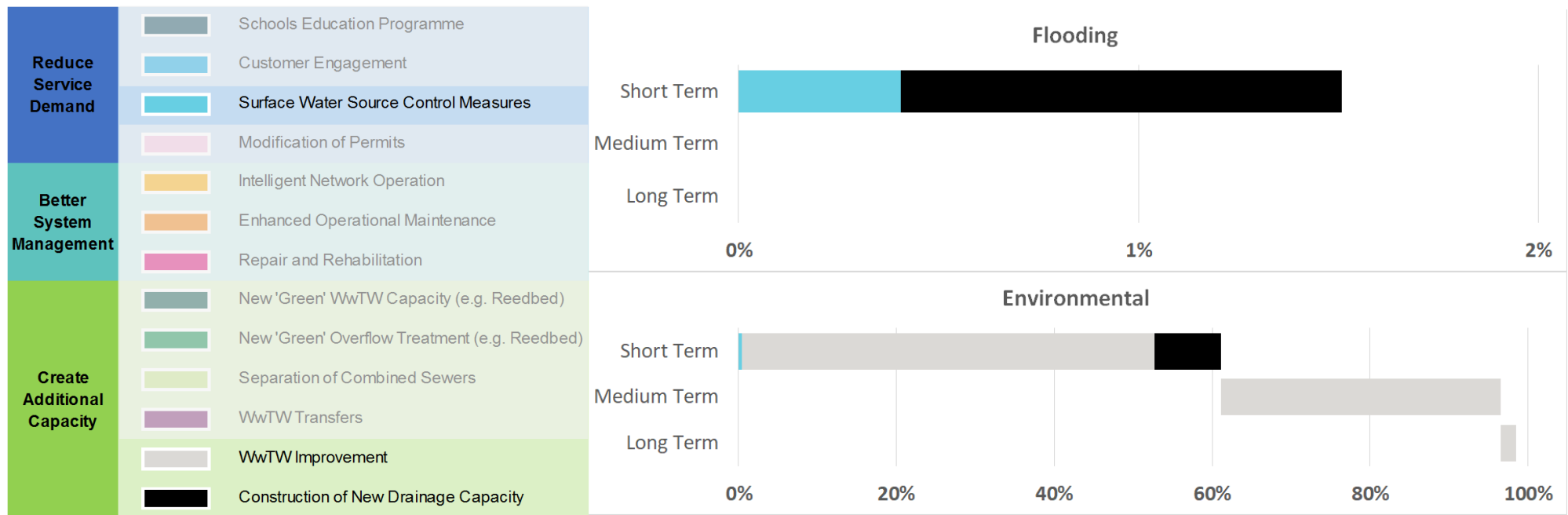
- Helwith Bridge
- Horton-In-Ribblesdale
- Stainforth

Around 99% investment in these TPUs could be to address environmental risks (Figure 40).

Short, medium and long term potential investment in these small TPUs could be through wastewater treatment works improvements to ensure permit compliance and through the construction of new storm water drainage capacity.

Additionally, flooding risk could be addressed through surface water source control measures (e.g. SuDS).

Figure 40 Short, medium and long term investment in TPUs with population less than 2,000 (Limestone Ribble) distributed by option type



5.3.19 TPUs with population less than 2,000: Middle Ribble (Settle to Calder) sub catchment

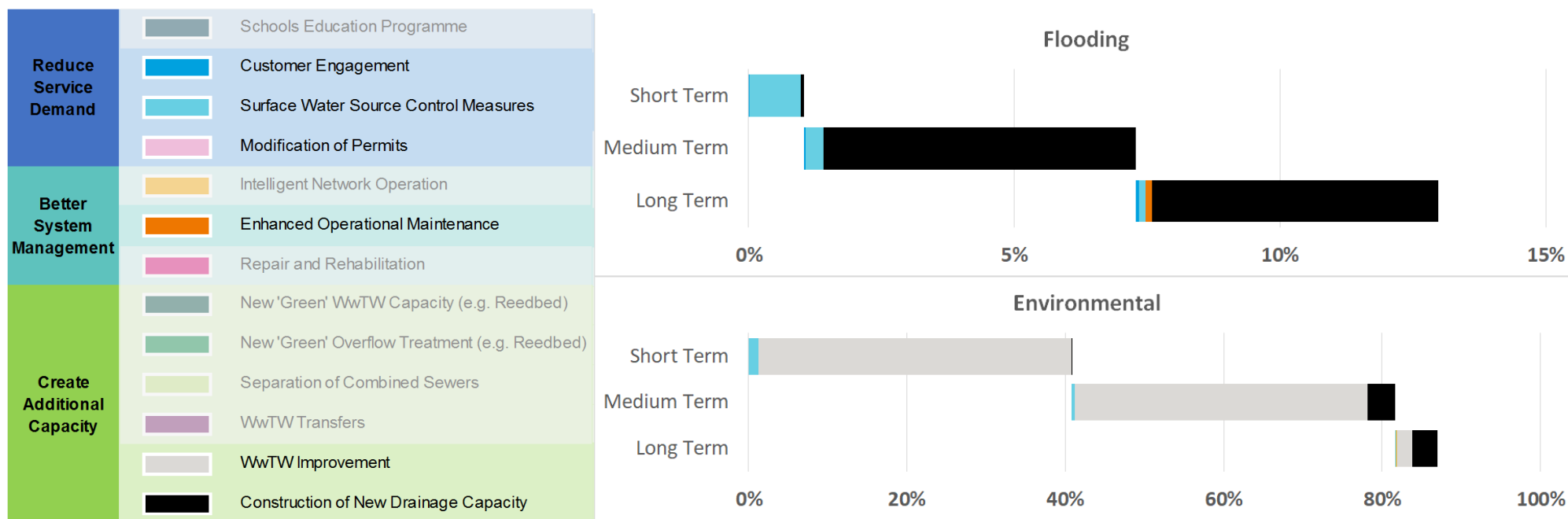
The following TPUs each have a population of less than 2,000, and have therefore been grouped together:

- Bolton-By-Bowland
- Halton West (Ribble)
- Long Preston
- Gisburn
- Hellifield
- Rimington
- Grindleton
- Holden
- Sawley
- Halton Place
- Kingsmill
- Waddington

Around 13% of the potential investment in these TPUs over the next 25 years could be to address flooding risks. Around 87% of investment could be to address environmental risks (Figure 41).

Short, medium and long term potential investment in these small TPUs could be mainly through wastewater treatment works improvements to ensure permit compliance, the construction of new storm water drainage capacity, and surface water source control measures (e.g. SuDS).

Figure 41 Short, medium and long term investment in TPUs with population less than 2,000 (Middle Ribble) distributed by option type



6. Next steps

The DWMP is inherently not a static plan so we will continue to work with stakeholders to develop partnership options and strategies which will make a difference within the Ribble SPA.

We are currently at draft publication (Figure 42) and between now and final publication in March 2023, we will reflect on updated guidance such as WINEP and storm overflows, and incorporate the feedback that we receive to ensure that the DWMP can build the best foundation to allow the North West to thrive in years to come.

Figure 42 Timeline between draft and final publication



We welcome your feedback on our draft publication of our first DWMP. Please get in touch using our mailbox:

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7. References

- [1] <https://environment.data.gov.uk/catchment-planning/ManagementCatchment/3070>
- [2] <https://environment.data.gov.uk/catchment-planning/OperationalCatchment/3033>
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- [6] <https://environment.data.gov.uk/catchment-planning/OperationalCatchment/3223>
- [7] <https://environment.data.gov.uk/catchment-planning/OperationalCatchment/3254>
- [8] <https://environment.data.gov.uk/catchment-planning/OperationalCatchment/3316>
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- [11] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/507122/LIT_10210_NORTH_WEST_FRMP_PART_B.pdf
- [12] <https://www.gov.uk/government/publications/surface-water-management-plan-technical-guidance>
- [13] <https://ribblelifetogether.org/ribble-life-together-partnership/>

8. Appendix

Table A.1 List of TPUs which triggered for RBCS across environment, flooding or wastewater treatment works categories which are numbered on the map in Figure 5

1	Barnoldswick	11	Grindleton	21	Long Preston	31	Stainforth
2	Billington	12	Hellifield	22	Newchurch-In-Pendle	32	Waddington
3	Blackburn	13	Helwith Bridge	23	Newton-In-Bowland	33	Walton-Le-Dale
4	Bolton-By-Bowland	14	Halton Place	24	Preston	34	Whalley
5	Burnley	15	Halton West Ribble	25	Ribchester	35	Wilpshire
6	Chipping	16	Holden	26	Ribchester Hospital		
7	Clitheroe	17	Horton-In-Ribblesdale	27	Rimington		
8	Colne	18	Hurst Green	28	Sawley		
9	Darwen	19	Hyndburn	29	Settle		
10	Gisburn	20	Lanebottom	30	Slaidburn		

Table A.2 List of TPUs which did not trigger for RBCS across environment, flooding or wastewater treatment works categories

TPU Name	Environment	Flooding	Wastewater Treatment Works
Barnside	Not triggered in RBCS	Not triggered in RBCS	Not triggered in RBCS
Burnley Higher Timberhill	Not triggered in RBCS	Not triggered in RBCS	Not triggered in RBCS
Colne Greenfield House Farm	Not triggered in RBCS	Not triggered in RBCS	Not triggered in RBCS
Hapton	Not triggered in RBCS	Not triggered in RBCS	Not triggered in RBCS
Kingsmill	Not triggered in RBCS	Not triggered in RBCS	Not triggered in RBCS
Laund Farm	Not triggered in RBCS	Not triggered in RBCS	Not triggered in RBCS
Mill Lane Hyndburn	Not triggered in RBCS	Not triggered in RBCS	Not triggered in RBCS
Ouzel Rock	Not triggered in RBCS	Not triggered in RBCS	Not triggered in RBCS
Portfield Bar	Not triggered in RBCS	Not triggered in RBCS	Not triggered in RBCS
South View	Not triggered in RBCS	Not triggered in RBCS	Not triggered in RBCS
Spouthouse Lane	Not triggered in RBCS	Not triggered in RBCS	Not triggered in RBCS
Wood Cottages	Not triggered in RBCS	Not triggered in RBCS	Not triggered in RBCS

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