

# Strategic Procurement Strategy

## Drainage

# Sign-off Matrix for Strategy & Approach

## Stakeholder engagement

### Operations

Andrew Pinkney –  
Drainage lead for  
Operations East  
Midlands

Mathew Scott –  
Drainage Lead for  
Operations North  
West

### MP-SMPA

Gareth Moores –  
Senior Project Manager  
Innovation Reapplied

Steve Ellis – Head of  
Product Development  
& Innovation (SMP)

Shane Phillips – Design  
and Engineering  
services – Drainage  
Lead – SMP

Eamonn Slevin –  
Delivery and Assembly  
Director (SMA)

### MP-CIP

Kirpal Jutley – LTC  
Drainage Lead

### MP- RIP/RDP

Paul Cockell – RDP  
Regional Programme  
Leader – RIP Mids

Colin Bird – Regional  
Programme Leader -  
RIP SW

### SES

Quentin Dawson –  
Head of Drainage  
and Water

### C&P Procurement

Mark Pinheiro – Head  
of CD&A (*role now sits in  
BI team*)

Neena Abdulla – Head  
of RIP Proc

Kat Ferguson – Head  
of CIP Proc (LTC)

Stuart Crawley – Head  
of Operational Proc

### C&P Commercial Services

Brian Read –  
Commercial Modelling

Ramesh Sharma – Head  
of Cost Estimating –  
left message

Martin Plock – Cost  
Intelligence

Chris Hickey – Head of  
MP Commercial

### C&P Strategic Procurement

Angelica Rice - Head of  
Cat Man

Chris Bethel – Head of  
Supply Chain  
Intelligence

Sanyalax Kelly – SPT  
Director

Jen Ariss – Strategic  
Support Team

Business Area/Investment Programme:	Individual & Role:	Comment if required:	Signature:	Date:
Executive Team – Panel Chair	Malcolm Dare - Executive Director C&P	Exec Team review meeting- approval given	Malcolm Dare	28/04/21
Executive Team	Duncan Smith – Interim Exec Director Operations	Exec Team review meeting- approval given	Duncan Smith	28/04/21
Executive Team	Peter Mumford - Exec Director Major Projects	Peter unable to attend so David Bray gave approval on his behalf at Exec Team review meeting	pp. David Bray	28/04/21
Executive Team	Mike Wilson – Exec Director SES	Mike unable to attend on proposed date, approved at Exec team review meeting arranged for 22 <sup>nd</sup> April 2021	Mike Wilson	22/04/21
MP – SMP/SMA Leadership Team	David Bray – SMP Director & SRO for Drainage	Exec Team review meeting- approval given	David Bray	28/04/21
C&P Leadership Team	Sanyalax Kelly Strategic Procurement Director	Exec Team review meeting- approval given	Sanyalax Kelly	28/04/21

# Key aims of the strategy - Drainage



**Consistency, not fragmentation:** drive consistency across all regions & programmes by taking an end-to-end sourcing approach considering all aspects from design to maintenance



**Standardisation** of the safest and most efficient designs, products and solutions, increase productivity. Currently we use 100s of different products/solutions but have no central record of these



**Ensure comparability** of suppliers on price and non-price differentiators (e.g. safety, flexibility, performance, reductions in carbon footprint) by a Total-Value-of-Ownership (TVO) approach



**Leverage competition**, reduce cost creep. On average we see up to **54%** increase from bid price to actual price



**Incentivise our suppliers** to build longer term capability and capacity, ensure availability of goods/services during peak periods, encourage innovation

- Our proposal is to rollout **three workstreams: Standardisation** of drainage solutions, **Re-engineering of incentives** and implementation of a **TVO approach**.
- We will start this approach in Smart Motorways Programme Alliance (SMPA) then roll out wider across other programmes
- Lower Thames Crossing, continue with engagement to identify future procurement opportunities

# Snapshot on our future vision in shaping the market



*To note: this is a high level picture. We will develop different aspects further across all tiers as our plan progresses  
(Tier 2 - Work Contractors, Tier 3 - Material suppliers - see slide 23 for further explanation of tiers)*

# Rollout of three workstreams

## Standardisation of drainage solutions



- Programme level approach ('Standardisation & basis for' 'Bundling' approach)
- Less complexity & more consistency
- Kit of parts

## Re-engineering Tier-2 & 3 Procurement Approach



- Programme level approach ('Advanced Frameworks')
- Leverage market with a 2-step approach (set up tender & work allocation mechanism)

## TVO (supplier evaluation, incentives and innovation)



- Programme level approach ('Supplier Assessment & Incentivisation')
- Introduction of Bonus/Penalty approach & incentive schemes

# Carbon Strategy

Key drivers of carbon emissions in category	Corporate emission	Maintenance & construction emission	Road user emission	Estimated Carbon emissions per year associated with key driver [tons of CO2]
Drainage Materials (Plastics, concrete, castings)				Data to be collated by SMPA

Identified measures to address key drivers in category	Expected impact / CO2 reductions [tons of CO2]			Timescale	What is needed to implement measure (investment/support, etc)?
Manufacture with reusable materials and recycle at end of life	Unknown at this stage			Short term is to rollout new approach in SMPA then all other programmes in NH over rest of RIS2 and RIS3	Develop a supplier selection process which covers carbon reduction measures
Improve productivity through use of standard products and modern methods of construction	Unknown at this stage				Testing of drainage products to ensure we select solutions to help achieve these aims. Programme of testing established through designated funds and due to start in spring 2022
				2022-2023	
Use of Green energy at manufacturing sites	Unknown at this stage			2022	This will be established through supplier selection process

# Statement of need - Drainage



**A Safer Network**

Maximise the use of offsite manufacturing and efficient, standardised construction methods to reduce time on site and accident frequency rates



**Improving Customer Satisfaction**

Efficient, standardised construction methods to reduce installation and maintenance time and TTM, and increase network availability



**Delivering the RIS**

Making optimum use of the most efficient standardised designs, product solutions and installation methods

## The Requirements

- Identification of the safest and most productive products, solutions, and installation methods.
- Standardisation of the most effective designs, products, solutions and methods.
- Implementation of procurement strategies and commercial models which support standardised solutions.
- Development of innovative products and solutions to further improve safety and productivity.

## The Objectives

- Selection and standardisation of the safest and most efficient designs, products and solutions.
- To embed category management strategies which will use a standardised digital product catalogue and take a holistic National Highways approach to procurement.
- Implementation of standardised solutions within existing contractual arrangements, retrofit current contracts or by developing new commercial models if required.

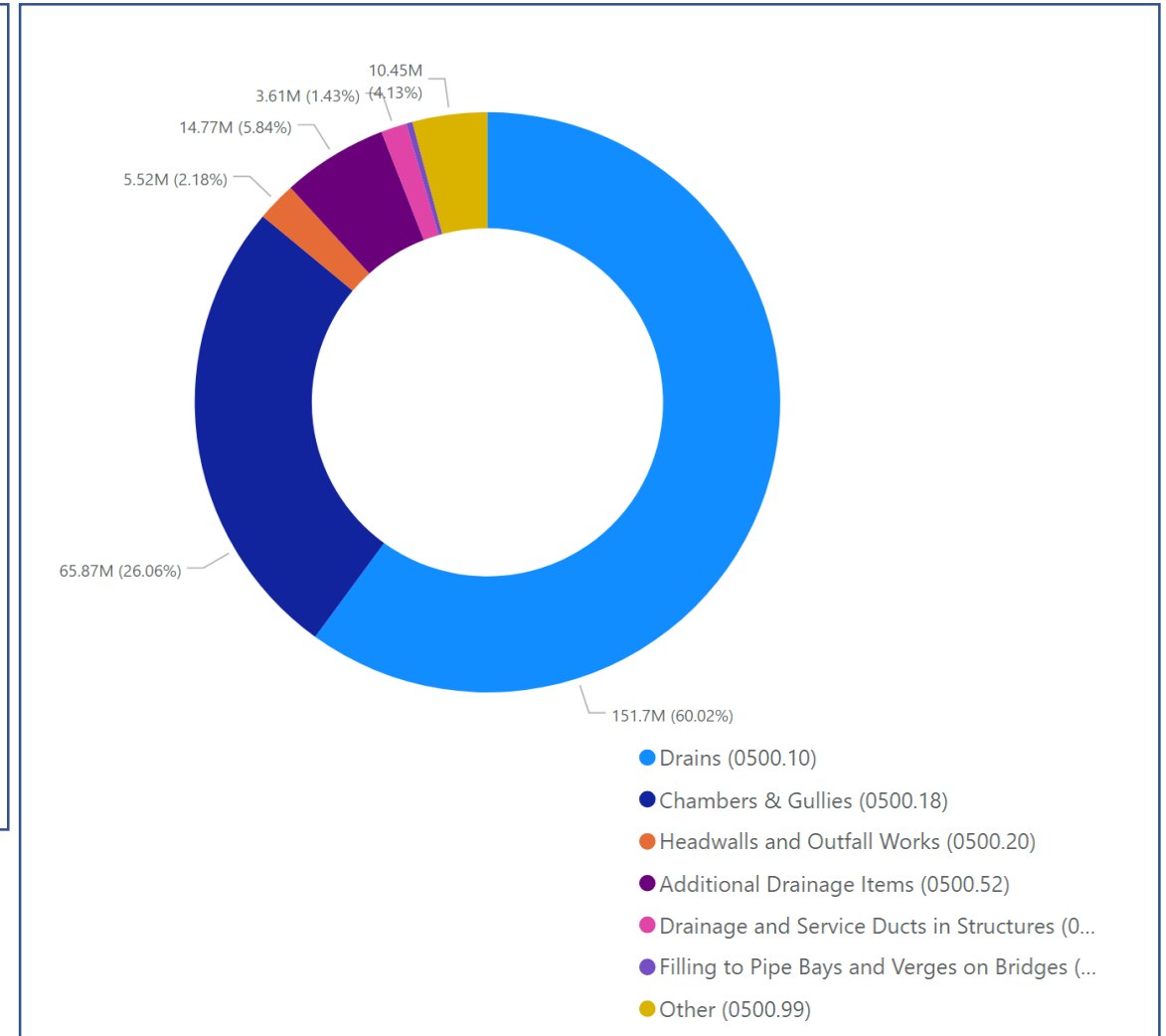
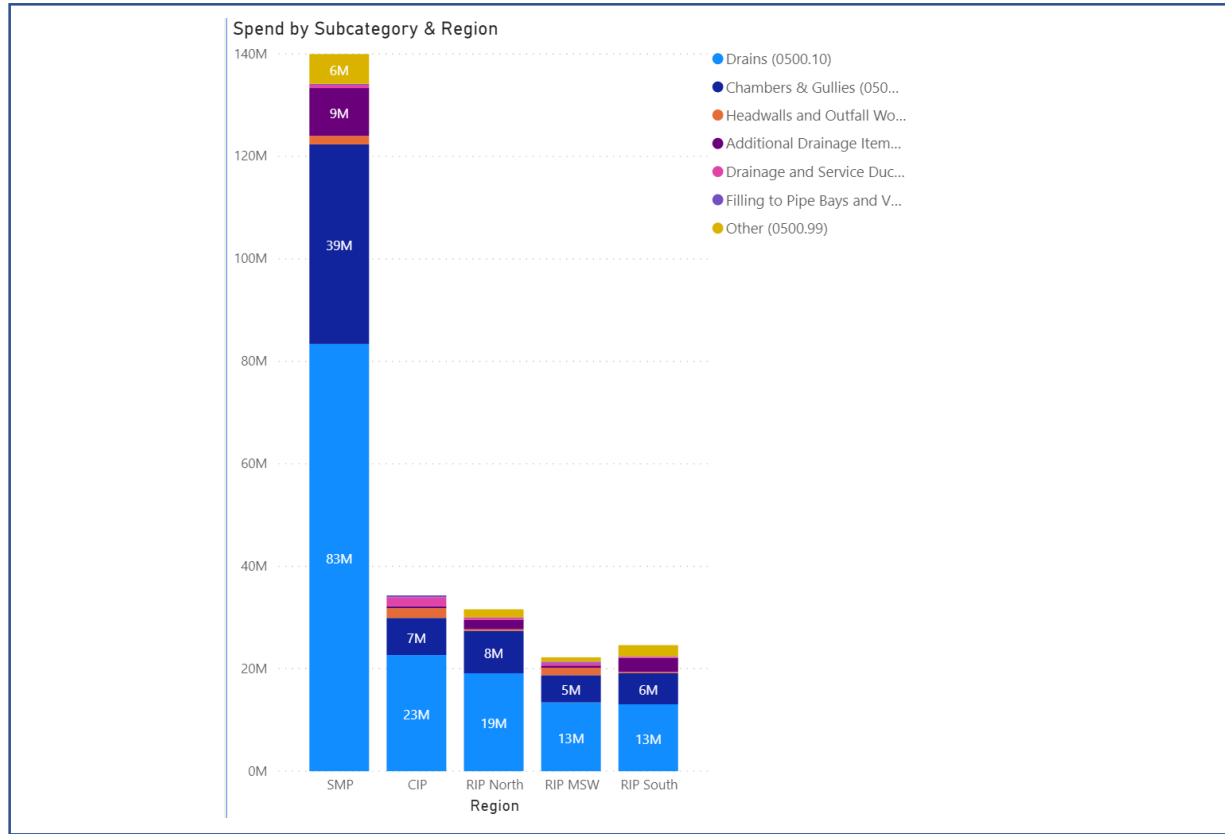
## The Challenges

- Need to establish an accurate demand profile for drainage across all of National Highways, to enable aggregation of demand for strategic purchasing arrangements.
- Design community and delivery partners not currently incentivised to utilise standardised products.
- Intellectual property rights issues will need to be overcome to leverage standardised designs.

## The Outcomes

- Category strategies and commercial arrangements which effectively support our imperatives.
- A holistic National Highways approach to procurement.
- Driving value for NH through standardisation, aggregation of demand, reduced whole life costs, and adoption of best practise methods.
- Ensuring collaboration through all stages from design to maintenance for most optimum product selection and maximise benefits

# Group, Category and Product – Historical Drainage spend breakdown (MP Agreed Price\*)



**CIP**  
2.37%  
Average % of Overall Cost

**RIP**  
3.52%  
Average % of Overall Cost

**SMP**  
5.74%  
Average % of Overall Cost

The above data is based on agreed pricing in relation to Major Projects and is merely indicative\*

**Conclusion:** The above analysis is based on agreed Major Project pricing at the start of RIS 1 adjusted for inflation, Due to there being no previous Drainage category management approach spend, the only direct spend data that was available for Drainage is where a clearly categorised supplier has carried out this work. Drainage spend would not be visible as a component of a larger General Civil engineering project.





# Business Requirements and Objectives








Requirement	Low Importance	1	2	3	4	5	High Importance
<b>Assurance of supply</b>	Disruption to supply has a minor impact on operations and / or brand perception					X	Security of supply is critical, disruption will affect safety and damage reputation
<b>Quality</b>	Quality issues have minimal impact on operations and/or					X	Quality performance has a major impact on our operations and/or brand
<b>Regulatory, Ethical, Environmental</b>	Compliance to ethical, environmental or regulations have a minimal impact on our operations or our brand					X	Compliance to regulatory, ethical and environmental issues has high impact on our operations and/or our brand
<b>Service</b>	Flexibility in delivery dates and service levels can be accommodated with minimal impact.				X		Late deliveries / poor service has a major impact on operations / brand
<b>Cost</b>	Cost competitiveness is not a major requirements.			X			Cost competitiveness is highly important for the business as is the ability to understand costs drivers of product / service
<b>Innovation</b>	R&D capability or investments in innovation has minimal impact on operations and/ or brands.			X			Excellent R&D / product engineers and investments to innovate are critical to our operations and/or brand

## Conclusion:




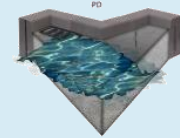


Category management and leveraging our supplier relationships will enable strategic sourcing opportunities for standardised products and solutions to meet the specific objectives, reduce costs and risks, improve management and oversight of service levels, quality and compliance, and drive improvements through innovative solutions and build knowledge and intelligence of drainage systems to inform repair or replace decisions and influence future solutions.

NH Divisions	Specific Objectives
MP- SMP	<ul style="list-style-type: none"> <li>Standardised and right first time design.</li> <li>Manage project costs and the risk of programme delays.</li> <li>Focus on improving customer satisfaction.</li> <li>Collaborative and problem solving suppliers.</li> <li>Flexible contracting models for differing strategies and priorities.</li> </ul>
MP- RIP	<ul style="list-style-type: none"> <li>All of the above points</li> <li>Drainage solutions and requirements may be different from SMP and CIP</li> </ul>
MP - CIP	<ul style="list-style-type: none"> <li>All of the above points</li> <li>Drainage solutions and requirements may be different from SMP &amp; RIP</li> </ul>
Operations	<ul style="list-style-type: none"> <li>Drainage solutions which minimise maintenance requirements will be preferred</li> </ul>


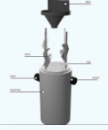




# Innovation in the Category

Innovation Theme	Description	Key Innovators	Exemplary Products
<p><b>AI for Predictive Maintenance</b></p>	<p>A few niche players are exploring the use of AI-/ML-enabled software to analyse drain maintenance-related data (e.g., CCTV survey videos, historical maintenance records and weather forecasts) and identify drains that have to be repaired on priority; these tools, which can be used with existing drainage infrastructure, require low upfront investment and can result in significant savings</p> <p><b>Case Example:</b> Atkins’ – along with Connect Plus Services – used a collection of software called Rehabilitation Automation Tools for Sewerage / Stormwater (RATS) to analyse drainage-related CCTV survey data captured for a 22 km stretch of the M11 motorway; the software was able to identify defects in 288 pipes at 50% of the cost associated with manual surveys (<a href="#">Link</a>)</p>	<p>intellegens SKANSKA ATKINS</p>	 <p>Alchemite Engine by Intellegens (used by Skanska)</p>
<p><b>Sensor-mediated Condition Monitoring</b></p>	<p>Several companies are exploring the use of light, acoustic and sonar sensors – usually installed in gullies – to monitor drain function in real time; the sensors can sound an alarm and notify external parties when the drain needs to be cleaned/repared</p> <p><b>Case Example:</b> Amey installed ruggedised gully sensors – manufactured by Map16 – across the roads in Maidstone to enable real-time monitoring of drain conditions; the data was used to prioritise maintenance operations and helped reduce the frequency of cleaning by 83% (<a href="#">Link</a>)</p>	 <p>acoustic sensing technology</p>	 <p>SewerBatt Vision by Acoustic Sensing Technology</p>
<p><b>Metal-ion Removing Filters</b></p>	<p>Numerous companies are exploring drainage filters that incorporate ion-absorbent (e.g., ferric hydroxide) or ion-exchange materials to remove toxic metal ions from highway run-off in areas where Sustainable Drainage System (SuDS) ponds cannot be constructed; a few companies, such as SDS, have also explored granular ion-absorbing materials, which can be added to existing filter drains</p> <p><b>Case Example:</b> NH used SDS’ granular ion-exchange material (Aqua-Xchange) in filter drains along a stretch of the M56 motorway to prevent pollution of a vulnerable Cheshire stream (<a href="#">Link</a>)</p>		 <p>INNOLET – G by Stormwater Management</p>

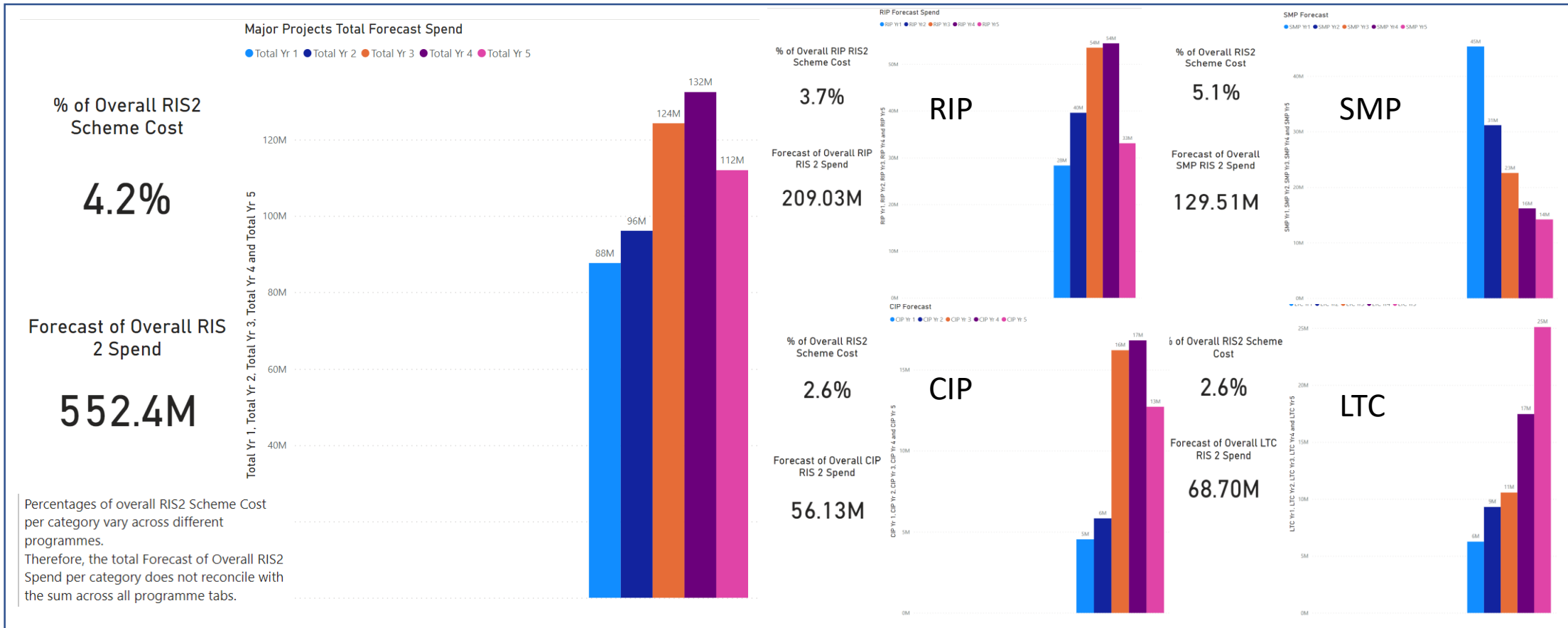
# Innovation in the Category

Innovation Theme	Description	Key Innovators	Exemplary Products
Large Diameter Thermoplastic Pipes	<p>Many companies now offer thermoplastic drainage pipes with diameters up to 3,000 mm; these pipes offer several advantages over their 900mm counterparts – including simpler installation, longer service life, reduced costs and improved flow attenuation</p> <p><b>Case Example:</b> Morgan Sindall replaced 900 mm pipes installed on the A414 Edinburgh Way with 1,500 mm Ridgistorm-XL pipes to optimise sediment removal and flow control; the new pipes were easier to install, and are likely to serve as a low-cost, long-term drainage solution (<a href="#">Link</a>)</p>		 <p>Ridgistorm-XL by Polypipe</p>
Use of Recycled Plastics	<p>Several suppliers are exploring the use of drainage pipes and kerbs manufactured using plastic waste (e.g., plastic bottles); being cheap and eco-friendly, such systems may prove to be instrumental in helping the drainage industry achieve zero carbon emissions by 2050 – an ambitious target set by the UK government</p> <p><b>Case Example:</b> A-One+ used Durakerb – a lightweight kerb made using 88% recycled material – on the trunk road network; due to its light weight, the company was able to lay the kerb quite quickly while also reducing its carbon emissions by 20% in the long run (<a href="#">Link</a>)</p>		 <p>Durakerb by Econpro</p>
Precast Slot Drains	<p>Several suppliers now offer heavy-duty, precast slot drains, which are easy to install and offer quick and effective removal of surface water; a few companies, such as Stanton Bonna, may also offer customised versions of these types of drains (e.g., taller drains that can incorporate cable-access ducts)</p> <p><b>Case Example:</b> NH installed Aqua-Slot drains – offered by Stanton Bonna – on the M6 motorway between junctions 13 and 15 (<a href="#">Link</a>)</p>		 <p>Aqua-Slot Drain by Stanton Bonna</p>

# Innovation in the Category

Innovation Theme	Description	Key Innovators	Exemplary Products
<p><b>Hydrodynamic Separators</b></p>	<p>Road manufacturers are exploring the use of hydrodynamic separators – also called vortex separators – to remove sediment from storm water, thus, preventing clogging and flooding of drains; a few companies, such as Contech, are also investing in software tools to help road engineers develop customised hydrodynamic separators</p> <p><b>Case Example:</b> <i>The California Department of Transportation installed CDS hydrodynamic separators offered by Contech on the I-210 Highway in California (<a href="#">Link</a>)</i></p>		 <p>Barracuda Hydrodynamic Separator by Baysaver Technologies</p>
<p><b>Permeable Pavements</b></p>	<p>Replacing conventional concrete in roads with more permeable materials – such as pervious concrete and porous asphalt – to help drain water from the surface of the road and reduce flooding; additionally, a few universities and niche companies are exploring geotextile-based permeable pavements that can remove pollutants and directly raise the water table</p>		 <p>Topmix Permeable concrete by Tarmac</p>
<p><b>Hydraulic Valve-based Flusher Systems</b></p>	<p>Multiple companies offer hydraulic pressure valves that can be incorporated in highway drainage systems to remove sediment and prevent backflow of water; these usually comprise a metal plate, which pivots in the direction of the outgoing water flow and mechanically closes in case of a backflow</p>		 <p>Ridgistorm Valves by Polypipe</p>

# Future Forecast Spend [Drainage]



**Total sum across all programme tabs: £463.4m**

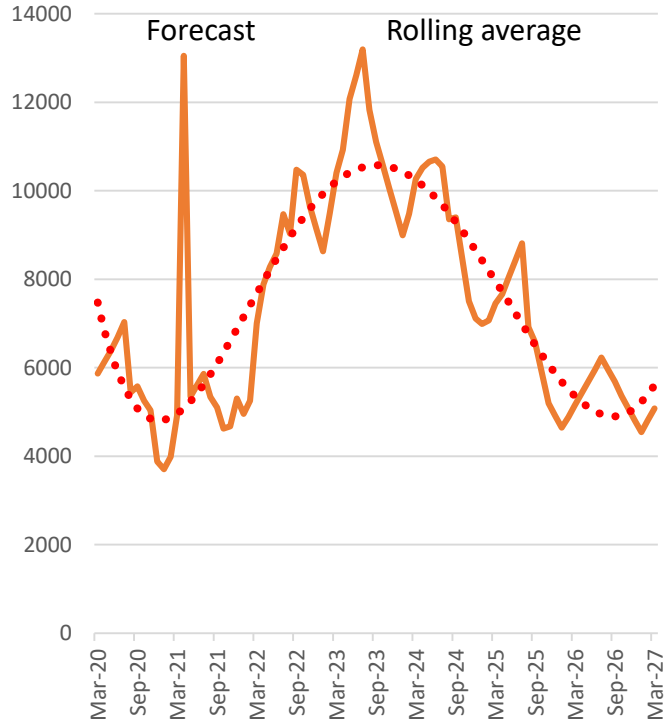
**Conclusion:**

- These figures will be reviewed and enhanced when PRISM and Webcast platforms become available. These platforms will provide a more granular breakdown
- This forecast is for **MP only**. Operations breakdown TBC (see slide 20 for high level view)

(Data source power BI 18 Mar 2021)



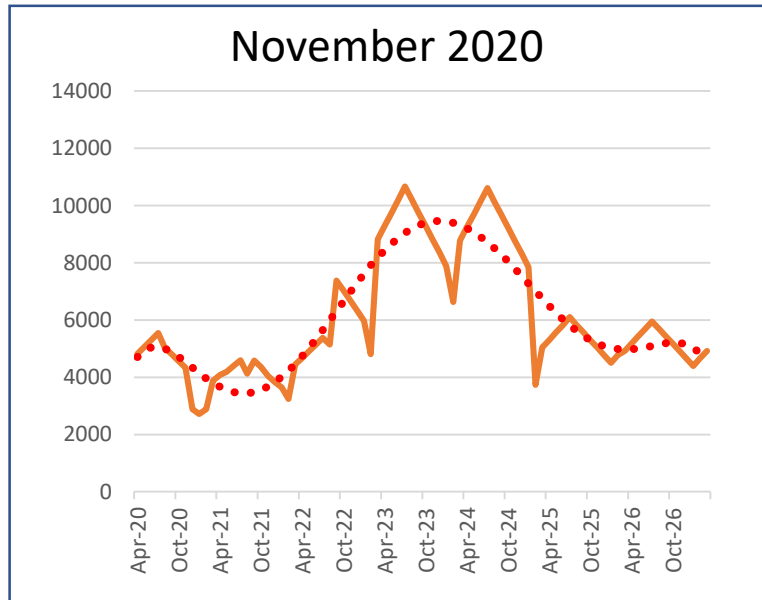
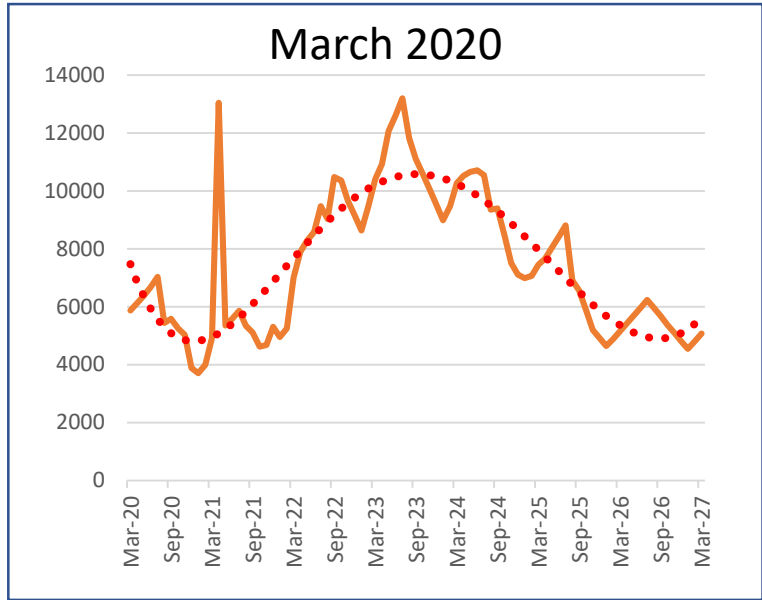
# Demand Profiles



- Highest yearly Shallow surface demand 159,991 m (2023/24)
- Highest monthly Shallow surface demand 15,876 m (Jul 2023)
- No of Catch pits required in RP2 is 12,615 (2020-2025)
- Supply chain need to deliver:-
  - 209 catch pits every month
  - 8km of deep drainage every month
  - 10.5km of shallow drainage every month of RP2

Based on data for MP only. Shows peaks in 2022/23. The model used is indicative and shows trends only, these are not actuals. We do not hold a detailed breakdown of the spend on drainage within the current Ops 9 year plan (see slide 20 for high level forecast). The Ops plan has significantly more variability to that of the MP programme and is not a detailed plan beyond 2021/22 and we are not sighted yet on how it aligns to the MP data held in the D&OP. Further analysis will be undertaken over the coming months as more data becomes available.

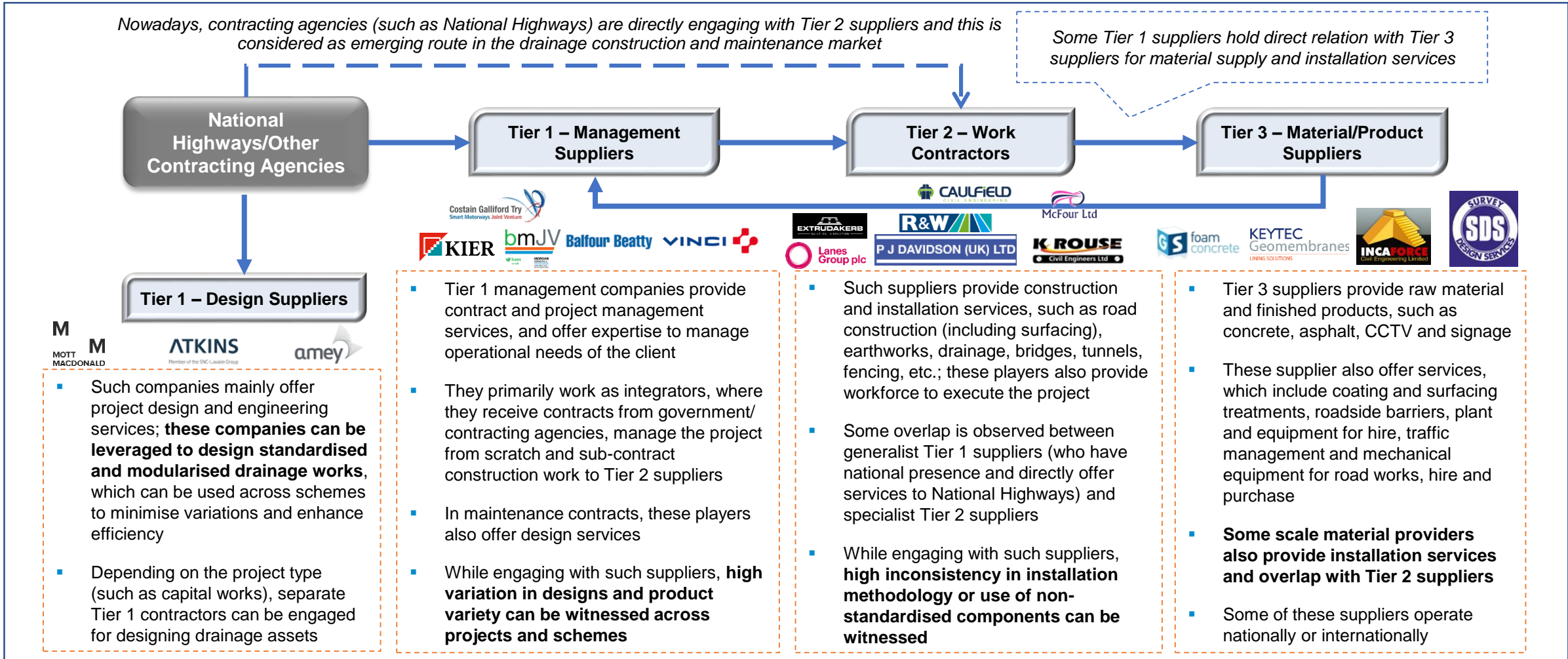
Collaboration with Drainage supplier community is continuing and will help us develop more insight into future demand. A working group has been established with Regional Delivery Partnership Tier 1 suppliers, they are currently undertaking tasks to input demand data into a central database. A meeting schedule is also being developed and will include Category Manger and Demand Modelling Representative.



Example used – Drainage deep (Carrier) in metres squared (m3) this is only a subset of drainage



# Supply Chain Mapping – value and objectives



**Conclusion:** A more direct approach in the Tier-3 and Tier-2 market will increase transparency about supply chain capabilities and capacity. This will form a baseline to influence the reduction of inefficiencies, incentivise further standardisation and embed NH's objectives (e.g. innovation) directly within each level of the supply-chain

# Activity Analysis: Analysis of Value Chain Activities for Drainage

For each activity in the value chain, this analysis shows factors which we believe will add value, our current way of working, and changes needed to enable realisation of value at each step.

	Value Chain	Value Factors	Current Situation	Changes Needed
Needs & Requirements	Strategy	<ul style="list-style-type: none"> <li>Safety &amp; Efficiency - assessment of strategic options around performance versus risk to optimise whole life costs and benefits</li> </ul>	<ul style="list-style-type: none"> <li>Strategic options chosen are not consistently leading to optimum drainage solutions</li> </ul>	<ul style="list-style-type: none"> <li>Re-assessment of strategy, for example: What is Highways England's current appetite for flooding? Should we look at how much of the road we close? Assessment of performance vs risk as to whether we need to replace drainage?</li> </ul>
	Operational Needs	<ul style="list-style-type: none"> <li>Efficiency &amp; Network Condition - an effective decision process around replacement versus repair/rehabilitation to match operational needs and give maximum benefits for drainage and other assets</li> </ul>	<ul style="list-style-type: none"> <li>Replacement is not always the best option, but designers think liability resides with them if they do not replace</li> </ul>	<ul style="list-style-type: none"> <li>Review of the decision process around replacement versus repair/rehabilitation options, to consider operational performance needs, whole life costs and other assets at the same time</li> </ul>
Delivery Unit / Procurement	Design	<ul style="list-style-type: none"> <li>Efficiency - drainage systems which are designed once and used many times</li> <li>Efficiency - design for rapid construction and minimal maintenance</li> </ul>	<ul style="list-style-type: none"> <li>Drainage is essentially already modular but there is too much variation and duplication in scheme designs</li> </ul>	<ul style="list-style-type: none"> <li>Reduce variation by developing a catalogue of the most efficient and effective designs and products for each situation and implementing a selection process to enable these to be rolled out across all schemes</li> </ul>
	Product Selection	<ul style="list-style-type: none"> <li>Efficiency - standardisation of drainage products and product selection processes, based on a minimum number and variety of component parts</li> </ul>	<ul style="list-style-type: none"> <li>Too much variety of drainage components, not all of them being the most efficient and effective</li> </ul>	<ul style="list-style-type: none"> <li>Investigate possibilities for programmatic, bulk procurement</li> </ul>
	Procurement	<ul style="list-style-type: none"> <li>Efficiency - savings from bulk procurement of standard products and mass production opportunities</li> </ul>	<ul style="list-style-type: none"> <li>No programmatic bulk procurement, only scheme by scheme procurement</li> </ul>	<ul style="list-style-type: none"> <li>Investigate possibilities for programmatic, bulk procurement</li> </ul>
	Manufacturing	<ul style="list-style-type: none"> <li>Safety - offsite manufacturing to reduce time on site and accident frequency rates</li> <li>Efficiency - Fewer defects through mass production</li> </ul>	<ul style="list-style-type: none"> <li>No incentive for offsite manufacturing</li> <li>Mass production opportunities not realised due to lack of bulk procurement</li> </ul>	<ul style="list-style-type: none"> <li>Develop a strategy to incentivise offsite manufacturing</li> <li>Investigate possibilities to enable mass production through bulk procurement</li> </ul>
	Installation	<ul style="list-style-type: none"> <li>Safety - reduced time on site and lower accident frequency rates through rapid construction methods using modularised components</li> <li>Efficiency - reduced installation time and reducing TTM through efficient, standardised methods</li> </ul>	<ul style="list-style-type: none"> <li>Inconsistent or variable installation methodology</li> </ul>	<ul style="list-style-type: none"> <li>Implement a slick, consistent and repeatable methodology for installing drainage using standardised drainage system designs and components</li> </ul>
	Operation	<ul style="list-style-type: none"> <li>Delivering Enhancements for Economic Growth - improving network availability by reducing installation and maintenance times</li> </ul>	<ul style="list-style-type: none"> <li>Non-standardised components</li> </ul>	
Maintain & Operate	Maintenance	<ul style="list-style-type: none"> <li>Network condition - easier maintenance using standard components</li> </ul>		
Decommissioning	<ul style="list-style-type: none"> <li>Environment - potential to re-use standard components</li> </ul>			

	Value Factors (Highways England KPIs/Targets)	Highways England Strategic Themes
<b>Value factors are defined in terms of Highways England KPIs/Targets, which align to Strategic Themes</b>	Safety (Network KSI and casualty reduction)	Safe & Serviceable Network
	Safety (Supply Chain Accident Frequency Rate reduction)	Safe & Serviceable Network
	Safety (HE Staff Accident Frequency Rate reduction)	Safe & Serviceable Network
	User Satisfaction	Customer Satisfaction
	Incident Management (Traffic Flow)	Free Flowing Network
	Network Condition	Safe & Serviceable Network
	Delivering Enhancements for Economic Growth	Supporting Economic Growth
	Environment	Improved Environment
	Efficiency	Delivering Performance & Efficiency
	Smart Motorways	Ensure Smart Motorways maintain safety and deliver journey benefits
	Employee engagement	Our People



# Size of Drainage Market

- Total size of the drainage market anticipated to reach **£8.8bn by 2023**. This is primarily made up of (a) Foul water drainage, (b) Surface water drainage, and (c) Highway drainage, so considers the sector from a more broader perspective.
- Drainage in SMP is, on average, circa 8% of the total cost, based on the 4 SMP schemes where we have some data. Very variable as expected as it is dependant on scheme conditions.

Scheme	Drainage order values	Principal Contractor Scheme Value	Drainage %
SMP M1 J13-16	£28,198,681	£203,066,665	13.9%
SMP M27 J4-11	£5,961,008	£218,026,121	2.7%
SMP M6 J13-15	£12,890,000	£225,961,843	5.7%
SMP M62 J10-12	£12,498,155	£103,804,854	12.0%

## National Highways percentage

As an indication in June 2019 we projected NH drainage percentage as **5% of total NH spend** (4% of which spent in Ops)

Overall, NH is a small part of the drainage market, considering e.g. Polypipe, will supply the entire market inc utilities. Furthermore infrastructure drainage can be covered through General Civils Lots e.g.

East Area Construction Works Framework (CWF) Lot 5 General Civils, Drainage & Geotechnical

Area 14 Lot 10 – Specialist Drainage doesn't have a works order for 19/20 or 20/21; suggesting a lack of works or folding into General Civils (noting this Lot has Carnell on it, Carnell operate extensively across our specialist drainage Lots so easier to justify doing any drainage under General Civils headings)

**Conclusion:** The investment in Road Period 2 offers a huge incentive to the drainage market, which places NH in a strong buying position. New contracting methods (notably in Ops) are also directed at the tier 2 & 3 suppliers. The drainage industry revenue is expected to rise at a compound annual rate of 1.8% over the five years from 2018/19 and **reach £8.8 billion in revenue by 2023**. So to reach the **forecasted market value for 2021** if we compound back by 1.8% each year, this calculates to **£8.5bn** (the size projections are based upon an assumed scope of category including foul water, surface water & highway drainage – which may extend the costing beyond expected levels).

Source: [UK research by Ibis World](#),

# Supplier Engagement



## 62.5%



62.5% of drainage suppliers see the current procurement process as a top 3 pain point (37.5% as the main pain point)

On Average there is **54%** increase from bid price to actual price across the drainage subcontractors

## 100%

Of drainage installers viewed onsite project control as a top 3 priority

Source: Drainage Deep Dive May 2020

### Summary of Feedback- Drainage Supply Chain Workshop Feb 2020

Procurement	Operational Maintenance	People
<ul style="list-style-type: none"> <li>Need Early Contractor Involvement to add value by being more realistic with prices, plan time more effectively to mobilise and be more innovative</li> <li>Improved asset information needed to understand true extent of work required to plan ahead.</li> <li>NH to approve list of specialists who can deliver to quality over price</li> </ul>	<ul style="list-style-type: none"> <li>Tier 1s should maximise opportunity to carry out works when putting out TM and consider partnering with other organisations, such as Environment Agency, to save cost</li> <li>Tier 1s don't undertake proper drainage cleaning and silt waste removal</li> <li>Lack of maintenance and maintenance records during project occupancy on network</li> </ul>	<ul style="list-style-type: none"> <li>Skill shortage in drainage over RIS 2, especially with HS2 construction underway</li> <li>More graduate schemes need to be set up and initiatives with schools to attract more young people</li> <li>Not enough time to build knowledge and expertise due to fast tracking of middle management up the ladder</li> </ul>
Commercial	Innovation	Standards & Design
<ul style="list-style-type: none"> <li>Increase in Tier 1 costs passed down resulting in reduced margins for Tier 2s</li> <li>Payments terms and quantification carry too much risk</li> </ul>	<ul style="list-style-type: none"> <li>Management of risk for trialling new innovations is far too challenging, NH need to take a shared approach to managing risk to encourage more pilots for new ideas</li> </ul>	<ul style="list-style-type: none"> <li>Standards and design need to be more robust and communicated more effectively to suppliers to build their understanding</li> <li>Design changes cause issues across supply chain</li> </ul>

#### Conclusion:

- Category management** - Short notice of schemes (1-2 weeks). Early involvement would improve value engineering. Confidence level of whether schemes are likely to progress. Designing on out dated information and repeating mistakes
- Data and communication** - Suppliers need to know specific demand allocation to about to plan supply.
- External Demand** - Suggest NH compile national picture of overall drainage demand, including HS2 and local authorities. Also, helpful to plan steadier or predictable level of resource requirements
- Opportunities** - Early contractor involvement, but need to involve the right people, and engage with supply chain below Tier 1 contractors align with NH objective to 'get the whole supply chain involved'
- Risks** - Adoption of the Digital Product Catalogue could increase scale of demand on specific products and suppliers. Consistency of demand will affect investment in improved technology to achieve lower carbon emissions. Identifying priority outfalls requiring treatment filter drains has effect on deliverability.



# Category Analysis



<p><b>Strength</b></p> <ul style="list-style-type: none"> <li>Increasing focus on adoption of modular construction methods, such as design engineering, DfMA, in-situ precast methods and Building Information Modelling (BIM)</li> <li>Government support (£170 million) for innovation and skill improvement through Construction Sector Deal</li> </ul>	<p><b>Weakness</b></p> <ul style="list-style-type: none"> <li>Limited collaboration between design firms and drainage product manufacturers</li> <li>Drainage construction and installation relies on a labour intensive model</li> <li>Lack of visibility of Tier 2 and Tier 3 companies into the overall drainage market spend, which hampers their capability to build capacity and innovate</li> </ul>	<p><b>Political</b></p> <ul style="list-style-type: none"> <li>A stable political environment would be observed after the Brexit, and hence, can have positive influence on construction market</li> </ul>	<p><b>Economic</b></p> <ul style="list-style-type: none"> <li>As per IMF, UK's GDP growth was less than 1% in 2020 and is projected to grow by 4.5% in 2021; however, the impact of COVID-19 outbreak is yet to be considered</li> </ul>	<p><b>Social</b></p> <ul style="list-style-type: none"> <li>Increasing preference for employees with adequate skills, which would focus on increasing apprenticeships</li> </ul>
<p><b>Opportunities</b></p> <ul style="list-style-type: none"> <li>Continuous investment by the UK government to improve the road infrastructure</li> <li>In 2020, the UK construction industry is forecast to grow at 1.4% Y-o-Y, driven by major infrastructure projects such as HS2, Thames Tideway and Hinckley Point</li> </ul>	<p><b>Threats</b></p> <ul style="list-style-type: none"> <li>Lack of skilled workforce, ageing working population and rising cost of labour</li> <li>Substantial fall in apprenticeship completions</li> <li>Difficulties faced by SMEs in accessing bank finance</li> <li>Economic downturn due to COVID-19 outbreak (more details yet to emerge)</li> </ul>	<p><b>Technological</b></p> <ul style="list-style-type: none"> <li>Rising focus on adoption of modular construction methods, such as design engineering and DfMA</li> </ul>	<p><b>Legal</b></p> <ul style="list-style-type: none"> <li>Extending support through full implementation of Modern Slavery Act 2015 in mid 2019 and enforcement of construction regulations 2015</li> </ul>	<p><b>Environmental</b></p> <ul style="list-style-type: none"> <li>In January 2020, the UK government introduced Environmental Bill to improve air and water quality</li> </ul>

<p>High ↑</p> <p>Total Spend</p> <p>Low</p>	<p><b>Core Suppliers</b></p> <ul style="list-style-type: none"> <li>Include some Tier 1 and Tier 2 suppliers engaged on maintenance contracts for surfacing, drainage, tunnels, etc. they have wider offerings than just drainage</li> </ul>	<p><b>Strategic Suppliers</b></p> <ul style="list-style-type: none"> <li>Include tier 1 suppliers engaged mainly on capital works, such as designing, contract and project management services</li> </ul>
	<p><b>Transactional Suppliers</b></p> <ul style="list-style-type: none"> <li>Primarily include Tier 3 suppliers that offer raw material, finished and standard products</li> </ul>	<p><b>Niche Suppliers</b></p> <ul style="list-style-type: none"> <li>Include some of the Tier 2 and Tier 3 suppliers that offer survey and other niche services</li> </ul>
<p>Low</p> <p>Business Criticality</p> <p>High →</p>		

**Conclusion:** There has been increased focus on modular construction techniques to enhance efficiency, however, minimal interaction between design firms and construction firms pose a real threat to the adoption of modular methods, especially at the design stage

# Key Supplier Risks



Risk type	Risk Description	Impact	Priority	Mitigation/Action
<b>Supply Chain</b>	<ul style="list-style-type: none"> <li>Financial and operational stability of Tier 2 &amp; 3 suppliers in the wake of Brexit and COVID-19 outbreak</li> <li>Limited visibility on the capacity and capability of Tier 2 &amp; 3 suppliers as NH primarily engages with Tier 1 suppliers and is less aware about the sub-contractors employed by Tier 1 companies</li> </ul>	<ul style="list-style-type: none"> <li>Contractors have missed the project deadlines, along with delivering lower quality work due to timeline pressure</li> </ul>	High	<ul style="list-style-type: none"> <li>NH should carry out supply chain mapping exercise to get better understanding of the capabilities of Tier 2 and Tier 3 suppliers involved in the supply chain</li> <li>Directly engage with Tier 2 &amp; 3 suppliers on maintenance projects to support them</li> <li>Provide visibility to Tier 2 &amp; 3 suppliers on upcoming projects to promote capacity building and innovation</li> </ul>
<b>Innovation</b>	<ul style="list-style-type: none"> <li>Limited visibility of Tier 1 suppliers and design firms on the innovations happening in the market</li> <li>Innovation in the domain is driven by mid-sized drainage equipment suppliers which develop new solutions in collaboration with dedicated engineering firms – usually involved in designing the drainage systems; while a few of the suppliers that NH partners with offer such services, a majority only provide peripheral drainage services (e.g., initial CCTV surveys of site)</li> <li>Limited players (Tier 2) operating in the market having necessary capability to manufacture drainage products using DfMA approach and other modular construction techniques</li> </ul>	<ul style="list-style-type: none"> <li>Contractors lack novel solutions</li> <li>Supply chain is not mature enough which limits the widespread adoption of modular standardisation construction techniques</li> <li>This may limit NH's exposure to new upcoming technologies</li> </ul>	High	<ul style="list-style-type: none"> <li>National Highways should invest significant amount to create substantial awareness in the market and encourage suppliers to adopt offsite manufacturing</li> <li>Further, NH may evaluate the feasibility of collaborating with smaller, specialised firms (e.g., SDS, Topmix and Intellegens) to modernise existing drainage systems</li> </ul>
<b>Capacity</b>	<ul style="list-style-type: none"> <li>Limited collaboration between design firms and Tier 2 &amp; 3 suppliers</li> <li>Lack of competent design firms who understand the implications of motorway drainage and understand the interfaces with other assets on parameters like the critical path, cost, etc.</li> </ul>	<ul style="list-style-type: none"> <li>Faulty designs can result in below par products</li> <li>Higher cost due to over designing</li> <li>Suppliers unable to meet project deadlines</li> </ul>	Medium	<ul style="list-style-type: none"> <li>National Highways should engage Tier 2 &amp; 3 suppliers directly to get an overview of the capability and capacity of drainage suppliers in its supply chain. Collate demand profiles to understand future demand and plan ahead</li> </ul>

**Conclusion:** National Highways should adopt corrective measures to mitigate the aforementioned risks; it should support companies to adopt modular construction techniques and enhance capacity so as to achieve maturity in the supply chain

# Category Opportunities

Strategic Themes	Opportunities	Benefits	Obstacles
<b>Supplier Relationship Management</b>	<ul style="list-style-type: none"> <li>Provide visibility to drainage suppliers by providing design ideas which can be standardised and used for next 5–10 years</li> <li>Engage directly with Tier 2 drainage suppliers and if possible engage with Tier 3 suppliers as well</li> <li>Assist suppliers to prepare a catalogue of the most efficient and effective designs and products for various situations</li> </ul>	<ul style="list-style-type: none"> <li>More visibility in the supply chain</li> <li>Assurance to suppliers for long-term relationship</li> <li>Reduced design costs by using drainage systems which are designed once and used many times</li> <li>Enhanced efficiencies would be achieved</li> </ul>	<ul style="list-style-type: none"> <li>Drainage construction supply chain is not mature enough</li> <li>Lack of innovative solutions and knowledge sharing from suppliers may delay or prevent the delivery of the most efficient and effective solutions</li> </ul>
<b>Sourcing Strategy</b>	<ul style="list-style-type: none"> <li>Incentivisation of offsite manufacturing</li> <li>Bulk/mass procurement of standardised products</li> </ul>	<ul style="list-style-type: none"> <li>Increased savings from procurement of mass-produced standard products in bulk</li> </ul>	<ul style="list-style-type: none"> <li>Standardisation of products may not be the best solution for all situations</li> <li>Poor logistics planning drives up cost</li> </ul>
<b>Continuous Improvement</b>	<ul style="list-style-type: none"> <li>Focus on adoption of modular construction methods, such as DfMA, design engineering and BIM</li> <li>Adoption of precast concrete slot drains</li> <li>Repair or rehabilitation of drainage versus replacement</li> <li>Assess whole life costs while selecting products</li> </ul>	<ul style="list-style-type: none"> <li>Standardisation of design resulting in reduced costs</li> <li>Lower manufacturing and assembly cost</li> <li>Higher productivity and improved safety</li> <li>Reduced congestion and vehicle throughput in sites and rapid installation</li> <li>Reduced weather dependency</li> </ul>	<ul style="list-style-type: none"> <li>Limited drainage players that have the capability to manufacture using DfMA approach</li> <li>Lack of industry awareness, knowledge and expertise</li> <li>Scheme designers may be reluctant to repair instead of replacement</li> </ul>
<b>Innovation</b>	<ul style="list-style-type: none"> <li>Although the pace of technology development in the category is slow, the industry is moving towards more sustainable and smart solutions</li> <li>While a few of these tools (e.g., AI-enabled maintenance software) can be retrofitted to existing systems, other technologies – such as permeable pavements – are suited to new projects</li> </ul>	<ul style="list-style-type: none"> <li>Leveraging these new technologies may result in significant savings in maintaining highways, while also meeting sustainability goals</li> </ul>	<ul style="list-style-type: none"> <li>Most of the new technologies are developed by smaller companies – including start-ups, such as Intellegens; thus, they may not be amenable for commercial application on a large scale</li> <li>Further, a majority of the new solutions are suited to new projects and cannot be incorporated in existing systems</li> </ul>

**Conclusion:** National Highways should encourage drainage suppliers to adopt modular construction, precast techniques and novel solutions (such as technology-based products) as a measure to achieve efficiency and cost reduction

# Implementation Strategy

# We have identified three workstreams for the roll-out of the drainage strategy

1 Standardisation of drainage solutions

2 Re-engineering Tier 2 & 3 Procurement Approach

3 TVO (supplier evaluation, incentives and innovation)



£ Benefits: Efficiency gains & cost improvement

- Programme level approach ('Standardisation & basis for 'Forward Bundling')
- Complexity mitigation & simplification

⊙-⊙ Benefits: Cost & performance improvement

- Programme level approach ('Advanced Frameworks')
- Leverage of market in 2-step approach (tender & work allocation mechanism)

♟️ Benefits: Performance & service improvements

- Programme level approach ('Supplier Assessment & Incentivisation')
- Introduction of Bonus/Penalty approach & incentive schemes

# High level details of the workstreams have been aligned





# Rollout short to long term - Drainage

