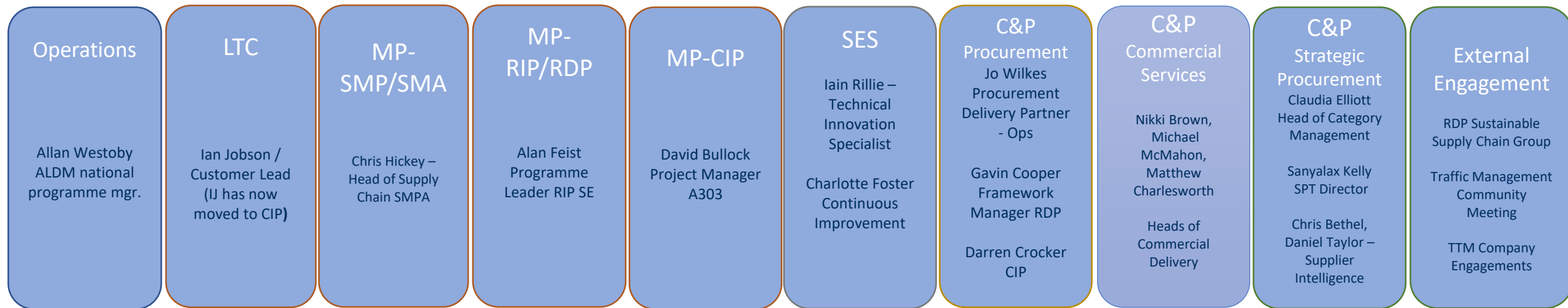


Strategic Procurement Strategy

Temporary Traffic Management

Engagement Matrix for Strategy & Approach - TTM



Business Area/Investment Programme:	Individual & Role:	Review:	Date:
Executive Team – Panel Chair	Malcolm Dare - Executive Director C&P	Approved	21.09.21
Executive Team	Duncan Smith – Exec Director Operations	Approved	21.09.21
Executive Team	Peter Mumford - Exec Director Major Projects	Approved	21.09.21
Executive Team	Mike Wilson – Exec Director SES	Approved	21.09.21
SRO	Steve Foxley – Programme Manager SMP M4	Approved	21.09.21
C&P Leadership Team	Sanyalax Kelly - Strategic Procurement Director	Approved	21.09.21
C&P Leadership Team	Andrew Stephenson - Procurement Director	Approved	21.09.21
C&P Leadership Team	Martyn Gannicott – Commercial Services Director	Approved	21.09.21
C&P Leadership Team	David O'Neil – Supply Chain Director	Approved	21.09.21
C&P Leadership Team	Mark Ollerton – MP Commercial Director	Approved	21.09.21
C&P Leadership Team	Richard Cerruti – Operations Commercial Director	Approved	21.09.21

Key Aims of the Strategy



Improve Safety:

Aim to reduce roadworker hours in proximity to live traffic and thereby reduce the risk of injury



Lean approach to increase the Working Window:

Aim to increase the time available for value adding activities during closures through Lean techniques Overall Equipment Effectiveness (OEE) measurement and thereby improve productivity



Fast and Reliable Journeys:

Aim to reduce the frequency of closures and to best address customer needs in terms of timings and communications of closures. Follow “Roadworks – A Customer View” toolkit methods, including fastest safe speed, to improve our Customer’s experience



Cost Efficient Delivery of Equipment (Rent or Buy):

Aim to source TTM equipment in the most cost efficient way in order to contribute cost reductions towards the RP2 efficiency target



A healthy and Competitive Supply Chain:

Aim to enable SME’s and new entrants to sustain a healthy balance of competition and capability in the supply chain.



Net Zero Carbon:

Aim to drive a switch to lo/no carbon vehicles in the execution of TTM, and to design and manage TTM for smoother and lower emitting customer journeys.



Innovative Equipment and Methods:

Aim to introduce innovative equipment and methods by facilitating trials and reviews of standards and preferring bids which feature innovations

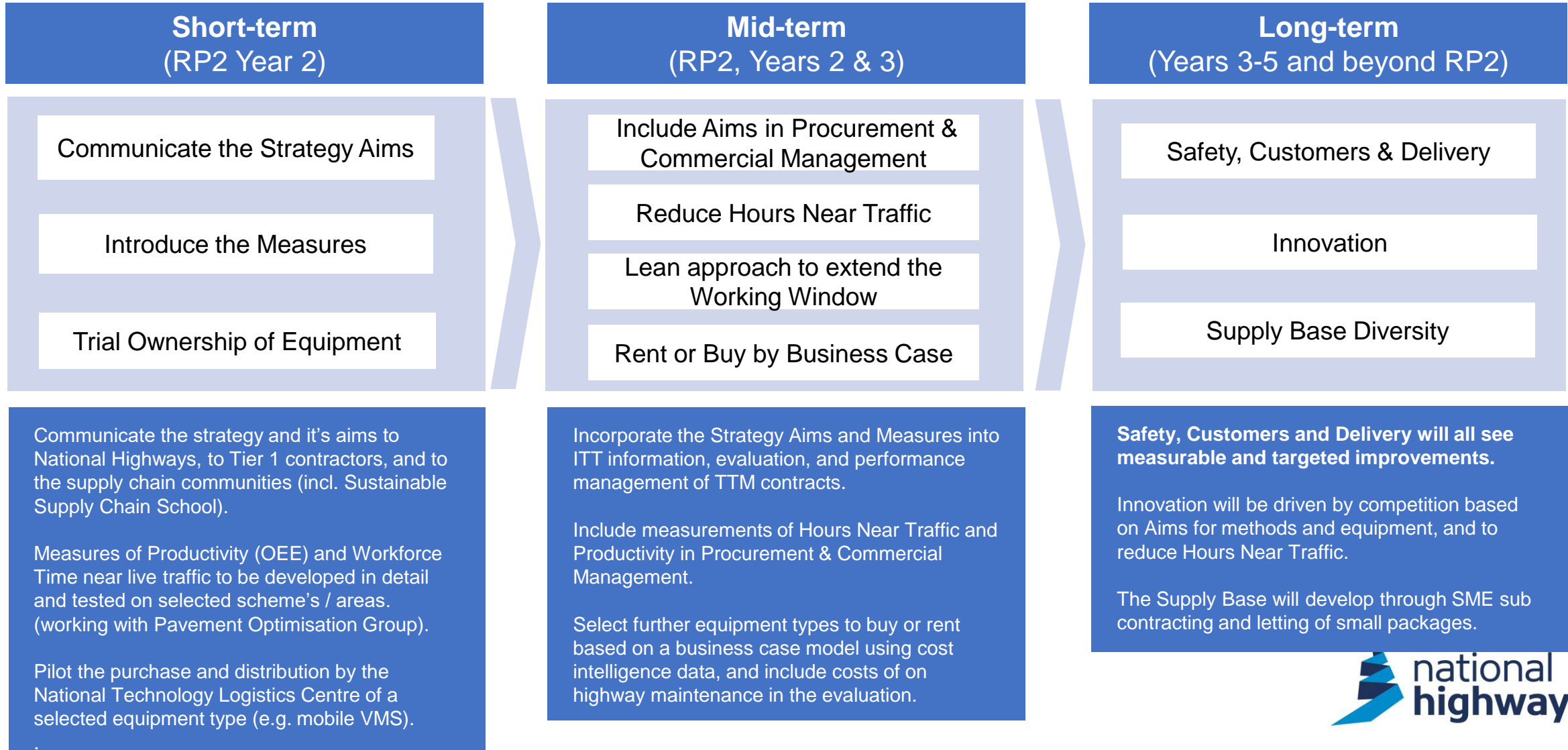


Quality:

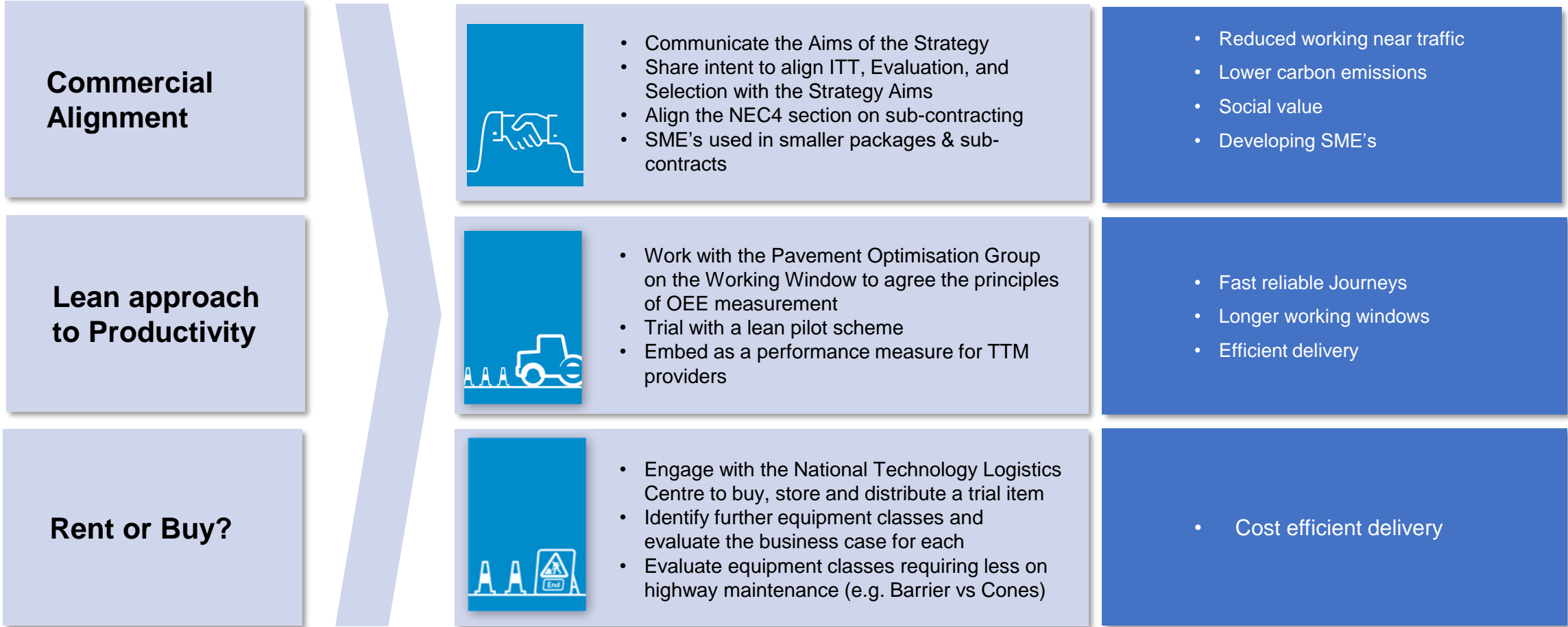
Aim to Improve Quality and Quality of Design by getting it right first time, and designing for the Aims

The Aims will be achieved by aligning with our procurement and commercial processes, as well as specific workstreams to extend the working window and to implement a “rent or buy” solution.

Phased high-level Implementation Plan to deliver our key aims



Rollout by Workstream



Category strategy – Carbon zero template

Key drivers of carbon emissions in category	Corporate emission	Maintenance & construction emission	Road user emission	Carbon emissions per year associated with key driver [tons of CO2]
1. TTM Vehicles		X		15,348T per annum *
2. Road user emissions at roadworks			X	Unable to quantify currently

* Taking D&OP 1.2 Baseline 4.2 forecast for Vans & IPV's (daily av 2022-27), Govt Carbon Factors 2020 for Freighting Goods), and Assuming 100 km/day per vehicle

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)?
1. Switch to Electric / Other	7,674T per annum	50% reduction by 2030 (illustrated)	Industry moves to electric & other motive power, aligned to strategy aims & net zero policy
2. Design for smooth flow	Unable to quantify currently	PPN 06/21 comes into force Oct 21	Incorporate into design brief & supplier selection criteria

Statement of Need



A Safer Network

Traffic Management is key to the Safety of Customers and Roadworkers



Improving Customer Satisfaction

It is one of our most significant points of contact with Customers



Delivering the RIS

Traffic Management enables the productivity of almost all roadworks

The Requirements

- Temporary traffic management (TTM) must be designed and deployed safely
- TTM must comply with Chapter 8 (Traffic Signs Manual)
- So far as is safe and practicable, TTM should allow Customers fast and reliable journeys
- TTM must be deployed in a timely and efficient way to enable access to road space for works
- There must be sufficient capacity and capability in the TTM supply chain to meet increasing demand in RIS2
- Additional incentives for not employing TTM, whilst achieving RIS 2 objectives

The Objectives

- To improve the Safety of Customers and roadworkers at roadworks
- To improve the Customer experience of roadworks
- To enable access to road space so that roadworks are efficient in time and cost
- To support a sustainable supply chain for TTM as it develops
- To deliver better environmental outcomes and social value

The Challenges

- Established TTM practices are labour intensive and roadworkers are close to live traffic
- The TTM industry is seen as slow to adopt innovations
- Forecasts show a 38% increase in demand (MP) between Yr2 and Yr4 of RP2
- Day to day fluctuations in demand cause inefficiency in the TTM supply chain
- TTM suppliers struggle to recruit in some areas, and use a high proportion of agency
- TTM is a Tier 2 supply to Major Projects so supplier relationships must focus through others

The Outcomes

- Customer safety and satisfaction to be improved through innovative working practices and technology
- The safety of roadworkers to be improved by innovations and less labour intensive practices
- The design and execution of TTM to enable productivity improvements in roadworks
- A sustainable TTM supply base capable of delivering increased capacity whilst adopting new technology and working practices to add value.

Group, Category & Product



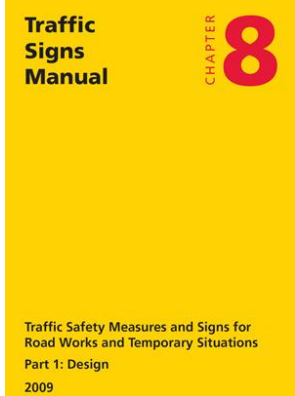
- **Temporary Traffic Management (TTM) enables access to road space for Operations and Major Projects**

- **Core TTM** is the planned deployment of necessary equipment (such as cones, vehicles and signage) to adjust the usual flow of traffic such as road and lane closures.
- **Emergency TTM** is the reactive deployment in response to incidents.
- **Ancillary services** are supplementary components that enhance the effectiveness of the core TTM, these can include CCTV Tascar, Temporary Barrier provision and Vehicle Recovery Services
- **Equipment** required to deliver the service includes specialist vehicles such as Impact Protection Vehicles (IPV) below, costing circa £110K, and cones, temporary barriers signage and lighting. Consumables include cone sleeves and batteries.



Chapter 8 Traffic Safety Measures and Signs for Road Works and Temporary Situations provides the official detailed guidance on:

1. Design (2009)
2. Operations (2009)
3. Update (2020)



In **Operations**, TTM is purchased according to Activity based price schedules, to which the primary inputs are labour and vehicles. Maintenance and provision of Equipment becomes more significant on longer duration deployments.

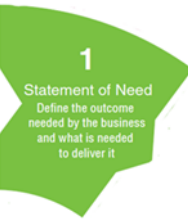
In **Major Projects** TTM is procured as a tier 2 service. Longer deployments often result in significant costs for ongoing hire of equipment, and ancillary services such as vehicle recovery



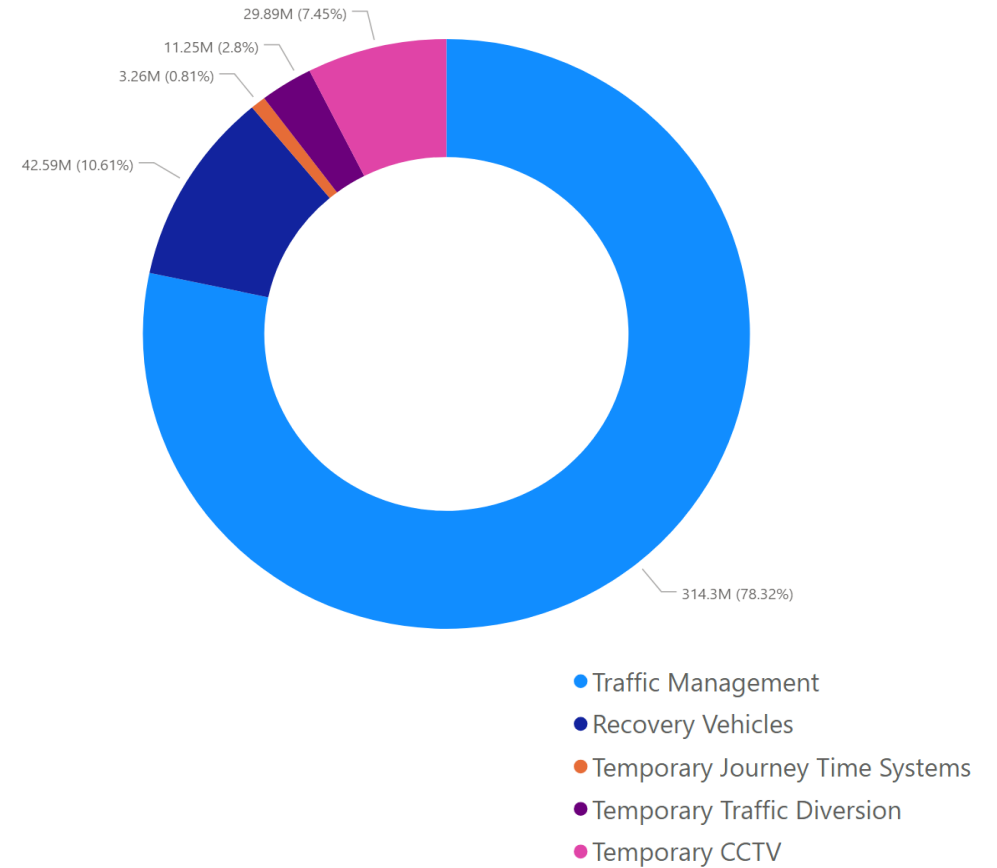
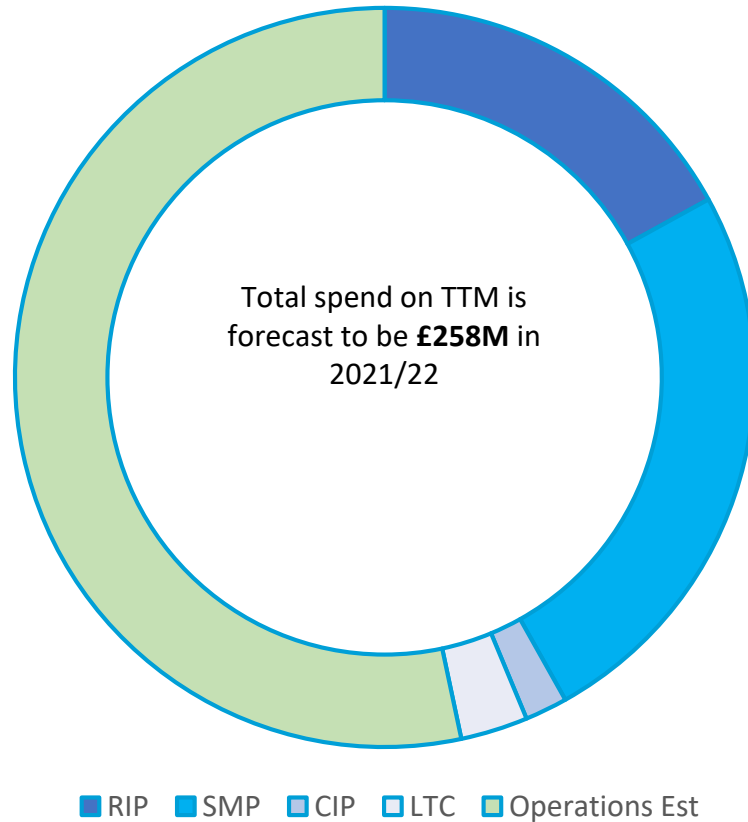
Up to 7% of Major projects spend in Roads Period 2 is forecast to be for TTM.

Group, Category and Product

- Temporary Traffic Management spend breakdown (MP Agreed Price*)



RP2 year 2 Forecast by Programme



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

Conclusion: TTM is a significant spend, with slightly over half in Operations and Major Projects (according to available forecast information). The subcategory split (right) indicates that the majority of the spend is on TTM Service. (Data is from Major Project pricing at the start of RIS 1 adjusted for inflation).

Business Requirements and Objectives





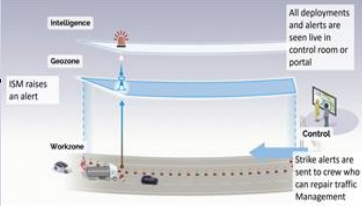



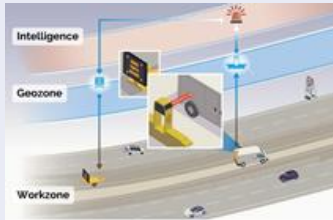
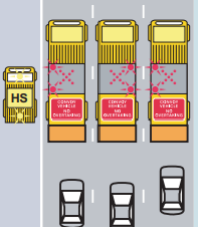







Requirement	Low Importance	1	2	3	4	5	High Importance
Assurance of supply	Disruption to supply has a minor impact on operations and / or brand perception					X	Security of supply is critical, disruption will affect safety and damage reputation
Quality	Quality issues have minimal impact on operations and/or					X	Quality performance has a major impact on our operations and/or brand
Regulatory, Ethical, Environmental	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
Service	Flexibility in delivery dates and service levels can be accommodated with minimal impact.				X	X	Late deliveries / poor service has a major impact on operations / brand
Cost	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
Innovation	R&D capability or investments in innovation has minimal impact on operations and/ or brands.				X	X	Excellent R&D / product engineers and investments to innovate are critical to our operations and/or brand

Conclusion:

- Traffic Management has significant impacts on the safe delivery of other works, and scores highly for assurance, quality, and service.
- Regulatory, Ethical & Environmental is deemed here to include **Safety**, and is scored at the maximum.
- Innovations in the industry are often safety focussed, and the implementation of such innovations is of high importance.

NH Directorate	Specific Objectives
Operations	<ul style="list-style-type: none"> • Operations have a particular requirement for TTM to be dynamic and able to respond to incidents. • Operations control centres manage network occupancy, and require effective communications with TTM
Complex Infrastructure Programme	<ul style="list-style-type: none"> • CIP schemes require detailed design and planning, and excellent coordination in large deployments. • CIP want to show leadership in innovation and customer satisfaction.
Smart Motorways Programme & Alliance	<ul style="list-style-type: none"> • TTM should engage early and work collaboratively with alliance partners to achieve the best design and innovation • SMP schemes are large with long duration TM so suppliers must have resources and capability • SMA have TTM frameworks in place with top 2 suppliers

Innovations in Temporary Traffic Management

Physical Deployment	Vehicles	Geo-zoning	Communications & Operations
<p>Automatic cone laying. Reduced manual handling and crew</p> 	<p>Electric vehicles Currently 3.5T And vans</p> 	<p>Intellicone smart taper Incursion warning</p> 	<p>Signalling for Roadworks Less reliance on Carriageway signs</p> 
<p>Swift gate taper Automated repeat closures</p> 	<p>Lowered working area</p> 	<p>Works egress warning</p> 	<p>Rolling road block closures Quicker & Safer TTM deployment</p> 
<p>Moveable barrier Operation Brock Large scale</p> 	<p>Autonomous IPV Driverless operation</p> 		<p>Safety Cam Van Reduces incursions</p> 
<p>Inflatable lane closure Vehicle incursion airbag</p> 	<p>IPV with crane to deploy equipment</p> 	<p>In car digital information</p> 	<p>Working Windows Tool</p> 

Future Forecast Spend - Operations

From RIS2 Spend Allocation:

Temporary Traffic Management	Area 1	Area 2	Area 3	Area 4	Area 6	Area 8	Area 7	Area 9	Area 10	Area 13	Area 12	Area 14	Total
Year 1 (April 2020 to March 2021)	£ 2,690.56	£ 12,834.63	£ 13,375.15	£ 11,052.64	£ 8,268.83	£ 7,214.66	£ 8,329.21	£ 25,886.79	£ 13,553.15	£ 8,904.95	£ 19,971.27	£ 5,696.62	£ 137,778
Year 2 (April 2021 to March 2022)	£ 2,690.56	£ 12,834.63	£ 13,375.15	£ 11,052.64	£ 8,268.83	£ 7,214.66	£ 8,329.21	£ 25,886.79	£ 13,553.15	£ 8,904.95	£ 19,971.27	£ 5,696.62	£ 137,778
Year 3 (April 2022 to March 2023)	£ 2,690.56	£ 12,834.63	£ 13,375.15	£ 11,052.64	£ 8,268.83	£ 7,214.66	£ 8,329.21	£ 25,886.79	£ 13,553.15	£ 8,904.95	£ 19,971.27	£ 5,696.62	£ 137,778
Year 4 (April 2023 to March 2024)	£ 2,690.56	£ 12,834.63	£ 13,375.15	£ 11,052.64	£ 8,268.83	£ 7,214.66	£ 8,329.21	£ 25,886.79	£ 13,553.15	£ 8,904.95	£ 19,971.27	£ 5,696.62	£ 137,778
Year 5 (April 2024 to March 2025)	£ 2,690.56	£ 12,834.63	£ 13,375.15	£ 11,052.64	£ 8,268.83	£ 7,214.66	£ 8,329.21	£ 25,886.79	£ 13,553.15	£ 8,904.95	£ 19,971.27	£ 5,696.62	£ 137,778
Total RIS 2	£ 13,453	£ 64,173	£ 66,876	£ 55,263	£ 41,344	£ 36,073	£ 41,646	£ 129,434	£ 67,766	£ 44,525	£ 99,856	£ 28,483	£ 688,892

Included in SDF:

Temporary Traffic Management	Area 1	Area 2	Area 3	Area 4	Area 6	Area 8	Area 7	Area 9	Area 10	Area 13	Area 12	Area 14	Total
Year 1 (December 2021 - March 2022)	£ 970	£ 4,324	£ 5,480	£ 4,835	£ -	£ -	£ 2,043	£ -	£ -	£ 2,333	£ 6,657	£ 1,899	£ 28,541
Year 2 (April 2022 to March 2023)	£ 2,909	£ 12,973	£ 16,441	£ 14,504	£ -	£ -	£ 6,128	£ 18,270	£ 3,023	£ 7,000	£ 19,971	£ 5,697	£ 106,916
Year 3 (April 2023 to March 2024)	£ 2,909	£ 12,973	£ 16,441	£ 14,504	£ -	£ -	£ 6,128	£ 24,361	£ 9,070	£ 7,000	£ 19,971	£ 5,697	£ 119,053
Year 4 (April 2024 to March 2025)	£ 2,909	£ 12,973	£ 16,441	£ 14,504	£ 10,136	£ 7,215	£ 6,128	£ 24,361	£ 9,070	£ 7,000	£ 19,971	£ 5,697	£ 136,404
Year 5 (April 2025 to March 2026)	£ 2,909	£ 12,973	£ 16,441	£ 14,504	£ 10,136	£ 7,215	£ 6,128	£ 24,361	£ 9,070	£ 7,000	£ 19,971	£ 5,697	£ 136,404
Year 6 (April 2026 to March 2027)	£ 2,909	£ 12,973	£ 16,441	£ 14,504	£ 10,136	£ 7,215	£ 6,128	£ 24,361	£ 9,070	£ 7,000	£ 19,971	£ 5,697	£ 136,404
Year 7 (April 2027 to November 2027)	£ 1,939	£ 8,649	£ 10,961	£ 9,669	£ 6,757	£ 4,810	£ 4,085	£ 16,240	£ 6,047	£ 4,667	£ 13,314	£ 3,798	£ 90,936
Total Scheme Delivery Framework	£ 17,455	£ 77,839	£ 98,646	£ 87,024	£ 37,165	£ 26,454	£ 36,768	£ 131,953	£ 45,350	£ 41,999	£ 119,828	£ 34,180	£ 754,658

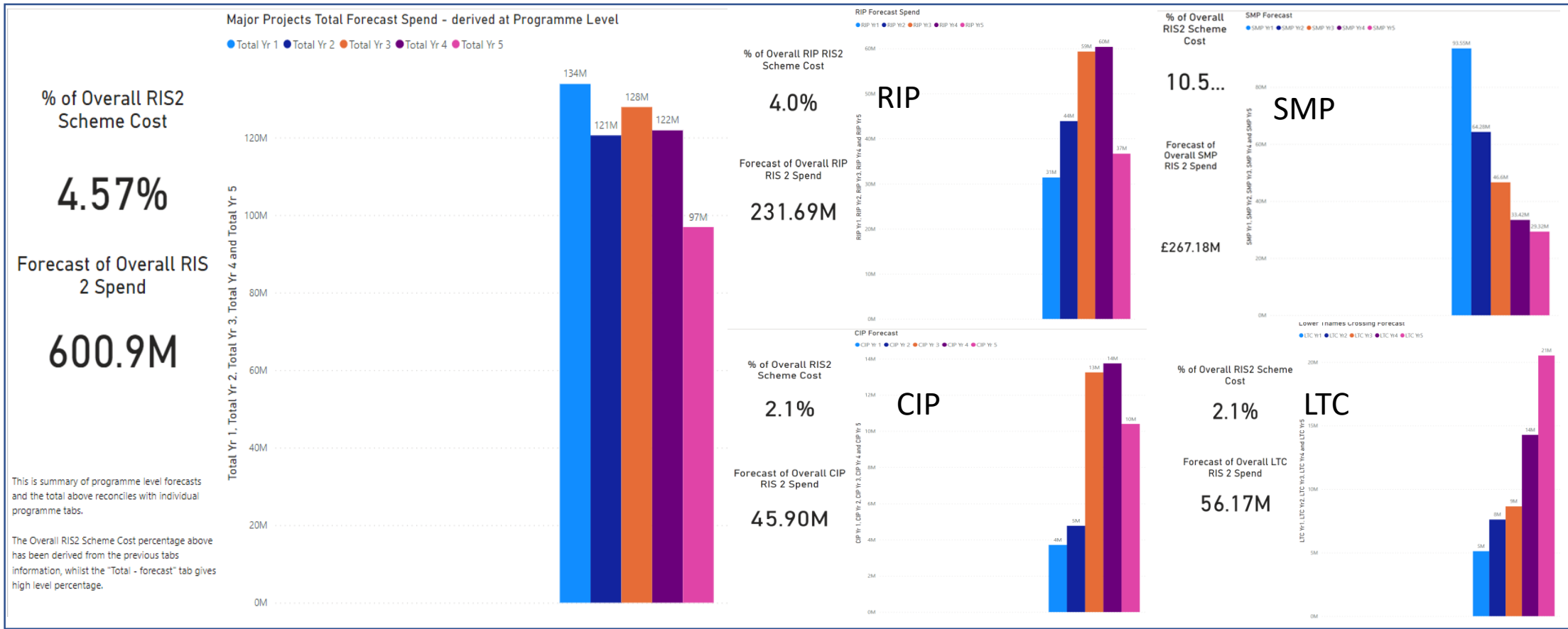
Conclusion: The Data provided is consistent with that included in the SDF procurement.

- RP 2 is split by Area and by asset type, so any assets not within scope of the SDF have been removed (pavement for example, as this will continue to be procured via pavement framework arrangements)
- Historical TTM spend had been calculated at 31% from current CWF live contracts. This figure has been used to estimate the TTM spend above.

In the second table

- Adjustments have been made for each Area to represent when they move onto the SDF.
- As RIS 2 only takes us to March 2025, the spend totals have been extrapolated to take us through to the end of the SDF in December 2027.

Future Forecast Spend – Major Projects

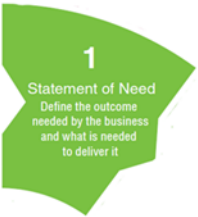


Conclusion:

- TTM is estimated as between 4.57% (above) and 7.2% of RIS2 Major Projects spend.
- SMP being the greatest proportion initially can be seen to reduce from a year 1 peak, whereas RIP continues to grow.
- These figures will be reviewed and enhanced when Webcast data becomes available.
- A group of 8 leading suppliers were each asked to estimate the proportion of their current turnover relating to National Highways. The total of these (not validated) estimates was £238 Million. Year 2 above + Operations SDF forecast = £258M, so estimates appear credible.
- D&OP data (overleaf) however shows significant growth in demand from 2023 so forecast updates will be closely monitored.

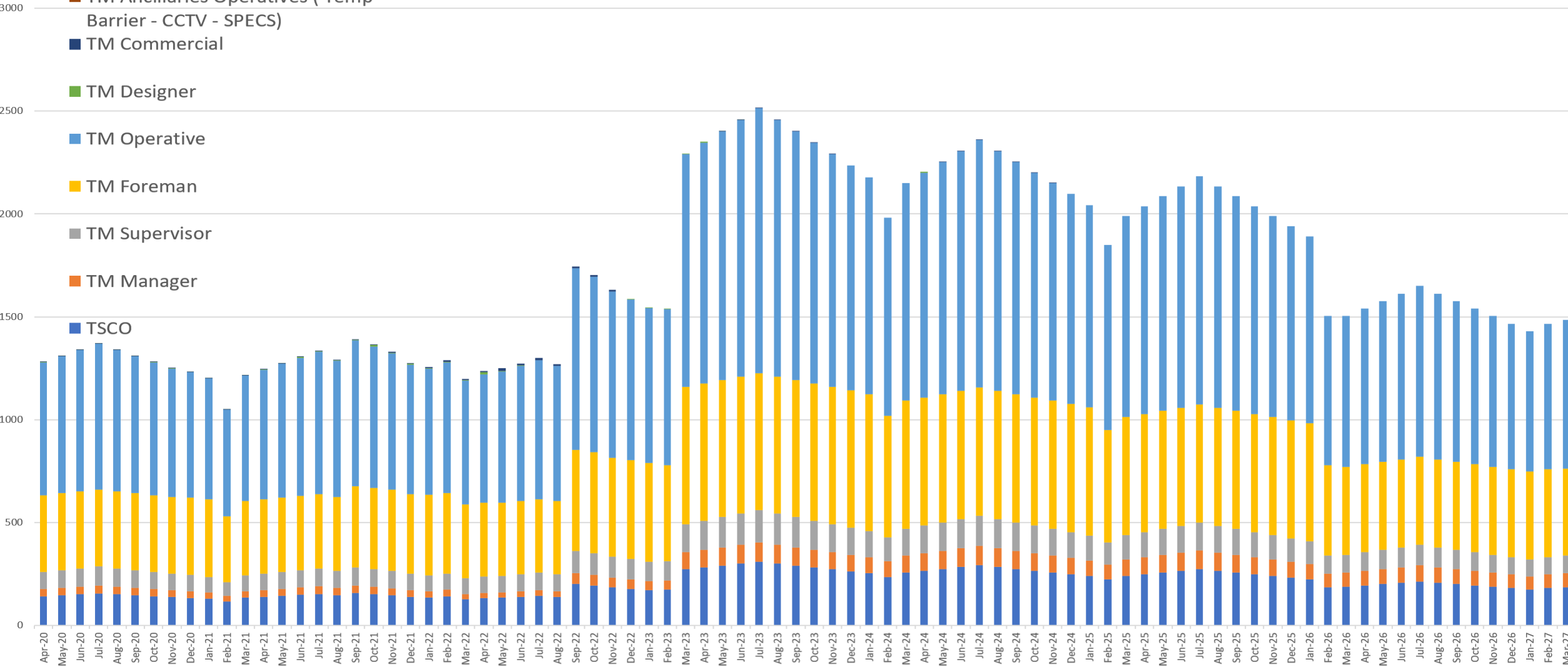
Future Forecast : Aggregated and Expressed as Labour

From Demand & Operational Planning



Combined TTM Labour

- TM Ancillaries Operatives (Temp Barrier - CCTV - SPECS)
- TM Commercial
- TM Designer
- TM Operative
- TM Foreman
- TM Supervisor
- TM Manager
- TSCO



Value Chain Analysis



Value Chain	Value Factors	Current Situation	Changes Needed
Identify and list the relevant step-by-step value chain activities	For each activity, list the value factors (Highways England KPIs/targets) which are affected and describe what would maximise the value achieved for each	List what is wrong with the current situation against each activity (i.e. why maximum value is not being achieved)	List the changes needed to enable realisation of maximum value for each activity
Specification	Safety (Supply Chain Accident Frequency Rate reduction), Safety (Network KSI and casualty reduction), Efficiency - Factors are enhanced if the specification allows for innovative and value added designs to be considered.	Minimum specification is Chapter 8 compliance. This becomes the norm and discourages enhanced quality offers.	Specification should include HE kpi objectives, and "Roadworks a customer's view" toolkit principles, as well as highest safe speed, and relevant specifics (eg. Line markings & barriers at dusk). Consideration given to targeted quality mechanism and/or other commercial measures to incentivise enhanced quality solutions.
Design	Safety (Supply Chain Accident Frequency Rate reduction), Safety (Network KSI and casualty reduction), Efficiency - Factors are enhanced if the design is developed using the expertise of all parties to a brief incorporating HE value factors.	TTM Design is often done in outline before the TTM provider is engaged. When the TTM is engaged, works may then be re-designed, or design may be committed and there may be resistance to change.	Design should follow from risk assessment. Early involvement, and collaborative working should design for: safety, customer satisfaction, efficient access & logistics, productivity of the works, and durability of the product (eg. reduced paving joints)
Operational Planning	Safety (Supply Chain Accident Frequency Rate reduction), Efficiency - Factors may be improved by less onerous demands on contractors to adapt to short term changes.	TTM work is subject to frequent late changes. (31% cancellation in Jan 21, 7 day accuracy was 51%) This may result in inefficient use of labour, and increased travel.	7 day accuracy KPI of 90% for RIS2. Root cause analysis of late changes and cancellations.
TTM Operations (Safety)	Safety (Supply Chain Accident Frequency Rate reduction) will be enhanced if the man hours which Roadworkers spend on the carriageway are reduced, and if manual handling tasks are reduced or eliminated.	Setting out and removing TTM is potentially hazardous, involving roadworkers in close proximity to live traffic. Roadworkers are on slow moving vehicles or even on foot, and in addition, are required to do physically demanding manual handling tasks, frequently at night.	Focus on: travel time to works; design, digital innovation and automation to minimise the time for which roadworkers are in proximity to live traffic; signalling for roadworks initiative; and work on safety qualifications and culture (including safety passports and inductions, and the Supply Chain Sustainability School).
TTM Operations (Customer)	User Satisfaction	Roadworks are a significant area of customer dissatisfaction and complaint. Complaints are handled by Highways England. The delivery and communication of TTM has a big impact on how roadworks are perceived.	Implementation of "Roadworks a customer's view" toolkit principles. There is a need to move the industry on from a Chapter 8 minimum mindset, and to inform TTM operatives through customer briefing & training. Positively influence customer perception through works maintenance and standards. Consider how to involve TTM companies in responding to complaints. Automation of diversion routes.
TTM Operations (Productivity)	Safety (Network KSI & casualty reduction), User Satisfaction, Efficiency - Improving productivity of works requiring overnight lane closures will reduce the number of closures required, shortening scheme programmes, reducing costs, reducing exposure to risk, and improving the customer's experience.	TTM crews go out first to a closure and come back last. Their time on the Carriageway bookends the works. The time efficiency of a closure is not routinely measured or incentivised.	Use of Lean techniques, and Overall Equipment Effectiveness to measure time and to quantify losses of time on lane closed operations. Close focus will fall on monitoring traffic levels to determine the safe time for "first cone", TTM crew performance, communications between all contractors and control centre, speed of operation vs rated speed of the prime asset (eg. Paving machinery), and the quantities and logistics of materials supply. Resource decisions and Supplier incentivisation may be designed accordingly.
TTM Maintenance	Safety (Supply Chain Accident Frequency Rate reduction), Safety (Network KSI and casualty reduction), Incident Management (Traffic Flow)	TTM works are visually inspected for damage (such as cone strikes) every 2 hours - as required in Chapter 8	Use of Geozoning and equipment monitored by sensors to enable faster response to strikes & incursions.

Show the relevant sections of the high level value chain map here

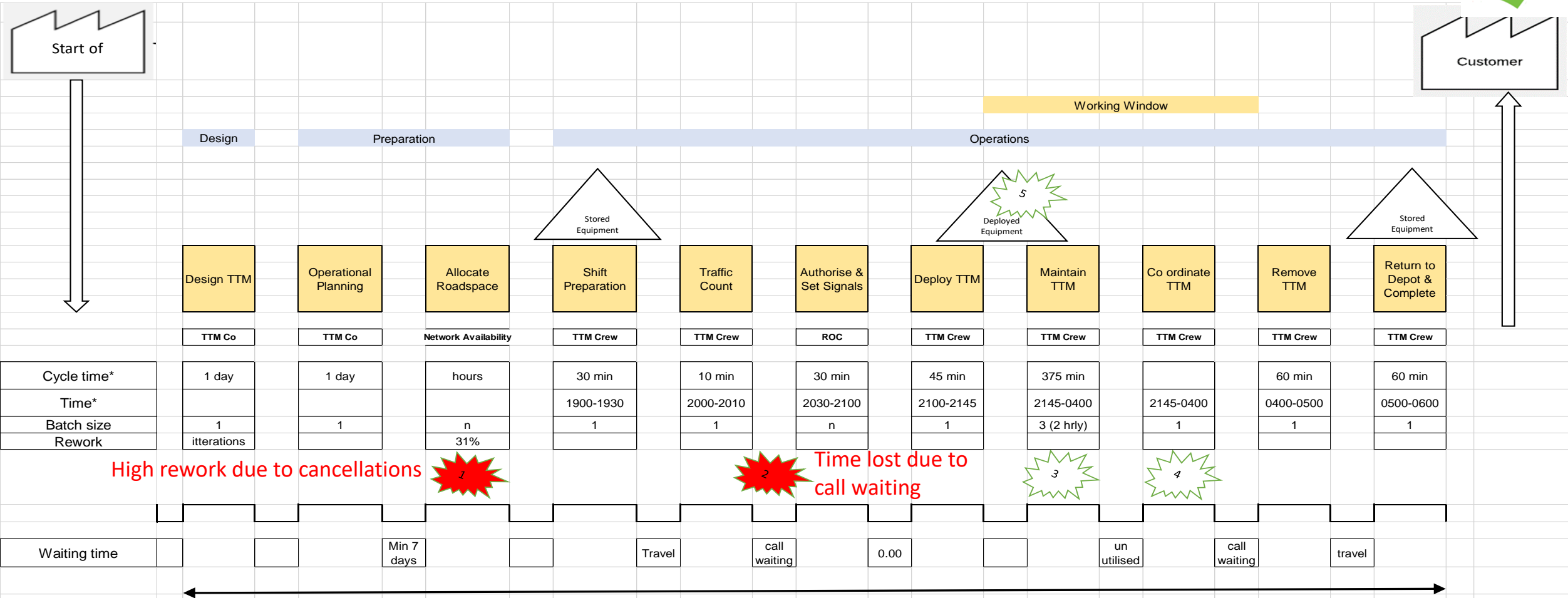
Conclusion:

- Value Chain Analysis was developed with the Stakeholder Group.
- VCA reveals significant opportunities to improve safety, delivery and customer satisfaction.
- In particular, there are safety and productivity innovations which can be applied to modernise TTM operations
- TTM is just one component of works productivity (overnight closures in particular), and can play an important part in Lean initiatives and sustained improvements measured as Overall Equipment Effectiveness (OEE).
- There are no current Innovation re-applied initiatives, however the group has been engaged.

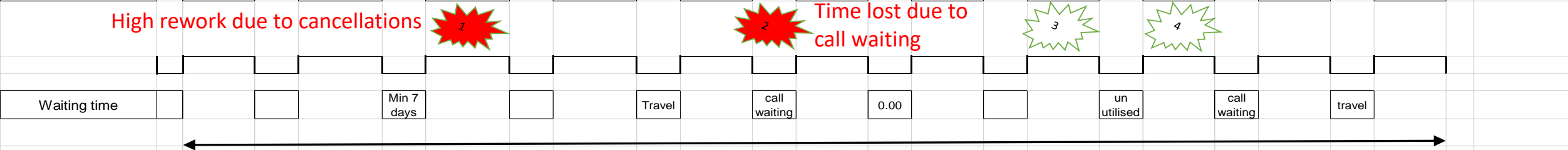


Value Stream Map (Supplementary Information)

1
Statement of Need
Define the outcome needed by the business and what is needed to deliver it



	TTM Co	TTM Co	Network Availability	TTM Crew	TTM Crew	ROC	TTM Crew	TTM Crew	TTM Crew	TTM Crew	TTM Crew
Cycle time*	1 day	1 day	hours	30 min	10 min	30 min	45 min	375 min		60 min	60 min
Time*				1900-1930	2000-2010	2030-2100	2100-2145	2145-0400	2145-0400	0400-0500	0500-0600
Batch size	1	1	n	1	1	n	1	3 (2 hrly)	1	1	1
Rework	iterations		31%								



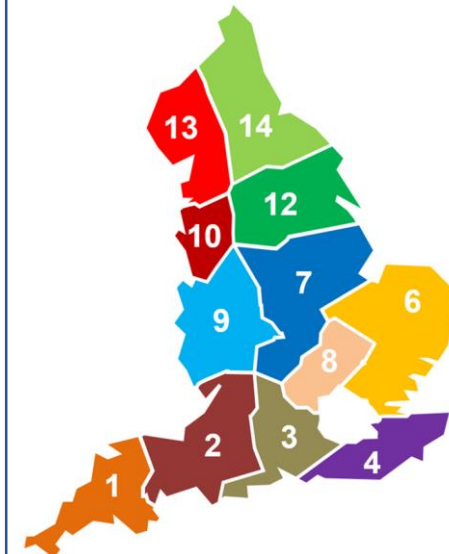
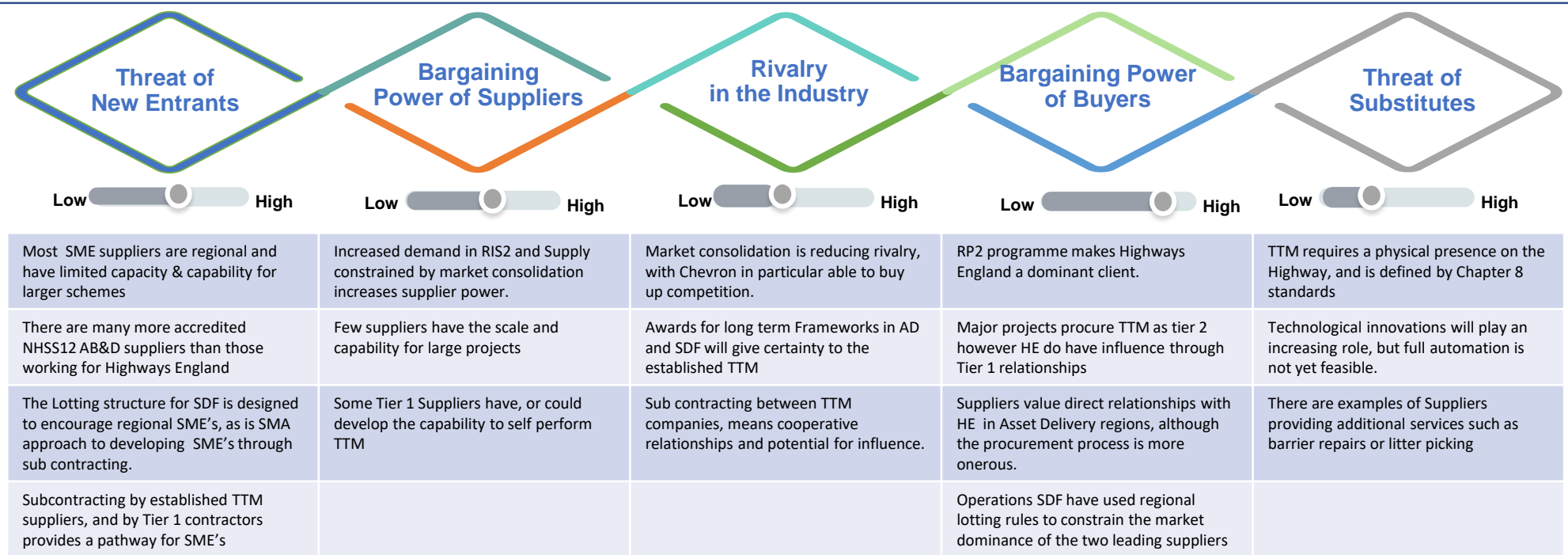
- 1 NEMS 7 day accuracy for Jan 21 was 50%. 31% of bookings were cancelled
- 2 Idea 1436 Mathew Sparkes - proposing Mobile web application for NEMS: Anecdotal evidence (East Senior Network Planner): window for answering calls is between ten minutes and one hour.
- 3 Cycle time is the working window for other (value adding trades). The objective is to maximise the window, and minimise the un-utilised (wasted) contingency time before TTM has to be removed.
- 4 Co ordinating role of TTM foreman has possible capacity to add greater value.
- 5 Long term deployment of rented equipment is a potential waste

* Timings are indicative, pending availability of information

Market Insight and Landscape

The Market for Temporary Traffic Management is largely populated by specialist contractors, although there are examples of Main (T1) contractors having in house TTM, and of specialist labour agencies T3 stepping up. Whilst there are many suppliers in the TTM market, the choice among those experienced in working to the standards required on the High Speed SRN is more restricted.

There are two dominant suppliers: Chevron and HW Martin who together represent est. 70% of National Highways spend. Challengers to this pairing include Colas, Forrest (Amberon) and Tarmac, each with a at least one CWF agreement in an Operational Area. There has been consolidation in the market, with Chevron and Amberon acquiring rivals in the last 2 years.



Conclusion: Industry rivalry is lower than desired, with 2 dominant suppliers secure in their positions. Industry consolidation is a concern, however there are mitigations in place through regional lots and sub-contracting, and due care must be taken not to make the high speed market unattractive to the most capable suppliers.

Key Supplier Risks



Risk type	Risk Description	Impact	Priority	Mitigation/Action
Supply Chain	<ul style="list-style-type: none"> The often-subcontracted nature of Traffic Management works may reduce the Traffic Management suppliers to their specialism, could prevent further expansion of the sector (Tier 1's maintaining preferred supplier lists) and reduce the opportunity to develop suppliers further e.g. expand into groundworks or foundations. 	<ul style="list-style-type: none"> Risk that Traffic Management workers knowledge is overlooked in favour of Tier 1's preferred options, leading to inadequate exploitation of supply chain expertise. 	Med	<ul style="list-style-type: none"> Encourage groupings of works, better forecasting of maintenance schedules to allow better resource utilisation Encourage collaboration of more established suppliers with SMEs to develop increased understanding of NH's requirements & influence opportunities to work directly.
Innovation	<ul style="list-style-type: none"> Opportunities to combine types of work e.g. road markings, barriers with Traffic Management not clearly taken up. Advent of in-car technology e.g. sensors that detect approaching TTM and warn drivers or autonomous vehicles that automatically avoid TTM 'lighthouse' sensors. 	<ul style="list-style-type: none"> Opportunities for cost, process & time efficiencies are missed. Lack of engagement with emerging technology misses opportunities to evolve TTM capability 	Med	<ul style="list-style-type: none"> Consider suppliers with a synergistic service offering to take advantage of Traffic Management downtime. Note possibility of inadequate skills mix i.e. TTM operatives may not have skills to deliver barrier installation. Initial investigations of technology application to TTM, limited due to early-stage development being enhancing rather than replacing physical TTM.
Capacity	<ul style="list-style-type: none"> Increased investment by UK Government in large infrastructure projects, such as HS2, is placing a resource and plant constraint on the market. Limited interconnectivity with other delivery suppliers to find better sequencing of works activities & shared benefits. TTM is an end-to-end service requiring a tie-up of capacity, particularly if active TTM e.g. CCTV monitoring is required. 	<ul style="list-style-type: none"> Lack of skilled resource & plant available. Inefficient deployment adding to time & cost. 	High	<ul style="list-style-type: none"> Government level visibility of competing demands to co-ordinate resource requirement & avoid pinch-points. Adopt a works 'community' where suppliers on the scheme can actively engage & collaborate as the works progress.

Conclusion: End-to-end TTM services could offer synergistic benefits if combined with e.g. barrier or road markings delivery.
 Capacity: This could lead to a decrease in the safe execution of works. Supplier capacity will need careful monitoring. There is a particular risk to the quality of recruitment if capacity growth is achieved through inappropriate sub contraction or use of agency labour.

Supplier Engagement



TTM Supplier Engagement

- 8 interviews with key suppliers carried out over 5 weeks (Nov & Dec 20), and the Supplier Community meeting was re-started in March 21
- Key Themes:
 - Investment is available for growth if there is a pipeline of work.
 - Recruitment and retention of operatives may be the greatest challenge to growth. Companies generally recruit and train in house, and many would like to reduce the proportion of agency.
 - The two dominant Suppliers see the Scheme Delivery Framework (SDF) lots as limiting, and see greater growth potential from other sectors (Other infrastructure, Local authority, Utilities).
 - Challenging Suppliers (e.g. Forrest, HTM) see SDF as an opportunity for growth and a direct relationship.
 - Suppliers are well informed about technical innovations, however attitudes vary e.g. Chevron (HRS) are keen to lead, whereas others are not early adopters.
 - Communications with ROC's are identified as a cause of lost time.
 - All have some in house design capability and discuss ECI positively.

RDP Tier 1 Sustainable Supply Chain Group

- Meeting involving a sub group of NH and 4 DIPS (16th Dec 20)
- Key themes:
 - The group believed that TTM suppliers will grow to meet demand if given visibility of the work pipeline.
 - It is easy to go to the 2 dominant suppliers in the market, and hard for challengers to win significant work.
 - SME's are seen as value adding, but neither lots strategies nor sub-contraction are without drawbacks.
 - Value added TTM proposals may be encouraged through >50% Quality scoring, and Early Contractor Involvement.
 - TTM has a big influence on works productivity. Communications with ROC's by telephone is seen as costing time & productivity.
 - Automation is an opportunity to remove workers from proximity to live traffic, but the industry has been slow to innovate.
 - There are successful safety innovations (e.g. Geozone incursion alarms) which are sometimes specified, but are not mandated.
 - Public awareness and respect for roadworkers needs to improve.

Conclusion:

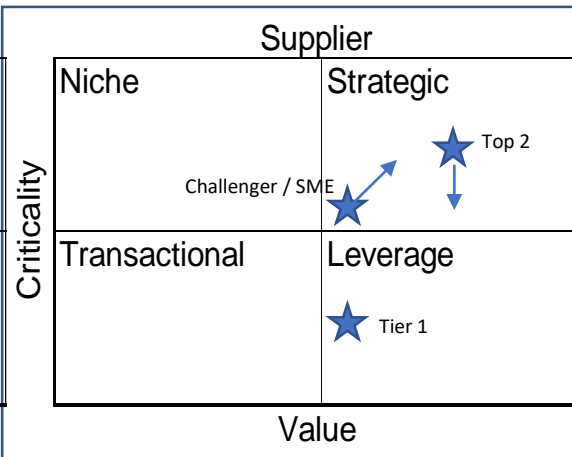
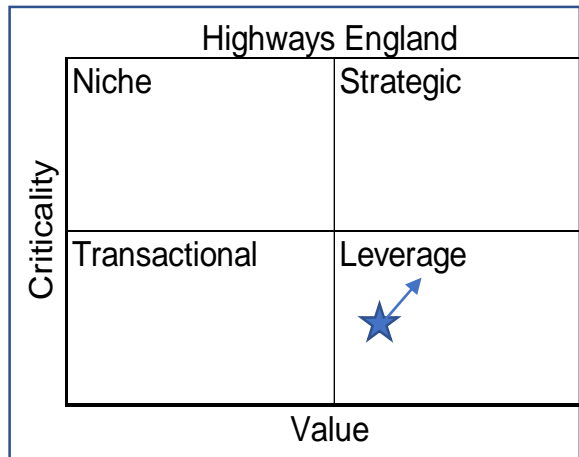
- Both TTM Suppliers and Tier 1 Contractors have offered positive engagement, and ideas for the Strategy.
- There is consensus on the importance of visibility of the pipeline of work.
- Interests differ on the best way to develop the supply market structure.
- Current and future innovations offer improvements in safety and productivity, however the industry has been slow to adopt innovations

Supplier Analysis



Strengths (Internal to HE)	Weaknesses
<p>Dominant market client</p> <p>Leadership on Standards & Innovation</p> <p>RP2 Pipeline of work</p> <p>Growing direct relationships with TTM</p>	<p>Making RP2 pipeline & growth visible</p> <p>Multiple touchpoints for Suppliers</p> <p>Varying Procurement by Programmes</p> <p>Client role can limit Engagement</p>
Opportunities (External to HE)	Threats
<p>Elasticity of Supply (Recruitment, Agency)</p> <p>Develop SME's through Lotting & Sub-Contraction</p> <p>Innovation pipeline</p> <p>Procure for Social & Environmental value</p>	<p>Supply market consolidation</p> <p>Immaturity of challenging Suppliers</p> <p>Competing infrastructure & Local Authority demand</p> <p>Industry recruitment Challenges</p>

Political	Economic	Social
<p>Government spending on infrastructure</p>	<p>Low interest rates</p> <p>Brexit and prospect of lower growth</p> <p>Covid impacts & shape of recovery</p> <p>Vaccination to renew consumer confidence</p>	<p>Safety Imperative</p> <p>Rising Unemployment</p> <p>Ageing blue collar workforce</p> <p>Focus on workforce wellbeing</p> <p>Working from home (new normal) & traffic volumes</p>
Technological	Legislative	Environmental
<p>Development of "digital twin" of works</p> <p>Geozoning and the Internet of Things</p> <p>Physical automation innovations</p> <p>Emerging AI technologies</p> <p>Communication with in car devices</p>	<p>Chapter 8 of "Traffic Signs" under review</p>	<p>Drive for zero carbon emissions</p>



Conclusion:

- Two dominant Suppliers have the capacity and capability for major projects. They see NH as strategic, but are looking at ways to diversify with other clients and sectors, reducing criticality.
- Tier 1 Suppliers with TTM capability see it more tactically, and challengers see opportunity (e.g. Through SDF lots).
- For NH; TTM is a leverage category but can add more value (e.g. design input, principle contractor roles, complementary services, productivity initiatives and social & environmental benefits), making it more strategic.
- Market consolidation does "pull a little" towards the Niche quadrant, however TTM supply is fairly elastic, if given adequate visibility of the demand pipeline.



Balanced Scorecard – Critical Success Factors & Social Value

Strategic Themes	Priorities & Value For Money	Alignment to NH Imperatives	Strategic Outcome
Customer Service	<ul style="list-style-type: none"> Minimise the frequency and duration of roadworks through improved productivity 	<ul style="list-style-type: none"> Customer Delivery 	<ul style="list-style-type: none"> Provide fast and reliable journeys Meet the needs of all users
Supply Chain/SME Accessibility	<ul style="list-style-type: none"> Develop SME's through sub-contracting (knowledge transfer), and SDF lots strategy 	<ul style="list-style-type: none"> Delivery 	<ul style="list-style-type: none"> Sustain a well-maintained and resilient network Achieve efficient delivery
Employment/Workforce Skills	<ul style="list-style-type: none"> Encourage greater full time recruitment & less agency in TTM 	<ul style="list-style-type: none"> Delivery 	<ul style="list-style-type: none"> Improve safety for all
Environmental Sustainability	<ul style="list-style-type: none"> Low/No Carbon Vehicles Co Productivities (e.g. Litter, Gulley clearance) 	<ul style="list-style-type: none"> Customer Delivery 	<ul style="list-style-type: none"> Sustain a well-maintained and resilient network Deliver better environmental outcomes
Community/Legacy benefits	<ul style="list-style-type: none"> Social value (e.g., Royal British Legion Industries sign manufacture, Employment of Ex Offenders) Respect for Roadworkers initiatives 	<ul style="list-style-type: none"> Delivery Safety 	<ul style="list-style-type: none"> Social Value Sustain a well-maintained and resilient network Improve safety for all
Learning & Innovation	<ul style="list-style-type: none"> Automation to reduce man hours near live traffic Use of sensors and geozoning for safety and communications initiatives 	<ul style="list-style-type: none"> Safety Customer Delivery 	<ul style="list-style-type: none"> Improve safety for all Achieve efficient delivery
Delivering on Budget	<ul style="list-style-type: none"> Rent or Buy business case for equipment Focus on time productivity of works Co productivities 	<ul style="list-style-type: none"> Delivery Customer Service 	<ul style="list-style-type: none"> Provide fast and reliable journeys Achieve efficient delivery

Conclusion:

- The proposed strategic approach can be mapped to deliver benefits across the spectrum of strategic themes and strategic outcomes to greater and lesser extents.
- The most significant however flow from stimulating innovation and productivity, and supporting a safer and sustainable supply chain.

Recommendation Summary

Recommendation	Implementation	Benefit	Imperative
Reduce operatives hours in proximity to live traffic	<ul style="list-style-type: none"> Communicate as a safety & commercial aim Distinguish “live” time from total time in tender templates Report as a supplier & project performance indicator 	<ul style="list-style-type: none"> Reduced risk of injury to roadworkers Stimulus to automation 	<ul style="list-style-type: none"> Safety
Lean approach to extend the working window	<ul style="list-style-type: none"> Traffic Management to monitor time utilisation on closures See Overall Equipment Effectiveness (OEE) Annexed Set targets to improve productivity in Traffic Management operations Report on time utilisation incl. other trades (and National Highways) 	<ul style="list-style-type: none"> Improved productivity resulting in better attainment of programme and fewer closures Fewer customer journeys affected by roadworks Cost reduction on TTM and other trades 	<ul style="list-style-type: none"> Customer Delivery
Procurement and Commercial processes aligned to the Strategy Aims	<ul style="list-style-type: none"> Include Strategy Aims in ITT information Supplier Quality Evaluation to be aligned NEC4 Section 12 Subcontracting updated with process and factors to be taken into account Link where applicable to Project performance incentivisation 	<ul style="list-style-type: none"> Realisation of the benefits above Realisation of the strategy aims 	<ul style="list-style-type: none"> Safety Customer Delivery
Purchase of selected equipment, pooling, and issue to Project or Area	<ul style="list-style-type: none"> Key equipment to be identified (e.g. mobile VMS) Engage the National Technology Logistics Centre for pool administration, storage & distribution Charge out to Project or Area on a cost recovery basis Equipment to be free issued to contractors for use 	<ul style="list-style-type: none"> Cost reduction due to removal of margin(s) on hiring equipment, and controlling utilisation and depreciation periods Opportunity to standardise equipment, and to facilitate innovation 	<ul style="list-style-type: none"> Delivery

Snapshot of our future vision

