Deploying Lean across a £2.5bn business

Derek Drysdale

Divisional Director Lean Improvement

Conference Pamplona 2015



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driving forward

- 4,300 miles (40% Motorway & 60% APTR).
- 9,000 bridges, 9,000 other structures and 34,000 drainage assets.
- 34% of all road travel and 67% of lorry freight travel.
- 4 million vehicles use the network daily.
- 6000 incidents/month
- Asset valued at over £100 Billion

Our Lean Journey

"working with our supply chain to achieve conscious competence in lean"

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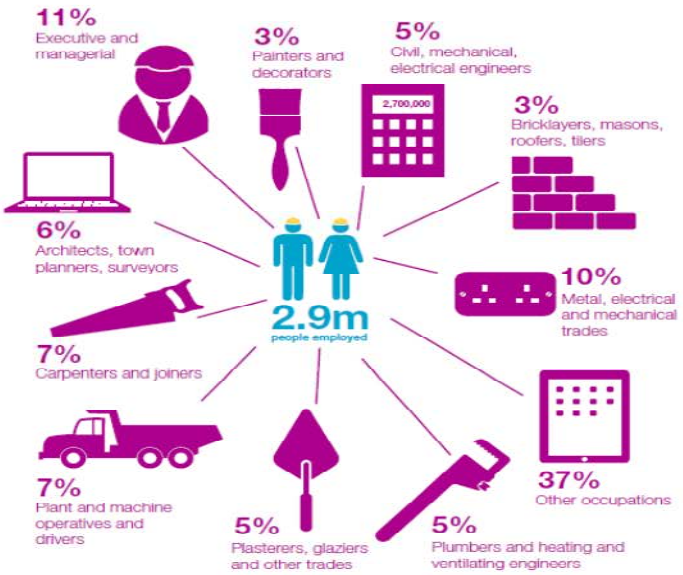
My Hypothesis!

If clients don’t ask for change they will not get it!

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HM Government

Construction

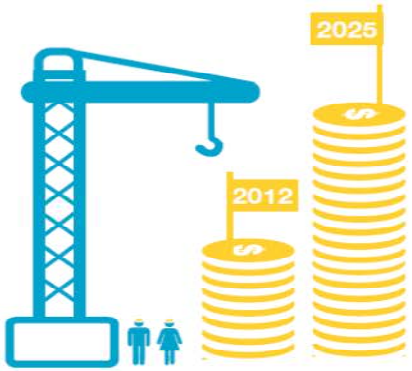


There are **2.9 million** jobs filled in the Construction Industry, circa 10% of all jobs (in over 280,000 businesses)



£90bn

Construction contributes nearly **£90bn** to the UK economy, 6.7% of the total



Global construction output is forecast to increase from around $8.5 trillion today to **$12 trillion in 2025***

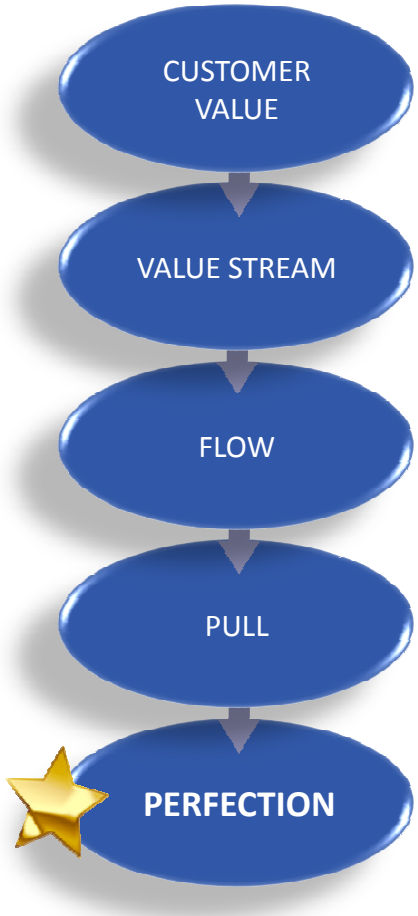
*Source: Global Construction 2025



The **UK has the sixth largest green construction sector in the world**. Around 60,000 jobs are expected to be supported by the insulation sector alone by 2015

#indstrategy

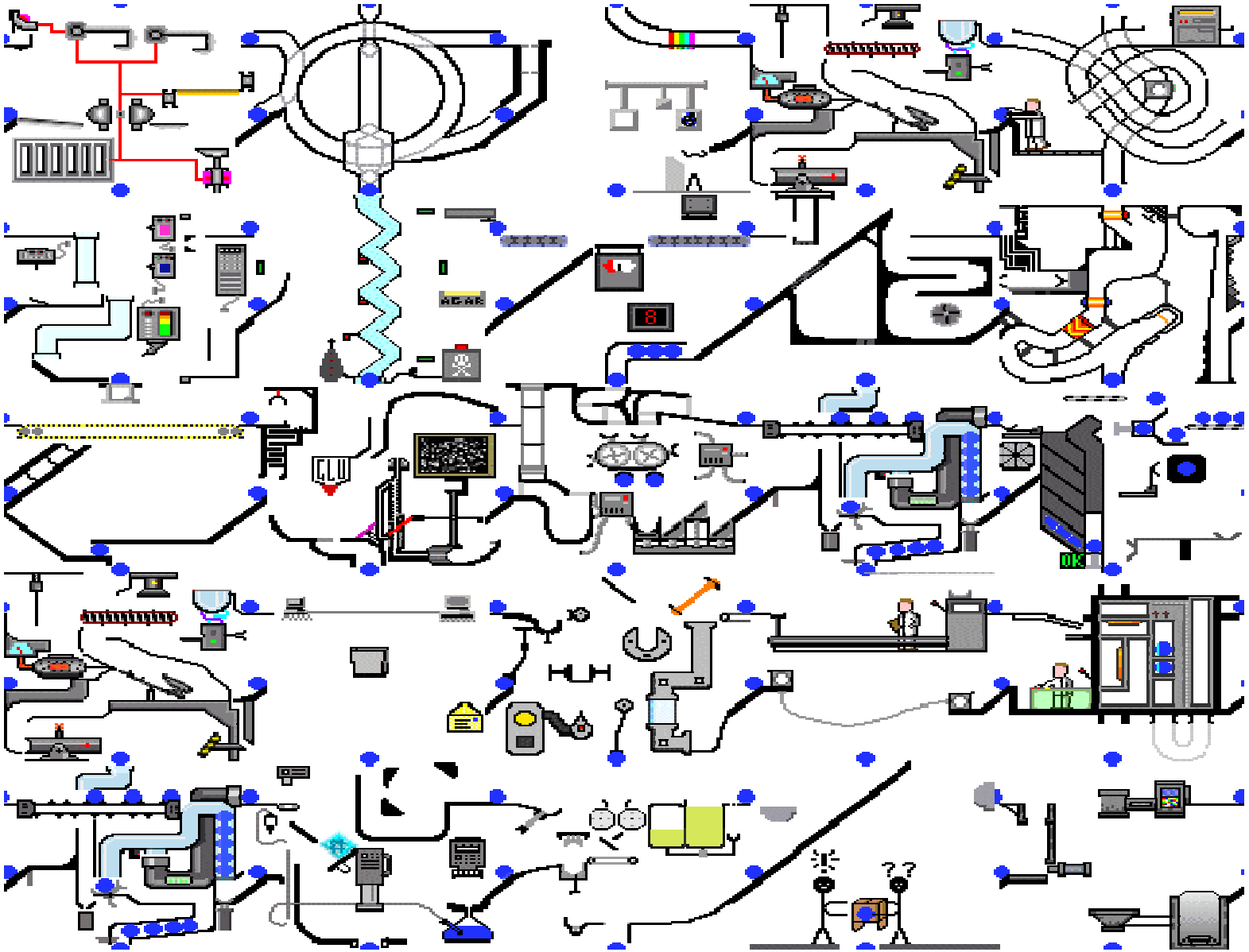
Defining Lean Thinking?



- **Understanding and agreeing exactly what your customer needs**
- **Understanding all your processes**
- **Smoothing the flow**
- **Pulling value through the chain**
- **Continuing to attack waste**

Principles now adopted world-wide in a variety of industries and professions

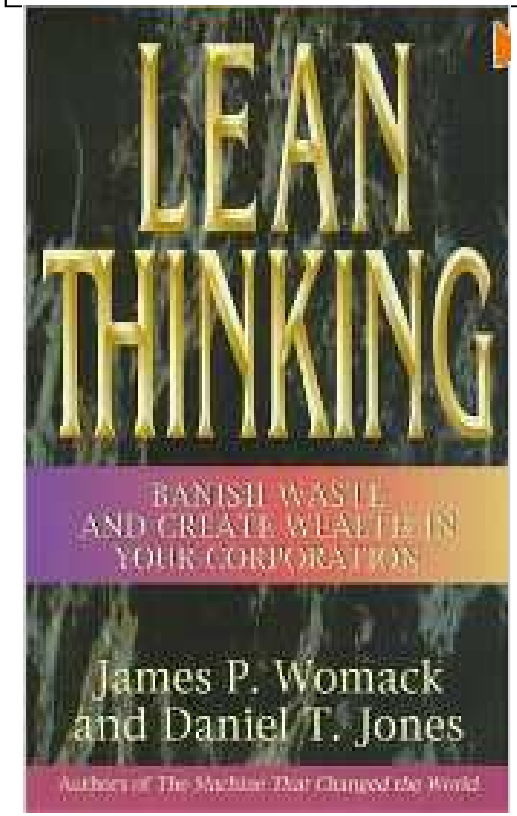
The Human Organism?

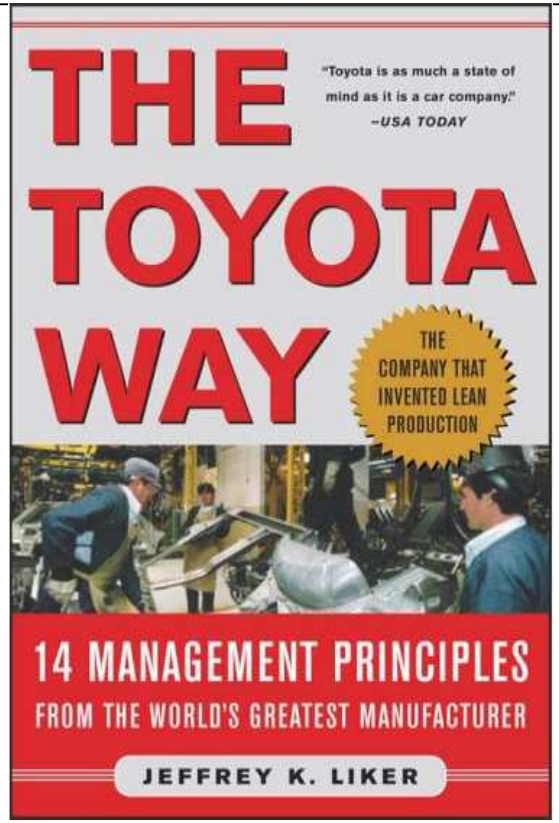


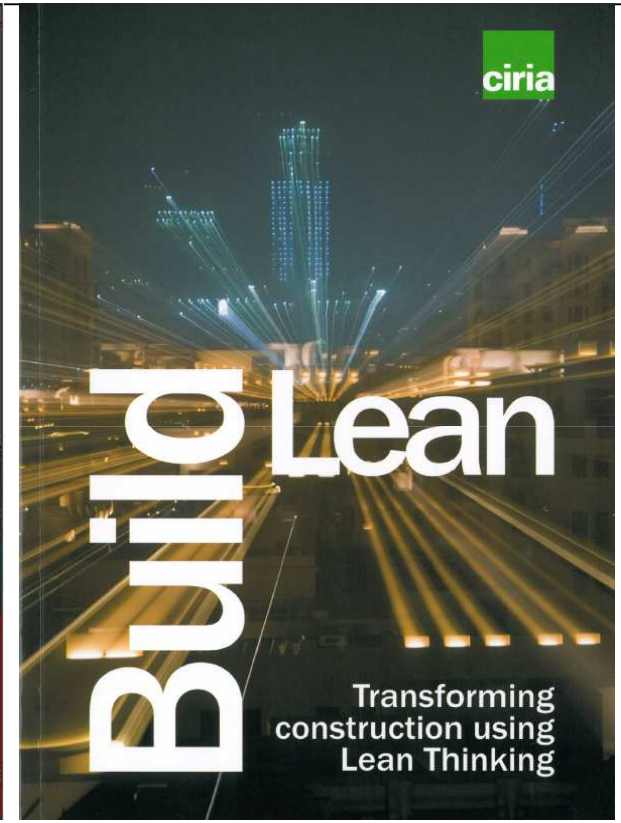
Is construction different from Manufacturing?



Our Philosophy



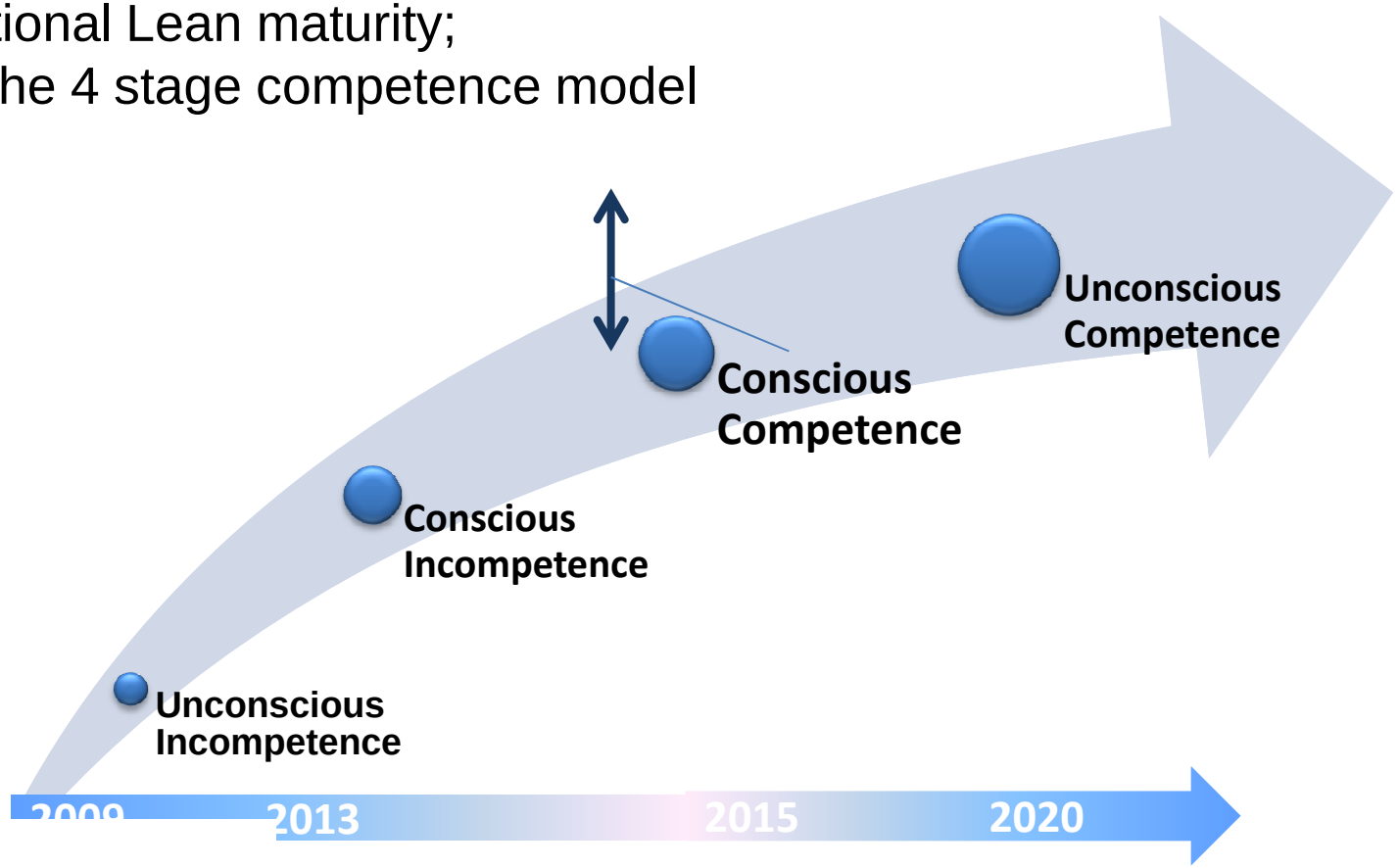




The Client must engage with the Supply Chain to achieve continuous improvement!

The route map to a Lean Highways England and our Supply Chain

Organisational Lean maturity;
applying the 4 stage competence model



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1. Articulate and demonstrate the need clearly
2. Senior level sponsorship is vital
3. Get key opinion formers onside
4. Learn how to do Lean properly
5. Become self-sufficient in Lean
6. Use Lean as a staff engagement tool not just for eliminating waste

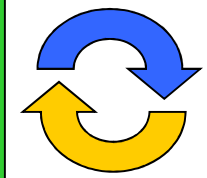
Alan Cook 6 Golden Rules

Major Projects 

SMART Motorways 

Highways England Lean Deployment

Maintenance 

HA Business 

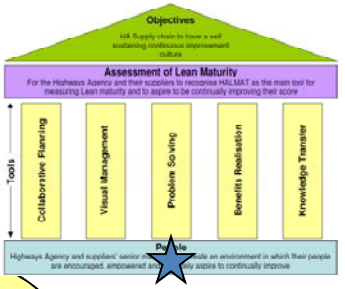

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CAUTION
REAR STEER
GN07 BKX
BROSHUIS...EXTENDING POSSIBILITIES
McArdle
MAN
RK53 EFK



Lean Improvement Community

Lean Practitioners [HA and Supply Chain}

Supply Chain Secondees

HA team

Supply Chain Business Improvement Directors

Specialist Consultants In Lean Construction

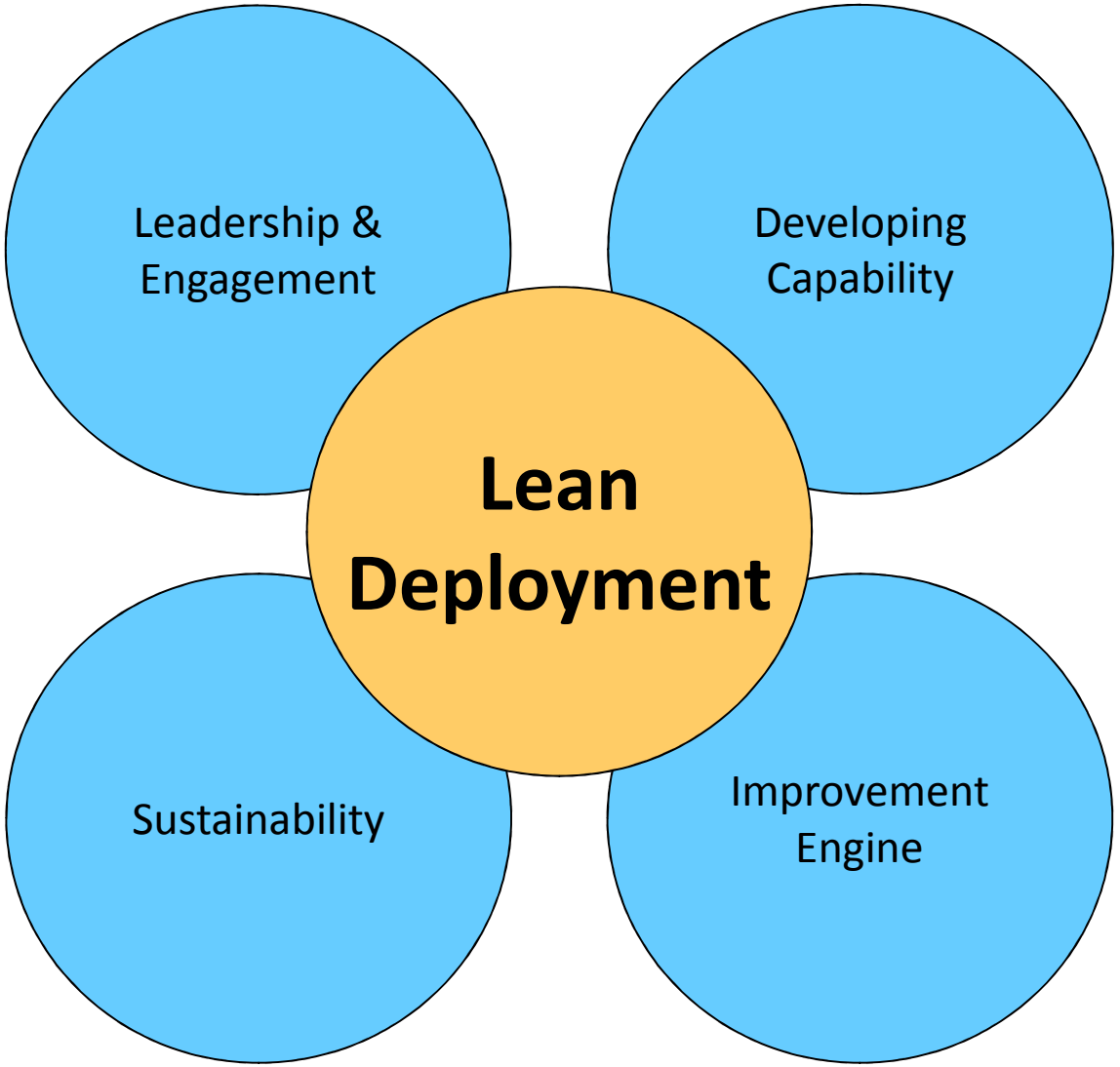
Senior Leaders

Lean Improvement Champions

Maintenance Community Lean teams

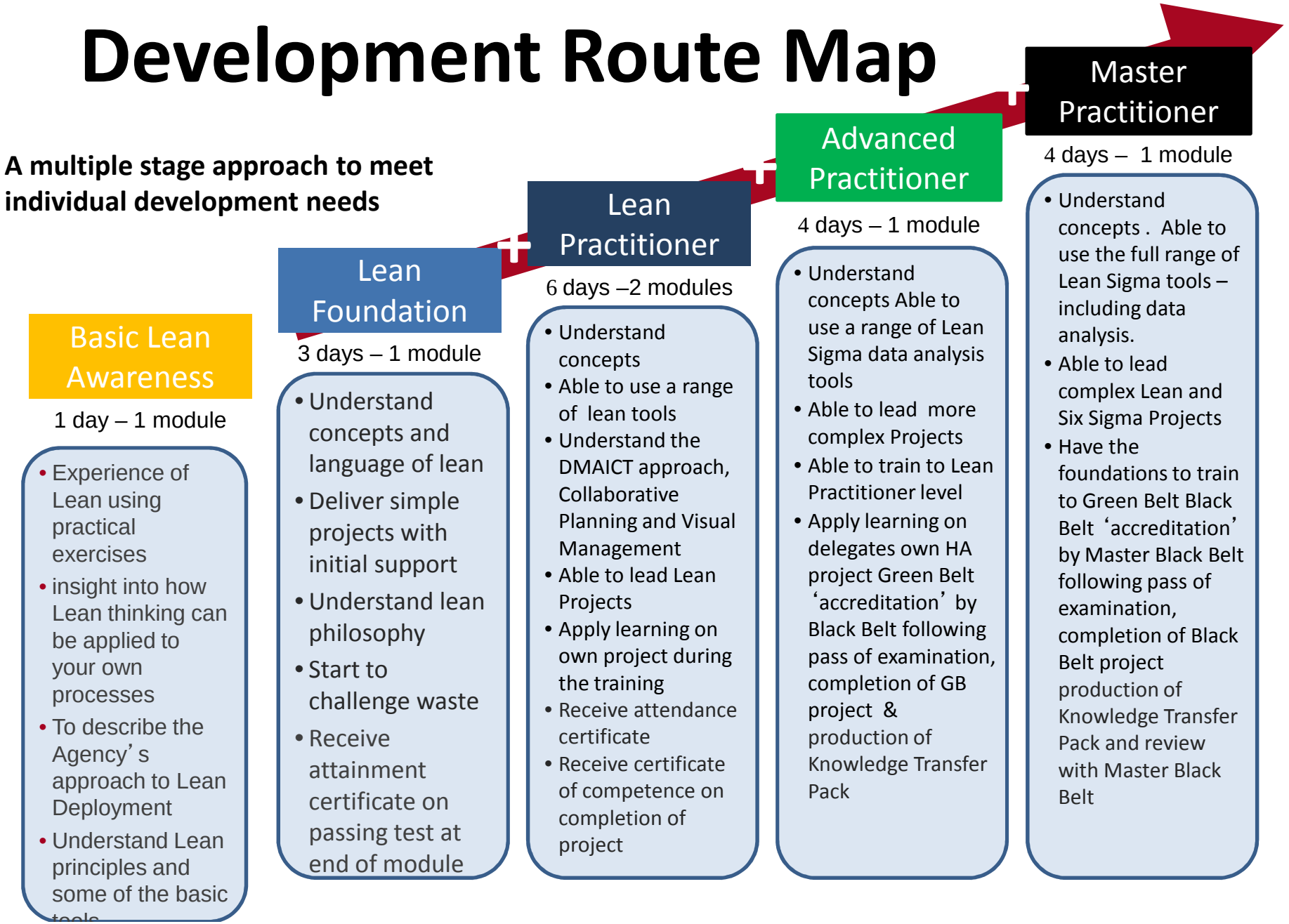
Project Managers

Lean Deployment Strategy

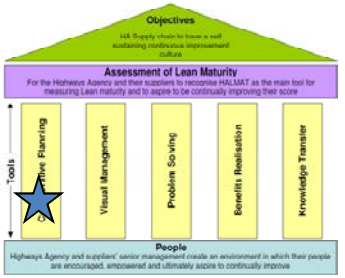


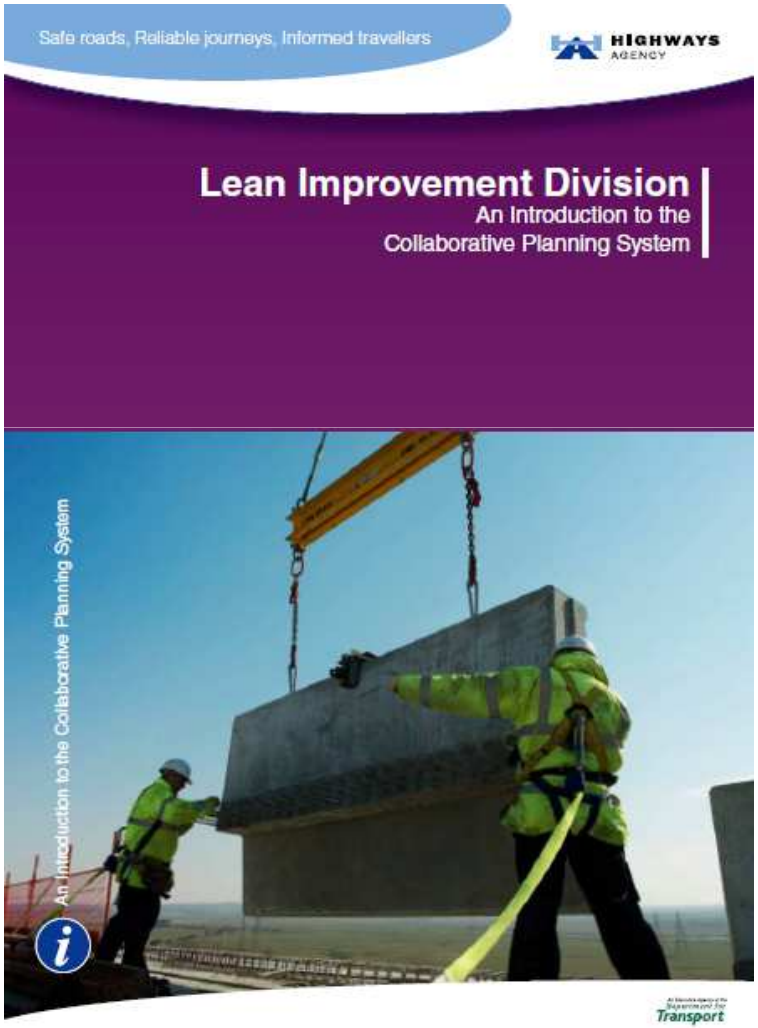
Highways Agency Development Route Map

A multiple stage approach to meet individual development needs



Collaborative Planning





The Collaborative Planning System

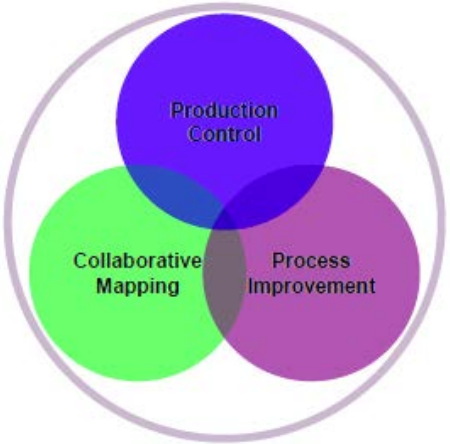
What is the Collaborative Planning System?

The **Collaborative Planning System** is about enabling teams to deliver the same amount of work but with less resource. It involves doing three things:

- **Production Control** - Enabling better productivity through effective resource and information management
- **Collaborative Mapping** - Enabling better planning through the creation of process-based lookahead programmes
- Seeking continuous **Process Improvement** through the implementation and adoption of continuous improvement tools

The adoption of the above techniques has been proven to generate rapid improvement in team performance.

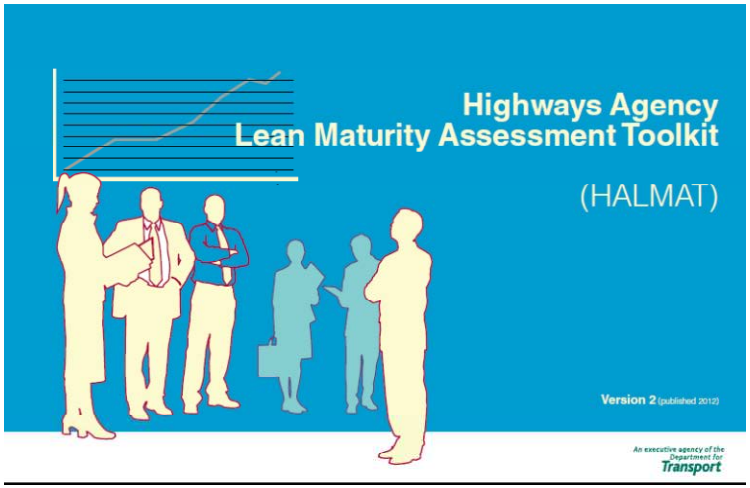
Figure 1 The Collaborative Planning System

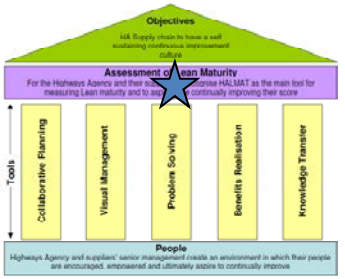


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Collaborative Planning in the Supply Chain

Projects SR 10	Days required for CP in 14/15	CP Effective Rating (range = 1 (low) -4 (High))	Collaborative Mapping	Weekly Production Control in Design	Weekly Production Control in Contruction	Daily Last Planner
A23 Handcross - Warninglid		4	Y	Y	Y	Y
A46		4	Y	Y	Y	Y
M1 J10 - 13		3	Y	Y	Y	P
M62 J25 - J30		4	Y	Y	Y	Y
M4 J19-20 and M5 J15-17		3	Y	P	Y	Y
M6 J5-J8 (BBox Phase 3)		1	Y	P	P	N
A11 Fiveways - Thetford	5	4	Y	Y	Y	Y
M25 J5-6/7 (section 2)		4	Y	Y	Y	Y
M25 J23-27 (section 5)		4	Y	Y	Y	Y
M1 J32-J35A		4	Y	Y	Y	Y
M1 J28-31		4	Y	Y	Y	Y
Manchester Combined (M60 J8 - J12, M62 J18 - J20 & M60 J12 - J15)	20	3	Y	Y	Y	N
M1 J39-J42	10	3	Y	Y	Y	
A556 Knutsford - Bowdon	2	2	Y	Y		
Growth Projects						
A45/A46 Tollbar End	5	4	Y	Y	Y	Y
A453 Widening		3	Y	Y	Y	P
M1 J19 Improvement	20	4	Y	Y	Y	Y
A14 Kettering Bypass	5	3	Y	Y	Y	P
M6 J10a - J13		4	Y	Y	Y	Y
M3 J2 - J4a		3	Y	Y	Y	P
Pipeline Projects						
M25 J30	10	1	Y	N		
M4 J3 - J8	5	2	Y	Y		
A21 Tonbridge to Pembury	10	1	Y	N		
A160/A180 Immingham		2	Y	Y		
A19 / A1058 Coast Road		0	N	N		
A63 Castle Street	5	0	N	N		
Autumn Statement						
A1 Leeming to Barton	2	1	Y	P	P	
A5-M1 Link	10	1	Y	P	P	
A1 Lobley Hill		2	Y	Y		
Contingency Scheme's						
M6 J16 - 19		2	Y	Y		
M5 J4a - 6	10	2	Y	Y		
M4 J8 - 12		2	Y	Y		
M1 J16 - 19	4	2	Y	Y		
Total						



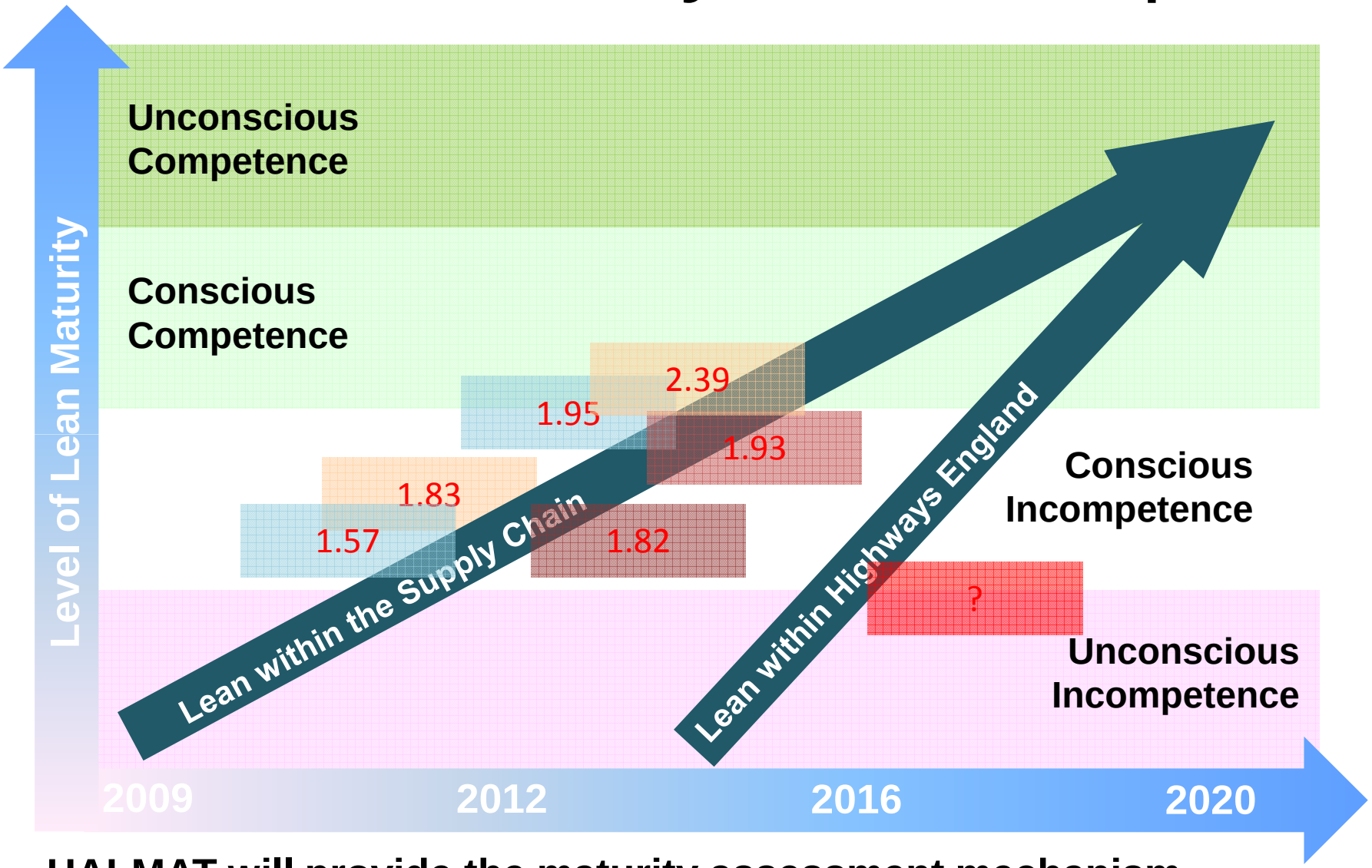


0 = Lean not yet introduced
1 = Improvement in patches of the organisation
2 = Lean is aligned to organisational strategy
3 = Organisation plus supply chain engaged in Lean
4 = Organisation is very mature
and striving towards perfection



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Lean Maturity Route Map



HALMAT will provide the maturity assessment mechanism

MAINTENANCE | MAJOR PROJECTS | CONSULTANTS | Highways England

Over 300 Case Lean Projects



Safe roads, Reliable journeys, Informed travellers

HIGHWAYS AGENCY

A1 Dishforth to Barton Improve
Motorway Communications D

Purpose:
- Maximise the output rates for installation of communications ducting

Deliverables:
- Root causes of delay and poor efficiency ider
- Procedures and Controls for sustained improvement
- Documented process
- KPI's and monitoring / reporting procedures identified

Improvements to Date:
- Now using 9m length pipes rather than 6m re productivity
- Reduction in air testing based on failure rate
- Activity sequence revised to install concrete ' associated issues

Benefits to Scheme:
- Reduced number of joints saving £15k in coll
- Productivity benefits based on 30km remaini reduction to programme
- Potential productivity increase of 15% by red

Transferability to other schemes:
- Significant reduction in H&S risk (man hours reducing/eliminating air testing
- 280km of buried cable to be replaced with du 9m lengths used.

Safe roads, Reliable journeys, Informed travellers

HIGHWAYS AGENCY

A46 Newark to Widmerpool
Efficiencies in Chamber Constru

Objective:
Update drainage chamber construction to reduce waste in labour and materials.

Stakeholders:
Main contractor (Balfour Beatty)
Designer (Scott Wilson)
Materials (Polypipe)
Installer (Parkway, Rouse)
Supplier (Burdens)

Deliverables:
New chamber type enabling leaner, safer on-site construction

Target Benefits
- Installation of pipes and chambers by a single gang
- Eradicated need for wet trades
- Eradicated need for in-situ concrete cutting
- Reduced component weight / improved manual handling
- Transferable solution
- Preliminary estimate of £200-250k saving on this scheme, primarily from increasing labour efficiency.

Safe roads, Reliable journeys, Informed travellers

HIGHWAYS AGENCY

A1 Dishforth to Barton Improvement
Maximising Blacktop Laying Efficiency

Objective:
- Maximise Laying Rates
- Increase utilisation of Plant and Labour
- Ensure Delivery to Programme

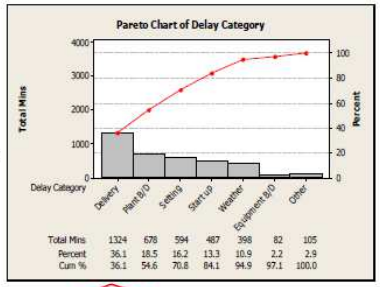


Deliverables:
- Maximised Productivity/Efficiency
- Root causes of delay & poor efficiency identified
- Procedures and Controls for sustained improvement
- Capacities and Constraints Identified.

Improvements to Date:
- Paver theoretical capacity is 330 tonnes/hr, however each individual coating plant can only produce 100 tonnes/hr. By changing the supply method and working time, paver gang working hrs have been halved and output doubled.
- New working procedures at shift start-up increased paver working time by over 8%.
- Mitigation plans and improved communications have minimised delay associated supplier plant breakdown.

Benefits to D2L:
- 100% increase in productivity.
- 17 day reduction to programme.
- Saving of 34 Gang working days.
- Estimated savings in excess of £600k.

Transferability to Other Schemes:
Evaluation of 2 shift working suggests a potential saving of £1.4m for similar sized scheme.



'Awaiting Delivery', 'Plant Breakdown' and 'Delay before Start of Laying' accounts for 70% of all recorded delay

Improving efficiency is not new!

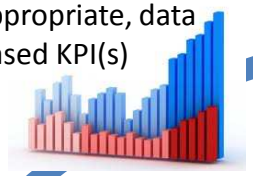


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Deploying lean across Highways England

Team Based Continuous Improvement

Measure Team Performance using appropriate, data based KPI(s)

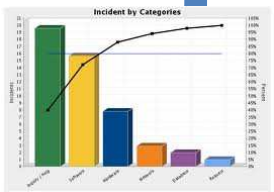




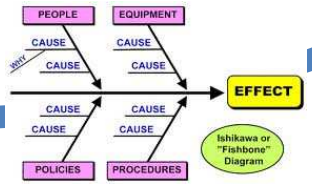
Display Performance on Teams own Visual Management Display & Communication Cell



Team undertake regular reviews of performance: Daily short meetings, less frequent performance improvement working sessions



Prioritise main instances of performance shortfall that the team can impact



Define root-cause of major instances of performance shortfall and identify improvement actions



Undertake actions and reflect changes in Standard Operating Procedures

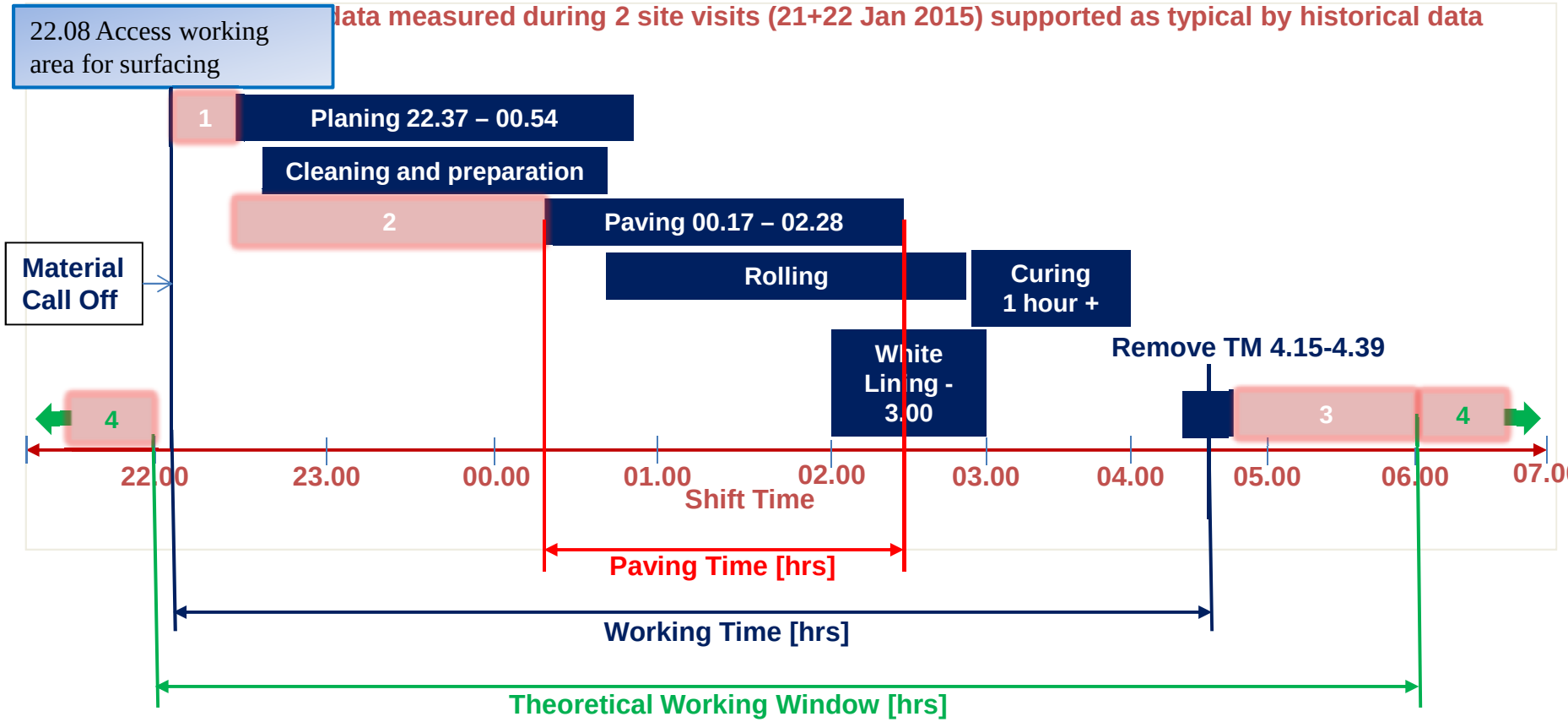


Carry out work to Standard Operating Procedure

An example of a lean project!


em
cleaner, greener, safer
wj
think exceptional
rubicon
wigzell
letting value flow
CHEVRON
HIGHWAYS
AGENCY
AGGREGATE
INDUSTRIES
TC
Optimising Surfacing Productivity
The 1000 T target

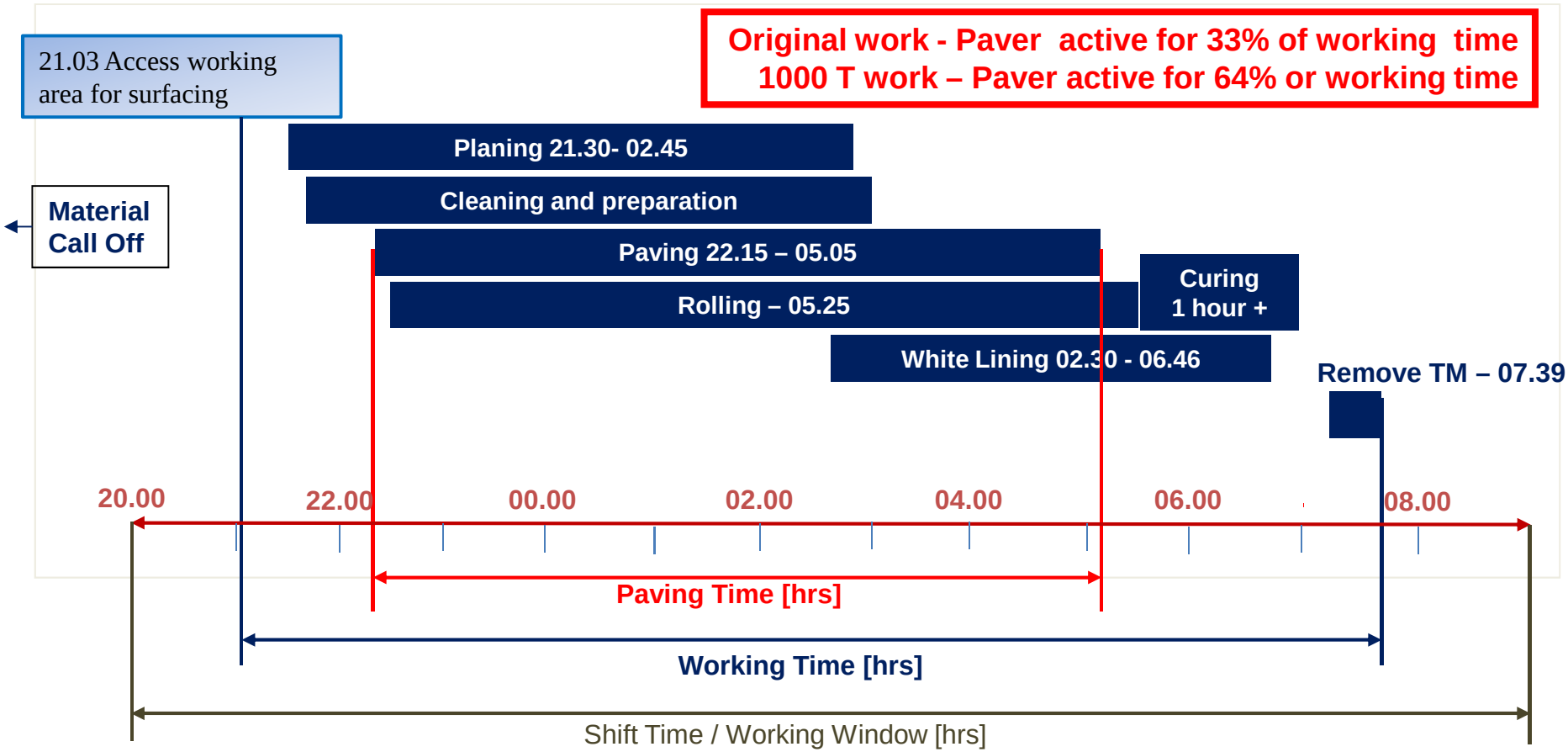
Current state – What were the issues



Top critical areas of Non Value Added

1. Why does it take nearly half an hour from close of motorway to start planing ?
2. Paver idle – Awaiting material – Why are we waiting ?
3. Off site nearly 1.5 hours before we need to be – can we extend paving further and get off later?
4. Are the working windows in line with contractually acceptable delay times – can they be increased?

The outcome – 1024 T !

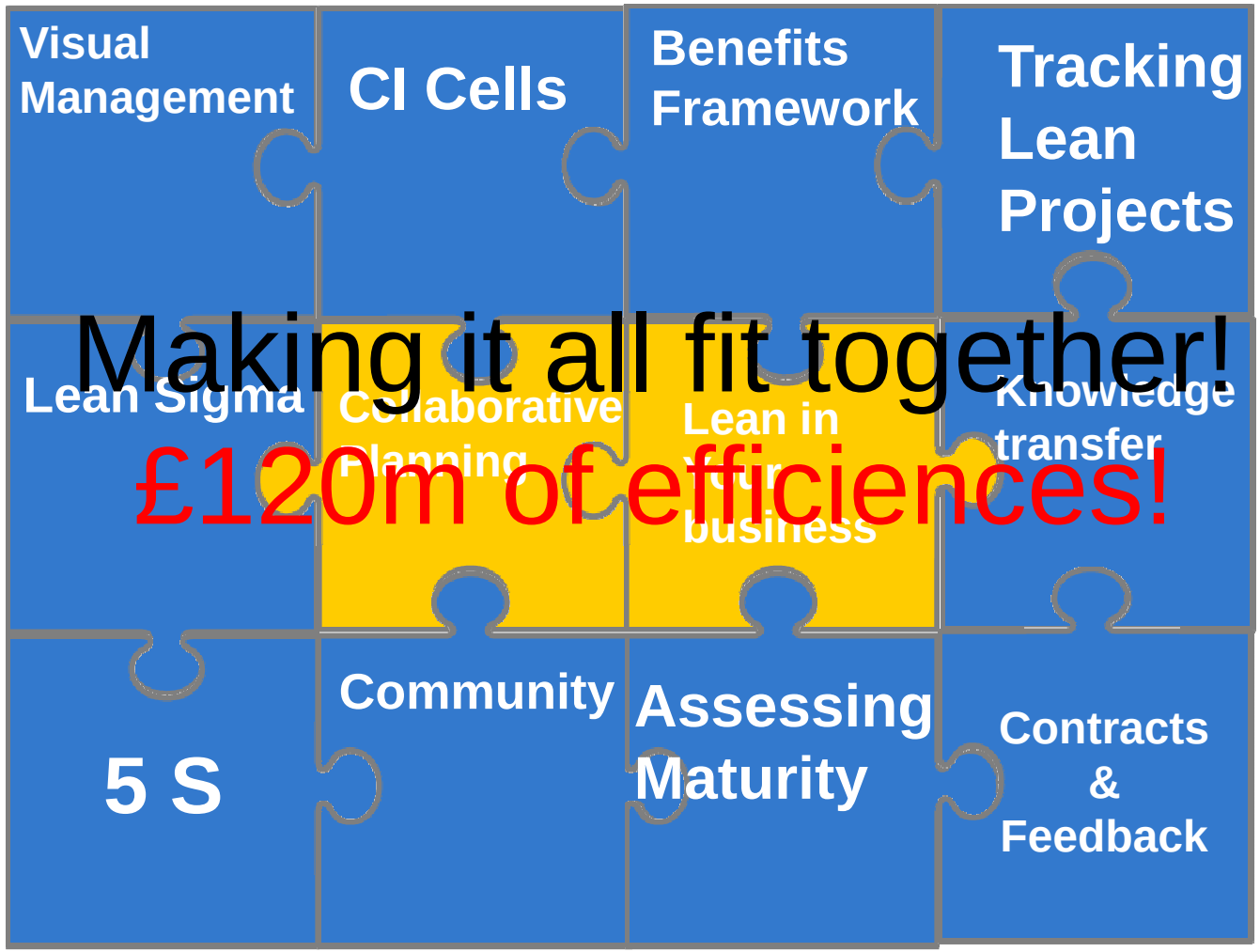


Data:

Shift Duration (staggered):	10 Hours
Theoretical Working Window 20.00-09.00:	13 Hours
Actual Work (TM on – TM off) 21.03-07.39:	10 Hr 36 Mins
Tonnage laid:	1024 T
Paving duration 22.15-05.05:	6 Hr 50 Mins

Statistics (@ 45 mm thin surfacing):

Average hourly tonnage laid:	137 T
Total meters laid:	938 m
Paving time of full working time - 6 Hr 50 Mins out of 10 Hrs 36 Mins	64%


Visual Management
CI Cells
Benefits Framework
Tracking Lean Projects
Making it all fit together!
Lean Sigma
Collaborative Planning
Lean in your business
Knowledge transfer
£120m of efficiences!
5 S
Community
Assessing Maturity
Contracts & Feedback

Lean Construction Research Alliance













To create improved project delivery to meet client needs and improved efficiency for constructors.

What next other than more of it?

- Focus on value especially from design (products)
- Improving all our processes
- Customer experience
- Shorter faster roadwork's – a challenge to us!
- Synchronizing decision making at the work face?
- BIM and lean
- Changing behaviors
- Gaining the support of Academia in developing new ideas?

Who are LCI-UK?

- A not for Profit Organisation
- Members come from across the industry and research community – practitioners and academia
- Working relations with other LCI groups across the globe
- LCI-UK Summit



More Information & Contact details

http://www.highways.gov.uk/specialist-information/lean-improvement/

http://leanconstruction.org.uk/#

Lean Construction Institute UK

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