



JAGUAR LAND ROVER OPERATIONAL EXCELLENCE

OUR JOURNEY TO DATE

Nigel Blenkinsop
April 2017

11th June 2013



We had a plan



Our Driver:

From no engine manufactured in Jaguar land rover for over 16 years to Engine Self Sufficient by 2020

The JLR Enterprise Strategy plans to build 3 Engine Plants (UK, China & India) by 2018

This required a Sustainable Powertrain Manufacturing Capability to be developed from scratch

- 2011 - 3 heads & 1 Consultant
- 2012 - 120 heads
- 2015 - 500 heads (Job #1 Jan 2015)
- **2017 - 1400 heads**
- 2020 – 2000+ heads (UK only)

Creates a requirement to Manufacture 700,000+ engines a year (I4, I3, I6, V8)

£800million investment in Global Powertrain Manufacturing

With high expectations



We had too:

Execute a Flawless Launch (Quality, Cost, Schedule)

Spend £500million Capital Efficiently – Maximise the return from Investment

The Stretch:

Create Something Special (World Class) and shift the JLR Operations paradigm

How – when we face the perfect storm ?

New Engine Design

New Factory

New People

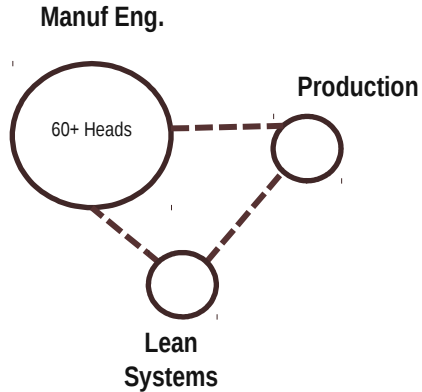
New Customer (x760)



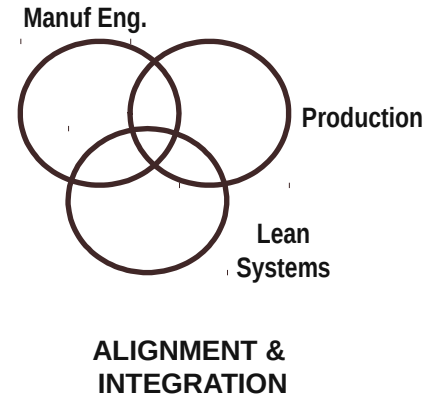
Assessment of My Organisation - Day 1



August 2012



FUTURE STATE



What Does Great Look Like ?



Senior Team – US Study Tour Nov 2012



- They all had a burning platform to initiate the journey
- Everywhere we visited had an air of calm from shop-floor personnel to Senior Leadership
- Development of their people was key from Leader to Associate – not only via training but by quality 1:1's too!
- Complete Leadership buy-in with evidence of buy-in within the whole organisation (with relatively few casualties)
- Everybody in the organisations had clarity of their purpose: Values, Mission, Vision, Goals
- They all had a dedicated Continuous Improvement departments
- Key to develop at least as many 'problem solvers' as 'problem finders'
- Time allocated in the standard day to develop and deploy improvement activities
- Very visible Leadership ! For example, go-look-see walks, 1:1's, Process Confirmation etc.

Operational Excellence



Operational Workshops took place before and after our Study Tour and included a two day Strategy Workshop where we worked on the following:-

- Powertrain Values
- Powertrain Vision
- Powertrain Mission
- Powertrain Goal



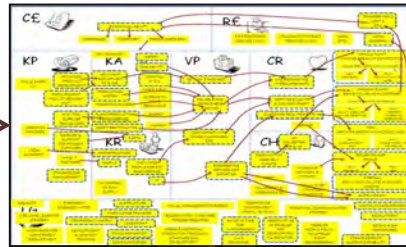
Compelling Reason (*The Customer*)

To enable every individual to articulate our purpose and to lead the journey we will go on and ensure we obtain the commitment of all the team in delivering our goals

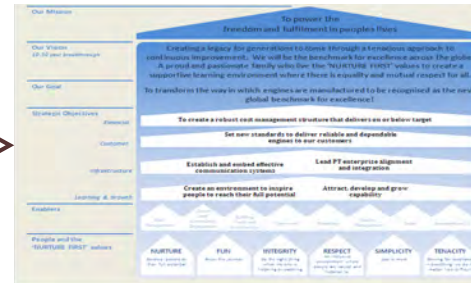
Powertrain' Operational Excellence



*Business environment
(Influence & Dependency)*



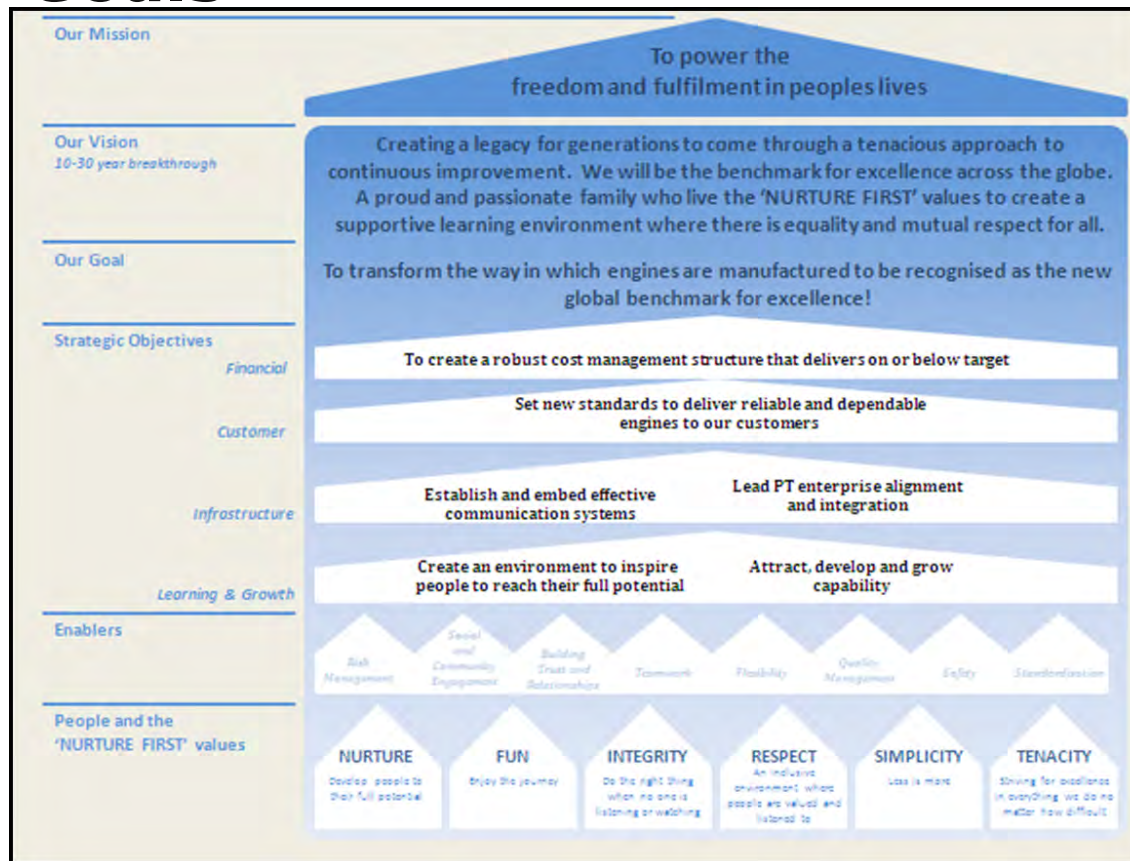
*Business model canvas
(Define our Core Purpose)*



Vision, Mission, Goal



Operational Excellence: Vision, Mission, Goals



Operational Excellence: Our Lean Engine



JLR POWERTRAIN

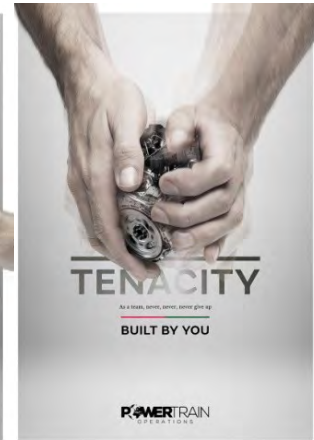


POWERTRAIN OPERATIONS (PTO)

A Values Driven Organisation



NURTURE F I R S T





Powertrain Operations - The Reality!



2013



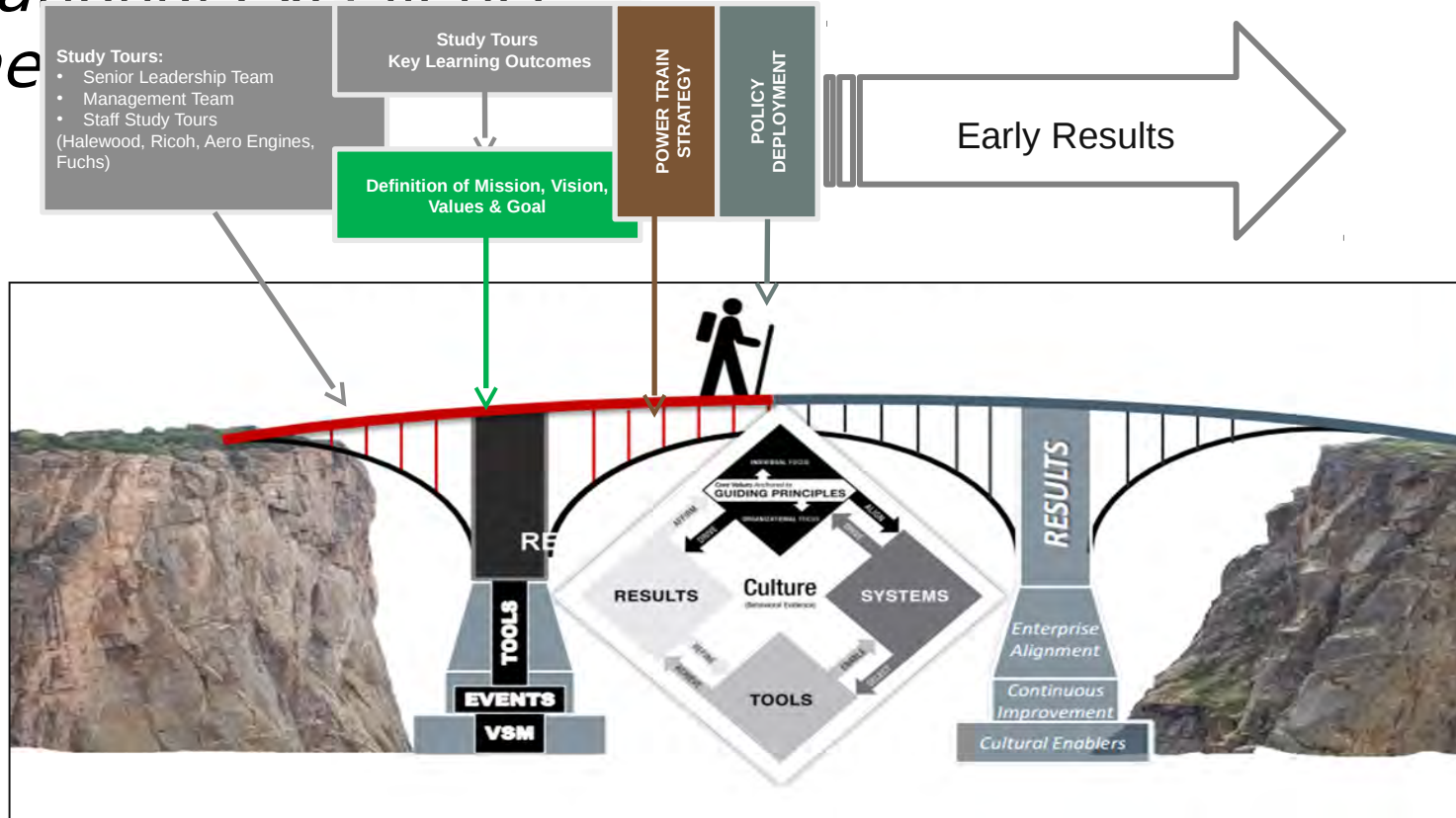
2017



Powertrain' Operational Excellence



Operational Excellence Journey



So that was the easy bit! - Welcome to Solihull



Solihull Operations - History:



1939

Rover No 2 Shadow Factory producing Bristol Hercules radial engines

1948

First Land Rover, the series 1 produced in Solihull



1945

After the war, car production began with the Rover P2

1970

Range Rover introduced as the first genuinely multi-purpose vehicle



1989

Launch of the Discovery



1994

Land Rover acquired by BMW

1997

Freelander Launched

New Range Rover Launched

2000

Land Rover acquired by Ford

2001

Range Rover Sport launched

2004

New Discovery launched most awarded SUV with over 100 industry & media awards around the world

2006

Launch of Freelander / LR2 and New Defender powertrain



2008



Tata Motors acquires Jaguar Land Rover

2012

All-new Range Rover launched



2013

All-new Range Rover Sport

2014

Range Rover Hybrid

2016

Current Defender Ends Production



2015

Jaguar XE



2016

Land Rover Discovery & Jaguar F-Pace



2017

Land Rover Velar

2015 Key Milestones

- 70 years of car production
- 45 years of Range Rover
- 25 years of Discovery
- 25 years of Land Rover Experience

Solihull Operations - Vehicles:



RANGE ROVER



RANGE ROVER SPORT



RANGE ROVER LONG WHEEL BASE



DISCOVERY



JAGUAR F-PACE



RANGE ROVER VELAR

Solihull Operations - Core Capability:



STAMPINGS



3 X BODY SHOPS



PAINT SHOP



2 X FINAL ASSEMBLY HALLS

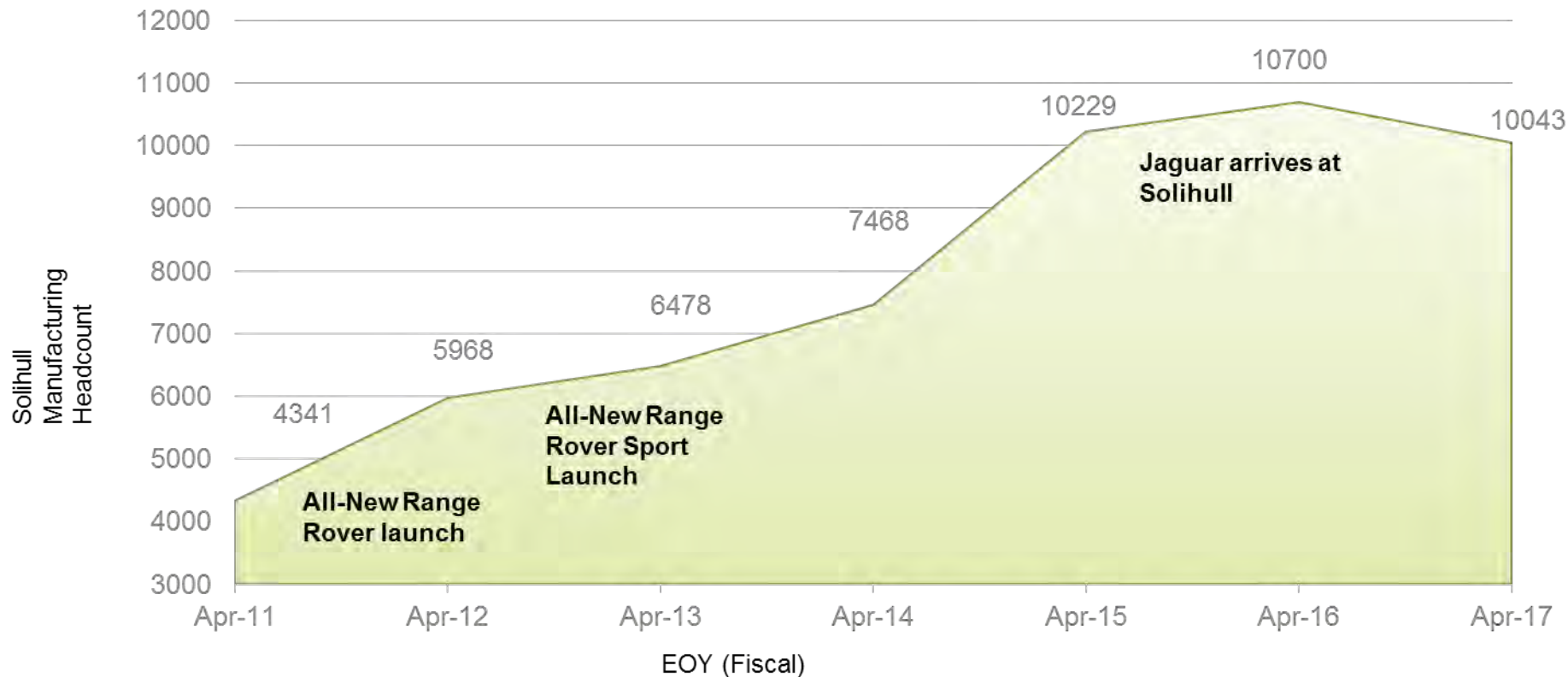


VEHICLE HANDOVER CENTRE



LAND ROVER EXPERIENCE

Solihull Operations - Our People:



Solihull Operations - Transformation:

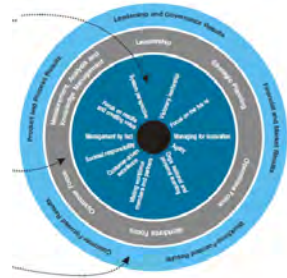




***...a culture where success is
inevitable...***

This is our greatest opportunity to
outline the scale of our ambition.

Solihull Operations - Transformation:



TATA

We are part of Tata Motors, whose business excellence model has been moulded to deliver strategic direction and drive business improvements.

It contains elements that enable companies following its directives to capture the best of global business processes and practices.



JAGUAR LAND ROVER

We have One Company Purpose: to deliver Experiences Customers Love, For Life. Our Blueprint for Lasting Success identifies the framework & values that underpin our approach



JLR MANUFACTURING

Identifies 12 elements which form the top level manufacturing strategy. Delivering a competitive Global Manufacturing Network on a roadmap to 2020/21.

These are aligned to the JLR Blueprint and are used to shape our own targets for the plant.



SOLIHULL OPERATIONS

As the largest and most profitable manufacturing plant, Solihull plays a leading role in delivering on the promises we make to our customers.

We have captured our nine Goals for what Solihull Plant needs to become on our "9 box" Vision.

Solihull Vision: Constancy of purpose:



- Our **Ambition** and **Commitment** to this aim will be **Relentless**.

1 CREATE STABILITY

Quickly Deliver our Base Commitments (Value Flow)

2 SAFEST VEHICLE OPS

Safest JLR Vehicle Operation Globally

3 QUALITY STEP CHANGE

RFT / FTT / Warranty / Supply Chain / PSW

4 LEAD PLANT

Launch Excellence as a Core Competency

5 PROFIT CENTRE

Solihull as Foundation of D7U/D7a Business

6 OPERATIONAL EXCELLENCE

Continuous Improvement as a Way of Life

7 WORKING PRACTISES

Workforce Involved & Engaged in Solihull Vision

8 FLEXIBLE SYSTEMS

Leverage Value through Customisation/Reconfiguration

9 MOS / QOS / LOS / POS

Align the Team on the Key Systems

Operational Excellence “Systems” Strategy:

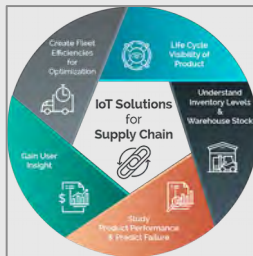


BUSINESS PERFORMANCE: TRANSFORMATIONAL WORKSTREAMS



SENIOR LEADERSHIP DEVELOPMENT

Creation & Execution of a 3 pronged strategic approach to Leadership Development: 1. Technical - Lean Leadership & Systems / 2. Personal - Developing Emotional Management & Resilience / 3. Commercial & Financial Acumen (IBP)



CONNECTED SUPPLY CHAIN

Lead Plant in developing low cost/resource, Supplier Performance Information Flow that informs the development of future, robust, integrated Enterprise Level Reporting across the JLR Value Stream.



BUSINESS REVIEW - SEQUENCE SUPPLIERS

Lead Plant engaging beyond our 4 walls to share capability, resource & experience, targeting the growth of our supply partners/stakeholders which in turn mitigates the risk they exert on JLR Operational Performance.



UK NSC RELATIONSHIP ENHANCEMENT

Sustainable Excellent Results depends upon the degree to which an organization's culture is aligned to specific, guiding principles rather than depending solely on tools, programs or initiatives



PLANT MAINTENANCE STRATEGY

compiled to communicate our ambition & detail our approach to transforming Business Performance through the Lifecycle Management of our Assets in combination with the growth in Capability & Confidence of our Technical Teams.



CULTURAL ENABLEMENT: LEAN LEGO

Lean Lego is a Peer to Peer Workshop, simulating a working production line where Lean principles are brought to life in a fun & interactive way. Participation spans the enterprise with JLR Team members working alongside our partners.



SAFETY STRATEGY

Clear alignment to Leadership Element Transformation: 3x Strategic Layers: 1. Immersion - Evolution of the Front Line Coach / 2. Deployment - Engaging the Population / 3. Governance - Ensuring through Leadership Footprint



DIVERT FREE VEHICLES

Strategic Approach to embed a culture that drives Quality at Source: 3x Levers: 1. Lean Production System - Bring IPS to Life for every Individual / 2. Leadership - Ensure the Leadership Footprint / 3. Engage Cross-Function to Solve Complex Issues.

Cultural Enablement - Leadership Behaviour:



- LEADERS STANDARD WORK

Fundamental Element of the Lean Management System: Ensures Execution of Standardised Processes

- VISUAL CONTROLS

Information Flow that Quickly and Concisely answers the Question: "Are we Winning or Losing?" (DSUM/STD Reports)

- DAILY ACCOUNTABILITY

Capture, Track & Review Commitments (BE Tracker)
Set the Direction of Improvement Activity to Close the Gap



SOLIHULL LEADERSHIP CIRCLE									
COMMITMENT TRACKER									
DATE	TIME	IPR	RATED	DSUM/DIPI	CATEGORY	DESCRIPTION	OWNER	TARGET	WAG
08/05/16	10:18			DSUM	Safety	Review handover process of new facilities/equipment from AMC to Production in terms of ensuring safety following assist accident (07/08/2016)	J Mullens	WKS5	
17/05/16	10:15			DSUM	Site Services	Assess what the standard for doors should be ensuring they do not open into wellways due to incident (16/06/2016)	Gir/Strivers	WKS2	
01/06/16	10:20			DSUM	MW&L/DIPI	High OIR exposure reported on 01th and 07th July mainly due to Bid IPS's ensured to investigate how this could be forecasted and mitigated in future	Baron Boddy	WKS2	
13/07/16	10:13			DSUM	Safety	SIC request that Road Safety process a way to use the local roads (Wag Club) and reduce of accidents/near misses to personalise the local safety brief push/advise. Physical ready by end of WK 29 for review in teaming	Jim O'Keeffe	WKS2	
24/08/16	10:12			DSUM	HR	Review of Drug and Alcohol policy to clearly process towards end of shift, should someone refuse to stay	Mark Wilson	WKS3	
25/08/16	10:13			DSUM	HR	Feedback on current procedure (post HR Ex) for Home Visits for concerning absence. Raised due to battery lifting accident (23/08/2016)	Mark Wilson	WKS3	
30/09/16	10:10			DSUM	FG	Review Major calls for sequence/bulk suppliers in PQR. & Preparing pack for Mid Year Business Review	Peter Langford	WKS4	
20/09/16	10:15			DSUM	FG	Review causes of Scrap at PQR and at WOK with ownership assigned to each commodity	Dave Adams	WKS4	
18/10/16	10:10			DSUM	FG	Q7a Quality strategy meeting between key stakeholders: PQ and M&M (from 6 month business review)	Dave Adams	WKS4	
18/10/16	10:17			DSUM	Manufacturing	Scrap review for PAJ2 (from 6 month business review)	J Heston	WKS4	
20/10/16	10:10			DSUM	Safety	Stairway way in front of TS BS needs to be assessed for danger of sharp object at head height (following accident 16/10/2015)	Olive Robert	WKS4	
20/10/16	10:10			DSUM	QA	Close attention needed to Men @ an following parts quality concerns on MTE	Andy Clarke	WKS4	
27/10/16	10:10			DSUM	Quality	Investigate feasibility for using camera for incoming supplier parts quality in PA2 as input			



Simplified

Acted 1053 (renewed) all facilities

Solihull Manufacturing Scorecard - Proof of Concept

EXAMPLE USING 2015-2016 SC DATA WHERE AVAILABLE																											
	JLR BLUEPRINT	KPI	A3 REF	OWNER	CATEGORY	2015 March Actual	15/16 End Yr Target	Current Average		APR	MAY	JUN	Q1 TARGET	JUL	AUG	SEP	Q2 TARGET	OCT	NOV	DEC	Q3 TARGET	JAN	FEB	MAR	Q4 FY Targets		
S	Five Core Values	FIRST TIME ACCIDENT RATE (FTA)	SOL-P-Q-20 16-01	Oliver Roberts	SOL	2.77	3.25	3.86		2.79	3.63	3.59	3.25	2.01	3.70	3.80	3.25	3.83	2.73		3.25						
		LOST TIME CASE RATE (LTC)			SOL	0.13	0.11	0.10		0.00	0.00	0.05	0.11	0.00	0.00	0.11	0.11	0.44	0.00		0.11						
Q	Customer First	WORLDWIDE R/1000 AT DMIS	SOL-P-Q-20 16-01	Joe McNamee	D7a	63.00	20.00	59.22		63.00	60.00	53.00	20.00	53.00	57.00	63.00	20.00	64.00	60.00	56.00	20.00						
					D7u	64.00	20.00	76.22		60.00	60.00	79.00	20.00	66.00	69.00	69.00	20.00	77.00	76.00	71.00	20.00						
	More Great Products, Faster	DIVERT FREE VEHICLES			SOL		20.00	8.64		6.90	7.55	4.44	20.00	5.75	6.60	8.15	20.00	10.25	12.05	18.05	20.00						
		WIP QUANTITY			SOL		1,500.00	1,489.56		1341.00	1388.00	1672.00	1500.00	2495.00	1311.00	1407.00	1500.00	1591.00	1261.00	1222.00	1500.00						
D	More Great Products, Faster	WIP AGE (OLDEST VEHICLE IN WKS)	SOL-P-Q-20 16-01	Nicola Fry																3.00	3.00						
		VOLUME ACHIEVEMENT																		94.80	100.00						
		BUILD TO SEQUENCE (BTS)			FA1		100.00	83.89		86.00		78.00	86.00	99.00	99.00	98.00	100.00	88.00	88.00	100.00	100.00						
					FA2		98.00	78.96		100.00	96.56	78.50	98.00	92.00	44.30	69.50	68.00	60.00	75.00	68.00	68.00						
	ACCEPTED BY SALES ON DAY (ASOD)	FA1				100.00	95.18		97.38	98.46	98.21	100.00	99.50	87.60	88.69	100.00	91.10	96.50	99.20	100.00							
		FA2				100.00	85.44		100.00	100.00	99.60	100.00	89.54	78.69	66.90	100.00	56.00	69.60	88.60	100.00							
C	Transformed Cost Structure	COST PER UNIT (CPU)			SOL-P-Q-20 16-01	Daniel Bayliss	D7a	2,168.00	1,830.00	2,179.00		2,138.00	2,354.00	2,148.00	1,830.00	2,191.00	2,135.20	2,166.00	1,830.00	2,113.00	2,105.00		1,830.00				
							D7u	2,168.00	1,830.00	2,179.00		2,138.00	2,354.00	2,148.00	1,830.00	2,191.00	2,135.20	2,166.00	1,830.00	2,113.00	2,105.00		1,830.00				
P	Engaged Passionate People	CASUAL ABSENCE %	SOL-P-Q-20 16-01	Mark Wilson	SOL	2.70	2.70	9.20		1.81	1.81	1.80	2.70	1.04	2.84	1.81	2.70	1.81	1.81	1.81	2.70						
		PULSE EMPLOYEE ENGAGEMENT INDEX (EEI)			SOL	82.50	100.00	82.50		82.50	82.50	82.50	100.00	82.50	82.50	82.50	100.00	82.50	82.50	82.50	100.00						
E	Environmental Innovation	ENERGY CONSUMPTION PER UNIT (MWh/Unit)	SOL-P-E-20 16-01	Bob Parkes	SOL	7.30	2.00	1.90		1.81	1.40	1.78	2.00	1.51	2.04	1.29	2.00	1.88	1.63	1.61	2.00						




62 LINE ITEMS REDUCED TO 17

Add1000more rows at bottom.

Solihull Operations - 2016/17 : What it means to win!



Our Operational Commitments:

Volume 307,059	Budget 	Non-Prod 	People 10,286 <small>(680 SALARIED STAFF/ 3rd SHIFT FA2)</small>
Sister Plant Darwin	Site Enablement 3xProject	Site Leverage 3xProject <small>(Trinity, DFL&RR1)</small>	Energy 1.9 <small>MWh/Unit</small>
Launch 3xCar/1x MY	Transition 1xCar <small>(X760)</small>	Cessation 1xCar <small>(L319)</small>	Cost/Unit 

(X761/L462/L560) / D7U 17MY NGI

Strategy Deployment System: Principally Driven



Guiding Principles

TECHNOLOGY

OWNERSHIP/ACCOUNTABILITY

True Business Ownership - Determine their KPIs....Doesn't have to be the same... They flow value in different ways.

INTEGRATED BUSINESS APPROACH

True Engagement - Everybody needs to Get it and Why!!! A One Team Approach...Production, Maintenance, Finance, Logistics, Engineering...

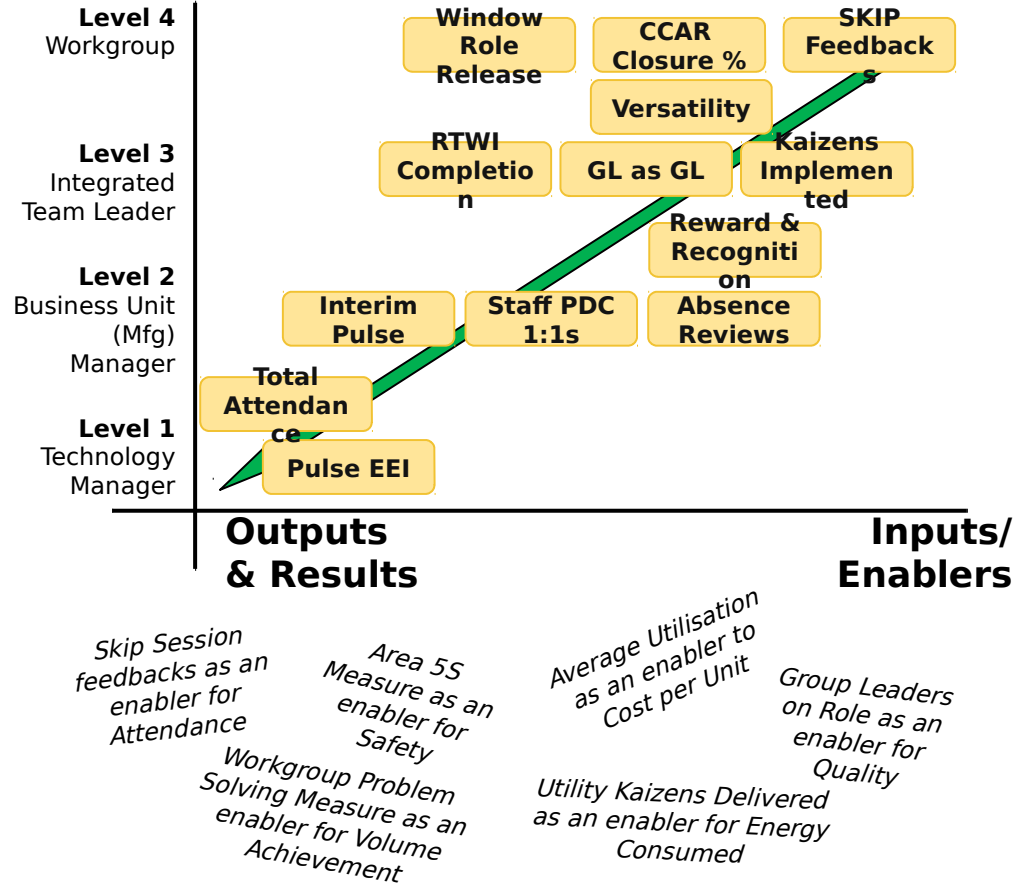
SIMPLICITY & TRANSPARENCY

Clear Line of Sight, Focussed Scorecard Visible to All Every Hour, Every Day.

ALIGN KEY SYSTEMS, PILLARS & TOOLS

Our ability to align and grow the capability of the Tools & Systems of IPS (MOS, QOS, LOS, POS) in unison with the growth of our people.

DRIVE INPUTS & ENABLERS AT WG



Respect Every Individual: Engagement & Recognition



Everybody on site... Engaged in and Understands:



SAFETY CULTURE & THE IMPACT OF PERSONAL CHOICE
LEAN PRODUCTION SYSTEM:
Standardised Work & Problem Solving
CHALLENGES FACING SOLIHULL & SOLIHULL VISION

Peer to Peer training. Confidence & Capability. Relating it to what we do.

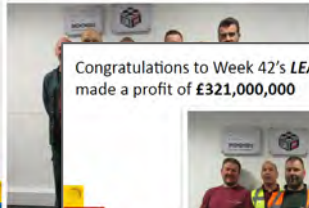


'It really helped to see the big picture'- Paint GL

'Lean Lego is a great tool. Very enjoyable!'- BS3 Associate

'Excellent teaching mode, created good understanding and enthusiastic engagement'- Manufacturing Director

Congratulations to Week 45's **LEAN LEGO** Winners who made a profit of **£372,000,000**



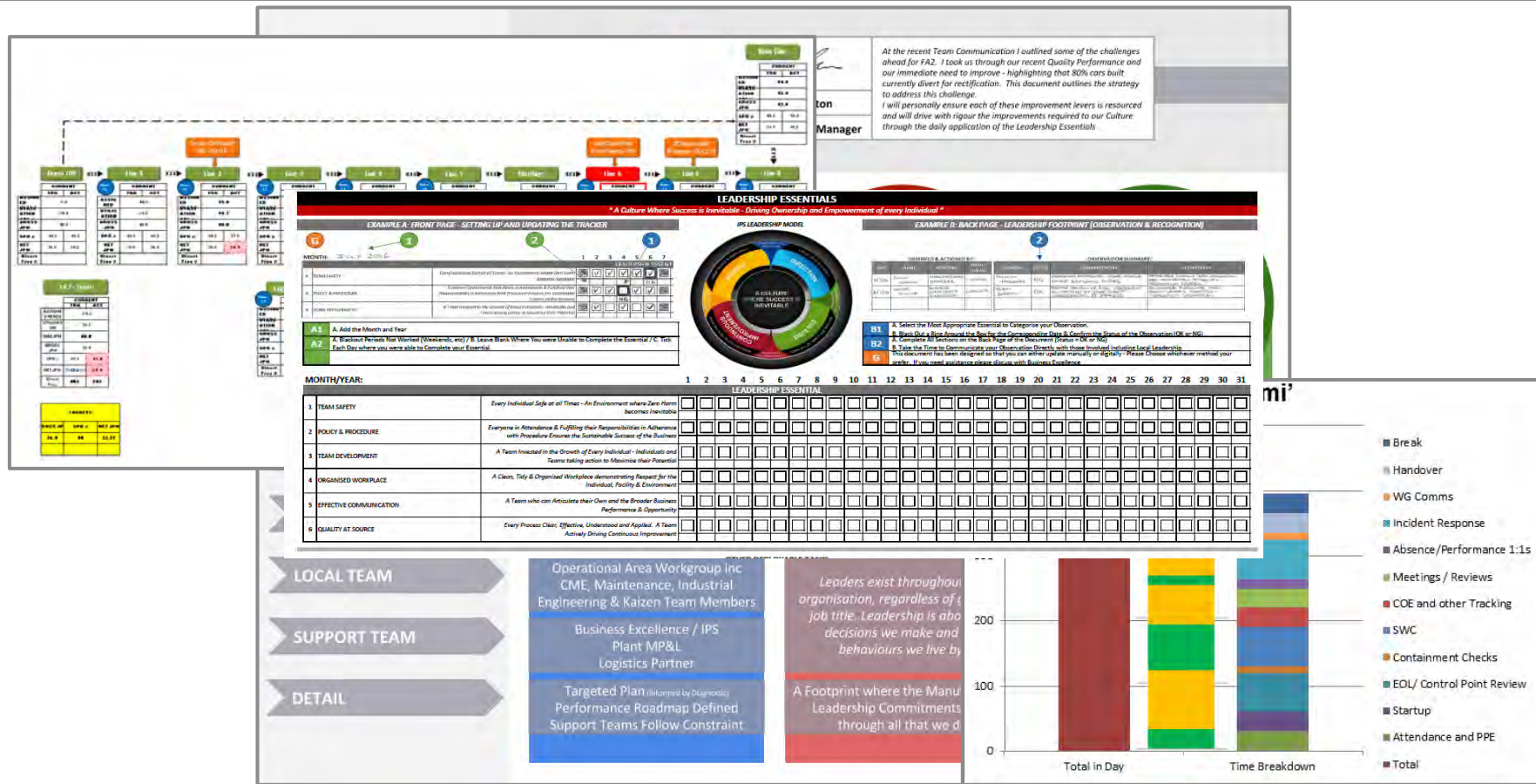
Congratulations to Week 42's **LEAN LEGO** Winners who made a profit of **£321,000,000**



SLEEPY TIME



Assure Quality at Source & Flow and Pull Value





THE JLR JOURNEY CONTINUES: NITRA STUDY TOUR

BOSTON SCIENTIFIC – ABBOT DIAGNOSTIC
ANALOG DEVICES & MYLAN ROTTAPHARM



Thank You



RANGE ROVER



RANGE ROVER SPORT



RANGE ROVER LONG WHEEL BASE



DISCOVERY



JAGUAR F-PACE



LANDROVER VELAR