Building the Lean Mean Project Machine

Lean Project Management in the Rail Industry?

APM   ARTP   Network Rail   **Magna Business Solutions Ltd**   PMProfessional

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Agenda

- *8:45 Registration and coffee*
- *9:30 Introduction (Alistair Kirk, Network Rail)*
- *9:45 Lean Project Management (Neil Butterill, Magna Business Solutions Limited)*
- *10:30 Coffee*
- *11:15 Ten Tools to Eliminate Waste in Projects (Paul Naybour, PMProfessional Learning)*
- *12:00 Reflections on Lean Project Management*

PMProfessional

Project Management

Alistair Kirk

Network Rail

Introduction

- Our Challenge

- Project Management Framework

Network Rail

Our Challenge

- £26 billion budget
- 31% over 5 years… but must deliver outputs
- Performance improvement 30% over 5 years
- Significant renewals programme ~ £2.5bn/year
- Opportunity to renew and improve
- Safe, efficient and effective delivery…but must maintain the operating service to passengers
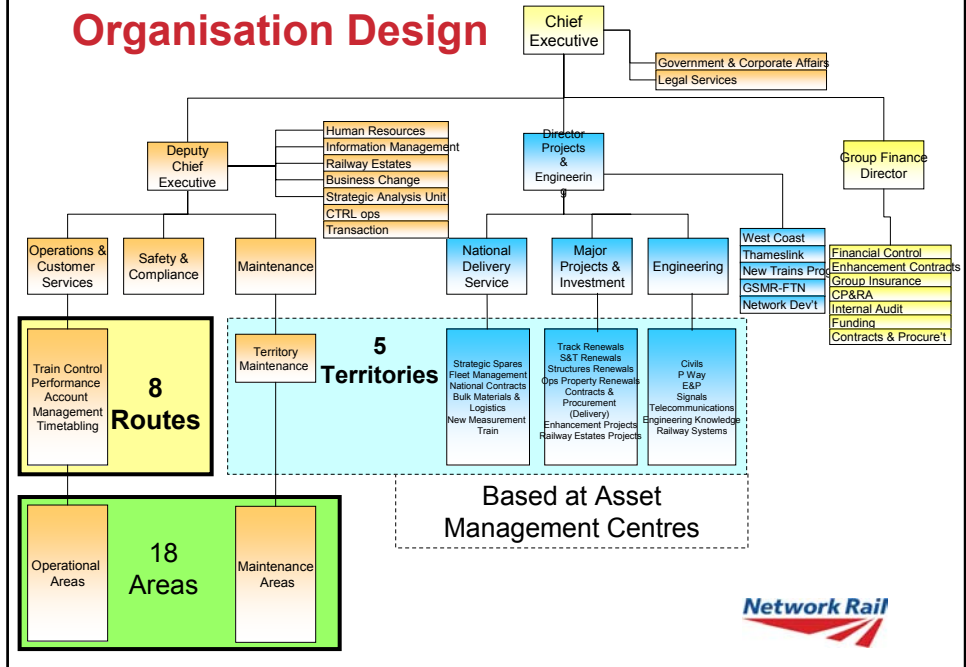
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Our Plan

- Culture change
- Organisational restructuring
- Customer and delivery focused
- Functional approach
- Top to bottom control
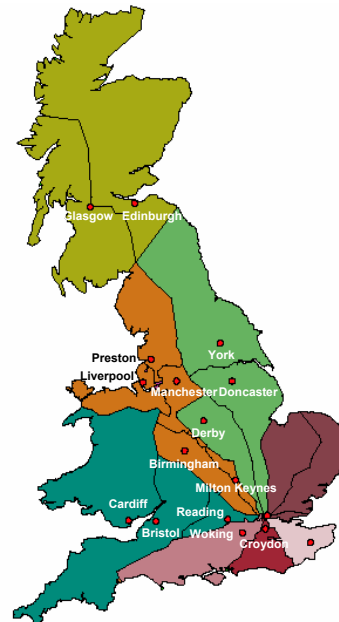- One way…refine and improve
- Taking control

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Organisation Design

Chief Executive

- Government & Corporate Affairs
- Legal Services

Deputy Chief Executive
- Human Resources
- Information Management
- Railway Estates
- Business Change
- Strategic Analysis Unit
- CTRL ops
- Transaction

Director Projects & Engineering

Group Finance Director
- Financial Control
- Enhancement Contracts
- Group Insurance
- CP&RA
- Internal Audit
- Funding
- Contracts & Procure't

Operations & Customer Services

Safety & Compliance

Maintenance

National Delivery Service

Major Projects & Investment

Engineering

- West Coast
- Thameslink
- New Trains Proj
- GSMR-FTN
- Network Dev't

Train Control
Performance
Account
Management
Timetabling

8 Routes

Territory Maintenance

5 Territories

Strategic Spares
Fleet Management
National Contracts
Bulk Materials &
Logistics
New Measurement
Train

Track Renewals
S&T Renewals
Structures Renewals
Ops Property Renewals
Contracts &
Procurement
(Delivery)
Enhancement Projects
Railway Estates Projects

Civils
P Way
E&P
Signals
Telecommunications
Engineering Knowledge
Railway Systems

Based at Asset Management Centres

Operational Areas

18 Areas

Maintenance Areas

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Territories, Routes & Areas

Territory	Route	Area
Scotland	Scotland	Scotland East
		Scotland West
London North Eastern	London North Eastern	North Eastern
		Great Northern
		East Midlands
London North Western	London North Western	Preston
		Manchester
		Liverpool
		West Midlands
		West Coast South
Western	Western	Wales & Marches
		West Country
		Thames Valley
South East	Anglia	WANLLT
		Great Eastern
	Wessex	Wessex
	Sussex	Sussex
	Kent	Kent

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Renewals Spend

Total Spend 2004/05 – 2008/09 (£bn)
Non WCRM

- Track
- Structures
- Signalling
- Electrification
- Plant & Machinery
- Telecoms
- Stations & Depots
- IT (and other)

Pie chart values:
- 3.3 (Track)
- 1.6 (Structures)
- 2.1 (Signalling)
- 0.4 (Electrification)
- 0.4 (Plant & Machinery)
- 1.0 (Telecoms)
- 0.9 (Stations & Depots)
- 0.6 (IT and other)

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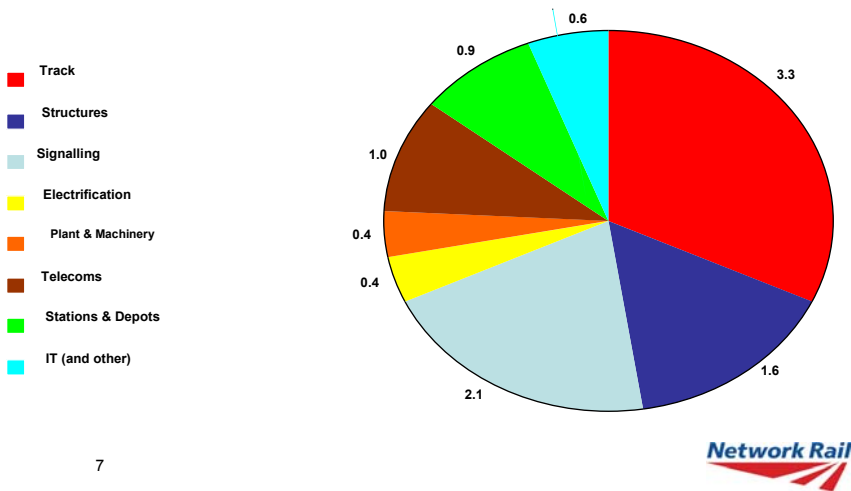
Unprecedented Work Volume

Kms

- Rail
- Sleepers
- Ballast
- S&C units

1996 - 2001
Control Period 1
(actual)
- 40% done in last year due to Hatfield
- Rail: 2791
- Sleepers: 2143
- Ballast: 2572
- S&C units: 816

2001 - 2006
Control Period 2
(projected)
- Rail: 2185
- Sleepers: 2870
- Ballast: 3395
- S&C units: 1326

2004 - 2009
Control Period 3
(projected)
- Rail: 4233
- Sleepers: 3593
- Ballast: 3824
- S&C units: 3075

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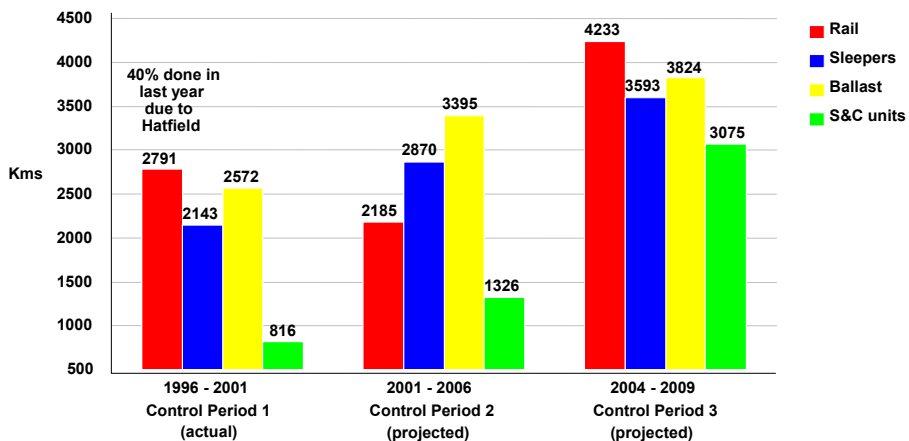
Five-year Renewals Efficiency Targets

% (y-axis), values: 35, 30, 25, 20, 15, 10, 5, 0

Categories (x-axis): 2004/5, 2005/6, 2006/7, 2007/8, 2008/9
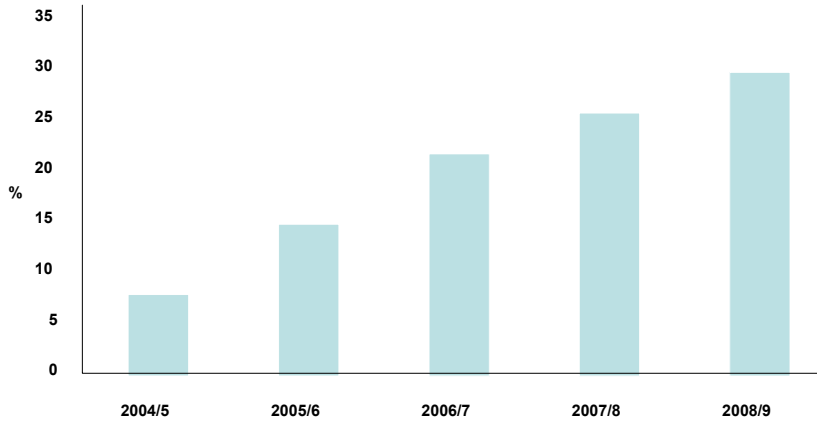
- Average efficiency target across all asset types
- Baseline is unit costs being achieved in 03/04

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Project Management Framework

Project Management Framework

Process
- Corporate Governance
- GRIP
- Project Controls Cycle

People
- Capability & Competence
- System Training
- Training & Development

Systems
- Investment Management System (IMS)

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Project Control Cycle
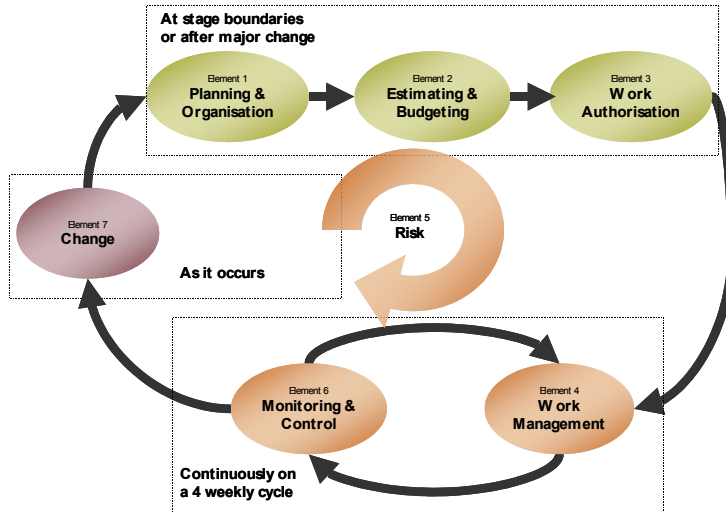
Project Control – Back to Basics

- A structured and integrated approach to:
  - Planning
  - Budgeting
  - Baselining
  - Progression
  - Cost Collection
- Provides a sound management framework for:
  - Performance Measurement
  - Earned Value Management
  - Timescale & Cost Risk Analyst
  - Contingency Management
  - Problem Identification & Resolution
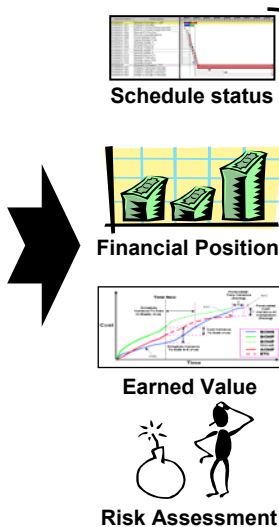 - Management Review & reporting

Supporting Systems

Systems adapted to support People & Process

SHARED DATA ENVIRONMENT

RISK MGT TOOL (TBD)

Baseline

1
2
3

CHANGE MGT TOOL (ORACLE PROJECTS)

7

RISK

4

Flowdown

Primavision

SCHEDULE & BUDGET TOOLS (P3e and ORACLE PROJECTS)

Change

6
5

Measurement

Project Performance and Reporting

FINANCIAL TOOL (Oracle Projects)

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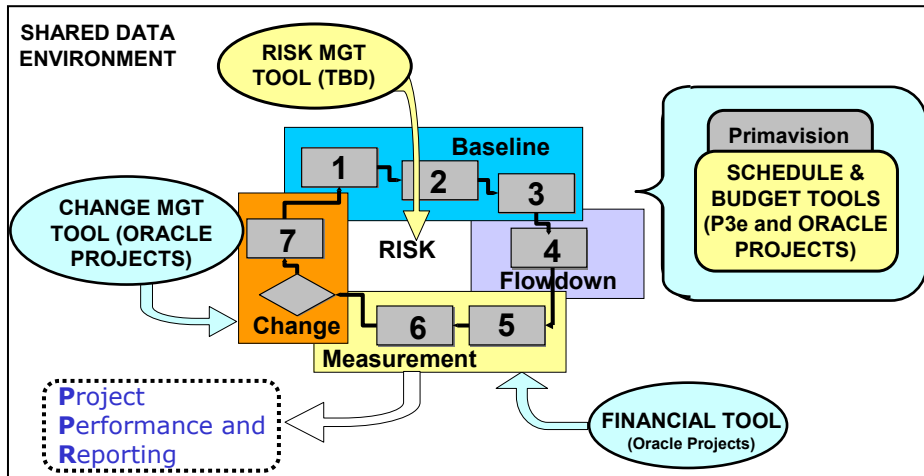
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Visibility Of Performance

Schedule status

Financial Position

Earned Value

Risk Assessment

- Outputs and Reviews result in a coherent Project Position against which management action can be taken:
- Schedule Position
  - Critical Path Analysis
  - Timescale Risk Analysis
- Financial Out-turn
  - Risk / Opportunity Position
  - Contingency & Exposure
  - Estimates At Complete
  - Margin
- Performance Status
  - Earned Value Analysis
  - Costs to date
  - Supporting Output Metrics

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Management Reviews

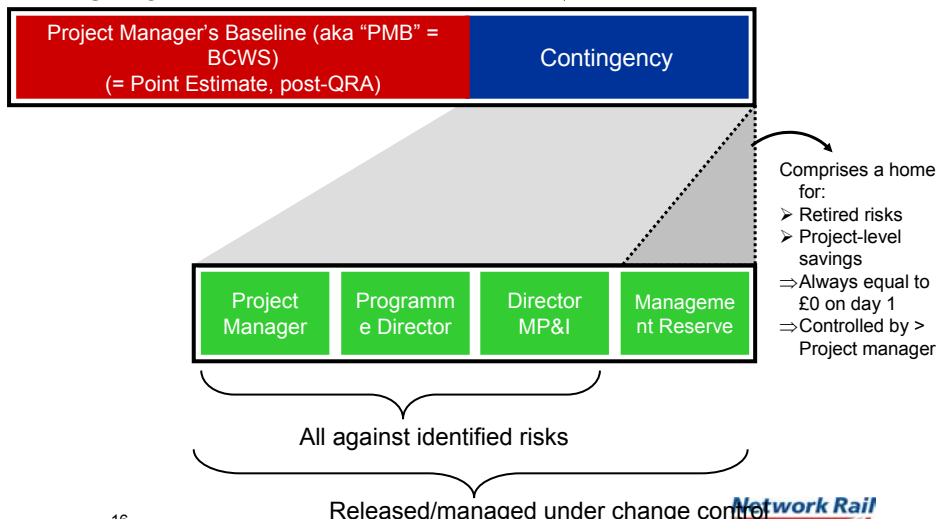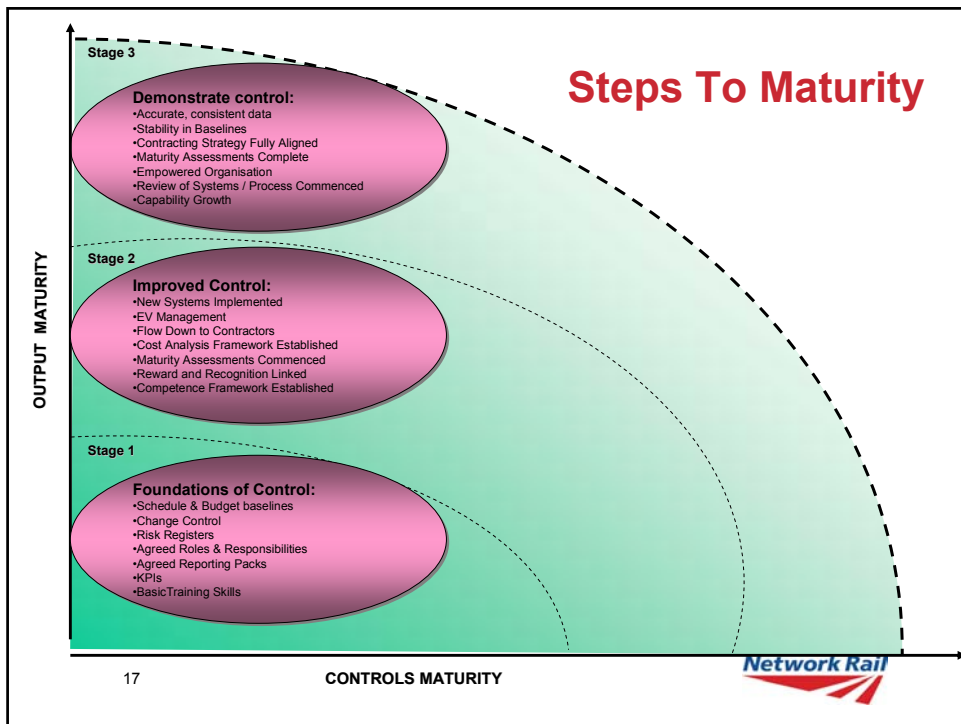**Integrated management framework drives performance management**

Project Reviews — Project Review - Cost / Schedule / Status / Issues

Risk Board — Project Level Review - Risk & Opportunities / Exposure

Monthly Business Review — Programme Review - Cost / Schedule / Status / Issues

Change Board — Programme Level Review - Baseline Control / Contingency Utilisation

Period Cycle

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Cost Control

All derived from QRA

AUTHORITY

Project Manager's Baseline (aka "PMB" = BCWS) (= Point Estimate, post-QRA)	Contingency

Project Manager	Programme Director	Director MP&I	Management Reserve

Comprises a home for:
- ➢ Retired risks
- ➢ Project-level savings
- ⇒ Always equal to £0 on day 1
- ⇒ Controlled by > Project manager

All against identified risks

Released/managed under change control

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Steps To Maturity

Stage 3

Demonstrate control:
- Accurate, consistent data
- Stability in Baselines
- Contracting Strategy Fully Aligned
- Maturity Assessments Complete
- Empowered Organisation
- Review of Systems / Process Commenced
- Capability Growth

Stage 2

Improved Control:
- New Systems Implemented
- EV Management
- Flow Down to Contractors
- Cost Analysis Framework Established
- Maturity Assessments Commenced
- Reward and Recognition Linked
- Competence Framework Established

Stage 1

Foundations of Control:
- Schedule & Budget baselines
- Change Control
- Risk Registers
- Agreed Roles & Responsibilities
- Agreed Reporting Packs
- KPIs
- BasicTraining Skills

OUTPUT MATURITY

CONTROLS MATURITY

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Key Enablers

- Initial:
  - Clear vision of management framework
  - Organisational Structure
  - Clear Roles & Responsibilities
  - People, Culture
  - Sponsorship
- Implementation:
  - Route Map to Embed Project Control
  - Integrated system and process development
  - Effective Training and At-Elbow Support
  - Clear, User-Friendly Documentation
  - 2 Way communications
- Long-Term:
  - Management review and reporting cycle
  - Stagegate Reviews

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Clear Roles & Responsibilities

Status/Review | **Process Operation** | **Sponsorship**

Project Managers

STATUS:
• Own Budget & Plan
• Update Progress & ETCs
• Risk Updates
• Change
• Sub Contractor Status

REVIEW:
• Schedule impact
• Earned Value & Actuals
• Estimate At Complete
• Management Data
• CAM Review / Action

Central Support Team

• Process Governance
• Toolset Experts
• Support to CAMs
• Baseline Maintenance
• Data Integration & Outputs
• Data Analysis

Co-located Support Teams

• At Elbow Support
• Co-located
• Feedback focal point

Sponsor

• Understand Process
• Define objectives
• Understand risks
• Review progress

Board

• Understand Process
• Use metrics
• Take Action

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Overview Of Documentation

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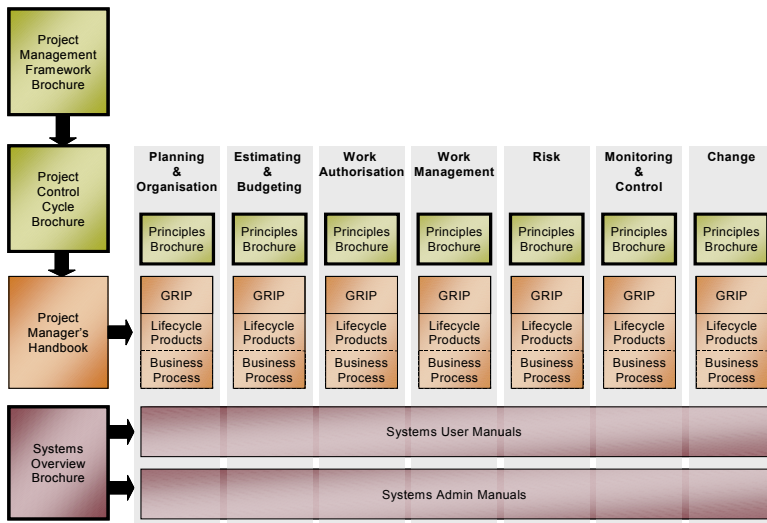
Route To Successful Implementation

Essential to drive process, discipline and data maturity

Work Start

+6 mths

Readiness Assessment

+3 to 6 mths

Integrated Baseline Review (IBR)
• Overview Stgs 1-5, focus Stgs 6 - 7
• Process Establishment
• Data Maturity Status

IBR

+3 to 6 mths

Readiness Review
• Schedule and budget integration
• Schedule & budget Ownership
• Baseline Maturity Status

Process Check

Process Maturity

Readiness Review

+3 to 6 mths

Readiness Assessment
• Focus Stages 1 - 5
• Overview Stages 6 - 7
• Check PM Understanding

Demonstration Review

Quarterly

Baseline Maturity

Surveillance Reviews

Demonstration Review
• Mature baselines and processes
• Meaningful performance trend data
• Effective performance analysis & reporting
• Stability, coherence, credibility

Operational Maturity

Performance Management

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Lean Project & Process Management

Neil Butterill

Magna Business Solutions Ltd

No trade-offs

TO POSITIVELY IMPACT ON
TIME, COST, QUALITY,
SAFETY & ENVIRONMENTAL CRITERIA
SIMULTANEOUSLY WITHOUT TRADE-OFF

↑

**CREATE
CONTINUOUS FLOW**

↑

**ELIMINATE/REDUCE
WASTE**

↗ ↑ ↑ ↖
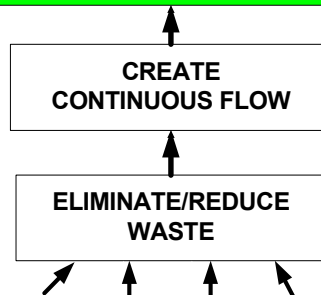
Support for Lean Project Management

- **The 'Rethinking Construction' report**
- **DTI**
- **CITB**
- **Construction Courses**
- **Business Schools**

What is Lean Project Management?

A way to do more & more with less & less – less effort, less equipment, less time & less space - whilst providing customers with exactly what they want

- Dan Jones

How?

- By eliminating **Waste**

- To create **Continuous Flow**

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Visual Management

CURRENT STATE   TASK TIME

TASK COST

VALUE	NON-VALUE ADDING	WASTE

FUTURE STATE

VALUE	NON-VALUE ADDING	WASTE

IMPROVEMENT
OPPORTUNITY

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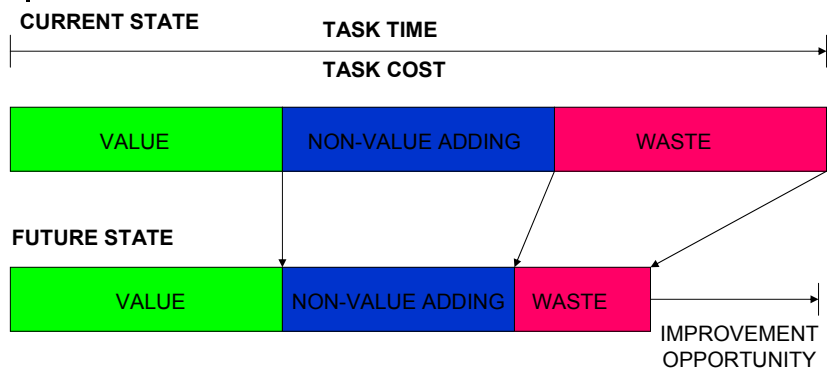
Lean Project Management

- **A 'lean' system/ process/ organisation is one that is waste free**

- **Lean is not about size or number of people employed**

Eliminating Waste

- **Understand what's waste**

- **Expose the waste**

- **Eliminate it**

Types of waste

- Building ahead of demand/time
- Waiting (people, material, information, for the next operation)
- Unnecessary transport (double handling)
- Inappropriate processing (larger machines, unnecessary steps, machines not quality capable, over design)
- Material stocks (early deliveries, storage space, deterioration)
- Unnecessary motions (ergonomics, bending, reaching)
- Building defective parts/sections
- Waste of untapped human potential

The Impact of LPM
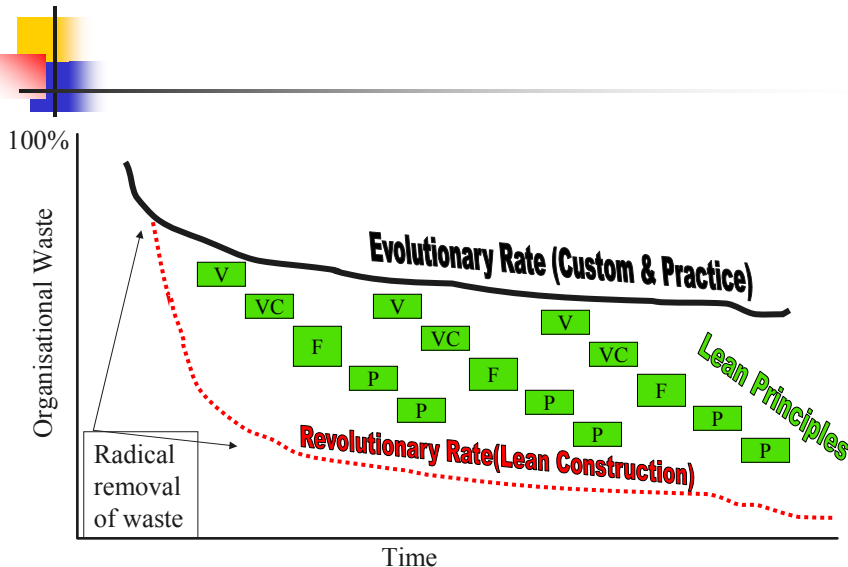
Value Adding Activities

In a Production/Construction Environment

- 40% value adding activity or support activity
- 60% waste

In an Information Environment

- 51% value adding activity or support activity
- 49% waste

Source: Cardiff Business School
Lean Profit Potential

LPM Puzzle
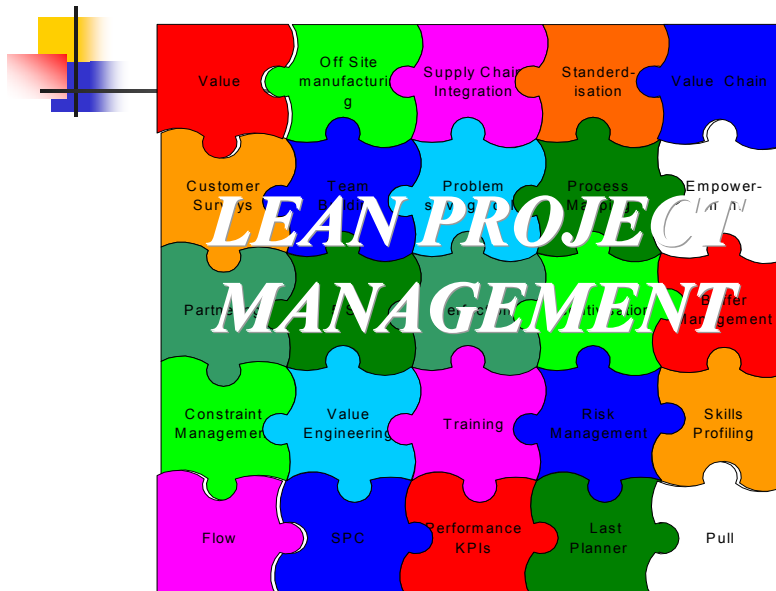
The 5 Principles of Lean

Value

Establish the expected value from the end users standpoint

Value Chain

Map out the value chain and eliminate non-value adding activities.

Flow

Aim for one piece continuous flow & Synchronise all activities

Pull

Don't make anything upstream until needed

Perfection

Increase rate of flow & compete against perfection

Implementation Benefits

- Project level:
- Bude STW
  - 20% programme reduction
- Middlesbrough
  - 12% under TC & 15% programme reduction
- Process level:
- Mourne WTW
  - 12% reduction in O/T in steel fabrication
- Sandiacre Design/Engineering
  - 20% time reduction

Results Achieved

- Predictability of project completions up from 60% to 93%.
- Project durations reduced by 40% with further reduction planned.
- At risk projects identified early with 70% Resolved to come in on time.
- No conflicts on work priorities.
- Escalation dramatically reduced (not measured)

Lean Project Management

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Eliminate Waste in Projects

Ten Tips on Practical Application of Lean Project Management

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Agenda

- What waste exists in our current PM practice?
- How can we maximise the added value?

  - Gate Reviews
  - Intermediate Deliverables
  - Risk Management
  - Planning
  - Project Reporting

  - Quality Control
  - Progress Meeting
  - Change Control
  - Procurement
  - Multi-tasking

- Conclusions

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Streamline Gate Reviews

Current Stage Gates

- Gates can block value flowing by
  - Delays for trivial issues
  - Poor attendance of Gate keepers
  - Poor preparation by Gate keepers
  - Cancellation, postponement of Gate Meeting

Streamlined Gates
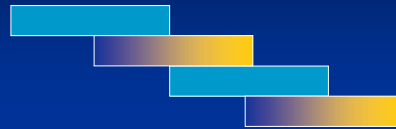
- Flexible Review Gates Based on
  - Phased approval of Gate Deliverables
  - Ability to continue the project while awaiting the gate approval
  - Final sign off by empowered and accountable sponsor

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Eliminate Unnecessary Deliverables

Current Scope Definition

- Many intermediate products do not add value because of
  - Blind compliance to company procedures
  - Low quality generic documents
  - Tick box mentality

Lean Scope Definition

- Intelligent application of company standards
  - Effort focused on key documents that add value
  - High quality documents that address key issues
  - Asks 'what value will this product bring to this project?'

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Active Risk Management

Current Risk Management

Define + Focus → Identification → Assessment → Planning → Management
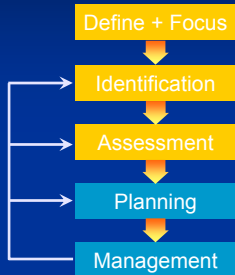
- **Risk management can**
  - Focuses on setting contingency
  - Produce little action planning or follow up

Active Risk Management

Define + Focus → Identification → Assessment → Planning → Management
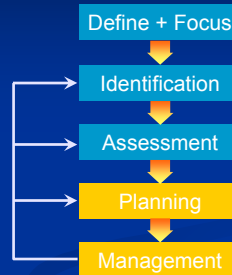
- **Active risk management**
  - Focuses on planning risk reduction actions
  - Making them happen

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Lean Planning

Current Planning

- **Planning can be**
  - Based on lots of inaccurate detail over a long timeframe
  - Prepared in isolation from the project team
  - Has little ownership or understanding
  - Often has to be revised

Lean Planning

- **Lean Planning**
  - Plans detail for foreseeable future with confidence
  - Maintains high level overview
  - Engages the project team and builds ownership

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Visual Project Controls

Current Reporting

- Reports can be
  - Very detailed
  - Primary focus on numbers
  - Use jargon not understood by the project team
  - Go unread by the project team and management

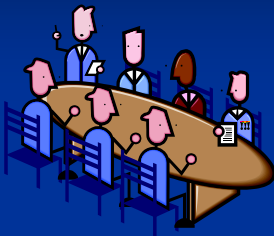## Visual Project Controls
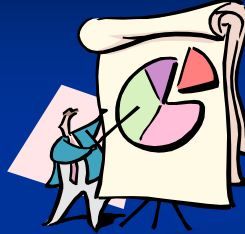
- Progress Reports should be
  - Use visual controls
  - Communicate status to everybody
  - Are clearly understood by all
  - Help create a sense of progress

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Stand up Progress Meetings

Current Progress Meeting

- Project Meeting can be
  - Long
  - Too many attendees
  - Boring
  - Expensive

Stand-up Project Meeting

- Should be
  - Short, 15 min max
  - Only package managers
  - Stimulating
  - Cheap
  - Stand-up!!!!!!!

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Effective Change Control

Current Change Control
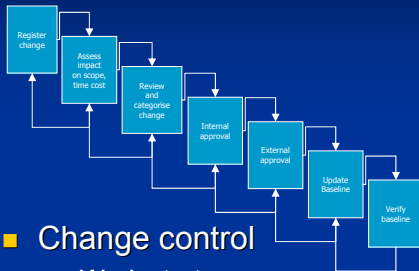
- Change control
  - Work starts as soon as possible
  - Customer kept at arms length from the design
  - Changes are required to rework requirements
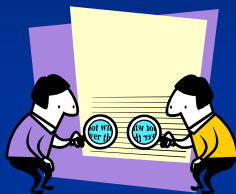 - Pure waste !!!!!!

Lean Change Control

- Lean Change Control
  - Work started as late as reasonable
  - Customer engaged in design review
  - Maintain options as long as possible
  - Aim to minimise re-work.
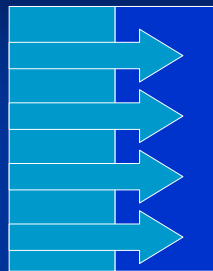
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Lean Procurement

Current Project Procurement

- Problems which include
  - Unclear requirements
  - Adversarial
  - Duplication, man to man marking

Lean Procurement

- Supply chain based on
  - Precise requirements
  - Integrated with the business
  - Just in time delivery
  - Joint long term drive to reduce waste
  - Still adversarial

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Eliminate Bad Multi-tasking

Current Task Management	Focused teams

■ Excessive multi-tasking
  ■ Reduces effectiveness
  ■ Increases chance of re-work
  ■ Causes stress
  ■ Completes less projects
	■ Dedicated Resource
	  ■ Increases efficiency
	  ■ Reduces chance of rework
	  ■ Reduces stress
	  ■ Completes more project

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Conclusions

- Lean PM includes
  - Focus on key PM processes and products that added value.
  - Do a good job of these added value processes.
  - Relentless search for and elimination of waste.
  - Continuous pursuit of quality to avoid re-work.
  - Letting the customer pull value from the project by keeping them involved in the project.

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Quotation

'If it's not adding value; it's waste'

Henry Ford

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Next Event

"Delivering customer benefit with programme management"

Friday 18th March

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