

RRUK Workshop 2008

Project B7: Rail Industry Cost Model

Andrew Smith (on behalf of the project team)
ITS, University of Leeds

The project team

1. Chris Nash, Andrew Smith and Phill Wheat (ITS, Leeds)
2. Clive Roberts, Chris Bouch and Colin Goodman (Birmingham)
3. Rod Smith, Simon Kingsley and Kat Lovell (Imperial College, London)

Brief agenda

- What is the project about?
- What did we say we would do?
- What have we done?
- What happens next?

What is the project about?

- The industry had seen some very large cost increases

Some cost data

£m, 2005/06 prices	1999/00	2005/06	% change
Infrastructure maintenance	765	1,195	56%
Infrastructure investment	1,944	3,146	62%
Infrastructure operating costs	834	1,236	48%
Passenger TOC costs	3,392	4,919	45%
Total passenger rail costs	6,935	10,496	51%

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- Unit cost rises post HF: passenger rail 42%
- Unit cost rises post HF : infrastructure only 48%
- Unit cost rises post HF : TOCs only 35%

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- The industry had seen some very large cost increases
- Need to meet the country's long-term transport needs
- New technology key role to play here
- Concern / barrier: fragmentation

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**Project to develop a methodology
for testing the cost impact of
introducing new technologies in
the rail industry**

**Understanding
industry costs**

Benchmarking

**Fragmentation
/ incentives**

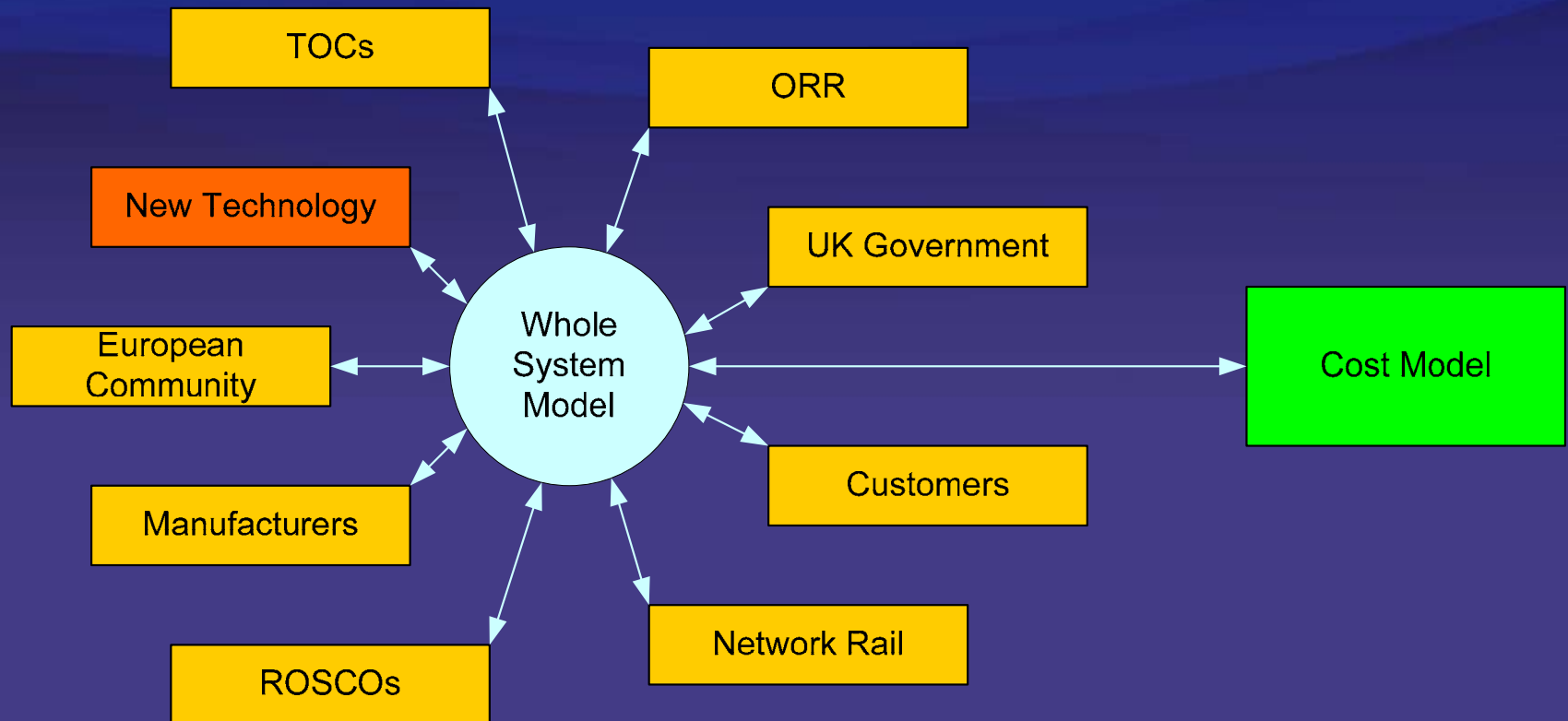
**The innovation
process**

What did we say we would do?

- Rail industry cost model - for testing the cost impact of new technology
- Investigation of institutional arrangements and their impact
- Benchmarking of costs – British / international comparators

Assessing the Impact of New Technologies

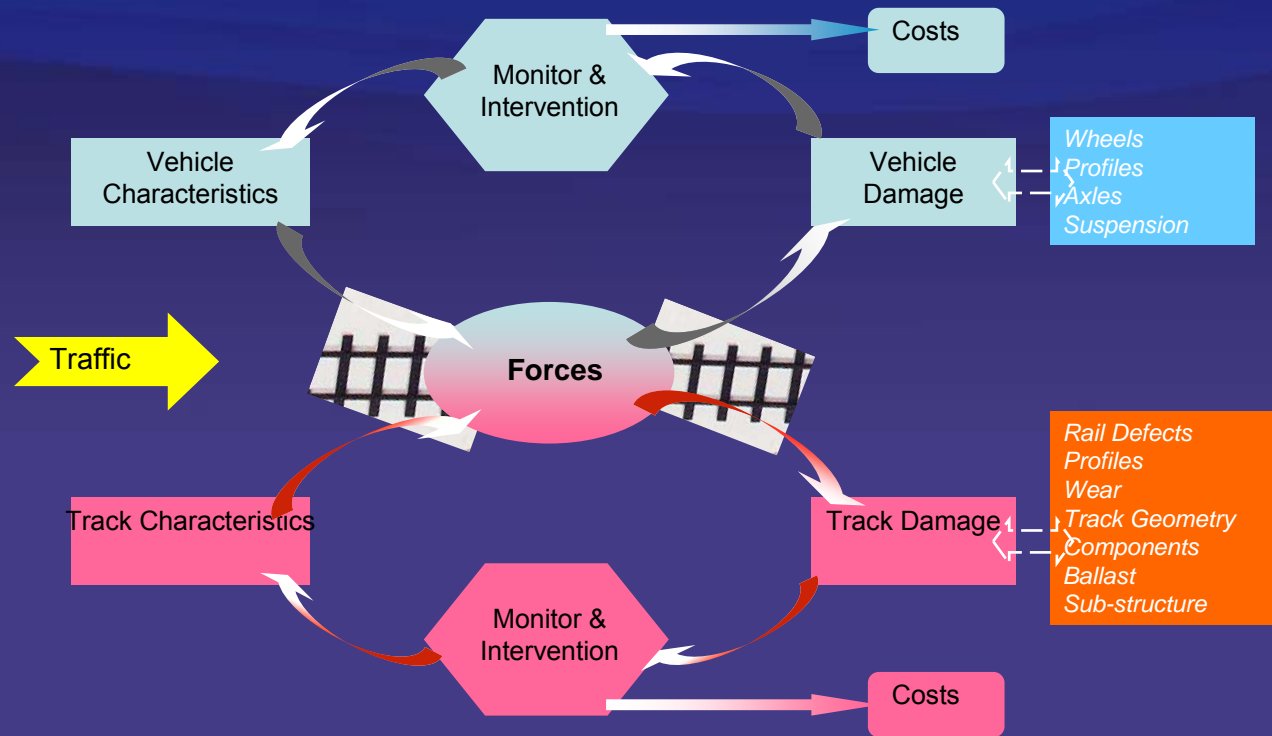
Project B7: Technology Assessment Model



Assessing the Impact of New Technologies

What's happening now? V/TSIC and VTISM

(Diagram by V/TSIC)



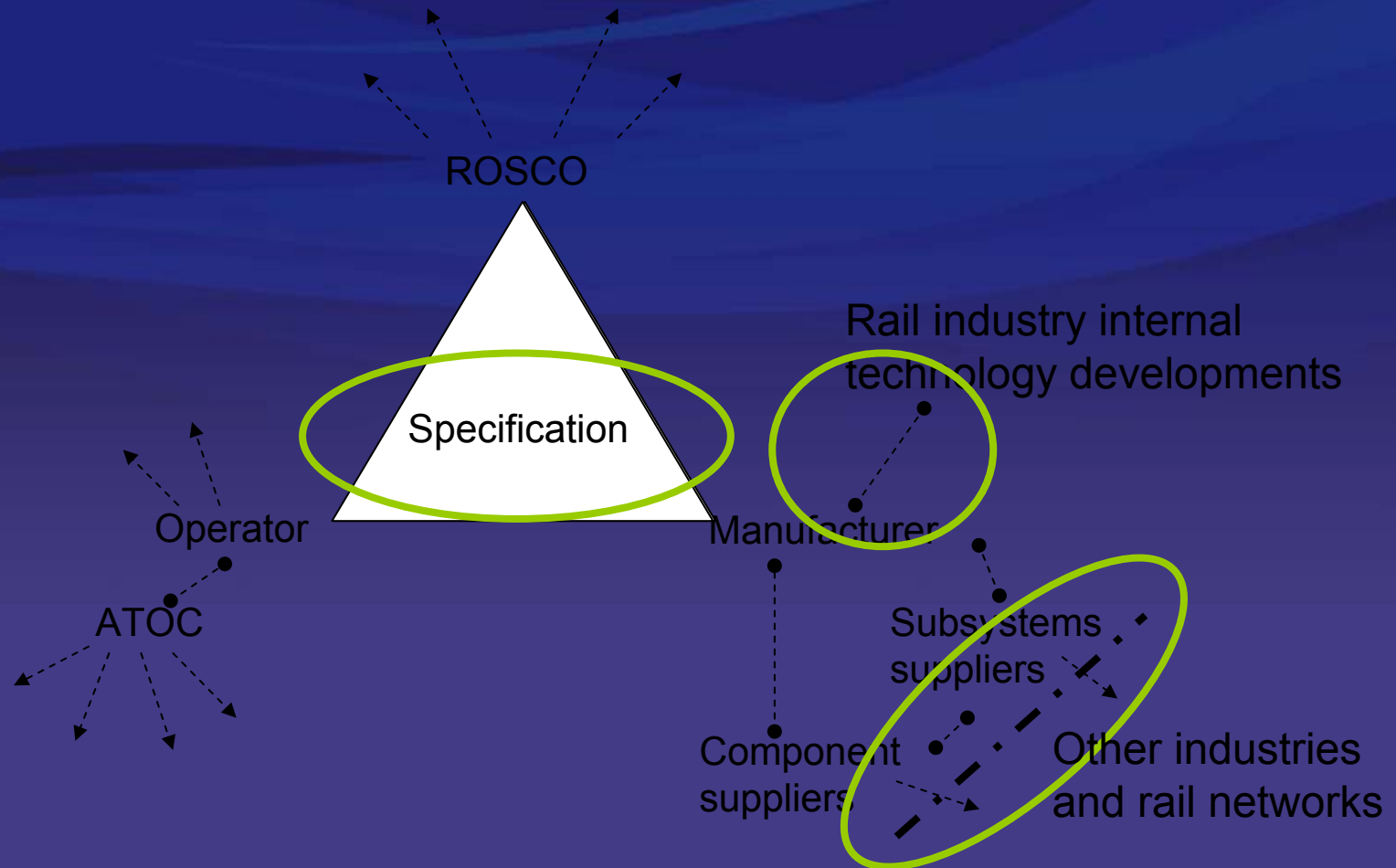
To summarise

- Methodical approach to technology testing – how to ensure capture all major effects (whole system)
- Focusing down – what are the key areas to look at
- Will use existing models where appropriate
- Recognition that new technologies may alter processes (e.g. how we do maintenance)
- Need to ensure the model is operational based on available data

Institutional arrangements: technology introduction in rail vehicles

- Work to investigate the stages of technology development and selection for UK rolling stock
- To understand the stages at which the technology change model might be used by the industry
- Conclusions will direct the selection of the technology cases to be used in model development.

Institutional arrangements: key stages in technology introduction



- > Looking outwards for technology developments and involvement in industry work
- Communication about technology – need further information about mechanisms

Benchmarking

- ITS currently doing international benchmarking (infrastructure) as part of a separate project
- So work focused on train operating costs
- International data not readily available – so analysed the British TOCs since privatisation
- Dissemination:
 - CILT 2007 and 2008
 - Oxford TSU Seminar 2007
 - ETC 2007
 - First Economics Owner Group Forum 2008

Table 6: TOC cost growth by TOC-type

TOC type	Growth in TOC costs (note 1) per train km over the relevant period			
	1999/00 to 2003/04 (4 years)		2003/04 to 2005/06 (2 years)	
TOCs on management contracts or re-negotiated franchises	Total	33%	Total	11%
	- Labour	25%	- Labour	7%
	- Rolling Stock	3%	- Rolling Stock	-6%
	- Other	64%	- Other	22%
Balance of TOC sector	Total	20%	Total	10%
	- Labour	24%	- Labour	12%
	- Rolling Stock	7%	- Rolling Stock	8%
	- Other	25%	- Other	9%

Econometric modelling - results

Output variables	
Economies of scale?	1.04 (broadly constant returns)
Economies of density?	1.165 (increasing returns)
Economies of train length?	1.73 (increasing returns)
Labour prices	
Log (average salary)	0.224**
35 hour week dummy variable	0.051**
Policy variables	
1 year franchising remaining	-0.054**
Years on management contract (dummy)	0.163***
Years before management contract (dummy)	0.008
Planned length of franchise	0.002

Some broader observations

- Costs have risen sharply wiping out earlier gains
- Apparently still rising
- Can explain some of the increases
- Policy impacts – re-negotiation and management contracts led to higher costs
- But large unexplained post 2000 effect in the model
- What will happen to costs going forward?
- Are the cost rises now built in, or will costs fall back?

Conclusions and next steps

- The railway must change radically to meet UK long-term transport needs. This will involve the introduction of new technologies
- Research is required into a better understanding of key technical interfaces that will be affected by the introduction of new technologies
- Project B7 is developing a methodology to describe the key technical interfaces and assess the impact of introducing new technologies
- Aim for close cooperation between Project B7, government and industry