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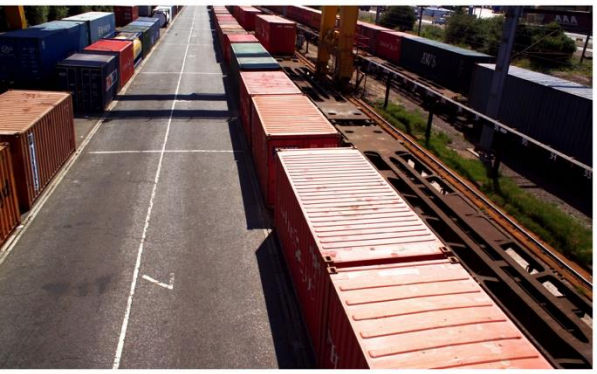

The European Freight Rail Experience with Innovation

Nigel Ash – Network Rail Consulting

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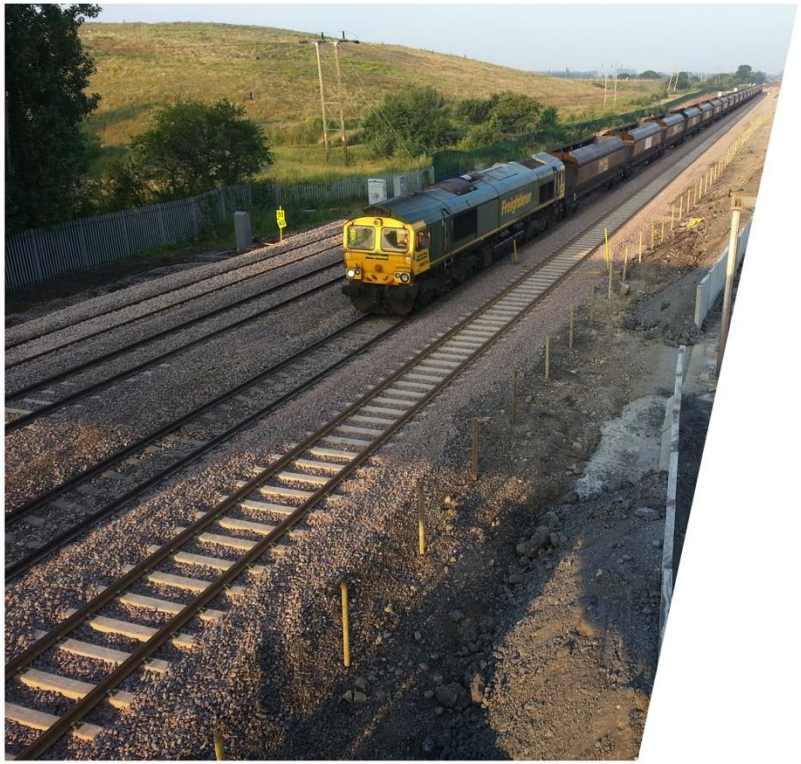
Challenges facing European Freight Rail



Freight Rail - the need to innovate

- Globalisation and modern demographic development has led to the need to:
  - move bigger quantities over further distances on busier railways
  - move goods/components that require logistical support and not stockpiling
- Environmental issues - sustainability and noise pollution; social responsibility; security issues and technological innovation have all changed the landscape
- Road Vs. Rail = 8 process steps Vs. 12 process steps

The EU encourages Rail Freight

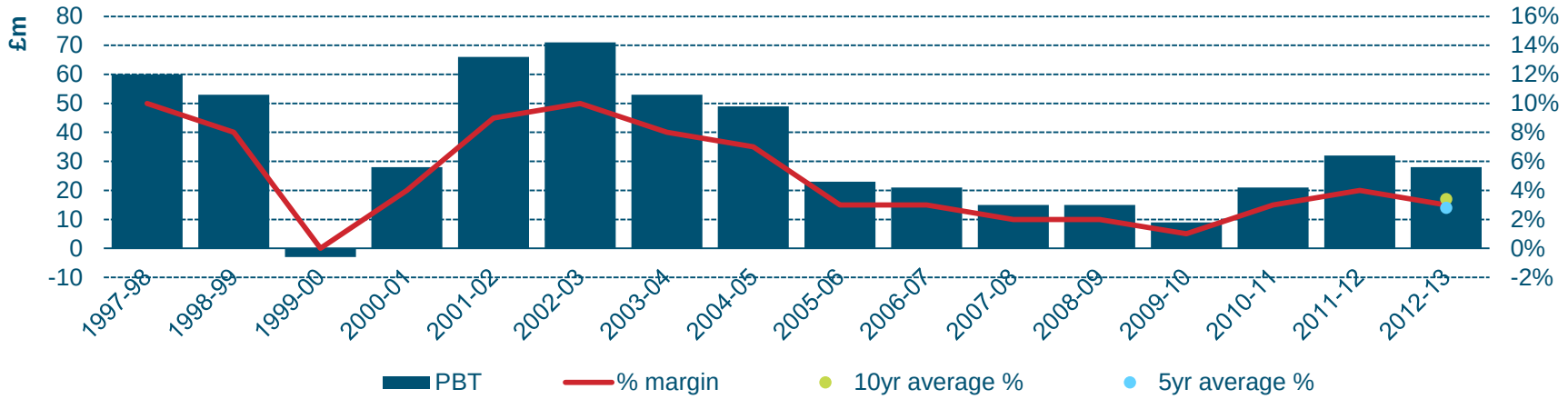
- Modal share of rail freight has been consistent around about 18%
- The European Commission wants to increase rail share by 2030 to 25% (286 billion train km's)
- The 2011 European Commission White Paper stated the goal that:
  - by 2030, 30% of road freight should shift to other modes of transport such as rail or waterborne transport
  - by 2050 50% of road freight should shift to other modes
- To achieve this the rail freight industry must see improvements in reliability, punctuality, predictability of turnaround and safety
- Efficient use of capacity needs to be maximised

UK follows wider EU trend

UK freight movement

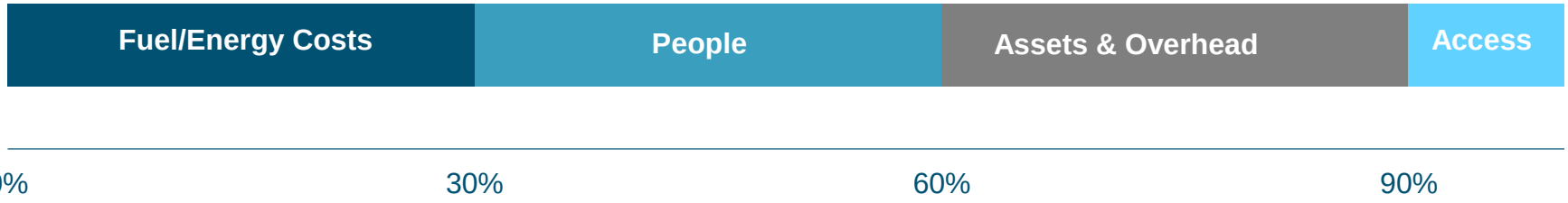
- Coal saw growth since 2010 but only due to economic recovery and price reduction as the US switched to shale gas
- 2014/15 forecast for both coal and metal freight to fall to 2010/11 levels
- Intermodal growth despite economic downturn

Finance in freight – UK example



A 1% reduction in the costs of fuel/energy, people and assets & overheads could more than **double** annual profits

Typical UK freight company cost of sales breakdown



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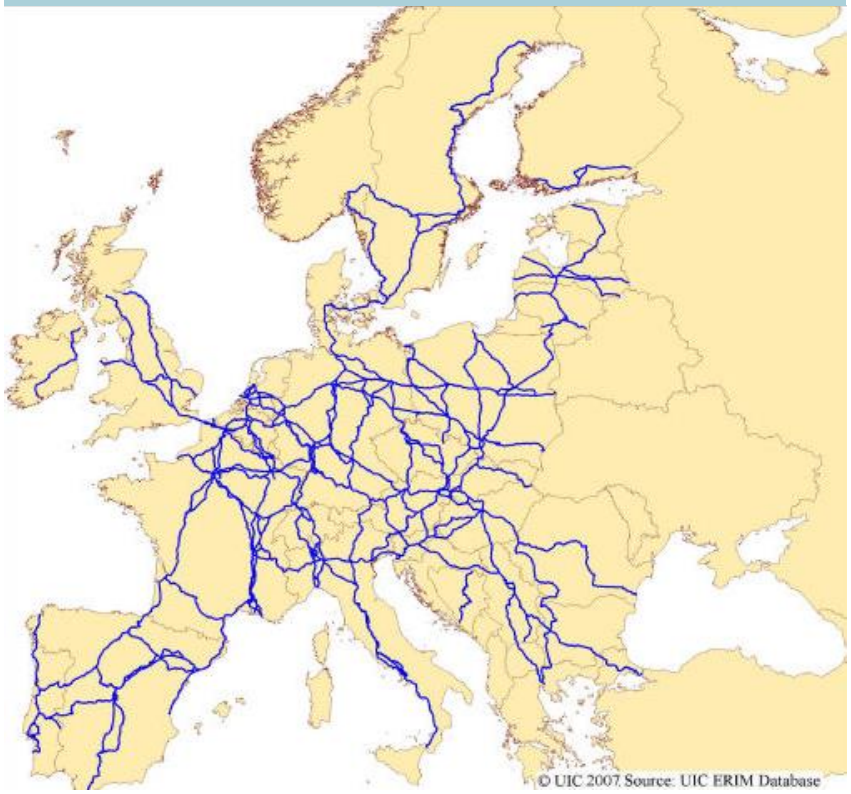
European Freight Rail Innovation: Interoperability

Interoperability across Europe

- Supported by the EU's executive body - the European Commission
- Establishment of nine initial rail corridors traversing Europe
- Corridors governed by a pan-European Executive Board
- Freight Rail companies developed a core of common infrastructure requirements across the countries
- Increased harmonization of operating rules, train planning and vehicle authorisation

Major European freight routes



Legislative and competition

- Three ‘Railway Packages’ adopted by EU since 2001 to reinforce the competitiveness of rail. Provisions introduced include:
  - Open access to all European railway undertakings for international and national freight services
  - Definition of conditions for companies seeking licenses to operate freight rail services across Europe
  - Increased transparency of the processes governing access charges and capacity allocation
  - Setting of requirements for safety certification of railway undertakings
  - Establishment of a European Railway Agency
  - Mechanism for harmonising safety standards and requirements

Uniform Infrastructure

- Uniform railway signalling across EU to improve interoperability – ERTMS
- Uniform set of maintenance rules for rolling stock
- Facilitate wagons with a high load capacity
- Kinematic Gauge standardization wherever possible:
  - Increased use of GC Kinematic Gauge (4,650mm high by 3,150 wide)
- Longer trains – up to 1,500m and associated infrastructure requirments

Railway Unification

Consulting

European Freight Rail Innovation: Logistics

Remote Condition Monitoring

- On-board remote condition monitoring and data from On-Train Monitoring Recorder if available
- Incorporated into new wagon design and retro-fitted where possible
- Enables rectification before train failure

Alarm Severity 1		
66012	14:12	Traction Motor 1
66324	15:17	Traction Motor 5
66011	15:31	Fuel Level
Alarm Severity 1		
66201	14:12	Air Compressor 3
66243	15:17	Water Temp
66013	15:31	Fuel Level
Alarm Severity 3		
66005	14:12	Traction Motor 1
66324	15:17	A Exam Overdue
66014	15:31	Fuel Level

Mobile consisting

- Mobile/hand-held, ‘cloud’ based applications for:
  - Depot and ground staff
  - Drivers and shunters
  - Network Rail/Infrastructure Staff
- Each person can log that their part in the process of preparing the train’s consist is completed
- Driver and depot controllers also log their readiness
- Reduction in train preparation time
- Removes need for paper processes and file storage in ‘portakabins’

Connectivity

- Cloud based application taking feeds from the timetable, GPS and the mobile consist readiness data
- Gives everybody early visibility of train arrival and ‘train ready to depart’ times
- Data also used for ‘Driver Advisory’ system which can enable live train path amendment

PORT OF FELIXSTOWE

Departures

Glasgow	14:12	On Time
Leeds	15:17	Pending
Tilbury	15:31	Pending

Arrivals

Wakefield	14:12	Pending
Tilbury	15:17	Delayed
Manchester	15:31	Pending

The Roller Container Transport System

* Picture Source: Wikipedia

- Containers equipped with steel roller wheels
- Moved between rail and lorry utilizing specially equipped rail cars and lorries with lever arm mechanisms

- Ideal for transporting items such as waste products or construction material to/from remote villages where rail is a better option than lorries travelling on winding roads
- Known as the ACTS system (Abrollcontainer Transport System) it is seen in Switzerland, Germany, Austria and the Netherlands

Rolling Highways

- Lorries are transported on rail cars with low decks and specialized bogie assemblies
- Drivers can rest in connected passenger cars
- Commonly seen in the mountainous regions in Switzerland, Austria, France and Italy
- Avoids traffic jams in narrow, winding roads whilst drivers can have compulsory rest time
- A further innovation - the Modalhor railroad car has standard bogies and a pivoting deck to enable easier loading and unloading

* Pictures Source: Wikipedia

CargoBeamer

- Lorries leave their semi-trailers on specially designed sliding pallets
- When the train arrives the pallets slide sideways onto the train
- As one pallet slides onto the train, another pallet slides off the train
- Trains loaded and unloaded in just 15 minutes, 10% of the time taken using a crane

*Picture Source: CargoBeamer

- No need for lorry and train to wait for each other
- No cranes used - can be used with overhead electrification
- The system is being developed in Germany with support from the EU

Summary


EWS 66010


MIND THE GAP
Danger
Overhead
Live wires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Only the beginning

- The rail freight industry in Europe needs to modernize and innovate in order to continue to compete with road haulage
- Network Rail has been focussing on enabling the move from ‘rail freight’ to ‘integrated logistics’
- Within the wider EU there has been a wider focus on innovations that help with the interoperability, and efficiency and reliability of rolling stock and freight handling
- Rail operators and governments will continue to drive and support innovation in order to meet challenging targets for rail’s modal share of freight

Thank you

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