Bestufs UK paper – Urban freight and the use of rail

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Introduction

- The use of rail as a component of urban freight continues to excite interest amongst researchers and transport practitioners
- Schemes for the revived use of rail as a component in urban freight have emerged but are of limited application, exclusive to one specific operation (Dresden) or aimed at non-commercial municipal services (waste).
- Generic and specific issues appear to be constraints on the immediate revival of rail as a credible and significant element in urban freight activities
- UK conditions are reviewed within this presentation to explain rail's present (stealth) role in urban freight and examines some prospects for the future built on European trials and developments.
- Potential role for "heavy" and "light" rail?

Declining

- Rail in Urban freight has been a declining activity within cities.
- Road transport has been more appropriate, better suited.
- Changes in urban supply patterns, land use planning and traffic regulation have all played their part.
- Rail's weaknesses have been evident through limitations in:
  - door to door capability,
  - integration of road and rail
  - and a difference in economic critical mass.
- Organizational and management issues also constrained rail's performance with a growing preference for big train models of operation.

Rail: For and Against

- The case for rail:
  - High capacity/weight and volume,
  - Low energy and environmental impact,
  - Network linkage between cities and within cities,
  - Operation in a controlled environment.
- The case against rail:
  - Constrained physical flexibility and interconnectivity,
  - Older physical infrastructure,
  - Disposal policy of redundant infrastructure,
  - Competition on the rail infrastructure for slots and paths,
  - High perceived costs and service limitations,
  - Deliberate withdrawal from “too difficult” markets,
  - Demolition of rail infrastructure and access points,
  - Product and service limitations,
  - Poor end to end security and cargo condition monitoring,
  - Move to trainload patterns of operation.

Road: For and Against

- Road dominates the city logistics market.
  - Process of gradual movement away from rail supply side offers to road based transport and logistics networks of increasing sophistication
  - User benefits unlikely to be foregone if rail cannot compete on all round service and product levels at a competitive cost
  - Moves to JIT and LEAN logistics pushes inventory and delivery failure onto the transport suppliers
- Road now possibly becoming a victim of its own success:
  - with increasing constraints imposed on access times, weights, dwell times, noise limits and emissions as well as wider transport and land use measures to segregate traffic.
  - Road freight generally seen as a “bad thing” but not recognized by planning authorities for the role played
- Constraints on new inter-modal terminals in terms of traffic generation concerns and transit through sensitive urban zones

Rail Does Serve Cities

- Rail delivers into cities through inter-modal terminals,
- Traffic activity is dictated by train operators supply side models,
- Multiple handling costs and security issues,
- New terminals are all limited by big train technology and commercial models largely insensitive to end user requirements,
- Terminals are not particularly efficient or intensive users of land space,
- Large volume movements of low value time insensitive materials,
- Road traffic generation remains a NIMBY issue and has constrained rail's share in traffic.

Models and Tech

- The orthodox rail business model is not well aligned to wider user needs,
- There is a case for more frequent and intensively utilised trains,
- Interest is limited partly by the technology and prevailing operating model,
- Low cost, reliable and widely available horizontal transfer technology is not in evidence,
- Rehabilitation of existing rail infrastructure for modern logistics terminals and depots has been compromised by cost reduction programmes, land sales and the withdrawal of network services.

Light Rail Options

- Similar generic constraints apply in relation to coverage, access and conflict with passenger priorities,
- Short overnight delivery “windows” with implied issues on reception and documentation,
- Volume and weight constraints within the loading gauge,
- Delivery module and security,
- A wishful supply side solution not recognising user needs?

Vienna

- The Vienna operation:
  - Designed for freight in an urban area using an existing infrastructure base
  - Designed to incorporate modern telematics based systems for the movement of freight within a large city with a rail component
  - Key players include national government, city authorities, tram operators and consulting groups
  - Initial demonstration in 2005 with the intention of exploring options and further traffic applications.
  - Telematics system designed to be an open interoperable based platform.

Amsterdam

- Congested city access with restricted delivery windows and missed deliveries,
  - 5000 plus trucks per day seeking access for delivery collection and movement within the urban zone
  - A dense tramway network exists giving new tram services to use this and to follow passenger trams in close formation without compromising flow patterns
- Current intentions are to use 10 trams with an ultimate fleet of 50 to replace about 50 % of the trucks in the urban zone
  - Inbound traffic is required to use key peripheral concentration docks to transfer to/from trams for movement to inner city hubs for delivery by “e-cars”. There is an implied multi-handling and time delay
- The service is not attractive to big stores/supermarkets requiring full trailer load services and is really aimed at boutiques and smaller retail stores.
- Interest in the model has been expressed by other cities including Tokyo, San Francisco and other Dutch cities

Summary

- These city examples are highly specific applications and are developed in “tram rich” environments with a high municipal input
- They require receptive markets or applications, appropriate routes and capacity, PPP type involvement (subsidy?), technical and operational feasibility and recognition of the impact on the dominant passenger activity
- Similar considerations apply to an even greater degree using metro/underground systems where potential conflict between passenger priorities and freight movements is intensified
- Maintenance of underground lines also compromises the potential to use infrastructure outside passenger activity times.
- The likelihood of wide scale application is limited and will require a massive shift in expectations, possible dilution of service levels compared to road borne movements with limited quantifiable environmental gains.

Trams Summary

- Dresden: City freight tram uses existing city tramway network on a point to point “conveyor belt” basis between the city logistics centre and the VW assembly plant in the suburbs. There has been no replication of this model
- Vienna: Used now for the internal movement of tramway infrastructure materials on a constrained basis. Commercial requirements and integration with city retail logistics requirements not adequately recognised in the concept development
- Amsterdam: Initial commercial trials scheduled for 2008 with an increase projected to a 50 vehicle fleet to replace truck deliveries. Using converted passenger trams in “follower” mode
- Zurich: Traffic activity confined to the movement of urban waste materials
- Brussels: Use of trams rejected in City Freight project report largely on the non-availability of a tram/train vehicle concept able to operate on street level and on main line railways.

Questions

- Playing the environmental card?
- Does superficial attractiveness of using rail for urban freight founder on a complex mix of technical, operational, managerial and economic factors?
- Should the discomfiture of road allow rail to offer lower quality products and services?
- Will major retailers really pay more for lower levels of service?
- How real are rail's advantages?
- Would the increased use of rail produce a significant economic and environmental benefit?
- Can orthodox light and heavy rail absorb an additional specialist traffic activity type on a wide scale under present access and train planning rules?

Conclusion

- Rail has lost the market and to regain this requires a massive re-positioning of products and services to emulate and match road based logistics activities within cities
- Orthodox rail technology and business models are not sympathetically attuned to this type of market opportunity and will need to address key issues simultaneously if it is to re-enter the market with a credible set of service offers
- This implies different technology, asset management, scheduling and managerial approaches to overcome current limitations that are not aligned in detail to the specific requirements of urban freight and logistics
- Need for new technology sets including rail/road vehicles, cargo modules and cargo transfer equipment specifically tailored for urban freight applications (size/weight/height/noise and horizontal transfer capability) and totally new rail freight concepts that are a radical departure from orthodox solutuions

Links

- Amsterdam Tram: http://www.citycargo.nl/index_eng.htm
- Studies including Brussels freight tram: http://cityfreight.eu/
- Two articles on urban rail freight: http://www.bestufs.net/articles.html
- Zurich Cargo Tram: http://tinyurl.com/34m6tm
- BESTUFS Workshop on Rail based urban transport:
  - http://www.bestufs.net/workshops/2001-08-30_dresden.html
- NewRail: http://www.newrail.org/