

# **Busways and Light Rail/Modern Trams**

**Can they be compared?**

by

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# **'Horses for courses': What does it mean?**

- **Buses on busways and light rail/modern tram have each a different function in a European city**
- **There are different aspects to consider in developed countries**
- **(unsure about US, Canadian and Australian/New Zealand cities)**
- **A strict 1 to 1 comparison between the two modes is a superficial approach to transport planning**

# **Advantages of light rail and modern trams**

**Please forgive that I will not go into details about the technical differences between these two modes.**

**Let us start with the different advantages of light rail and trams dividing them into :**

- **Technical considerations**
- **Comfort and design**
- **Low carbon footprint**
- **Planning advantages**
- **Acceptance of car traffic restrictions**
- **Change of mode**
- **Economic impact**

# **Light Rail and Tram: technical considerations**

- **Light rail and modern trams have varying passenger volumes according to the manufacturer and the number of units. That means:**
  - **Flexible vehicle capacity and length**
  - **The capacity varies between 165-660 passengers.**

# **Light Rail and Tram: comfort and design**

- **Smooth running of vehicles giving a comfortable ride**
- **Individual design of light rail and tram vehicles enables citizens of a town to identify with this mode**
- **It has normally a high acceptance and is loved not only by public transport users but by most citizens.**

# Tram in Strasbourg



# Tram in Lyon



# Tram in Montpellier



# Tram in Milano



# **Light Rail and Tram: low carbon footprint**

- **Use of electricity which is clean - although overall this depends where the electricity comes from - and the electricity can in part be recycled**
- **Although in fairness one has to say that diesel vehicles can also have near zero emission.**

# **Light Rail and Tram: planning advantages**

- **Light rail and trams are easy to integrate into an urban environment**
- **Trams are normally better to integrate than light rail vehicles**
- **Construction of a modern tram can easily be combined with urban improvements, for instance pedestrianisation and urban regeneration**

# Tram and Pedestrianisation: Sevilla



# Tram and Pedestrianisation: Grenoble



# **Light Rail and Tram: acceptance of car traffic restriction**

- **There is no other mode in urban areas which allows planners to work at such high level of car capacity reduction.**
- **A reduction of two car lanes in each direction is not unusual.**

# Road capacity reduction in Barcelona

The change of the street (C-245) from  
Esplugues to Cornellà

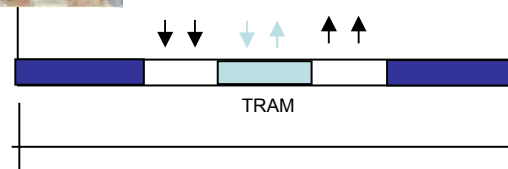
2001



2002



2003



# Road capacity reduction in Paris: T3



# Road capacity reduction in Madrid/Prada



# Road capacity reduction in Montpellier: Line 1



# **Light Rail and Tram: change of mode**

- **There are a large number of studies which show that there is a relatively high change from car users to light rail or tram.**
- **The study results often report '11-50%' but definitions and methods vary**

# **Light Rail and Tram: economic impact**

- **Property values are affected in 2 ways:**

**A) Increase in property values around stops – residential and/or commercial**

**B) improvement of the urban environment as an indirect result of A (increase or continuous growth of property values).**

# **How high is the value created? Example Dublin**

- **Since 2004, Dublin has 2 new tram lines. The daily ridership is high, between 85,000 and 100,000.**
- **According to estate agents the property premium the tram has created is estimated to be between 10-20%.**

## **Example: Freiburg**

- **Freiburg opened a new tram line (Nr. 5) in the west of the city in 1997. In 2009, there are 8,845 people living there.**
- **The property price premium is 24% compared to other residential areas in Freiburg.**



Freiburg - Etzsch jede Stunde

Waldkirch - Müllersbach alle 30 Minuten

Freiburg - Müllersbach

Freiburg - Müllersbach

Freiburg - Müllersbach

neue Nähe

BREISGAHN

HN

257

257

5

frei

## **Our UK research results:**

- **We studied the light rail/tram lines of Greater Manchester, South London (Croydon Tramlink), Nottingham and Sheffield.**
- **In total we studied 5,126 house sales at 73 stops between 2001-2007.**

# Table 1: Overall results on house prices – British case study cities

British case study cities	Greater Manchester	Nottingham	Greater London	Sheffield
Number of observations	850	872	1,854	1,550
Weighted average premium [%]	9	15	10	0,6

# **Light Rail and Tram: finally**

- **Cannot easily be removed once in place and will stay there for a long time.**

# **Disadvantage of Light Rail/Tram**

- **Cost of the vehicle and infrastructure are high**
- **Overhead wiring is unpopular in city centres**
- **Not flexible which can cause problems if there are traffic jams or accidents**
- **Cyclists could get stuck in the rail**

# **Light Rail and Tram: best potentials**

- **In cities from 100,000 to under one million inhabitants, depending on urban structure**
- **as the main mode along axes with high passenger flows**
- **supported by a denser bus network (with their own bus lanes) which could include busways in larger cities.**

# Busway in Nantes



# **Buses on busways: technical and planning**

- **As with trams they have a flexible vehicle capacity**
- **Low carbon footprint – especially if trolley buses**
- **Can also have a high acceptance in reducing car lanes by politicians, for instance Nantes**

# **Busway: acceptance**

- **High acceptance by public transport user (and citizens) when well designed**
- **Relatively high change from car users to buses on busway possible, for instance Fastrack in Kent claims 17%**

# **Economic Impact of busways**

- **Some evidence suggests that similar results as for light rail and tram investment are possible for busways**
- **One of the UK busways (Fastrack) serving the outer London suburbs in Kent opened in 2006.**

## **Fastrack: Kent**

- **We used sale price data on individual houses. We found that for semi-detached houses there was a 7% price premium within a 300m corridor of the busway/bus lane. It was lower for terrace houses.**
- **We checked the local tax valuations of the houses to see if there were any obvious differences in size or quality, but there were not.**

# **Busways: are much cheaper than trams**

## **Assuming:**

- **2 lines 10km long,**
- **headway 5 min. and**
- **an average speed of 20kph**
- **operated with 32 high capacity buses (145 passengers) and**
- **Compared with 32 trams carrying the same number of people.**

# **Busway compared to tram**

- **Investment cost of busway system was €8.5 million per km compared to €16 million per km for a tramway including vehicles and stops.**
- **Operating costs of a busway were about two thirds of a tramway. If one uses a bi-articulated trolley bus then the operating costs were about 80% of a tram (Deutsch, V. (2008) Universität Wuppertal).**

## **Busway: disadvantages**

- **They are not as easy to integrate into an urban environment in the city centre or in other historic dense urban areas (19th century housing).**
- **They can easily be removed and changed into car lanes.**

# **Conclusions - 1**

**Purely from a operational point of view busways are as effective as trams in carrying passengers unless one needs very large capacities, then light rail will be the better mode.**

**Busways are also more cost effective than trams unless one has a very high passenger flow.**

## **Conclusions - 2**

**But, especially modern trams have more planning advantages than light rail or busways.**

**The potential for restricting car use is normally easier to achieve for modern trams than for busways because of the technical and legal position of trams and light rail. (Also psychological and political)**

**Aesthetically trams are easier to integrate into a historic environment than busways and buses.**

**Thank you for your attention!**

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