9th International Scientific Conference MOBILITA ´04, Bratislava May 6 – 7, 2004

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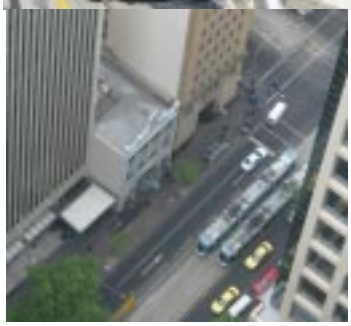
REVIVAL OF LIGHT RAIL - A TOOL FOR A SUSTAINABLE URBAN FABRIC

Introduction

A brief introduction based on visual information about the inter-relation between rail and the urban fabric.

Historic cities have an urban fabric based on the pattern of pedestrian movement. In a lot of cities the new build car infrastructure start to cover -like a bedding- the original urban fabric. Unintentionally this bedding suffocates a great part of the minuscule historic fabric and activities needed for sustainable mobility.

Historic urban fabric characterized by a mix of activities and transportation-modes in the same public space, Amsterdam, end 19th Century (picture BRO)



The tracks of early forms of Public Transportation (PT) followed the historic urban fabric and connected existing concentrations of activities; the task of tomorrows 'PT' will be to support valuable urban 'patterns & activities', to stimulate sustainable transportation and to explore new regional development axis like Bratislawa-Vienna. (RIGHT = new French trolleys serve the historic grid of Melbourne, Australia)

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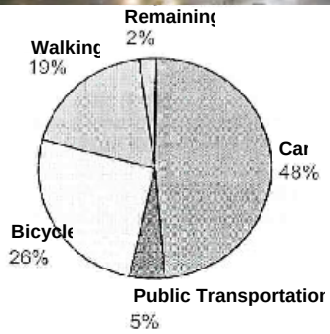
In the competition for traffic-space on arteries the new Lyon, France tram 'captured' free lanes to the detriment of car lanes because a tram serves more customers and do not need parking place in the heart of the city or the CBD (picture BRO).



Good facilities are one of the explanations of the high Dutch bicycle Modal Split 2002 and low 'PT' use on short distances; good 'PT' within bicycle range promise preservation of local 'PT' if the system renews towards competition with car convenience.

Future for sustainable public transportation (mass transit)?

The car is an extremely practical invention or 'Tool'. Even a moderate increase in 'Slow-Mode' commuting or the use of Public Transport can improve global dilemmas. This can be partially achieved by reducing that suffocating-process. It is more productive to promote the use of the public space we want, than to forbid a development. For 'promotion' of sustainable mobility, we are in need of a better quality of the Public Transportation and of better 'Design Tools' for mobility.

The success of + 200.000 inhabitants cities like Strasbourg and Grenoble show how (re)introduction of high quality tram can push the Modal Split towards a more sustainable Modal Split AND revitalize the urban core along the central part of a 'trunk-route'.

Keep in service or introduction of (very) long coupled Light Rail like in Gdanks, Poland reduces the frequency of 'PT' in car-oriented societies and will push less sustainable car use.

Light rail succes-stories

Recent examples such as Portland (USA), Melbourne (Australia) and Lyon (France) demonstrate the application and benefits of urban planning in conjunction with 'modern' Tram & Light Rail PT-networks. So it is just money to buy better trams. But we have to give this an extra in the competition with the car. Special Karlsruhe and Heilbron in Germany show the extreme success of 'close' Light Rail penetration of the urban fabric and the elimination of transfer. A hybrid tram that DIRECT enters the centre and the Central Business District of a city as well as the core of a series of neighbourhoods, replies better to the mobility of today then an old fine PT-network with the need of one or more transfers. But a wider PT-network (in hybrid co-operation with sub-urban rail) is in need of high quality pedestrian (bicycle / car) commuting to and from the tram-stops.

The implantation of the terminus of the Hybrid Light Rail Karlsruhe-Heilbron, Germany, in the core of Heilbron started the transformation towards a pedestrian friendly centre; trees could be placed on former car parking because the Light Rail guaranteed new & more customers.

The implantation of the new Lyon tram, France, was the start of a revitalisation of inner urban space by more green, high quality urban furniture and beautiful and really climate protective tram-stop shelters (picture BRO).

Urban quality around stations & stops for the users

Sustainable urban mobility needs appealing and user-friendly design of stops, shelters and of rolling stock. The new low floor Tram in Strasbourg (France) and the new hybrid Light Rail in Stockholm (Sweden) resulted in a significant advance toward more sustainable urban mobility. User-friendly shelters and bicycle lockers make 'Slow-Mode' commuting by rail-systems more efficient, even in harsher climates and during wintertime. This needs a jump in the design process we can achieve by a more intensive co-operation between design disciplines, emphasising station and PT-stop catchment areas and their configurations.

The Modal Split diagram shows that a shift toward more 'PT' needs better access for the 'Slow Mode' to the 'PT': improvement of pedestrian (& bicycle) routing and facilities close by stops and stations is a must to catch passengers that also can drive to work, shop, school or recreation.

New Light Rail is in need of a renewed density and an increase of Urban activities within the catch of stations: new high quality high-rise dwellings pushed use of Public Transportation in Den Bosch, Netherlands

Modern trolley & Light Rail fit well in pedestrian areas; competition with the car only can be persisted by a high frequency & high speed on free tracks in the outskirts and the region.

Elevated main pedestrian and bicycle route crossing with the Karlsruhe Light Rail, became a landmark and a climate protected 'PT-stop'.

A lesson from Curitiba, Brazil is that only real shelter of passengers makes 'PT' competitive with the car; real climate protection of passengers is more productive than a lot of expensive 'high-tech gadgets' invented by 'PT-fanatics' (picture municipality of Curitiba).

'Pt' friendly urban fabric & regional structure

Not only do shelters and stations have to provide some climate-protection so they can compete with the convenience of a car, but also the structural area of the potential PT catchment zones in existing or in newly built residential areas must become attractive for pedestrians and cyclists on their way to facilities, work, commuting stations and PT-stops.

Mid-city and in historic sites space can be so tight, that a tram has to pass close by; modern isolation and absorption are available to secure spatial quality (rubber track isolation, Grenoble, France)

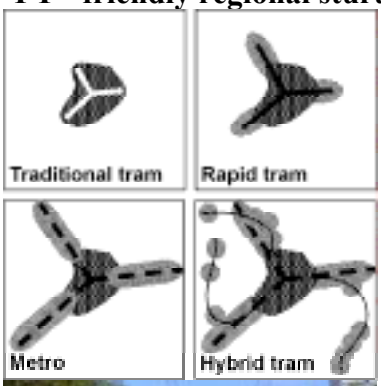
The Delft station, Netherlands, only could be reached by a detour; a shortcut through private gardens increased the station-catch immense.

Sustainable urban layout guarantees a short-cut towards 'PT'-stops (Capelle a/d IJssel, Netherlands

Excellent bicycle parking-facilities and climate protective shelter attract commuters who can choose between 'PT' or a car-ride with car-jam stress, respective a dangerous (winter) drive (Götenborg, Sweden).

Existing tramlines can 'Speed-Up' with simple constructions like high kerbs (Amsterdam, Netherlands) and direct route through a Round-a-Bout (The Hague, Netherlands)

'PT' friendly regional sturture (between Bratislawa-Vienna?)

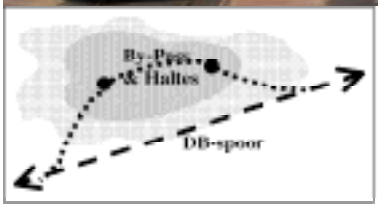


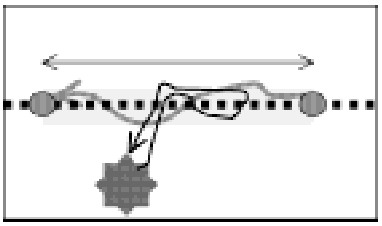
Traditional tram & metro systems follow the historic urban structure; Hybrid Light Rail hunts for passengers in the nearby regional area, a build direct connexion WITHOUT need of transfer.

Travel-time lost by commuter 'Pick-Up' in the heart of pedestrian areas must be regained by speed-up in the outskirts and other locations.

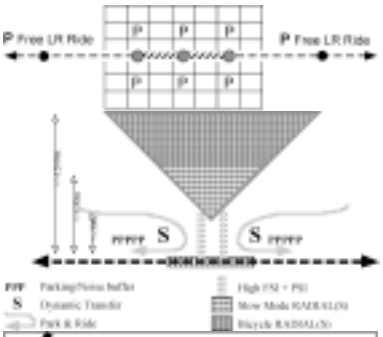
High-speed regional Light Rail track near Karlsruhe, Germany, allows 'slow-mode' drive in the heart of villages and regional centres (= 'frontdoor-frontdoor trips).

Pick-Up of commuters VERY close from their destinations and bring them without transfer extreme close to a main destination than to guarantee an exact schedule by double rail-tracks everywhere; single rail-track in a village in the Karlsruhe region was the only solution to pick up passengers in the heart of the build-up area.

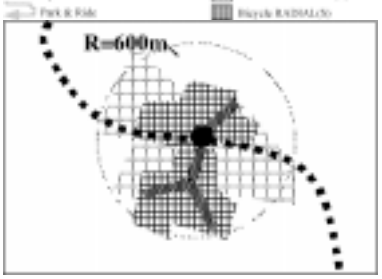




An often overlooked phenomenon is that car-visitors of a shopping street have to return to their car (Star = Parking); 'PT'-visitors will double the 'window-shopping' activity on their way to the next 'PT'-stop (circle = 'PT'-stop).



Light Rail as 'Trunk' of a 'PT-system' serves as toll free transportation inside the Calgary Central Business District and between Car parks and the 'CBD'.
'Slow Mode' needs a time saving and traffic safe local urban structure around stations & stop'.
1)Hatched triangle shows most productive location for pedestrian shortcuts,
2) Curved arrows indicate in front / along stations or stop only -30 km/u traffic.



Urban pattern, structure and activities should be maximum 'PT' orientated within 600 m radius of a national station; 300 m radius fits a Light Rail stop.

Do we need research on the Bratislawa-Vienna axis?

The comparable axis Saarbrücken-Sarrequimines (France-Germany; ±1997), Karlsruhe-Heilbron (Germany; ±2002), Leiden-Alphen a/d Rijn (Netherlands; test since 2003) and the shorter axis Grenoble-Moirans (France; ±2010) show the extra benefits of 'Frontdoor – Frontdoor' HYBRID Light Rail:

- Quick (short time) realization,
- Realization costs ± 1/3 of traditional rail
- Lower running costs than traditional rail
- Higher frequency because of shorter trains
- Provokes and attends to urbanization or re-vitalisation along the track and within the station-catch-areas.

And what are the possibilities of connecting the industrial area 'Eurozone' with HYBRID Light Rail?

A special situation on the on the Bratislawa-Vienna axis is the need to change the 'spine-line' in Bratislawa from narrow track rail towards standard gauge.