



Guidance of bicycle traffic at tram stops

Examples from Leipzig

**12th SRL Public Transport Conference 2009 / 2nd MeetBike Conference
„Integrated Urban Mobility“**

**12th and 13th of March 2009
Kulturthaus, City of Dresden**

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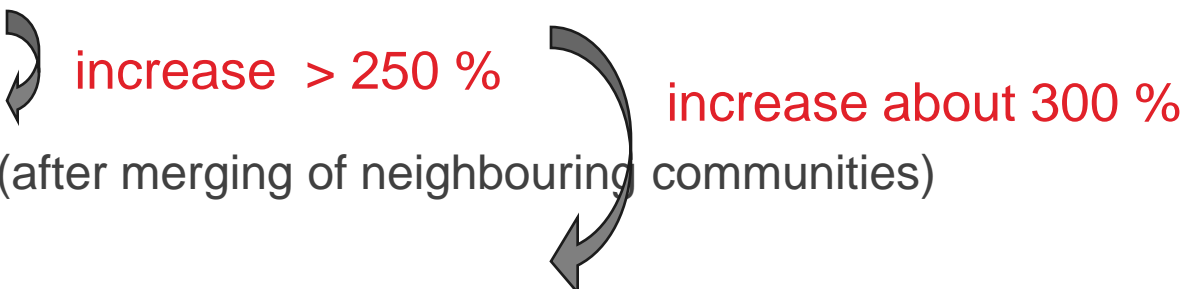


Bicycle use in Leipzig

facts

- 1998
 - 437,000 inhabitants owned about 236,000 bicycles
= about 540 bicycles per 1.000 inhabitants
- 2008
 - 511,000 inhabitants owned about 370,000 bicycles
= about 724 bicycles per 1,000 inhabitants
- increase between 1998 and 2008
 - about 134,000 bicycles
= 184 bicycles per 1,000 inhabitants
- share of bicycle traffic (Modal Split):
 - SrV 1990: 5,2 %
 - SrV 1998: 13,2 %
 - SrV 2003: 12,4 % (after merging of neighbouring communities)
 - SrV 2008: ...

increase > 250 % **increase about 300 %**





different kinds of tram stops

- tram stops with a waiting area in the middle of the road (like an island)
 - a) without access for handicapped people
 - b) useable for handicapped people (ramps and elevated entering area)

- tram stops with a waiting area beside the road (normally on a sidewalk)
 - a) without access for handicapped people
 - b) as an cap (closing up to the tram way)
 - c) with elevated road lane
 - d) with elevated cycling lane

main criteria for choosing the guidance of bicycle traffic

- safe guidance for cyclists
- existing space consideration for the needs of all users
- character and quality of the road: type and intensity of use



conflicts

- passengers boarding and leaving
- waiting passengers
- crossing passengers (moving from sidewalk to waiting area)
- risk of falling because of high curbs
(especially while crossing the tramway with an acute angle $< 50^\circ$)
- other motorized traffic

objectives for the tram stop design

- continuous and safe guidance of bicycle traffic
- efficient division of getting boarding and leaving passengers from bicycle traffic
- undisturbed tram operation and short duration of stay at the stop
- save and barrier free accessibility at the tram stop and for the tram itself

Tram stops with waiting area beside the road



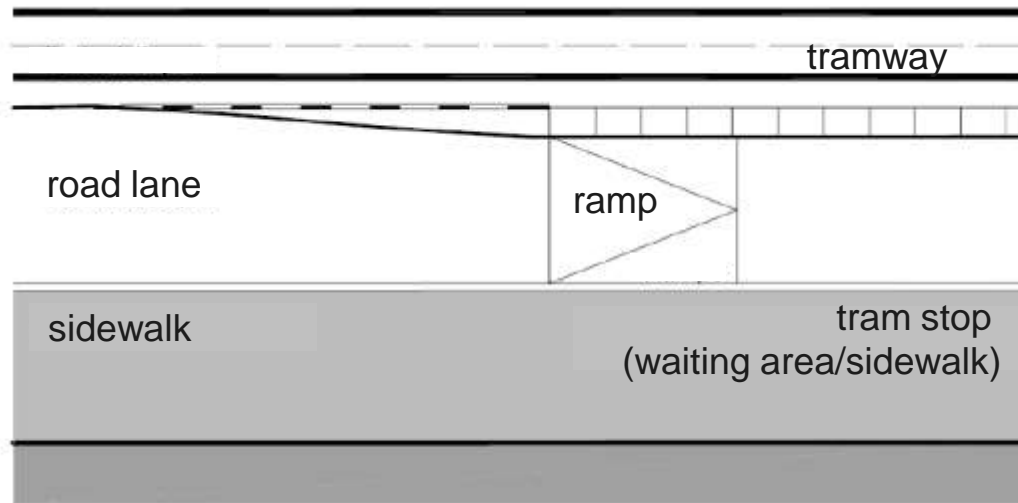
- possible combinations for guidance of bicycle traffic and of different kinds of tram stops if waiting area is situated on or close to the sidewalk
(from ERA-draft 01/09, FGSV, Köln 19.01.2009)

kind of stop	tram stop beside the road	elevated road lane	cap
guidance of bicycle traffic			
combined guidance of car and bicycle traffic on road with or without marked bike lane or other markings	possible	possible	partly possible, if bicycles going right of the tramway an elevated bicycle lane is advisable
guidance of bicycle traffic beside the road (on level of sidewalk/ waiting area)	partly possible depending on the width of side areas (sidewalk)	partly possible depending on the width of side areas (sidewalk)	possible

Tram stops with an elevated road lane



- principle of the elevated road lane
(from ERA-draft 01/09, FGSV, Köln 19.01.2009)



- guidance of car traffic over an elevated entering area
 - straight guidance of car and bicycle traffic
 - allows access for handicapped passengers (same level of road lane and tram floor)
- waiting area for passengers on sidewalk beside the road
- possible traffic lights to increase the safety while passengers boarding and leaving need to avoid widening of road lane about 3,50 m (from ERA-draft 01/09: 3,25 m)
 - critical passing between cars and bicycles

Tram stops with elevated road lane – Example Leipzig

„Pfaffendorfer Straße“ (tram stop „Zoo“ - city bound side)

■ **situation:**

high traffic amount (about 16,000 cars/24h)

no separate bicycle guidance before and after the tram stop exists

■ **guidance of bicycle traffic at the tram stop:**

on the road without special markings

installation of traffic lights to increase the safety for boarding and leaving passengers

elevated road lane to allow access for handicapped passengers



Tram stop with cap design - in general



- if there is a separate bicycle lane beside the road lanes before and after the tram stop, than there should normally be enough space for passenger waiting and entering
- straight guidance of bicycle traffic is possible
- solutions for narrow sidewalks could be similar to the design for caps of bus stops
- it is important to allow an undisturbed view between passengers and cyclists
 - transparent design of equipment (like shelters)
 - avoiding advertisement, posters etc.
 - possible usage of small fences to enforce the necessary field of view

Tram stop with cap design

Example Leipzig



situation in Leipzig

- during the 1990's : enforced rebuilding of tram stops with “island” design

advantages:

improved level of service for car traffic

improved accessibility for handicapped passengers (compared to the situation before)

short duration of tram stops

disadvantages:

waiting area in the middle of the road (noise, pollution, need to cross the road)

possible missing of the tram or otherwise high risk situation for “last minute” passengers

- today: choosing cap design for tram stops if possible

challenge: guidance of bicycle traffic



Leipzig today: more than 4 different kinds of tram caps exists

Tram stop with cap design and narrowing of the road

Example Leipzig

„Zschochersche Straße“ (tram stop „Elster Passage“)

- **situation:**
 - shopping street
 - high amount of traffic (10,500 – 14,900 cars/24h)
 - no specific bicycle infrastructure
- **guidance of bicycle traffic at the tram stop:**
 - continued on the road
 - need to cross the tram tracks

problem:

crossing the tracks = risk of accidents
for cyclists !



Tram stop with cap design and narrowing of the road

Example Leipzig



„Pfaffendorfer Straße“ (tram stop „Zoo“ - out bound side)

■ **situation:**

high volume of traffic (about 16,150 cars/24h)

bicycle guidance before and after the stop on the road with marked bicycle lane

■ **guidance for bicycles at the tram stop:**

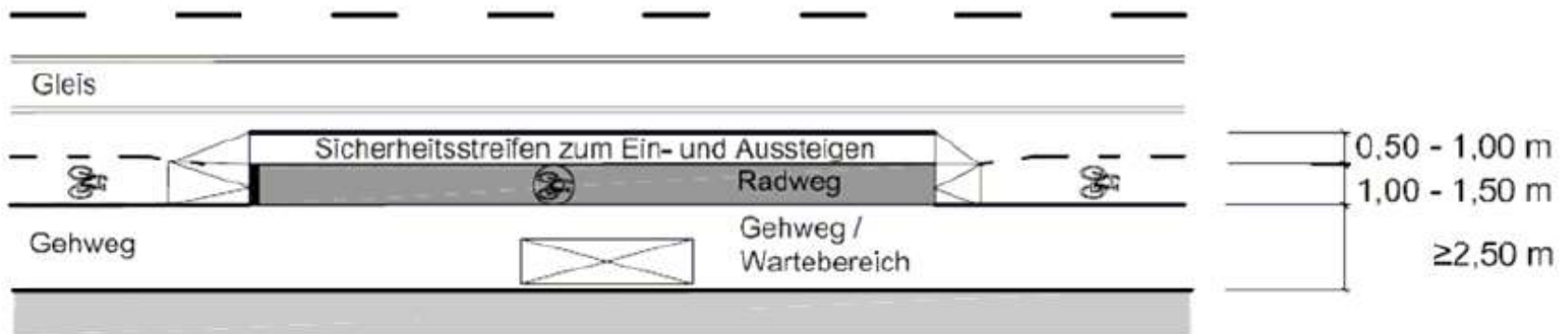
aligned bike lane between waiting area and sidewalk



Tram stop with cap design and elevated bicycle lane



■ principle:



needed space beside the road $\geq 4,00$ m

→ suggested signage: as pedestrian way and possible usability for cyclists
(from ERA-draft 01/09, FGSV, Köln 19.01.2009)

Tram stop with cap design and elevated bicycle lane

Example Leipzig

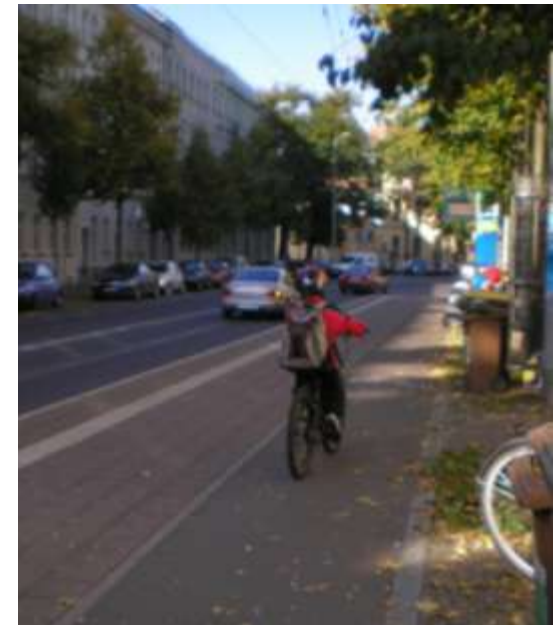
„Könneritzstraße“ (tram stop „Holbeinstraße“ – out bound side)

■ situation:

shopping street with a middle amount of traffic (about 5,350 – 15,350 cars/24h)
no existing bicycle infrastructure (planned after 2011)

■ guidance of bicycle traffic at the tram stop:

elevated (over the cap), between entering area and waiting area/sidewalk
no need for special signage as cyclists can use the road as well



Tram stop with cap design and elevated bicycle lane

Example Leipzig



„Könneritzstraße“ (tram stop „Holbeinstraße“ – city bound direction)



Tram stop with cap design and elevated bicycle lane

Example Leipzig

„Könneritzstraße“ (tram stop „Rödelstraße“ – city bound direction)

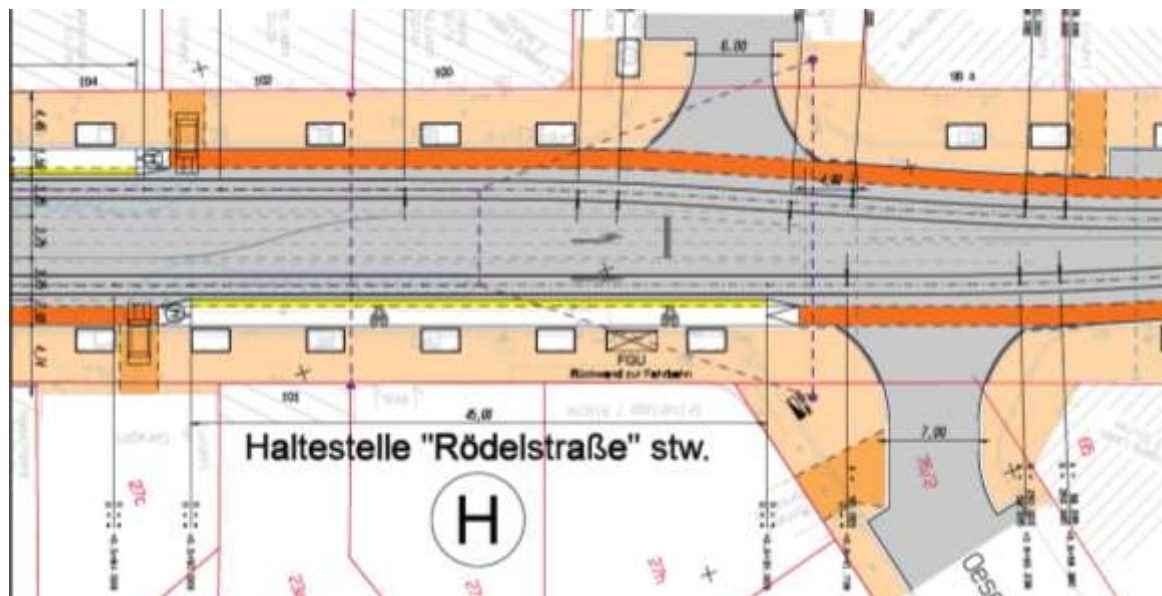
■ situation:

shopping street with a middle amount of traffic (about 5,350 – 15,350 cars/24h)
marked bicycle lane on road level before and after the tram stop

■ guidance of bicycle traffic at the tram stop:

elevated bicycle lane between road/tram way (lower level) and waiting area/sidewalk

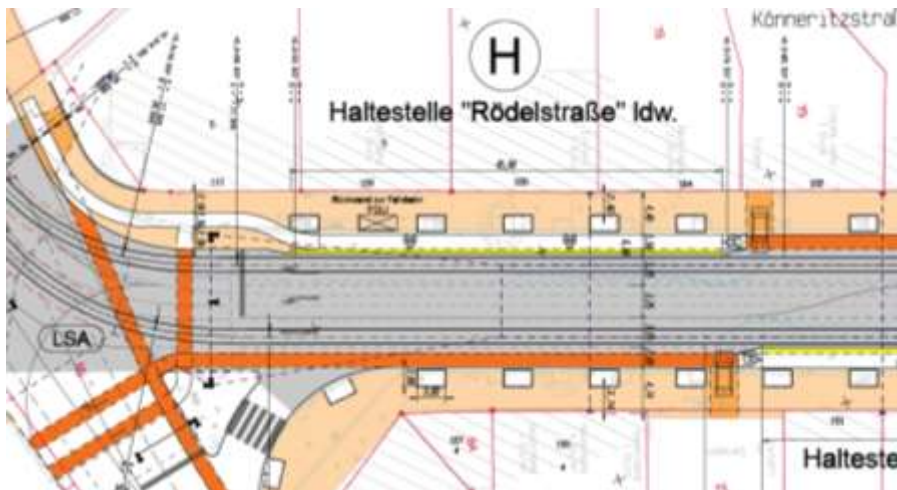
separation from waiting area/sidewalk
with curb stones of 3 cm height



Tram stop with cap design and elevated bicycle lane

Example Leipzig

„Könneritzstraße“ (tram stop „Rödelstraße“ – out bound direction)



Tram stop with cap design and deviated bicycle guidance - Example Leipzig

„Eisenbahnstraße“ (tram stop „Einertstraße“ – city bound side)

■ situation:

shopping street with a high amount of traffic (about 10,950 – 13,200 cars/24h)
bicycle lane before and after the stop (< min. width)

■ guidance of bicycle traffic at the tram stop:

as a bicycle way over the cap, between waiting area and sidewalk
behind the tram stop deviating back to the curb side
no need for special signage as cyclists can use the road as well



Tram stop with cap design and deviated bicycle guidance - Example Leipzig

„Lützowstraße“ (tram stop „S-Bahnhof Gohlis“)

- **situation:**
high amount of traffic (13,000-16,050 cars/24h)
marked bicycle lane before and after the tram stop
- **guidance at the tram stop:**
interrupting bicycle lane
ramp to the sidewalk
signage: as pedestrian way and possible usability for cyclists



Objective of the City of Leipzig

- Reducing the existing conflicts with cyclists at tram stops
→ The shown solutions try to reduce the problems. The conflict between cyclists and boarding and leaving passengers still exists.

Experience

- Because the reconstruction of the shown examples took part during the last 3 years, a final valuation is not possible.
- At this time some analyses being conducted.



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