



# **SOLUTIONS Training Kit**

## **Cluster 2: Transport Infrastructures**

[www.urban-mobility-solutions.eu](http://www.urban-mobility-solutions.eu)



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## About SOLUTIONS

SOLUTIONS aims to foster knowledge exchange and boost the uptake of innovative sustainable urban mobility solutions through the further exploitation of existing knowledge.

The main focus of the SOLUTIONS project is on the exchange between cities from Europe, Latin America and the Mediterranean.

The project looks at the following thematic areas:

- public transport
- transport infrastructure
- city logistics
- integrated planning / sustainable urban mobility plans
- network and mobility management
- clean vehicles

## Introduction to Cluster 2: Transport Infrastructures

**Transport Infrastructures:** infrastructure for public transport (tramways, bus lanes, passenger waiting and boarding areas), infrastructure for soft modes (e.g. cycle routes, pedestrian facilities) and infrastructure for urban freight systems. This element will also include better sharing of road-space.

**Issues:** improving the quality and safety of road infrastructure, design of cycle ways etc.

**Main focus:** present summarized information and recommendations about design of urban streets (sharing of road space) and the design for the cycling infrastructure improving the safety of infrastructure.

SOLUTIONS for	Type of impact
Dedicated bus lanes	Improve
Intermodal interchanges	Improve
Pedestrians infrastructure	Improve (avoid)
Improving non-motorised infrastructure – improving public space and urban road designs for cycling and walking	Improve (avoid)
Cycle infrastructure I - Innovative safe cycling infrastructure	Improve (avoid)
Cycle Infrastructure II – cycle highways	Improve (avoid)
Infrastructure for car and bike sharing	Improve (Shift)
Pedestrianisation of city centres and streets	Improve (Avoid)

## Solution 2.1: Dedicated bus lanes



Lille, France



## **Solution 2.1: Dedicated bus lanes**

### **Objectives and implementation**

- Dedicated lane for buses (emergency and some other designated vehicles) separated from other traffic
- Counter flow bus lanes, especially in congested urban areas have been shown to be effective in some places
- Can be combined with improvements to public space and improving pedestrian and cycling infrastructure
- Low effort compared to rail bound public transport

## **Solution 2.1: Dedicated bus lanes**

### **Drivers**

- Allow the commercial speed of buses to be maintained so that they run to timetable
- Making services more reliable and help deliver fuel saving due to smoother driving
- Average travel speed is higher than for buses within mixed traffic
- Travel is safer for passengers

### **Barriers**

- Lack of space especially in central urban areas and historic city centres
- Resistance from other road users; allowing cyclists & taxis has been successful in some places



## **Solution 2.1: Dedicated bus lanes**

### **Examples**

- Implemented in many European cities especially London, Berlin, Paris, Nice, Nantes, Dublin etc.
- Paris and Berlin: examples for contraflow lanes; can be a useful & low cost way of ensuring that private cars and other traffic do not use the bus lanes



## Solution 2.2: Intermodal interchanges



intermodal interchanges scheme

## Solution 2.2: Intermodal interchanges

### Objectives and implementation

- Allows people to change from one mode of public transport to another
- Provide passengers with convenient & more seamless journeys
- Different types: large and complex (connecting international travel with regional & and local transport); small (bus based route interchanges)
- Crucial for success: understand the requirements of the users, both existing and potential new ones



## **Solution 2.2: Intermodal interchanges**

### **Drivers**

- Sound sustainable urban mobility planning

### **Obstacles**

- Fragmented and uncoordinated transport authorities and operators

## Solution 2.2: Intermodal interchanges

### Examples

- Moncloa interchange in Madrid (ES)
- St Pancras International, (London, UK)
- Gare du Nord (Paris, FR)
- Köbánya-Kispest in Budapest (HU).
- EU NICHES, NODES and CITYHUBS projects



## **Solution 2.3: Pedestrians infrastructure: improving the safety of crossing roads using infrastructure measures**

## **Solution 2.3: Pedestrians infrastructure**

### **Objectives and implementation**

- Improve safety and comfort of pedestrians
- Increase their visibility
- Examples: central protective islands on roads, extended pavements, narrowing of the roadway, elevated surface of roadway, improved placement of information signs and lighting
- Measures can be implemented individually or combined

## Solution 2.3: Pedestrians infrastructure

### Drivers

- Considerably improved safety and comfort of pedestrians
- Generally improved quality of life in the locality (reduced noise, aesthetics)
- Low technical and financial efforts

### Obstacles

- Funding
- Lack of political will of local authorities



## **Solution 2.3: Pedestrians infrastructure**

### **Examples**

Many cities in Europe have implemented this solution and it can be easily transferred.



## **Solution 2.4: Improving non-motorised infrastructure – improving public space and urban road designs for cycling and walking**



Munich, Germany (Harald Schiffer)

## **Solution 2.4: Improving non-motorised infrastructure**

### **Objectives and implementation**

- Provide guidelines and common standards on the planning and design of urban roads and public space
- Balance the needs of users (motorised, mechanised and pedestrian)
- Planning and design must be based on liveability and quality of life
- Create a culture of shared space and tolerance
- Keeping speeds reasonable for the safety of all users
- (New) materials, colours and designs can be used to enhance the urban transport environment



## **Solution 2.4: Improving non-motorised infrastructure**

### **Drivers**

- Increases the attractiveness of non-motorised transport
- Helps balance people's choice of travel mode (level playing field approach)

### **Obstacles**

- Lack of recognition of the importance of vulnerable road users

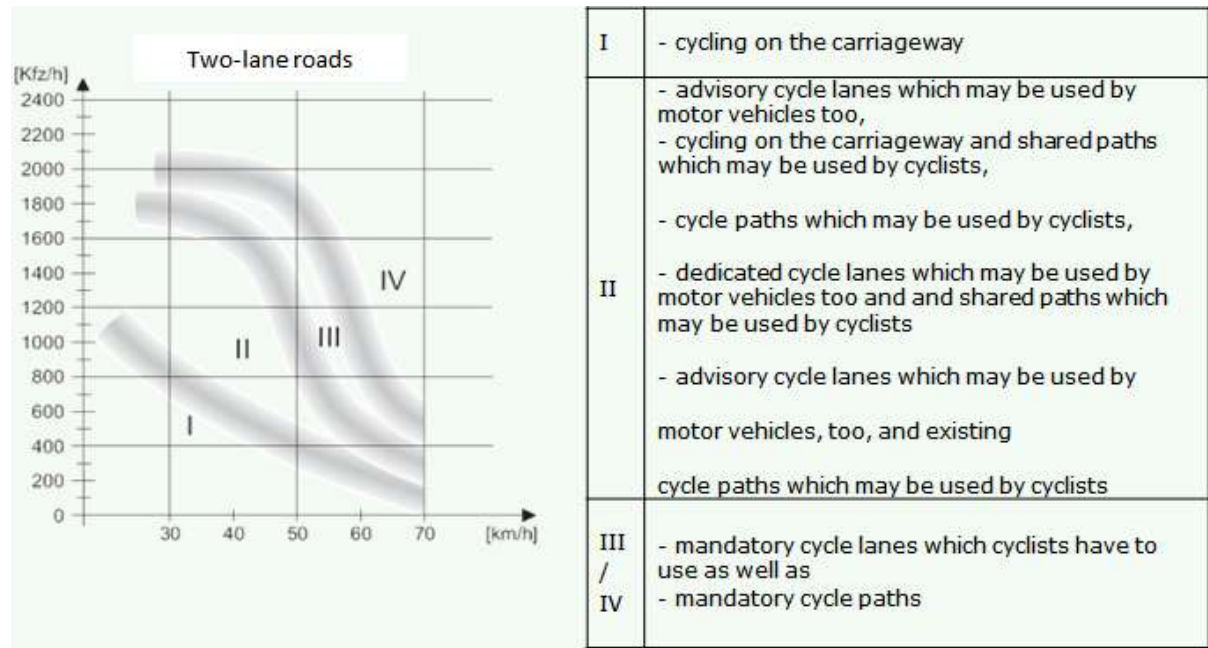
## Solution 2.4: Improving non-motorised infrastructure

### Examples

- Netherlands, Germany and France (especially where new light rail routes bring public space improvements)



# Solution 2.5: Cycle infrastructure I - Innovative safe cycling infrastructure



Areas for the pre-selection of suitable forms of cycle facilities types (FSGV 2010 )



## **Solution 2.5: Cycle infrastructure I - Innovative safe cycling infrastructure**

### **Objectives and implementation**

- Helps to increase the modal share of cycling by improving safety
- Provides innovative cycle infrastructure
- Segregated cycle lanes, separated lanes using different materials, contraflow lanes, Dutch-style roundabouts, cycle counters
- high and low level cycle signals dealing with 'right-turn' traffic/'left-turn' traffic (UK)



## **Solution 2.5: Cycle infrastructure I - Innovative safe cycling infrastructure**

### **Drivers**

- Best share space between individual/commercial motorised traffic
- ensure that speed restrictions and safety concerns are fully satisfied

### **Obstacles**

- Political background („motorised traffic more important“)
- Insufficient road width (for segregated lanes)



## **Solution 2.5: Cycle infrastructure I - Innovative safe cycling infrastructure**

### **Examples**

- UK
- The Netherlands
- Germany
- Spain



## Solution 2.5: Cycle infrastructure I - Innovative safe cycling infrastructure

### Examples



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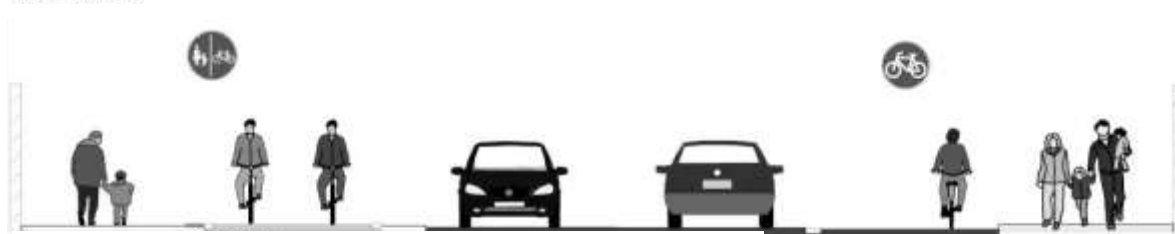
## Solution 2.6: Cycle Infrastructure II – cycle highways



footway

cycle high way

Off-street cycle highway (FGSV)



Cycle highways on urban streets (FGSV)

## **Solution 2.6: Cycle Infrastructure II – cycle highways**

### **Objectives and implementation**

- Part of a cycling network in a municipality or an urban-rural region
- Link major target areas over long distances with safe and attractive cycle routes allowing high speeds



## **Solution 2.6: Cycle Infrastructure II – cycle highways**

### **Drivers**

- Makes crossing a city shorter
- Improves cycling speeds in a safe environment
- Health benefits

### **Obstacles**

- Lack of knowledge and responsibility at municipal level (e.g. no cycle infrastructure officer)
- Funding

## Solution 2.6: Cycle Infrastructure II – cycle highways

### Examples

- Netherlands, Denmark, Germany, UK and Spain



Netherlands (©Jörg Thiemann-Linden)



Netherlands (©Jörg Thiemann-Linden)

## Solution 2.6: Cycle Infrastructure II – cycle highways

### Examples



Denmark (©Dankmar Alrutz)



Denmark (©Dankmar Alrutz)



UK (©Jörg Thiemann-Linden)

## Solution 2.6: Cycle Infrastructure II – cycle highways



Netherlands (©Dankmar Alrutz)



Green Ring in Madrid (Colmenar)



Cycleway in San Sebastián



## **Solution 2.7: Infrastructure for car and bike sharing**



## **Solution 2.7: Infrastructure for car and bike sharing**

### **Objectives and implementation**

- Make car and bike sharing attractive
- Planning and allocation of space in highly visible areas of city centres for car and bike sharing stations
- Usually involves removing parking



## **Solution 2.7: Infrastructure for car and bike sharing**

### **Drivers**

- increases the opportunity for integrated mobility and reduces the need to own a car in cities

### **Obstacles**

- Removal of parking or road space from cars
- resistance from public transport operators if they are not involved in the car or bike schemes
- Political or institutional barriers



## Solution 2.7: Infrastructure for car and bike sharing

### Examples

- Brussels (co owned car and bike schemes by the public transport organisation)
- London
- Paris
- Berlin

## Solution 2.8: Pedestrianisation of city centres and streets



## **Solution 2.8: Pedestrianisation of city centres and streets**

### **Objectives and implementation**

- Improve safety, air quality and the liveability of public spaces
- Restrict access of cars and commercial vehicles to areas or roads in a city
- Allow public transport, emergency vehicles and deliveries (at certain times)
- Restrictions can be implemented by infrastructure measures, retracting bollards or electronic devices

## **Solution 2.8: Pedestrianisation of city centres and streets**

### **Drivers**

- Improvement of the quality of public space
- Improvement of social inclusion
- Noise reduction
- Improvement of local air quality

### **Obstacles**

- Lack of political will
- Poor planning
- Resistance of uninformed retail owners and commercial players
- Lack of parking in area
- Poor communication and stakeholder engagement
- Poor signage/restriction enforcement



## **Solution 2.8: Pedestrianisation of city centres and streets**

### **Examples**

- Most major European cities
- Many market towns and numerous historical cities (especially in Italy)

# Thank you!

## Contact us:

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