Ricardo Energy & Environment

Guidance for Cycling Projects in the EU – Validation Workshop (DG MOVE)

EU Cycling Summit, Salzburg

Charlotte Brannigan, Tom Nokes (Ricardo), Ian Skinner (TEPR)

25th September 2018, 13.00-14.30

TEPR Transport & Environmental Policy Research

FGM AMOR austrian mobility research

1. Welcome and brief overview

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Agenda

1. Welcome and Brief Overview
2. Structure and content of the overall guidance
3. Structure and content of measure-specific section
   - **Breakout session 1**
4. Structure and content of minimum quality standards
   - **Breakout session 2**
5. Concluding wrap-up session

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Projects aim and objectives

- **Client:** DG MOVE
- **Duration:** 12 months
- **Aim:**

  "*To develop guidelines that will foster the implementation of measures to promote cycling which are appropriate to the local context of cities*".

- Fits in with the broader framework of the EU goals set out in the Transport White Paper and the Urban Mobility Package.
- Cities and local authorities are in the best position to understand their unique local conditions, and are best placed to take the responsibility for implementation of such initiatives.
- At the same time, the EC can add value by providing an overall EU framework that provides clear, unbiased, coordinated and verified information.
- This will support entities in navigating the challenges, help to disseminate best practice, and enhance awareness of the potential for cycling to contribute to more sustainable urban mobility.

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Guidelines for cycling projects in the EU

Where do I start?

What are the issues faced by my city?

What measures are available?

What are the impacts of cycling measures?

What has worked elsewhere?

What will work in my city?

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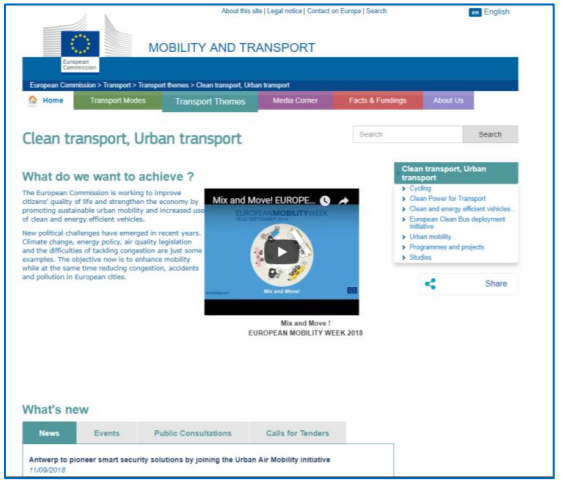
Guidelines for cycling projects in the EU



- Online, interactive guidance at the EU level
- Bringing together existing guidance on cycling infrastructure
- Enabling easier searching, filtering and digestion of the information
- Tailored to city categories/types
- *The structure and content of the guidance will be finalised using feedback from this validation workshop*

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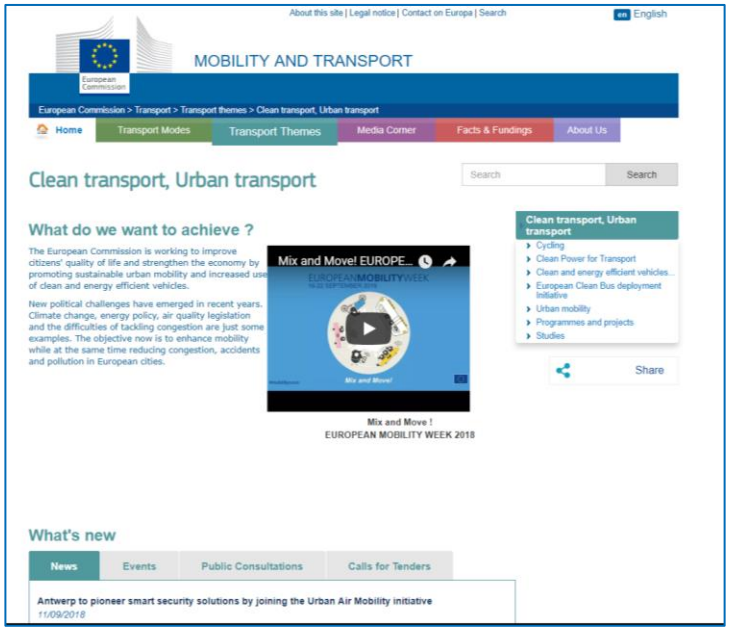
Methodology overview

Supported by an Advisory Panel: ECF, Eurocities, Polis, ICLEI, Bypad / Euro Cyclogistics Fed, EPOMM,



Part 1: Measures

Case studies

1. Selection and characterisation of cities
2. Analysis of selected measures in each city

Guidance on measures: Collation and analysis

Part 2: Minimum standards

Minimum infrastructure standards: Collation and analysis

Desk research / literature review

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Selection and characterisation of 20 case study cities

Metropolises (over 2m)	
Berlin	🚲🚲
Budapest	🚲
Larger urban areas (1-2m)	
Brussels	🚲
Copenhagen	🚲🚲🚲
Gdansk	🚲🚲
Seville	🚲🚲
Large urban areas (0.5-1m)	
Malmö	🚲🚲🚲
Ljubljana	🚲🚲
Tallinn	🚲

Medium urban areas (0.1-0.5m)	
Nijmegen	🚲🚲🚲
Burgas	🚲🚲
La Rochelle	🚲🚲
Brighton	🚲
Košice	🚲
Bolzano	🚲🚲🚲
Small urban areas (under 0.1m)	
Trikala	🚲🚲🚲
Agueda	🚲
Bregenz	🚲🚲🚲
Hradec Kralove	🚲🚲
Slatina	🚲

Key

North, North West
Baltics, Eastern, Central
Southern, Mediterranean

Starter	🚲	Under 5%
Climber	🚲🚲	5-20%
Champion	🚲🚲🚲	20%+

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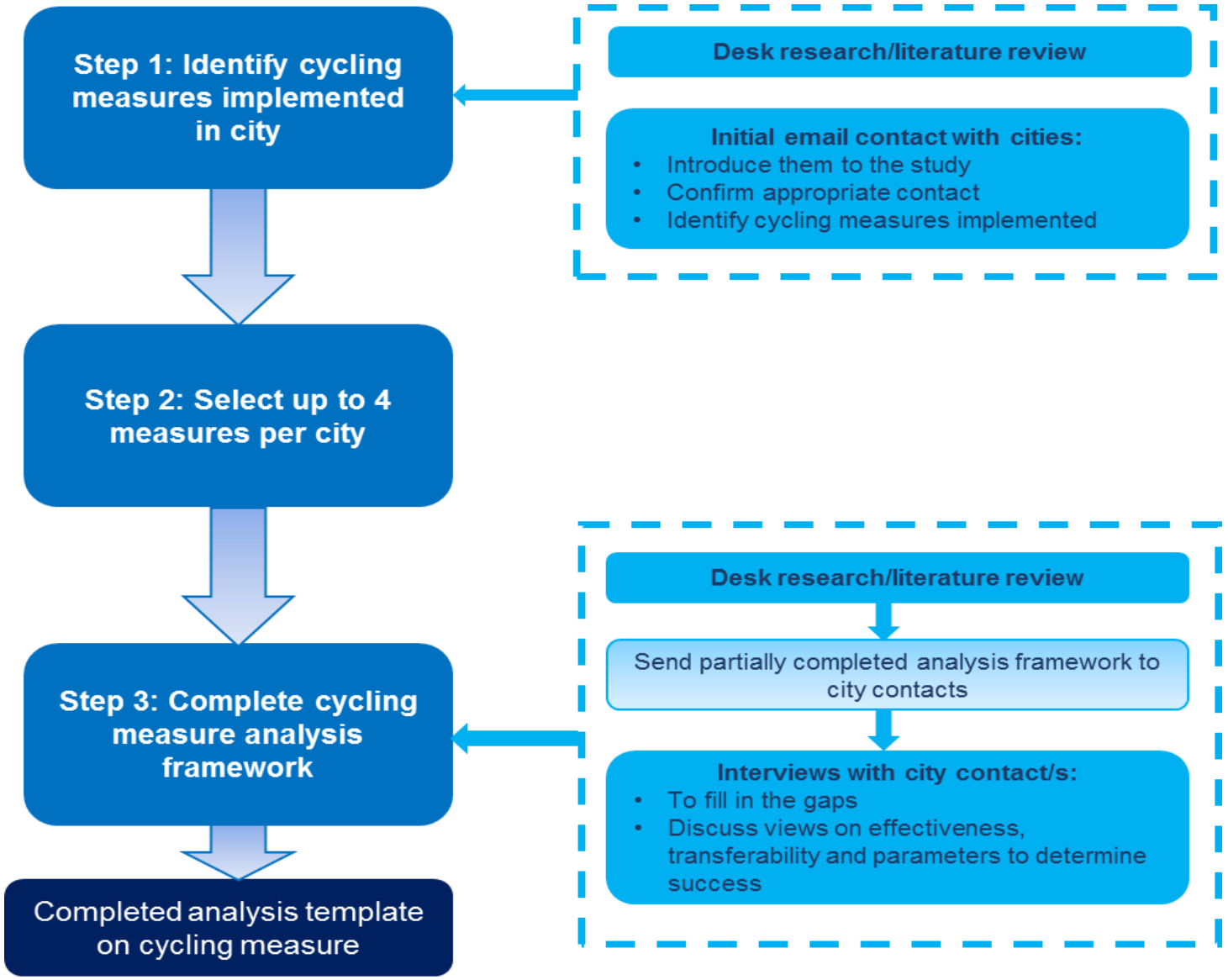
Analysis of selected cycling measures in each case study city



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Collation and analysis of existing guidance on measures

STEP 1: Identify and review existing guidance documents:
- Literature review / web search
- Suggestions from Advisory Panel members
- Suggestions from interviews with stakeholders

STEP 2: Extract relevant information in review template:
- Information on scope, geography, city-types and cycling initiatives covered

STEP 3: Further input, clarification and tailoring
- Targeted interviews with selected authors of relevant guidelines (up to 10)
- Feedback from Advisory Panel members
- Feedback from participation in cycling events

Standardised fiches for each of the key existing guidance documents/projects → Referred to in guidance

Similar approach taken for Minimum infrastructure standards (Part 2)

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Key deliverables

- Online guidance on cycling projects in the EU:
  - Part 1: Measures
  - Part 2: Minimum infrastructure standards
- Hosted by the Commission – http://ec.europa.eu/transport

- Available end December 2018

- Draws upon:
  - Case study city engagement and information
  - Comprehensive literature review of existing guidance on measures
  - Comprehensive literature review of existing minimum infrastructure standards
  - Feedback from this validation workshop

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Workshop aims

- To explore / receive feedback on:
  - **Session 2: Overall guidance**
    - Content
    - Means of access
  - **Session 3: Guidance on individual cycling measures**
    - Measures covered
    - Structure/presentation
  - **Session 4: Minimum quality standards for cycling infrastructure**
    - Infrastructure for which minimum standards presented
    - Structure
    - Level of detail

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Workshop feedback

- Following the workshop, we will circulate the following:
  - Workshop slides
  - Summary of workshop discussion
  - List of current guidance/standards/literature
  - Link to online survey to provide further feedback

Please leave your card or email details in order to receive the above information

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Any questions?

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2. Structure and content of the overall guidance

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Cycling infrastructure guideline content – access to information

Introduction / Home page

Landing page, appealing to all

Overview of guidance / 'How to'

Process overview

'Your city' and measure identification

Guidance Topics

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Cycling infrastructure guideline content – access to information

Introduction / Home page — Landing page, appealing to all

Overview of guidance / 'How to' — How to use this best practice guidance

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How to use this best practice guidance

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1. What sort of city am I and what measures can I introduce to encourage and support cycling?
2. How can I develop a strategic approach to encouraging cycling that is appropriate for my city?
3. How can I design and adapt cycling measures so that thy are tailored to my city's needs?
4. How do I implement measures and evaluate their success?
5. How do I ensure that cycling in my city continues to improve?

'Your city' and measure identification

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	What type of 'cycling city' is my city?
	What measures / solutions would suit my city and the challenges it faces?
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Guidance Topics	**Cycling measures**
	Minimum quality standards
	Interesting tools – SUMPs, HEAT, BYPAD etc.
	Other resources for developing cycling action plans for your city

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Links to existing CYCLING GUIDANCE

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Session 2 – Key questions – Guideline content

- Guideline content

1. Does the overall content and structure make sense?

- Using the site:

2. Does enabling access by ‘measure’ and ‘challenge’ make sense?

3. How else, as a potential user, might you expect to access the information on the site?

4. What information should be on landing page to make it appealing to potential users?

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3. Structure and content of measure-specific section

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Cycling Measures Covered

Encouraging conditions for fostering cycling

Organisational measures and legal frameworks

Information, communication and promotion

Monitoring and evaluation

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Cycling Measures Covered

Groupings	Cycle measure
Hard Infrastructure	Cycle lanes
	Cycle tracks
	Cycle (super)highways
	Grade separated crossings
	Intersections
	Contra-flow lanes
Soft Infrastructure	Mixed-use zones
	Cycle streets
	Cycle logistics
	Multimodal integration
Cycle parking and associated infrastructure for bicycles and cyclists	Cycle parking
	Provision of facilities at workplaces
	Bicycle maintenance/repair facilities
Provision of information and awareness raising	Cycle information and awareness raising campaigns
	Cycle events and activities
	Cycle training
	Bicycle maps, signage and wayfinding
Encouraging conditions for fostering cycling	Speed limits / traffic priorities/management / ITS technology
	Traffic restrictions and charges, including parking
Organisational measures and legal framework options for cycling	Bicycle Steering Group
	Bicycle development strategy
	Subsidies
	Monitoring and evaluation
Services, products and supporting measures	Bike sharing schemes (including rental)

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Overarching structure of information provided for each section

Section	Description
Measure Grouping	Cycle measure grouping
Cycling measure	Name of cycling measure
High Level Overview	
Definition	One sentence overview of measures
Considerations for applicability	Level of cycling, Topography, Tourist destination, Student population
Main impacts	Congestion, Accessibility, Environment, Health, Community, Road Safety, Economy, Modal share
Resources required	Finance, Time, Manpower
Detailed Information	
Description of the measure	Key Features, Function and objectives, Range of alternatives, Links with other measures
Performance	Impacts that can be expected from implementation
Parameters of success/failure	Contextual factors required to ensure success, including key lessons for transferability
Relevant guidance and literature	Hyperlinks to the relevant EU/national guidance and literature

Reference to city case studies

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Measure example: Cycle Track

– *A cycle track is part of the road network used exclusively by cyclists with physical separation from motorised traffic.*

Considerations for applicability

LEVEL OF CYCLING	TOPOGRAPHY	TOURIST DESTINATION	STUDENT POPULATION
YES	YES	YES	YES
[text]	Flat cycle tracks are more comfortable and attractive. Consider the impact on the directness of the route when avoiding steep topography.	[text]	[text]

Main Impacts

CONGESTION	ACCESSIBILITY	ENVIRONMENT	HEALTH
2	2	2	2
[text]	[text]	[text]	[text]
COMMUNITY	ROAD SAFETY	ECONOMY	MODE SHARE
1	3	1	2
[text]	Cycle tracks provide a physically separated space in which cyclists can travel without mixing with motor vehicles. It is the safest bikeway that can be implemented.	[text]	[text]

Resources Required

FINANCE	TIME	MANPOWER
2	2	2
Require the physical adaption of existing road or pavement, which may include installing bollards or creating grade differences	[text]	[text]

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Measure example: Cycle Track

Cycling Measures: Cycle Tracks

Key features

Key Features:: Also known as bicycle paths or hybrid bike lanes, cycle tracks are characterised by physical separation, which is achieved by partitioning objects or by raising the level of the track above the carriageway. They can only be used by cyclists and motor vehicles are not allowed to drive or park on them. The tracks usually run alongside the roadway but can also deviate from the road network - these are known as solitary cycle tracks

Function and objectives: Due to the physical segregation of cycle tracks from road traffic, they provide cyclists with significant safety benefits. Having a dedicated cycling space that provides efficient connections within an urban area, will also increase the appeal and accessibility of cycling. The Old Shoreham Road cycle track in Brighton provides a route for young people to travel to school on foot or by bike, while also contributing to reducing road congestion during peak times. The main aim of cycle tracks in Berlin is to increase traffic safety by improving the visibility and protection of cyclists in road space. The original objective of Seville's cycling network was to foster cycling as a sustainable alternative to car transport in an area without any cycling tradition.

Range of alternatives : Traffic calming measures can be used as an alternative to cycle tracks by creating conditions that are suitable for traffic mixing. Cycle streets can be implemented on major routes through residential areas. A cycle lane can be used when the space or budget is not available for a cycle track. Furthermore, at adequate traffic volumes and speeds, cycle lanes can be suitable.

Links with other measures:

- Strategically positioned cycle parking along a cycle track route can increase the number of cyclists as a result of improved attractiveness, accessibility and intermodality.
- Grade separated crossings such as bridges and tunnels can also improve the performance of a cycle track by ensuring the continuity and improving coherence and directness.
- There are several complementary information and awareness raising measures, including cycle maps, cycling events and signage. These measures contribute to raising the profile of the cycle track and increasing its attractiveness.

Performance

The most important impact of cycle tracks is improved road safety resulting from the separation of cyclists and motorised road traffic. Seville have seen a reduction in the percentage of cyclists involved in fatal or serious accidents, since the introduction of its cycle network.

Cycle tracks can be used to improve connectivity and the accessibility of a city. In Brussels, the development of the inner ring road will provide cyclists and pedestrians with a network that links busy metro stations with green space and commercial areas.

The improved safety and accessibility that cycle tracks can provide will often result in a modal shift from private cars and public transport to cycling, as measured in Seville. As well as health and environmental benefits, a reduction in motorised traffic will improve congestion, a major issue facing many European cities.

While cycle tracks can offer a safe and direct route for cyclists using the road network, consideration must be given to the design and number of intersections. The sudden mixing of cyclists and road traffic at intersections can result in dangerous situations, and cycle tracks with many intersections will increase waiting times. Intersection design options and examples of best practise are presented in a separate factsheet.

Parameters of success/failure

Underpinning many parameters for a successful bike route is a good understanding of where the bike track will be built. This includes understanding the stakeholders affected, the opinion of the public, the characteristics of the road and existing initiatives and agendas. This understanding can be achieved through extensive stakeholder consultation and/or by building a multidisciplinary team to deliver the project, such as the Brussels Mobility team.

Effective consultation with local residents, cyclists and businesses will ensure support and approval for the cycling infrastructure. In Brussels , visuals were used to help clearly communicate the vision of the project. In Brighton, extensive consultation allowed the bike track to be designed so that it supported the way in which local citizens and students used the area, as well as how future users could potentially use the scheme.

Opposition to the implementation of cycle tracks can be a challenge for any city. As demonstrated by the Brussels case study, an effective traffic management plan can alleviate the negative impacts that may result from reduced parking spaces or the removal of motor vehicle lanes. Furthermore, each of the case studies below comment on the importance of strong political and citizen advocacy.

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Measure example: Cycle Track

Case study: Brighton, UK - Old Shoreham Road 'stepped track' segregated cycle lane

Background and context

The sustainable transport policy of Brighton's Development Plan identified the Old Shoreham Road as one of the areas in which investment would be made to improve the public realm by encouraging and enabling cycling and walking. Consultation with local residents had previously identified support for more cycle facilities along this part of the road network.

The Old Shoreham Road is an A-road (A270) that connects the city centre to locations to the west of the city. Prior to the completion of the A27 bypass around Brighton, the Old Shoreham Road was the main coastal route through the city from the west, but the road continues to carry substantial amounts of traffic. Prior to the introduction of the scheme, speeding was an issue on this section, with vehicles regularly speeding over 45 mph (the speed limit is 30 mph).

Details of the scheme

The Old Shoreham Road cycle lane scheme involved the introduction of an off-road cycle lane along a 1.5km section of the road. As the section links a number schools and further education colleges, the aim of the scheme was to provide a route for young people to travel to school on foot or by bike. This would also contribute to reducing road congestion during peak times. In the longer-term, the intention is to extend the scheme further west along the Old Shoreham Road.

The measure included:

- Fully segregated one-way cycle lanes on each side of the road. This was achieved with a low kerb edge, often referred to as a 'stepped track' or 'hybrid' cycle lane, whereby the cycleway is built higher than the carriageway, but lower than the footway.
- Improvements to junctions including side road entry treatments. This ensures continuation of the route, makes crossing the road easier for pedestrians and people with mobility problems, and improves awareness of the cycle track amongst drivers.
- Shared areas for cyclists and pedestrians at bus stops.
- Toucan crossings and for cyclists
- A new zebra crossing, with a shared area for cyclists and pedestrians around the crossing.

Performance

The cycle track is along a key route that provides access to education establishments and the city. Therefore, an increasing number of people use the route to get to school, college or work – a bicycle counter has demonstrated that cycling on that proportion of the road continues to increase.

Parameters of success

The City Council understood the local area and so the various elements of the scheme were designed to facilitate the way in which local citizens and students used the area, as well as how future users could potentially use the scheme.

Extensive consultation was undertaken on the detail of the scheme. This also helped to deliver the second important element behind the success of the scheme, i.e. that it had the approval of local residents and potential users.

Additionally, the segregated track was implemented on the most direct route in the area, and so minimised travel time for cyclists. From the perspective of planning a journey, this is the most convenient approach for the user.

Transferability

The scheme transferable to situation of similar circumstances, i.e. where there are high volumes of vehicles and where there is concern about the speed of the motorised traffic. The stepped track design was used to make the most of the limited space, which did not allow for a fully segregated cycle lane to be introduced.

The location of the scheme also tied in well with other initiatives, such as 'safe routes to school' and the desire to encourage young people to cycle safely within the city. The need to improve road safety in this context was an important selling point of the scheme.

Key insights and lessons learned

The consultation with local residents and potential users was important. This enabled the city Council to understand local concerns and needs, as well as the future potential use of the scheme. It also helped to gain the support of the local residents and has helped to ensure that the segregated lane is used.

- In order to promote the scheme locally, it was important to link the scheme to other agendas, such as the need to improve road safety and to encourage young people to cycle .

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1. Description of the measure
2. Performance
3. Key parameters of success/failure
4. Case study city examples
5. Relevant guidance, literature etc

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Breakout Session 1

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Breakout Session 1 – Key questions – Cycling measures

1. Has the information on each measure been presented/structured in a way that makes sense to potential users? *(see handout)*

2. Have the relevant measures been covered? *(see handout)*

3. What level of detail is appropriate for cycling measures (considering guidance should not duplicate existing work)?

4. Identifying measures that are appropriate in the context of local cities – have we gone far enough in considering application of measures / transferability for different cities?

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4. Structure and content of minimum quality standards

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Developing guidelines with minimum standards for cycling infrastructure - Requirements

1. **Define minimum quality criteria:**
   - Without addressing detailed technical solutions (e.g. surface material, lane width)
   - Focussing on quality aspects from the users' perspective (e.g. cyclists' constraints related to factors like co-existence with motorised traffic, constraints inherent to the applicable legislation in the Member States, etc.)

2. **Cover in particular for the relevant infrastructure:**
   - Safety
   - Comfort
   - Accessibility
   - Coherence
   - Attractiveness
   - Adaptability
   - Value for money
   - Sustainability (economical, environmental, social)

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Developing guidelines with minimum standards for cycling infrastructure - Requirements

3. **Be intended for implementation at local, regional and national levels;**

4. **Take account of and cover the following elements:**
   - Users' needs – designing principles
   - Network planning (functions and solutions), including the integration of cycling in SUMPS where applicable
   - Different types of cycling infrastructure
   - Surface solutions and criteria for all types of infrastructure
   - Intersection solutions and criteria
   - Signs and marking solutions and criteria
   - Cycle parking and other connected facilities solutions and criteria
   - Maintenance and management solutions and criteria
   - Usage by standard bikes and bikes with electric motor assistance (e-bikes)

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Developing guidelines with minimum standards for cycling infrastructure - Purpose and overview

Purpose

The aim is to outline the minimum quality criteria for cycling infrastructure in cities across Europe, offering a holistic view of key requirements rather than prescribing detailed advice. This guidance recognises the differing levels of cycling engagement and infrastructural development across cities/Member States. Therefore, where appropriate, the standards will highlight where recommendations are of particular relevance to starter cities or champion cities.

Overview

- Development of guidelines on minimum quality criteria for cycling infrastructure – presented as one of the 'guidance topics' in the online guidance
  - Series of topics included in TOR – streamlined with the Commission/Advisory Group
- Identified standards/criteria in the literature review – national level, associations etc.
  - Further standards identified via interviews with stakeholders
- Drawn upon the best and most appropriate standards from the various existing publications produced as part of other projects
- Guidelines produced will be concise
- Considers the different 'level' or ambition of cities – starter, climber, champion

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Developing guidelines with minimum standards for cycling infrastructure - Structure

1. Different types of cycling infrastructure
2. Cycle parking and other connected facilities solutions and criteria
3. Intersection solutions and criteria
4. Signs and marking solutions and criteria
5. Surface solutions and criteria for all types of infrastructure
6. Maintenance and management solutions and criteria
7. Usage by standard bikes and bikes with electric motor assistance (e-bikes)
8. Users' needs – designing principles
9. Network planning (functions and solutions), including the integration of cycling in SUMPS where applicable

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Developing guidelines with minimum standards for cycling infrastructure - Structure

1. Different types of cycling infrastructure
   - Safety
   - Comfort
   - Accessibility
   - Coherence
   - Attractiveness
   - Adaptability
   - Value for money
   - Sustainability (economical, environmental, social)
2. Cycle parking and other connected facilities solutions and criteria
3. Intersection solutions and criteria
4. Signs and marking solutions and criteria
5. Surface solutions and criteria for all types of infrastructure
6. Maintenance and management solutions and criteria
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8. Users' needs – designing principles
9. Network planning (functions and solutions), including the integration of cycling in SUMPS where applicable

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Minimum quality standards example: Different types of cycling infrastructure - Safety

Summary

Cycling infrastructure refers to the hard and soft measures implemented to support the uptake of cycling within a region. Safety is an essential component to consider in the implementation and advancement of cycling infrastructure within cities. The suitability of the following recommendations will depend on the level of expertise and embeddedness of cycling within a city. To learn more about implementation specific measures, refer to **cycling measures**.

Recommendations

1. Provide adequate space for cyclists

- Ensure cycle lanes/tracks/highways are of adequate width:
  - To enable overtaking where required
  - To accommodate different types of bicycles (e.g. cargo bikes and bicycles with trailers that require more space)
  - To accommodate increasing speeds due to increased use of electric bicycles

2. Ensure infrastructure is well-lit

- Well-lit infrastructure to ensure the visibility of cyclists

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Minimum quality standards example: Different types of cycling infrastructure - Safety

3. Consider segregation between cyclists and motorised traffic on busy roads

- Segregation and/or buffers can be implemented on busier roads to enhance the safety of cyclists
- Average traffic volume and speed should be considered
- Options include bollards, concrete blocks and barriers, alongside subtler measures, such as raised road markings

4. Consider mixed-use approach on low traffic speed/volume roads

- Increasing the visibility of cyclists
- Reducing traffic speeds further

5. Give cyclists priority

- Where possible, consider the priority given to cyclists, including the implementation of cycle streets, priority at intersections by signalling and built infrastructural elements and etc.

For starter cities in particular, it is essential to prioritise traffic safety and traffic management measures. In particular, measures which focus on ensuring the safety of parts of the network which put more vulnerable groups at risk, such as school routes, are important to confront first (CIVITAS, 2018).

Advanced segregation measures can enhance the safety of existing cycling networks. For more detail on the most suitable method of segregation, explore the Transport for London (2014) international best practice study.

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Minimum quality standards example: Different types of cycling infrastructure - Comfort

Summary

Cycling infrastructure refers to the hard and soft measures implemented to support the uptake of cycling within a region. Ensuring the comfort of cyclists is maximised is a key requirement for driving the uptake of cycling within cities. Smooth and well-maintained cycle networks, with minimum gradients, enhance cycling networks through improving safety and the enjoyment cyclists experience.

Recommendations

1. Design cycleways with **smooth, even surfaces**

- to enable cyclists to enjoy their surroundings, without feeling the need to look out for uneven elements in the cycleway surface

2. Choose an appropriate cycleway surface material

- Based on the primary type of user the cycleway plans to serve (e.g. recreational, commuter)
- Expected usage of the cycleway in question

3. Ensure **relaxed gradients** on cycleways where possible

- Maximising the comfort of the user

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Breakout Session 2

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Breakout Session 2 – Key Questions – Infrastructure Minimum Quality Standards

1. Are the minimum quality standards structured in a way that makes sense to potential users?
   - Infrastructure/category type
   - Quality aspects – safety, comfort etc.

2. Are the right categories of infrastructure being covered (*see handout*)?

3. Have the minimum quality standards been covered in a sufficient level of detail? (and sufficiently complement measure specific text?)

4. Identifying minimum quality standards that are appropriate in the context of local cities – have we gone far enough in considering application of criteria for different cities / level of cycling?

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Developing guidelines with minimum standards for cycling infrastructure - Requirements

1. **Define minimum quality criteria:**
   - Without addressing detailed technical solutions (e.g. surface material, lane width)
   - Focussing on quality aspects from the users' perspective (e.g. cyclists' constraints related to factors like co-existence with motorised traffic, constraints inherent to the applicable legislation in the Member States, etc.)

2. **Cover in particular for the relevant infrastructure:**
   - Safety
   - Comfort
   - Accessibility
   - Coherence
   - Attractiveness
   - Adaptability
   - Value for money
   - Sustainability (economical, environmental, social)

3. **Be intended for implementation at local, regional and national levels;**

4. **Take account of and cover the following elements:**
   - Users' needs – designing principles
   - Network planning (functions and solutions), including the integration of cycling in SUMPS where applicable
   - Different types of cycling infrastructure
   - Surface solutions and criteria for all types of infrastructure
   - Intersection solutions and criteria
   - Signs and marking solutions and criteria
   - Cycle parking and other connected facilities solutions and criteria
   - Maintenance and management solutions and criteria
   - Usage by standard bikes and bikes with electric motor assistance (e-bikes)

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5. Concluding wrap up session

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Overview and next steps

- Promotion and considerations on future of the guidance
  - Presented at 2018 Civitas Forum last week
  - Other possible ways of promoting the guidance?
  - How guidelines might be updated/maintained beyond the end of the contract – possible link to Eltis?

- Next steps / timings
  - Feedback welcome over the next week (by 05/10). We will circulate:
    - Workshop slides
    - Summary of workshop discussion
    - List of current guidance/standards/literature
    - Link to online survey to provide further feedback
    - **Please leave card or email details**
    - Or send any feedback to Charlotte.Brannigan@Ricardo.com
  - Update guidance based on feedback received today and via email/survey following the workshop
  - Final guidance and Report – Early 2019
  - http://ec.europa.eu/transport

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Measure example: Cycle Track

Detailed description of the measure

Key features
Also known as bicycle paths or hybrid bike lanes, cycle tracks are characterised by physical separation, which is achieved by partitioning objects or by raising the level of the track above the carriageway. They can only be used by cyclists and motor vehicles are not allowed to drive or park on them. The tracks usually run alongside the roadway but can also deviate from the road network - these are known as solitary cycle tracks

Function and objectives
Due to the physical segregation of cycle tracks from road traffic, they provide cyclists with significant safety benefits. Having a dedicated cycling space that provides efficient connections within an urban area, will also increase the appeal and accessibility of cycling. The Old Shoreham Road cycle track in Brighton provides a route for young people to travel to school on foot or by bike, while also contributing to reducing road congestion during peak times. The main aim of cycle tracks in Berlin is to increase traffic safety by improving the visibility and protection of cyclists in road space. The original objective of Seville's cycling network was to foster cycling as a sustainable alternative to car transport in an area without any cycling tradition.

Range of alternatives
Traffic calming measures can be used as an alternative to cycle tracks by creating conditions that are suitable for traffic mixing. Cycle streets can be implemented on major routes through residential areas. A cycle lane can be used when the space or budget is not available for a cycle track. Furthermore, at adequate traffic volumes and speeds, cycle lanes can be suitable.

Links with other measures
- Strategically positioned cycle parking along a cycle track route can increase the number of cyclists as a result of improved attractiveness, accessibility and intermodality.
- Grade separated crossings such as bridges and tunnels can also improve the performance of a cycle track by ensuring the continuity and improving coherence and directness.
- There are several complementary information and awareness raising measures, including cycle maps, cycling events and signage. These measures contribute to raising the profile of the cycle track and increasing its attractiveness.

Performance

The most important impact of cycle tracks is improved road safety resulting from the separation of cyclists and motorised road traffic. Seville have seen a reduction in the percentage of cyclists involved in fatal or serious accidents, since the introduction of its cycle network.

Cycle tracks can be used to improve connectivity and the accessibility of a city. In Brussels, the development of the inner ring road will provide cyclists and pedestrians with a network that links busy metro stations with green space and commercial areas.

The improved safety and accessibility that cycle tracks can provide will often result in a modal shift from private cars and public transport to cycling, as measured in Seville. As well as health and environmental benefits, a reduction in motorised traffic will improve congestion, a major issue facing many European cities.

While cycle tracks can offer a safe and direct route for cyclists using the road network, consideration must be given to the design and number of intersections. The sudden mixing of cyclists and road traffic at intersections can result in dangerous situations, and cycle tracks with many intersections will increase waiting times. Intersection design options and examples of best practise are presented in a separate factsheet.

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Measure example: Cycle Track

Parameters of success or failure

A cycle track should follow a number of core design principles. These are listed below with examples from the case studies.

- Coherence – In Berlin, the cycle tracks will have a continuous green coloured surface with cycling symbols.
- Directness – In Seville, the cycle tracks were built to avoid detours and multiple street crossings, increasing directness.
- Safety – In Berlin, as well as bollards there will be an additional 1m buffer between cyclists and motorised transport
- Comfort – In Brussels, a comfortable 2.5m wide bidirectional bicycle track was built.
- Attractiveness – In Brighton, cyclist priority lights were also provided at junctions
- Adaptability – In Brighton, consultation with potential users enabled the city Council to understand the future potential use of the scheme.

Figure 1: Berlin cycle tracks with continuous green coloured surface

Underpinning many parameters for a successful bike route is a good understanding of where the bike track will be built. This includes understanding the stakeholders affected, the opinion of the public, the characteristics of the road and existing initiatives and agendas. This understanding can be achieved through extensive stakeholder consultation and/or by building a multidisciplinary team to deliver the project, such as the Brussels Mobility team.

Effective consultation with local residents, cyclists and businesses will ensure support and approval for the cycling infrastructure. In Brussels , visuals were used to help clearly communicate the vision of the project. In Brighton, extensive consultation allowed the bike track to be designed so that it supported the way in which local citizens and students used the area, as well as how future users could potentially use the scheme.

Opposition to the implementation of cycle tracks can be a challenge for any city. As demonstrated by the Brussels case study, an effective traffic management plan can alleviate the negative impacts that may result from reduced parking spaces or the removal of motor vehicle lanes. Furthermore, each of the case studies below comment on the importance of strong political and citizen advocacy.

Demand for the measure is an effective way of generating political support and will be a key selling point. In Brighton on the Old Shoreham Road, large volumes and high speeds of traffic resulted in safety concerns and generated demand for action. In Berlin, there is also support public pressure calling for better conditions for cyclists, especially in terms of safety and the inefficient use of space.

Key Lessons for Transferability

Political and citizen advocacy for cycle tracks is key to overcoming the challenges faced during the planning and implementation stages.

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