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BiTiBi.eu



Quality level of infrastructure
used by BiTiBi cyclists in 8
pilot locations

November 2016



Co-funded by the Intelligent Energy Europe
Programme of the European Union

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BIKE+TRAIN+BIKE

BIKE+TRAIN, A COMPETITOR OF CARS

Facilitating active means of transportation like cycling in combination with public transport creates opportunities to overcome mobility and other societal issues that derive from a high share of motorised traffic in the modal split. Combining these means of transportation offers similar efficiency as a car. **In the Netherlands the greatest competitor of cars is the Bike+Train(+Bike) sequence.** It seems like a logical choice: almost half of the train passengers get to the station by bicycle.

In other European countries this combination is still just beginning. The potential reach of train users will increase significantly if people use cycling as access to/from the train stations instead of walking, driving, or using local buses. A possible reason for other countries lagging behind in modal share for the bike- train- bike combination is that **the standards of cycling facilities are still low or non-existent in many cities.** This factor is being explored within the BiTiBi project.

	Flexibility	Speed
Car	Average	Average
Train	No	Yes (Super fast)
Bike	Yes (Super flexible)	No
BiTiBi	Average	Average

	Walking distance	Bicycle distance	Electric bicycle
Distance to station	< 1 km	< 5 km	< 7,5km
% of tot. population living in radius around station	19%	69,1%	81,2%

data from the Netherlands.



NO SERVICES FOR CYCLISTS WITHOUT SAFE BICYCLE INFRASTRUCTURE

BiTiBi tests the impact of **implementing high-quality bicycle facilities**, including guarded parking and bike rentals, at several train stations throughout Europe. While implementing facilities for cyclists will convince some, **an important motivation for people to bike is the subjective feeling of safety along the routes to get to/from the station**. Establishing services at these stations without allowing people to cycle safely to them would prove the project unsuccessful and frustrating for users.

To exemplify the comprehensive Bike-Train-Bike projects, the quality of the bicycle infrastructure around all pilot stations has been assessed, using the ReCYCLE City tool developed by Noor Scheltema. The main idea is to expand awareness of the importance of safe, qualitative, and well-designed bicycle infrastructure.

The outcome of this study is **valuable information for both railway and bike hire operators, along with local governments and cities in charge of providing good public space for cyclists**. This study gives an overview of specific potential micro-level infrastructure improvements on routes towards stations where it is missing and at those that already facilitate cycling towards stations.

A comprehensive report, including the results of the study, will be distributed to the pilot cities. This brochure highlights the important negative or positive elements of each city that have been seen in that pilot location, which could exist in other cities. At the end of the report the most important findings on the different routes and the recommendations have been summarised.

RESEARCH METHOD

ASSESSING THE INFRASTRUCTURE USED BY CYCLISTS

The ReCYCLE City tool, by Noor Scheltema

ReCYCLE City is an evaluative tool, developed by Noor Scheltema, used to get a clear scope of all factors that influence bicycle usage. In each city all routes leading to the stations from neighbourhoods, up to +/- 4 km's away, **are reviewed by means of site visits by bike**. The knowledge obtained during the site visits has been included in the ReCYCLE City tool. Thus, 20 criteria have been rated, one-by-one, in order to get a final figure for each route. Using the same criteria made it easy to compare all routes and cities to one another.

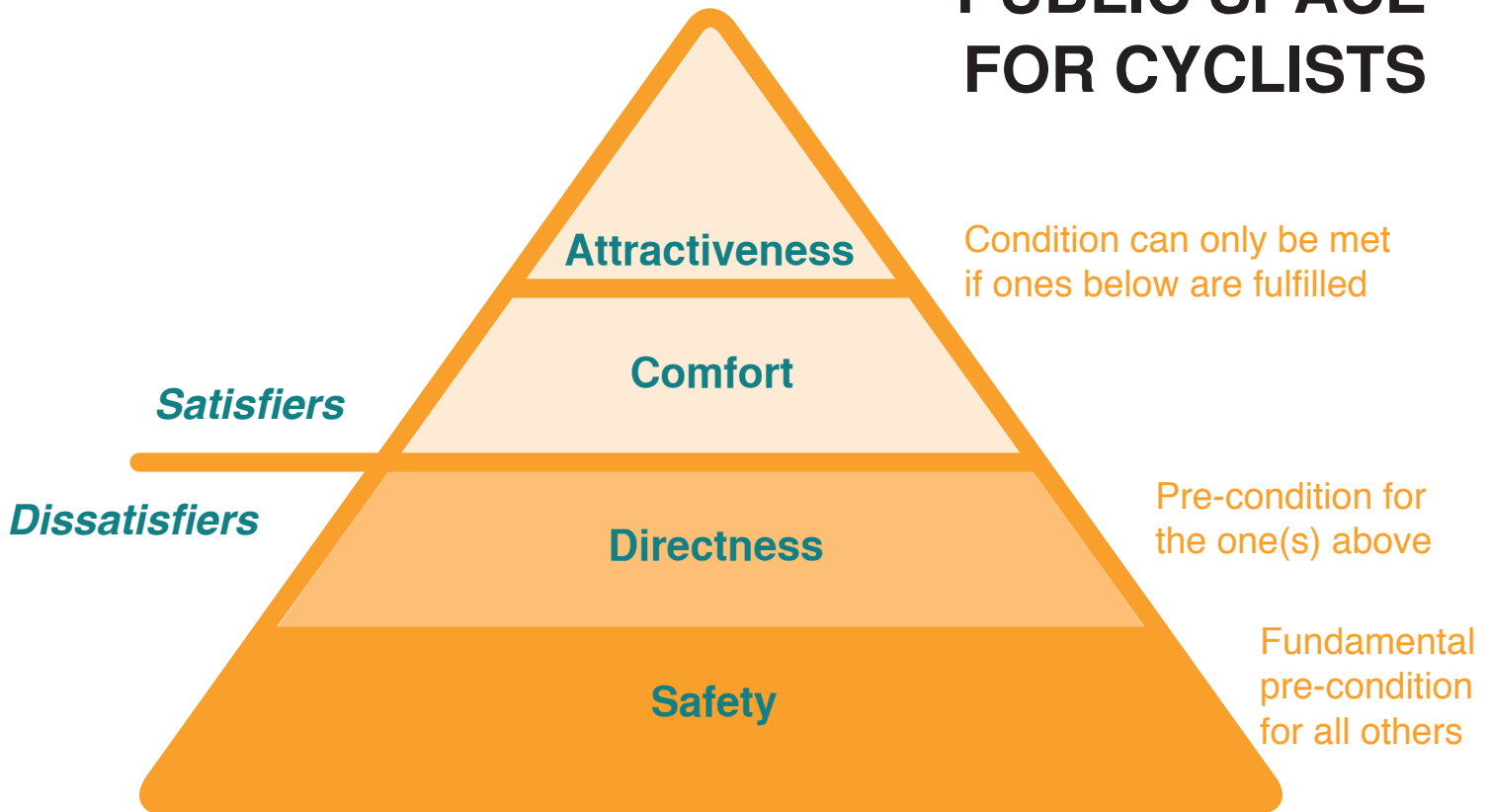
The tool categorises the cycling conditions on routes towards railway-stations into four main conditions: **Safety, Directness, Comfort, and Attractiveness**.

A final graph pinpoints the strengths and weaknesses of all routes.

Up to seven different routes leading to the pilot stations in the following cities have been assessed in the scope of BiTiBi: Ghent (Ghent St. Pieters) and Liège (Liège-Guillemins) in Belgium, Liverpool (Liverpool South Parkway and Southport) in the United Kingdom, Como (Como Borghi) and Bollate (Bollate Centro and Bollate Nord) in Italy, and Sant Boi and Sant Cugat del Vallès in Spain.



PYRAMID FOR SUCCESSFUL PUBLIC SPACE FOR CYCLISTS



1. Safety

- a. Road division
- b. Visibility & lighting
- c. Pavement

2. Directness

- a. Linearity
- b. Continuity
- c. Right of way to bicyclists
- d. Orientation
- e. Fluency
- f. Flatness

3. Comfort

- a. Human scale
- b. Special bicycle amenities
- c. Bicycle parking types
- d. Bicycle racks
- e. Bicycle parking levels

4. Attractiveness

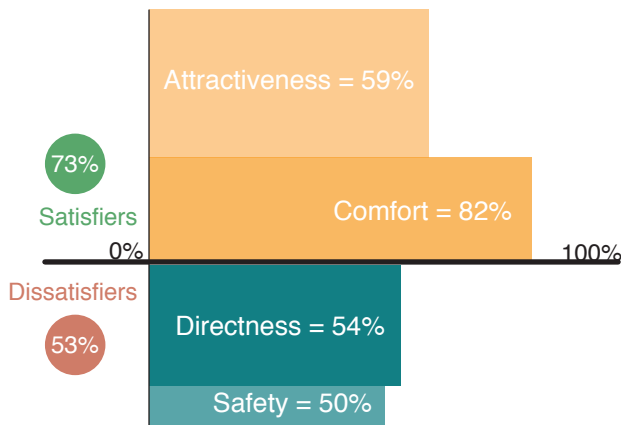
- a. Maintenance
- b. Liveliness
- c. Experience

© ReCYCLE City tool by Noor Scheltema
Pyramid for Successful Public Space for Cyclists (2012)
website: recyclecity.noorderwerk.nl

BELGIUM

GHENT - LIÈGE

LIÈGE: HIGH-LEVEL FACILITIES AT THE TRAIN STATION BUT A LOW RATE IN TERMS OF SAFETY OF THE INFRASTRUCTURE



In Liège, seven bike routes leading to Liège-Guillemins station have been assessed. The graph showcases the average rate of each route.

Well thought out services at the train station makes “satisfiers” rather high, whereas the most negative aspect of the bike routes is the lack of safety for users. For example, **unclear right of way rules confuse cyclists**, forcing them to use sidewalks or unnecessarily stop more often. Furthermore, an **absence of signage and special amenities at intersections** make for unclear decision points/

In the case of Liège, despite an investment in high-level facilities at the main train station, the lack of quality bicycle infrastructure limits the combination of the bike+train means of transportation.



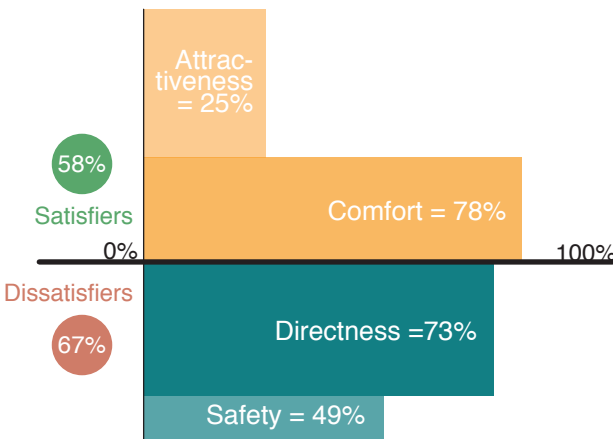
Attractiveness: a special slow-traffic bridge connects the city centre with the eastern neighbourhoods.



Directness: newly designed boulevard would suit for cyclists, unfortunately continuity is interrupted greatly and therefore the added value of this cycle path is reduced.



GHENT: IMPORTANT DIFFERENCES EXIST BETWEEN ROUTES WITHIN THE SAME CITY

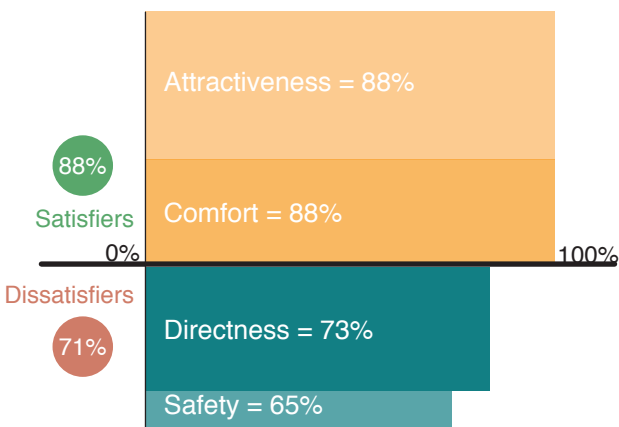


ROUTE n°2: From Vennes (south-east of Ghent) to the train station

Ghent is one of the most bicycle-friendly cities in Belgium, serving a high number of cyclists. The City has developed an ambitious Cycling Plan to invest in both bicycle infrastructure and facilities.

Nonetheless, **we noticed important differences between the routes leading to Gent-Sint-Pieters station.** Nowadays, the facilities for cyclists seem only to be implemented for cyclists traveling to/from the city centre and universities.

Bicycle parking at this station is going to become one of the best in Europe, offering 11,000 spots. This “satisfier” will only be noticed by people **if Ghent improves all the routes leading to the station, especially the ones coming from residential neighborhoods.** Along these routes, emphasis should be on prioritising cyclists, maintenance, wayfinding, and dedicated bicycle infrastructure.



ROUTE n°6: From the city-center to the train station

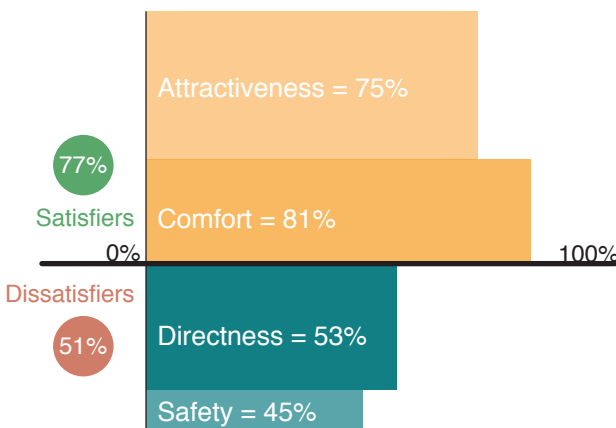


Some special bicycle amenities are implemented around town: here is a box left turn for cyclists.

ITALY

COMO - BOLLATE

COMO: A CITY AT A HUMAN SCALE BUT A LACK OF SEPARATED BICYCLE INFRASTRUCTURE



The city of **Como** is **entirely at a human scale**. Therefore, the levels of **Comfort and Attractiveness** are already **very high**. In the city-centre pedestrians and cyclists share the streets and the number of cars is very low.

Outside of the old city-centre, however, **no specific infrastructure is available for cyclists**. To get people cycling more, and from further away, additional **segregated lanes, bi-directional flows, and awareness** have to be created to give cyclists a feeling of safety and the **direct routes they need**.



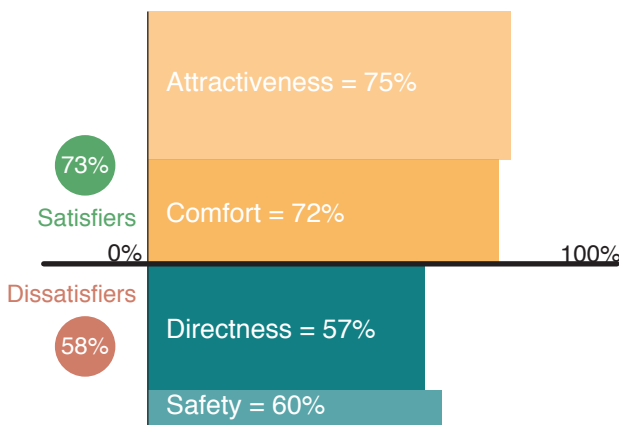
Directness: in order to cross this intersection cyclists need to behave like pedestrians which slows down the trip. There is a lack of continuity in the bike routes leading to the station.



Attractiveness: very calm street in the old city-centre, with a human scale allowing cyclists and pedestrians to get around safely.

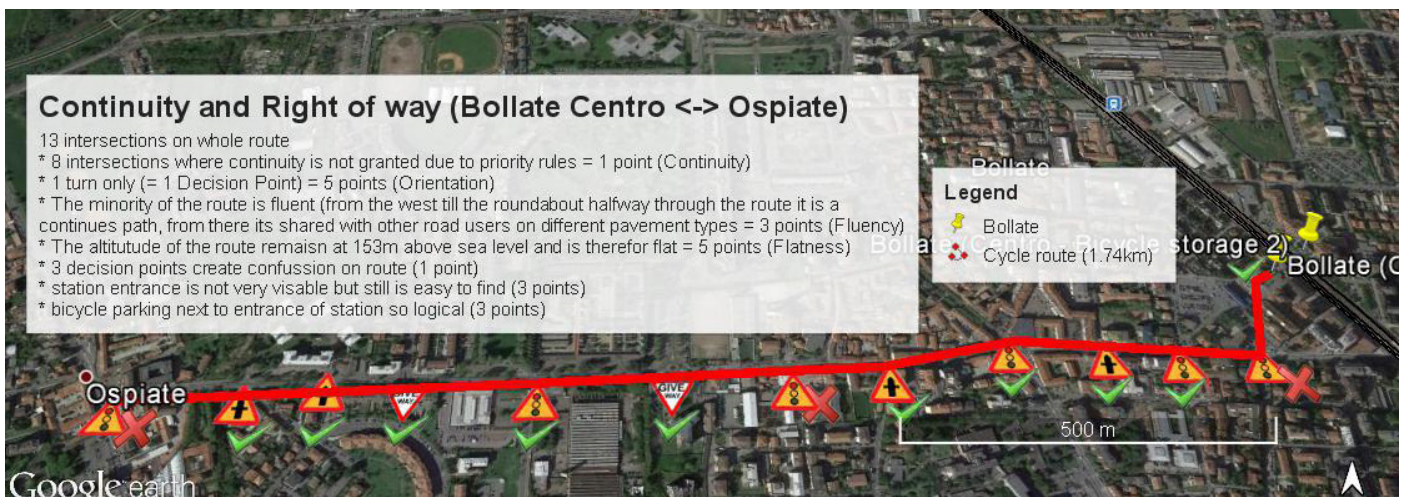


BOLLATE: CYCLISTS NEED A LIVELIER ENVIRONMENT AND SOMETHING TO LOOK AT AND “EYES ON THE STREET”



In Bollate **routes are mostly linear and the city, along with its environment, is completely flat**. The inhabitants benefit from a rather comprehensive network, which is a good starting point for increasing the bike+train trips.

The problem in Bollate is that the quality of the routes is rather good beyond 500 meters from the station, however, the most vital parts (close to the station) are still not arranged so well. Moreover, the Attractiveness of some bike routes could be increased by creating more interesting public spaces along some of the routes. Cyclists need something to look at, lighting, and “eyes on the street” for a better sense of security. The bike routes go through a forest and the countryside, where liveliness of the surroundings is low.

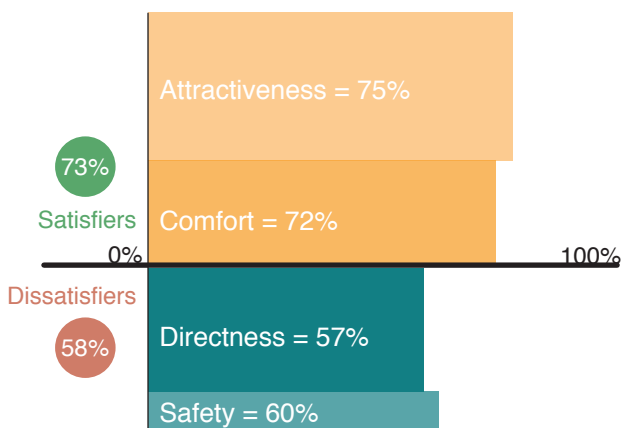


Assesment of intersections on a road leading to Bollate Centro.

SPAIN

SANT BOI - SANT CUGAT

SANT BOI: HILLY CITIES MUST FACILITATE UPHILL ROUTES



Cyclists are not keen on riding along hilly routes, but if they are facilitated properly by a well-designed infrastructure, cycling uphill is less harsh.

In Sant Boi, **people cycle on well-maintained routes** along well-maintained parks, shops and cafes, thus the Attractiveness is rather high. Nonetheless, **unclear right of way rules confuse cyclists** and reduce the ability for free flowing bicycle traffic.



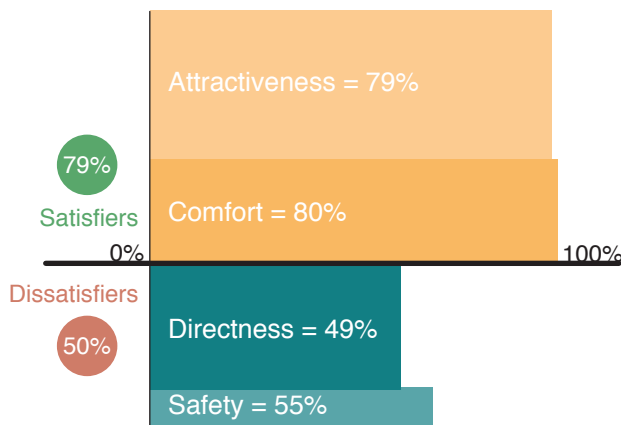
Safety: the main streets leading to the station and the bike parking have no bicycle infrastructure.



Attractiveness: quiet street in a nice and well maintained public surrounding.



SANT CUGAT: INCREASING THE NUMBER OF CYCLISTS, A MATTER OF PRIORITY



Sant Cugat is a very lively town, with well-maintained streets that offer some interesting sights for cyclists.

Nonetheless, Directness is disrupted completely by the high amount of one way streets and the frequency of intersecting roads that have priority at all times.

Since the “satisfiers” are very high the city should be focusing on fixing the “dissatisfiers”. The main priority **needs to be facilitating cyclists at intersections**. Moreover, **the area surrounding the station should be a point of attention**, as the closer you are to the station the more confusing infrastructure becomes.



Directness: segregated bi-directional cycle track loses its continuity because of abrupt endings/starting at crossings (use of the pedestrian crossing).

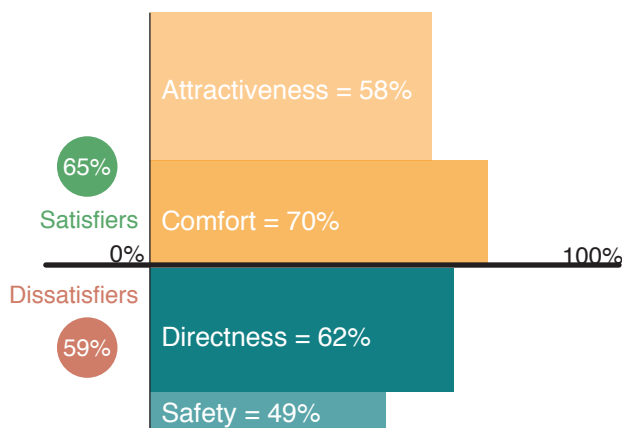


Safety: segregated cycle track allows cyclists to ride far from the car traffic.

ENGLAND

LIVERPOOL SOUTH PARKWAY - SOUTHPORT

LIVERPOOL SOUTH PARKWAY: IMPROVING THE DIRECTNESS OF THE ROUTES



The “satisfiers” are largely due to the high standards of bike parking facilities.

Yet most routes leading to the Liverpool South Parkway station **share the road with motorized traffic** (+ 50km/h). Additionally, the amount of **obstacles** (randomly parked cars and potholes) **makes cycling a quite unsafe experience**. Bikers are not guaranteed any priority when using routes that are off of the main roads. This, in combination with sudden unexpected turns and no facilities to cross a road properly, makes most routes quite indirect.

At intersections, where separated bicycle lanes are integrated, a different way of guiding cyclist through them should be considered; cyclist are not pedestrians. The gated way of guiding people through a crossing is old fashioned. Dutch style traffic lights outside of the built area should be looked at to redesign these intersections to lower the speed of turning traffic.



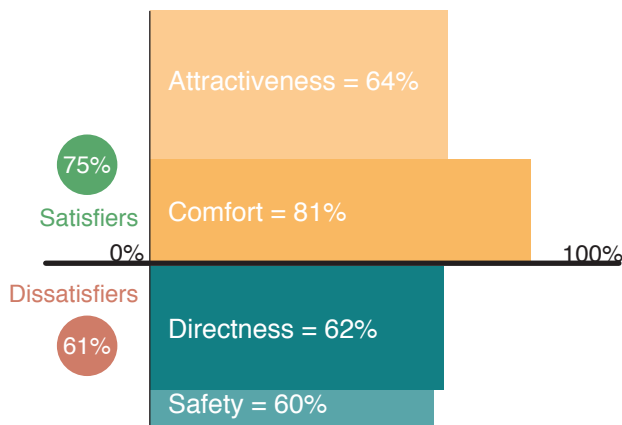
Directness: one of the many ‘gated’ guiding traffic lights in which cyclists and pedestrians need to request for green multiple times.



Safety: there is a cycle path that leads from the bicycle storage towards the first main road.



SOUTHPORT: IMPROVING SAFETY OF THE ROUTES



Along the routes assessed lanterns are present and most intersections are easily visible when approaching. Southport has few slopes and offers **good initial conditions to encourage cycling**. The environment along the routes is attractive to cyclists due to the scale of public surroundings as well as the liveliness of the town.

The negative aspects of the routes are due to the infrastructure. Indeed, **almost all routes run via main roads**, most of which have a low speed limit, but the design of these roads has not been adjusted to reflect this speed limit, and therefore does not realistically live up to the needs of cyclists. Moreover, there is no clear signage around the town directing cyclists to the station.

We recommend simply slowing down motorized traffic to create a better atmosphere for cyclists by implementing max. speed signals of 30 km/h. Either (semi-)segregated lanes should be implemented along most routes or the full road layout needs to be redone to enforce the speed limit naturally. Another problem in Southport is **randomly parked cars, creating obstacles**, as cyclists need to shuffle around to avoid these. Subsequently, clustered parking would help mitigate bike and car conflicts. **Similarly at traffic lights bike lanes guaranteeing space for cyclists to overtake cars improves safety and continuity for them.**



Safety: segregated bicycle lanes are available.



Safety: bike lane and bike box to overtake queuing cars at traffic light.



Attractiveness: very nice surroundings. But the street is rather straight and can be inviting for cars to drive fast.

CONCLUSION

MOST IMPORTANT FINDINGS ON THE DIFFERENT ROUTES

Although the outcome varies quite significantly per pilot location and even per route, one overall conclusion can be drawn up: **there is a lack of Safety and Directness (“dissatisfiers” are not met), at every pilot location.** These are fundamental, however, for people before they are willing to take on cycling. In other words, the **Safety and Directness conditions need to be improved** at most locations in order to encourage people to begin cycling.

This main outcome is valuable input for city councils and local governments that want to make their city nicer to live in and more sustainable. It provides an opportunity for them to invest in bicycle infrastructure at places with the highest return on investment. Secondly, for some local governments/city councils, it will be of added value to get insight into small-scale problems on the routes towards the stations.

Despite the fact that there is a lot of work needed in improving safety and directness, **Comfort and Attractiveness “satisfiers” are already available at most locations.** This is partly because of the available facilities at the train stations thanks to the BiTiBi project. Moreover, these conditions rank high because most cities are lively, human scale, and have very interesting and well maintained public spaces.

A recent Spanish study done in three cities (Madrid, Zaragoza and Elche) providing public bikes to the inhabitants shows that people would use their bikes, more than they currently do, if cycling conditions were better.

Question: Under which circumstances would you use bike-sharing more often?

40% reported better cycling conditions.

Source: Observatorio de la Bicicleta Pública de España



RECOMMENDATIONS

Seek a proper balance between Safety and Directness by attending to the real needs of cyclists when designing/implementing specific infrastructure.

Many pilot locations have tried to implement “safe” routes; mostly creating a subjective feeling of safety. In reality, this is a false feeling, due to the confusion of the bike lanes’ priority rules (mostly no priority) and the high amount of intersections where cyclists are not properly guided (mostly behaving as pedestrians).

Aiming at continuity (arranging priority among intersecting local roads, and guidance at bigger intersections and roundabouts) **and simplicity in design** (create a standard and try not to overcomplicate situations) **will make routes for both cyclists and motorized traffic much easier to read** and therefore Safer, even more Direct, Comfortable, and Attractive.

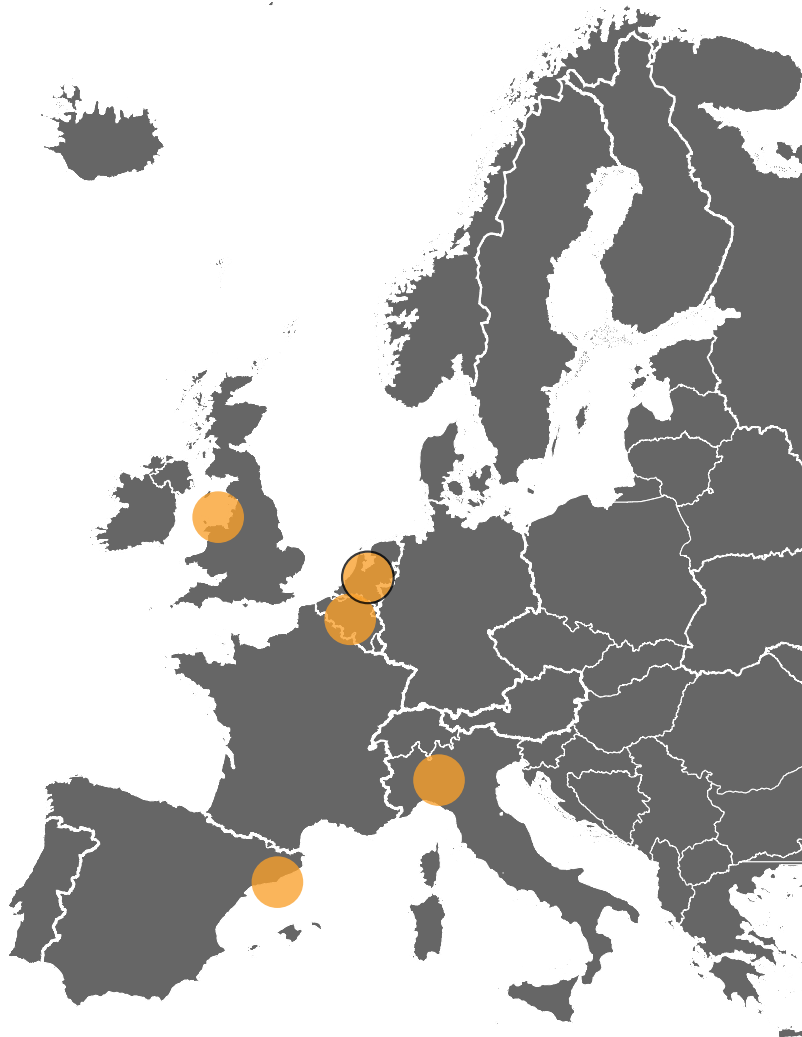
Cities and train/bike operators should approach mobility from **the mindset of a door-to-door trip**. Developing well-designed bicycle infrastructure in towns without safe parking, or creating parking without safe infrastructure to reach it, makes cycling policy frustrating for users and reduces the potential success of the investment. **Thus railway companies and cities should collaboratively develop a comprehensive plan for improving both cycling conditions and facilities simultaneously.**

Bicycability	pilot cities																							
	Liege Guillemins			Ghent St-Pieters			Como Borghi & Lago			Bollate Nord & Centro			Sant Boi			Sant Cugat			South-port			Liverpool South Parkway		
Scores	min.	BE	max.	min.	BE	max.	min.	MIL	max.	min.	MIL	max.	min.	BCN	max.	min.	BCN	max.	min.	UK	max.	min.	UK	max.
Attractiveness	42%	64%	79%	25%	56%	88%	58%	71%	83%	30%	43%	58%	62%	75%	92%	58%	79%	100%	33%	64%	88%	25%	58%	92%
Comfort	73%	84%	88%	78%	82%	88%	80%	81%	85%	53%	67%	70%	70%	72%	76%	78%	80%	83%	78%	81%	88%	63%	70%	78%
Directness	40%	57%	62%	58%	68%	73%	34%	53%	66%	40%	60%	62%	44%	57%	68%	37%	49%	60%	57%	62%	68%	45%	62%	71%
Safety	43%	52%	55%	41%	54%	66%	39%	45%	53%	54%	59%	67%	57%	60%	64%	42%	55%	70%	54%	60%	65%	39%	49%	60%
Total percentage		64%			68%			62%			59%			64%			62%			67%			62%	
Total satisfiers	61%	76%	84%	58%	72%	88%	73%	77%	81%	42%	58%	65%	67%	73%	82%	70%	79%	86%	61%	75%	88%	48%	65%	80%
Total dissatisfiers	41%	56%	60%	54%	65%	71%	35%	51%	62%	56%	60%	60%	49%	58%	65%	40%	50%	62%	60%	61%	66%	44%	59%	66%
Total score		71			74			69			67			71			70			73			69	

Final score of each city assessed.

(minimum score, average score of all routes leading to the station, maximum score.

BITIBI



BiTiBi.eu

You can follow the BiTiBi project – the pilots in Belgium, England, Italy, Spain and the development of the Dutch model – on the BiTiBi.eu website. Get inspired by the local pilot projects and how they provide a seamless door-to-door transport connection by combining bikes and trains.

This document is a summary of delivery D2.6 Microscopic assessment quality level of cycle infrastructure connecting train stations. You can get a complete document by sending a request at info@bitibi.eu.

