BIKE. TRAIN. BIKE.

bike train bike

The Guidelines to Implement BiTiBi Services

Easier. Faster. Cooler.

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

Project title: Easy and energy efficient from door-to-door Bike+Train+Bike

Document name:
D2 5_Guidelines BiTiBi

Authors:
inno-V (Henk Nanninga, Eduard Röntgen)
with contributions from TML (Bruno van Zeebroeck), NS (Kees Miedema, Piero Witmer, Lotte van Grol, Sabine van Baalen), AIM/VAIC (Silvia Casorrán), Copenhagenize (Clotilde Imbert), BlueBike (Sven Huysmans, Deborah Anné), Poliedra (Federico Lia, Chiara Bresciani), MR (Lisan Beentjes, Linda van der Haar), inno-V (Joeri de Visser) and UIC (Nicholas Craven)

Photos:
inno-V, NS, Merseyrail, Blue Bike, AIM, Copenhagenize Design Co, FG Catalunya, Poliedra, FerrovieNord, Google Maps, Wikipedia, Fietsersbond, Brompton, Velopa

Contents:
Robust guidelines for implementing the BiTiBi seamless door-to-door transport approach for achieving a behavioural change in travel and modal shift from car to bike and train and from (overused) bus/tram and train to bike and train;

Target group:
This document is meant as a public version for rail and bike operators and other stakeholders (local and regional authorities, mobility consultancies) and takes into account the lessons learnt during the project.

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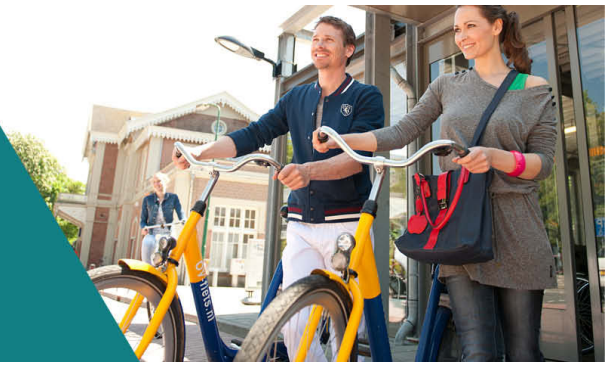
1. INTRODUCTION



1.1 The guidelines

Purpose of the document

This document contains guidelines on how to implement (part of) the BiTiBi approach in your organisation. Target groups are railway companies, bike (facility) suppliers, public bike companies and local community governors and officers.

- It describes how to create and maintain the six "building blocks" of which the concept of BiTiBi is constructed and it shows the effects it can have for residents, railway companies, bike suppliers and for local communities.
- The guidelines summarise all the experiences from the project during the past 3 years and contain inspirational examples from the Netherlands and all the pilots that can provide help with starting the BiTiBi-approach elsewhere.

Relation with other documents

The first version of the BiTiBi guidelines was drafted in 2014 at the start of the project and was mainly based on the Dutch example. This final version of the guidelines has been redesigned and includes the lessons learnt and experiences from applying the approach in other countries. It also includes recent data, new policy developments and the information on the extra building block (BB6) that has been added to the project later.

The guidelines contain relations with other documents in the project. Where relevant, the guidelines will refer to these documents in the text.

- The *final report on the BiTiBi pilots* contains a description of concrete actions that have been taken during the project in all the pilots.
- The *global evaluation report* contains concrete project results of the past years (investments, impacts, surveys).
- The *quality level of infrastructure used by BiTiBi cyclists* gives an overview of bike infrastructure quality in the pilot.
- And the *final report* will give a general overview, summarizing all the documents and focusing on the legacy of the project and relationship with the future.

All documents can be found on the BiTiBi website.

Reading guide

- The first part of this document contains a general introduction on the project including its six building blocks and explains the possible advantages the approach can have for your organisation.
- The second and main part of the document discusses for every building block (1) the best practice in NL, (2) a guide on implementing the approach with tips and tricks and (3) interesting experiences from the pilot cities of the past three years that can provide

inspiration for others on how to implement the BiTiBi-approach elsewhere. This part contains many pictures and provides a quick overview of essential information in an easy-to-read way.

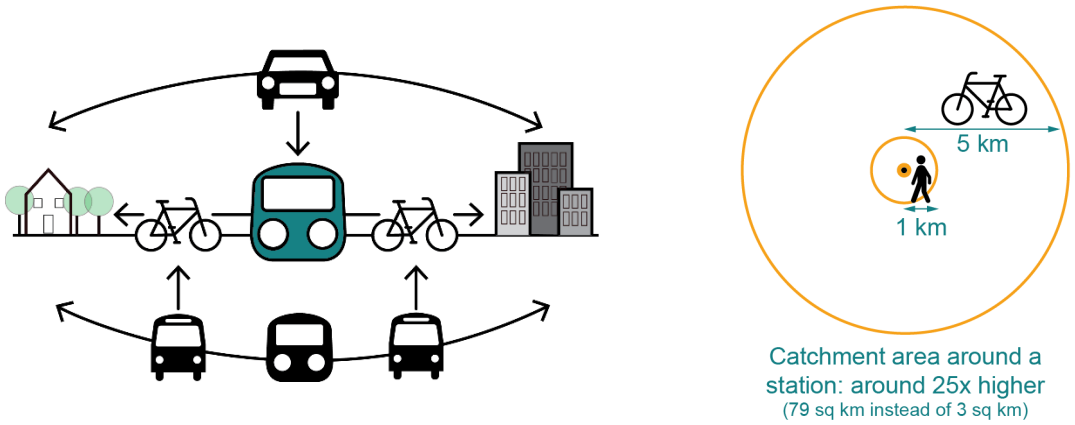
- The final part of this document addresses some concluding remarks about the project. The annexes contain some additional information on the advantages of the BiTiBi approach and an example of a Dutch management agreement for bike parking.

1.2 The BiTiBi project: faster, easier, cooler

BiTiBi is short for “Bike-Train-Bike”. BiTiBi has been an innovative, three-year project co-funded by the European Union aimed at improving the liveability of European cities and improving the energy-efficiency of our transport.

- Combining the two most energy-efficient modes of transportation, the bike and the train, provides a seamless door-to-door transport connection.
- Combinations where the bike will be used at one end of the trip only (like car-train-bike, bike-train-walk or bike-train-bus) are also part of the BiTiBi-approach.

The BiTiBi partnership has agreed that the future of urban mobility is a return to a tried and tested combination of bikes and trains: faster, easier and cooler. BiTiBi services create an energy-efficient transport mode with catchment areas significantly larger than the train-only mode.



1.1 Illustration of the BiTiBi concept and the intended changes in modal shift – from car and local PT to bike and train. BiTiBi services also increase the train catchment area.

Today, seamless BiTiBi services are only provided in a few EU countries. The Netherlands is the best example and the bike has an indisputable role in Dutch society. Almost every Dutchman owns a bike and they use their 19 million bikes for all sorts of trips. Dutch railway stations count 420,000 bike racks, an average of around 1,000 per station. More than 40% of all train users use a bike from home to the station and 14% of them use a bike at the destination side of their trip. The BiTiBi approach is part of the explanation for that success.

Pilot projects have been implemented in the areas of Barcelona, Milan, Liverpool and in Belgium with the ambition to improve transportation networks and inspire other European cities to consider a modern, multimodal approach to transport. Key to the project is that the pilot cities learn from the Dutch best practice and use the Dutch experiences as a ‘dot on the horizon’.

- It must be said that the Dutch example cannot simply be copied to other countries. Experiences in the UK and in Belgium show that cultural, legal and geographical

differences oblige companies to adapt the Dutch example. These changes are important for making the BiTiBi approach a success.

1.2.1 Six Building Blocks

The most important measures within the BiTiBi approach are the provision of enough bike parking at railway stations and offer (shared) bikes, especially for the last mile. But the BiTIBi approach is not just about the hardware, it also includes marketing, promotion, integrated tariffs and the organization of bike-train solutions. People have to be convinced and enticed to use bikes and the BiTiBi offer has to be truly seamless.

BiTiBi has created a structured approach referred to as building blocks (BBs) to achieve the expected results from each of the pilots. The building blocks cover the main aspects and actions of the bike + train concept while allowing each of the pilots to monitor and cover all other aspects of the project. The BB rationale is to present a plan that is coherent and replicable.

The six building blocks of BiTiBi are:

- BB1 – Existence of safe, sheltered and convenient bike parking at train stations;
- BB2 – Availability of convenient public bikes;
- BB3 – Unity of bike-train organisations;
- BB4 – Integrated payment system/fare integration;
- BB5 – Positive communication and marketing about bike-train combination;
- BB6 – Existence of safe and secure routes to reach the stations. (BB6 was not initially part of the project and so the project did not include actions for this building block).

1.2.2 The four pilots

One of the objectives of BiTiBi is to inspire and provide guidance for other interested areas in Europe with different degrees of preparedness in respect to bike-train transportation networks. The four pilot projects in Belgium, Italy, Spain, and the United Kingdom began the program with a common will to learn from Dutch best practice but at different levels of progress.

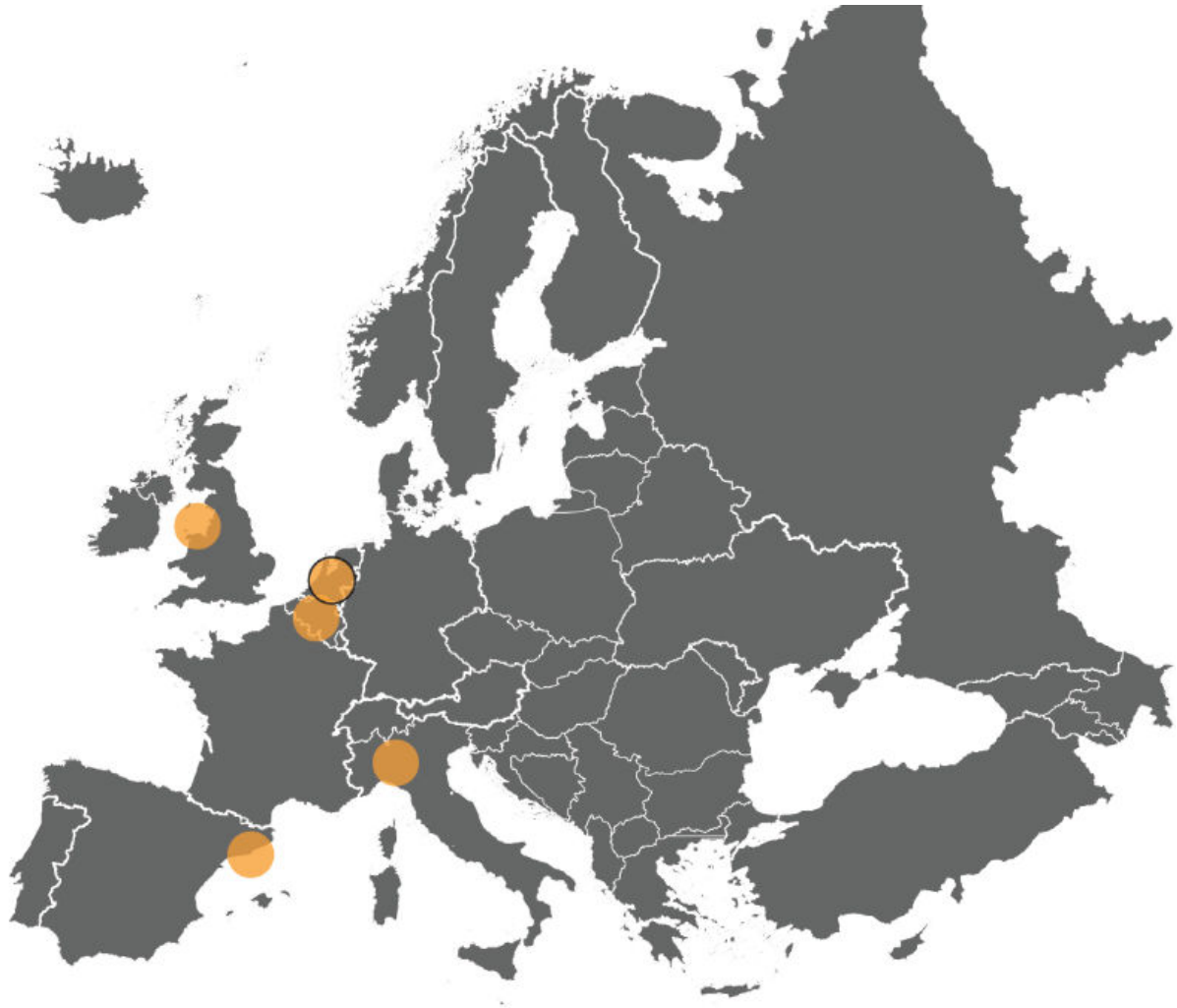
The most remarkable difference between the pilot projects lies in the different degree of preparedness in Belgium and the UK compared to Italy and Spain. In fact, the present network in Belgium and the UK can be described as fairly advanced both in terms of cycling culture and infrastructure, whereas the situation in Italy and Spain can be summarised as lagging behind North-Central Europe in terms of the cycling culture and infrastructure.

The initial circumstances of the pilot areas can be summarised in more detail as follows:

- *Belgium*: At the beginning of the BiTiBi in 2014, the project locations had 42 operational bike sharing stations known as Blue-bike. Launched in 2011, the Blue-bike service is a B21 (=back to one) bike sharing system to enable railway passengers to bridge the last mile of their journey. The system covers the Flemish Region extremely well while being much less widespread in Wallonia. Soon after the project started, it was decided that the BiTiBi project will focus on one Flemish (Ghent) and one Walloon (Liege) pilot with existing Blue-bike services.
- *Italy*: The selected pilot projects are the railway stations of Bollate Nord, Bollate Centro, and Como Borghi located in the Milan area. All stations are served by the same railway company, Ferrovienord. Both the Bollate Centro and Bollate Nord stations already had pre-BiTiBi safe and sheltered bike parking, with 200 spaces in Bollate Centro and 100 spaces in Bollate Nord. On the other hand, Como Borghi train station had 20 spaces in a non-

sheltered bike parking. A comprehensive strategy for bike parking was lacking, and has been developed thanks to BiTiBi in collaboration with Ferrovienord.

- *Spain*: BiTiBi pilots have been chosen at Catalonian train stations served by FGC (the local urban railway operator) in Sant Cugat del Vallès (FGC Vallès corridor) and in Sant Boi de Llobregat (FGC Llobregat corridor). Both locations are located at a distance of approx. 15 km from Barcelona city centre, Plaça de Catalunya. There is safe bike parking, referred to as Bicibox, available at both FGC stations, but the capacity for seven (Sant Boi) and 28 (Sant Cugat) bikes respectively is not enough to accommodate current and future demand. There are currently two safe bike parking projects in development and being built. In addition, electric bikes are proposed to companies to enable their employees to complete the last mile between railway station and company by bike.
- *UK*: Merseyrail, BiTiBi's partner, operates the urban railways in the Liverpool area and is keen on combining bike and train. It provides two bike services named Bike & Go and Go Cycle. Bike & Go is a nationwide A-to-A bike scheme available at 70 Railway stations across the UK. Thus, most of the pilot actions affect the entire scheme. Especially the marketing activities were mostly nationwide and created significant results at the majority of the participating stations. Go Cycle offers secured cycle shelters at 90% of its Liverpool urban railway stations.



1.1 The location of the 4 pilots and the Dutch example

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1.2.3 Impacts of the BiTiBi-approach

Pilot results promising

The impacts in terms of energy savings and reduction of CO2 emissions of BiTiBi have been calculated for the pilots. BiTiBi aims to produce two behavioural changes with the pilot actions:

- Car users changing their mobility patterns to a bike-train combination trip
- Train travellers changing their transport mode to/from the station to cycling

The effects of the application of the BiTiBi-approach have been measured before, during and at the end the project. Impacts are calculated based on data collected from bike operators (new BiTiBi users and new BiTiBi trips). This means that the calculation of the impacts assumes that all these new trips are now done by the bike-train combination. The calculation of impacts is also based on user survey data.

In two years, the BiTiBi pilot projects in Belgium, Italy and the UK saw an increase of **11,032 new users**, meaning that **159,312 new trips per year** have been done combining bike and train. The impact for the whole BiTiBi project in terms of new train and bike pkm created and avoided car and bus pkm are shown in the figure on the next page. This shows the great impact the BiTiBi approach can have in a relatively short time.

Potential future results

Based on the BiTiBi project results and some further hypothesis: the BiTiBi team worked out a scenario in which 20% of EU railway users would connect journeys to and from the railway station by bike: 20% is less than half the share of Dutch travellers going to the railway station by bike today.

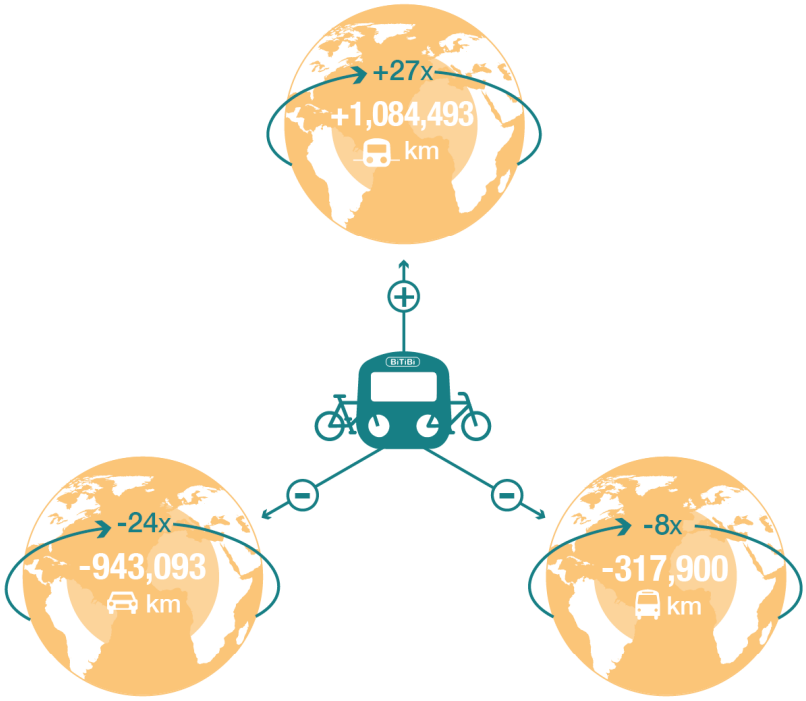
At the same time, it is five times more than the assumed 4% of European railway users joining railway stations by bike (and the BiTiBi pilot average modal share when the project began).

If 20% of the European railway users would use a bike to reach the railway station instead of the 4% today, this would lead to:

- 250 million more railway users
- 5,000 million less carpkms
- a reduction of 800 ktons of CO2, 55 tons of PM and 250 tons of NOx emitted
- a reduction in energy use of 200,000 toe or 2,500 MWh
- 1,200 lives saved EACH year, worth 3,000 million EUR annually
- 400% return on investment rate for investments in bike parking
- more liveable cities.

Please find more details in the *Evaluation report of local pilots* (D4.3) and the *BiTiBi Global evaluation report* (D4.4).

Mobility shift : Number of car and bus pkm/year avoided & number of new train pkm/year



This mobility shift entails the following impacts on the environment :

52,049 liters/year of FUEL and **38** tonnes of oil equivalent/year of + - ENERGY have not been used.

136 tonnes/year of CO_2 have not been emitted every year.

1.2 Impact of BiTiBi-approach on travel habits and the environment.

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2. Building Block n°1

BiTiBi

bicibike
treno train
bici bike

Safe, sheltered, convenient bike parking

2.1 Best practice NL

In the Netherlands, bike facilities have always been available at railway stations. A cooperation between Dutch Railways (NS), ProRail (responsible for the rail network) and the Government offers guarded bike facilities at 90 larger stations. They also offer free bike parking facilities at all stations in the Netherlands (currently 410 stations).

Today, about 450,000 free-to-use bike racks (mostly unprotected and partly sheltered) are being offered at all railway stations throughout the country.

- This means, on average, every station has parking capacity for more than 1,000 bikes. Fifteen years ago, there were about 300,000 racks available.
- In the Netherlands, infra-provider ProRail and local communities are responsible for non-secured bike facilities. ProRail is responsible for building the facilities and the local government for daily maintenance.

On top of that, safe parking opportunities are available at all stations:

- At around 300 small and intermediate stations in the Netherlands ‚bike lockers' are available that offer a secure place for one bike. These lockers can be rented for a monthly or yearly subscription fee.
- At the 90 larger stations, secure bike shelters are available (secured both by staff or through 'automated access' with gates). The capacity of a single secure shelter at one of the larger stations ranges from 500 to 8,000 cycles. Investment costs are paid for by ProRail and the Ministry of transport.
- For the management of the secured bike parking, NS, ProRail and local governments recently agreed on a new model for managing these spaces where they each cover 1/3 of the costs. At several stations you can park your bike for free and it will be guarded night and day, sometimes only the first 24 hours are free and for the remainder, a payment or subscription is needed from day one.

2.1.1 Governmental policy stimulating bike use

Since the beginning of the 1990s, train use grew rapidly thanks to spatial planning, free transportation for students and investments in the system leading to new railway stations and higher train frequencies. This is why the Ministry of Transport in 1999 introduced an investment plan to enlarge and renew all cycling facilities at railway stations.

- Around 250,000 parking places have been built or modernised and at least 20 secured bike shelters have been renovated and enlarged. A follow-up 'action plan' was implemented for the period 2011-2020 with a budget of more than € 220 million. Co-financing from the national government meant that local governments, Infra Manager ProRail and NS were willing to co-operate and invest in bike parking.
- In November 2016, it was announced that the existing budget will be increased by € 40 million (this will be matched by regional governments with the same amount) to be able to focus on areas where demand exceeds supply. The total number of racks at stations in the Netherlands will grow from the current 450,000 to 600,000 by 2030, according to the Ministry, to cater for the expected extra demand.

The investment plan made a huge impact. According to several surveys (in 2002, 2005 and 2011) the stations with new and enlarged bike facilities saw 20% more train passengers and 11% more bike use in 2002 due to the new/extra racks. Bike trips from or to stations grew between 2000 and 2010 by 40%. Users were very satisfied with these product improvements as the scores (on a 10-pointscale) grew from a 5.3 (for the old racks) to a 7.1 (for the new racks). This score could have

been higher, but the success of the bike program led to more bike use and therefore a shortage of available racks.

2.1 Row of unguarded (double deck) bike racks

2.2 Row of bike lockers at a medium-sized Dutch station

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2.2 Implementing BiTiBi

Bike parking will mostly be used in connection with “the first mile”- the trip from home to the departure station. Some people also use a second bike for “the last mile” - the trip from the arrival station to their destination. Mostly for commuters and other people with a regularly used destination station (students) it can be worth it to buy a second bike. For other, more irregular, train travellers a “public bike” –see building block 2– is a perfect option.

When building parking facilities at stations, the questions that need to be answered (and which will be addressed in this chapter) are:

- Before building: Where should bike facilities be placed? How many? What kind of racks?
- Specifically for a guarded or secure facility: what tariffs and opening hours shall be offered?
- After completing the facility: how to maintain, monitor and regulate?

2.2.1 Location, location, location

Location is the absolute priority. Racks and guarded bike parking at the wrong location will not be used, that is the experience in the Netherlands. Bike parking should be located:

1: Near the access routes: “in the flow” of the access routes

- Observe where cycles are parked
- Involve cyclists – ask cyclists where they want to have their parking. In places with only few cyclists in particular, cyclists can become real ambassadors for BiTiBi.
- Do the cycle “reality test” yourself; where would you, as a cyclist, prefer to have the parking?

2: Near the departure platforms:

- Maximum acceptable distance of the first racks for small stations: 10-20 meters from the station entrance(s);
- The racks furthest away should be placed within 50-75 meters;
- At larger stations larger distances are acceptable, but only if there is no space available within 50 meters of the entrance(s).
- If there are more entrances: divide the bike parking (if possible) over all entrances (and keep reckoning with the division of passengers or the number of cyclists using these entrances).

3: Within view point of local residents (to feel safer)

4: On ground floor level, not in a basement, and easily accessible

It is relatively easy to define (“place them in the flow of people”), but especially at busy stations or in dense areas it can be difficult to achieve. There are conflicting priorities, since the most convenient place for bike parking can also be the best place for shops, etc.

2.3 Covered bike parking in Houten (NL) with excellent location directly under the railway tracks

2.4 Wrong location of racks in Hilversum (NL): bike parking area situated next to a badly accessible bike path is non-used

2.5 *At the other side of the main station of Hilversum (NL) not enough racks are available. Cyclists tend to park their bikes right in front of, and almost inside, the station hall*

2.2.2 Quantity

The rules to determine the quantity needed could be summarized as follows:

- Provide enough racks at each station currently and in the future. Enough means: even during peak hours there have to be at least 20% more racks than bikes to avoid overcrowded bike parking. This rule is valid for every single location around the station where bikes are standing. *For example: if you count 40 bikes, you need (at least) 50 rack spaces.*
- On top of that, take into account the potential "snowball effect" of bike facilities (more bike facilities leading to more bike users) and provide more racks than strictly needed or make a spatial reservation for extra racks. Do not be too cautious. It is better to create too much spaces than too little. A space shortage emerging soon after starting is not desirable. *For example: if you count 40 bikes and there is enough space available, provide 60 to 80 racks and reserve space for additional racks.*
- Take into account the estimated growth of train passengers in the next five years. For newly-built facilities, you have to take into account the growth in the next 20 to 25 years. It would be a shame if a facility would be too small after just a few years.
- Take into account the targeted or expected modal share of bikes for the first and last mile thanks to BiTiBi, instead of the current modal share of the bike. In The Netherlands the average share of bike use for the first mile is 45%, but in the model city of Houten it is almost 60%.

The following, theoretical, example illustrates the previous points on quantity determination:

- A railway station has 1,000 trips per day by boarding or alighting passengers; 80% of the passengers have the station as an origin and 20% as a destination; The estimated growth in the next 5 years is 10% and for the next 25 years it is 40%; The targeted modal share for 'the first mile' is 50% and for 'the last mile' is 15%.
- The number of racks needed can then be calculated as follows: 1,000 trips per day = 500 people per day use this station. In five years' time, this number will grow by 10% to 550 people per day. 80% x 550 = 440 people use the station as their origin; the target modal share is 50%, so 50% x 440 = 220 people will use a bike for 'the first mile' and back. 20% x 550 = 110 people use the station as their destination; the target modal share is 15%, so 15% x 110 = 17 people will use a bike for 'the last mile' and back. In total 237 people will use a bike.
- The minimum number of racks needed in this example is 237 x 1,2 = 285 racks. For a newly-built facility you have to reckon with 40% growth, so you need to create a minimum of 363 racks. It is advised – as was done at Houten station (NL) – to expect a total capacity of twice racks required within 5 years' time: create space for (285 x 2 =) 570 racks.

To count the number of racks needed at a station, follow these steps:

1 Count the number of bikes parked around railway stations:

- Standing in racks
- Standing next to racks
- Standing at annoying places and "in the wild"

2 Some bikes need special facilities or extra space. So take into account the number of:

- Odd-sized bikes
- E-bikes
- Scooters

3 Do not count the following bikes to calculate the capacity, but remove them (after the right procedures have taken place):

- "Orphan bikes" – bikes without an owner (bikes standing over 4 weeks at a station without being used)
- "Bike wrecks" – bikes that do not function anymore

4 The sufficient number of racks is determined based on bike counts during hours of peak use:

- Therefore count how many bikes have been parked on several occasions on working days between 10:00 and 14:00.
- For busy "destination stations" where many bikes are left outside overnight: also do the count at night and during peak hours
- For "student towns" with universities, it is recommended to count during the weekend (preferably on Sunday mornings), because the experience in these cities is that the number of parked bikes during the weekends is sometimes higher than during working days.
- Do not count during school holidays
- Do not count during freezing cold, stormy, thundery or rainy days, because on these days fewer people tend to use a bike than during days with "normal" weather
- Monitor every year and provide extra racks when needed

5 How to write down the number of bikes for further analysis:

- Draw a sketch of the station and the immediate surroundings (or use a map, Google Maps or an aerial photo of the station)
- Mark the entrances and the platforms
- Mark the location of the city centre, offices, schools and housing districts
- Name the (usual) main directions of the trains using each platform
- Mark the bike facilities already available and mention the number of racks at each facility
- Mark all locations where bikes are parked and mention the number of bikes at each location.

2.6 Places only for e-bikes and odd-size bikes in Hilversum station (NL)

2.2.3 Quality

The following quality rules are also quite straightforward:

- Only provide high quality racks. This is to limit the risk of damage of bikes, e.g. crooked wheels. Do not use cheap “wheel benders”.
- The space between two bikes should be at least 42 cm; this to prevent damage to cables
- If possible and especially in countries with high chances of snow or rain: provide roofed or covered racks.
- Provide a fastening feature for separate locks: to reduce the risk of theft.

- If possible, provide bike boxes, lockers or guarded bike parking: to reduce the risk of theft. “Human guarded” bike parking is preferred above automated and “digitally guarded” bike parking.
- Provide sockets for e-bikes in guarded bike parking, boxes and/or lockers.
- Make parking visible: it is important that people can see the parking immediately when arriving at the railway station. This has several positive effects:
    - Cyclists do not waste time by looking for the racks or walking a great distances between the racks and the train platform.
    - Not hiding the racks means that thieves and “vandalizers” are discouraged
    - Non-users can be encouraged to use a bike the next time they go to the station.
- Signposting from the bike parking to the platforms and back (!) is necessary, especially for non-frequent users.
- Information displays at the entrance of the bike parking about actual train departure times (including information about the actual platform use) provide extra quality; no need to hurry when your train is running late.

2.7 Bad example of bike racks: no possibility to secure the bike properly

2.8 Good cycling racks provide an extra 'fastening feature' to lock both the wheels and the frame to an object

2.2.4 Price

In addition to location, quantity and quality of the bike parking, the pricing of the paid guarded parking should of course also be attractive and affordable for (frequent) users.

This means that paid options should be much cheaper than a local bus ticket; monthly and yearly subscriptions should be available and there should always be an option to park bikes for free.

Until a few years ago, there was one tariff to park a bike valid for every guarded and automated bike shelter in the Netherlands. The fare scheme has always been as indicated below (prices as in 2016):

	standard bikes	*odd-size bikes */***	*motor bikes ***
1 day (or day part):	*€ 1,30*	*€ 4,75*	*€ 7,00*
10 trip card (=10 days)	*€ 11,50*	*n.a.*	*n.a.*
Monthly subscription:	*€ 14,00*	*€ 31,00*	*€ 80,00*
Yearly subscription:	*€ 105,00*	*€ 230,00*	*n.a.*

* such as scooters, tandems, goods bikes, and bikes for disabled people
** only when enough space is available in the bike parking

Free parking options

In relation to the new policy for the management of the guarded bike parking where NS, ProRail and local governments each cover a part of the maintenance and operation costs, a new tariff

system is being introduced at certain guarded parking around the Netherlands. The tariff system is as follows:

- The first 24 hours are free, after that you pay € 0,50 or € 1,25 per day and € 55,00 or € 75,00 per year for a standard bike. For odd-size bikes you pay € 2,50 per day and € 150,00 per year.
- At some stations, parking during the first 10 days are free.
- At one station (the City of Groningen) parking during the weekend is free of charge; because of the many students there is a lack of capacity in the free-to-use racks during the weekend, so the Municipality chose to offer free parking in the guarded parking.

2.9 New tariff system in guarded parkings (first 24 hours are free, after that you pay €1,25 per day)

The new bike parking at Utrecht Jaarbeursplein (open 24 hours per day) was the first parking to introduce the new tariff system as a pilot project. Experiences have been very positive and in 2016, some further 20 parkings have adopted the new system and, considering the success of the system, more are being included in the near future.

By offering a free guarded parking space for 24 hours, the existing capacity is used efficiently as paid parking places were often empty while outside unguarded parkings were completely full. Now, daily commuters will find a safe and free parking space when using the bike to travel to these stations and the 'bike chaos' in front of many stations has been reduced. People are now discouraged from leaving their bike for more than one day in the parking and bikes parked for more than 28 days are being removed.

2.10 *Bike parking Jaarbeursplein Utrecht where a successful pilot was held for the new tariff system: The poster says: "Easy, safe and dry bike parking – your bike won't want anything else anymore".*

2.2.5 Opening hours

In The Netherlands, bike parking facilites are required to be open from 15 minutes before the departure of the first train until 15 minutes after the arrival of the last train of the day. However, for the most locations this is not profitable. So, NS in the past decided to automate these parking facilities. Some of these facilities are now supervised during the day from 7:00. to 19:00. Before

and after that period you can enter the facility using your “OV chip card”. Some facilities are only accessible by public transport chip card at all times.

- For the smallest stations, only lockers are available. These lockers also are accessible throughout the day.
- A considerable advantage for the Dutch bike parking is that every visitor of the facility has to pass the guard or the bike repair shop. In Flanders by contrast, there is no human supervision or it is possible to enter the facility without being seen. As a result, there is less of a sense of well-being and security .

In Belgium, most guarded shelters are open from 7 till 19 and closed during school holidays, but when the shelter is closed regular users can still use the shelters.

The advice here is as follows:

- If possible, make sure human supervision is available throughout the week, at least from 7.00 till 19.00, but preferably from the first train till the last train of the day.
- Make sure the guard is located at the entrance so he/she can have eye contact with everyone who enters the facility.

2.2.6 Maintenance, monitoring and regulation

Monitoring of wrecks, “orphan bikes” and/or wrong or illegal parked bikes can help to keep the station square tidy and attract users. It also helps to keep enough parking places for bikes.

Transferring bikes between locations is one of the most difficult and expensive aspects of bike parking, in particular in a bike-crowded country. Who has the authority to do this, who should carry the cost and how is it organized? In the Netherlands, this is indeed done as described below: by hand and using a central ‘warehouse’, managed by the municipality. Whether this is the most efficient way is debatable. These days, there are more systems to make this easier and more manageable. The key points here are:

- Maintain and regulate bike parking. Otherwise, parking will quickly start looking messy and lots of non-used bikes will remain in the parking. This results in parkings being overcrowded for no reason. At some Dutch railway stations 20-40% of the racks were used by non-used (‘orphan’) bikes.
- Monitor the number of bikes on a regular basis. Count several times a year using the instructions described earlier.
- Add “orphan bike and annoying bike parking management” to Local (Police) Regulations.
- Check if bikes are left for more than 2, 4 or 6 weeks without being used. This can be done by labelling “suspicious bikes”: old bikes, sometimes with crooked wheels, rusty wheels and dust on the saddle. These bikes probably are “orphans”, bikes without an owner.
- After 2, 4 or 6 weeks these bikes can separated out and after an additional 4 or 6 weeks these bikes can be shipped to a warehouse. Wrecks and wrongly parked bikes may also be removed.
- This is only allowed in compliance with strict procedures. These procedures are part of the local (police) regulations. If there are no procedures or the procedures are not followed properly, cyclists can start juridical procedures to recover damages for their removed bikes or cut locks.
- Owners can go to the warehouse to retrieve their bike after showing their ID and a key and/or a proof of purchase of the bike.
- Bikes that are not retrieved after several months from the warehouse can be sold to the public.

2.11 Lack of bike management can lead to messy station squares, like here at Alkmaar station (NL)

2.12 *In the Netherlands bike management has to be part of Local Police Regulations. It has to be published clearly to cyclists that bikes may be removed if they are parked too long, at an annoying place off the racks, or if they are blocking emergency exits. The sign reads: bikes outside of rack can be removed*

Signs around Dutch train stations indicate the following messages (translated from the Dutch):

- Non-parking zone for bikes and scooters. Except in the racks. Reference to Local Police Regulations.
- Non-parking zone for bikes and scooters. Tow-away regulations apply. Bikes and scooters placed outside racks will be removed. Cut locks will not be compensated.
- Do you miss your bike? Look in the racks.
- Be aware! In this area, the rule is: “bike wrong = bike away”

2.2.7 Attractiveness

Make bike parking accessible and simple to use.

- Availability – there should always be enough space for my bike
- Accessibility – if a parking area is not at ground level, slopes or ramps should have a low gradient and stairs should have a bike gutter. This will make it easier to push a bike down or up; however, many train customers dislike having to move between different levels, so they should preferably be avoided
- Reliability – a locker or automated parking should always work
- Safety – bikes should always be standing safe during the day and the night; the presence of people, a human guard and visibility from surrounding buildings can improve the feeling of security
- Ease of use – there should be no hassle to use a bike parking facility

2.13 Wayfinding system indicating available places in bike racks at a bike parking in the Netherlands. This system is now used more and more within big bike parkings and offer users the possibility to find free parking places quicker.

2.3 Inspiration from the pilots

2.3.1 Spain: regulations for bike parking at stations

In Catalonia, bike parking at railway stations is restricted to train travellers only; this restriction makes bike management easier. This should avoid the problems indicated above under the heading ‘maintenance, monitoring and regulation’.

2.14 Bikes parked near rear entrance of Sant Cugat station in Barcelona (ES)

2.3.2 Velostazione Como: excellent location

A secured and covered bike storage (‘Velostazione’) next to the station hosting up to 90 bikes (with room for more racks if needed) opened in September 2015.

Although the station is quite small with only one platform, the functional design and location of the parking facility is important to its success as it makes the facility easy and pleasant to use. This is not often the case at smaller stations elsewhere.

- The location of the bike parking is excellent. Arriving from the square in front of the station, cyclists get a direct and easy access to the parking.
- There is also direct access to the platform enabling fast transfer times between bike and train. The distinct industrial look makes the parking recognisable and a sign outside guide people to its entrances.

2.15 Direct access to the platform makes bike-train-bike transfers easy and fast

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2.3.3 Impressive bike parking in Ghent

Impressive renovations of the train station are currently underway, with plans for 11,000 bike parking spaces. The temporary situation may seem a little confusing, however once completed, the new bike parking facilities under the new station will impress users with its level of safety, easy to use racks, and clear overview with open sight-lines.

- The northern access point to the new covered bike parking facility nicely accommodates users with a ramp for easy entry and exit.
- However, the southern access point currently lacks a ramp, though there are plans to introduce one. This shows that ease access of the station for people traveling by bike is consistently made a priority.
- What is more, the location of the bike parking facility, directly underneath the railway tracks, provides easy access and for busy commuters.

2.16 New covered bike parking facility, directly under the railway station, in Ghent (BE)

3. Building Block n°2

Convenient public bike access

3.1 Best practice NL

3.1.1 Shared bike system OV-fiets

In 2003, a shared bike system (called: OV-fiets) has been introduced in the Netherlands following a small-scale pilot in 2000 started by Dutch infraprovider ProRail, supported by Dutch Ministry of Transport, the cyclist organisation 'Fietsersbond' and the inventor of the "witte fietsenplan" (the 'white shared bike system' invented in Amsterdam in the 1960's) Luud Schimmelpenninck.

- This started in 2002 as a public society and was more successful than its predecessors because a web-based system was set up with a database of members and bikes with a chip in the key and automated payment systems.
- It grew from 800 bikes at approx. 40 stations and 11,000 users in 2004 to 8,200 bikes at 260 (out of 410) railway stations, 180,000 card holders and over 1.5 million rentals in 2015.

3.1 The success story of OV fiets

- OV fiets in the Netherlands is a nationwide concept. Currently, it is available at just under 300 locations, mainly train stations (260 of them) but more and more at busy metro and bus stops. The following list shows the diverse types of locations and the nationwide success. The numbers only give an indication and are not up-to-date.
    - Guarded bike shelters (at approx. 100 locations); like Houten
    - Non-guarded self-service bike shelters (at approx. 30 locations); like Utrecht Overvecht
    - On the street (a pilot in Utrecht at two locations: Moreelsepark and Janskerkhof)
    - Lockers (at approx. 120 locations)
    - OV-fiets Box (14 locations) or Carrousel (five locations); like Bunnik
    - A Bike Dispenser was in the past available at four locations, but NS no longer operates these facilities anymore
- OV-fiets has a preference for guarded bike shelters. The use of OV-fiets at these locations is high and the costs to protect bikes are relatively low given the fact that staff are already available to guard the parked bikes. Unstaffed locations are required to offer a nationwide distribution of this product, but the costs for these locations are – per rental – high. The Bike Dispenser will no longer be offered due to low reliability and high maintenance costs.
- OV-fiets is a typical 'back-to-one' (B21) system. You bring the bike back to the same location where you rented it, but for an additional fee you can bring the bike to another location.

The OV fiets system is highly appreciated by its customers and changes the way people travel. According to a survey from 2011, the introduction of the Dutch public bike (OV-fiets) led to the following results:

- if the OV-fiets was not available, 8% of the users would have used car instead of train
- 46% use OV-fiets instead of bus/tram for the last mile
- 54% use the train more often because of the availability of OV-fiets
- users give the OV-fiets public bike system a high score (on a scale to 10) of 7.8.

3.2 Users of OV fiets appreciate the system

3.3 Renting an OV Fiets is possible from various types of locations, the majority of the rentals takes place at a staffed location. Above, one of the automated facilities. NS will make them more attractive and user-friendly in the coming years.

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3.4 A row of OV fiets shared bikes at a staffed location where staff hires out the bikes after scanning your smart card

3.5 Here, the bikes are stored within the four self-service lockers. Location: Amsterdam Airport Schiphol (NL).

3.1.2 Pricing and registring

In the Netherlands, the price for the system was based on a subscription fee (€10 a year for individual subscribers) and a cost per rental. For business subscriptions, there was no yearly fee but the costs per rental were somewhat higher.

From January 1, 2017, NS has changed the tariff structure and abolished the 'subscription-structure' for everyone. NS states that research shows that a subscription often is a barrier for people to use the shared bike system.

- To keep the costs manageable for NS, the price for one rental increased from € 3,35 to € 3,85. For more than 90% of travellers, this still means that they benefit from this new tariff as they use the system less than 20 times a year.
- The maximum duration of a rental is three days (3 x 24 hours).

When registering as a new user, it is still necessary to register on the website; a Dutch public transport chip card is also needed as well as a Dutch bank account to be able to verify future payment of the rental fee. OV-fiets has a non-paper policy. The whole administration process can be done online:

- Sign up for an account on their website (www.ovfiets.nl).
- Identification: by address, email and bank account plus the number of public transport smart card (the Dutch nationwide used "OV chip card")
- Rent: after this you can use an OV-fiets bike immediately (although in practice, it takes 24 hours to activate the account).

3.2 Implementing BiTiBi

A public or shared bike system or scheme, is a service in which bikes are made available for shared use to individuals on a short term or daily basis. The main purpose is offering "the last mile": public bikes allow people to depart from their arrival station to their destination free from worries of ownership.

There is a difference between a back-to-one (B21) and a back-to-many (B2M) bike share system. At a B2M bike-sharing system it is common to collect a bike at point A, cycle to point B and drop off your bike at point B.

- OV-fiets is an example of a B21 system: You collect your bike at point A and at the end of the day you bring it back to point A. (For a supplement of € 10,- it is possible to return your OV-fiets to another location. This is meant to 'discourage' B2M use of OV-fiets and it is meant to cover the costs of redistribution.)
- At railway stations a B21 system is common and easier to implement because all bikes will return at the end of the day – or after a couple of days – to the station. No teams are needed to redistribute bikes over the locations and people often return to the same railway station from where they collected their bike.
- For users, the reliability is higher, because with a B2M system there is no guarantee that a bike is available at your rental location. With a B21 system you have a guarantee as you are the one with the key to the bike.
- On the other hand, there has been a recent growth of the concept of (city-wide) bike-share systems, mostly introduced and sponsored by outdoor companies or banks. Examples of these B2M systems can be found in the city centers of Paris, Lyon, Brussels, London, Copenhagen, Barcelona, Milano and (parts of) New York City. These developments cannot

be neglected. Especially in countries where cycling is not in everyone's mindset, these public bikes can help to advertise the use of bikes. It is remarkable that railway companies are not involved in these B2M systems. In general railway companies are only interested easing the trip to and from railway stations whereas a B2M system can improve the accessibility of a whole city.

3.2.1 Product

In the Netherlands, the local public bike, 'OV-fiets', is a simple but strong concept. This concept has been copied and slightly adapted to other countries, like the Bike & Go concept in the UK and the Blue Bike concept in Belgium:

Netherlands	Belgium	UK
Standard Dutch bike Strong and simple Easy maintenance	Standard bike with 3 gears	More luxury style with 7 gears
Recognizable (NS style) No co-branding Non-commercial look and feel	Colors from "the station" brand 1 private sponsor	Independent style
Comfortable saddle Only rear luggage carrier Puncture resistant tyres Chain guard Mudguard Two integral locks Height adjustable	Rear basket	Front and rear luggage carriers
Battery operated lights	Dynamo lights (pedal operated) with "stand light"	Dynamo lights (pedal operated)
Rear brake only	Front and rear rollerbrakes	Front and rear brakes
One gear	3 gears	7 gears
Front and rear end reflectors		

3.2.2 Price and invoicing

Choose pricing wisely, and make it attractive compared to local public transport. Easy (monthly) invoicing by e-mail and direct debit, like in the Netherlands, is also important.

- In Belgium, bike rental has been free in six cities. Local and regional government paid the costs with the argument that every train user is not a car user. Promoting train use by subsidizing bike rental can reduce car use, congestion and the need for car parks in city centers. In another five cities, bike rental only costs € 1,00 instead of € 3,00 per day. The local and the Flemish Administration pay the rest. This system is expanding into Wallonia.
- The price per rental in the Netherlands roughly equals a round-trip by bus (in Belgium and the UK this was also the principle). The price in Belgium is € 1,00 - 3,00 and in the UK GBP 3,80 per day.
- In Belgium, the subscription fee was initially € 18 per year, but at this price, it was not successful enough so Blue Bike lowered the fee to € 10.
- Blue Bike started by sending the passes to the customer's home address and the customer then returns an authorization by mail. This added at least two extra days before the customer could rent a bike. Blue Bike then introduced the ability to purchase a subscription on location at 14 stations. People receive a voucher to rent the bike the same day and the pass is sent afterwards.

3.2.3 Location

In the Netherlands, OV-fiets is a nationwide concept. Covering almost the whole country makes it an attractive and effective mode of transport in combination with the train.

Where should I place the bikes?

- Preferably in a guarded parking that is open all day. If that is not possible, you can either store the bikes in lockers or you can use a guarded parking that is not open all day. For instance, Merseyrail opted for ticketing and support staff to hand the bikes over to customers.

3.2.4 Number of bikes

- The minimum number of bikes at each location is six. A regional system should consist of at least four or five locations. But ideally, you should provide a more or less nationwide or region-wide system. Only then, customers can rely on the availability of a bike on their station of arrival.
- The number of bikes should depend on the number of "egress", which is 1% of the total number of "egress" (in 2015). In Belgium, the system is available at the 40 main stations, in the Netherlands the system became nationwide once it was available at the 80 main stations. It is now available at 260 railway stations.

3.2.5 Maintenance, costs and organisation

How do I organise the maintenance?

- B21 systems do not require much maintenance, except for repairing of flat tyres etc. A partnership with the guarded bike parking staff or with a local bike repair shop is an option. It is also possible to work together with a workplace for disabled people.
    - In the Netherlands OV-fiets works together with a nationwide party for the maintenance and distribution. OV-fiets aims to do most of the repairs at each local parking facility and tries to use staff already available as efficiently as possible.
- For B2M systems, a team has to be present nearly permanently to return bikes between full and (almost) empty locations to keep the number of bikes at the correct level. The cost of a B2M system is typically more than double of the cost of a B21 system. If the team of redistributors is too small, the system will soon will. Clients do not want to find the racks empty.

What is the size of the organisation needed?

- In the Netherlands, the OV-fiets team used to consist of approx. 10 people, but OV Fiets is now part of the broader organisation at NS with people that cover management of all door-to-door mobility services within the railway company.
- At OV fiets, also an events team is available to provide extra bikes during events
- For a smaller nationwide system, the team should consist of at least people. On top of that, there has to be a maintenance team for automated locations. The same team also serves as an event team.

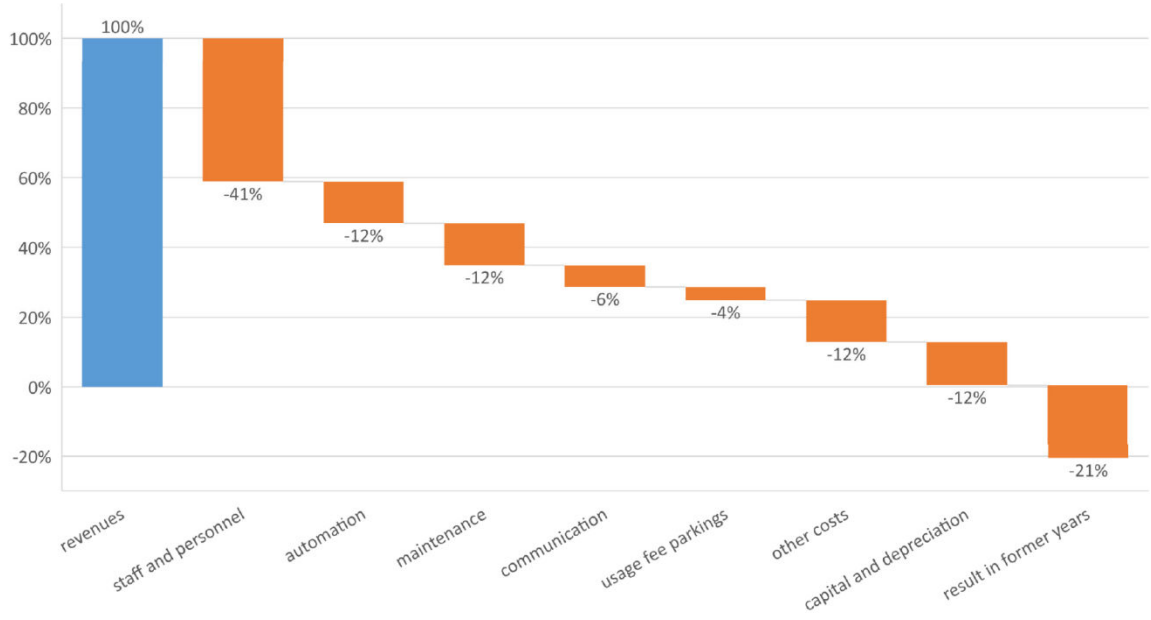
- At staffed locations, several people are appointed to hand over and retrieve bikes. During the startup, extra capacity is needed for contact with stakeholders and further implementation.

What is the main advantage of a B21 system?

- Firstly, it is much cheaper to maintain. And secondly: as a user, you are sure at the end of the day that the shared bike you rented in the morning is still waiting for you, because the key is in your pocket.
- The disadvantage for the bike rental company is that with a B21 system, you cannot rent every bike as often per day.
- In a B2M system, you are not sure whether there is a bike available at the end of the day because in a B2M system, you pay for every minute you use the bike, so you typically give up the bike after your first trip, then pick another for your return. For most B2M systems, the first 10 till 30 minutes are free.

What is the cost per bike?

- The investment is approx. € 300 - € 350 per bike in the Netherlands (OV Fiets), but can vary depending on the extras, like gears, luggage carriers and hand brakes. Yearly depreciation in this case would be around € 60 per bike. Maintenance costs could be approx. € 150 per bike per year, but this depends on the type of bike used and is difficult to estimate based on the Dutch example at OV Fiets.
- Automation costs could be anywhere between € 1,000 and € 1,750 per location (indicative amounts as this varies a lot between locations), depending on the system and the number of OV-fiets bikes planned to be stored at the station.



3.6 Indication of costs and revenues of OV-fiets (indicative percentages, average for the years 2012-2015).

What is the cost per rental?

- For NS, the costs of rental at guarded locations are approx. € 1,00 lower than the costs per rental for unstaffed locations (lockers and automated bike parking shelters). 90% of rentals occur at the 100 guarded locations; 10% of rentals occur at the automated locations. The unstaffed locations are more expensive, but they are needed for the coverage of the system.

How do you get enough income to pay for staff?

- The OV-fiets system works according to a 'shop-in-shop' formula. Local staff already available for repair and for guarding the bike parking is paid for every bike rental.

Is this feasible on a small scale and how many do you need to have a profitable system?

- In general, a large system is more efficient, which makes it easier to be profitable. But it also depends on the number of people using the bikes and the costs of maintaining the bikes. It depends on many local and regional variables. You should expect a minimum yearly cost of € 400,000 for a running system. This is without the costs for capital investments.

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3.3 Inspiration from the pilots

3.3.1 Regular but recognizable bikes: Blue Bike (Belgium), Bike & Go (UK)

The best communication a bike operator can get is to make sure customers easily recognize the bikes at the stations and in the streets. For that, the bike should have a specific identity, while still look like a regular bike.

- Customers using the BiTiBi concept are not tourists visiting a city. They want a regular city-bike that is good quality, looks nice and is efficient.
- Bikes must be simply and elegantly branded to ensure that people can spot them easily at the train station. Moreover, if these bikes can be recognised in the streets when they are used, this is free advertising that the bike operator cannot ignore.
- Compared with some public bikes, all the bikes developed in the BiTiBi projects have been designed to look like regular city bikes. If they are simple and robust, they offer more options to the cyclists than normal public bikes. For example, the Bike & Go bikes have seven gears and two integral locks. The Bike & Go also has both front and rear luggage carriers.

3.7 Bike&Go bikes: regular but recognizable bikes

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

3.3.2 Rent two bikes: Blue Bike (Belgium), Bike & Go (UK)

In the three most developed bike-train services, members are allowed to rent two bikes at a time. It is hardly surprising that this option is available in Belgium (Blue Bike) and the United Kingdom (Bike & go) given the pioneering work done in the Netherlands by the Dutch OV-fiets programme. Indeed, in the Netherlands, this option is highly valued by customers. This was introduced several years ago because clients are the best ambassadors for the public bike system and it is an advantage when you are traveling together and both can rent a bike.

Using a single subscription, in Belgium and the UK the member can rent two bikes at the same time and from the same station. The price of the second bike is the same as the first. You can rent a bike for a family member, a friend or a colleague on your own smart card.

3.3.3 Selecting a station for Bike & Go (UK)

Merseyrail uses the following criteria for success when selecting a station for Bike & Go:

- High footfall
- A destination station. Points of interests (think of both leisure and business) in the city that are not in walking distance but are in cycling distance - between 1-5 miles
- Early – late opening hours ticket office (bikes are rented out via staff at booking office so long opening hours are required)
- Ideally mostly flat area and with some cycling infrastructure

3.3.4 Innovative financing at Blue Bike (Belgium)

A third-party payment system can be the ultimate leverage for financing and extra promotion.

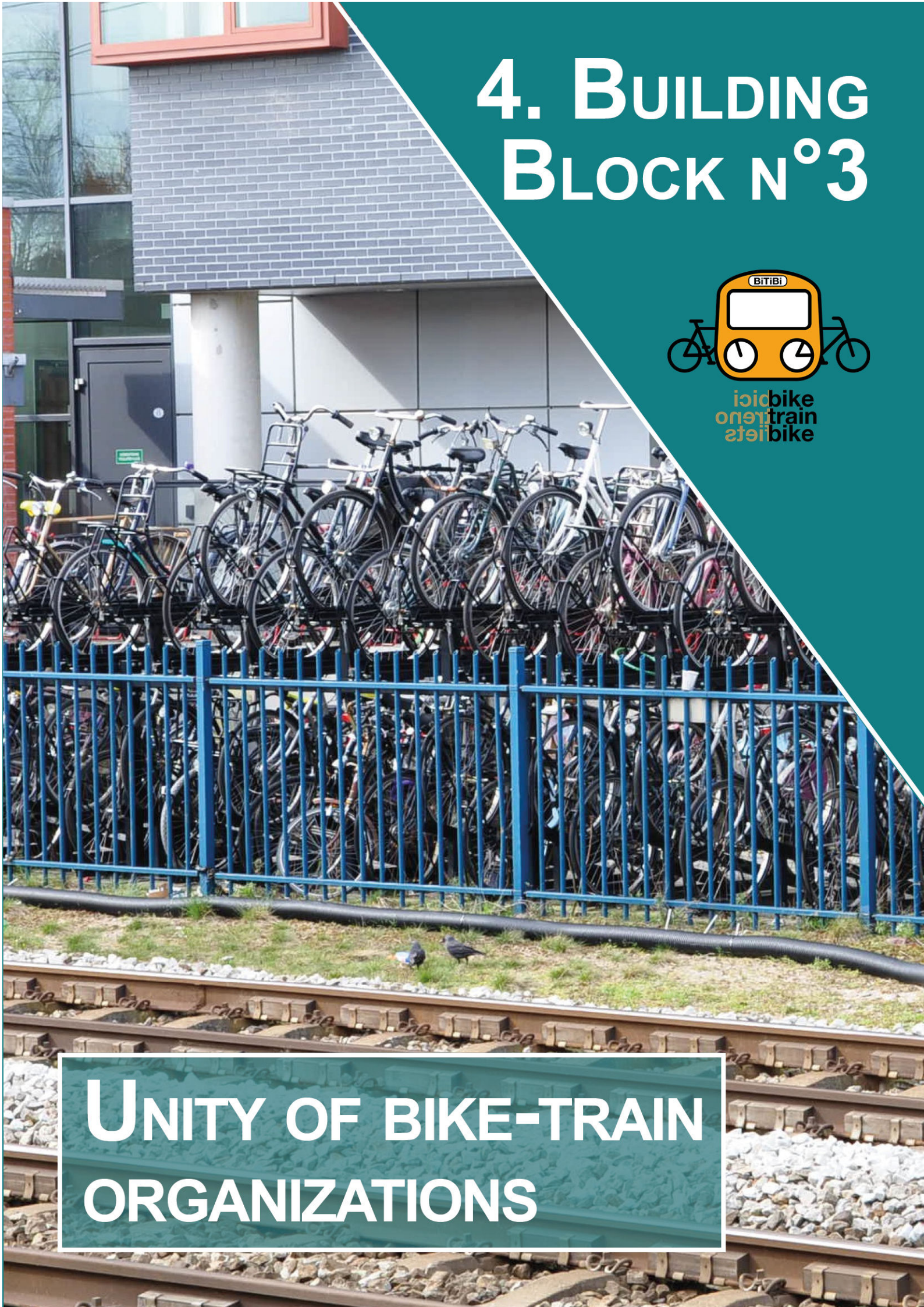
- Blue-bike organised cooperation with cities in which the city pays €1/ Blue-bike rental, and the region pays another euro. The user fee is thus reduced to €1 instead of €3.
- A clear advantage of the system is that the very low user-fee reduces the threshold for using the system and increases attractivity.
- Another less visible advantage is that cities get involved in Blue-bike and handle local promotion themselves. An agreement concerning local marketing efforts contributes to the success.

3.8 Row of Blue bikes parked outside Ghent station

3.3.5 Corporate offer at Bike & Go (UK)

The corporate offer offers staff of participating organisations the possibility to hire a bike on their journey to work or meetings. The following actions were launched:

- A corporate membership page was added to www.bikeandgo.co.uk so interested businesses could find out more about the scheme and how to contact the operator.
- A workshop with stakeholders and corporate sales managers of the participating TOCs (train operating companies) was held to discuss how the corporate offer can best be sold to corporate clients.



4. Building Block n°3

BiTiBi

bici bike
treno train
bici bike

Unity of bike-train organizations

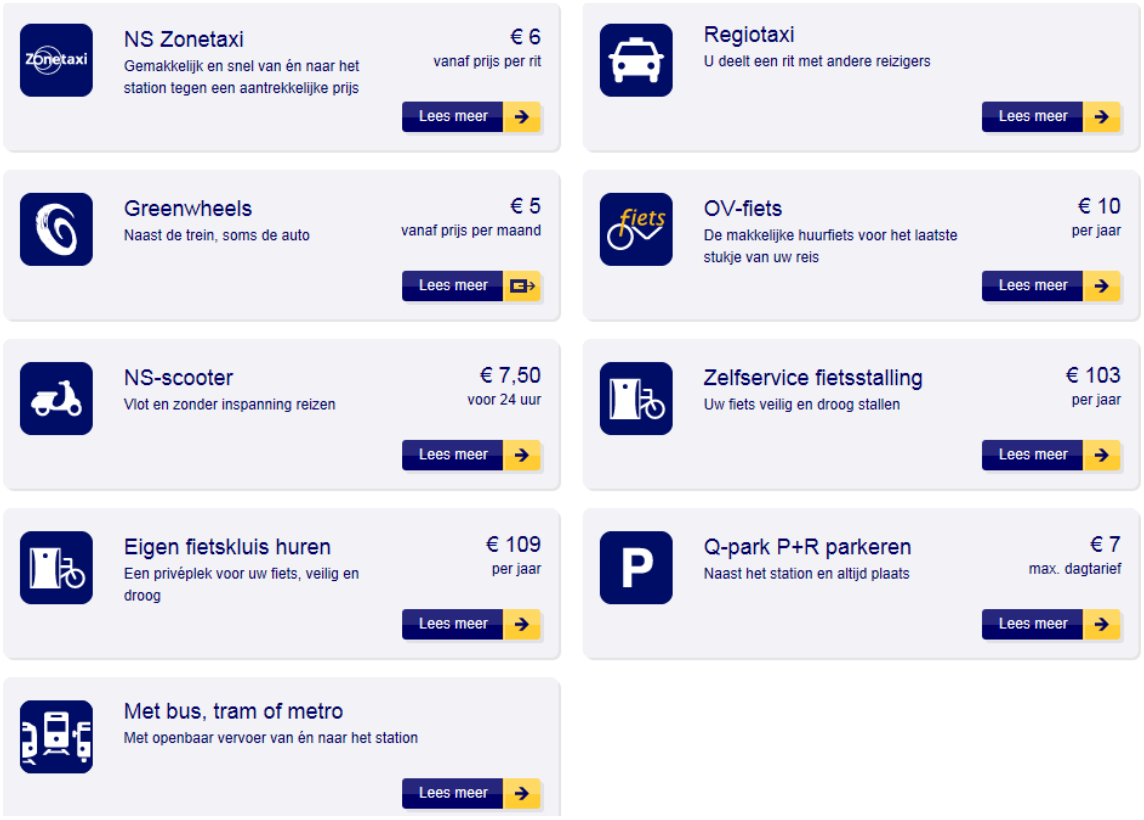
4.1 Best practice NL

The importance of a door-to-door approach (rather than a station-to-station approach) is obvious as there are almost always 'first miles' and 'last miles' to bridge. Where a train company or a local community lacks systems for overcoming these 'miles' other than public transport or taxi, the majority of people using trains will have their origin or destination in walking distance of the railway station. Other people will soon look for alternatives such as the car to make their trip. Having one integrated organisation is the best guarantee for a successful door-to-door approach.

- In 2000, NS Fiets started to operate and maintain all guarded bike parkings (mainly for the first mile). In the same period, an investment plan was introduced in co-operation with national and local governments to renew, upgrade and expand both staffed and unstaffed bike parkings and racks.
- Since 2008 the public bike scheme OV-fiets has been adopted by NS ("OV-fiets B.V.", a form of public limited company). This became part of the organisation responsible for guarded and automated bike shelters NS Fiets ("NS Bike"). NS Fiets was also responsible for the distribution of keys for bike lockers.
- When OV-fiets became part of NS Fiets, the organization could use the marketing expertise and the client database of NS. Since then, the number of subscribers tripled to 160,000 people. NS doing all the marketing and the main communication of the programme has kept the costs down.
- Later on, NS Fiets became part of "NS Retail and Transfer" (now: NS Stations services). The division was responsible for all transport modes used to and from railway stations. NS Transfer is responsible for the development, operation and maintenance of concepts to ease the first and last mile to railway stations, for example: bike parkings, OV-fiets, Park-and-Ride (in co-operation with Q-Park), NS Zonetaxi and Carsharing (in co-operation with Greenwheels).
- NS also consults local and regional PT companies for the creation of reliable connections between bus and train as a 'guarantee' for a coherent and successful approach.

Piero Witmer (product manager OV Fiets at NS) explained NS's position as follows:

"Our customers travel from door-to-door. Our proposition is only complete when providing the whole journey. Only by using this integral approach, can we make the train distinctive to the car."



4.1 The NS website shows examples of the nationwide standards NS Transfer offers alone or with partners like car sharing company Greenwheels and car parking provider Q-park.

4.2 Implementing BiTiBi

When bike and train companies work well together, the implementation of a bike share scheme is easier from the word go. A train company with a consistent door-to-door approach for all modes of transport, with cycling clearly being one of the key parts, is essential here. The integration and unity of bike and train organisation will follow the BiTiBi-approach and is less important when starting with a BiTiBi-approach.

An integrated organisation could bring the following:

- The bike organisation can benefit from the marketing experience – and the budget – of the train operator and its extensive client database. Moreover, using the train operator structure is a way of keeping costs low.
- There are also numerous concrete examples which demonstrate the good co-ordination necessary between bike and train operators. The decision on the location of the bike parking and the bike station is an obvious one.

There are other experiences as well. Oddly enough, the Belgian rail provider NMBS/SNCB – although it is a main shareholder in Blue Bike – does not allow Blue Mobility to provide brochures

about Blue Bike at NMBS/SNCB ticket counters, whereas NS provides OV-fiets brochures at their ticket counters. This is important and provides constant exposure at the station for the product towards your clients.

Establishing unity with bike & train organization does not mean that all management levels are convinced of the value of public bikes for the train operating company.

4.3 Inspiration from the pilots

4.3.1 User friendly approach of Merseyrail (UK)

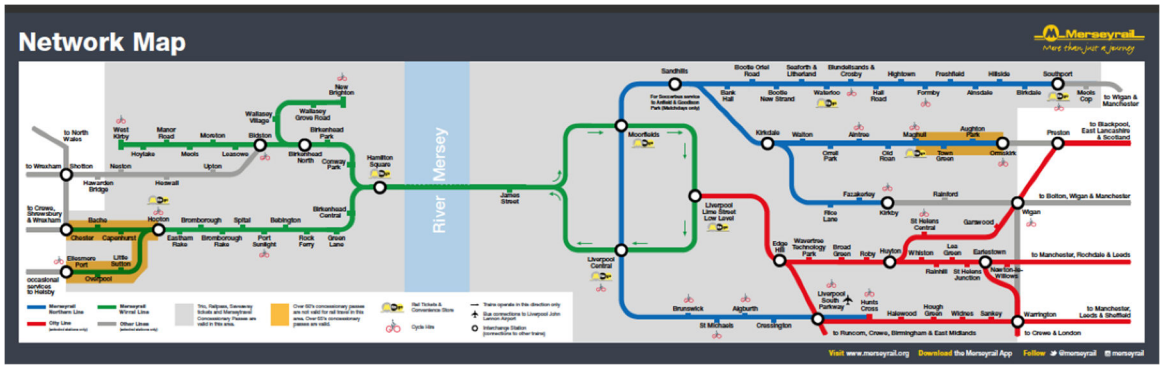
Logo on rail network map

Recently, Bike & Go has improved its user-friendly approach by placing its logo on the rail network map of Merseyrail on the trains, informing customers when the service is available at the various stations.

Staff

Bike & Go also uses the staff of the train stations to hand out the keys for the bikes to the customers. This personal touch is important, especially in a culture that is not yet cycle-minded.

Merseyrail provides promotion and information of the Bike&Go system at their stations and travel centres.



4.2 Bike&Go rental locations visible on the rail network map of Merseyrail (UK)

4.3 Promotion and information of the Bike&Go system at Merseyrail stations

4.3.2 Dedicated team at FerrovieNord (Milan, Italy)

A dedicated BiTiBi team was created within Ferrovienord (FN). Looking at the Dutch best practice, this team made plans to open bike parkings at the FN railway stations. This has led to the opening (and/or to plan for the opening) of a grand total of 20 bike parking stations (including the BiTiBi pilots in Bollate Centro, Bollate Nord and Como Borghi) in 2015-2017. Even cycling infrastructure has been build linking their stations to nearby cycle paths.

The BiTiBi actions led to a comprehensive strategy of bike-train-bike services by the infrastructure manager, Ferrovienord, using the BiTiBi brand as a unifying factor. It is particularly important to underline the change of both mentality and behaviour within the Italian company with respect to the use of bikes, and the use of the BiTiBi model. Ferrovie Nord has committed itself to investments in cycling facilities throughout their network, even though this is outside of their traditional core business.

4.4 One of the 'Velostazioni' (guarded bike parkings) that have been created around the FerrovieNord network. This is the BiTiBi pilot location Como Borghi station. This fits perfectly in the strategy of the Infra manager to provide safe and convenient bike parkings as a service to its customers.

5. Building Block n°4

bike
train
bike

Easy Payment Systems, Processes & fares

5.1 Best practice NL

As mentioned before, NS is responsible for all processes for guarded and automated bike shelters as well as for the bike lockers and for OVfiets.

- A smart card was introduced in 2010 for Dutch public transport that can be used to pay for travel by all public transport in the whole country (train, bus, tram, metro). Incidental users must buy a disposable chipcard as regular tickets are not used anymore. In 2014, around 18,5 million “OV-chipkaarten” had been issued and of them, 13,6 million cards are in use. With 17 million Dutchmen, that is quite a high coverage.

5.1.1 OV-fiets shared bike

Since 2012, the Dutch public transport chip card can be used nationwide to rent an OV-fiets. In the beginning, OV-fiets had their own cards and mobility cards and discount from NS could also be used.

- This is the real integrated payment. Payment to top up the smart card can be done by cash, prepaid, postpaid, creditcard or debitcard.
- Unfortunately, the OV-fiets proposition is only available for people with a Dutch bank account. The system is not available for tourists.

In the Netherlands, the integration of OV-fiets with the train operator allowed the company to combine discount campaigns and to highlight intermodality.

- In September and October 2015, NS combined the discount on off-peak hours & weekend cards for trains with the OV-fiets membership.
- Since train and bike cards are combined in the “OV chip card”, people can rent a bike as soon as the subscription is accepted and do not have to wait for a card to arrive at home.

5.1.2 Bike parking

You can use the OV chip card for payment of bike parking at around 40 guarded bike shelters. This pilot has recently been implemented into regular use; all train users will be able to pay for bike parking with their PT smart card. This means that the integration of bike and train in the Netherlands is becoming even more seamless.

- You ‘check in’ with your PT smart card, where staff is usually available in order to make sure everyone checks in.
- You ‘check out’ with your PT smart card with the staff at the bike parking; if payment is needed (because you parked your bike for more than 24 hours in one of the parkings with the new tariff system, or when parked at one of the bike parkings with the ‘older’ tariff system), you can choose for payment by automatic bank transfer or by debit card at the bike parking.
- The NS website promotes “Bike parking on credit” – do not pay cash anymore, but use your OV chip card and receive a monthly bill.

5.2 Implementing BiTiBi

Daily life – especially for commuters in public transport – is constant registrations and subscriptions and they often end up with a pile of cards and tickets. For a seamless bike-train-bike trip, limiting the number of transportation cards is another key element to the success. Therefore, all train passengers can use the same card to safely park their own bike, which they used to reach the station, and to rent a public bike for the last mile of the trip.

- Integrate payment of bike parking and the shared bike system with the payment of your train trip.
- Having a public bike scheme integrated in the services of a train operator allows the company to combine discount campaigns and to highlight intermodality.
- Make registering easy and fast. It can be a long process to first pay the annual fee after which a card is sent to the customer by post.
- Same-day registering and first time usage can be helpful in attracting new customers.

5.3 Inspiration from the pilots

5.3.1 Easy payment for public bikes and fast registering in the UK

In the United Kingdom (just as in the Netherlands), all operators have opted for a swipe card or a key-fob which allows cyclists to get a bike and register its trip. For the payment, the rental fee is automatically charged at the end of every month.

Bike & Go has improved its customer-service by creating an “on-the-spot” registration tool.

- Customers can sign up on their phone or tablet device which will provide them their membership number. Normally, they would receive their membership within five working days, but with the number handy, they can hire a bike straight away.
- Staff just need to check the welcome e-mail and see some valid ID. This feature is only available for two weeks following signing up. After that, it is necessary to use the membership card.

5.3.2 Italy and Belgium: integration with public transport smart card

Italy

Based on the Dutch example, FerrovieNord made the introduction of smart card integration central in their strategy of bike-train-bike services. To save time and money, they decided not to invest in a new complicated system but use software to integrate with existing schemes. This is why the regional public transport smart travel cards (‘Itinero’ and ‘Ioviaggio’) now can be enabled to provide access to the bike parkings. It makes the combined bike-train journey much more convenient and provides much better monitoring of the use of the system.

Belgium

Joining the Mobib card platform for Blue-bike allows the instant possibility for all Mobib card holders to access and use Blue-bikes without a separate ‘Blue-bike’ card. People will be able to subscribe online to Blue-bike with their Mobib card number and hire a bike straight away. This is not only a quick win for both the customer and the supplier but it is also a main tool for marketing and communication (available from April 2017). The Mobib card is the first initiative towards a Belgian integrated payment card for the use of public transport in Belgium.

5.1 Accessing the BiTiBi pilot location in Como with a regional public transport smart card.

BEAT THE RUSH

Bike to the Station

6. Building Block n°5

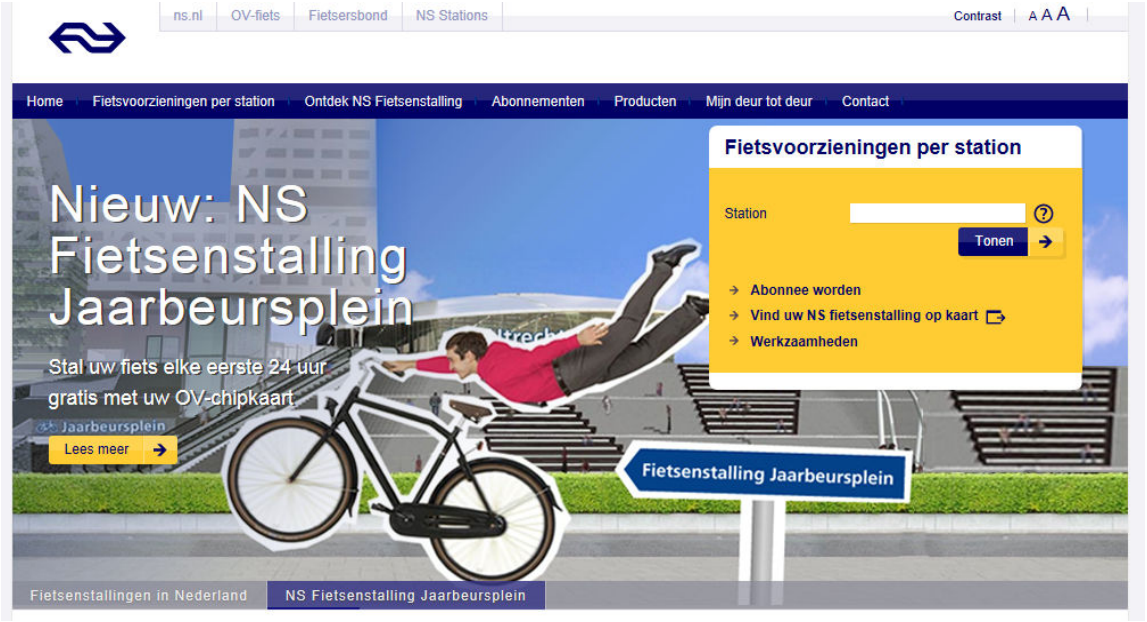
Positive Communication & Marketing

6.1 Best practice NL

6.1.1 Examples within NS

NS is the leading partner in communication, marketing and promotion of bike use. NS promotes its product OV-fiets and the use of bike shelters, lockers and free bike parking racks whenever it produces material such as brochures and online.

- Information about OV-fiets and bike parking is available at every NS ticket and service shop. Every guard and service employee has a tablet and can provide up-to-date information about the bike facilities at every station in the country.
- NS's idea is to promote more of an integrated door-to-door travel. That means promotions for your door-to-door travel, instead of only NS/train or OV-fiets or bike parking. Buying door-to-door services in combination with your NS-subscription has to be very easy.



6.1 An example of positive communication by NS to promote the new bike shelter at Utrecht Central Station. It says the first day parking is free and you can pay using the nationwide OV chipcard

6.1.2 Inspiration outside NS

6.2 *Promotion campaign from 1979 by the Dutch Fietsersbond: 12 cyclists use the same space as one car and 48 car users fit into one bus*

6.3 *Marketing campaign by manufacturer Brompton: 42 folding bikes need the same space as 1 car*

6.4 Examples of positive communication in Haarlem (NL) "bike parking, free and dry" (left), Helmond (NL) "don't forget to check in your bike" in the free to use bike parking (right)

6.2 Implementing BiTiBi

Bike services cannot be developed without cyclists. Therefore, promoting cycling should be a part of the communication actions from the very beginning of the service.

6.2.1 Bike parking

In the Netherlands, bike facilities at railway stations are generally heavily used, but some facilities need extra attention. At some stations, lockers and automated bike parking areas are not much used. Sometimes, the free-to-use facilities have a high quality or bike theft is so low that people do not feel the need for a paid bike parking facility. Here, NS offers train users discounts such as a free first month after subscribing or free use for the first day. It is NS's ambition to provide the first 24 hours for free.

- In other countries where cycling is not commonplace, bike-use campaigns can be used to promote cycling. The promotion of bike parking is more crucial than the promotion of shared bikes, because the number of people that will/can use bike parking is higher.
- Business-to-business marketing and free publicity can also be useful for bike parking.

6.2.2 Public bikes

The keys to OV-fiets success are easy to remember: OV-fiets is easy to rent, part of the door-to-door transportation, rental fee payment is incorporated in the public transport smart card, OV-fiets needs little infrastructure (flexible system), OV-fiets is easy and fun to use, it is healthy, hassle- free and fast. The marketing NS uses to promote OV-fiets are:

- The concept of OV-fiets as a fantastic product. It has a non-commercial look and feel
- It receives a lot of free publicity. Many municipalities want to pay for OV-fiets to be offered in their city.
- OV-fiets has a recognizable logo, a strong catch line and a design manual. There are many promotional project leaflets, promotion roll-ups, posters and merchandising products, dissemination materials and postcards available. Presentations on OV-fiets and bike parking are available in five different languages.
- NS did have a dedicated OV-fiets website and newsletter, but made the information available on websites of NS and other stakeholders too. This is now more integrated into the main NS website. There are also links to the product on websites of other stakeholders
- NS is very active on social media, like Twitter. NS@Online reacts immediately to complaints, questions, compliments and suggestions of train and OV fiets users

Free publicity is key and often better (and cheaper) than paid publicity. Customers are the best ambassadors! Get free publicity wherever you can and be creative. Marketing techniques include:

- Approach large business customers (one contact, multiple users)
- Tell a friend and member get member actions (although the latter is a very well-known marketing technique, only 4–5% of the new members are informed by friends or relatives)
- Free rides offered in subscription of a cycle magazine (14% of new members)
- Offering a coupon in combination with a train ticket is in particular a great success

Promotion via large employers seems interesting, although it can also be a risk. A large bank in the Netherlands offered “BiTiBi schemes” to its employees. As a consequence, there were ate time no OV bikes available for other clients during working hours.

For one-day events with a relatively specific and strong peaks, like concerts or congresses, it is advised to deploy the event team to prevent a ‘sold-out situation’.

NS promotes OV-fiets in their own magazine for regular customers, in ads in stations and in train and at events like the Olympic Games where hundreds of yellow-blue OV-fiets bikes were transported to London and Vancouver so athletes and visitors were able to use OV-fiets during the games just as at home. The bikes where introduced by Dutch cyclists, among them Tour de France winners.

6.3 Inspiration from the pilots

6.3.1 Belgium: Creating a community of users

Creating a committed user community has proved to be essential in the success of a bike sharing system.

- Blue-bike reaches potential users by communicating on different media levels and being creative, resulting in low costs and high impact. In social media, Facebook was used to post promotional campaigns, a live feed of the twitter account was implemented on the homepage. The Facebook page has 3,010 followers, the Twitter page has 1,300 followers, and Instagram has 93 followers.
- The Blue-bike 'community' is activated through gamification, such as photo contests, free gadgets, free coffee to encourage users to participate in service and product development. Short surveys about where users want Blue-bike to be installed in the future, what they want the future Blue-bike bike to be like, a challenge to invent the new slogan and so on.

6.5 Recognizamble communication by Blue Bike (BE), using real Blue Bike users instead of actors

6.3.2 Community spirit in Bollate (IT)

A key success factor is the community spirit around the Velostazione in Bollate Centro. The project is strongly embedded locally. The nice atmosphere makes the cycle parkings function as a central meeting point for commuters and other people involved.

- The municipality is the most important funder of the project. Local organisation 'Fabbrica dei segni' is the social enterprise that manages the parkings and repair shop. An enthusiastic group of volunteers do their best to make the cycle station a success. Even teachers of nearby high-schools are partner in the project and encourage students that have problems at school to work in the cycle station offering them the chance to acquire technical skills.
- Also, in association with the Italian Federation of Friends of the Bike (FIAB), bike repair training was organised and advice about commuting by bike was given out.

6.3.3 Barcelona: try a bike

In Catalonia, the 2015 European Mobility Week provided the opportunity to promote cycling. Actions were organised to encourage people working in companies located based within five kilometres of the train stations to try a bike. Offering a bike experience is the best way to convince people that biking to work is doable. The 'Try a bike' event was offered free-of-charge to companies in Sant Boi and Sant Cugat.

- This was an opportunity to create interest among employees, giving them an opportunity to test the route between the office and the FGC station. The goal was to help them realise that cycling between the train station and the office is a pleasant way to finish their daily commute. A professional service, electrical bikes and snacks at the end the route are included.
- In Sant Cugat, a group of employees from a pharmaceutical company tried e-bikes, riding from their office to the station – a distance of 2.8 km. New cyclists were amazed how fast they reached the train station.

6.6 Try a bike initiative in Barcelona (ES)

6.3.4 The UK: Making the bikes visible in station halls

Making bikes visible is simply the best way to promote cycling and intermodality. This has been done in various ways:

- Signing and branding has been developed at stations to promote Bike&Go. This included Bike&Go flags, large banners and posters.
- In the Haymarket station in Scotland, Bike & Go bikes are parked in the hall, instead of a secure shelter by the building. Therefore, there is no risk of missing them, everyone walking in and out of the station pass the bikes. More than making the service very visible, people can also stop to look at the bikes. They become part of the landscape and people's daily commute. As a result, this station has become the best performing location of the Bike & Go network.
- It was found that a lot of customers were not aware of the fact that you can hire a bike straight away if you sign up on the spot. All stations put up new large banners promoting the 'hire me today message' and the registration page of the Bike & Go website was redeveloped to accommodate mobile devices.

6.7 Promotional activities and better visibility of the Bike & Go system has resulted in more users

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6.3.5 Velostazioni: consistent signing and branding (IT)

The 20 bike parking stations ('Velostazioni') that are realised and planned around the network of FerrovieNord use the BiTiBi brand as unifying element. The logo is visible on signs around the stations.

6.8 Consistent signing and branding of bike parkings around the network of FerrovieNord in Milan (IT), inclusing the BiTiBi logo

7. Building Block n°6

bike
train
bike

Safe & Secure Ways to Reach the Station

7.1 Best practice NL

In the Netherlands, the Bike+Train(+Bike) sequence is the greatest competitor for cars. The primary condition to enable people to do the first and last miles of a door-to-door bike-train-bike journey is safe cycling conditions to the station. This is why, over the course of the project, this sixth building block has been added. Railway stations in the Netherlands are in most cases safe to reach, we highlight a few important aspects.

7.1.1 A nationwide high quality network of bike infrastructure

All over the Netherlands, cyclists can rely on a high-quality network of bike paths and lanes, tranquil cycle streets and separate traffic lights especially for cyclists.

7.1 In Hilversum (NL), a cycle path has been created right down the station hall with a direct entrance to the bike parking that is situated right below the station hall

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7.1.2 Safe and direct signposted routes

Cycle-friendly and safe routes help making a trip to the railway station more pleasant. A pleasant, separate, car-free route helps to increase the number of cyclists. It is the role of municipalities to create these routes.

7.2 Separated cycle lanes at both sides of the streets, in this case leading towards Hilversum station (NL), are common practice in the Netherlands and provide safe and comfortable access for bikes.

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7.3 All over the Netherlands the same high standard bike signposting is available.

7.2 Implementing BiTiBi

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.

7.2.1 Research with the ReCycle City tool

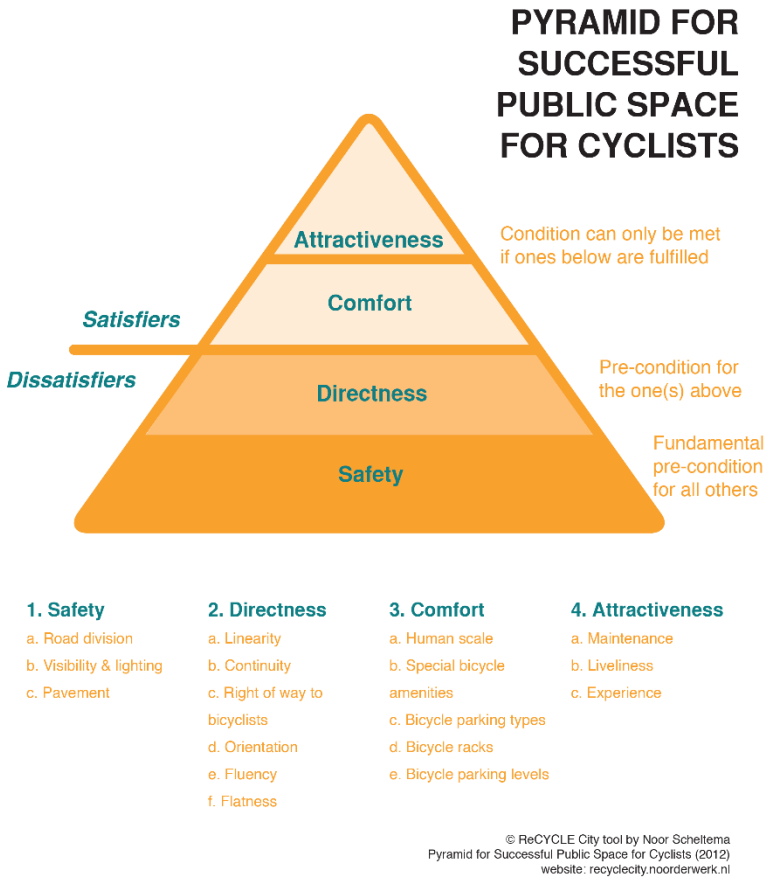
To get a clear picture of all factors that influence the usages of bikes such as access and egress mode of transport, the quality of the bike infrastructure around all pilot stations has been assessed within the BiTiBi-project. This has been done using the evaluation tool ReCYCLE City, developed in 2012 by Dutch scientist Noor Scheltema at Delft Technical University (TU Delft). Up to seven different routes leading to the pilot stations have been assessed.

Please find more information on this research in the *Microscopic assessment quality level of cycle infrastructure connecting train stations* (D2.6). You can obtain a complete document by sending a request at info@bitibi.eu.

ReCYCLE tool

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

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



Conclusions of the research

The following graph pinpoints the strengths and weaknesses of all routes. The scores are indicated for all levels of the pyramid for each pilot city. The scores for all individual routes have been averaged. The average percentage for all satisfiers is 72% and for all dissatisfiers it is 58% (the maximum percentage that can be obtained is 100%). During the BiTiBi project, the quality of the

infrastructure to and from the station has not been changed. Therefore, no effects can be measured within the project, but we do know from other studies the importance of good cycling infrastructure.

Bicycability	pilot cities								comparison
City	Liege	Ghent	Como	Bollate	Sant	Sant	South-	Liverpool	pilot cities
Station	Guille-	St-	Borghi	Nord &	Boi	Cugat	port	South	
Scores	mins	Pieters	& Lago	Centro				Parkway	ave-
Country/Region	Belgium	Belgium	Milano	Milano	Barcelona	Barcelona	UK	UK	rage
Attractiveness	64%	56%	71%	43%	75%	79%	64%	58%	64%
Comfort	84%	82%	81%	67%	72%	80%	81%	70%	77%
Directness	57%	68%	53%	60%	57%	49%	62%	62%	59%
Safety	52%	54%	45%	59%	60%	55%	60%	49%	54%
Total percentage	64%	68%	62%	59%	64%	62%	67%	62%	64%
Total satisfiers	76%	72%	77%	58%	73%	79%	75%	65%	72%
Total dissatisfiers	56%	65%	51%	60%	58%	50%	61%	59%	58%
Total score	71	74	69	67	71	70	73	69	71

7.4 Strenghts and weaknesses of all routes that have been studied in the pilot cities

One overall conclusion can be drawn: 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.

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

Some other conclusions are:

- At most locations, the Satisfiers are already more available than the Dissatisfiers, but there is a wide variation in the quality level of the different pilot locations and different routes.
- Some of the satisfiers have already been fulfilled thanks to BiTiBi investments (such as station facilities)
- The scores for attractiveness differ widely. The routes of Bollate and Ghent run through less maintained and less interesting public surroundings than others where the public spaces which surround the routes are surprisingly well maintained and attractive
- Dissatisfiers are scoring lower in the direct surrounding of the train station compared to the Dissatisfiers within the neighbourhoods. In city centres and around train stations, there is less space available in combination with more functions that need space. Nevertheless, the emphasis has to be on the direct environment of the station because most cyclists can take advantage of the investments. *By the way: this gap can sometimes occur in the*

Netherlands too when municipalities do not always focus on the cycle routes towards train stations but on routes to city centres instead.

7.2.2 Recommendations

- Find a proper balance between safety and directness by attending to the real needs of cyclists when designing/implementing specific infrastructure. In descending order, this should be improved first:
  - Safety -- Directness -- Attractiveness -- Comfort
  - Station surroundings -- Main roads/routes leading to the station -- Neighbourhoods
- 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.
- Pay attention to the station environment to enable (potential) cyclists to reach the station; start adressing BiTiBi as an Integral mode of transport! Engage cities as much as possible in the BiTiBi process, cities and train/bike operators should approach mobility from the mindset of a door-to-door trip. Make cities as enthusiastic as possible about the approach. Developing well-designed bike 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.

When looking at the pilot city Ghent with this in mind, we see one of the most bike-friendly cities in Belgium where the city has an ambitious Cycling Plan to invest in both bike infrastructure and facilities. Nonetheless, there were important differences between the routes leading to Ghent-Sint-Pieters station. Bike parking at this station is going to become one of the best in Europe, but to be able to let everyone profit, better routes to the station are needed (with clear priority rules, good maintenance, wayfinding and dedicated bike infrastructure). Even in a bike-friendly city like Ghent, facilities for cyclists seem to be developed for cyclists traveling to/from the city centre and universities only, and bike-train-bike passengers are often forgotten.

Further reading

A complete design manual for bike traffic was recently published by the Dutch Bike Council (www.crow.nl/publicaties/_nieuw-design-manual-for-bike-traffic). Other interesting information concerning the topic of cycle infrastructure can be found at:

- http://noorderwerk.nl/bike-scan/
- http://www.fietsberaad.nl/library/repository/bestanden/Cycling-handbook_secure.pdf
- http://www.fietsberaad.nl/library/repository/bestanden/CyclingintheNetherlands2009.pdf
- http://www.makingspaceforcycling.org/MakingSpaceForCycling.pdf
- https://www.ice.org.uk/getattachment/disciplines-and-resources/briefing-sheet/cycle-design-guidance/ICE-Cycle-Design-Guidance-Briefing-report-update.pdf.aspx

- https://www.cycling-embassy.org.uk/wiki/dutch-cycle-infrastructure

7.3 Inspiration from the pilots

7.3.1 Some impressions from the pilots

7.5 Ghent (Belgium) has a popular cycle lane along the canal for cyclists in both directions offers a fast and safe connection, although it is relatively small and cyclists have no right of way at crossings.

7.6 A "cycle street" in Ghent (in Dutch "fietsstraat", sign on the right) where cars are guests and, in this case, have one-way access while bikes can access the street in both directions. Speed bumps are often necessary to reduce speed. Cycle streets are possible if traffic intensity is not too high.

7.7 Sant Cugat (ES): separate bi-directional cycle lane, offering fast connections, but unfortunately priority is not always given.

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7.8 At Como (IT) a long cycle path has been established at the border of Lake Como, offering beautiful views. The path is very popular with tourists and residents and provides a direct connection between parts of town, but the mixed use with pedestrians sometimes makes it difficult to navigate.

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8. CONCLUDING REMARKS

With the large societal advantages and the good Dutch example in mind, the BiTiBi project have made the first steps to expand the concept all over Europe. We have seen that combining efficient transport modes into one seamless transport service provides promising results in a relatively short time.

We have learned that the provision of safe, sheltered bike parkings has the biggest impact, reaching a great number of users. Investments in shared bikes are also central in the BiTiBi-approach, but have a lower societal return on investment. The project has also shown the importance of good co-operation, attractive communication, easy payment and high quality cycle routes to make a successful BiTiBi approach. It has not always been easy, but the project shows that results can be impressive, even in countries that are not cycle-minded. With hard work, using the Dutch best practice as inspiration and adapting it to the local situation, implementing the BiTiBi approach has been possible in very diverse environments.

The guidelines, together with the other documents published within this project, should help to facilitate a further spreading of BiTiBi-like services across Europe.

8.1 The BiTiBi team in Liverpool (UK)

More information

More information on the BiTiBi project can be found on the website www.bitibi.eu, Facebook (/biketrainbike), Twitter (@biketrainbike) and Instagram (#biketrainbike). Please don't hesitate to contact us through email (info@bitibi.eu) for any other information.

As mentioned before, the guidelines contain relations with the *BiTiBi Final Report* and the *Final report on the BiTiBi pilots*, the *Global evaluation report* and the *Quality level of infrastructure used by BiTiBi cyclists*. These documents can all be found on the website.