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bike train bike

Global evaluation of BiTiBi implementation & communication including policy recommendations

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Target group:

Public

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1. Background

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 bicycle and the train, provides a seamless door-to-door transport connection. The BiTiBi partnership has agreed that the future of urban mobility is a return to a tried and tested combination of bicycles and trains. ***Faster, easier and cooler***.

Ten partners from four countries (teams of rail or bike operators with mobility consultancies) have worked in the project.

Four pilot projects have been implemented in Barcelona area (Spain), Milan area (Italy), Liverpool (United Kingdom) and in Belgium, with the additional ambition of inspiring all European cities to consider a modern, multimodal approach to transport.

The actions of the BiTiBi project can be summarised as follows (corresponding to six different building blocks – BB):

- Build safe, secure and convenient bike parking facilities at train stations (BB1)
- Provide convenient public bikes (BB2)
- Unite the bicycle and train stakeholders (BB3)
- Integrate payment system of bike and rail services (BB4)
- Communicate the advantages for combining bicycles and trains positively (BB5)

And a new building block added during the project:

- Safe and secure roads to stations (BB6)

BiTiBi Work Package 4 has had the objective to monitor and evaluate the actions and results in pilots.

The deliverable D4.4 is the final evaluation of the whole project: Global evaluation of BiTiBi implementation and communication.

2. Evaluation of the implementation and communication of the pilots results

2.1. Evaluation of the actions of the project

The BiTiBi partners have taken several actions to replicate the proven BiTiBi approach of the four pilots, starting at different points (intermediate pilots and beginner pilots), all with positive results.

When evaluating the actions taken in the project, it should be noted that the actions of each Building Block (BB) in the BiTiBi approach require more or less time to be implemented. Some of the actions require more time than the three years provided for in a project (or two years for the pilots).
While there are actions relating to communication and marketing (BB5) that have been implemented following the start of the pilots, some measures for the implementation of new BiTiBi services like secured shelter facilities (BB1) or fleets at the station (BB2) have required more time, sometimes more than was initially assumed. Finally, there are actions, such as those relating to unity between bike-train organisations (BB3) and the integrated payment system and fare integration (BB4), which require more time than provided for in the project. Nevertheless, positive steps have been taken towards accomplishing these measures.
A valuable new building block has been considered in the project: *Safe and secure roads to the stations (BB6)*. The routes to the stations have been analysed to provide tools for local stakeholders to improve cycling access to the station in the pilots.

The actions of each building block were assumed to require different levels of intensity in each pilot, as shown in next figure.

Overview of actions that will be undertaken in the different pilots, relating to the 5 BiTiBi Building blocks (BB)

Operator (country)	BB1 Safe, sheltered and convenient bike parking at train stations	BB2 Convenient public bikes	BB3 Unity of bike-train organisations	BB4 integrated payment system / fare integration	BB5 Positive communication and marketing about bike-train combination
FGC (ES) Pilot 1 Sant Cugat	Considerable actions will be taken	Considerable actions will be taken	Some actions will be taken	Considerable actions will be taken	Considerable actions will be taken
FGC (ES) Pilot 2 Sant Boi	Considerable actions will be taken	Considerable actions will be taken	Some actions will be taken	Considerable actions will be taken	Considerable actions will be taken
FN (IT) Pilot 1 Como	Considerable actions will be taken	Some actions will be taken	Some actions will be taken	Some actions will be taken	Considerable actions will be taken
FN (IT) Pilot 2 Bollate	Considerable actions will be taken	No actions to be taken	Some actions will be taken	Some actions will be taken	Considerable actions will be taken
BM (BE)	Considerable actions will be taken	Considerable actions will be taken	Some actions will be taken	Considerable actions will be taken	Considerable actions will be taken
MR (UK)	Some actions will be taken	Some actions will be taken	No actions to be taken	Considerable actions will be taken	Considerable actions will be taken

*Figure 1. Overview table from the BiTiBi contract, with the importance of **actions to be performed** in each pilot per Building Block (BB) as foreseen at the start of the project*

2.1.1. Belgium

Belgium has been an intermediate pilot where there were already existing BiTiBi services at in the beginning of the pilot (September 2014), such as Fietspunt, providing bike repair services, and Blue-bike. The pilot has been focused on Blue-bike, the national bike sharing scheme linked to train stations, which started in 2012.

Blue-bike **has evolved tremendously in terms of the number of rentals and users** since the start of the BiTiBi project. From 30,000 rides a year in 2013 to 160,000 rides in 2016. Key to this success has been the **involvement of the local municipalities** in terms of **marketing towards inhabitants, visitors and companies**. This has been done through the introduction of a **third payment system** to reduce of the local rental fee to 1EUR and an agreement on local marketing efforts. The number of involved municipalities in this third payer system has grown from two at the beginning of BiTiBi to 32 to date.

The major challenge has been the **software** which did not progressed as quickly as it should or could have. Implementations of new marketing tools like the projected **member-get-member tool** has therefore not been launched yet. The large growth of Blue-bike already weighed heavily on the basic functionality of the software, which needs to be guaranteed continuously. Furthermore, the implementation of the **integrated Mobib card** has, because of this, been delayed and will probably be launched towards the end or even after the BiTiBi project. It will, however, contribute to the sustained growth of Blue-bike in Belgium.

There is an increased amount of focus on **social media** and the Blue-bike 'community' through **gamification, photo contests, free gadgets and community questions** to involve the users more with the development of the service and product. The users are, for example, asked where they want new Blue-bike locations, to invent a new baseline for Blue-bike and their feedback about the new bikes. There are 2,800 followers on Facebook, 1,180 followers on Twitter and 77 on Instagram. The newsletter is sent to 7,180 addresses.

2.1.2. Italy

The pilots in Italy are based in Milan area and are operated by Ferrovienord. The three stations are Bollate Centro, Bollate Nord and Como Borghi and they were beginner pilots which had some infrastructure which has then been extended during the project.

The most important results in terms of BiTiBi relates to BB3 as **Ferrovienord has created a bike-train-bike team** with one experienced engineer and an communications and marketing expert. This team has successfully worked, within Ferrovienord, to **spread the bike-train-bike BiTiBi model** and to encourage promoting the positive case for more **integrated bike parking in Ferrovienord railway stations**. This has led to the opening (and/or to plan for the opening) of a grand total of **20 velostations** (including the BiTiBi pilots in Bollate Centro, Bollate Nord and Como Borghi) in 2015-2017 **with the BiTiBi logo** (BB1) and a **unique card to access the bike parking** (BB4). The software for registration and monitoring has been developed with the BiTiBi approach and Como bike park has worked as the first pilot for applying the general BiTiBi

approach to all the velostation in Ferrovienord which will be part of the **same registration and monitoring service**.

BiTiBi has therefore led to the setting up of a **comprehensive strategy for bike-train-bike services by the rail operator**, Ferrovienord, using the **BiTiBi brand as a unifying factor**. It is particularly important to underline the change in mentality within the Italian community with respect to the use of bike and the use of the BiTiBi bike+train+bike model: the demand for more bike parking is widespread, and the Ferrovienord plan is an ambitious one.

Bike repair and cycle training courses organized by Ferrovienord and FIAB (Italian Federation of Cyclists) have also helped to spread the BiTiBi model.

The main difficulties were that Ferrovienord operates the railway infrastructure and therefore does not carry the main responsible for communications in relation to the railway companies. This is why the development and updating of a website not directly managed by Ferrovienord and the Living Lab was done through courses, in other words not online but in a very personal form. The BiTiBi physical living lab, which focused on information and awareness-raising of the rational for bike+train using **gaming activities,** had great success reaching some **150 people and with good penetration in the press**.

2.1.3. Spain

Sant Cugat and Sant Boi, within the Barcelona metropolitan area, were both beginner pilots in the project with little infrastructure for the promoting of BiTiBi and they have both achieved positive results.

The most important results for the BiTiBi approach have been the **creation of a new electric bike fleet service** (12+8 bikes), mainly for long-term renting out to companies, and the **construction of a new bike park** (300 (120 initially) + 24 racks), at both stations (BB1 and BB2).

Achieving an **agreement between the stakeholders**, defining who is in charge of what and who pays what has been a challenge. Some 15 internal meetings and 25 meetings with the municipalities of Sant Cugat del Vallès and Sant Boi de Llobregat have required in order to set up the scheme. Finally, a new and valuable stakeholder has signed the agreement: Barcelona Metropolitan Area. It is already responsible for secured bike shelters (Bicibox) all over the 36 municipalities included in the metropolitan area. This took a long time to arrange but, as this was something starting from zero, it was necessary.

Access system for bike parkings is done using the Bicibox card (which can be used in all of the secured shelters in the metropolitan area) which has achieved a high level of **integration**, although further work on the bike-train unity (BB3) will be necessary. The electric bike fleet is also kept at these shelters.

Moreover, in terms of marketing and communication of the new services (BB5), considerable effort has been made locally. Many positive actions have been taken to promote the services: **calls and visits to companies** (150 calls and 10 visits to interested companies)**, try-a-bike**

days from companies to stations, workshops, flyers (200 in local language)**, posters** in the streets, **Welcome pack** for new companies… The most significant issue realised in the Barcelona metropolitan area pilots is that there is a need for social media presence in the local language as support for the rest of the communication actions. To this end, managed *BiTiBi.cat* accounts were created in May 2016 on **Facebook and Twitter** (57 and 127 followers, respectively, growing weekly), 7 **monthly newsletters** have been sent out, as well as the creation of the **Living Lab** (platform to inform, register, survey and share). People are interested[1] and the BiTiBi concept is starting to spread beyond the pilots. In fact, during the project some BiTiBi services have been developed in other municipalities such as a bike fleet at the Sant Quirze del Vallès station (FGC) or a bike park at the Gavà station (RENFE).

The **routes to access to the station** have been analysed (BB6) and there are some planned **improvements in the cycling network** like a cycle lane in Sant Boi that will connect the industrial zone with the train station.

Finally, more time will be needed to work on the integrated payment system to include BiTiBi in the **T-mobility card** that is expected to start working in 2017 (BB4).

2.1.4. United Kingdom

The most important results of the BiTiBi project is the significant growth in usage of both secured cycle shelters on the Merseyrail network and Bike & Go bike hire across the UK.

Bike & Go rentals have more than doubled in 2016 compared to 2015. The main reason for this significant growth is the **improved marketing and communication** that was part of the BiTiBi project. With new posters, banners and leaflets we were able to share our unique selling points to potential customers and create awareness that Bike & Go is a good option for the last mile. We succeeded in attracting new customers with this approach with more than **2000 new customers** signing up to the scheme since the start of the BiTiBi project. The majority of the customers do not plan before hand to sign up for the scheme, showing that the message 'hire a bike today' that is present on several communications at the stations is being received.

The secured cycle shelters on the Merseyrail network also experienced a significant increase in users: **the amount of users with an access fob nearly doubled** since the start of the BiTiBi project.

The corporate offer for Bike & Go was launched in 2016 with a PR moment, press releases, a new corporate page on the website and social media attention. We are already seeing the results of this approach as **six companies have signed up for the corporate scheme** and several large companies have shown interest. Biggest challenge now is to find people within the participating train operating companies that can go out onto the market and promote the scheme actively to businesses nationwide.

[1] 70% of people registered at the Living Lab (BiTiBi.cat) were interested in using the bike to go to work or to study if some improvements were performed. The most valued actions were regarding good cycle shelter and good bike routes.

The biggest challenges we faced are **IT-related**: the backbone of both the secured cycle shelters and Bike & Go is the back office system. Problems with these systems directly affect the customer's experience of the product and can discourage them to use it again. These systems need to work flawless, especially when growth is expected.

The **routes to access to the two pilot stations** have been assessed and show several problems that is representative for most of the UK. Increased spending on cycling infrastructure is required. Cycling organisations should team up together and work with local councils to create awareness of the importance of including cycling infrastructure in road improvements. Only when safety is improved for cyclist on the road, the usage of bikes will be able grow further.

2.1.5. BiTiBi project

The pilots in the BiTiBi project have to be understood differently in countries that started with an intermediate approach to BiTiBi compared with those that started as beginners.

While the actions in the beginner pilots (Milan and Barcelona areas) have been more focused on new infrastructure and services (BB1 and BB2), the intermediate ones (Belgium and United Kingdom) have been focused on the marketing and communication of the existing services (BB5).

Likewise, the territorial scope of the actions and the results in the beginner pilots have primarily been local (or, in some cases, regional) while the actions of the intermediate pilots have been aimed at the entire country and the results are also evident nationwide.

All the pilots have included good coverage of the Building Blocks (BB) and a new BB6 has been incorporated to the project regarding *Safe and secure roads to the stations* (see next figure). In terms of actions in BB3 and specially BB4, these have been long-term measures and some actions have been implemented.

Overview of actions that have been undertaken in the different pilots, relating to the 6 BiTiBi Building blocks (BB)

Operator (country)	BB1 Safe, sheltered and convenient bike parking at train stations	BB2 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 Safe and secure roads to the stations
FGC (ES) Pilot 1 Sant Cugat	**Considerable** actions have been taken	**Considerable** actions have been taken	**Some** actions have been taken	**Some** actions have been taken	**Considerable** actions have been taken	**An extra** analysis have been made
FGC (ES) Pilot 2 Sant Boi	**Considerable** actions have been taken	**Considerable** actions have been taken	**Some** actions have been taken	**Some** actions have been taken	**Considerable** actions have been taken	**An extra** analysis have been made
FN (IT) Pilot 1 Como	**Considerable** actions have been taken	**Some** actions have been taken	**Considerable** actions have been taken	**Considerable** actions have been taken	**Considerable** actions have been taken	**An extra** analysis have been made
FN (IT) Pilot 2 Bollate	**Considerable** actions have been taken	**No** actions have been taken	**Considerable** actions have been taken	**Some** actions have been taken	**Considerable** actions have been taken	**An extra** analysis have been made
BM (BE)	**Considerable** actions have been taken	**Some** actions have been taken	**Some** actions have been taken	**Considerable** actions have been taken	**Considerable** actions have been taken	**An extra** analysis have been made
MR (UK)	**Some** actions have been taken	**Some** actions have been taken	**No** actions have been taken	**Considerable** actions have been taken	**Considerable** actions have been taken	**An extra** analysis have been made

*Figure 2. Overview table with the importance of the **actions performed** in BiTiBi project per Building Block (BB) and pilot.*

2.2. Improvement of BiTiBi infrastructure and services

Actions aimed at 'Building safe, secure and convenient bike parking facilities at train stations' (BB1) and 'Providing convenient public bikes' (BB2) have been carried out during the whole BiTiBi project as actions outside BiTiBi (not founded by EU). The integration of these services to combine bike and train in the pilots are explained in section 3.1 of the report.

This means that the infrastructure and facilities for the bike and train combination has been improved across all the projects.

There has been an increase of train stations with BiTiBi facilities for all the pilots, as well as more bikes in the sharing schemes or more racks in the secured bike parkings.

Over the period September 2014 to September 2016, there was increase of 9% of the Blue-bike locations in **Belgium**. There are currently Blue-bikes facilities in 9% (48) of the NMBS stations (national Belgian rail operator). The increase in the number of bikes has been even greater over this two-year period: there are now 18% more shared bikes (1,300 bikes).

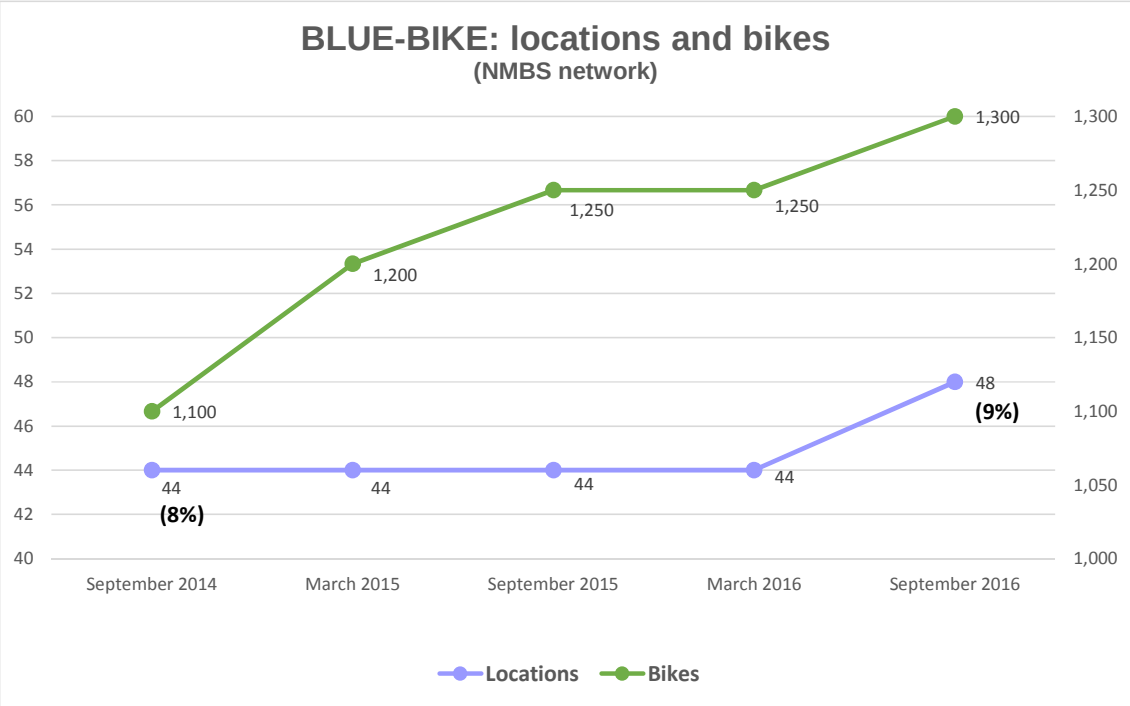

Figure 3. Increase of locations and shared bikes of Blue-bike at NMBS network in Belgium (source: Blue-bike).

In **Italy**, over the same period, the BiTiBi team in Ferrovienord (FN) opened four new secured velostations at the train stations in Como Borghi, Garbagnate Milanese, Saronno and Bruzzano. These have to be added to the velostations already operating by September 2014: Bollate Centro and Bollate Nord as well as four other velostations. This represents a significant increase of 67%, from 6 to 10 velostations. A further seven velostations are planned to open

across Ferrovienord network over the next few months and into 2017. As of In September 2016, there are secured velostations in 8% of the stations across the Ferrovienord network (the rail operator in the Milan area). The number of racks in secured velostations have doubled[2].

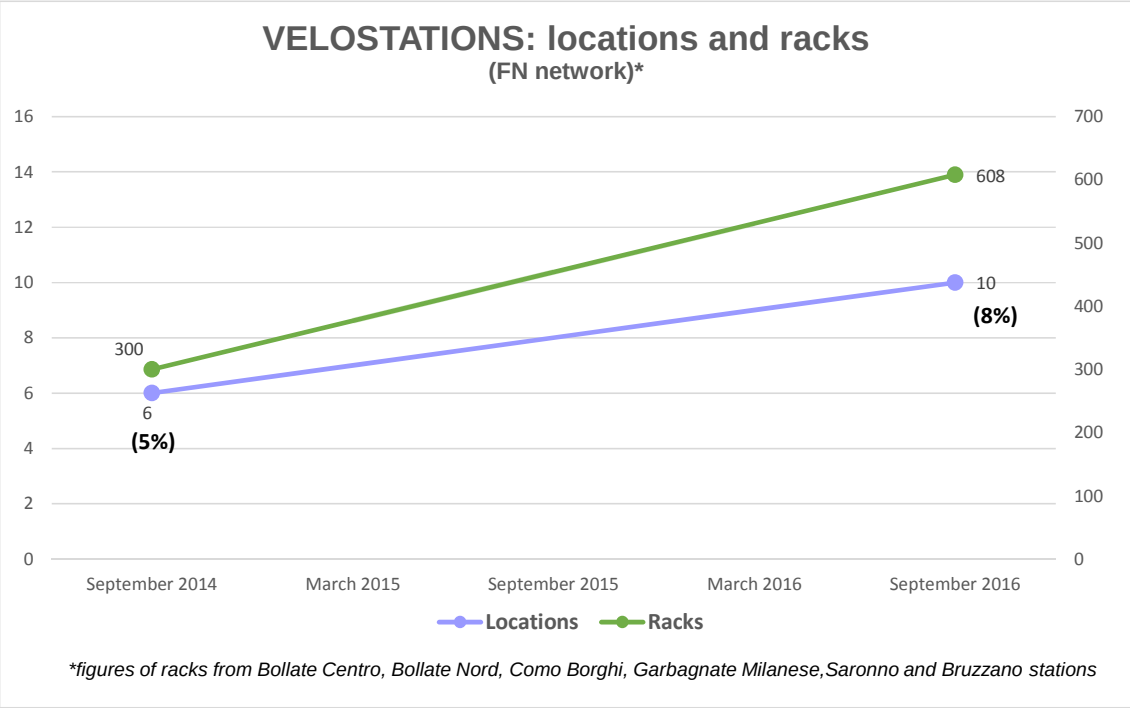

Figure 4. Increase of locations and racks of velostations across the FN network in Italy (source: Ferrovienord and Fabbrica dei Segni)

In **Spain**, two new secured bike parkings opened in October 2016 in the Barcelona metropolitan area as part of the Ferrocarrils de la Generalitat de Catalunya (FGC) network. In Sant Boi, FGC has built a secure shelter with 24 racks and in Sant Cugat, the municipality is initially building a secured bike parking for 120 bikes, but there is scope for a further planned 300 racks.

At the same time, both pilots include a fleet of electric bikes for companies to cover last-mile trips with a Business to Business offer: eight bikes in Sant Boi and twelve bikes in Sant Cugat.

In the **United Kingdom**, the infrastructure and services for both the shared scheme and the secured cycle shelters have been improved since September 2014.

Bike & Go, the shared bike scheme at train stations run by four rail operators (Merseyrail, Northern, Abellio Greater Anglia and ScotRail), has put considerable effort into expanding. Over this two year period, Bike & Go locations have grown by 40% and there are now 70 locations. This means that there is a bike sharing facility in 7% of all train stations within the networks of

[2] The figures for racks are only from the cycle shelters in the pilots (Bollate Centro, Bollate Nord and Como Borghi) and the other new ones (Garbagnate Milanese, Saronno and Bruzzano) are monitored by FN. There is no data from the four cycle shelters already in place in September 2014.

the four train operators participating. The number of bikes has also increased by 30%, with currently 650 Bike & Go bikes available.

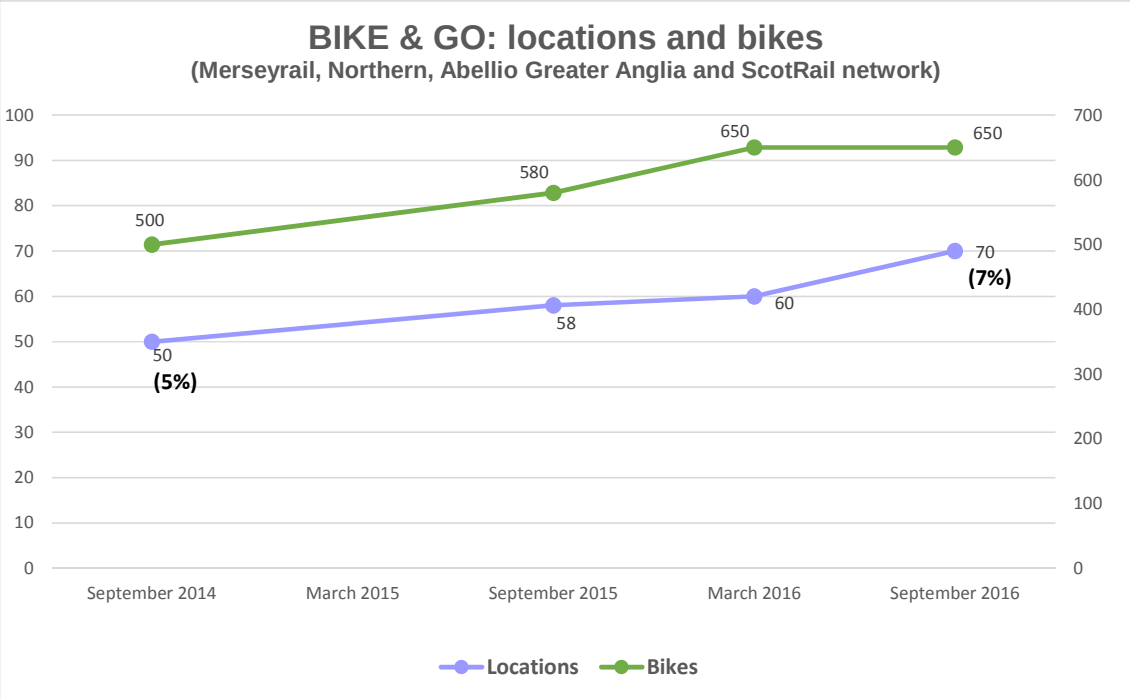

Figure 5. Increase of locations and shared bikes of Bike & Go at Merseyrail, Northern, Abellio Greater Anglia and ScotRail network in UK (source: Bike & Go and Merseyrail).

The improvements have been even greater in terms of secured cycle shelter at the Merseyrail stations (Liverpool area network). The number of train stations with secured cycle shelters has increased by 65%, the number of shelters increased by 68% and the number of racks increased by 69%. This means that from September 2014 to September 2016, the service improved significantly with secured shelter coverage growing from 52% (34) to 86% (56) at Merseyrail stations.

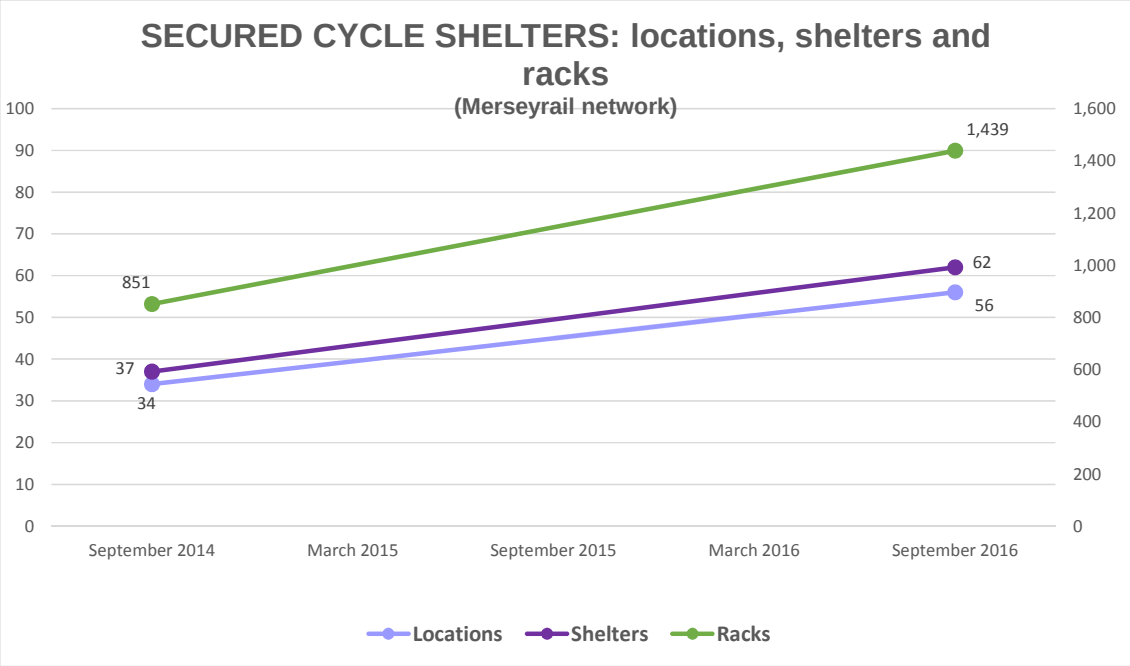

Figure 6. Increase of locations, shelters and racks at Merseyrail network in UK (source: Merseyrail).

In total, the BiTiBi projects in Belgium, Italy, Spain and United Kingdom, over this two-year pilot period, achieved an increase of 37% in BiTiBi locations, 22% in shared bikes and 78% in racks compared with the infrastructure and services which were in place in September 2014.

	2014	2016	*Increase*	*%*
Belgium				
Blue-bike				
Locations	44	48	*4*	*9%*
Shared bikes	1,100	1,300	*200*	*18%*
Italy				
Velostations				
Locations	6	10	*4*	*67%*
Racks	300	608	*308*	*103%*
UK				
Bike & Go				
Locations	50	70	*20*	*40%*
Shared bikes	500	650	*150*	*30%*
Secured cycle shelters				
Locations	34	56	*22*	*65%*
Shelters	37	62	*25*	*68%*
Racks	851	1,439	*588*	*69%*
TOTAL				
Locations	**134**	**184**	***50***	***37%***
Shared bikes	**1,600**	**1,950**	**350**	***22%***
Racks	**1,151**	**2,047**	**896**	***78%***

Figure 7. Overall increase of locations, shared bikes and racks due to BiTiBi project (source: Bike and train operators).

2.3. Increase of BiTiBi users and BiTiBi trips

The improvement in the BiTiBi infrastructure and services arising from these pilots has also meant a significant growth in BiTiBi users and BiTiBi use, which means an increase in the number of trips combining bike and train.

All the pilots have seen an increase in the number of members for all of the BiTiBi services, as well as a growth in rentals for the shared bike schemes and in the use of the secured bike parkings.

Belgium has seen a very impressive expansion of both Blue-bike members and rentals over these last two years. In September 2016, there were 15,200 members which was an increase of 75% compared with September 2014. In terms of the use of Blue-bikes, the growth in the number of rentals has been even greater by 151% for 2016 compared with 2014, or an increase of 163,707 rentals/year[3]. It represents a rate of 10.8 rentals per member annually.

[3] For 2014 data, the figures for annual Blue-bike rentals covers the period September 2013 to August 2014 and, for 2016 data, the period September 2015 to August 2016.

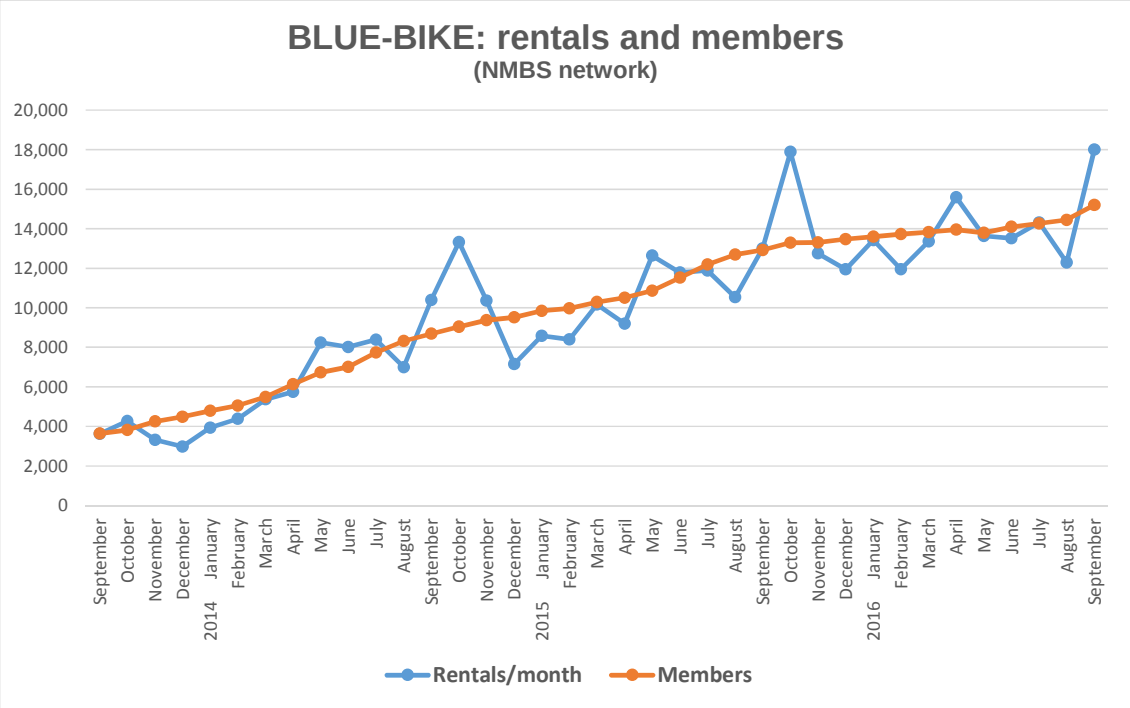

Figure 8. Increase of monthly rentals and members of Blue-bike in Belgium (source: Blue-bike).

The increase of 49,227 Blue-bike rentals per year represents an increase of 98,454 trips combining bike and train annually in Belgium[4].

BELGIUM				
Blue-bike				
	2014	**2016**	***Increase during the project***	***%***
Members	8,684	15,200	*6,516*	*75%*
Rentals	65,253	163,707	*98,454*	*151%*
Increase of rentals/year			**49,227**	
Increase of trips by Blue-bike/year			**98,454**	

Figure 9. Increase of annual BiTiBi trips due to Blue-bike in Belgium (source: Blue-bike).

The absolute numbers for **Italy** are not as high as those for Belgium but the growth in members and uses of the secured bike parkings is still very positive. The adding of velostations in the pilots has meant an almost quadrupling in the number of registered users since September 2014, reaching 748 members (an additional 405 in Bollate Centro and Bollate Nord and 123 new users in Como Borghi). There is no data yet for new users covering the three new

[4] Here, two one-ways trips are assumed for each rental as Blue-bike is an AtoA bicycle sharing system, which means that users must return the bike to the same location where they picked it up and on the same day. The locations are based at train stations so users that pick up a bike have already arrived by train and will use the bike twice (round-trip) and will leave by train once they return to the station.

velostations opened in September 2016. The usage of secured bike parkings also increased compared with September 2014 to 6,434 uses/year (61%).

The usage rate for velostations included in the pilots is currently 102.4 uses per member annually or 119.0 for Bollate and 17.6 at the new velostation in Como Borghi. Since the velostations opened at Como Borghi just over one year ago, there have been quite a lot of registered users but many of them are still not using it very frequently. Further growth in use is thus necessary.

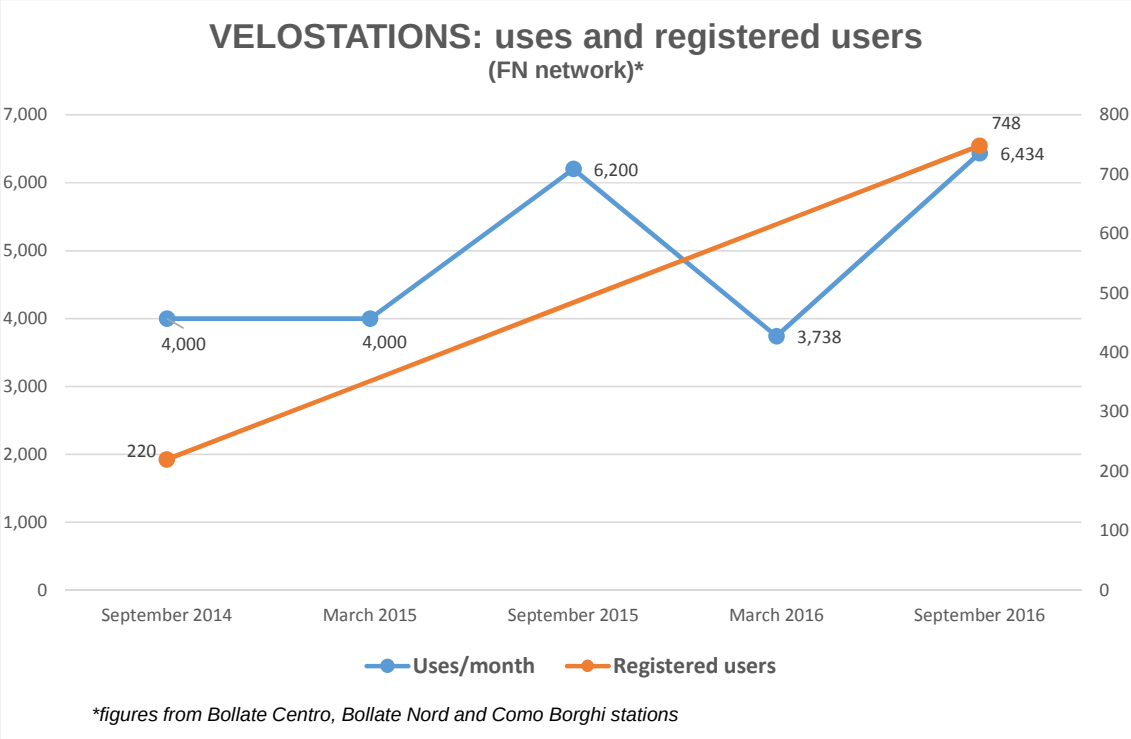

Figure 10. Increase in monthly uses and registered users for velostations at FN network in Italy (source: Ferrovienord and Fabbrica dei Segni).

The increase of 15,368 uses per year for velostations in the stations represents an increase of 30,735 trips combining bike and train annually in Italy[5].

[5] Here, two one-ways trips are estimated for each use of the cycle shelters. Users that park a bike at the cycle shelter have already cycled to the train station, will travel by train (round-trip) and when they return to the train station, they will travel onwards by bicycle.

ITALY				
Velostations				
	2014	**2016**	***Increase***	***%***
BOLLATE: Members	220	625	*405*	*184%*
BOLLATE: Annual uses	48,000	74,400	*26,400*	*55%*
Increase of uses/year			**13,200**	
COMO BORGHI: Members		123	*123*	
COMO BORGHI: Annual uses		2,168	*2,168*	
Increase of uses/year			**2,168**	
Increase of trips by velostations users/year			**30,735**	

Figure 11. Increase of annual BiTiBi trips due to the velostations at FN network in Italy (source: Ferrovienord and Fabbrica dei Segni).

Note that the velostation in Como Borghi opened in September 2015 and so the 2,168 uses only apply to the last year (not to the whole two-year pilot period as for the other BiTiBi services).

In **United Kingdom**, both Bike & Go and secured cycle shelters services have seen a rise in the number of members and in the use of these facilities.

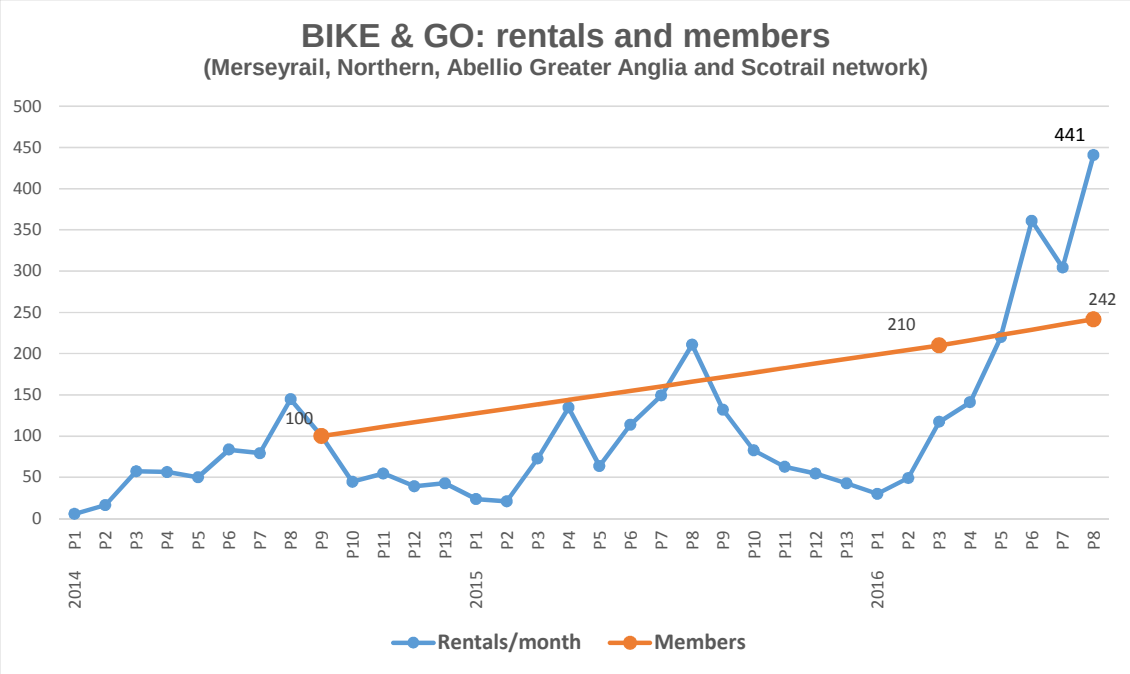

Figure 12. Relative increase of monthly rentals and members of Bike & Go at Merseyrail, Abellio Greater Anglia and ScotRail network in UK (source: Bike & Go). Figures of monthly rentals and members in September 2014, in the beginning of the pilot, have been taken as 100.

The Bike & Go, the station-based bike sharing scheme, has seen a significant growth in members over these two years, 142% since September 2014, and the annual Bike & Go rentals have experienced an even higher increase (198%)[6]. Although the absolute numbers are not very high, they are likely to increase considerably going forward as this is young and expanding service.

Moreover, the secured cycle shelters at stations have seen a very positive development. Membership has almost doubled since September 2014 with an increase of 98%. The number of annual uses has grown by 49%; this means a current rate of 15.2 uses/member annually.

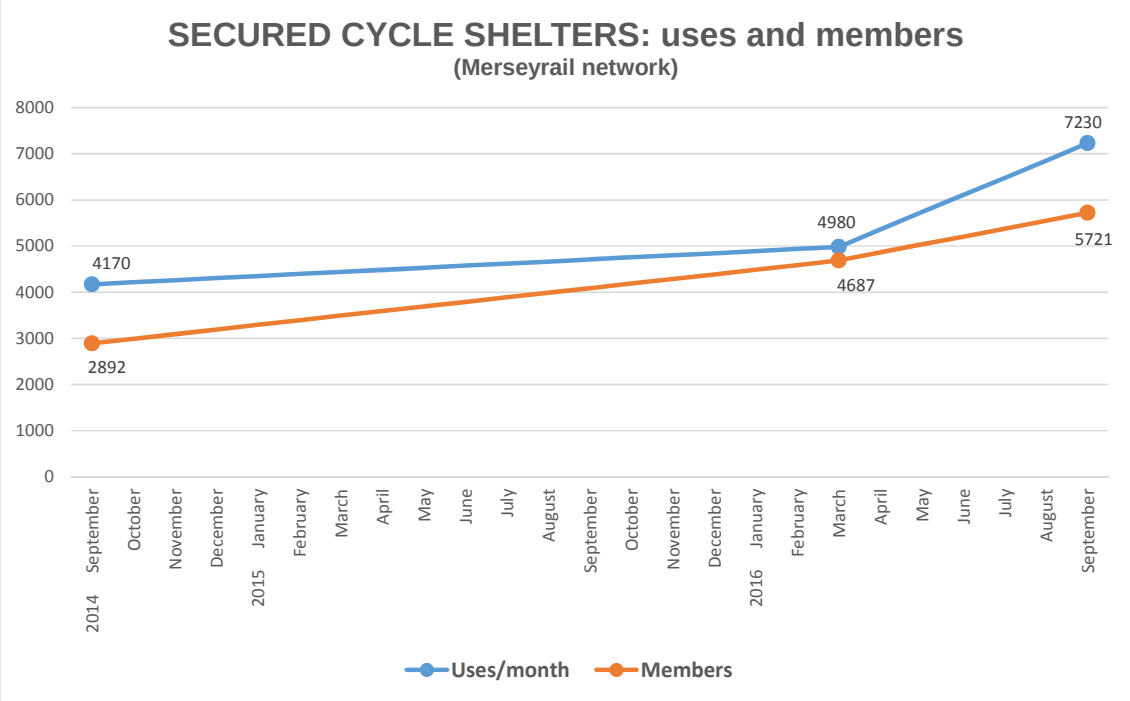

Figure 13. Increase of monthly uses and members of the secured cycle shelters at Merseyrail network in UK (source: Merseyrail).

Both increase of Bike & Go rentals and secured cycle shelters uses have represented a growth on BiTiBi trips in UK[7].

[6] Figures of annual Bike & Go rentals are compared between annual data in 2014 and an estimation of annual figure for 2016, based on data from January to September 2016.

[7] Here, 2 one ways trips are estimated for each rental as Bike & Go is an AtoA bicycle sharing system, which means that users must return the bike to the same location where they picked it up during the same day. The locations are at train stations, so users that pick up a bike have already travelled by train, will use the bike twice (round trip), and once again in the station will travel again by train. For secured cycle shelters uses, 2 one ways trips are estimated for each use of the shelters. Users that park a bike at the shelters have already ridden to the train station, will travel by train (round trip), and once again in the shelter will ride again from the train station.

UK				
Secured cycle shelters				
	2014	**2016**	***Increase during the project***	***%***
Members	2,892	5,721	*2,829*	*98%*
Uses	58,320	86,760	*28,440*	*49%*
Increase of uses/year			**14,220**	

Figure 14. Increase of annual BiTiBi trips due to secured cycle shelters in UK (source: Merseyrail).

To summarize, the BiTiBi project has, from September 2014 to September 2016, achieved an **increase of 9,973 new BiTiBi users** across the different pilot countries. Meanwhile, **143,409 new trips have been done combining bike and train**.

	Increase September 2014 - September 2016
Belgium	
Blue-bike members	6,516
Italy	
Registered users in the velostations	528
UK	
Secured cycle shelters members	2,829
TOTAL	
Increase of BiTiBi users	**9,873**

Figure 15. Increase of annual BiTiBi users due to BiTiBi facilities in the pilots.

	Increase September 2014 - September 2016
Belgium	
Increase of trips by Blue-bike/year	98,454
Italy	
Increase of trips by velostations users/year	30,735
UK	
Increase of trips by secured shelters users/year	14,220
TOTAL	
Increase of BiTiBi trips	**143,409**

Figure 16. Increase of annual trips combining bike and train due to BiTiBi services in the pilots.

2.4. Increase of train uses, cyclists and decrease of car users

The BiTiBi project has shown that the increase of BiTiBi users has represented an increase of train users as well as an increase new cyclists alongside a decrease of the use of cars.

This is a very important factor in reducing energy consumption and greenhouse gases emissions, as well as the emissions of other pollutants. Moreover, as cycling is a physical activity that improves our health, there are further benefits.

Surveys of users of the BiTiBi services in the pilots have shown good results in terms of modal shifts before using the facility. The results are reliable, as the surveys have been carried out twice (June 2015 and June 2016).

The changes behavioural which can be seen in relation to the opportunities offered by BiTiBi have been very positive. Around 20-50% of BiTiBi users are new train users for that specific BiTiBi trip and 40-70% of the users are new cyclists in relation to the train trip (first/last mile trips by bicycle). BiTiBi has also reached a significant impact in terms of the reduction in car use.

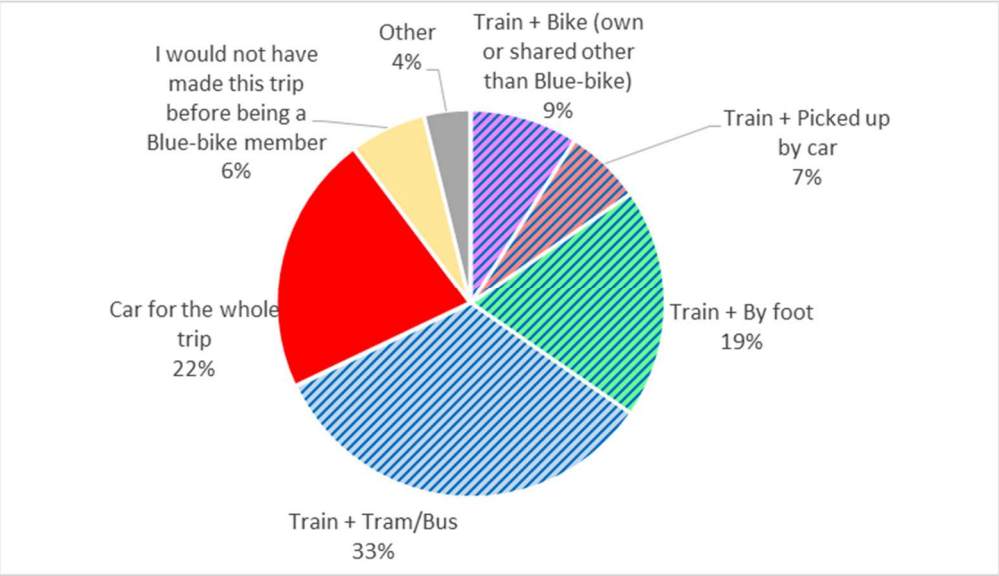

Figure 17. Previous modal share, for those trips now done combining train and bike, before being a Blue-bike user (source: User survey to Blue-bike users – June 2016).

BELGIUM		
Blue-bike		
New BiTiBi users		
Train	**32%**	**New train users**
Bicycle	**72%**	**New cyclists from/to the station (first/last mile)**
Bus/Tram /Metro	4%	Previous BTM users for the whole trip
	33%	Previous BTM users for the first/last mile trips
Car	**22%**	**Previous car users for the whole trip**
	6%	Previous car users for the first/last mile trips

Figure 18. Modal shift before being a Blue-bike user (source: User survey to Blue-bike users – June 2016).

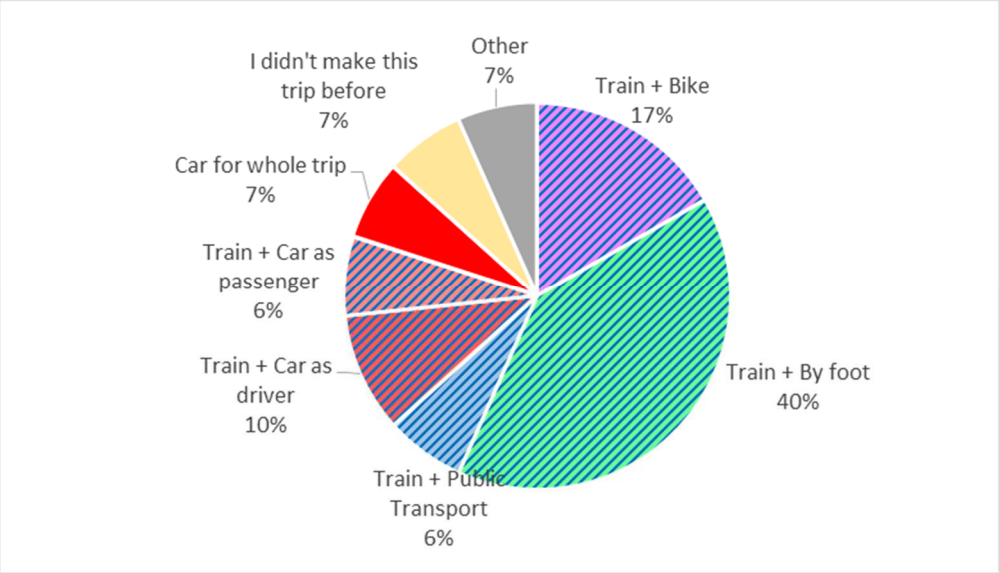

Figure 19. Previous modal share, for those trips now done combining train and bike, before using the velostation (source: Survey of velostation users – September 2016).

ITALY		
Velostations		
New BiTiBi users		
Train	**20%**	**New train users**
Bicycle	**43%**	**New cyclists from/to the station (first/last mile)**
Bus/Tram /Metro	7%	Previous BTM users for the first/last mile trips
Car	**7%**	**Previous car users for the whole trip**
	17%	Previous car users for the first/last mile trips

Figure 20. Modal shift before using the velostatio (source: Survey velostation users – September 2016).

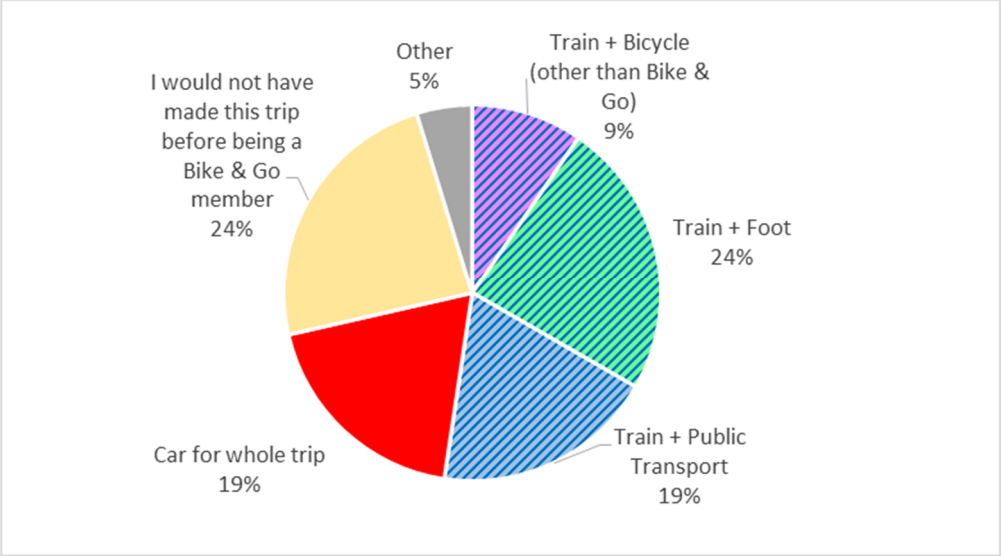

Figure 21. Previous modal share, for those trips now done combining train and bike, before being a Bike & Go user (source: User survey to Bike & Go users – June 2016).

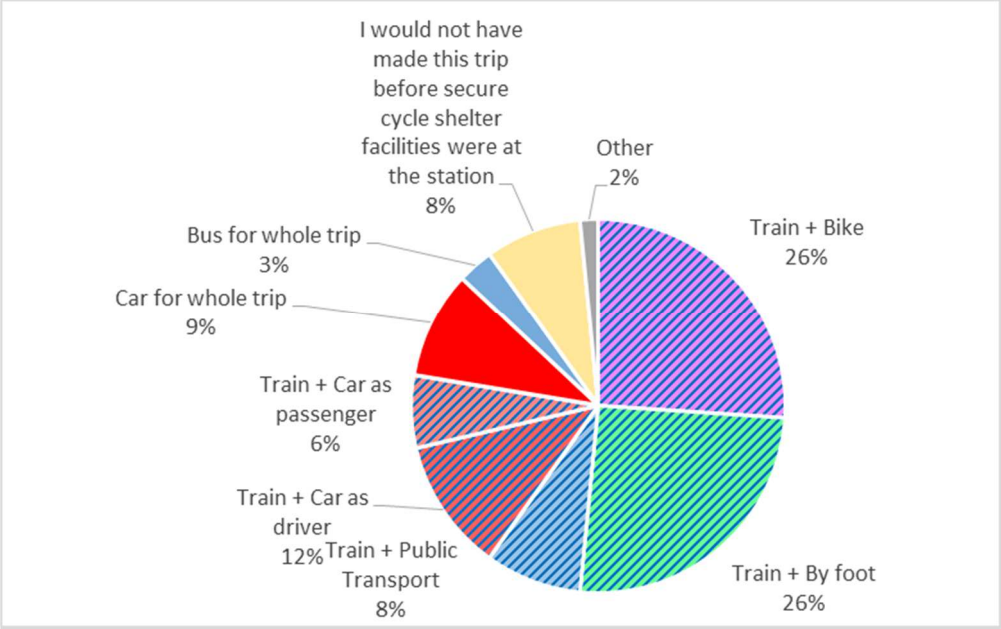

Figure 22. Previous modal share, for those trips now done combining train and bike, before being a secured cycle shelters user (source: Survey of secured cycle shelters users – June 2016).

UK		
Bike & Go		
New BiTiBi users		
Train	***48%***	***New train users***
Bicycle	***67%***	***New cyclists from/to the station (first/last mile)***
Bus/Tram /Metro	*19%*	*Previous BTM users for the first/last mile trips*
Car	***19%***	***Previous car users for the whole trip***
Secured cycle shelters		
New BiTiBi users		
Train	***19%***	***New train users***
Bicycle	***48%***	***New cyclists from/to the station (first/last mile)***
Bus/Tram /Metro	*3%*	*Previous BTM users for the whole trip*
	8%	*Previous BTM users for the first/last mile trips*
Car	***9%***	***Previous car users for the whole trip***
	18%	*Previous car users for the first/last mile trips*
TOTAL		
New BiTiBi users		
Train	**25%**	**New train users**
Bicycle	**50%**	**New cyclists from/to the station (first/last mile)**
Bus/Tram /Metro	3%	Previous BTM users for the whole trip
	9%	Previous BTM users for the first/last mile trips
Car	**10%**	**Previous car users for the whole trip**
	16%	Previous car users for the first/last mile trips

Figure 23. Modal shift before being a Bike & Go user and a secured cycle shelters user (source: Survey of Bike & Go users and secured cycle shelters users – June 2016).

2.4.1. Increase of train uses

In Belgium, 32% of Blue-bike users did not use the train before using the shared bikes system for the same trip. In Italy, 20% of the users of the velostations are new to using the train for that trip. And in UK, the modal shift is quite different when comparing users of the shared bike scheme and the secure shelters service. Whilst Bike & Go has seen 48% new train users, 19% of those using secured cycle shelters did not travel by train for that trip before using the BiTiBi combination.

Thus, the percentage of new train users is higher for shared bike schemes users compared to secured bike parkings users. The shared bikes systems are probably offering a new combination for the last mile trip which has attracted new train users who see this as a new solution. Secure bike parkings have a greater impact on first mile trips and is probably more seen as an improvement in train services for those who already use the train (already cycling to the station under less safe conditions or using public transport to reach the station). This is then

not a new combination, or a new possibility as they could already cycle to the station before leaving the bicycle in an less safe location, however, it is an improvement. This is, however, such a significant improvement that around 20% of new users thought that altering their previous mode of transport to now combine bike and train was a good idea.

It is important to highlight that the percentage of new train users includes those who stated that they would not previously have used the BiTiBi service for that trip: this was 7% of Blue-bike users in Belgium, 7% of the velostations users in Italy and 24% of Bike & Go users and 8% of secured cycle shelters users in the UK. The high percentage for Bike & Go could be due to the fact that the bike sharing system primarily is used for leisure trips. This has the benefit that trains are used during off peak hours where operating costs of trains are at their lowest.

		Average distance	*Annual increase of pkm*
Belgium			
New train users due to Blue-bike	1,044		
New train trips due to Blue-bike	*31,556*	*26.3*	*830,281*
Italy			
New train users due to velostations	53		
New train trips due to velostations	*6,147*	*12.2*	*74,993*
UK			
New train users due to secured cycle shelters	273		
New train trips due to secured cycle shelters	*5,481*	*23.9*	*131,046*
TOTAL			
Annual increase of train users	**1,370**		
Annual increase of train trips	***43,183***	***1,036,320***	***pkm by train/year***

Figure 24. Annual new train users and train trips due to BiTiBi (source: User survey and Bike or train operators).

New train users which have been attracted because of the BiTiBi project are therefore included in new BiTiBi users. New train users should be understood as train users who are new at using the train for that trip and which have been attracted by the combination of bike and train. It does not mean that they did not use the train at all prior to this. During the pilots, there have been an annual increase of 1,646 in new train users: 1,044 in Belgium, 53 in Italy and 273 in UK. This represents a total of 43,183 new train trips and an increase of 1,036,320 person-kilometre (pkm) by train[8].

[8] Average distances for the whole BiTiBi trip have been taken from the user surveys for each pilot. The train trip distance used is the whole trip distance minus the first/last mile distance multiplied by two.

2.4.2. Increase of cyclists

BiTiBi services have created more cyclists to and from the stations. This means more cycling for the first and last mile to complete the train trip, in other words, new cyclists here does not mean that they did not use the bicycle before but that they were new cyclists for that trip.

In terms of new train users, there are more new cyclists for that trip among shared bike users (around 70%) than for the users of secured shelters (around 40-50%).

In Belgium, 72% of Blue-bike users swapped from using a car to using a bicycle for their trips to/from the station when they started using the shared bikes system: 9% were already cycling to/from the station and 19% walked there. In Italy, 43% of the users of the velostations are new cyclists to/from the train station who have stopped using their car: 17% were already travelling to and from the station by bicycle and 40% by foot. In UK, the modal shift is again quite different between users of the shared bike scheme and the secure shelters service. While Bike & Go saw 67% new cyclists for that BiTiBi trip, 48% of the users of secured cycle shelters had not used a bicycle for that trip before using the BiTiBi combination.

		Average distance	*Annual increase of pkm*
Belgium			
New cyclists due to Blue-bike	2,339		
New bicycle trips due to Blue-bike	*70,685*	*4.3*	*303,673*
Italy			
New cyclists due to velostations	114		
New bicycle trips due to velostations	*13,319*	*1.9*	*25,305*
UK			
New cyclists due to secured cycle shelters	685		
New bicycle trips due to secured cycle shelters	*13,776*	*4.5*	*62,573*
TOTAL			
Annual increase of cyclists	**3,139**		
Annual increase of bicycle trips	***97,779***	***391,552***	***pkm by bike/year***

Figure 25. Annual new cyclists and bicycle first/last mile trips due to BiTiBi (source: User survey and Bike or train operators).

There has been an annual increase of 3,139 new cyclists as well as 97,779 new first/last mile trips by bicycle. This means that the annual increase of cycling pkm is 391,552, using the average distance to/from the station that users indicated in user surveys[9].

[9] The first/last mile distance average, distance to/from the train station, it is an average from user surveys in the pilots. The respondents were asked to state the distance in time units and the cycling speed in urban areas used to calculate the distance was 12 km/h.

2.4.3. Decrease of car users

The most important impact of the implementation of the BiTiBi project, with the new infrastructure and with the appropriate marketing and communication tools for the services, has been the significant decrease in car users.

As for the increase in train users and cyclists, there is a difference in the decrease in car use between users of the bike sharing schemes and those using the secured shelters. The behavioural change in relation to car use is greater for shared bike users. Whilst bike sharing users were previously mostly using the car for the entire trip, secure bike parking users primarily used the car for the first/last mile to travel to and from the station. Around 20% of shared bike scheme users previously used the car for the entire trip and only around 5% for the first/last mile trip. Around 5-10% of secure bike parkings users were using the car for the entire trip while 15-20% of them used it for the first/last mile.

The main outcome is that in Belgium, 22% of Blue-bike users were previously car users for the entire trip, in Italy 17% of the velostations users previously used the car for the first/last mile trip and in UK, 19% of Bike & Go users were car users for the entire trip while 18% of secured cycle shelters users were using the car for the first/last mile.

This means that there has been an annual decrease of 1,363 car users, 26,173 whole car trips and 26,173 first/last mile trips by car. Translated to pkm not travelled, this results in a saving of 929,445 car pkm every year, with positive impacts for the environment on fuel consumption and on CO_2e emissions savings, which will be calculated in section 3.2.1 of this report.

		Average distance	Annual increase of pkm
Belgium			
Previous car users for the whole trip	**710**		
Previous car users for the first/last mile trips	209		
Previous whole car trips	***-21,458***	***34.9***	***-748,964***
Previous first/last mile car trips	*-6,311*	*4.3*	*-27,114*
Italy			
Previous car users for the whole trip	**18**		
Previous car users for the first/last mile trips	44		
Previous whole car trips	***-2,049***	***16.0***	***-32,784***
Previous first/last mile car trips	*-5,123*	*1.9*	*-9,733*
UK			
Secured cycle shelters			
Previous car users for the whole trip	**133**		
Previous car users for the first/last mile trips	250		
Previous whole car trips	***-2,666***	***33.0***	***-87,974***
Previous first/last mile car trips	*-5,036*	*4.5*	*-22,876*
TOTAL			
Annual decrease of car users for the whole trip	**860**		
Annual decrease of whole car trips	***-26,173***	***-869,722***	***pkm by car/year***
Annual decrease of car users for the first/last mile trip	503		
Annual decrease of first/last mile car trips	-26,173	***-59,723***	***pkm by car/year***

Figure 26. Annual decrease of car users and car trips due to BiTiBi (both for the entire trip and for the first/last mile trip) (source: User surveys and Bike or train operators).

2.5. Awareness of the services

The pilots also included awareness surveys have been performed face-to-face at or near the train stations, once the BiTiBi service was up and running, to establish if they are aware of the existence of BiTiBi opportunities. This is helpful for the evaluation of the impact of the marketing and communication campaigns. In Belgium and UK, where the services were already working prior to the pilots, awareness surveys have been carried out twice: in 2014 and in 2016.

The level of awareness of the BiTiBi services has been very high due to the many marketing and communication actions carried out in social media, at the stations, by organising events, through business-to-business campaigns… Around half of the people interviewed knew about the BiTiBi opportunities across all the pilots.

The main result in **Belgium** is an increase of the awareness of the BiTiBi services in Wallonia: from 45% to 52% in terms of the secured shelters (fietspunt/point vélo) and a greater increase of awareness of the Blue-bike service, from 15% in November 2014 to 24% in June 2016.

The results for Flanders were very positive already in November 2014 where 56% of people interviewed were aware of the existence of the secured bike parkings (fiestpunt) and 62% were aware of the existence of Blue-bike. The figures in June 2016 were lower due to a lack of iconographic information (leaflets) when the interviews were carried out (something that was easy to recognize), whereas this had been available at the time of the previous survey.

For the pilots in **Italy**, the awareness survey was performed once, three months after the opening of the Como secured shelter and 55% of the people were aware of BiTiBi opportunities, and 33% thought it was an interesting option.

In **UK**, there has been a considerable increase of the awareness of Bike & Go and Secured cycle shelters: from 5% in 2014 to 45% in 2016 of awareness of BiTiBi services.

2.6. Satisfaction of the users

The satisfaction of users of the BiTiBi services has been evaluated on the basis of the results from the user surveys done in 2014 (in Belgium and UK).

According to the users, the most important features in shared bikes services were the convenience, the ease of use of the facility.

For in secured shelters, the most valued features were ‘convenience’, ‘safe to use’, and ‘distance to platform/station’ of the shelters.

In **Belgium**, when satisfaction levels among Blue-bike users was surveyed, the most important factors for a good bike share system were: ‘easy to use’, ‘convenience’, and ‘price’. Furthermore, users rated the performance of these three categories as ‘very good’.

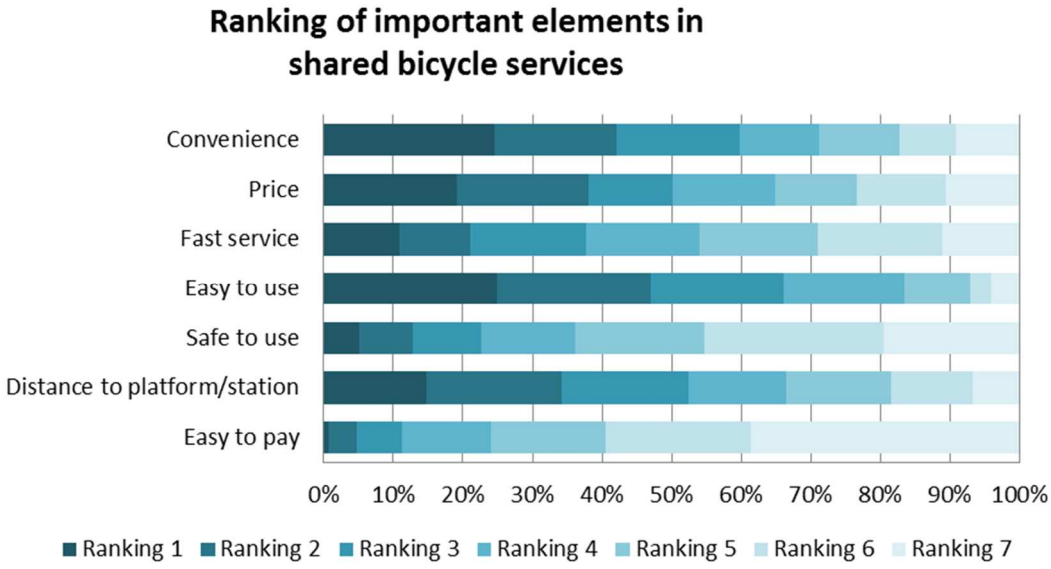

Figure 27. Importance of different aspects of Blue-bike service, in Belgium (order of priority)

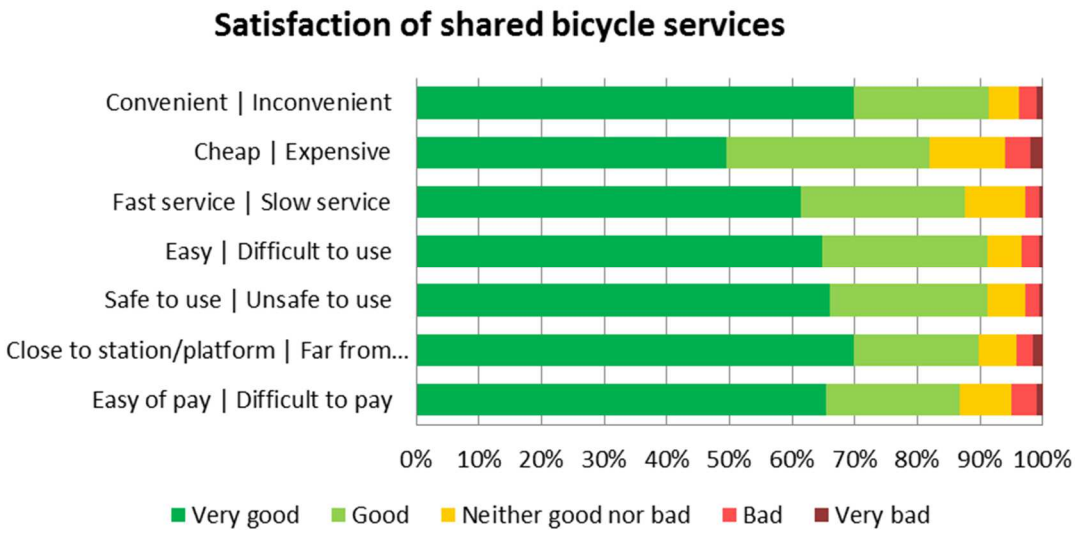

Figure 28. Satisfaction of users of Blue-bike service, in Belgium

For users of the secure bike parking service, the three most important factors of the service were identified as 'convenience', 'safe to use', and 'distance to platform/station'. Users were very satisfied with the performance of all three of these important factors.

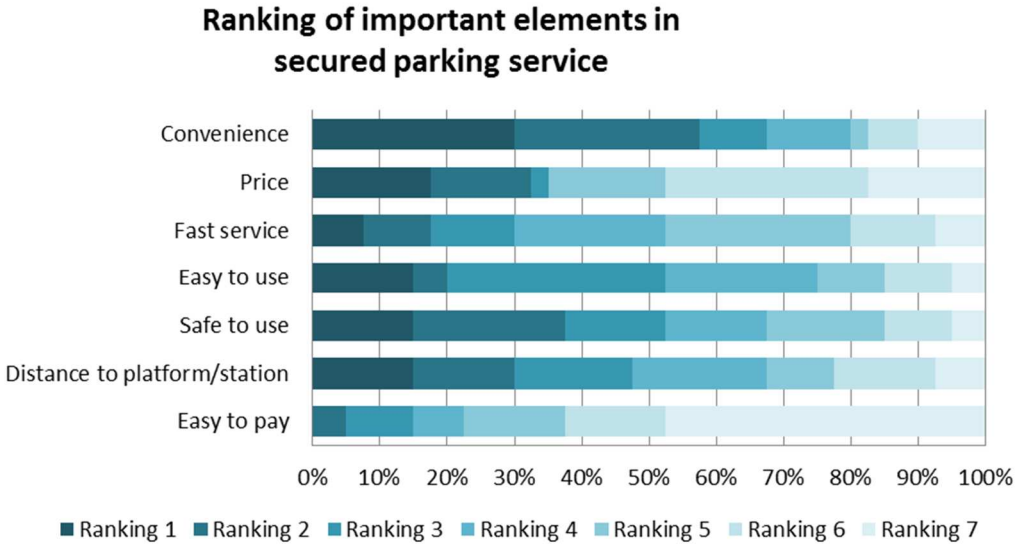

Figure 29. Importance of different aspects of safe park service, in UK (order of priority).

Figure 30. Satisfaction of users of secured shelter service, in UK.

For users of the Bike & Go bike share scheme, the most important elements of the service are: 'Convenience', 'Easy to use' and 'Distance to platform/station'. Participants rated the performance of these three factors as 'very good'. Despite overall high levels of satisfaction, it seems that users think that maybe there is room for improvement in the ease of the service.

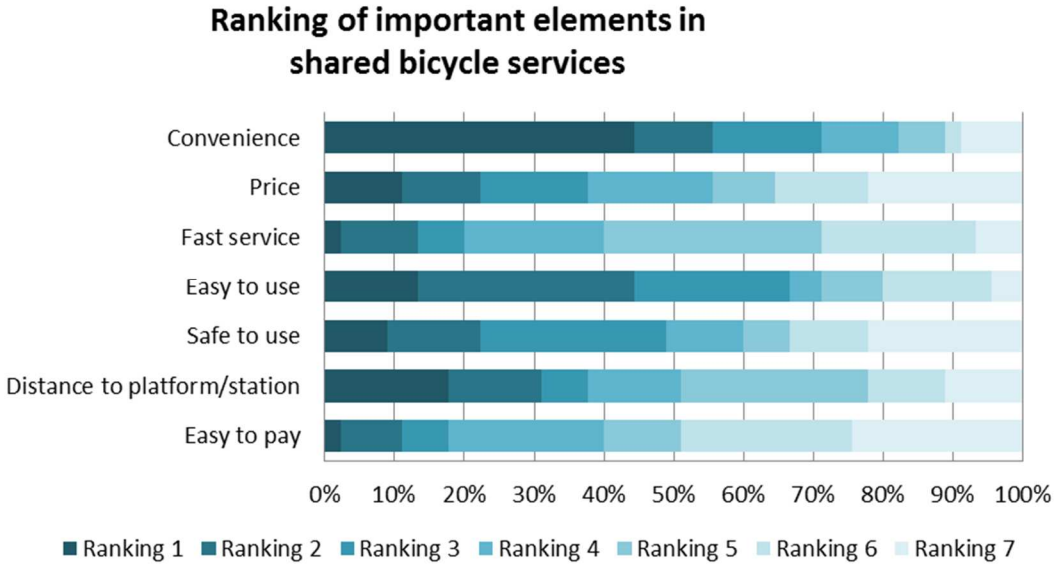

Figure 31. Importance of different aspects of bike sharing services, in UK (order of priority).

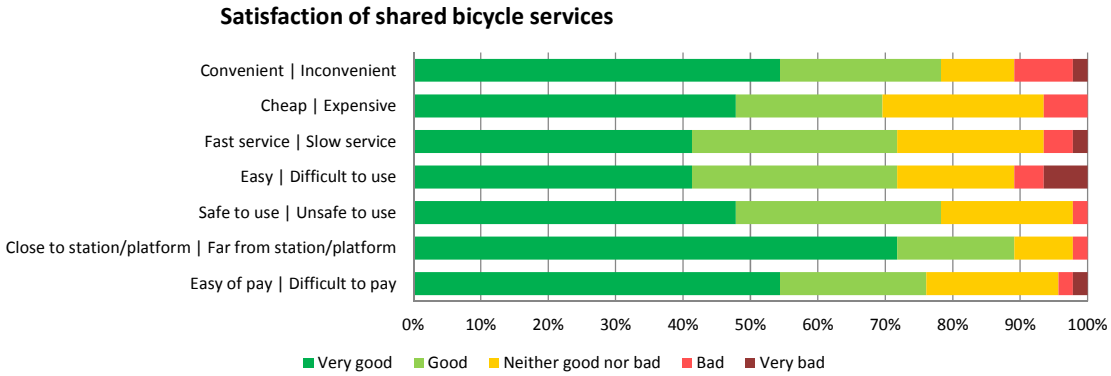

Figure 32. Satisfaction of users of bike sharing services, in UK.

2.7. Dissemination and communication of BiTiBi project

There has been a positive dissemination and communication of the BiTiBi project, the BiTiBi approach and the BiTiBi services during the pilots and also beyond the countries of the pilots.

2.7.1. Belgium

In Belgium:

- 20,000 leaflets have been distributed, in different ways: in leaflet holders, at the street terminals, at the bike points, distributed by partners, during events...
- 800 organisations or individuals have been approached directly via email or phone to promote the project: for events, member organisations, mobility operators and organisations, municipalities...
- 1,000 companies have received BiTiBi information as part of the business-to-business campaign through municipalities, with free train tickets, the organisation of events…
- 30 press releases related to BiTiBi: in television, newspapers, online…
- 300 meetings have been organised for the implementation of the actions. The meetings were mainly in order to launch Blue-bike locally by setting up the third-party payment system and follow-up meetings from a marketing perspective and to make sure all efforts possible are performed towards visitors and companies. The stakeholders participating were mainly the municipalities, the railway companies and other organisations.

In Belgium, communication and promotion was not done under the BiTiBi brand, but under the Blue-bike brand. The reason for this is that the Blue-bike brand had already been used in marketing communications.

2.7.2. Italy

In Italy:

- 1,500 leaflets have been distributed at the following events:
  - May 1, 2015, **New bike rental in Bollate**, leaflets distributed next to the service point, 500 people
  - September 22, 2015, **Expo 2015, Milan**, 400 people (wide audience)
  - September 22, 2015, **Opening of Como Borghi velostation** , 50 people
  - October, 10-11, 2015, **Training courses**, 125 people
  - June 9 (Bollate Centro), June 14 (Bollate Nord) and June 23 (Como Borghi), 2016, **Bitibi physical living lab events**, 150 people
  - At all the **conferences** where BiTiBi was presented
- 50 organisations or individuals have been approached directly via email or phone to promote the project: Public Administrations, Cyclist associations, Journalists, Academics, Companies.
- some companies have been informed about BiTiBi, although no real business-to-business campaign has been carried out.
- 25 local and national newpapers and websites have published press releases on BiTiBi. Furthermore, the national newspaper “Corriere della Sera” interviewed Alberto Colorni from Poliedra regarding BiTiBi and other aspects of cycling (June, 2016).
- 10 follow-up committee meetings have been held for the implementation of the actions. The meetings mainly aimed at implementing the following actions: new bike rental in Bollate, Expo 2015, Milan, Opening of Como Borghi velostation, training courses, BiTiBi physical living lab events and BiTiBi meeting. The stakeholders participating were: Ferrovienord, Trenord, Poliedra, Municipalities of Como and Bollate, Fabbrica dei Segni (Bollate association that manages velostations and bike rental), Bollate schools consultants.

2.7.3. Spain

In Spain:

- 200 leaflets have been distributed: at the stakeholder workshops for both pilots, during company visits, during ‘Try a bike day’ activities, environmental day activities, the Brainstorming activity at Esade Creapolis (university) and the Carless day.
- 200 organisations, companies and individuals have been approached by phone or email as a way of promoting the project.
- 150 companies have had a phone call with a presentation of the BiTiBi project and services, during a business-to-business campaign.
- 10 press releases have been issued through FGC and local media. The national television in Catalunya (TV3) is also preparing a special documentary on bicycles and cycling and they recorded the Barcelona meeting where the partners and stakeholders participated.
- 40 follow-up committee meetings have been organised: some 15 internal meetings and 25 meetings with the municipalities of Sant Cugat del Vallès and Sant Boi de Llobregat

have been necessary when setting up the scheme. Finally, a new and valuable stakeholder, Barcelona Metropolitan Area, has signed the agreement. Barcelona Metropolitan Area is already responsible for secured bike parkings (Bicibox) across all of the 36 municipalities in the metropolitan area.

2.7.4. UK

In UK:

- 50,000 leaflets have been given out to members of public, businesses and universities taking part in pilots.
- newsletter and E-shots go out to a part of the customer base every month, to 1,500-2,000 individuals to promote Bike & Go usage and the deliverables from the BiTiBi project. Extra promotional emails to encourage usage of Bike and Train have been send out to approximately 500 individuals on several occasions.
- unknown how many companies saw the press releases and social media activities, but 6 companies signed up so far.
- 25 press releases
- About 3 meetings have been organised as BiTiBi project meetings (in 2014, to discuss the BiTiBi project with local stakeholders, and in 2016, the business-to-business meeting), a part from Bike & Go and secured cycle shelters meetings. The B2B stakeholder meeting was held early 2016 and was attended by 5 organisations.

Indicators in the pilots	Belgium	Italy	Spain	UK
No. of distributed project leaflets	20,000	1,500	200	50,000
No. of organisations or individuals approached directly via email or phone to promote the project	800	50	200	2,000
No. of companies reached with BiTiBi information in the B2B campaign	1,000		150	(6)
No. of BiTiBi press releases	30	25	10	25
No. of meetings of follow up committee for the implementation of the actions	300	10	40	3

Figure 33. Summary of dissemination and communication figures for the pilots during the BiTiBi project.

In Liverpool and UK, communication and promotion was not done under the BiTiBi brand, but under the Bike & Go brand. The reason for this is that the Bike & Go brand had already been used in marketing communications.

2.7.5. Beyond the pilots

There has been a positive dissemination and communication of the BiTiBi project, the BiTiBi approach and the BiTiBi services during the pilots and also beyond the countries of the pilots to other EU countries as well as the rest of the world.

Social media has been a very important and useful tool for dissemination and communication to other countries.

In terms of Twitter, by September 2016 there were 546 followers of the @biketrainbike account. That represents a fulfilment level of 55% of the project objective to reach 1,000 followers.

In terms of Facebook, with 730 Likes, we have achieved 73% of the BiTiBi project objective of reaching 1,000 Likes.

The bitibi.eu website has achieved the initial objective of 10,000 site visits (100%), with 10,494 unique visits. It has had 80% of the pageviews initially assumed: 23,779 compared with the objective of 30,000.

Finally, the project newsletter has reached 306 recipients (44% of the initial objective 700). It should be noted that the project communication was focused on the newsletter but more aimed at Facebook and Twitter.

Social media activity has grown considerably over the last few months due to the increase of the actions performed as part of the pilots. Moreover, the organisation of the final conference (publication of two press releases, invitation of a large panel of train companies and local authorities in Europe...) and the publication of the results, facts and figures of the project will focus further attention to the BiTiBi pages. Therefore, the objectives will undoubtedly be reached by the end of the project, with the exception of the number of subscribers to the newsletter, which is a less popular information channel than social media.

Moreover, BiTiBi has been also participated in many **national and international conferences** where the project and the BiTiBi approach has been introduced. BiTiBi has been presented at 28 conferences where more than 2,720 persons have participated.

By the end of the project, BiTiBi will be represented at major conferences such as the National Conference on Bike and Train Intermodality in France (Paris – November 14th) and the Annual Polis Conference (Rotterdam – December 1st). The project will possibly also be represented at VeloCity in June 2017.

	Partner	Date	Event	Location	Format (presentation, interview, etc)	Audience (estimation)	Type of audience	Partner general appreciation & remarks
1	AIM	November 2014	**Polis Conference**	Madrid, Spain	General presentation + Spanish Projects	30		
2	inno-V	June 5th 2015		Utrecht, The Netherlands	General presentation	50	Bicycle advocates and professionals working in transportation	RAS
3	Copenhagenize	January 28th 2015	**Winter Cities Conference**	Edmonton, Canada	Inspiration keynote on bicycle urbanism –	500	Bicycle advocates and planners	RAS
4	Blue Bike – Copenhagenize	March 24th 2015	**EU / Polis – European Mobility week 2015**	Brussels, Belgium	Workshop during a 2-day seminar on transportation in Europe – 2 sessions of 25 minutes on Blue Bike and BiTiBi	50	Professionals working in transportation (cities, transport operators…)	RAS
5	Copenhagenize	April 3rd 2015	**Study Trip of the University of Antwerp**	Copenhagen, Denmark	Inspiration keynote on bicycle urbanism –	25	Students	RAS
6	Copenhagenize	April 16th 2015		Helsingborg, Sweden	Inspiration keynote on bicycle urbanism – Conference on Logistics	300	Bicycle advocates and professionals working in transportation	RAS
7	Blue-bike	May 7 2015	**Mobility commision - Flemish Parliament**	Brussels, Belgium	General presentation + Blue-bike projects	60	mobility experts Flemisch Parliament	RAS
8	FGC	May 5 2015	**AMTU Annual Catalan Mobility Conference**	Mataró, Spain	BiTiBi presentation	300	Mobility experts, municipalities technicians	Important interest of the journalist for this subject
9	Blue-bike	May 20 2015	**Internal mobility event Flemish Bus-operator**	Mechelen, Belgium	General presentation + Blue-bike projects	30	Bus-operator staff	RAS
10	Blue-bike	June 5 2015	**Velocity workshop**	Nantes, France	General presentation + Blue-bike projects	80	European bike-experts	RAS
11	TML	June 17th 2015	**European Sustainable Energy week**	Brussels, Belgium	General presentation at workshop	40		RAS
12	Copenhagenize	August 11th 2015	**Interview for the television - Chanel : Planete**	Copenhagen, Denmark	Interview	0	Mainstream	Important interest of the journalist for this subject
13	Copenhagenize	Sept. 15th 2015		Malmö, Sweden	Inspiration keynote on bicycle urbanism –Conference on Logistics	400	Bicycle advocates and professionals working in transportation	RAS
14	Copenhagenize	Oct. 7Th 2015	**EU Cycling Summit. Conference of the Ministers of Transport**	Luxembourg, Luxembourg	Inspiration keynote on bicycle urbanism. BiTiBi mentioned.	100	EU Ministers of transport and their staff	Bike & Train combination mentioned in the press conference
15	FGC	Feb 16th 2016	**Bicycle Catalan Government working group (3-4 times per year)**	Barcelona, Spain	Intermodaly bike-train policy, including BiTiBi	30	Bicycle entities and governments	Press conference about the Catalan measures
16	Copenhagenize /TML	October 14th 2015	**EASME workshop**	Brussels	stand at EASME workshop	30	Mobility experts and governments	Distribution of brochures and explanation of the project at the stand
17	inno-v		**Bike & City discussion (pakhuis de Zwijger -**	Amsterdam		30	policy makers - other interested people	
18	Copenhagenize		**Roule Libre – Radio programme**	Paris	Invitation to present BiTiBi at the main radio programme on cycling on the local French radio : France Bleu 107.1		Wide audience – Only in Frencg	RAS
19	inno-v	May 2016	**Seminar on bike + train intermodality**	Borovnica, Slovenia	Presentation of the project + interview at the local radio	50		Report sent to the City of Borovnica with recommendations for the development of bike + train services
20	Copenhagenize /TML/Blue-bike/inno-v	June 11th 2016	**EU Sustainable Energy Week - EASME**	Brussels	Presentation of the project + Blue-bike + infrastructure to reach the stations	30	Mobility experts, train companies	75 people registred. Room for abour 30 people.

21	Copenhagenize	June 21st 2016	**Copenhagenize Master Class**	Copenhagen, Denmark	Presentation of the project + Blue-bike + infrastructure to reach the stations	21	Mobility experts, policy makers, engenieers	RAS
22	PLD	September 28 th, 2016	**UIC training**	Rome, Italy	Presentation of BiTiBi for an audience of railway operators and infrastructure managers		railways operators and infrastructure managers	
23	TML	October11, 2016	**CER workshop**	Brussels, Belgium	presentation of BiTiBI for passenger workgroup at CER		railway operators and infrastructure managers	
24	PLD	July 22, 2016		Piacenza, Italy	Presentation of BiTiBi among Smart Cities & Communities projects	10	Vice-mayor, university deputy, smart city deputy	
25	PLD	May 10, 2016	**Mantova Smart City symposium**	Mantova, Italy	Presentation of BiTiBi among Smart Cities & Communities projects	100	Mobility experts, policy makers, engenieers	
26	PLD	May 20, 2016	**Bike-up, European festival on e-bikes, Lecco**	Lecco Italy	Presentation of BiTiBi among sustainable mobility projects	50	Mobility experts, policy makers, engenieers	
27	PLD	September 22, 2015	**Expo Milan, Italy**	Milan, Italy	Poster on BiTiBi at Expo Milan during the event sustainable mobility in the Italian Universities	400	Wide audience visiting Expo	124168 Expo visitors on that day
28	PLD	June 6, 2016			Interview on BiTiBi and other aspects related to cycling by Alberto Colorni for Corriere della Sera, national newspaper			
						2,716		

It should furthermore be noted that other parties, such as the **Community of European Railway and Infrastructure Companies (CER) and the International Union of Railways (UIC),** which are European railway umbrella organisations, have already shown an interest in expanding the BiTiBi approach.

3. Evaluation of the key performance indicators

3.1. Impacts for rail operators

The BiTiBi approach has an evident impact on rail operators, as it promotes the use of trains.

On the one hand, the investment to set up a new BiTiBi facility has to be taken into account, both for shared bicycle scheme and for secured bike parking at train stations. However, BiTiBi facilities should be seen as an improvement of the train service, as a complete door-to-door service.

On the other hand, the railway operator also has to consider the new BiTiBi users which give rise to new train passengers and new train trips.

3.1.1. Investment

The investment cost for a bike sharing scheme and a secured bike parking is estimated based on data from different operators in the pilots, including NS from the Netherlands. Sometimes other stakeholders fund the new infrastructure, for instance municipalities or regional governments and this must be taken into account.

For a shared bike scheme the investment cost is around 1,500 EUR to 2,000 EUR per bike and the annual operating cost is around 600 EUR per bike. If a bicycle is used for five years, the total yearly bicycle cost lies between 800 and 900 EUR. This investment cost includes the bike station cost (with, for example, the key terminal for Blue-bike), which means that the greater the number of bikes per station, the lower the average investment cost per bike.

For a secured bike parking, the investment cost is estimated at between 1,000 – 1,500 EUR per bike rack space. If the shelter is used over 20 years, the yearly cost is between 50 and 100 EUR/year.

More general research in the Netherlands finds an average investment cost of 940 EUR/ rack space. Figures varies from 104 EUR for unsecured, unsheltered parking in a city centre to 2,700 EUR/rack space for an underground bike parking at a railway station. The cost for exploitation varies between 20 to 30 EUR/rack space and 450 EUR/rack space per year. The average is 188 EUR/year (fietsverkeer 34, Frans Bekhuis – Crow-fietsberaad / Kees van Ommeren en Martijn Lelieveld Decisio)

The investment in the BiTiBi pilots rises to approximately 3 million EUR for the shared bike systems and to approximately 3 million EUR for secured bike parkings.

However, it should be noted that for NS, the national train operator in the Netherlands, the aim with OV-fiets, the national shared bike scheme linked to train stations, has always been to provide a better service for train passengers applying a door-to-door approach. Therefore, they have always assumed the costs of this service. It should be considered that in the Dutch case, it

took eight years before the investment reached breaking even. At the same time, this brings a great deal of new customers to NS.

3.1.2. New train uses

The BiTiBi services mean new intermodal options for current train passengers but they also attract new train users.

We know from BiTiBi user surveys in the pilots that 30-40% of the shared bikes schemes users are new train users for that BiTiBi trip and around 20 % of the secured bike parking users are also new train users for that BiTiBi trip. New train users should be understood as new train users for that trip, thanks to the facilities of the combination of bike and train. It does not mean that they did not use the train at all before.

The BiTiBi impact is then, that approximately one of every three new shared bike users and one of every five new secured shelter users are new train passengers for those new BiTiBi trips.

3.2. Impacts for society

The BiTiBi benefits for society are wide-ranging, as impact relates to environmental issues, health and general quality of life.

3.2.1. Energy consumption and CO2 e emission savings

Car journeys are avoided because of the behavioural change of new BiTiBi users and this annual reduction also implies reductions in fuel consumption and CO_2 and other greenhouse gases emission.

As explained in section 2.4 of this report, the modal shift of users for each BiTiBi service of the pilots has been translated to an annual increase or decrease of trips across other transport modes and their correspondent annual increase or decrease of person kilometres (based on data from user surveys in the pilots: modal shift and average distances).

BELGIUM				
Blue-bike		**98,454 new BiTiBi trips/year**		
New BiTiBi users		**Annual increase or decrease of trips per mode**	**Average distance (km)**	**Annual increase or decrease of pkm per mode**
Train	**32% New train users**	**31,556**	**26.3**	**830,281 pkm by train/year**
Bicycle	**72% New cyclists from/to the station (first/last mile)**	**70,685**	**4.3**	**303,673 pkm by bike/year**
Bus/Tram /Metro	4% Previous BTM users for the whole trip	-3,787	34.9	-132,170 pkm by BTM/year
	33% Previous BTM users for the first/last mile trips	-32,818	4.3	-140,991 pkm by BTM/year
Car	**22% Previous car users for the whole trip**	**-21,458**	**34.9**	**-748,964 pkm by car/year**
	6% Previous car users for the first/last mile trips	-6,311	4.3	-27,114 pkm by car/year

Figure 34. Annual increase and decrease of trips and pkm because of BiTiBi for each form of transport in Belgium (source: user survey and Bike or train operators).

ITALY					
Velostations			**30,735**	**new BiTiBi trips/year**	
New BiTiBi users			**Annual increase or decrease of trips per mode**	**Average distance (km)**	**Annual increase or decrease of pkm per mode**
Train	**20%**	**New train users**	**6,147**	**12.2**	**74,993 pkm by train/year**
Bicycle	**43%**	**New cyclists from/to the station (first/last mile)**	**13,319**	**1.9**	**25,305 pkm by bike/year**
Bus/Tram /Metro	7%	Previous BTM users for the first/last mile trips	-2,049	1.9	-3,893 pkm by BTM/year
Car	**7%**	**Previous car users for the whole trip**	**-2,049**	**16.0**	**-32,784 pkm by bike/year**
	17%	Previous car users for the first/last mile trips	-5,123	1.9	-9,733 pkm by car/year

Figure 35. Annual increase and decrease of trips and pkm because of BiTiBi for each form of transport in Italy (source: user survey and Bike or train operators).

UK					
Secured cycle shelters			***28,440***	***new BiTiBi trips/year***	
New BiTiBi users			**Annual increase or decrease of trips per mode**	**Average distance (km)**	**Annual increase or decrease of pkm per mode**
Train	***19%***	***New train users***	***5,481***	***23.9***	***131,046 pkm by train/year***
Bicycle	***48%***	***New cyclists from/to the station (first/last mile)***	***13,776***	***4.5***	***62,573 pkm by bike/year***
Bus/Tram /Metro	*3%*	*Previous BTM users for the whole trip*	*-889*	*33.0*	*-29,325 pkm by BTM/year*
	8%	*Previous BTM users for the first/last mile trips*	*-2,370*	*4.5*	*-10,765 pkm by BTM/year*
Car	***9%***	***Previous car users for the whole trip***	***-2,666***	***33.0***	***-87,974 pkm by car/year***
	18%	*Previous car users for the first/last mile trips*	*-5,036*	*4.5*	*-22,876 pkm by car/year*

Figure 36. Annual increase and decrease of trips and pkm because of BiTiBi for each form of transport in the UK (source: user survey and Bike or train operators).

To calculate the annual impact on fuel consumption and CO_2 emissions form the BiTiBi services, both the decrease in motorised vehicles pkm (car and bus/tram/metro) and the increase in train pkm has to be considered. New bike pkm have not been included in this calculation, as bike trips do not use fuel nor emit gases.

The conversion factors (average across the EU) used are those derived from the TREMOVE transport model (www.tremove.org) for 2015. These are well-to-wheel emission factors, so they take into account the production, distribution and combustion of the fuel.

Conversion factors			
	Fuel (l/km)	**Energy (toe/km)**	**CO2e (t/km)**
Car	0.0563	0.0000509	0.0001698
Bus/Tram/Metro	0.0124	0.0000117	0.0000756
Train	0.0046	0.0000122	0.0000444

Figure 37. Conversion factors from TREMOVE.

Multiplying the total pkm and conversion factors provides the annual energy savings, CO2 emissions savings and fuel consumption savings, which are given per form of transport:

BELGIUM	Impact on mobility (pkm/year)	Fuel (l/year)	Energy (toe/year)	CO2e (t/year)
Car	-776,078	-43,693	-40	-132
Bus/Tram/Metro	-273,161	-3,387	-3	-21
Train	830,281	3,819	10	37
TOTAL		**-43,261**	**-33**	**-116**

Figure 38. Total annual impact on fuel, energy and CO2e savings for Belgium

ITALY	Impact on mobility (pkm/year)	Fuel (l/year)	Energy (toe/year)	CO2e (t/year)
Car	-42,517	-2,394	-2	-7
Bus/Tram/Metro	-3,893	-48	0	0
Train	74,993	345	1	3
TOTAL		**-2,097**	**-1**	**-4**

Figure 39. Total annual impact on fuel, energy and CO2e savings for Italy

UK	Impact on mobility (pkm/year)	Fuel (l/year)	Energy (toe/year)	CO2e (t/year)
Car	-124,499	-7,009	-6	-21
Bus/Tram/Metro	-40,845	-506	0	-3
Train	179,219	824	2	8
TOTAL		**-6,691**	**-5**	**-16**

Figure 40. Total annual impact on fuel, energy and CO2e savings for UK

For the UK, both secured cycle shelters and Bike & Go avoided car pkm and bus/tram/bus pkm and new train pkm have been taken into consideration.

For the entire project, counting all the pilots, **52,049 litres of fuel, 38 toe and 136 tonnes of CO_2e are avoided annually**.

BiTiBi project	Impact on mobility (pkm/year)	Fuel (l/year)	Energy (toe/year)	CO2e (t/year)
Car	-943,093	-53,096	-48	-160
Bus/Tram/Metro	-317,900	-3,942	-4	-24
Train	1,084,493	4,989	13	48
TOTAL		**-52,049**	**-38**	**-136**

Figure 41. Total annual impact on fuel, energy and CO2e savings for BiTiBi pilots

3.2.2. Other pollutants savings

The number of car trips avoided annually can also be translated to other pollutant savings such as particulates PM_{10} or NO_x emissions.

The conversion factors used are taken from the project *"Electrification Status of Passenger Cars. Assessing the status of electrification of passenger cars and potential future implications for the environment and the European energy system (EEA)"* (2015). This has then been adapted for commuting trips, where the occupancy rate is lower, and an interpolation for 2015 has also been carried out[10].

The annual savings that BiTiBi services have reached are **17.1 kg of particulates PM_{10} and 327.3 kg of NO_x**.

	Belgium	Italy	UK	TOTAL
PM10 (kg/year)	-14.1	-0.8	-2.3	**-17.1**
NOx (kg/year)	-269.4	-14.8	-43.2	**-327.3**

Figure 42. Total annual impact on PM_{10} and NO_x savings for BiTiBi pilots

3.2.3. External costs of pollutants emissions

The financial impact form BiTiBi in terms of avoided harmful effects from main pollutants from transport has been evaluated in relation to the reduction in car pkm as well as the emission savings for CO_2, PM_{10} and NO_x.

[10] The occupancy rate used is 1.2 person/car, and the interpolation for 2015 is 0.018143854 PM_{10} gr/pkm and 0.347068446 NO_x gr/pkm.

The conversion factors used to translate avoided emissions to avoided costs valued in EUR have been taken from the report for the European Commission "*Update of the Handbook on External Costs of Transport*" (2014)[11].

The annual savings for the BiTiBi project if 23,824 EUR/year.

	PM10 (€/year)	Nox (€/year)	CO2 (€/year)	TOTAL
BELGIUM	-3,804	-2,866	-12,935	**-19,605 €/year**
ITALY	-208	-157	-709	**-1,074 €/year**
UK	-610	-460	-2,075	**-3,145 €/year**
				-23,824 €/year

Figure 43. Total annual impact on external costs related to CO_2, PM_{10} and NO_x savings for BiTiBi pilots

3.2.4. Health benefits of regular cycling

Cycling is a physical activity which means that it also has positive health effect.

The BiTiBi approach has an impact on new cyclists and it increases the number of first and last mile trips by bike to/from the station. Section 2.4.2 deals with the modal shift for new cyclists showing that some 70% of new shared bike system users are new cyclists for that trip, while around 40-50% of secured bike parkings users are also new cyclists.

The World Health Organization (WHO) has developed a tool that values the health benefits of regular cycling as a reduction in premature deaths, which is called HEAT (Health economic assessment tool). It is based on a reduction of probability of death for people who cycle regularly (the tool takes data for age 20-64 years).

Data from BiTiBi user surveys have been used, such us average distance cycled per day (twice the distance to/from the station), the number of cycled days per year and the numbers of new cyclists per year. To assess health impacts, only cyclists using the BiTiBi service more than 3-4 times a week have been taken into account as health effects of cycling only occur if people do physical exercise (cycling) for at least 30 minutes three times a week. This is probably an underestimation as even those only using BiTiBi once or twice a week probably reach the threshold of 30 minutes of physical exercise three times a week.

In Belgium, only 5% of Blue-bike users use the shared bikes more than three times a week (average of 192 days/year). In UK, data from Bike & Go is not being used, because the service is not used as regularly as needed to use the HEAT tool. Instead, 35% of the members of secured cycle shelters use the shelters more than four times per week (average of 252 days/year). In Italy, 80% of the registered users of the cycle shelters use them more than four times a week (average of 180 days/year).

[11] The average costs for Europe (€2010) are 270,178 €/t for $PM_{2.5}$ in urban areas (similar to PM_{10}), 10,640 €/t for NO_x and 0.02 €/vkm for CO2. A car occupancy rate of 1.2 persons per vehicle has been used.

The HEAT tool expose that the level of cycling for Blue-bike in Belgium provides an estimated protective benefit of 14 %, compared to persons not cycling regularly. In the case of Italy and the velostations this percentage is 6% and in UK with the secured cycle shelters it is 19%.

The BiTiBi project, with the annual increase of cyclists and cycling trips to/from the station and the physical activity that this represents, has achieved a total economic benefit of 1,236,000 EUR per year[12].

		Annual benefit
BELGIUM	Blue-bike	275,000 €/year
ITALY	Velostations	104,000 €/year
UK	Secured cycle shelters	857,000 €/year
		1,236,000 €/year

Figure 44. Total annual economic benefits based on premature death reduction due to regular cycling in BiTiBi pilots.

We note that premature deaths due to cycling accidents has not been considered separately as a minus in the analysis and the WHO HEAT tool. The study behind the tool takes all mortality causes into account, including road accidents. This is, however, based on a Danish situation. Research in the Netherlands has shown that the health benefits of cycling are much greater than the reduction in health benefits from accidents and that in urban area, a shift to cycling does not add to the number of road casualties (Schepers, 2011 *How does a modal shift from short car trips to cycling affect road safety*).

[12] The value of statistical life applied in the HEAT tool is 4,381,000 € for Belgium, 3,556,000 € for Italy and 3,722,000 € for UK.

4. Estimation of the future impacts of BiTiBi

The BiTiBi approach will carry on growing over the next years, both in the pilots as well as across other EU countries.

4.1. Scenario for 2020

The scenario for 2020 is a realistic scenario, with the growth and expansion of BiTiBi services in Belgium, Italy, Spain and UK.

By 2020, in Belgium, Blue-bike membership will have risen to 55,000 and 500,000 annual rentals and with coverage of around 30% of the stations at NMBS (Belgian railway operator) network. Note that secured bike parking has not been taken into account here as it was not part of the project. However, there is considerable benefits in terms of energy and CO_2 in Belgium due to a significant number of bicycle racks.

In Italy, secured velostations will have expanded to cover around 45% of Ferrovienord stations, with around 3,500 racks for bikes, reaching around 2,800 registered users and 300,000 annual uses of the secured shelters.

In Spain, is estimated that secured bike parkings will expand to cover the FGC stations of the metropolitan area of Barcelona (AMB), representing around 35% of the total number of FGC stations. This will feature around 900 bike racks spaces with approximately 100,000 annual uses.

In UK, the Bike & Go system will have achieved around 30,000 rentals per year with 7,000 customers. The aim is to expand to at least another 15 high footfall stations, representing around 10% of the stations at the four train operating rail operators participating of Abellio Group. In terms of Merseyrail's secured shelters, they will see little expansion as these are already present at around 90% of the Merseyrail stations (1,500 racks). The goal here will be to improve the quality of the shelters and the scheme in the next years which will further increase the usage: around 150,000 annual uses and 10,000 members.

This BiTiBi expansion in Belgium, Italy, Spain and UK will, since the start of the pilots in 2014, have estimated cumulative savings of 241,455 litres of fuel, 177 energy toes and 623 tonnes of equivalent CO_2 (greenhouse gas emissions).

BiTiBi project			Scenario 2020
	Fuel (l)	Energy (toe)	CO2e (t)
Belgium	-191,141	-144	-511
Italy	-17,057	-11	-34
Spain	-6,823	-4	-14
UK	-26,434	-18	-64
TOTAL	-241,455	-177	-623

Figure 45. Estimation for 2020 scenario of cumulative impact on fuel, energy and CO2e savings for BiTiBi pilots (2014 – 2020)

4.2. Scenario for 2030

A most ambitious scenario would be for 2030, with the expansion of BiTiBi across EU with the participation of the European railways umbrella organisation “Community of European Railway and Infrastructure Companies” (CER) and the “International Union of Railways” (UIC). It is a hypothetical “what if…” scenario

There are currently 7,220 million railway passengers in EU countries (UIC statistics, 2015) and we estimate an increase of 3.2% by 2030 achieved because of BiTiBi (see below). We do not assume any other increase in rail passenger numbers.

For the **first mile**, we assume that in all the EU countries, 20% of train passengers will travel to the station by bike by 2030, which means a 16% increase compared to the assumed 4% without this policy. A rate of 20% of train passengers using the bicycle to travel to the railway station is half the share of people going to the railway station by bicycle in the Netherlands (42%). The average modal share for cycling in the BiTiBi pilots in 2014 was 4%. We assume it can be used as an average throughout the EU.

And we know from our results that of those passengers using the bike for the first mile, 20% are new train passengers, as they were using other forms of transport before using this BiTiBi combination. That is why we consider an increase of 3.2% rail passengers .

In 2030, the safe bike parkings users will carry out 1,192 million new BiTiBi trips (bicycle trips to stations).

By applying our results for modal shift and average trip distances to different forms of transport from the BiTiBi project in the pilots, we calculate the car and bus pkm being avoided and new cycling and train pkm. 10% were doing the whole trip by car (average of 40 km) and 15% travelled to the station by car (average of 3 km).

Therefore, by 2030, 5,305 million car pkm will be avoided because of secured bike parkings at train stations and 3,576 million bike pkm will be new uses of the bicycle.

For the **last mile**, we assume that in 2030 all the EU countries will reach the goal foreseen for Blue-bike by 2020: 500,000 rentals/year that in Belgium means 0.002 shared bike rentals/train passenger[13].

Expanded to the EU countries, in 2030 there will be 16 million of new shared bikes rentals at train stations.

As done before for the first mile, we use the results of modal shift when using BiTiBi: 20% were doing the whole trip by car (average of 40 km) and 5% were reaching the station by car (average of 3 km).

This means that in 2030, 131 million car pkm will be avoided due to shared bikes schemes at railway stations and a further 48 million bike pkm will be added.

4.2.1. Energy consumption and CO2 e emission savings

The total impact of the expansion of BiTiBi services all over EU by 2030 will be 5,436 million car pkm avoided and an increase of cycling by 3,625 million bike pkm.

This impact then translates into energy and emission savings. In the EU, the BiTiBi approach will achieve a reduction of 300,009,918 litres of fuel, 221,866 toe and 784,005 tonnes of CO_2e.

EU				Scenario 2030
	Impact on mobility (million pkm)	Fuel (l)	Energy (toe)	CO2e (t)
Car	-5,436	-306,043,123	-276,689	-923,022
Bus/Tram/Metro	-1,832	-22,721,201	-21,439	-138,526
Train	6,251	28,754,406	76,262	277,543
Bike	3,625			
TOTAL		-300,009,918	-221,866	-784,005

Figure 46. Estimation for 2030 scenario of impact on fuel, energy and CO2e savings in EU countries.

4.2.2. External costs of pollutants emissions

BiTiBi further gives rise to other emission savings which can be calculated for the 2030 scenario as has been done in section 3.2.2.

The savings for 2030 are 53.05 tonnes of PM_{10} and 247.56 tonnes of NO_x due to avoided car pkm of from secured bike parking users and of 1.31 tonnes of PM_{10} and 6.12 tonnes of NO_x due to avoided car pkm of shared bike schemes[14].

[13] There were 231,570,000 annual railway passengers in Belgium in 2015 (source: UIC statistics, 2015).
[14] The occupancy rate used is 1.2 person/car, and the interpolation for 2030 is 0.010000517 PM10 t/million pkm and 0.046666758 NOx t/million pkm.

This means that the external costs savings are around 105,380,979 EUR for the safe bike park and 2,604,519 EUR for the shared bike scheme.

4.2.3. Health benefits of regular cycling

The BiTiBi approach also has an impact on the health of the population as it means new cyclists and increases first and last mile trips by bike to/from the station, and as cycling is a physical activity.

As in section 3.2.4, regular cycling is translated into economic health benefits as a reduction in premature deaths (with the HEAT tool from the WHO). To calculate the order of magnitude, only people using the bicycle more than three times a week are taken into account. This means, that most users of shared bicycles/last mile are not taken into consideration when calculating health benefits. The frequency of using shared bicycles is often not high enough to get a positive health impact. Therefore, the fact that those people may use a bicycle elsewhere is not taken into account.

The number of passengers, among new cyclists for the first mile, who would be expected to die prematurely if they were not cycling regularly would be 12,020. The number of deaths per year that are prevented by this level of cycling is 1,189 and so this level of cycling provides an estimated protective benefit of 10 % (compared to persons not cycling regularly). The value of the social health benefit is 3,075,665,000 EUR[15].

In terms of cyclists for the last mile, the shared bike users, the number who would be expected to die if they were not cycling regularly[16] would be 367. And the number of deaths per year that are prevented by this level of cycling is 33, so this level of cycling provides an estimated protective benefit of 9 % (compared to persons not cycling regularly). The value of the social health benefit is 84,455,000 EUR[17].

4.2.4. Cost benefit comparison

By applying these figures, we can do a cost benefit exercise of the expansion of secured bike parkings and shared bike schemes at railway stations.

For the first mile users, counting 200 traveling days per year and two trips per day, we have 2.98 million users of the secured bike parkings. We make the general assumption that we need 2.98 million racks. As seen in section 3.1.1 the average of investment for the safe bike parkings, including all the building and access systems, the costs is 1,000 EUR/rack. If the infrastructure of the bike parking has a life-span of 20 years, this means that the annual proration of the investment is 50 EUR/year per rack. The maintenance cost of the bike parking is around 200 EUR/year per rack. Therefore, the annual cost of the secured bike parking, which is 745 million EUR is off-set by the annual health benefits for society (3,076 million EUR). If we also take into

[15] The value of statistical life applied is 2,587,000 € (according to HEAT tool from WHO).
[16] It has been taken into consideration that only 5% of shared bike users do it regularly, more than 3 times per week (source: user surveys in BiTiBi project).
[17] The value of statistical life applied is 2,587,000 € (according to HEAT tool from WHO)

consideration the external costs of pollutant emissions saved by the BiTiBi approach (105.38 million EUR), the benefits are much bigger.

For the last mile users, as previously said, in the scenario for 2030, we estimate that all EU countries will have reached the Blue-bike goal in Belgium for 2020. The current number of rentals per bike is 123 annual rentals/bike. This means that an estimated 16 million rentals in 2030 will require 130,700 bikes across the EU, which represents an investment of 196 million EUR. If the life span of a bike is five years, then the investment is 39 million EUR/year. The annual maintenance cost of bike system is approximately 600 EUR/year per bike, as seen in section 3.1.1. For all of these figures, the health benefits and the external cost benefits for society are less than the annual cost of the bike sharing scheme. Shared bikes users should pay 2 EUR per trip to compensate for this. This would be an annual contribution of 32 million EUR as 16 million rentals are estimated. During a start-up phase, public authorities could cover these 2 EUR/trip, but after settlement period of a few years, users should pay this trip cost while public authorities could cover the investment and maintenance. If such contributions are made, the cost benefit balance remains positive.

We furthermore note that

- this cost benefit analysis is very basic and does not take (fully) into account some of the social benefits, like the positive impact of congestion, the time gains for the users, etc. It does probably also underestimate the health benefits as it only considers the health benefits of the very regular user of the shared bicycles, but this shared bicycle use is likely to be on top of other bicycle use which would then increase the physical health impact of cycling.
- for the Dutch OV fiets system, the system costs (investment and maintenance) are compensated for by the user contributions. The system is at break-even without any public money, even if this could be justified taking given the different social benefits.

Cost - benefits	**Safe and sheltered bike parks** (cycling in the first mile)	**Shared bike scheme** (cycling in the last mile)
Investment (million €)	2,980	196
Annual proration of investment (million €/year)*	149	39
Annual maintenance (million €/year)	596	78
Annual cost (million €/year)	**745**	**118**
Health benefits (million €/year)	**3,076**	**84**
External costs savings (million €/year)	**105**	**3**
Annual benefits (million €/year)	**2,436**	**-31**

Figure 47. Estimation cost-benefit of BiTiBi services for 2030 scenario in EU countries.

5. Conclusions

The aim of BiTiBi project has been achieved. Many actions in the pilots have been carried out with positive outcomes also beyond the pilots across the whole rail network.

There has been an **improvement of the infrastructure and the BiTiBi services**, with a current overall coverage of 37% of the train stations with BiTiBi facilities. For the intermediate pilots, there has been a significant increase of the number of available locations in shared bike schemes (7-9% of current coverage of the train stations in Belgium and in four of the train operator companies in UK)) while the increase of locations of secured and sheltered cycle shelters has been spectacular (there are now secured and sheltered cycle shelters at 86% of stations). For the beginner pilots, the coverage of secured bike parkings represents 4-8% of current stations (all Ferrovienord and FGC stations at Barcelona metropolitan area).

BiTiBi users[18] and BiTiBi trips have all seen positive growth. BiTiBi services members have at least doubled those from the beginning of the project in 2014 and rentals of shared bikes and uses of the safe bike parkings have almost doubled and in some cases tripled. In absolute numbers, Blue-bike users and rentals in Belgium are the highest of all the pilots.

The **behavioural change** due to BiTiBi facilities has been very positive:

- 20-30% of actual BiTiBi trips had not been made by **train** before the BiTiBi project. The percentage of new train uses (or trips) is higher among shared bike schemes trips (30-40%) than among secured bike parkings use (around 20%). The shared bikes systems are probably offering a new possibility for the last mile trip which has attracted new train users who see this new combination as a solution. Secured bike parkings have a greater impact for the first mile trips and it is probably seen more as an improvement of the train service, especially for those who are already train users. The BiTiBi impact is that approximately one of every three new shared bike trips and one of every five new secured bike parking uses are new train trips (new BiTiBi trips).
- 40-70% of the BiTiBi trips were previously done by motor vehicle (car or bus) and have shifted to **bike** to complete the train trip (first/last mile trips by bicycle). As for train trips, there is a greater shift to cycling for that trip among shared bike trips (around 70%) than for users of secured bike parkings (around 40-50%).
- the decrease in car use has been 5-20% thanks to options under BiTiB. As for the increase in the use of trains bicycles, there is a difference between the decrease in car use relating to the use of bike sharing uses and that for the use of secured shelters. The behavioural change in car use is greater in relation to shared bike trips. While bike sharing trips mostly replaced car trips for the entire trip, trips relating to secured bike parkings trips mostly replaced trips by car for the first/last mile, to travel to and from the station. Around 20% of shared bike scheme trips were done by car prior to the project for the entire trip and only around 5% for the first/last mile trip. Around 5-10% of trips relating to secured bike parkings were done by car for the entire trip while 15-20% of them were done for the first/last mile.

[18] A BiTiBi user is someone combining bike and train.

The outcome for the levels of **awareness of the BiTiBi services** at train stations has been very positive due to a multitude of **marketing and communication actions** that have been carried out across social media, at the stations, by organising events, via business-to-business campaigns. Around half of the people interviewed were aware of the BiTiBi opportunities . This figure for all the pilots was between 25% and 60% of the people interviewed in the vicinity of the station (most were above 50%).

In terms of the **user satisfaction for BiTiBi services**, the most important features in shared bikes schemes is the convenience of the service and the ease to use the facility. For secured bike parkings, the most valued features are 'convenience', 'safe to use', and 'distance to platform/station' of the shelters.

The total **investment** required from train or bike operators (as well from other stakeholders such as local and regional governments) for launching the BiTiBi services is, for a shared bike scheme, around 1,500 EUR to 2,000 EUR per bike and the annual maintenance cost is around 600 EUR per bike. If the life span of a bicycle is five years, the total yearly bicycle cost is between 800 and 900 EUR. The investment cost for a secured bike parking is estimated at between 1,000 – 1,500 EUR per bike space. If the parking is used for a period of 20 years, the yearly cost is between 50 and 100 EUR/year.

The **BiTiBi benefits to society** are wide-ranging and the impacts apply to environmental issues, health and general quality of life. The BiTiBi project has achieved annual savings of 943,093 car pkm, 317,900 bus, tram or metro pkm and seen an increase of 1,084,493 in train pkm. This means a significant annual reduction of 52,049 litres of fuel, 38 toe of energy and 136 tones Co2e emissions. In terms of the use of BiTiBi services, this represents a general rate of ---0.6534 fuel l/rental or use, -0.0005 toe energy/rental or use and -0.0017 t CO2e/rental or use. There are savings also in other pollutants emissions annually arising from the BiTiBi project. These include 17.1 kg of particulates PM10 and 327.3 kg of NOx. This means rates of savings of -0. 2 gr PM_{10}/rental or use and -0 4.1 gr NO_X/rental or use.

External costs reductions arising from avoided emissions of pollutants relating to BiTiBi are have also been taken into account and so has the **health benefits of cycling regularly**. Cycling is a physical activity and therefore has health effects. The BiTiBi approach impacts on the number of new cyclists and increases first and last mile trips by bike to/from the station. Based on the HEAT tool from WHO, the reduction of probability of death for people who cycle regularly (reduction of premature death for people aged 20-64 years) can be calculated. The total cost saving is 1,259,824 EUR/year because of emissions avoided and health benefits deriving from BiTiBi.

Estimations of **future impacts from BiTiBi** has been done on the basis of a **year 2020 scenario**. The expansion of BiTiBi in Belgium, Italy, Spain and UK will have achieved estimated cumulative savings from 2014, when the pilots started, of 241,455 litres of fuel, 177 energy toes and 623 tonnes of equivalent CO_2 (greenhouse gas emissions).

A **further scenario** has been analysed for **year 2030** with BiTiBi services expanded across all of the EU based on two hypotheses:

- By 2030, 20% of European rail passengers will travel to their railway station by bicycle. This is half the current rate of the Dutch railway passengers (42%).
- The uptake of shared bicycles will by 2020 have reached the Belgian level which is still far below the Dutch level.

The main results of the scenario exercise are:

- 1,192 million new BiTiBi trips for cyclists over the first mile and 16 million shared bikes rentals are done in the 2030 scenario, which equates to 5,436 million car pkm avoided and 3,625 million new bicycle pkm. The impact is greater for the secured bike parkings than for the shared bikes schemes.
- The total energy and emission savings of the BiTiBi approach within the EU will be a reduction of 300,009,918 litres of fuel, 221,866 of toe and 784,005 tonnes of CO2e.
- Other pollutant emission savings are 53.05 tonnes of PM_{10} and 247.56 tonnes of NOx arising from avoided car pkm from secured bike parking uses and 1.31 tonnes of PM10 and 6.12 tonnes of NOx due to avoided car pkm from shared bike schemes. The external costs savings are around 105,380,979 EUR for the safe bike park and 2,604,519 EUR for the shared bike scheme.
- Equally, the health benefits for society as a reduction in premature deaths because of the increase of cycling regularly are also greater for BiTiBi first mile cyclists than for last mile cyclists: 3,075.67 million EUR for first mile cyclists and 84.46 million EUR for last mile cyclists.

A cost benefit exercise shows that the expansion of secured bike parkings at railway stations is more worthwhile than the implementation of shared bike schemes at railway stations. While annual costs of about 745 million EUR (including the yearly cost of the investment and the annual maintenance) for the first mile services by 2030 in the EU already have been off-set by the annual health benefits for society arising from regular cycling which amount to 3,076 million EUR. There are also 105.38 million EUR of external cost savings. For the last mile services, the annual costs (118 million EUR, including the yearly cost of the investment and the annual maintenance) are higher than the economic health benefits (84.46 million EUR) and the external costs savings (2.6 million EUR). A user contribution of 2 EUR/rental is required for shared bike schemes in order to achieve a positive cost–benefit balance. This user contribution could be subsidised by public authorities during the initial phase. This cost benefit analysis did not take all social benefits into account and, after a few years, the user contributions for shared bike schemes would compensate for the investment and operational costs, as the OV-fiets in the Netherlands shows.

The cost–benefit ratio is positive for both BiTiBi services. But the benefits from the secured bike parkings are much greater. Just taking into consideration the health benefit for society, there are already much greater than the cost.

6. Policy recommendations

The BiTiBi project can be extrapolated to other countries in Europe. The below section contains some policy recommendations for the setting up and running of bike and train combinations, in other words BiTiBi services.

6.1. Spread the BiTiBi concept

In some European countries, the bicycle culture is in its infancy or is latent. This means that people do not realise the convenience and efficiency of combining bike and train.

Governments, citizens, companies etc. are often not aware of this concept and so there is a need to talk about it and to spread the concept as a very efficient mobility solution. There is a need for a dissemination strategy, starting with places where the seed of new BiTiBi services will have the best chances of growing.

6.2. Keep local governments engaged

The main stakeholders for a new BiTiBi approach are local governments (this includes municipalities, regional governments, national governments…) and their involvement in these projects is indispensable for success .

These stakeholders need to be involved from the outset because they will spread the concept and they hold the key to a sustainable financial model. The BiTiBi approach in the Netherlands really took off once the financing was shared between railway companies and local government parties such as cities and regions. In Belgium, Blue-bike found creative co-financing solutions for its development. In Barcelona area, the project did not grow much until creative solutions for financing had been found.

Furthermore, it is important to engage local governments as they, generally speaking, carry the responsibility for the cycle routes to and from railway stations, and improvements.

6.3. Start with secured and sheltered bike parkings at the stations

The BiTiBi approach clearly provides society benefits. Compared to the investment, society benefits are greater for secured bike parking, as the investment is relatively low for a quite significant benefit, where health benefits play an important part and the number of users is high. Investment cost for shared bicycles is higher as more hardware is often needed. However, shared bicycles more often replace complete car journeys whereas the health benefits are lower as it is used less frequently. In terms of costs and benefits to society, bike parkings have a greater impact than shared bicycles.

Furthermore, this allows rail companies to provide an extra service to their customers and attract new customers. Depending on the service and how it is communicated and promoted, new passengers will be during or outside peak hours. This is something that railway companies should be aware of. Where the trains are at or above capacity during peak, it can often be of

greater interest to have extra passengers outside peak hours. Communicating shared bicycles successfully can help in achieving this.

The first step for rail companies and public authorities interested in applying the BiTiBi approach is the provision of bicycle parking, ideally secured and sheltered. The next step, once the habit of cycling has been established, might be the provision of shared bicycles for the last mile.

6.4. Taking a long-term business perspective

When establishing shared bikes systems at stations, these must be sustainable over the long term.

Bike schemes often require high set-up costs. However, also be aware that there are considerable operational costs involved. This product does not provide high revenue returns from costumers and it takes a few years for a product to grow once it has been introduced to the market. To be sustainable over the long term, the aim of bike schemes should be to reach break-even. In the Netherlands, reaching break-even for in the shared bike system OV Fiets, a service of the national railway company NS, took eight years.

By improving the opportunities for using the bike for the first and last mile of a train journey, the barriers for people to choose the train are reduced. It is clear that the benefits are not just more profit to the railway companies as more people use the train, but also society also benefits by lowering the environmental impact of the transport system.

6.5. Maintain good communication with the target groups

A good marketing and communication plan is a very important tool for reaching all the target groups. These target groups must be aware of all the new BiTiBi opportunities and improvements. Remember that clients and partners are your best ambassadors and that the main reason for cycling in combination with train is and should be convenience. Communicate this in terms of easy, fast and cool.

6.6. Work on the integration of BiTiBi services

The final aim is to have BiTiBi services included in the mobility payment chip card, providing an easy way to pay. The reason why this is so important is that making payment easier will improve the levels of use, even though the process of achieving a national or regional mobility card is a slow one.

Other deliverables, guidelines and the pilot reports themselves provide further and detailed information on how to implement a BiTiBi approach in practice.