



Measure Evaluation Result

LIM 4.2 - Expansion of public bike sharing system, include e-bikes

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Executive Summary

The expansion of the bike sharing system offers more options to cyclists, and encourages them to follow more routes and visit more points of interest in the area. Tourists have been informed about the bike sharing schemes through promotional material placed in hotels, tourist information offices, and other locations throughout the Limassol region, the mobile application, and campaigns.

In Limassol, with the support of measure LIM 4.2, the bike sharing system was expanded. In cooperation with the main bike sharing company, NextBike CY, the number of bike sharing stations was increased to a total of 35, and the number of bikes available to 215, by March 2021, at their own expense. Also, during DESTINATIONS, Limassol Tourism Company in collaboration with NextBike CY, added 5 new bike parking facilities (3 bike sharing stations and 2 free parking facilities installed through DESTINATIONS by LTC) to serve the cycling paths available in the region. Other bike rental companies have been encouraged to increase the number of bikes in their fleets and add electric bikes for rental to cover the needs of less athletic people or senior citizens.

The bike sharing company is responsible for the operation and maintenance of the system. The bike sharing system is self-sustainable with fees and memberships. With the expansion of bike sharing services, tourists and residents have the opportunity to organise and make their leisure trip more comfortable. The users have the chance to cycle in different areas of the Limassol region with the leave/park system at any station in the network.

In Limassol, the e-bike network was expanded by 21 e-bikes (not funded by DESTINATIONS). Bike rental companies attract a new market segment of people who are less athletic to ride long distances. Electric bikes provide an excellent option for these people, and at the same time encourage them to use e-bikes in their everyday life.

The use of cycling increased as the length of the street cycle network and length of the number of streets with sidewalks and bike lanes expanded, reaching 0.4 Km and 256.1 Km respectively. There is a considerable decrease of air pollution (108.4 tCO₂) and noise pollution (45.26 dB) in comparison with levels at the beginning of the measure, as more tourists and residents prefer to use sustainable modes of transportation including the bike sharing system over other modes of less environmentally friendly transportation. Moreover, the number of people which were satisfied with the e-bike system has significantly increased throughout the implementation of the measure, reaching 80%. As a result, with the improvement of cycling conditions, the local partners understand that there was an increase in the use of cycling as mode of transport, contributing to an increase of savings in fuel costs (fuel cost saving: 14,046€) and litres of fuel (fuel consumption saving: 11,328 L).

Continuous meetings with Next Bike CY, Cyprus Cycling Federation, Council of the promotion of Cycling, and Cycling Clubs will take place to discuss and exchange ideas and suggestions regarding improvements of cycling infrastructure and the new bike schemes.

A Description

The bike sharing system has been expanded in order to offer more options to leisure cyclists and encourage them to follow more routes and visit more points of interest in the area. The opportunities to combine cycling with special interests are highlighted, emphasising and ensuring a stress free and enriched tourist experience.

At the beginning, 10 e-bikes and 20 conventional bikes were available for rent. By March 2021, the bike sharing company Next Bike CY had increased its fleet to 215 conventional bikes and 21 e-bikes. Great efforts took place to encourage other bike rental companies to increase their number of bikes and add electric bikes for rental, to cover the needs of less athletic people or senior citizens. In total, 5 bike parking facilities (Figure 1) were installed by LTC in Limassol city by March 2021.

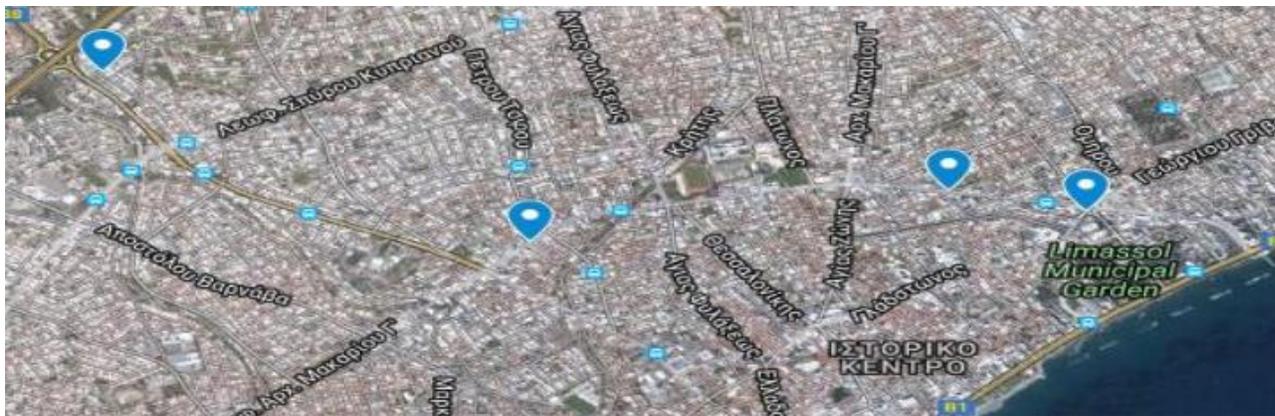


Figure 1: New parking facilities in Limassol city centre

A1 Objectives and outputs

City policy level objectives

This measure is in line with Limassol Municipality's Strategy according to the measure 'Tourist Mobility Action Plan', contributing to the below objectives:

- Fewer CO₂ emissions and a cleaner, more attractive environment
- Less traffic noise in the city centre and increased attractiveness for tourists and locals
- Less energy consumption
- Public health and safety
- Change habits of local people and tourists
- Increase the total share of citizens that use sustainable mobility modes
- More attractive tourist destination

Measure Specific objectives

- Support investors to expand the bike sharing network. The bike share provider has committed to expand the network given we provide support through the application, promotional campaigns, competitions, and through receiving the necessary permits from local authorities
- Add new stations
- Increase the number of bikes and e-bikes available for sharing and renting
- Obtain licensing for additional stations

Outputs¹

- 5 promotional campaigns
- 5 new bike parking facilities (LIM 3.1)
- *195 new conventional bikes, funded by Next Bike
- *11 new e-bikes, funded by Next Bike
- *7 new bike sharing stations

Supporting activities

In order to increase the impact of the measures, the bike sharing and rental companies worked together to increase stations, as well as to increase the number of available bikes and e-bikes for rent. Moreover, local authorities provided licenses for new bike sharing stations, while cycling clubs and associations promoted the action to their members.

A2 Inter-relationship with other measures

This measure shares synergies and has a strong interaction with other CIVITAS DESTINATIONS measures, as follows:

- **LIM 3.1:** *Increase cycling and walking in combination with special interest tourist activities as an integrated product*, as this measure aimed to upgrade cycling through the development of cycling paths connected to the coastline, development of bike parking points, and in general, encourage cycling for leisure.
- **LIM 3.4:** *Attractive and accessible public spaces to promote intermodal leisure trips*, as this measure aims for the development of an ecological route where travelers can change from one mobility mode to another, including e-bikes and bikes, to move around the city.
- **LIM 4.3:** *Promote the uptake of electric vehicles*, as the electro-mobility campaigns will make tourists and residents more aware of the expanded bike sharing system.
- **LIM 6.1:** *Awareness of the use of sustainable mobility modes for leisure trips*, as the expansion and upgrade of the bike sharing system is in accordance with LIM 6.1, which focuses on increasing the awareness of travelling by using sustainable mobility modes, and promoting them through campaigns and competitions.
- **LIM 6.3:** *Bicycle challenge: competition between employees of companies*, as the expansion of the bike sharing system and the increase in available stations and bikes in

¹ * Extra output

the region, as well as the new parking points developed under this measure, encourage people to cycle to work instead of driving.

- **LIM 7.4:** *Mobility application and travel planner for smart phones to provide real time information*, as within LIM 7.4, travelers can determine the nearest bike rental station and bike sharing station in the new expanded network.

A3 Target groups and/or affected part of the city or region

Tourists and residents moving throughout the region will be influenced by this measure.

A4 Stakeholders involvement

Stakeholder name	Activities description
Bike sharing company	To work together in order to increase stations by three and bikes by thirty
Bike rental companies	To increase number of available bikes for rent and e-bikes for rent
Local authorities	To provide license for new bike sharing stations
Cycling clubs and association	To promote to their members
Hotels	To promote cycling to their guests

Table 1: Stakeholder involvement

B Measure implementation

B1 Situation before CIVITAS

Prior to the DESTINATIONS project, there were very few public bike sharing systems in the region, and only a few public bike rental stations. This lack of infrastructure was disempowering residents and visitors from cycling activities. By adding stations and increasing the number of bikes, more people will have the chance to use the system and users will have the option to cycle to new areas, as the system allows users to leave/park the bike at any station within the network. Before DESTINATIONS, the Limassol region had 20 bike sharing stations, 10 e-bikes, and 20 conventional bikes available for rent and sharing purposes.

B2 Innovative aspects

- **New conceptual approach** - Residents and tourists find it easier to use the bike in their everyday life, since they can cycle to different places. Additionally, less athletic people will have the option of renting electric bikes. The bike sharing system is growing and offers more options to leisure cyclists, encouraging them to follow more routes and visit more

points of interest in the area. The number of users of the bike sharing system has increased by 40% in 2019 in comparison to 2018, and statistics reveal that more people (October 2019: 6,493 users, October 2018: 3,604 users) are using the public bike sharing system.

B3 Technology development

Not applicable.

B4 Actual implementation of the measure

LTC held meetings with the bike sharing company (Next Bike Cyprus) in November 2016, and with the Cyprus Cyclist Association and Biking Cyprus (1 of the 2 bike rentals in the year 2016) in December 2016 to present DESTINATIONS and to determine problems and propose solutions to promote cycling.

In June 2016, in collaboration with Limassol Municipality that had to provide relevant permissions, LTC had an onsite visit to determine locations for the installation of parking facilities. Furthermore, in the context of LIM 3.1, LTC followed all necessary procurement procedures according to the National Law of Cyprus for purchasing and installing 3 bike sharing stations in Limassol city centre (2 in Arch Makariou Avenue, 1 in Saint Nickolas Roundabout), and 2 free bike parking stations in Ysponas Municipality (January 2018). LTC implemented this activity in collaboration with NextBike CY, who are the only bike sharing company in Cyprus.

At the beginning of DESTINATIONS, the bike sharing company and bike rental companies were informed about the implementation of the project measures. They were also given incentives by LTC to increase their fleet with conventional bikes and e-bikes, which included participation in all project events to promote cycling, and facilitating them in gaining relevant permissions from local and national authorities. During DESTINATIONS, LTC organised several events and provided the opportunity to bike sharing and rental companies to promote their products:

- Mobility Week Events (2017, 2018, 2019, 2020)
- Event 'Cycling of Love' (2019 & 2019)



Figure 2: Promoting bike sharing & e-bikes during Mobility Week 2017, 2018, 2019, & 2020

- Site Visit “Improvement regarding Urban Accessibility in Limassol City” (26/7/2019)
- Site Visit “Promotion of e-bike and Electromobility” (9/5/2019)

In 2020, the number of bike rental companies reached 5 in the Limassol Region. At the beginning, only 10 e-bikes and 20 conventional bikes were available for rent, but the bike sharing company NextBike CY increased its fleet to 215 bikes and 1 e-bike. The number of e-bikes available for rent has been increased to 21 by March 2021.



Figure 3 - Competition and Event "Cycling of Love"
September 2018 & 2019

C Impact evaluation

C1 Evaluation approach

Expected impacts and indicators

Impact category	Impact indicator	Unit of measure
Economy	1- Fuel costs savings	€
Environment	2- CO ₂ emissions	ton
Environment	3- Traffic noise	dB
Energy	4- Fuel consumption	L
Transport system	5- N ^o of conventional and electric bikes	N ^o
Society	6- Awareness level about the bike sharing system	%
Society	7- Acceptance level about the bike sharing system	%

Table 2: Expected impact and indicators

Method of measurement

Impact indicator	Method*	Frequency			Target Group	Domain (demonstration area/city)
		Bef.	Dur.	Aft.		
1- Fuel costs	E	10	26	45	Transport service providers	Demonstration area
2- CO ₂ emissions	DC/E	12	26	45	Vehicles in demonstration area	Demonstration area
3- Traffic noise	DC/E	12	26	45	Inhabitants and visitors	Demonstration area
4- Fuel consumption	E	12	26	45	Vehicles in the area	Demonstration area
5- N° of conventional and electric bikes	DC	9	24	34	Freight transport service	City
6- Awareness level about the bike sharing system	S	8	24	34	Residents and tourists	City
7- Acceptance level about the bike sharing system	S	8	24	34	Residents and tourists	City

*(Data collection (DC), Estimation (E), Survey (S))

Table 3: Method of measurement

Detailed description of the indicator methodologies

- **1 Fuel costs and 4 Fuel consumption** – To calculate these indicators, it was necessary to perform assumptions based on the experience of NextBike CY who unfortunately does not keep track of statistical data. With the expansion of the public sharing system (both bikes and e-bikes), an average of 236 bicycles are used instead of cars or other modes of transportation. Based on the experience of NextBike CY, each cyclist is renting the bike to cover approximately a distance of 10 km. NextBike CY's experience says that cyclists are cycling around 60 days per year. Based on the approximate consumption of an average car (8 L/100 Km) and the average fuel price in Cyprus for the period of measure implementation (1.24 €/L), the saved fuel costs and consumption due to the limitation of using the car were estimated.
- **2 CO₂ emissions** – This indicator was obtained using data extracted from the environmental sensors, collected from the main areas in the city in which the bike stations were installed.
- **3 Traffic noise** – This indicator was obtained based on environmental sensors collected from 6 areas in the city centre in which the bike stations were installed.
- **5 N° of conventional and electric bikes** – This indicator was obtained based on the actual number of rented bikes and bike stations in the city.
- **6 Awareness and 7 Acceptance levels of public bike sharing system** – These indicators were defined based on 350 surveys applied to citizens and tourists. The surveys intended to

assess the understanding, usefulness, and willingness to accept the measure. Survey findings related to questions such as “Have you seen/do you know about the bike sharing system NextBike”, “Did you use bike sharing in Limassol”, “How often did you use it”, “How was your experience with this service”, and “Will you use the bike more often”.

The Business-as-Usual scenario

Considering the type of indicators, which was mostly comprised of surveys and indicators whose information was gathered for the first time, carrying out a BAU analysis was not possible. However, the expansion of the public bike sharing system would not have been achieved without the implementation of this measure.

C2 Measure results

Impact category	Impact indicator	Unit of measure	Baseline	Ex-Ante	Ex-Post
Economy	1- Fuel costs savings	€	0	33,945	14,046
Environment	2- CO ₂ emissions	ton	291.92	143.52	183.52
Environment	3- Traffic noise	dB	93.06	63.06	47.8
Energy	4- Fuel consumption	L	0	27,375	11,328
Transport system	5- N ^o of conventional and electric bikes	N ^o	10 e-bikes and 20 conventional	172	21 e-bikes and 215 conventional
Society	6- Awareness level about the the bike sharing system	%	0	40	80
Society	7-Acceptance level about the the bike sharing system	%	0	40	80

Table 4: Measure results

C2.1 Economy

1- Fuel costs savings

Following the assumptions from the experience of NextBike CY, who unfortunately does not keep track of the usage of the bikes, the expansion of the public sharing system (both bikes and e-bikes) was considered to cause an average of 236 bicycles to be used instead of cars or other modes of transportation. In addition, it should be noted that following the results of the surveys

applied to residents and tourists, 83.9% of the people surveyed in 2019 used the bike sharing system.

With the 236 bicycles replacing cars or other less environmental modes of transportation, citizens and tourists have been contributing to reduced fuel costs. The local partners estimated that with the implementation of this measure, it was possible to achieve fuel savings of 14,046€, since the expansion of the bike sharing system offered more options to leisure cyclists who are encouraged to follow more routes and visit more points of interest in the area. The use of cars is limited at least for leisure.

C2.2 Environment

2- CO₂ emissions

From the environmental sensors installed in the 6 areas in the city centre in which the bike stations were installed, the local partners were able to clearly understand the positive effect of the expansion of the public bike system. The measure reduced the use of conventional modes of transport, and decreased unnecessary driving for leisure, resulting in a decrease of 108.4 tCO₂, accounting for 183.52 tCO₂ compared to the baseline scenario. More tourists and residents prefer to use sustainable modes of transportation, including the bike sharing system, compared to other modes of less environmentally friendly transportation.

3- Traffic noise.

Similar to indicator 2, from the environmental sensors installed in the 6 areas in the city centre in which the bike stations were installed, it was possible to assess the positive effect of the expansion of the public bike system. The local partners registered a considerable decrease in traffic noise in comparison with the beginning of the measure – a reduction of 45.26 dB was achieved, accounting for 47.8 dB compared to the baseline scenario (93.06 dB).

C2.3 Energy

4- Fuel consumption

Following the assumptions from the experience of NextBike CY, who unfortunately does not keep track of the usage of the bikes, the expansion of the public sharing system (both bikes and e-bikes) is considered to have resulted in an average of 236 bicycles being used instead of cars or other modes of transportation.

The implementation of the measure resulted in 11,328 L of fuel savings from the bike sharing system expansion and the upgrade of leisure cycling. The local partners estimated this saving of fossil fuels, assuming that the tourists and residents cycle for 10 km for 60 days per year.

C2.4 Transport System

5- N° of conventional and electric bikes

Before DESTINATIONS, the bike sharing system was limited, with only 10 e-bikes and 20 conventional bikes being available to residents and tourists. With the actions carried out under this measure, and more specifically the promotional campaigns and incentive programs provided to bike sharing companies, Limassol region, with the support of NextBike CY, was able to expand the bike network to 21 e-bikes and 215 conventional bikes, resulting in an increase of 195 new conventional bikes and 11 new e-bikes.

C2.4 Society

6 and 7- Awareness and Acceptance levels about the bike sharing system

The surveys aimed to understand the levels of acceptance, awareness, and usefulness of the application to approximately 350 tourists and residents. The results revealed that, during the implementation of the measure, awareness about the expansion of the bike sharing system and the acceptance of its use were significantly increased, as the measure was accepted and adopted very fast by Limassol tourists and residents.

Some indicative results from the surveys revealed that, in 2018, 73.1% of people were aware of the bike sharing system, a percentage which increased in 2019 to 89%. In 2018, from the people surveyed, 45.7% were using the bike sharing system, while in 2019, 83.8% of people accepted the measure, which therefore almost doubled. Additionally, in 2018, 63.6% of people had used the bike sharing at least once, while in 2019, 83.9% of people (who answered the surveys) had used the bike sharing. In both years, 90-92% of people were very satisfied with the bike sharing system. In the question if they will use the bike more often, 70.6% of people answered positively in 2018, while 100% of people answered positively in 2019.

C3 Quantifiable targets

No.	Target	Rating
1	Less fuel costs: 33,945 €	★
2	Less CO2 emissions: 148.4 t CO ₂	★
3	Less traffic noise in the city centre: 30 dB	★★★
4	Less energy consumption: 246.4 MWh	NA
5	Less fuel consumption: 27,375 L	★

6	*Increase of sharing bikes: 172 N _o of new bikes	***
7	*Increase the awareness and acceptance levels of people by 40%	***
8	Increase the total share of citizens that use sustainable mobility modes: 4,800 new cyclists for two years	NA
<p>N/A = Not Assessed 0 = Not Achieved * = Substantially achieved (at least 50%) ** = Achieved in full *** = Exceeded</p>		

*New target, not in GA

Table 5: Assessment of quantifiable targets

All targets have been achieved compared to those initially stated in the Grant Agreement, either fully or substantially, allowing data to be collected and analysed on time.

The reduction of unnecessary traffic congestion and driving for leisure trips allowed Targets 1 and 5 to be substantially achieved. The expansion of the bike sharing system allowed savings of 11,328 L, and consequently, savings on fuel costs of 14,046 €. These results are based on assumptions in order to approach the two indicators. Both values did not reach the expected values (ex-ante), but it is very important that they achieved considerable fuel and cost savings. Additionally, both ex-ante values were overestimated during the proposal stage.

Targets 2 was Substantially Achieved. After the implementation of the measure, the evaluation results revealed that the CO₂ savings reached 108.4 t, compared to the expected 143.52 t. The target was only Substantially Achieved as the evaluation was planned for additional months, however some delays in the implementation of activities led to data being evaluated only for a one-year period. Additionally, an acceptance period must be considered in order for tourists and residents to be informed about and adopt cycling into their leisure trips.

Target 3 was Exceeded. With the measure implementation, it was possible to achieve a reduction of 45.26 dB of noise pollution compared to the baseline (93.06 dB) in the 6 areas in the city where the bike sharing stations were installed.

Target 4 was not assessed due to a lack of data on the energy consumption that might have been saved from increased cycling. However, it is expected that this target has been at least substantially achieved through the implementation of interrelated measures and the achievement of indicators 2 and 5.

Target 6 has been Exceeded, as the number of e-bikes has increased by 11, reaching a total of 21, and the number of conventional bikes increased by 195, reaching 215 in total. Therefore, the total number of bikes reached 236.

Target 7 was Exceeded. During the surveys, it was possible to understand that 80% of the residents and tourists surveyed were aware of and had already accepted cycling for leisure.

Initially, the plan was to increase the total share of citizens that use sustainable mobility modes to 4,800 new cyclists for two years (Target 8). However, all the other indicators examined in this measure (indicators 1 to 7) led to the conclusion that there has been a significant increase in the number of citizens using sustainable mobility modes of commuting. This conclusion is supported from almost all the activities within the DESTINATIONS project in Limassol city. On the other hand, due to the limitation of having such statistical data, it was impossible to assess the exact number of new cyclists over the two years.

C4 Up-scaling of results

Not applicable

D Process Evaluation Findings

D1 Drivers

The key stakeholders contributed by providing support to realise the new bike sharing stations. There was a very good collaboration between the key stakeholders, including bike sharing company NextBike CY, Limassol Municipality, other Municipalities in the Limassol Region, and bike and e-bike rental companies. Municipalities gave permissions for the installation of the bike sharing stations, allowing the project to run smoothly.

D2 Barriers

There were no barriers for this measure and the evaluation was completed successfully.

D3 Main Lessons Learned

The main lesson learned from the implementation of this measure is that bike rental and bike sharing companies should consider the needs of more vulnerable target groups to enable them to adopt sustainable modes of commuting. Stakeholder involvement is also very important in order to realise the bike sharing expansion plans into new areas and new markets, and to design the new business model to adopt new needs and requirements. Moreover, authorities should invest more in road safety, and rental and bike sharing companies in cycling infrastructure, to motivate residents and tourists to use cycling in their leisure trips as well as in everyday life.

E Evaluation conclusions

The evaluation of this measure was effectively undertaken throughout the project lifetime. All outputs have been implemented on time, allowing very good representative data to be gathered and analysed.

F Additional information

F1 Appraisal of evaluation approach

Data was successfully collected, allowing the evaluation for this measure to be completed on time.

Initially, the plan was to increase the total share of citizens that use sustainable mobility modes to 4,800 new cyclists over two years (Target 8). However, all the indicators examined (indicators 1 to 7) led to the conclusion that the number of citizens using sustainable mobility modes has significantly increased. This conclusion is supported by almost all the activities which took place during the DESTINATIONS project in Limassol city. On the other hand, due to the limitation of not having such statistical data, it was impossible to assess the exact number of new cyclists over the two years. Additionally, the energy consumption (Target 4) was not assessed, but it is expected that it was substantially achieved through the implementation of the interrelated measures analysed in section A2 and the examined indicators 2 and 5.

F2 Future activities relating to the measure

Continuous meetings will take place with NextBike CY, Cyprus Cycling Federation, Council of the promotion of Cycling, and Cycling Clubs to discuss and exchange ideas and suggestions regarding improvements of cycling infrastructure and the new bike schemes.