URBAN GreenUP

D2.7: Final report about implementation and commissioning of NBS in Valladolid

WP 2 , T 2.8

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Technical References

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Project Coordinator	Raúl Sánchez Fundación CARTIF rausan@cartif.es
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0 Executive summary

Valladolid is a front-runner city in the URBAN GreenUP project (www.urbangreenup.eu) whose aim is to act as a living laboratory that demonstrates the economic, social and environmental impacts of fully functional green infrastructure, promoting citizen awareness and participation, and fostering of ecological reasoning and ecological intelligent among the citizens.

Valladolid works to validate and demonstrate the effectiveness of the URBAN GreenUP methodology. It has been planned to install 42 interventions along the city, which includes 42 Nature-Based solutions (NBS): 36 technical and 6 non-technical interventions. These interventions have been grouped according to how they are being procured and implemented.

This is the final report that describes the state of interventions and their development as well as the monitoring elements, according to the technical and economic specifications of the NBS developed by the URBAN GreenUP project WP2 demo partners.

The report describes the development of the tendering procedures, the public processes and civil works, describing not only the technical issues, but also experiences that have occurred. The implementation process is defined as a learning process that adapts to the circumstances, problems and barriers, and takes advantage of the different opportunities for co-creation and co-development to exploit the maximum potential of the process and resources available.

This deliverable shows the different stages for the successful implementation of the demonstrative interventions in Valladolid, technical and non technical, and describes the work done to date and the milestones achieved.

The following table summarizes the implementation status of the technical interventions.

Implementation phase	% delivery	Procurement group (PPP)	Abstract
Cancelled	0%	Floodable park	River Duero Basin does not recommend constructing the Floodable park in the selected plot.
Under review (in risk)	10%	Sustainable park	River Duero Basin did not report favourably to build the NWTP at the planned location in Las Contiendas park. The team is currently evaluating an alternative at another location (SUD next to the storm tank on Santander Avenue). We also evaluate synergies with the Urban Waterbuffer project (UWB).
Project phase	<50%	Stormwater management systems	The scope was expanded to include budget released from the Floodable park. Technical project was finished by CENTA on August 2020; however, its signature is not legally valid.
Procurement of proposed works is underway	60%	Cycle lane	Green corridor' project delivered by VAL (Aug 2020). Municipal Supervision ongoing. On the process of the preparation of the procurement documents. All the NSB will be tendered together (5 months).
	60%	Resting areas	
	60%	Pollinator's mod.	
	60%	Urban carbon sink	
	60%	Green noise barriers	Project delivered by SGR (Sep 2020). Supervision asked for changes to the project (Nov 2020). New project estimated

			to be delivered on Dec 2020. Procurement documents are underway.
Tendering process ongoing	75%	Electro wetland	LEI delivered the construction Project subcontracting the service. There will be signed an agreement between LEI and VAL, to provide the legal aspects for the construction (as LEITAT is in charge of that task). Approval on Dec 2020. Agreement signature expected on January 2021.
Works have started on site	80%	Bio-filter	Project delivered by CAR (June 2020). Tender process awarded. Contract formalized Nov 2020. Works ongoing.
Good progress with on-site delivery	85%	Urban orchard	Improvements in municipal orchards and Composting facilities already implemented by VAL. Small scale livestock on of the specifications and management definition.
	85%	Smart soils	Provider awarded on April 2020 by VAL. Purchase of smart soil for *Trees* and *Green corridor* already finished. Soil for SUDs not purchased (2021)
	70%	Trees	100% trees purchased -> Plantation autumn-spring.
	65%	Green canopies	Works started on July 2020. Delays in the implementation, expected November. Current date: February 2021.
Construction phase	100%	Green roof	Implemented on August 2020.
	100%	Green façade	Implemented on June 2020.
	100%	Vertical mobile gardens	Implemented on March-May 2020.
	100%	Green covering shelter	Implemented on March 2020.

Table 0.1: Technical interventions implementation status (December 2020).

And the following table summarizes the implementation status of the non-technical interventions of the URBAN GreenUP project in Valladolid.

% delivery	Non-technical activity	Abstract
80%	VAc37- Engagement Portal for citizen	There is a webspace in the Innovation Agency website for the URBAN GrenUP project in Valladolid. VAL is currently in the process of renewing its website. The local page of the URBAN GreenUP project will be improved (contents, interaction, NBS database).
80%	VAc38- Sponsoring activities	Sponsor a “Nature-Base Solution” initiative is ongoing, that will be improved with other activities after the NBS implementation (pollinator's modules, trees, etc.)
80%	VAc39- Promotion of ecological reasoning and intelligent	WP2 embers attend all the events to which they are invited to discuss the URBAN GreenUP project. This scenario will continue at least until the end of the project. Local engagement activities can be improved.
90%	VAc40- Single desk for RUP deployment	Single desk is always open to receive any comment, suggestion, support, from citizens and stakeholders. Both personally and electronic media or telephone.
60%	VAc41- Support to citizen project of NBS	Many projects related to NBS already make synergies with URBAN GreenUP in Valladolid. This action continues. The creation of a NBS database to Valladolid is planned but it is not executed.
60%	VAc42- City mentoring strategy (Staff Exchange activities)	The Mentoring strategy have already implemented many activities with stakeholders with interest in the UGU Project. The strategy can be improved and extended.

Table 0.2: Non-technical interventions implementation status (December 2020).

The following table express the % implementation for every NBS intervention of Valladolid demo. On average, the implementation is around 70%.

	Group	Nature Based Solution (NBS)		%Delivery	Implementation phase
		Code	Intervention		
Green corridor	Cycle lane	VAc1	Green cycle lane	60%	Procurement is underway
		VAc 15	Cycle-pedestrian green paths	60%	Procurement is underway
	Resting areas	VAc 6	Green Resting areas	60%	Procurement is underway
	Urban carbon sink	VAc11	Floodable Park	0%	Cancelled
		VAc7	Urban Carbon Sink	60%	Procurement is underway
		VAc35	Educational path	60%	Procurement is underway
	Pollinator's mod	VAc19	Natural pollinator's modules	60%	Procurement is underway
		VAc20	Compacted Pollinator's mod.	60%	Procurement is underway
		VAc21	Natural pollinator's modules	60%	Procurement is underway
Trees		VAc 2	Planting 1,000 trees	85%	Good progress with on-site delivery
		VAc 3	Tree shady places	85%	Good progress with on-site delivery
		VAc 4	Shade and cooling trees	85%	Good progress with on-site delivery
		VAc5	Re-naturing parking trees	75%	Good progress with on-site delivery
Stormwater management systems		VAc 8	SUDs for green bike lane	50%	Technical project finished
		VAc9	SUDs for re-naturing parking	50%	Technical project finished
		VAc10	Rain gardens	50%	Technical project finished
		VAc14	Green Parking Pavements	50%	Technical project finished
Green infrastructure		VAc24	Green Vertical mobile garden	100%	Works fully completed
		VAc27	Green Covering Shelter	100%	Works fully completed
Green Roof		VAc28	Green Roof	100%	Works fully completed
Green canopies		VAc29	Green Shady Structures	90%	Good progress with on-site delivery
Green façade		VAc25	Green façade	100%	Works fully completed
Green noise barriers		VAc22	Green noise barriers	60%	Procurement is underway
		VAc23	Green noise barriers	60%	Procurement is underway
Bio-Filter		VAc30	Urban garden bio-filter	80%	Works have started on site
Electro wetland		VAc26	Electro-wetland	75%	Tenders have been let
Smart soil		VAc16	Smart soils as substrate	90%	Good progress with on-site delivery
		VAc17	Smart soils as substrate	100%	Works fully completed
		VAc18	Smart soils as substrate	80%	Works have started on site
Urban orchards		VAc31	Urban orchard	100%	Works fully completed
		VAc32	Community composting	100%	Works fully completed
		VAc33	Small-scale urban livestock	40%	Technical specifications underway
		VAc36	Urban Farming Educational act.	90%	Good progress
Sustainable park		VAc13	Natural Wastewater Treat. Plant	10%	Under review
		VAc34	Educational path in NWTP area	10%	Under review
		VAc12	Green filter area	10%	Under review
Non-technical interventions		VAc37	Engagement portal for citizens	80%	Stakeholders actively involved
		VAc38	Sponsoring activities	80%	Stakeholders actively involved
		VAc39	Ecological reasoning & intelligent	80%	Stakeholders actively involved
		VAc40	Single window/desk	90%	Good progress / Stakeholders benefitting
		VAc41	Support to citizen NBS project	60%	Stakeholder partnership established
		VAc42	City mentoring strategy	60%	Stakeholder partnership established

Table 0.3: Implementation status for the NBS actions of Valladolid Demo (December 2020).

Data and results expressed in this report are updated to December 2020, as a result of the Second Review Report delivered by the European Commission on October-November 2020, after the Review meeting of September 2020.

1 Introduction

1.1 Purpose and relation with other tasks

The purpose of this deliverable is to show the final development of the interventions implemented in Valladolid Demonstration to ensure appropriate implementation and installation of the solutions and monitoring elements. Furthermore, the implementation development of the actions involves a learning process for all the stakeholders to be used in the definition of a methodology to be replicated in other scenarios. Barriers, challenges and opportunities affect the development and the final results. This report aims also to reflect these concerns as clearly and as pragmatically as possible.

This Deliverable *D2.7 Final report about implementation and commissioning of NBS in Valladolid* is the final report that follows the previous one *D2.6 Report on implementation progresses in Valladolid*. It is related to the activities in parallel carried out by the other Front-runner cities Liverpool and Izmir. There was delivered a first initial version of D2.7 on May 2020, using the information shared with the rest of the partners by Valladolid City Council during the 6th Project Meeting that has taken place "virtually" in Izmir on the 11-12 of May 2020. Current second version is completely updated to December 2020.

Valladolid's implementation is closely aligned with WP1 (to support the development of the re-naturing strategy and serve as a validation test-bed). The activities included in WP5 Monitoring and Evaluation will evaluate the front runner cities demonstrations and contribute to an overall evaluation.

1.2 Contribution of Partners

The URBAN GreenUP project is being delivered by a wide-ranging consortium of partners. Valladolid is a front-runner city and is one of the main actors in the project, assuming major responsibilities and workload commitments to our agreed deliverables. The city of Valladolid is supported by several local partners, in order to create a group of stakeholders to lead the city transition.

In addition, the technical and economical design of the interventions of Valladolid Demonstration in the URBAN GreenUP project is developed by a team working together as illustrated in the following table.

Partner	Expertise	Interventions in Valladolid Demo
Ayuntamiento de Valladolid	Valladolid City Council is a local government public entity from Spain. Demo Valladolid Coordinator.	- New green cycle lane and re-naturing existing bike lanes - Cycle-pedestrian green paths. Green Resting areas. - Arboreal interventions: Planting trees, tree shady places. - Urban Carbon Sink. - Green Parking Pavements. - Urban orchards. Small-scale urban livestock. Urban Farming Educational activities. - Educational paths. - Non-technical activities: Engagement Portal for citizen, Sponsoring activities, Promotion of ecological reasoning and intelligent, Single desk for RUP deployment, Support to citizen project of NBS, City mentoring strategy.
CARTIF Fundación CARTIF	Applied Research Centre in terms of R&D and technology transfer activities.	- Urban garden bio-filter. - Natural & Compacted pollinator's modules. - Smarts soils as substrate. - Community composting.
singular green	Singulargreen SL Company specialized in landscape architecture.	- Green roof. - Green shady structures. - Green covering shelter. - Green façade. - Green noise barriers. - Vertical mobile gardens.
Confederación Hidrográfica del Duero	Duero River Basin Authority is a public body under the Ministry of Agriculture, Food and Environment of Spain, authority for Duero Basin water management.	- Floodable Park.
Fundación Centro de las Nuevas Tecnologías del Agua – CENTA	Public research institution in terms of R&D&I in water management.	- Natural wastewater treatment plant (NWTP). - Drainage urban systems (SUDs) - Rain gardens. - Green filter area.
LEITAT managing technologies Acondicionamiento Tarrasense Associacion - LEITAT	Research Centre specialized in production technologies.	- Electro wetland.

Table 1.1: Partners of Demo Valladolid interventions in the URBAN Green UP Consortium.

1.3 Document structure

This document aims to generate a general overview of the work carried out from the technical design of the actions specified in deliverable D2.3 *Technical specifications of Valladolid Demo* and how the actions have been developed up to the present time at the closing date of this document.

The structure of this document follows the one presented in the previous report Deliverable 2.6, with two core sections (technical and non-technical actions).

a) TECHNICAL INTERVENTIONS:

The content of this section differs from the Deliverable 2.6 as the VAcXX actions or group of them has been taken as main points. For each main point the scheme has been organised as follows:

- Technical Description: This section has been extracted from Deliverable *D2.3 Technical Specifications of Valladolid demonstration*, which includes a summary of each intervention, describing also the differences with that report, if exist.
- Development: This section shows the development of each action from the previous definition to the final state, including the technical Project or technical-economic specifications, the Public Procurement Process (PPPs) involved, which were initially defined in *D2.5 Tender documents of Valladolid Demo*, and the implementation indeed. It should be noted that some of these PPPs have been modified since the delivery of the D2.5 to adapt to new circumstances. Section 2 describes widely the public procurement processes for the implementation of Valladolid Demo.
- Status: This section summarizes the current state of implementation of each action and reflects the percentage of progress of the intervention, from the definition of its location and technical design to the work completed and in operation, according to the criteria defined in the following table.

Percentage delivery	Technical interventions
10%	NBS locations under review
20%	NBS location agreed
30%	Detailed design and specifications are agreed and underway
40%	Economical specifications are calculated
50%	Technical project finished
60%	Procurement of proposed works is underway
70%	Tenders have been let
80%	Works have started on site
90%	Good progress with on-site delivery
100%	Works fully completed

Table 1.2: Status criteria for Valladolid Demonstration of technical interventions.

In the interventions where applies, there is also included a specific subsection about the impacts of the Covid-19 crisis in the implementation of the intervention. In Spain, the Government declared the first period of State of Alarm from mid-March to mid-June, prohibiting any activity classified as "non-essential". In October there was declared the second period of State of Alarm, with certain restrictions on activity and mobility. Between the two periods, the limitations have not ceased.

b) NON-TECHNICAL INTERVENTIONS:

This section summarizes the non-technical interventions for Valladolid taking into account those included in previous reports and updates the current state of these actions. The status is reflected with the percentage of the state of progress of the intervention, from the definition of its location and technical design to the work completed and in operation, according to the criteria defined in the following table.

Percentage delivery	Non-technical interventions
10%	Non-technical interventions described
20%	Locations/approach proposed
30%	Preliminary site visits/assessments made
40%	Engagement with stakeholders, partners, and wider community started
50%	Interventions mapped in detail/ Regular engagement with stakeholders
60%	Stakeholder partnership established
70%	Interventions about to commence
80%	Intervention has begun/ Stakeholders actively involved
90%	Good progress with delivering the Intervention/Stakeholders benefitting
100%	Intervention completed

Table 1.3: Status criteria for Valladolid Demonstration of non-technical interventions.

2 Procurement

This section describes, in brief, the procurement procedures for the implementation of the NBS in Valladolid Demo. This section is based on the information collected in the deliverable D2.5 Tendering processes for Valladolid Demo (September 2019), updating the information to the present time.

2.1 Public procurement procedures

The 36 technical interventions that Valladolid demo is implementing are grouped in public procurement categories. The following table summarizes the different interventions that are part of each Public Procurement Procedure (PPP) to facilitate the search for a specific NBS.

Public procurement group		Code	Intervention	Leader
Green corridor project	Cycle lane	VAc1	New green cycle lane and re-naturing existing bike lanes	VAL
		VAc 15	Cycle-pedestrian green paths	VAL
	Resting areas	VAc 6	Installation of 3 Green Resting areas	VAL
	Pollinator's mod	VAc19	Natural pollinator's modules	CAR
		VAc20	Compacted Pollinator's modules	CAR
		VAc21	Natural pollinator's modules	CAR
	Urban carbon sink	~~VAc11~~	Floodable Park	~~CHD~~
		VAc7	Urban Carbon Sink	VAL
		VAc35	Educational path in floodable park area	VAL
Trees		VAc 2	Planting 1,000 trees	VAL
		VAc 3	Tree shady places	VAL
		VAc 4	Shade and cooling trees	VAL
		VAc5	Re-naturing parking trees	VAL
Smart soil		VAc16	Smart soils as substrate	CAR
		VAc17	Smart soils as substrate	CAR
		VAc18	Smart soils as substrate	CAR
Green infrastructure		VAc24	Green Vertical mobile garden	SGR
		VAc27	Green Covering Shelter	SGR
Green Roof		VAc28	Green Roof	SGR
Green canopies		VAc29	Green Shady Structures	SGR
Green façade		VAc25	Green façade	SGR
Green noise barriers		VAc22	Green noise barriers	SGR
		VAc23	Green noise barriers	SGR
Bio-Filter		VAc30	Urban garden bio-filter	CAR
Electro wetland		VAc26	Electro-wetland	LEI
Urban orchards		VAc31	Urban orchard	VAL
		VAc32	Community composting	CAR
		VAc33	Small-scale urban livestock	VAL
		VAc36	Urban Farming Educational activities	VAL
Stormwater management systems		VAc 8	SUDs for green bike lane	CEN
		VAc9	SUDs for re-naturing parking	CEN
		VAc10	Rain gardens	CEN
		VAc14	Green Parking Pavements	VAL
Sustainable park		VAc13	Natural Wastewater Treatment Plant	CEN
		VAc12	Green filter area	CEN
		VAc34	Educational path in NWTP area	VAL

Table 2.1: Public procurement processes (PPP) and its relation with the URBAN GreenUP Actions.

2.2 Procurement categories, lots and projects

The implementation of the NBS in Valladolid demo is being developed by a total of 24 public procurement processes, which are summarized in the following table.

Procurement group	Contracts / Lots	Type of contract	Type of Procurement procedure
Green infraestructure	Lot 1 Green canopies Plaza España	Works	Open
	Lot 2 Vertical mobile gardens	Works	Open
Green façade	Green façade in El Corte Inglés	Works	Open
Green roof	Green roof in El Campillo market	Works	Open
Green canopies	Green canopies Sta. María Street	Works	Open
Noise barriers	Green noise barriers	Works	Open
Trees	Trees purchase (1 - Nov 19)	Supply	Framework supply agreement
	Trees purchase (2 - Mar 20)	Supply	
	Trees purchase (3 - Jun 20)	Supply	
	Trees purchase (4 - Sep 20)	Supply	
Green corridor	Project and works mgmt	Service	Minor contract
	Cycle lane	Works	Open
	Resting areas		
	Pollinator's mod.		
	Carbon sink		
Smart soils	Smart soil purchase (1 - May 2020)	Supply	Framework supply agreement
	Smart soil purchase (2/3 - Oct 2020)		
	Smart soil purchase (4 - 2021)	Supply	Framework supply agr.
Bio-Filter	Urban garden Bio-filter	Works	Minor contract
Electrowetland	EW (Quality / Health & Safety)	Services	Frmewrk service contr.
Urban orchards	Composting	Works	Minor contract
	Improvements	Supply	Framework supply agr.
	Livestock	Works	Minor contract
Stormwater management systems 'SUDs'	Soil permeability tests	Service	Frmewrk service contr.
	Stormwater management system	Works	Open
	Works management	Service	Minor contract
Sustainable park	Sustainable park	Works	Open
	Works management	Service	Minor contract

Table 2.2: Procurement processes, lots, types of contracts and types of procurement.

Type of contract	nº	Type of procurement procedure	nº
Works contracts	12	Open procedure	9
Supply contracts	7	Minor contract	6
Service contracts	5	Framework supply agreement	7
		Framework service contracts	2
	24		24

Table 2.3: Abstract of procurement procedures and types of contracts in Valladolid Demo.

The following figures show respectively the PPPs defined in D2.5 and those currently foreseen. Colours identify the different procurement processes delivered. As well as there are included the types of contracts, in general.

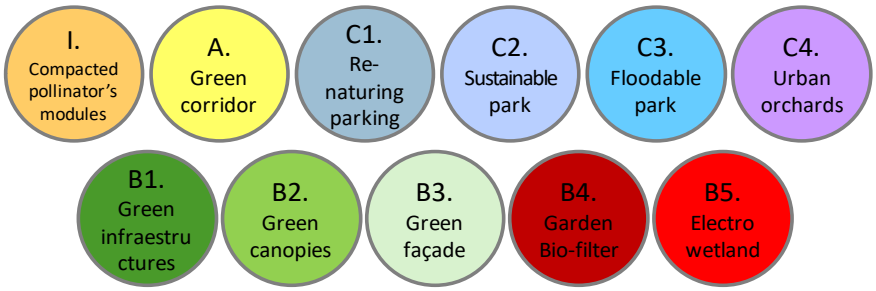


Figure 1. Technical NBS procurement groups diagram defined in D2.5.

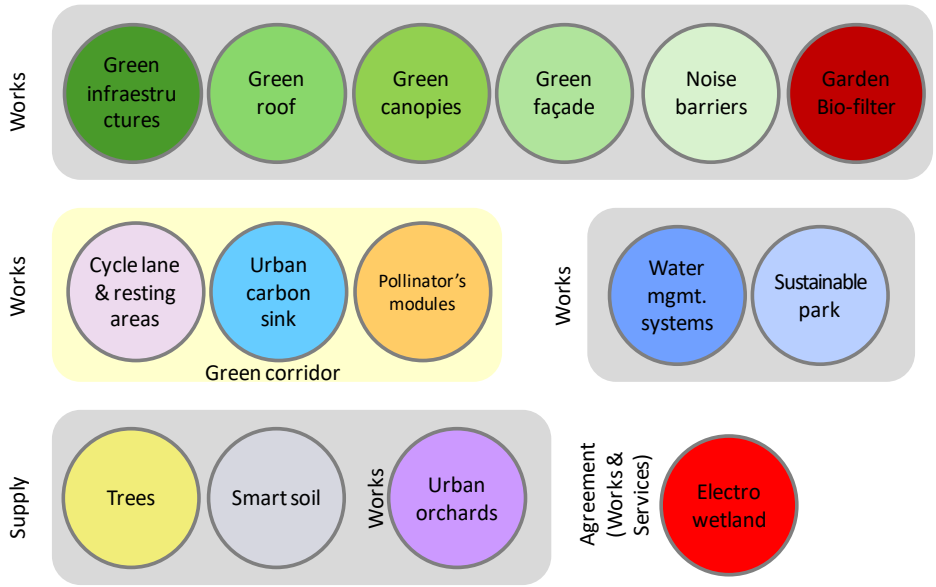


Figure 2. Technical NBS procurement groups diagram updated (December 2020).

The following subsections describes the contracts included in every type of procedure.

Open procedures

Most of the implementation of the NBS in Valladolid are delivered through Works contract under the Open procedure. There are included the green singular infrastructure, such as the VAc22-VAc25, Vac27-VAc29, the Green Corridor (VAc1, VAc 15, VAc 6, VAc19, VAc20, VAc21, VAc7, VAc35), the Stormwater management systems 'SUDs' (VAc8, VAc9, VAc10, VAc14) and the Sustainable park (VAc12, Vac13, VAc34).

On average, experience shows that an Open procedure longs about 5 months, from the publication of the procurement on the public procedures platform of Spain (Esp. *Plataforma de contraltos del sector public*, PCSP), until the formalization of the contract.

Minor contracts

Legal framework in Spain considers the type of public contract according to the "Minor" procedure. This is applied to procurement under certain economic thresholds:

- Works minor contracts (budget < 50.000 €): Urban garden Biofilter (VAc30), Community Composting facilities (VAc32) and Small-scale urban livestock (VAc33).

- Service minor contracts (budget < 15.000 €): Three contracts, the Project and works management for the Green Corridor (in a single minor contract); works management for the Stormwater management systems 'SUDs' and works management for the Sustainable park.

Framework supply agreement

Valladolid City Council signed a Framework Supplier Agreement with a number of companies which provide goods and products (suppliers). This agreement makes it possible to request a direct offer from the suppliers of the framework agreement, who confirm the availability of the products and offer a unit price, adapting to an economic downturn signed in the agreement. The supplier offering the lowest price for the same product is the successful bidder. This greatly facilitates the administrative purchasing procedure (supply contract).

The following agreement is currently in force: "Framework Agreement for the approval of suppliers for Valladolid City Council and other affiliated entities", signed on 24th October 2018 (*Acuerdo Marco* V.36/2017).

Through this framework agreement, the following interventions have been purchased: Trees (VAc2-VAc5), Smart soil (VAc16-Vac18) and the drop irrigation systems for the urban orchards (VAc31).

Framework services contracts

Valladolid City Council provides services of quality control (QC) and coordination of health and safety (H&S) for all municipal works. With these purposes, there are signed several framework services contracts with different companies. Currently, both companies are INCIDEC for the QC and INCOPE for the H&S.

These services are executed in every NBS that is implemented in Valladolid throughout public procurement. Likewise, it is also offered by Valladolid City Council to the implementation of the Electrowetland (VAc26), executed by LEITAT. Throughout the QC contract, there were also developed the 'Soil permeability tests" for the Stormwater management systems 'SUDs'.

Quality control	Health and Safety technical assistance
INCIDEC S.L. Contract: 2016 – 2018	INCOPE Consultores, S.L. (infrastructures)Contract: 2020 - 2021
Cost	Cost
0-500.000 € of PEM: 2.5% on PEM 500.000 € - 1M€ of PEM: 2.0% on PEM > 1M€ of PEM: 1.5%	0.428967% on PEM: •0.038997% on PEM for H&S study •0.38997% on PEM for H&S coordination

Table 2.4: Framework contracts for municipal works services.

Collaborative agreement

For the implementation of the Electro-wetland (EW) there will be signed a collaboration agreement between LEITAT and Valladolid City Council. This agreement is the legal instrument for the implementation of the Electrowetland (VAc26) in Valladolid. This intervention is designed, constructed, operated and monitored by LEITAT. Valladolid City Council will not launch any procurement procedure for the works implementation, as LEITAT will subcontract a construction company for this task, as well as LEITAT will finance the costs. The implementation of this intervention differs from the usual mechanisms of public tendering.

3 Progress report on Technical Interventions

3.1 Cycle lane and resting areas (VAc1, VAc6, VAc15)

3.1.1 Technical Description

- **New Green Cycle Line (VAc1)**

  The intervention *VAc1- New green cycle lane and re-naturing existing bike lane* sections, is the Urban 'Green Corridor core. This cycle lane (new and re-natured) connects the city of Valladolid from East to West, as opposed to the main transport roads that have a North-South orientation. Valladolid Mobility Department has supported the design of the bicycle track that will be part of the Urban Green corridor. With the URBAN GreenUP project budget, there will be built a part of the whole Green corridor.

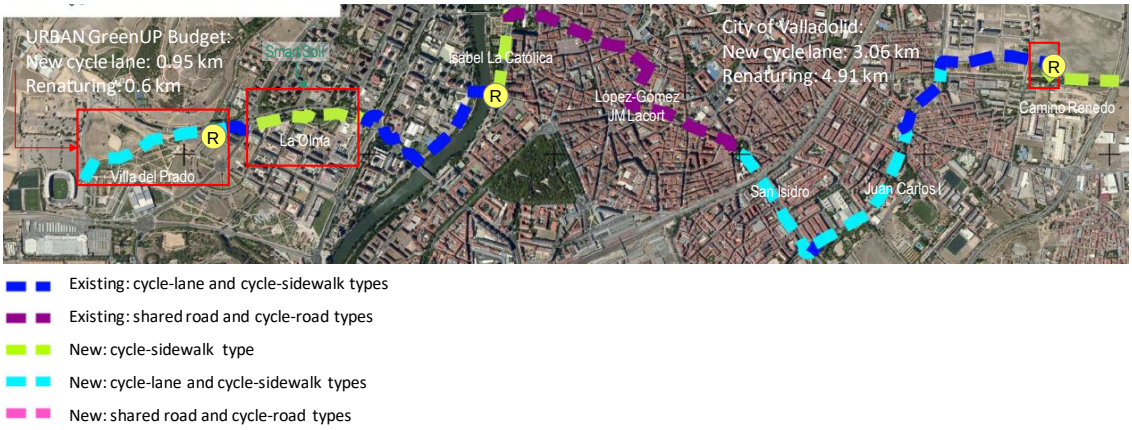


Figure 3. Green corridor and cycle lane in Valladolid (Vac1) with the location of resting areas (Vac6).

- **Installation of Green Resting Areas (VAc6)**

  The *VAc6- Green Resting Areas* will install 3 resting areas in three areas of the Urban Green Corridor. Each resting area will have an approximate surface of 100 m^2 with the following elements: a tree shade area, a small pollinator module, a bike parking, resting structures (benches/green slopes) and a water fountain.

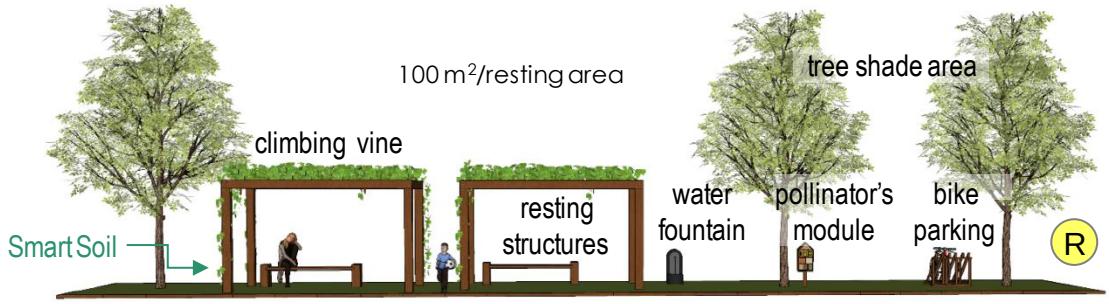


Figure 4. Green resting areas diagram (Vac6).

- **Cycle-Pedestrian Green Paths (VAc15)**

  The Green Corridor will cross the city from East to West, through a cycle lane (*VAc1-New green cycle lane*). Along the green corridor, seven cycle-pedestrian green paths areas will be installed, which are crossing points for the coexistence of cyclist and walkers, located in highly trafficked places.

  This intervention includes green pavements in a special structure with filter properties. Those green pavements leave small gaps filled with a designed bespoke smart soil and with specific creeping grass species with short growing heights and requiring minimum long term maintenance. This intervention has no irrigation system, so the vegetation will grow naturally.

  These features will improve the management of the water runoff and it could serve in the cycle-pedestrian areas to reduce cycle speed in specific urban sections where the paths are busier and shared with pedestrians. These sections of pavements will indicate slow velocity zones in street crosses, pedestrian stops, etc. as will be signalled. Total surface of the seven VAc15 installed will be 450 m^2.

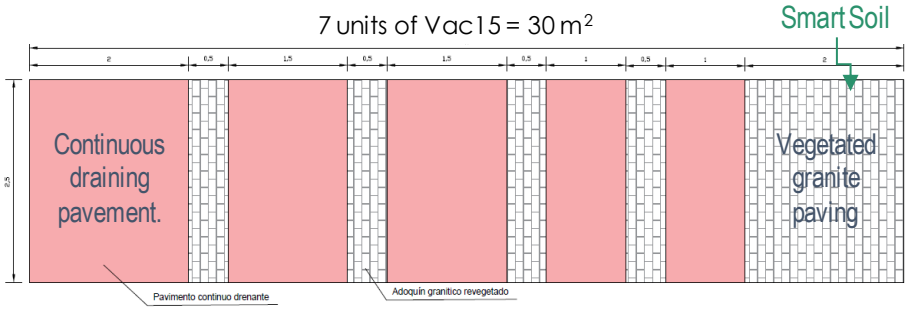


Figure 5. Cycle pedestrian green paths (Vac15).

3.1.2 Development

Project. The "Green Corridor" Project includes various actions in order to integrate NBS implementation and works: the path of a cycling lane, three resting areas, natural pollinator modules, and, when possible, smart soils as substrate will be used. On the other hand, the Green corridor is completed with the installation of sustainable drainage systems (SUDs) and planting trees along the corridor.

Public procurement group		Code	Intervention	Leader
Green corridor project	Cycle lane	VAc1	New green cycle lane and re-naturing existing bike lanes	VAL
		VAc 15	Cycle-pedestrian green paths	VAL
	Resting areas	VAc 6	Installation of 3 Green Resting areas	VAL
	Pollinator's modules	VAc19	Natural pollinator's modules	CAR
		VAc20	Compacted Pollinator's modules	CAR
		VAc21	Natural pollinator's modules	CAR
	Urban carbon sink	VAc7	Urban Carbon Sink	VAL
		VAc35	Educational path in floodable park area	VAL

Table 3.1: Green corridor: PPP and its relation with the URBAN GreenUP Actions.

The Green Corridor Project was subcontracted by Valladolid City Council to an external company named Zenit Ingeniería y Paisajismo, which delivered the project on August 2020, as expected.

Procurement. The tendering processes for the individual actions that compose this project are ongoing. Currently, technical project is under municipal supervision. All the administrative documents of the procurement file are almost finished (legal report, financial report, justifying report, technical conditions and administrative conditions). The following table summarizes the bidding dates and expected execution of each of the projects within the green corridor.

The procurement for contracting a planning company to write the technical project was a Minor Service contract. The same project planner will be also the Works manager for the implementation.

Contract	URBAN GreenUP Actions	Start/End dates of PPP	Expected delivery dates
Green corridor	VAc1, VAc 15, VAc 6, VAc19, VAc20, VAc21, VAc7, VAc35	August 2020/Dec 2020 Municipal Supervision Feb 2021 Procurement	May 2021

Table 3.2: Relevant dates regarding procurement of Green Corridor project.

Implementation. Works contract will be executed after the awarding process, and works will last 5 months. Construction is planned before the vegetative phase of the trees.

3.1.3 Status

Green corridor project was launched in May 2020. The project's results were delivered in August 2020, and finally, the NBS will be implemented after that and finished by the end of February 2021. All the actions of the Green Corridor Project will be delivered together in the same procurement, by February 2021. The progress of this action is set in 60% as the *Procurement of proposed works is underway*.

Covid crisis. The timeframe was delayed by COVID-19 on the awarding process for the technical project (march 2020). Despite the closure of all non-essential activity, Valladolid City Council continued with their activity on line and the contract was awarded on May 2020, during the first lockdown.

10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

3.2 Urban Carbon Sink (VAc7)

3.2.1 Technical Description

This action consists of the installation of urban woodland (initially planned to plant 1,500 trees in a 40,000 m^2 surface area, but technical project defined almost 2,000 trees) with appropriate species adapted to temporary flood condition and with high capacity for carbon sequestration (*Fraxinus* spp., *Salix* spp., *Populus* spp., *Quercus* spp, etc.). Species selection has been made by a local Forestry Engineer, according to the mix of different habitat in the same demonstrative area. There will be hydrographic arboreal species, fruit trees, forest trees and a mixed area.

Hygrophilic matrix
Mixed matrix
Fruit matrix
Forest matrix

It is essential to take into account and establish the requirements of a long term management plan (pruning, spacing, etc.). Management will be delivered by the City Council.

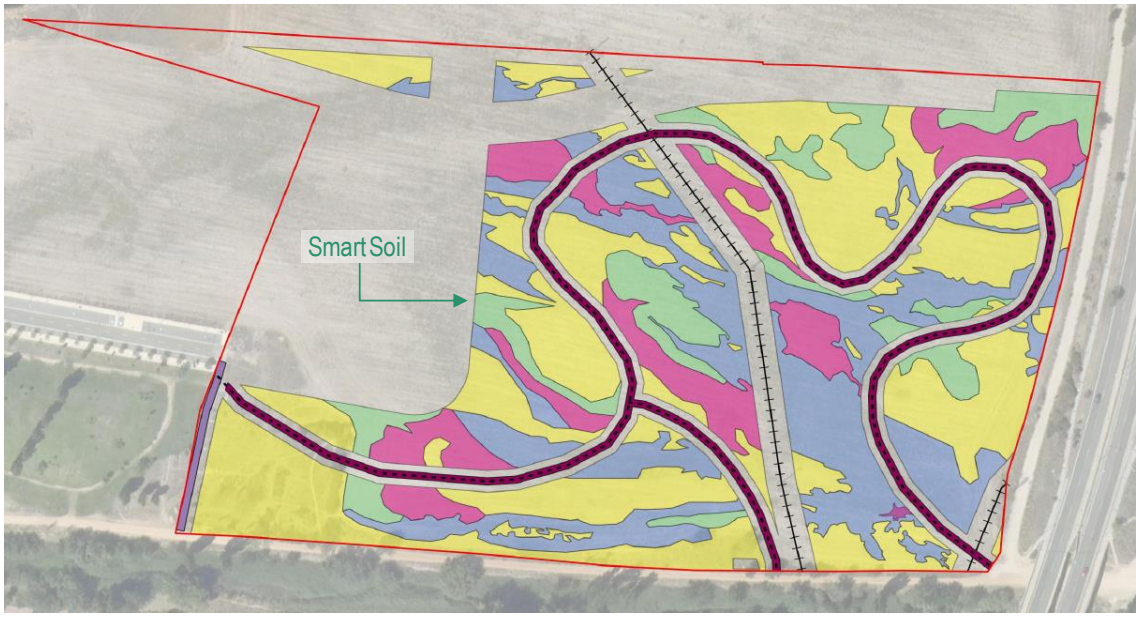


Figure 6. Carbon sink park: VAc7-Urban carbon sink and VAc35-Educational path.

3.2.2 Development

Project. For the time being, the implementation of the floodable park has been cancelled (see 3.6 section). Nevertheless, in this group, the rest of the interventions of the Floodable park will be implemented anyway, including: the urban carbon sink, the natural pollinator´s modules and the related smart soils as substrate, as it is detailed in the respective points. So, we talk about the "Urban carbon sink park", instead of the Floodable park.

The Urban carbon sink is included in the "Green Corridor project". See section 3.1.2 for more details.

Procurement. All the interventions included in the "Green Corridor project" will be launched together into a single process, as the City council requests for the integration of the whole interventions (cycle lane, restring areas, pollinators' modules and the carbon sink).

The procurement for contracting a planning company to write the technical project was a Minor Service contract. The same project planner will be also the Works manager for the implementation.

3.2.3 Status

In this case, the type of contract to be executed is "Work". The company selected to write technical project for the Green corridor (Vac1, Vac15, Vac6, Vac19-20-21, Vac7, Vac35) delivered the technical project on August 2020.

The City Council is working on the following call for tenders for the execution of the technical project delivered (Works contract). As it is already mentioned, for the whole Green Corridor project execution, all the actions of the Green Corridor Project will be tendered together, by February 2021. The progress of this action is set in 60% as the Procurement of proposed works is underway.

10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

3.3 Pollinators modules (VAc19, VAc20, VAc21)

3.3.1 Technical Description

A total of 13 units of compacted pollinator modules and 21 natural pollinator modules are planned to be located in several locations of Valladolid, including smart soils as substrate. The different types of Pollinator's modules are included in the "Green corridor project", together with VAc1, VAc 15, VAc 6, VAc19, VAc20, VAc21, VAc7, VAc35.

PPP Group	Code	Intervention	Leader
Pollinator's mod (Green corridor project)	VAc19	Natural pollinator's modules	CAR
	VAc20	Compacted Pollinator's modules	CAR
	VAc21	Natural pollinator's modules	CAR

Table 3.3: Compacted Pollinator's modules: PPP and its relation with the URBAN GreenUP Actions.

The project will install 13 units of *VAc20-Compacted pollinator's modules- Julia model* in several locations across the Valladolid city centre. Each Compacted pollinator's module will be installed in the ground with Smart Soil (Vac16), with anti–allergy species and will have an estimated surface of 4-5 m^2.

There will be installed 6 units of *VAc19-Natural pollinator's modules –Marina Model* and 15 units of *VAc21-Natural pollinator's modules – Inés model* in several locations in Valladolid. Each

natural pollinator's module will be installed in the ground with Smart Soil (Vac16), with anti–allergy species and will have an estimated surface of 10 m^2.

These green spaces attract pollinators and biodiversity through flowers and plants. To achieve that, a favourable sequence of flowering permits the production of pollen, nectar and essential oils. Species selection is considering the location in sunny or shadow places.

Compact modules are similar to Natural Pollinator's modules but in containers adapted to the location where they will be installed.

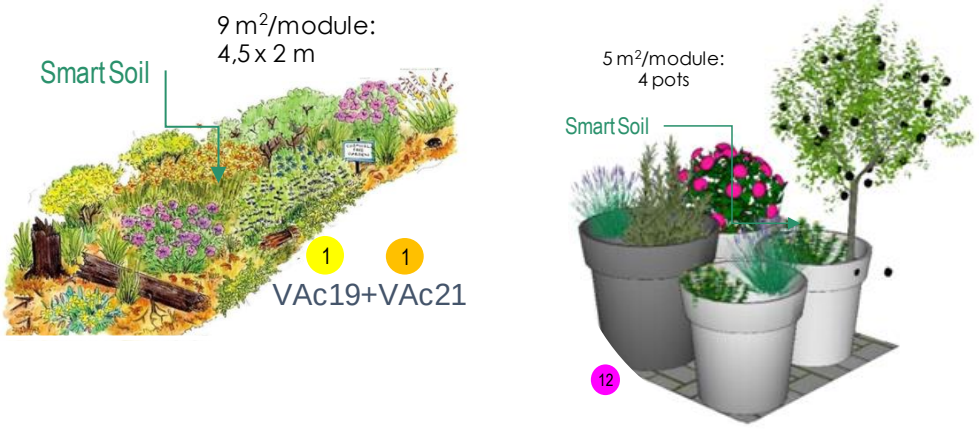


Figure 7. Natural (Vac19-Vac21) and Compacted Pollinator's modules design (Vac20).

The following image represents the locations for the pollinator's modules. It is worth mentioning that some of the Pollinators modules were designed to be implemented in the Sustainable Park (Vac21). As this intervention is in risk, the pollinators modules for this area are being implemented in other locations of the same SubDemo C.

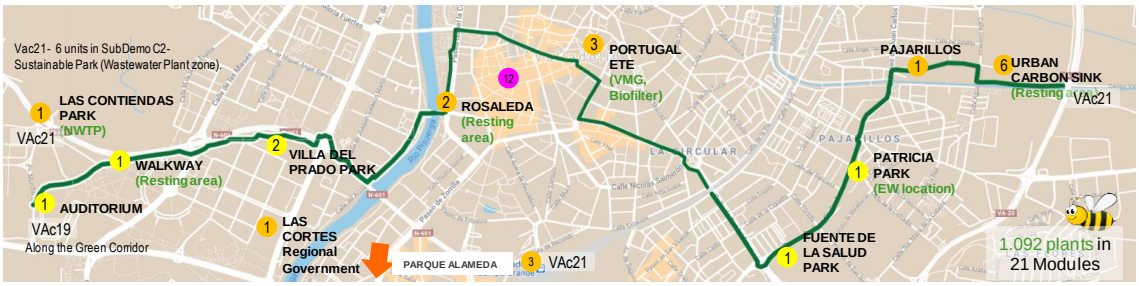


Figure 8. Natural (Vac19-Vac21) and Compacted Pollinator's modules location (Vac20).

3.3.2 Development

Project. The pollinator's modules, both Natural and Compact, are included in the "Green Corridor project". See section 3.1.2 for more details. The technical project was delivered on August 2020. This is currently under municipal Supervision.

Procurement. The procurement for the Works contract under the Open procedure is already ongoing, as almost all the documents of the administrative file are completed. All the interventions included in the Green corridor project will be procured together. See Section 3.1.2. for more information.

3.3.3 Status

Valladolid City Council is currently working on agreeing on the location of the modules in the city centre, together with the areas of Urban Planning and Mobility. The locations are already proposed, according to the commitments of the URBAN GreenUP project. The final design of the pollinator's modules is also included in the technical project. All the interventions included in the Green Corridor project are implemented at 60%, as "*Procurement works are underway*".

10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

3.4 Trees related actions (VAc2, VAc3, VAc4, VAc5)

3.4.1 Technical Description

- **Planting 1,000 trees (VAc2)**

  This action is designed to provide trees along the Green Corridor which will be renatured with the highest arboreal and plant density possible in the urban space available. The URBAN GreenUP project trees will reinforce the current green areas, the number of trees will increase and damaged individuals will be substituted. Those trees will be used to replenish and complete flower beds or planting trees in renovated streets.

- **Tree Shady Places (VAc3)**

  This intervention VAc3 is planting 250 trees in the surrounding area next to the Football Stadium (leisure area), which will generate an arboreal shade place. Maximum green area around the car parking is 4 Ha. For the species selection, trees were selected for their shading properties, as each tree species projects a characteristic shadow: high or low, dense or sifted, seasonal or year round. Planted trees (new units and/or substitution of current individuals) will provide humidity, and preserve the local biodiversity in the funfair area.

- **Shade and Cooling Trees (VAc4)**

  The vegetation is essential to help counteract the Heat Island Effect (HIE) effect typical of urban areas. It is calculated that there is a difference in the temperature among 1.5 - 1.9 °C between the cities and surrounding areas. Valladolid urban area has seen a reduction of tree cover and planted areas in recent decades. This intervention looks to increase the urban tree population a provide shade and cooling purposes benefits across the Valladolid city centre.

- **Re-Naturing Parking (VAc5)**

  It is foreseen to plant trees in the public facilities of Football Stadium area. This action involves the development of a new concept of car parking in combination with *VAc9- SUDs for re-naturing parking* and *VAc14- Green Parking Pavements* actions.

3.4.2 Development

Technical specifications. As there is no technical project, specifications for the selection of tree species is delivered by the Parks and Gardens service of Valladolid City Council.

Procurement. Trees are purchased by Valladolid City Council under the Framework Supply Agreement, currently in force. Request for supply is launched to the 4 nurseries that are part of the agreement. They offer a proposal, and the nursery with the lowest price for every tree species is awarded.

PPP Group	Code	Intervention	Nº trees	Leader
Trees	VAc 2	Planting 1,000 trees	1,000	VAL
	VAc 3	Tree shady places	500	VAL
	VAc 4	Shade and cooling trees	250	VAL
	VAc 5	Re-naturing parking trees	600	VAL
			2,350 trees	

Table 3.4: Trees related actions: PPP and its relation with the URBAN GreenUP Actions.

The purchase contract is divided into 4 phases. Thus, trees are acquired in packs and distributed throughout the tree-related actions. Currently, all the compromised trees are already purchased by Valladolid City Council. Autumn-Spring 2020-2021 plantation campaign is currently ongoing.

Phase	Purchase contract	Plantation Date	Nº Trees
Phase I	December 2019	January-Mar 2020	584
Phase II	April 2020	May – October 2020	837
Phase III	May 2020	June 2020	10
Phase IV	November –2020	Nov –2020 – Mar 2021	960
			2,391 trees

Table 3.5: Implementation of Trees related actions.

Implementation. Trees purchased in the URBAN GreenUP project are planted by the City Council with own resources. Trees on Phase I have been planted on January in different locations for actions VAc2, VAc3 and VAc4. Selected locations are Villa del Prado, Las Contiendas Park, Auditorium gardens, Huerta del Rey neighbourhood, Fuente El Sol park, Soria Avenue, Santos-Pilarica area, but also in some specific streets of the city centre such as Panaderos St.

Trees on Phase II have been planted on locations such as the Valladolid fairground area, Segovia Av, Huerta del Rey, Fuente El Sol and Santos-Pilarica. The available trees are being planted in the autumn-spring season.

Trees on Phase III were planted on Plaza España square and Cañor Argales square, in the city centre.

Trees on Phase IV are already purchased and in the process of supplying the municipal nursery.

Figure 9. Trees related actions locations: VAc2 Planting 1,000 trees.
Locations: Santos-Pilarica and parking in Las Contiendas park

Figure 10. Trees related actions locations: VAc3 Tree shady places.
Locations: Football Std Area, Villa del Prado, Auditorium gardens.


Figure 11. Trees related actions locations: VAc4 Shady and cooling trees.
Some locations: Panaderos St, España Sq, Caño Argales Sq, municipal nursery.

3.4.3 Status

From the initial number of trees, more than 600 trees have been planted in the city of Valladolid (>25% of the project total). All 100% of the urban trees have been purchased. Plantation works start in January 2020; however, due to climate condition (early spring in Valladolid) plantation works stopped on March 2020. Plantation works are already ongoing during the Autumn 2020 campaign. Trees already purchased are stored in the municipal nursery and they are planning to be planted in the autumn campaign. Development progress is set at 83% as the plantation are already made for some of the trees.

10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

Covid. The supply of trees was affected by the first State o Alarm of the health crisis. Nurseries were asked to say in writing whether they were prepared to supply trees during that period of closure. All nurseries replied in the affirmative.

3.5 Stormwater management systems (VAc8, VAc9, VAc10, VAc14)

3.5.1 Technical Description

- **SUDs (Cycle lane) (VAc8)**

SUDs are drainage systems that are designed to manage and use rainwater close to where it falls on the surface and by incorporating vegetation, tend to provide the greatest benefits. Most SUDs schemes use a combination of SUDs components to achieve the overall design objectives for the site.

Some SUD's types available in San Isidro St and N-601 St (Padre José Acosta Avenue) are being developed, according to the GA and D2.3. However, some small changes in the location of the intervention have taken place (from the central median to lateral median in only one site, San Isidro St). VAc8 will include the following types of SUDs:

- Medium lateral permeable in Avenida Soria.
- Medium permeable and rain garden on Avenida Padre José Acosta N-601.

A pre-engineering technical and economic definition of the intervention was delivered by CENTA Technological Center in 2019. The characteristics of the VAc8 SUDs have been extended to increase the effectiveness of the solutions, using part of the released budget of the Floodable park for water interventions. So the surface of VAc8 will be increased compared to the GA (350 m^2 to more than 1.000 m^2), including 1 new module of rain garden that will be implemented in Padre José Acosta Avenue.

- **SUDs (Renaturing parking) (VAc9)**

For the parking area located in the surroundings of the Stadium Nuevo José Zorrilla, the following SUDs are planned (VAc9): detention basin (connected to the rain garden in VAc10). The main purpose is the retention of the surface runoff and the infiltration.

The characteristics of the VAc9 SUDs have been extended to increase the effectiveness of the solutions, using part of the released budget of the Floodable park for water interventions The detention basin will have a total surface of 370 m^2, bigger to the 150 m^2 committed in the GA, and will occupy the existing roundabout in Mundial 82 Avenue.

- **Rain garden (Renaturing parking) (VAc10)**

A rain garden is a planted depression or a hole that allows rainwater runoff from impervious urban areas, like roofs, driveways, walkways, parking lots, and compacted lawn areas, the opportunity to be absorbed. This reduces rain runoff by allowing stormwater to soak into the ground (as opposed to flowing into storm drains and surface waters which cause erosion, water pollution, flooding and diminished groundwater).

The rain garden VAc10 will be located in the surroundings of the parking lot of the Football Stadium Nuevo José Zorrilla. This area is not connected to the municipal sewer network so it suffers from surface runoff during storm episodes.

The rain garden will be placed in an existing green area which surrounds the main parking lot of the Football Stadium Nuevo José Zorrilla. This area is also included in VAc5 (plantation of trees). VAc 5 and VAc 10 are compatible.

There will be installed 2 rain gardens, the one in the Stadium parking will have a total surface of 450 m^2). Its shape will respect the existing green area, so that means that it will be mostly linear.

- **Parking Green Pavement (VAc14)**

Parking green pavement concept refers to permeable and porous pavers which allow water to percolate through them. Therefore, this kind of pavements allows natural drainage through the spaces between the pavers and migration of water into the earth.

The solution consists on several layers of different permeable materials which offer resistant capacities and growing the growing of vegetation. Correct design, detailing and construction are essential to the long-term performance and minimising future maintenance.

A green pavement composed of concrete pavers with holes over a permeable substrate, has been selected. The holes in the surface can be filled with aggregate or vegetation depending on

the need, in this case, it is defined as the implantation of green pavements with 50% vegetal soil and high drainage capacity. Gaps will be filled with a minimum of 25 m^3 of Smart Soil.

Green pavements provide durability, low maintenance, and similar resistance to heavy loads as traditional pavers, but also help to reduce the local heat island effect, reduce of stormwater runoff. This also helps improve the local air quality among other benefits.

Location: Parking area in Villa del Prado Park: A new green parking would be built in the Football Stadium area, in a current vehicle car parking which is not paved, where the terrain is in bad condition due to the weight of the vehicles (there are many holes and water accumulates on rainy days). These green parking pavements will help to increase the number of parking spaces of the zone because of the high demand during important football matches in the stadium, different events in the auditorium, the funfair area and other sportive and leisure activities.

Taking into account the available budget for this intervention it will be possible to build approximately 680 m^2, less than expected in GA (2,000 m^2). However, initial calculations for PR#1 expected to build only approximately 360 m^2, so improvements have been made.

Figure 12. Location of the Stormwater management systems (SUDs) in Valladolid.

3.5.2 Development

Initial data. Topography and soil infiltration campaigns were developed during March-April 2020 by Valladolid City Council [VAL], providing more accurate data to support the basis for the construction project, which is undertaken by CENTA technology centre.

Figure 13. Permeability test delivered for the SUDs. April 2020. Source: Incidec/Cemosa.

Project. Technical project delivered by CENTA Technologic centre was almost finished on July 2020. However, the signature of the technician who designed the intervention was not valid for the procurement (lack of civil insurance). For that reason, the technical project is expected to be delivered on December 2020.

Procurement. All the SUDs water interventions will be implemented together in a single procurement process called "Stormwater Management Systems". Works contract will be launched under Open procedure procurement. This process is not even started, as these interventions are in Project phase. Procurement will be launched on the first quarter of 2021.

PPP Group	Code	Intervention	Leader
Stormwater management systems (SUDs)	VAc 8	SUDs for green bike lane	CEN
	VAc9	SUDs for re-naturing parking	CEN
	VAc10	Rain gardens	CEN
	VAc14	Green Parking Pavements	VAL

Table 3.6: Stormwater management systems (SUDs): PPP and URBAN GreenUP Actions.

Synergies. A new opportunity has emerged in the last months. Field Factors, a consultancy firm from Holland and partner on the NAIAD H2020 project, has contacted the Innovation Agency, because the Enterprises Agency from the Holland Govern is promoting water management replication projects through the 'Partners voor Water' programme. Field Factors has implemented in the Sparta Stadium in Rotterdam (Holland) a system to reuse the rain water for irrigation with a natural treatment plant, and now, within the collaboration project emerged with the Valladolid City Council called Urban Waterbuffer In Valladolid (UWB), is studying the viability to replicate it in the Valladolid Stadium.

With the aim to unite efforts to implement a complete and solid water management system in the Stadium area, the partners involved in the development of the URBAN GreenUP interventions in this zone (CEN, VAL), worked together with Field Factors Consultancy to integrate both projects in one. This will allow using the rain gardens SUD´s to collect water to reuse it in the UWB, and to solve the runoff problems existing during episodes of heavy rainfall. In addition, the stadium building will be restored and new areas of training camps are projected. A total renovation of the stadium area is under study by the City Council. All of these interventions are being taken into account to obtain an integrated and holistic project.

Covid. The Soil tests contracted by VAL to provide better initial data were delayed because of COVID-19, as this not-essential activity was forbidden during the State of Alarm and the administrative procedures were stopped. However, they were finally implemented during this period (April 2020) through on-line procedures. The technical team (CEN, VAL) were working during the State of Alarm, so the project was not delayed for that reason. Covid also affected to the topographic information campaign delivered by the City Council to get cartography from the Stadium area. Results were also achieved on time.

3.5.3 Status

Soil infiltration tests and topographic data are already delivered (April 2020). SUDs construction project is still in progress. Expected delivery on December 2020). Implementation works have not been started, as procurement is not launched. The construction project estimated a period of 5 months for the construction.

This group of interventions are at <50%, with the Technical project almost delivered.

10%	20%	30%	40%	<50%	60%	70%	80%	90%	100%

3.6 Floodable Park (VAc11)

As it is said in the previous Deliverable 2.6, the implementation of the floodable park has been cancelled. An extensive report prepared by the Duero River Basin Authority shows the risk of flooding derived from the floodable park could outweigh the permissible. In a very simplified way, the results indicate that in the event that the flooded park is filled with water, due to the permeability of the terrain, it is very possible that the water affects the foundations of buildings built in the area. A possible solution would be to waterproof the entire base of the park, which is technically and economically unviable. This action has been cancelled, and then, not delivered.

3.7 Sustainable Park (VAc13, VAc34, VAc12)

3.7.1 Technical Description

- **Natural Wastewater Treatment Plant (Vac13)**

  The initial design of the NTWP in Valladolid consists of a combination of vertical flow constructed wetlands and a surface flow constructed wetland. For the later reuse of the reclaimed water, a tertiary treatment is included. The Sustainable park, for Va14, Vac12 and Vac34, were pre-designed for Las Contiendas park. The sewage water is pumped from the sewage collector coming from Zaratán and submitted to a preliminary treatment prior to the wetlands. Those units are designed to reduce the visual impact, respecting the green character of the NTWP and maximizing its integration in the park.

- **Educational path in Wastewater Treatment Plant area (Vac34)**

  This educational path will be designed following the same criteria to the ones defined for other educational interventions. The EP will create an attractive place for citizens to enjoy nature in the urban area, without leaving the city. This educational path will be close to the *Vac13- Natural Wastewater Treatment Plant*, to enhance the value of the different elements included in this area in an educational and entertaining way. Informative panels will explain the role of NBSs solving environmental challenges, in this concrete case, those related to water.

- **Green filter area (Vac12)**

  Green filter is a land application system for treating water (wastewater). It consists of a plot area, sized according to the influent to be treated, which has forests installed and is irrigated with wastewater. The residual water partially evaporates and the rest is taken up by the roots of trees and filtered through the soil. In VAc12, the water to be used for the irrigation of the green area will be the treated water from the NTWP (VAc13).

3.7.2 Development

PPP Group	Code	Intervention	Leader
Sustainable park	VAc13	Natural Wastewater Treatment Plant	CEN
	VAc34	Educational path in NWTP area	VAL
	VAc12	Green filter area	CEN

Table 3.7: Sustainable Park: PPP and its relation with the URBAN GreenUP Actions.

Project. Technical pre-engineering project was delivered on 2019 by CENTA Technologic center. River Duero Basin (Public Authority for Water Management) denied the permission for implementing this intervention (Sustainable Park) in the location selected, in Las Contiendas Park (May 2019).

There is an alternative proposal: a Detention pond. It consists in a SUDs technique to manage the overflows of the Santander Avenue storm tank to the Pisuerga River, expanding its capacity of treatment. It will improve water quality discharged to the river. This change of the type of water NBS, from a Natural water treatment plant to a SUDs, is pending approval by the European Commission. There are several challenges to tackle on the implementation of this alternative. The NWTP main objective is the water treatment, and the detention pond is a SUDs, so the objectives are not the same although both clean waste water. On the other hand, CENTA spent their PM for the NWTP project, so there are not available resources for writing another project. Finally, there must be also considered the permission of the River Duero basin for the alternative.

There are other alternatives under study: The synergies with the Urban Waterbuffer project. This new project will implement a blue NBS in the football Stadium area. This will collect rainwater, clean it with a biofilter (natural), percolate into the subsoil and then water would be reused for the irrigation of the football stadium green areas (football pitch and others). This new intervention might be included into the URBAN GreenUP project. Conditions are under study.

Procurement. There are two types of contract: a minor contract service for contracting the Works Management services to an external company, which will be open before starting the construction. Finish works were expected to finish on November 2020 but due to the COVID-19 situation and the difficulties found on the establishment of an alternative it has been delayed to 2021.

The other type of contract is an open procedure work contract, for the construction of the Detention pond. The procurement process has an estimated duration of 5 months.

Implementation. The expected execution period for the works is other 5 months.. This intervention is considered "in risk" due to the difficulties experienced. The expected delay is due to the need to change not only the location but also the type of intervention, pending approval.

3.7.3 Status

It is under review phase: It has to be approved by the European Commission to study the change of intervention and the alternative location. After approval, changes will be included in an amendment. This intervention was delivered at 30% when we reached the pre-engineering project in Las Contiendas. But currently it is considered 10%, "NBS location under review".

10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

3.8 Smart soils (VAc 16, VAc 17, VAc 18)

3.8.1 Technical Description

Smart soils designed for the URBAN GreenUP project are technosols made of by-products from agrifood industries allowed for this purpose (in the Spanish law for technosols[1]), biomass residues coming from different types of pruning (urban and non-urban), biochar and other waste included in the Spanish Regulation AAA/1072/20135[2]. All smart soil must contain between 5-10% of biochar.

Smart soil composition		Smart soil characteristics	
By-products	90-95%	Texture	sandy loam - silty loam
		C/N ratio	+ 12
Biochar	5-10%	Organic matter	+ 4%
		pH	6,5-7,5

Table 3.8: Smart soils composition and characterization.

The estimated amount needed for the 3 demo sites is 983 m^3.

3.8.2 Development

Project. The technical-economic descriptive report was drawn up by Valladolid City Council on the basis of the specifications provided by CARTIF, in terms of composition and quality.

[1] *Resolución de 8 de enero de 2008, de la Dirección General de Calidad y Evaluación Ambiental, por lo que se da publicidad a la instrucción técnica de residuos ITR/01/08, de 8 de enero de 2008, de la Dirección General de Calidad y Evaluación Ambiental, referente a la elaboración de suelos (tecnosoles) derivados de residuos. Consellería de Medioambiente y Desarrollo Sostenible de la Comunidad de Galicia.*

[2] *Orden AAA/1072/2013, de 7 de junio, sobre utilización de lodos de depuración en el sector agrario.*

Procurement. The purchase of smart soil was done through the Framework supply agreement of Valladolid City Council. The tender has already been awarded (Abonos EMUPA) Request 6 March -Offer received 4 April 2020.

PPP Group	Code	Intervention	Leader
Smart soil	VAc16	Smart soils as substrate	CAR
	VAc17	Smart soils as substrate	CAR
	VAc18	Smart soils as substrate	CAR

Table 3.9: Smart soils: PPP and its relation with the URBAN GreenUP Actions

The total amount of smart soil per zone is shown in the table below, with a total of 983 m^3

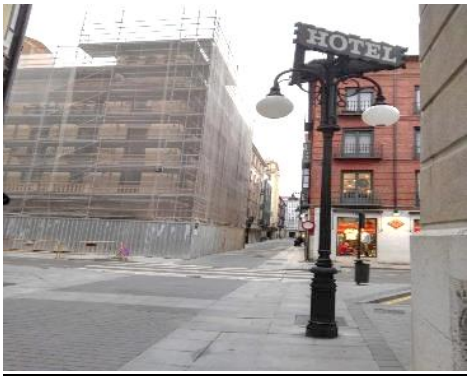
		Intervention	Zone and units	m3
Smart soils	VAc16	Smarts soils as substrate (A)	A.- Green corridor	
	VAc2	Planting 1,000 trees	With each unit tree	126
	VAc15	Cycle-pedestrian green paths	3 green paths	126
	VAc19	Natural pollinator's modules	6 units	126
			Total (A)	378
	VAc17	Smarts soils as substrate for (B) *V*	B.- Centre	
	VAc6	Installation of 3 Green Resting areas	1/3 green resting areas (zone B)	20
	VAc20	Compacted Pollinator's modules	13 units (1,5 m^3 / module)	20
			Total (B)	40
	VAc18	Smarts soils as substrate (C.)	C.- Football stadium + C.- Floodable park	
	VAc14	Green Parking Pavements	Car parking (xx m2)	200
	VAc5	Re-naturing parking trees (250)	With each unit tree	40
	VAc6	Installation of 3 Green Resting areas	1/3 green resting areas (zone C1)	20
	VAc21	Natural pollinator's modules (6)	6 units in C2	18
			6 units in C3	18
			3 units in C4	9
	VAc7	Urban Carbon Sink	Floodable park (xx m2)	240
	VAc6	Installation of 3 Green Resting areas	1/3 green resting areas (zoneC3)	20
			Total (C)	565
			Total (A+B+C)	**983**

Table 3.10: Smart soils detailed list of the related NBS interventions.

Implementation. The first amount of Smart Soil of 245 m^3 was purchased on May 2020. This smart soil was used for planting trees (Vac16). The second and third purchases of Smart Soil were delivered on November and December 2020. That Smart Soil will be used for the Green Corridor interventions (Vac16, VAc17, VAc18). The same supplier will provide the total amount of Smart Soil needed. Smart soil for the SUDs (Stormwater treatment systems) has not been purchased yet.

Purchase	Purchase contract	NBS intervention	Volume (m^3)
I	May 2020	Tree related actions (VAc2, VAc5)	245
II	November 2020		245
III	November 2020	Green corridor interventions (VAc15, VAc19, VAc6, VAc20, VAc21, VAc7)	665
IV	2021	SUDs (VAc14)	>200
			1,355 m^3

Table 3.11: Implementation of Smart soil for some NBS (Vac16, Vac17, Vac18).



Biochar used in smart soils with a reference for particle size evaluation

Figure 14. Smart soil purchased in the 1st Supply hold in municipal nursery in Renedo.

Figure 15. Smart soil purchased in 2nd Supply hold in municipal nursery in Renedo, and 3rd Supply in EMUPA facilities (Nov 2020).

3.8.3 Status

The maturation process of smart soils is quite slow (several months), the company developed the mixture in their facilities and there have been supplied in three purchases on May, Nov and Dec 2020. There has been purchased Smart soil for planting trees, and for the Green Corridor interventions along 2020.

The distribution of the smart soil has been done progressively; the contractor supplied the smart soils when the NBS require them (and are ready to be launched). This intervention will be completed when all NBS with smart soils will be finished. Smart soil for the implementation of

SUDs will be purchased when the execution of the Stormwater management systems procurement is already finished.

PPP	Code	Intervention	% implementation										%
Smart soil	VAc16	Smart soils as substrate	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	90%
	VAc17	Smart soils as substrate	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	100%
	VAc18	Smart soils as substrate	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	80%

Table 3.12: Smart soils detailed list of the implementation.

The estimated date for the implementation of the whole Smart soil is 2021, when the purchase for the SUDs is finished.

10%	20%	30%	40%	50%	60%	70%	85%	90%	100%

3.9 Green noise barrier (VAc22, VAc23)

3.9.1 Technical Description

This NBS is designed to reduce the traffic noise that impacts on the local residential areas. The green noise barriers have a specific geometry favouring sound reflection, they are composed by vertical garden modules with a specific substrate favouring sound absorption.

The location of the NBS is in the road median of the street Paseo Hospital Militar (Military Hospital Street). The pedestrians on the left sidewalk will be protected from the noise produced by the right lanes (East-West direction).

This NBS is composed of a structure and a vertical garden on it. The structure will be fixed to a continuous foundation footing. The structure is formed by steel pillars every 2 meters. In horizontal position there are going to be installed metal frames of 80 x 40 x 2 mm every 60 cm, to be able to fix the garden. The vertical garden consists of steel sheet modules of 1.5 mm thickness, galvanized and lacquered in furnace, and substrate formed by panels of special rock wool for vertical gardening 100 mm thickness and 170kg / m3 density, adhered to the steel sheet.

The vegetation requires special plants adapted to the climate of Valladolid. The amount planted is 40 units / m^2.

3.9.2 Development

Project. First version of the technical project was delivered by Singulargreen on August 2020. Municipal supervisor asked for changes in the content, increasing the level of detail of the construction. The second version of the project is ongoing.

Technical project considered the current plantation of trees in the road median. The design will respect some of the trees and some will be relocated.

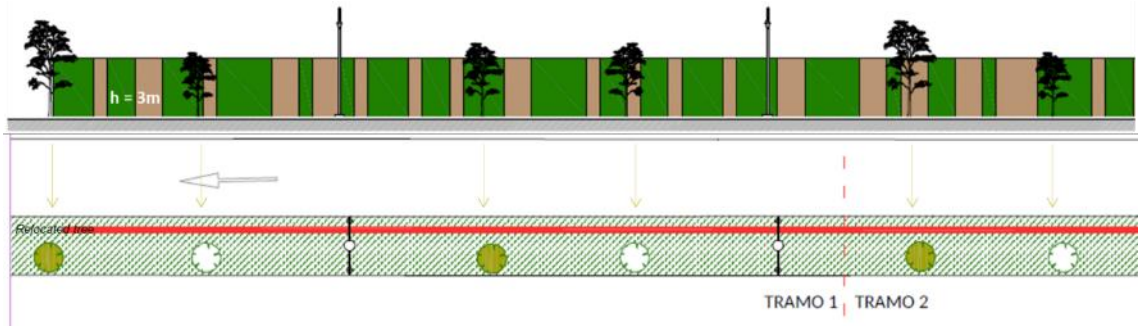


Figure 16. Design of the Noise barriers.

Procurement. Green noise barrier is included in the Public Procurement Process by Open procedure. This process is still open. Most of the documents of the procurement file are already prepared. The positive report of the municipal supervisor is compulsory before launching the procurement.

PPP Group	Code	Intervention	Leader
Green noise barriers	VAc22	Green noise barriers	SGR
	VAc23	Green noise barriers	SGR

Table 3.13: Green noise barrier: PPP and its relation with the URBAN GreenUP Actions.

Challenges. During the development of the noise barriers, different issues have arisen regarding the location of the NBS. On the first selected location, simulations of the amount of noise absorbed were made; the results obtained in this area were not too high.

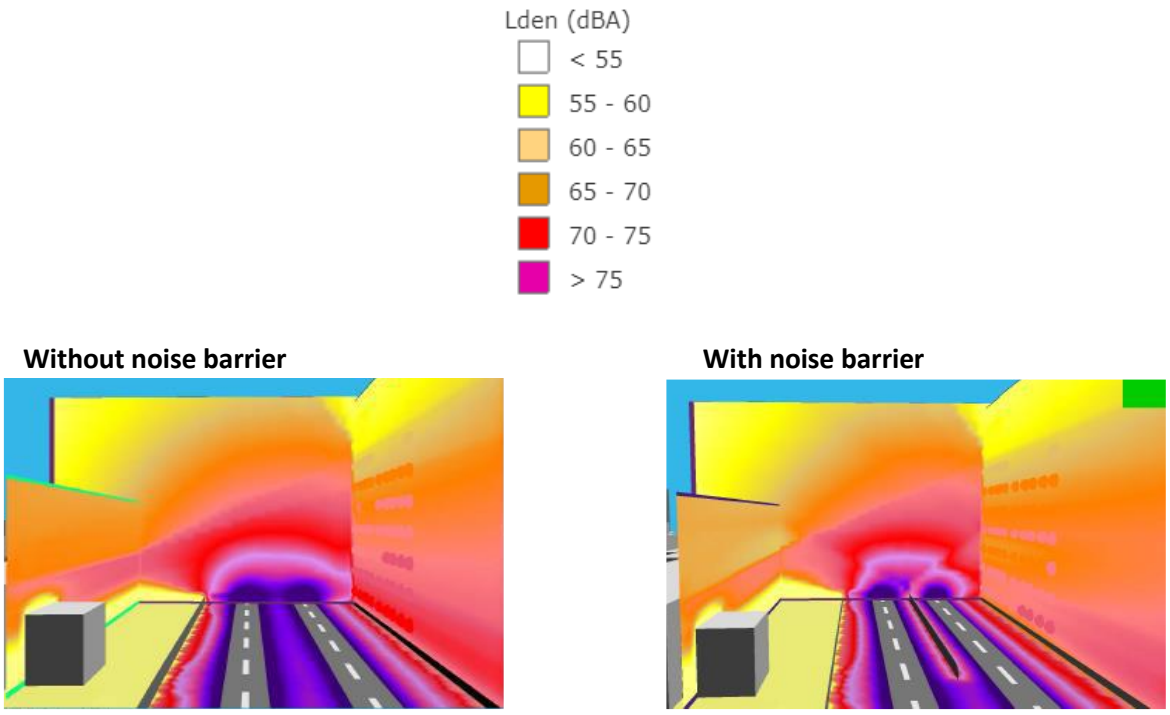


Figure 17. Simulation of absorbed noise with the Green noise barriers.

For this reason, other locations that would increase the efficiency of this NBS against noise were sought. Several areas were evaluated, none of which were suitable for installation for reasons such as proximity to housing windows (visibility) or technical difficulty due to installation on a bridge. With all the information of the locations, a decision was taken taking into account the technical, political and administrative pros and cons, being selected the initial option. While the decision was taken, the environmental area of the city council made modifications in the area. Likewise, it has been necessary to coordinate interventions with the Department of Mobility, for the layout of a new bicycle lane in the same section of the street.

3.9.3 Status

Singular Green is working on the second version of the technical project.

Once the project is finished, the procurement procedure will be launched, and the process for the installation of the noise barrier will begin. Procurement is expected to be completed in February 2021, and installation will end on May 2021. This intervention is at 60%, as the technical project is already delivered in its first version, and Procurement of proposed works is underway.

10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

3.10 Green vertical mobile garden (VAc-24)

3.10.1 Technical Description

Vertical mobile gardens are a type of vertical garden that are self-supporting, that is, it does not need to be supported by any auxiliary element, and it can be installed or moved to different places in the city.

The vertical mobile gardens have a metal structure that supports the substrate and the irrigation system. The substrate serves to set the roots and provide the water and the necessary nutrients. The own irrigation system guarantees the water contribution and vegetation development. This irrigation system must be connected to the water supply network. The excess water can be discharged to the public road or to the sewerage network, depending on the design.

This action includes different types of vertical mobile gardens that have been considered:

- A vegetable structure formed by letters with the name of the city VALLADOLID
- Vertical mobile gardens (panels with bench) (2 units)
- Green stackable frames (No irrigation connection to the water network) (14 units)

3.10.2 Development

Project. Technical project was delivered by Singulargreen, together *Vac24-Green vertical mobile garden*, with *Vac27- Green covering shelter*.

Procurement. *Green covering shelter* (Lot 1) and *Green vertical mobile gardens* (Lot 2) tendering was included in the Public Procurement Process group called "Green Infrastructures". This process started by the 18th June 2019 and finished the 13th November 2019. Procurement type of the works contract was Open procedure.

PPP Group	Code	Intervention	Leader
Green infrastructure	VAc24	Green Vertical mobile garden	SGR
	VAc27	Green Covering Shelter	SGR

Table 3.14: Green vertical mobile garden: PPP and its relation with the URBAN GreenUP Actions.

Challenges. Urban regulation does not permit to anchor the panels to the pavements. Therefore, the risk of falling of the units needed to be avoided. In order to solve it, the 14 units of Green stackable frames were grouped into small geometrically stable compositions so they can be self-supporting.

Regarding the other type, Valladolid Letters, the solution adopted was to add a constructive detail for the parking slab perforation. In addition, the dimensions of the water waste and supply were recalculated. The allocation of this structure has been discussed internally within the City Council and finally, it had been installed in José Zorrilla Sq., according to political willingness. Valladolid Letters were initially pre-installed on Portugalete Square.

Figure 18. Vertical mobile garden letters of Valladolid. Left: first attempt of location (Portugalete Sq), Right: Final location at José Zorrilla Sq.

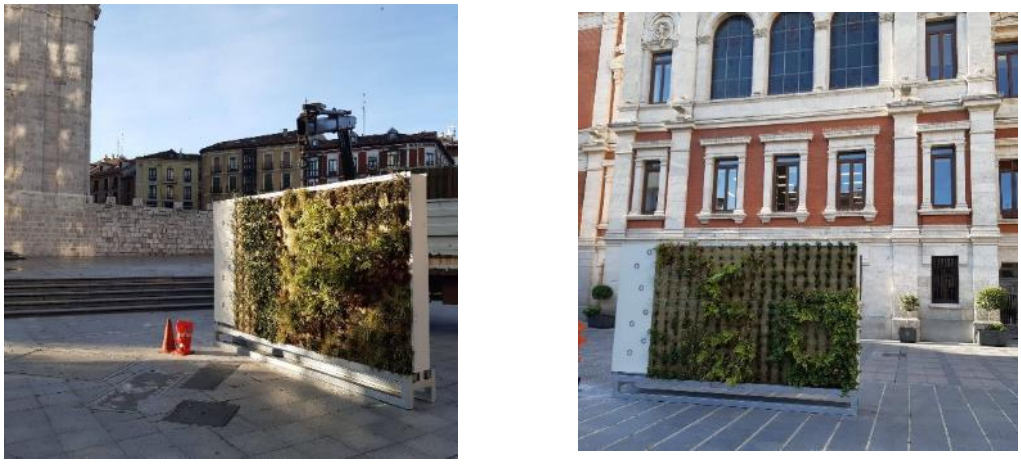


Figure 19. Vertical mobile gardens "Board Panel" implementation: VAc24 (right. First location in Rinconada Square. Left: current location in Portugalete Square).

Implementation. The three types of structures have been finally installed on May 2020, with a total of 17 units. More municipal funds have been invested to implement those extra units of GVMG, as a commitment of the City Council for the implementation of NBS.

3.10.3 Status1 unit of a vegetable structure formed by letters with the name of the city VALLADOLID has been installed in José Zorrilla Sq.

Figure 20. Vegetal sculpture – letters of 'VALLADOLID' in Zorrilla Square.

2 units of Vertical mobile gardens (board). The first is located in Portugalete Square, close to the Cathedral. The second is in Santiago St, the main commercial street. Citizens use both benches for resting close to the cool green area.

Figure 21. Vegetable board mobile gardens (Portugalete Square and Santiago Street).

14 totems of Vertical mobile gardens grouped. 5 units have been installed in Mayor Sq, 3 units in María de Molina St., 3 units in San Benito Sq. and 3 units in Atrio de Santiago St.

María de Molina St. **San Benito Sq.**

Mayor Sq. **Atrio de Santiago St.**

Figure 22. Vertical mobile gardens totems type at different locations.

The implementation progress is 100%. All the vertical mobile gardens are installed, working and being monitored.

10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

Covid. The COVID-19 lockdown affected to the location of the gardens, as some were moved from the initial locations and these works were delayed. Likewise, baseline monitoring partially stopped during the State of Alarm.

3.11 Green Façade (VAc25)

3.11.1 Technical Description

A green façade is a constructive system that allows to plant vegetable species in the entire vertical surface of a façade. The structure that supports this system is affixed to the façade. On this structure, there are placed different layers and a hydroponic substrate in which the plants grow.

3.11.2 Development

Public-private agreement. This is an example of public-private collaboration, between Valladolid City Council and El Corte Inglés, the owner of the building in Constitución St where the Green façade is installed. Both entities share responsibilities on the construction, operation and maintenance of the vertical garden. The agreement was signed on May 2019.

Project. Technical project was delivered by Singulargreen, in coordination with the architects of El Corte Inglés, the owner of the building. Both subprojects, one of the interventions inside the building, and the vertical garden outside were totally coordinated to fit.

Procurement. Green covering shelter tendering was included in the Public Procurement Process "Green façade". This process started by the 7th of November 2019 and finished the 15th of January 2020. A period of fewer than three months for an Open procedure, shorten than expected.

It is worth mentioning that the public tender included only the actions on the outside of the building, as well as the irrigation elements that are stored in the room inside.

PPP Group	Code	Intervention	Leader
Green façade	VAc25	Green façade	SGR

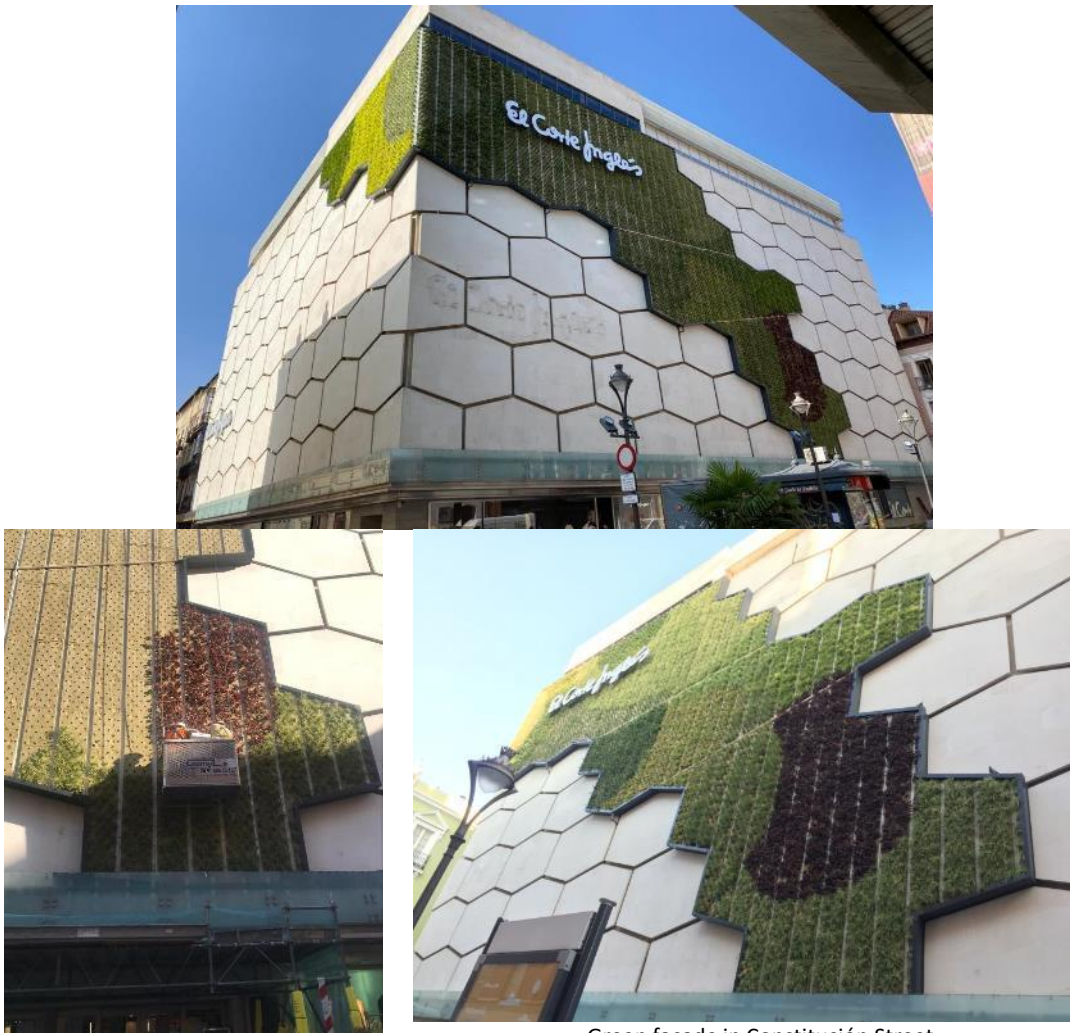
Table 3.15: Green façade: PPP and its relation with the URBAN GreenUP Actions.

Works were separated into 2 different parts, according to the public-private collaboration:

Figure 23. Green façade: two separated actions to conform the NBS.

- P1: The structural reinforcement of the building is co-designed, executed and financed by El Corte Inglés. This works started last 3rd February and finished on the 5th March 2020.
- P2: The construction of the vegetable garden executed through a process of public bidding and the co-financing of the Valladolid City Council and the European Commission through the URBAN GreenUP project. This project is performed by Singular Green and the constructor is Tierra Ingeniería y Paisajismo.

Implementation. Works were delayed because of Covid crisis, and the green wall was installed by the end of June.



Planting the green façade (June)

Green façade in Constitución Street

Figure 24. Green façade in El Corte Inglés building (Vac25).

3.11.3 Status

Works are completed and this NBS action was fully implemented by June 2020. Implementation progress is set on 100%.

10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

Covid. The works were expected to start by March. However, the state of alarm due to Covid-19 stopped totally the works on site from 16th of March. Works restarted on May, and they were initially expected to be finished on 15th June. Works were delayed. Final installation ended on June 2020, despite difficulties (lack of raw materials, such as plants supply, lack of health and safety equipment for protecting the workers to Covid, such as masks and gloves, etc.).

3.12 Electro-wetland (VAc26)

3.12.1 Technical Description

An Electrowetland (EW) is an innovative and hybrid technology between a constructed wetland and a bio-electrochemical system. The proposed technology consists of a natural wastewater treatment system that, also, generates electrical energy from the organic matter degradation. This electricity generated by the system will be stored and later used to monitor some of the parameters that contribute to the Heat Island Effect (HIE).

3.12.2 Development

Technology. The development of the technology for the generation of electricity through the combined action of microorganism and plants in a wet substrate has been carried out by LEITAT Technology Center in its facilities (Catalonia). Good results have been obtained in the cleaning of the wastewater and generation of electricity. Some different materials have been tested in their laboratory.

The EW prototype installed in the LEITAT facilities has been tested for more than 1 year. The scalable design proposed, has been able to generate electricity constantly during long periods and to power the required environmental sensors of temperature and humidity. However, at a pilot scale, the electricity generated seems not to be enough to power the irrigation of nearby gardens or street illumination.

Figure 3.1: Electro-wetland prototype built in LEITAT headquarters (Barcelona)

PPP Group	Code	Intervention	Leader
Electro wetland	VAc26	Electro-wetland	LEI

Table 3.16: Electro-wetland: PPP and its relation with the URBAN GreenUP Actions.

Project. LEITAT submitted the construction project to the Valladolid City Council on September 2019. The supervision of the project by a competent municipal technician was carried out in the summer of 2020, when the agreement between both entities was at an advanced stage of maturity. The municipal supervision report requested changes in the project, which was delivered in its version #2 in November 2020.

Procurement. The implementation of the EW does not follow a public tendering process like other project interventions. Works will be contracted and financed by LEITAT.

Agreement. The construction of the EW does not follow a public procurement process. The budget for the construction of the EW belongs to LEITAT, so they have selected the construction company. However, this is an intervention promoted by the City Council, so what the City Council facilitates is the authorisation, the transfer of the public space and the quality control and health and safety services. Likewise, the maintenance will be delivered by LEITAT with the local support of the City Council. Those particular characteristics must be written on a specific agreement signed between the two Consortium members, LEI and VAL. Currently, both of them are working on the final stage of the Agreement in which the Project Approval by the City Council will be based. This Agreement follows an administrative procedure which is expected to be finished on December-January. After the approval of the agreement text and other documents of the administrative file by the Mayor, LEI and VAL will sign the agreement.

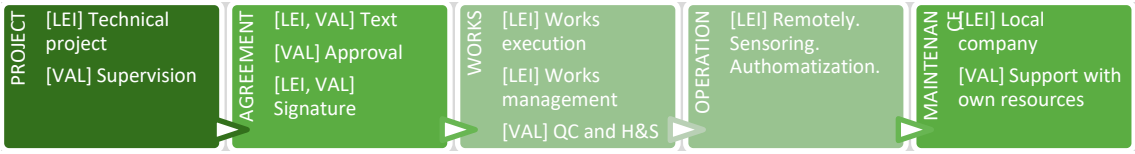


Table 3.17: Content of the Agreement LEI-VAL for the Electrowetland.

Implementation. LEITAT has selected a company to be in charge of the Direction of the Civil Works. When the administrative procedure with VAL is finished, LEI will subcontract the civil works. The subcontracting costs are higher than expected so LEI included the increase in the subcontracting budget in amendment #2 (LEI total budget will not be increased). This second Amendment is currently in the approval process by the European Commission.

The construction is scheduled after the signature of the Agreement, with construction work lasting about 8 weeks.

Challenges. The electro-wetland has an important innovative character because it is a solution that has been tested only at the laboratory level. This has involved solving different types of barriers in relation to the location and compliance of regulations apart from the technological ones. The initially planned locations have been changed because of technical reasons, but it is still in SubDemo A. This justified change in the location will be supported by developing specific non-technical actions for communication and dissemination among the citizens.

3.12.3 Status

The implementation of this action has been delayed due to the complication in the processing of the administrative works file for the signature of the Agreement. The City Council of Valladolid is co-promoter of the intervention, but the implementation of the work is carried out by LEITAT, partners in the project. The operation and maintenance tasks are carried out jointly. It is necessary to write a specific agreement between the two entities.

Implementation works have not been started. Execution is 75% because the administrative procedure is about to finish. After that, works will start on site (80%).

10%	20%	30%	40%	50%	60%	75%	80%	90%	100%

3.13 Green covering shelter (VAc27)

3.13.1 Technical Description

A Green Covering Shelter is a very light type of green roof. This type of green roof has a very light and thin substrate to avoid a big load on the roof of the shelters. It is located in España Sq., using the existing structure. Due to this is an old and weak structure, the current shelter does not support heavy loads so that 66% of the shelters are covered. The total green extension is 488 m^2.

3.13.2 Development

Project. Technical project was delivered by Singulargreen, together *Vac24-Green vertical mobile garden*, with *Vac27- Green covering shelter*.

Procurement. Green covering shelter tendering was included in the Public Procurement Process group called "Green Infrastructures". This process started by the 18th of June 2019 and finished the 13th of November 2019. Procurement type of the works contract was Open procedure.

PPP Group	Code	Intervention	Leader
Green infrastructure	VAc24	Green Vertical mobile garden	SGR
	VAc27	Green Covering Shelter	SGR

Table 3.18: Green covering shelter: PPP and its relation with the URBAN GreenUP Actions.

Implementation. Works started on January 2020 and finished on March 2020. The work began with the tasks of waterproofing the roof in the two lateral sections delimited for the action. The special inert substrate of rock wool was installed to support the mulch coverage of 1 cm and sedum cuttings of 200 g/m2. The irrigation system is composed by drip pipes to bury, drippers of 0.7 l /h placed each 20 cm, sprinkler irrigation system formed by MP rotator or similar and sprinkler (including special PVC parts for fixing the sprinklers to the ribs).

The green covering shelter includes a new rainwater management system with gutters and downspouts, which did not exist before.

Figure 25. Green Covering shelter delivered.

3.13.3 Status

This action has been delivered during March 2020, so implementation progress has reached 100%.

10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

Challenges. However, after implementation, it was observed an unexpected issue with the water collection system that was solved by adding an auxiliary metallic profile to improve the capture of the leftover water. On the other hand, the newly installed gutters and downpipes accumulate rainwater at certain points in Plaza España, creating puddles on the floor, which affect the daily market traders generating dissatisfaction.

Covid 19. Construction was slowed during the COVID-19 State of Alarm of March 2020. Although the works were almost finished, the public procedures were stopped. Baseline monitoring partially stopped during the lockdown.

3.14 Green Roof (VAc28)

3.14.1 Technical Description

In Valladolid, there has been installed a green roof in El Campillo municipal Market.

Originally, an inner substrate was going to be used. This type of vegetation roof has the advantage of being able to have adhered to inclined surfaces. The initial design for this NBS was divided into 7 small vegetable roofs with a semi-cylindrical shape, adapted to the current surface of El Campillo Market (D2.3). The total area was 244 m_2.

The final design of this intervention includes two types of substrate to demonstrate the effectiveness of two different materials. The total area is increased to 524 m_2; the Type S is 315 m_2 and the Type L 2019 m_2.

The roof of this building is a walking surface, which is currently closed to the public. With the construction of this NBS, the roof will be revitalized and renewed. This area might be transformed into open urban space again, available for the citizens.

3.14.2 Development

Project. Technical- economic description for the Green roof was delivered by Singulargreen. In addition to the green roof, Valladolid City Council made a complete renovation of the roof: waterproofing, renovation of materials, finishes. The project was enlarged with some previous works for the total restoration of the current roof, as this had leaks and cracks. This total restoration intervention will finish with the new horizontal garden. Valladolid City Council has increased the co-financing budget needed to cover the whole restoration (not the NBS). Total budget spent in the whole renovation of the roof is more than 250k €.

There is a new design with two types of green roofs substrate:

- Organic-mineral substrate (Type S). One of the roof types (Type S) uses the classical Organic-mineral substrate. On the top layer will be planted multiple vegetation (like crass, cespitose, sedum, grasses, vivacious and bushes or trees). Also, native species will be selected. It has variable maintenance (like a garden).
- The other type is an Inorganic substrate based on sheep wool (Type L): On the top layer will be planted sedum vegetation. The substrate is an innovative substrate from a Circular economy Project named 'Lanaland', developed by the local SME SBioRN.

The green area is 524.09 m^2. The water for irrigation is pumped up from the underground (water table), which makes the intervention more sustainable since no drinking water is used..

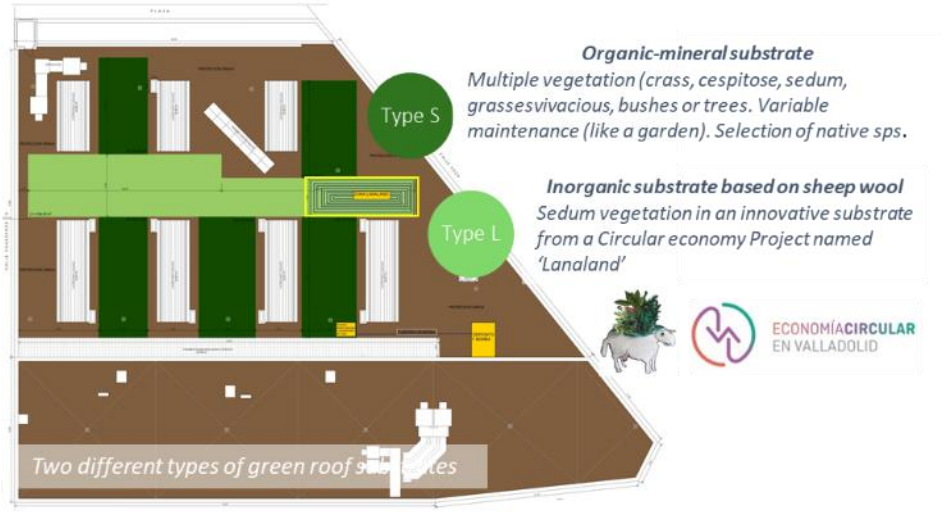


Figure 26: Two different types of green roof substrates (Vac28).

Procurement. The procurement process was an open work contract. It started on the 7th of January but it was stopped because of COVID-19 (State of Alarm). The process finished on the 29th of April 2020. The contract was awarded during that first State of Alarm period.

PPP Group	Code	Intervention	Leader
Green Roof	VAc28	Green Roof	SGR

Table 3.19: Green Roof: PPP and its relation with the URBAN GreenUP Actions.

Implementation. The construction of the green roof started in June, as expected. The execution period was 52 days. The works were expected to be finished by the 15th of June, but due to the COVID-19 situation, the finish date has been delayed one month. Likewise, the plantation was also delayed to avoid the hottest days of the summer. The green roof was fully installed by August.

Figure 27. The green roof in El Campillo municipal market (Vac28) (aerial view, Aug and Nov 2020).

3.14.3 Status

The green roof was fully implemented in August 2020. The progress on implementation is set on 100 %.

10%	20%	30%	40%	50%	60%	70%	80 %	90%	100%

Covid. The procurement was delayed because of the State of Alarm of COVID-19. However, the contract was awarded during COVID crisis (April 2020), and works started on June 2020. The green roof was expected to be finished at the 15th of July, but this was delayed because of a lack of plants supply. Baseline monitoring partially stopped during the lockdown.

3.15 Green Shady Structures (VAc29)

3.15.1 Technical Description

The green shady structures designed for the city of Valladolid will be made by pieces of stretched textile structure on which an inert substrate is installed. This inert substrate is covered with seeds that germinate and grow on the textile structure. This NBS can be fixed to the façades of the buildings on the street or by posts located on the sidewalk. In this case, the structures are fixed to the façades. Each one of the pieces is triangular with an approximate length of 4m on each side. This NBS also has a new public efficient lighting installation. The 21 pendant triangular awnings cover the whole Santa María Street (200 m long)

Figure 28. Green Shady structures design (Source: Singulargreen).

3.15.2 Development

Project. Technical project was delivered by Singulargreen.

Procurement. Green Shady Structures tendering was included in the Public Procurement Process group "Green canopies". This process started by the 7th of January 2020 and finished the 29th March 2020, during the lockdown.

PPP Group	Code	Intervention	Leader
Green canopies	VAc29	Green Shady Structures	SGR

Table 3.20: Green shady structures: PPP and its relation with the URBAN GreenUP Actions.

Implementation. Works started on July 2020. In the first period, some pre-work was done. SGR has prepared a special firemen protocol together with the City Council specialists. Information letters were sent by VAL to all affected neighbourhood communities (19) during June 2020, to warn them of the start of the work, and because their facades will be affected. There is an archaeological site on Santa María Street and then it is necessary to hire an archaeologist to supervise the work.

Works on site started on July 2020 and are expected to finish on Jan-Feb 2021.

Installing the anchors to the façades

Detail of the canopies

Old press kiosk renovated: This keeps the irrigation and electrical systems. See the hanging truss in detail.

Hanging truss for the irrigation water and electricity systems

Figure 29. Implementation of the Green shady structures (Vac29).

Technical and operational challenges. There have been other 4 works open at the same time in Santa María Street. Two of them were small private works in portals #21 and #7. The works were combined with the green canopies works, as there was coordination between works managers. There was another municipal work on the square of Santa María St and Claudio Moyano St, due to the pedestrianization of the city centre, so coordination was also delivered. However, there is still open another work on portal #12, with a longer date of ending. Singulargreen have adapted the canopies design (project) to this situation, in order to continue with the implementation on time.

Renovation of an old press kiosk to hold the control systems (circular economy)

Coordination between coexisting works: Open construction in Santa María St #12

Coordination between coexisting works (Pedestrianisation of Claudio Moyano Street, June 2020)

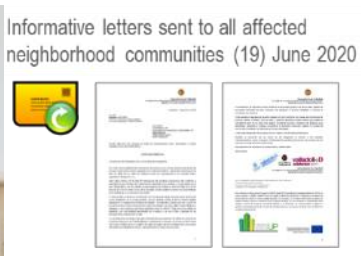
Access of the firemen. Works done:
- Maintain a minimum height of the system over 4.5 m high.
- Develop a fuse breakage system.
- Establish a protocol for the firemen brigades (delivered by SGR).
- Practice with experience (fire truck practising).

Figure 30. Challenges during the execution of the Green shady structures (Vac29).

Social challenges. From 2018 the City Council made several communication actions with the affected communities to explain the intervention, their expected benefits, and receive feedback. On 2018 there were launched specific informative sessions to all neighbours and traders. Informative letters were sent to all neighbours communities. Participation has been quite low. Once the work has started, some communities of neighbours are dissatisfied with the installation of the green canopies in their façades. To date, the City Council has received 18 communications from affected residents and businesses, expressing complaints, claims and requests for additional information.

Some of the lessons learnt are the need of conducting more informative sessions to ensure the participation of the citizen directly affected. The importance of involves those directly affected in the design or the planning process of the intervention.

Informative session on Green canopies in Sta. María St. (April 2018). Attendees: Neighbours (3) and Traders (6) in two sessions (morning, evening). Low attendance.



How did we warn the citizens directly affected by this NBS? Through posters on the portals, leaflets in the mail boxes and door to door campaign. Informative letters sent to every community before the works.

Figure 31.Social challenges of the Green shady structures (Vac29).

3.15.3 Status

There is good progress with on-site delivery, so the progress on implementation is set on 90%. Final date is expected on January-February 2021.

10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

Covid. The procurement was delayed because of the State of Alarm of COVID-19. However, contract was awarded during COVID crisis (April 2020), and works started on July 2020.

3.16 Bio-Filter (VAc30)

3.16.1 Technical Description

Urban Garden Bio-Filter is an air filter framed in an urban garden for the emissions of underground car parks or other stationary sources of pollutants agents in urban environments. The NBS is composed of three main elements, the fan extractor to extract the polluted air from the underground car park, the plenum section to distribute the air under the BioFilter and the BioFilter itself.

It is composed of several layers for support, pollutants absorption and protection and finally, is cover by vegetation. The absorption/capture of air pollutants is made by the different layers and the metabolization of these pollutants is made by the soil microbiota and the vegetation.

3.16.2 Development

Technology. The development of the technology for the absorption of air pollutants through the combined action of plants and types of substrates has been carried out by CARTIF in its facilities. Good results have been obtained in the absorption of particles and nitrogen oxides.

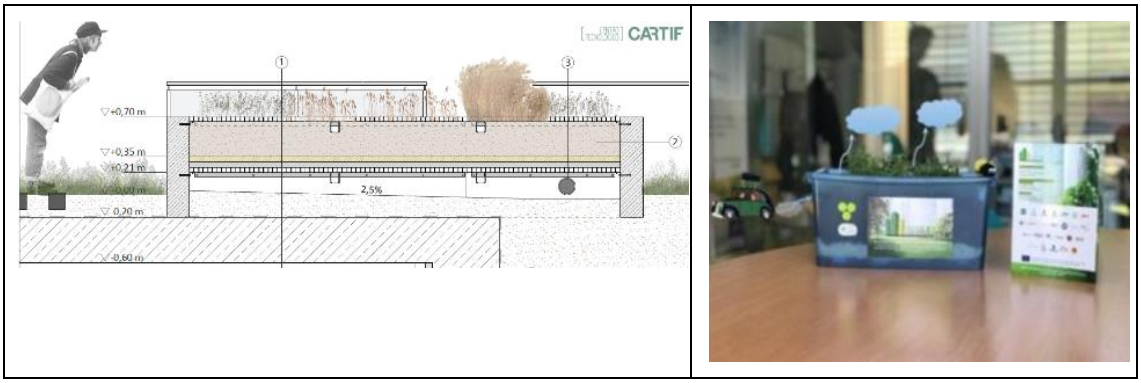


Figure 32. Biofilter design and small laboratory initiative in CARTIF (Vac30).

Previous works. There was a field visit on the 7th of May (during the Covid 19 State of Alarm) to the underground car parking. CARTIF opened a test on the wall of the underground car parking wall to verify the extraction air system.

Project. Technical project was delivered by CARTIF on June 2020. They subcontracted the project to an architect with a legal signature. Project was shared within the City Council on June for the internal review. Finally, the project was supervised by a municipal technician on August 2020.

Procurement. The public procurement process is a construction minor contract. The award of the contract took two months (Jul-Aug). Although almost 3 more months were needed for the formalization of the contract (collecting the contractor's documentation and the authorization of the municipal expenditure). PPP Group	Code	Intervention	Leader
Bio-Filter	VAc30	Urban garden bio-filter	CAR

Table 3.21: Bio-Filter: PPP and its relation with the URBAN GreenUP Actions.

Implementation. Works are already ongoing. The execution time is 90 days, so the Biofilter will be installed on February 2021.

Figure 33. Test opened in the wall of the extraction system (May 2020). New location of the BioFilter in Portugalete Square (Vac30).

Challenges. The initial location for the BioFilter in Zorrilla Square has changed because of technical difficulties to access to the extraction air system. The location changed on February 2020 from Zorrilla Square to Portugalete Square, where there is another underground car

parking, and current location is close to one Vertical Mobile garden (Vac24) and a Natural pollinator's module (Vac19).

3.16.3 Status

Works have started on site. Works are expected to finish on February 2021 (three months execution). The progress on implementation is set on 80%.

10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

Covid. During the first State of Alarm, a field visit was made to drill into the extraction system and validate the installation, despite the mobility restrictions.

3.17 Urban orchards (VAc31), Community composting (VAc32) and Small-scale urban livestock (VAc33)

This group of Nature Base Solutions aims to improve the existing orchard areas with community composting, small-scale urban livestock, natural pollinator modules (Vac21) including smart soils as substrate (Vac18), and the realization of urban farming educational activities (Vac36).

Valladolid has four municipal urban gardens, which are loaned to unemployed people and social communities. Orchards are located in Parque Alameda, Santos-Pilarica, Valle de Arán and Barrio España neighbourhood.

PPP Group	Code	Intervention	Leader
Urban orchards	VAc31	Urban orchard	VAL
	VAc32	Community composting	CAR
	VAc33	Small-scale urban livestock	VAL
	VAc36	Urban Farming Educational activities	VAL

Table 3.22: Urban orchards: PPP and its relation with the URBAN GreenUP Actions.

Technical Description

Since there are already urban gardens in the city, it was decided to invest in them instead of creating new ones since there are still vacancies and improvements to be done in the existing ones.

The state of the orchards was analysed and various technical points were identified for improvement. The technical design of the urban orchard has finished taking into account the suggestions about the sustainable use of water and green shady areas to be implemented in common spaces, among others. The improvement that has been implemented is a drip irrigation system in the orchards of Valle de Arán, and then Santos-Pilarica and Parque Alameda.

Development

Project. There is no construction project, as the implementation is carried out directly by Valladolid City Council with its own resources.

Numerous meetings between different departments of the City Council, the company in charge of the management of the orchards and CARTIF have been held to find out in detail the most suitable irrigation system, as well as the shadow and common spaces.

Procurement. The public procedure to carry out this action is by purchase of supplies within the Valladolid City Council's Framework Agreement for Suppliers.

Implementation. On the one hand, the area where the precarious leisure and rest area for the users of the Alameda Park orchard was located was cleared and cleaned up by the users themselves and the company contracted to manage the orchards on 2018.

On the other hand, the purchase of supplies needed for the installation of drip irrigation was delivered on June. The installation of the system was made by the orchard users helped by staff of the company in charge of the management of the orchards as well as the Parks and Gardens Service. The installation of the drip irrigation system has been completed in the municipal garden of Valle de Arán (July 2020). Nowadays, the City Council learns from experience, strengthening the use of the automatic irrigation system among the orchard users, maturing the system. Later it will be installed in the rest of the municipal gardens.

Improvements in the municipal orchards are financed at 100% with municipal budget.

Figure 34. Shadow area in Parque Alameda orchard improved, ex ante and ex post scenarios (2018, 2019).

Figure 35. Drop irrigation system in Valle de Arán urban orchards (summer 2020).

Status

The shade and leisure area of Parque Alameda urban orchard has already been cleared and improved. The installation of the drip irrigation system has been completed in the municipal garden of Valle de Arán (July 2020). Although the City Council is going to continue with the improvements in the urban orchards, this intervention is fully completed at 100%.

10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

Covid 19. The implementation of the actions was expected to be completed by the end of May, but due to COVID-19 was delayed and expected to be in August 2020. Administrative procedures delayed because of the first lockdown may-jun: awarding of the new management company for the urban orchards, as well as delays in the awarding of the new gardeners 2020. Likewise, orchards were closed during State of Alarm.

3.17.1 Community composting (VAc32)

Technical Description

Composting is a natural method for treating solid waste in which organic material is broken down by microorganisms in the presence of oxygen to a point where it can be safely stored, handled and applied to the environment as a fertilizer and soil amendment.

Organic material has a twofold origin:

- Community: urban allotments, small-scale urban livestock, nearby restaurants, markets, fruit stores, etc.
- Industry processes: crop or agroindustry residues.

The objective is to close the loop on organics recovery. Likewise, this NBS has educational and engagement purposes. VAc32 will provide to the users of the orchards a source of fertilizer for their allotments; this action requires that beneficiaries make their own compost.

Composting is an activity that has been demanded for a long time by the users of Valladolid city council's orchards, in fact, some of them have already installed homemade composters. The city council plans to install composters, apart from those to be installed in the orchards related to the URBAN GreenUP project, in different parts of the city, accessible to all citizens to involve them in this task:

- Municipal recycling points
- Near schools and educational centres.
- Parks and green areas.

Figure 36. Ex ante scenarios for the Community composting facilities (Vac32).
(Santos-Pilarica, Parque Alameda and Valla de Arán).

Development

Project. Several options were proposed in Deliverable 2.3. There is no need for a complete technical project. The tender only requires a simple technical specification report. These specifications were provided by CAR and VAL.

Procurement. The public procedure to carry out this action is by a Work minor contract, which started in January 2020 and was open for at least 4 months, due to the Covid crisis. Bidding offers received between February and later on May 2020. Awarding and signature of the contract was delivered after the Covid lockdown (June).

Implementation. Construction works started on September 2020, after the formalization period. Urban orchards were constructed in the four municipal orchards during September-October 2020.

Figure 37. Two composting facilities in Parque Alameda and Santos-Pilarica orchards (Vac32) (Sep 20).

Covid. The construction of the composting facility was delayed because of COVID-19 as the administrative procedures and non-essential activities were stopped during the first lockdown. The administrative procedure for hiring the construction company was not carried out until after the end of the first State of Alarm (Mar-Jun 2020).

Status

Community composting are fully implemented, so this intervention is delivered at 100%.

10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

Covid. Implementation of improvements in the municipal orchards initiated before lockdown, but were halted by the COVID crisis. Awarding was delayed after the end of the lockdown. The initial implementation was expected to be on April.

3.17.2 Small-scale urban livestock (VAc-33)

Technical Description

The installation of the small-scale urban livestock has an important educational component. It is intended to involve the citizens in the care of the hens. The idea is that, weekly, a family or neighbour will take care of the animals in exchange for being able to collect all the eggs during that time. The animals are always very well received by the children, for which several educational activities will be done here.

A Small-Scale Urban Livestock is a form of small livestock keeping that is concentrated in and around cities. Small farm animals like poultry, pigs, fish, and rabbits are the most commonly used because require minimum space and maintenance. On the one hand, animals provide meat, milk and eggs for families use and manure for urban orchards. They can be a source of income; they provide food or services, help to reduce the volume of organic waste and can be part of social networks for those who are involved in them (Source: FAO).

On the other hand, animals can generate problems such as smell, risk of disease, pollution of waterways, noise, or quarrels between neighbours when they invade and damage gardens.

This NBS is perfect to be implemented with other urban farming interventions such as VAc31-Urban orchards, and VAc32-Community composters and VAc36-Urban farming educational activities.

Development

Project. The installation of an urban henhouse is planned along with an infrastructure for the composting of chicken manure. This intervention will be implemented in Santos-Pilarica municipal orchard, as the closest neighbours are farther than in Alameda Park (and there have been received many complaints from these neighbours). For contracting of the works, a technical-economic description of the installation is needed, without a complete project. Valladolid City Council is currently working on the technical definition of the specifications to implement the avi-compo model, that mixes composting and henhouse in the same installation. This is a way of increasing the educational value of the solution with urban agriculture activities.

Procurement. The public procedure to carry out this action is through a Minor works contract (below 40,000 €). Legal documentation for the registration of this minor livestock facility is also being prepared by the City Council. Likewise, it is necessary to organize the internal management of the hen house with personnel hired by the City Council.

Status

The drafting of the technical report on the chicken coop is in progress in accordance of the Department of the Environment, which is in charge of the management of the municipal orchards. In the implementation of this type of intervention, it does not begin only with a process of public purchase of the facility (technical aspects), but there are legal and procedural aspects to be articulated as well. It is the first time that the City Council of Valladolid works with farm animals in the urban environment. The deviations relate to delays in implementation, expected in 2021.

10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

Covid. The implementation of the actions is expected to be during the summer, delayed due to COVID-19.

4 Progress report on Non-Technical Interventions

4.1 Engagement Portal for Citizens (VAc37)

There is a webspace in the Innovation Agency website for the URBAN GreenUP project in Valladolid. The Innovation Agency is currently in the process of renewing its website. The local page of the URBAN GreenUP project will also be improved (contents, interaction). This process was delayed by the COVID-19 State of Alarm, as the awarding procedure stopped. Currently, the new website is still in progress as there is a service contract with a specialized IT company.

http://www.valladolidadelante.es/node/12344

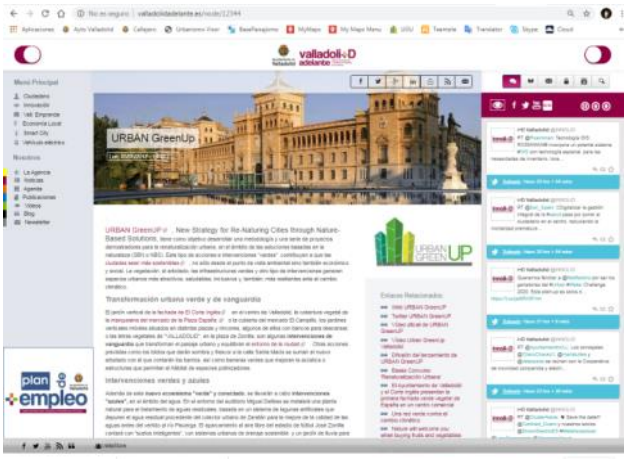


Figure 38. Local website for URBAN GreenUP. Source: Valladolid Innovation Agency.

In this period, other resources have been used to fulfil the objectives of engagement of this action:

- Publish news and updated information about the project on the website of the Innovation Agency: www.valladolidadelante.es
- Creation of a hashtag "Re-naturing Valladolid" #renaturalizavalladolid, by the Communication Department of the Innovation Agency in May 2018.
- Use of social networks: Facebook @VLDAdelante, Twitter @INNOLID, Instagram @Valladolidadelante… to inform and engage citizens in activities.
- Use of the website of the City Council and the agency to publish news on topics related to the project. www.valladolid.es.
- Creation of an email ugu@ava.es where the citizens can directly address questions and ideas related to the project.

On the other hand, the Mobile APP that is being developed by [GMV-S] will provide information about the NBS: characteristics, benefits, etc. So this will also contribute to increasing the engagement, in addition to the website.

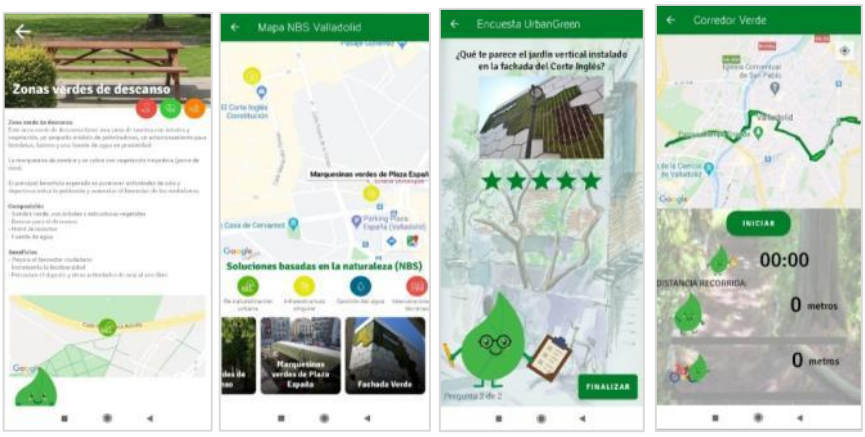


Figure 39. Mobile App for Valladolid Demo (dissemination, engagement, surveys, usage stats) Source: GMV.

Implementation progress status is set on 80%.

10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

4.2 Sponsoring activities (VAc38)

In section 5.2 Sponsoring activities of D. 2.3, three different types of sponsoring activities are considered:

- URBAN GreenUP sponsorship in events
- URBAN GreenUP sponsorship in other related projects
- Sponsor a “Nature-Base Solution” initiative

Sponsor a “Nature-Base Solution” initiative is ongoing, but it will be improved with other designed activities after the NBS implementation (such as “Sponsor a compacted pollinator's modules”, “Sponsoring trees”, etc.). Selected street for the first initiatives is Panaderos Street, a commercial street from the city centre where there are new urban trees planted by the URBAN GreenUP project. These initiatives have not been implemented by the State of Alarm COVID-19, although it is currently ongoing again (December 2020). Contacts with the shops and traders have already been done. The City Council is in contact with a local association and the University of Valladolid for the implementation of the “Sponsor a tree” initiative.

All the Sponsoring activities are financed with own budget from the WP2 partners.

Figure 40. Sponsoring activities (VAc38). Events, public-private collaboration, NBS projects, workshops.

Examples: BY&For citizens international conference (Sep 2018). Co-financing of El Corte Inglés (Vac25). Several workshops on nesting boxes for bats and birds (project "Wood that revives", and workshop with the local environmental association ACENVA)

Implementation progress status is set on 80%.

10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

Covid. There have been no face-to-face activities with a high number of attendees in closed places since the declaration of the State of Alarm COVID-19. This situation delays the implementation of new initiatives.

4.3 Promotion of Ecological Reasoning and Ecological Intelligent (VAc39)

Citizen awareness and participation, and fostering of ecological reasoning and ecological intelligence, are developed from the beginning of the URBAN GreenUP project in Valladolid: forum, workshops, contests, C&D activities, etc. Regular engagement with stakeholders has been made yearly.

4.3.1 Execution of activities

Thematic meetings.

(See Deliverable 2.6 for more detailed information)

- **URBAN ECOSYSTEMS FORUM, CENCYL+ project**. Salamanca (Spain), 22nd November 2017.
- **MICHELIN CITIES NETWORK MEETING**. Clermont Ferrand (France), 29 November-1st December 2017.

Figure 41. URBAN GreenUP engagement in Michelin Cities Meeting (Source: Valladolid City Council).

- **LA CIUDAD IMAGINADA.** Valladolid (Spain), 1-2-3 December 2017. Citizens *imagining* the city the would like.

Figure 42. La Ciudad Imaginada 2017 (Source: El Norte de Castilla).

- **ENVIRONMENT FORUM OF EUROCITIES.** Amsterdam (Holland), 4-7 April 2018.
- **"DAY OF THE EARTH" AND "DAY AGAINST NOISE".** Valladolid (Spain), 23-26 April 2018.

Figure 43. URBAN GreenUP stand for the Day of Earth 2018 (Source: Valladolid City Council).

- **CONTEST "RE-NATURING YOUR CITY".** Valladolid (Spain), April-May 2018. Contest for scholars and associations.

Figure 44. Poster of the contest "Re-naturing your city" 2018 (Source: Valladolid City Council).

- **CONFERENCE ON URBAN FORESTS AND HEALTH IN CITIES. NEW PERSPECTIVES.** Madrid (Spain), 7th June 2018.
- **TREES OF VALLADOLID WEBSITE**. 7th September 2018
- **1ST EDITION OF INNOVATION AND TECHNOLOGY FOR THE WATER SECTOR EXHIBITION – H2ORIZON**. Sevilla (Spain), 19-21 September 2018.
- **BY&FORCITIZENS CONGRESS.** Valladolid (Spain), 20-21 September 2018.
- **INFODAY H2020, CHALLENGE 5.** Huelva (Spain), 13 November 2018.

Figure 45. H2ORIZON flyers and CENTA participation (Source: CENTA).

- **ENTREPRENEURSHIP ROUTE**. Valladolid (Spain), academic year 2018-2019.
- **II INTERNATIONAL COURSE OF SELECTION OF TECHNOLOGIES AND DESIGN OF SEWAGE TREATMENT PLANTS. MODULE V: REUSE OF TREATED WASTEWATER.** La Paz (Bolivia), 25-27 March 2019.
- **XX UNIVERSITY-ENTERPRISE CONFERENCE "SUSTAINABILITY OF WATER AND SOIL RESOURCES IN AGRICULTURE".** Córdoba (Spain), 4 April, 2019.
- **KNOWING AND UNDERSTANDING EUROPEAN PROJECTS Conference.** University of Córdoba (Spain), 9 May 2019.
- **TRAINING WORKSHOP. CIRCULAR WATER ECONOMY: ADAPTATION TO DROUGHT AND SCARCITY MANAGEMENT.** Loulé (Portugal), 16 May 2019.
- **NEST BOXES WORKSHOP**. Valladolid (Spain) 17th May 2019.

Figure 46. Poster and participants of the nest boxes workshop (Source: ACENVA).

- **VALLADOLID, TODAY AND YESTERDAY PHOTO EXPO.** Valladolid (Spain), 2019.
- **6TH CONFERENCE ON WATER ENGINEERING (JIA).** Toledo (Spain), 22-25 October 2019.
- **CYCLE OF CONFERENCES "TREES IN THE CITY". Architects for sustainability, COACYLE.** Valladolid (Spain), 3 November 2019.
- Meeting with the traders of the daily market of the Plaza España canopies (VAc27), on December 2019.

Figure 47. Meeting with the traders of the daily market of the Plaza España canopies (Source: INNOLID).

- Presentation of the URBAN GreenUP project in Valladolid for the Local Agenda 21, on December 2019.

URBAN GreenUP in Valladolid's tourist rote

This activity is in progress. The tourist route is in process of definition. The objective is to show all the interventions that will be implemented in the city thanks to the project URBAN GreenUP, but will also include other works that have been realized in the city related to energy efficiency, sustainable mobility, smart city... So that, innovation can also become a tourist attraction of the city.

In the BY&FORCITIZENS congress (September 2018), and yearly during the European Mobility Week (September) tourist routes were carried out around the city to show the implementations in the city through the REMOURBAN H2020 project and the places where the URBAN GreenUP interventions will be implemented. The experience was positive and had a great acceptance by the citizens. The following year, during the European Mobility Week 2019, that Innovative Tourist Route was celebrated again for the general public.

URBAN GreenUP App

This activity is in progress. GMV is developing a mobile application (URBAN GreenUP APP) to inform about the different NBS that will be implemented and carry out to increase public awareness (see Vac37).

Diffusion materials and communication activities

In addition, other communication and dissemination activities have been carried out through social networks (Twitter, Facebook, Instagram, LinkedIn...), television, newspapers, and the City Council and the Innovation Agency websites.

Figure 48. URBAN GreenUP in some Valladolid local newspapers (Source: Valladolid City Council).

4.3.2 Status

The members attend all the events to which they are invited to discuss the URBAN GreenUP project. This scenario will continue at least until the end of the project. Local engagement activities can be improved.

Covid. These activities stopped during the COVID-19 State of Alarm. Since then, there have been no face-to-face activities with a high number of attendees in closed places. This situation delays the implementation of new initiatives

10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

4.4 Single Window/Desk for RUP Deployment (VAc40)

Valladolid Local Desk is managed by the Innovation Agency of Valladolid City Council. It was launched at the beginning of the URBAN GreenUP project. There has been provided also an email ugu@ava.es. Single desk is always open to receive any comment, suggestion, and application, from citizens and stakeholders. Both personally and electronic media or telephone.

In-person attention has been suspended during COVID-19 State of Alarm. Since then, face-to-face meetings are completely limited to extraordinary situations.

Implementation progress status is set on 90%

10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

4.5 Support to Citizen Project of NBS (VAc41)

Many projects related to NBS already make synergies with URBAN GreenUP in Valladolid. The creation of a NBS database to Valladolid is planned but it is not executed. This NBS database will be included in the new website for the Innovation Agency of Valladolid City Council, which is still currently in progress (see Vac37). There will be an information sheet for each of the most significant NBS in Valladolid.

4.5.1 Execution of activities

Promotion of the implementation of NBS in the city (projects)

One of the objectives of the Local Desk (VAc40) is to encourage the implementation of NBS projects by citizens and businesses in the city. Different studies of architecture and engineering of the city have approached the local desk to learn how to implement NBS in the city and establish potential synergies. The following initiatives stand out for their degree of development, as they will surely be projects executed in the city.

NAIAD H2020 Project/URBAN WATERBUFFER IN VALLADOLID (UWV) Project, 2018-2020. The project Urban Waterbuffer in Valladolid, supported by the 'Partners voor Water' programme, from Enterprises Agency from the Holland Govern, aims to replicate water management actions that are being carried out in that country. The Sparta Stadium of the city of Rotterdam has implemented a similar system that collects rain water and thanks to a garden designed specifically for water treatment, it allows the recharge of the aquifers in the area, which act as deposits. The renovated water is obtained for irrigation. This intervention is part of the NAIAD Project (H2020). The Holland SME Field Factors leaders the project. This model is intended to be reproduced in the football stadium area of Valladolid adapting to the peculiarities of our city, in order to take advantage of rainwater in a closed cycle and to benefit from the advantages of this type of systems, both economic and environment, while revaluing the area. Synergies with URBAN GreenUP project are detailed in *section 4.5. Stormwater management systems* and section *4.7 Sustainable park*.


Figure 49. Meetings in Valladolid with Field Factors and iCatalist (Source: VAL, 2018-2019).

More information: https://fieldfactors.com/blog/indexphp/urban-waterbuffer-is-open; https://fieldfactors.com/blog/indexphp/a-rainwater-harvesting-system-for-zorrilla-football-stadium-valladolid

LAND ART STUDIO. 28th May 2018. In the Juan de Austria Park renovation project, synergies with the URBAN GreenUP project were established. Both projects have similar NBS interventions (SUDs, rain garden, compacted pollinator's modules, vertical garden). Valladolid City Council had a meeting in order to establish synergies.

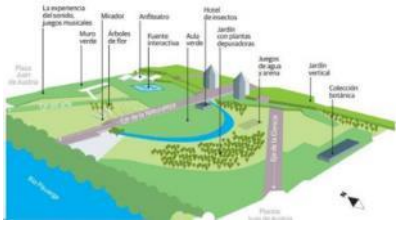


Figure 50. Renovation project for the Juan de Austria Park (Source: Land Art Studio).

https://www.elnortedecastilla.es/valladolid/parque-juan-austria-20180423205259-nt.html

IMPLUVIUM project. From July 2018. Impluvium by iCatalist is a local project where a rain collection system was designed in 4 buildings belonging to Valladolid City Council, for reuse in school gardens or the municipal orchards. This project is related to the urban farming activities in Parque Alameda and Santos-Pilarica in Valladolid. Actions developed: accompaniment to a visit to the urban gardens, presentation by the municipal technician and the management entity (INEA) which are important stakeholders to Impluvium project (water management prototype) www.icatalist.eu

LANALAND project. LANALAND by SBioRN is a circular economy project granted by Valladolid City Council that creates green roofs using sheep wool as a substrate. Sheep wool is currently a residue. The wool substrate acts as an insulator, is light, retains 50% water weight, is moldable, allows plants to be rooted and is biodegradable.

Figure 51. Pilot planter LANALAND (Source. SBioRN).

This new substrate of sheep wool has been installed in the Green roof of El Campillo Market (see section 3.14), as a good example of collaboration among innovation projects.

ERASMUS + PROJECT "GREENSET YOUR CITY!"

This project was proposed by Jesús y María local school in Valladolid. There will be participants from Finland, Italy, Check Republic and Germany. It is a 2 years' project for the exchange of knowledge and good practices of European students by the theme of re-naturing the cities, under the URBAN GreenUP project. The scholars will receive a workshop about the URBAN GreenUP project in Valladolid. A physical visit to the interventions will be delivered (May 2020). The students will also make the design of urban architecture and nature based-solutions in the participant cities, as it will be desirable that the students could participate in any URBAN GreenUP intervention. **Covid 19**. Unfortunately, after two years of preparation, this project was cancelled due to the Covid 19 health crisis. It was initially moved from May to October 2020. It has finally been postponed.

INDNATUR project. January 2018 to December 2021. A "green" European project to improve industrial parks through Nature-Based Solutions. Valladolid City Council (beneficiary) implements a pilot in the Argales Industrial Park so that this area is more sustainable from an environmental, social, economic and cultural point of view. The objective of the project is the improvement of the urban environment and air quality in industrial areas and adaptation to climate change. Another pilot project will be carried out in the Cantarias industrial park (Bragança).

CENCYL VERDE project. January 2018 to June 2021. Adaptation to climate change is the fundamental objective of the CENCYL GREEN CITIES project. It will be carried out through the planning of green infrastructure and other comprehensive measures in cities that are part of this CENCYL network: Figueira da Foz, Aveiro, Guarda, Viseu, Ciudad Rodrigo, Salamanca and Valladolid. The green economy will be boosted within the urban diversity of this cross-border area between Spain and Portugal.

"VallaCambio" project. Local initiative from iCatalist to develop a serious board game for the engagement of the Nature-Based Solutions in Valladolid, about local sustainability and circular economy. This is a local project financed by the City Council as project to lead Valladolid to Circular Economy in 2019.

Figure 52. Board-cards serious game 'VallaCambio' (Source: iCatalist).

OTHER PROJECTS. The URBAN GreenUP project in Valladolid established many other initiatives of synergies with many other international and local projects. This interaction has taken place in different ways: through in-person and distance interviews, exchange of information and experience, others.

Figure 53. Interaction and synergies with other European and innovative projects.

NATURVATION, H2020 project. 'DEGREN', LIFe project. 'Urban Cool Islands' Climate Kick; Life 'Heatland'; Life 'Agua de Prata'; 'ACT on NBS' Climate Kic; Project 'SCALE', Erasmus+; Interreg 'URBforDAN'.

4.5.2 Status

Implementation progress status is set on 60% "Stakeholder partnership established". Support for other projects and citizens on the implementation of NBS will continue until the end of the URBAN GreenUP project in Valladolid.

10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

4.6 City mentoring strategy (VAc42)

4.6.1 Execution of activities

The City Mentoring strategy of Valladolid already many activities with stakeholders with interest in the UGU Project. The Mentoring Strategy develops two activities: Valladolid Consortium Mentors Group and Activities with stakeholders. Among those stakeholders identified to received mentoring are: Other members of the URBAN GreenUP Consortium, especially other front-runner and follower cities; other cities with interest on urban Renaturing and NBS; the academia; private companies' experts in NBS implementation; civil society and social entities; among others.

This intervention collaborates with WP1 and WP6, through a number of good practices from Valladolid that are being selected for mentoring purpose (Fr to FW cities and other cities from the Cluster).

So the Mentoring strategy has already deployed many activities with stakeholders with interest in the UGU Project, but the strategy can be improved and extended. These activities have been stopped during the COVID-19 State of Alarm.

Activities already executed are (see Deliverable 2.6 for more detailed information):

- **ERASMUS + PROJECT "GREENSET YOUR CITY!"**
- **PERSONAL MEETING WITH ETAYENESH ASFAW.** Valladolid, 2nd February 2018.
- **INTERVIEW WITH UTRECH UNIVERSITY**. 1st January 2019.
- **SCALE PROJECT (ERASMUS+) MEETING**. 1st February 2019. Valladolid (Spain).
- **INTERVIEW WITH UNIVERSITY OF TEXAS**. 2nd February 2019.
- **NBS COMMISION – PARKS AND PUBLIC GARDENS SPANISH ASSOCIATION**. November 2019.

Other implemented activities:

- Organize and participate in the Replication Webinars from WP6. Valladolid was the front-runner city in charge of the first replication webinar that was launched on the 7th June 2018.
- Exchange of experiences and good practices with other members of the URBAN GreenUP Consortium, especially front-runner and follower cities, or the Cluster of Cities. The first External webinar for WP6 and the Cluster of cities was held on the 26th November 2020 called “Vertical greening”, with stories from Valladolid and Singapour.
- Exchange of experiences and good practices with other cities on NBS. Some of the attended event-congresses are: Vitoria, Barcelona, Madrid, Zaragoza, Valladolid, Murcia.
- Visit to CARTIF Foundation facilities in Boecillo (Valladolid, Spain).

Academia:

Citizens:

Companies:

Cities/Local entities/region:

Figure 54: Citizen mentoring strategy (VAc42).

Interviews for doctoral students of several universities and technology centers along the world (Valladolid Univ., Texas Univ., RMIT, Sidney Univ., Aalborg Univ.)
Support to citizens with interest on NBS: gardeners, architects, landscapers.
Support to politicians with interest on NBS: local, regional governments, EU Parliament.
Support to companies with interest on replicate and collaborate with the URBAN GreenUP project.

Staff exchange among the Front-runner and Follower cities of the URBAN GreenUP project is held at the regular meetings of the Consortium. In this action, members of the WFs visit the RFs and participate first-hand in the experience gained by the RF staff in the implementation of the NBS. However, since the COVID crisis, no regular face-to-face meetings have been held, which complicates this activity.

4.6.2 Status

Implementation progress status is set on 60% "Stakeholder partnership established”. This action will continue until the end of the URBAN GreenUP project in Valladolid.

10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

5 Conclusions

Throughout the document, the progress made from the design of the actions to the implementation at the closing date of the document has been presented. For the evaluation of the progress, the information has been provided by the City Council of Valladolid updated to December 2020.

The following table summarizes the progress of the different technical actions shown in the document. At the closing date of this document, four procurement groups of technical NBS actions are considered fully delivered, the other five are under construction phase and six are on the procurement phase. One is still in project phase, whereas another is under review.

NBS	Implementation phase	Abstract	Percentage delivery
Floodable park	Cancelled	Available budget for other blue NBS.	0%
Sustainable park	Under review	Change from NWTP to detention basin. Management: Permitting plan CHD; CEN has no personnel costs. Synergies with Urban Waterbuffer project.	10%
Stormwater manag. systems	Project phase	First version of the project delivered by CEN (July 20). Legal requirements of the author: valid signature (Dec 2020)	< 50%
Cycle lane	Procurement of proposed works is underway	"Green corridor" project delivered by VAL (Aug 2020). Municipal Supervision ongoing. On the process of the preparation of the procurement documents. All the NBS will be tendered together (5 months).	60%
Resting areas			
Pollinator's mod.			
Carbon sink			
Green noise barriers		Project delivered SGR (Sep 20). Supervision asked for changes to the project (Nov 20). Project reviewed (Dec 20)	60%
EW	Tendering process ongoing	Construction project updated Oct 2020 by LEI, so municipal Supervision achieved. Working on the Agreement LEI-VAL (administrative). Works will start after the signature.	75%
Bio-filter	Works have started on site	Project delivered by CAR (June 2020). Tender process awarded. Contract formalized Nov 2020. Works ongoing.	80%
Urban orchard	Good progress with on-site delivery	Improvements in municipal orchards already implemented (drop irrigation). Composting facilities construction already implemented. Small scale livestock ongoing.	85%
Smart soils		Provider awarded on April 2020. Purchase of smart soil for *Trees* and *Green corridor* already finished. Soil for SUDs not purchased (2021)	85%
Trees		100% trees purchased -> Plantation autumn-spring.	85%
Green canopies		Works started on July 2020. Delays in the implementation, expected November. Current date: February 2021.	90%
Green roof	Works fully completed	Implemented on August 2020.	100%
Green façade		Implemented on June 2020.	100%
Mobile gardens		Implemented on March-May 2020.	100%
Covering shelter		Implemented on March 2020.	100%

Table 5.1: Progress on technical actions (summary December 2020).

The following graph represents the status of the implementation of the 36 technical NBS.

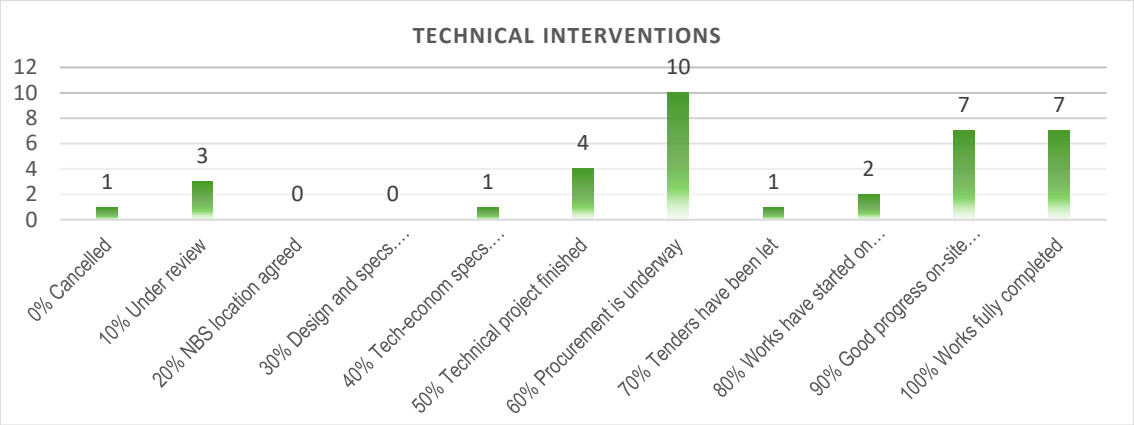


Figure 55. Status of the 36 technical NBS implementation (December 2020).

Regarding the non-technical actions reaches an 80-90% of execution, however, Covid-19 has delayed these activities temporarily as there are only essential face-to-face meetings.

Percentage delivery	NBS
80%	VAc37- Engagement Portal for citizen
80%	VAc38- Sponsoring activities
80%	VAc39- Promotion of ecological reasoning and intelligent
90%	VAc40- Single desk for RUP deployment
60%	VAc41- Support to citizen project of NBS
60%	VAc42- City mentoring strategy (Staff Exchange activities)

Table 5.2: Progress on non-technical actions (summary December 2020)