

# Seville

# Optimised Implementation Plan – CDW

**CityLoops Seville Cluster** 





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Abstract	This Optimised Implementation Plan explains how Seville will implement the tools and processes developed in the project preparation phase in its demonstration actions, and how relevant local stakeholders and CityLoops project partners will be involved.					
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## Seville's demonstration projects

Seville has three complementary demonstrations in CityLoops to make CDW handling more circular. Quality assessment and procurement guidelines will facilitate use of recovered CDW from water infrastructure works. Optimisation of municipal clean points will support citizens and small producers of CDW to deposit construction materials in a suitable site for further processing, thus avoiding dumping and landfilling of potentially recoverable materials. Finally, digital tools for both citizens and city managers will support data-driven decision-making and analysis of the sustainability impacts of pilot projects and policies, to see what impacts these have on CDW generation and citizen wellbeing.

# 1. Demo action 1: Renovation of water pipelines with circular material management

### **1.1. Short description**

EMASESA, as the public entity responsible for water and waste mater infrastructure and management in Seville, will undertake circular renovation of old water and sewage pipelines by recycling concrete, road surface, filling, and soil. The pilot focuses on water network infrastructures and the materials are concrete pipes, road surface, soil and filling material. The CDW quality and technical properties of the dug up pipes in the demonstration sites will be analysed and compared to required specifications, which must be met in order for the recovered material to be used again in construction. If it meets the quality standards, the CDW will be used to replace primary raw materials such as filling under the pavements in pipe replacement works and/or to improve soil quality in nearby municipal sites. The piloted material management approach will be incorporated into green procurement criteria that can be used in other similar public works, to ensure as much CDW as possible can be reused or recycled instead of dumped. EMASESA will work to engage construction stakeholders to mainstream the use of circular considerations in public contracts, and will also publish a practical guide for quality classification and handling of CDW according to the waste hierarchy.

## **1.2.** Activities

Activity	Timeline	Responsible partner
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Preparation - of tools and	Oct 2019 - Mar 2021 (M1-	EMASESA, with support
methods, identification and	18)	from IDENER
engagement with		
stakeholders.		
Procurement of demolition	Mar 2021 – May 2023 (M18-	EMASESA
contractors	M44)	
Demolition and construction	Mar 2021 – May 2023 (M18-	Demolition contractor,
works for substitution of	M44)	overseen/ contracted by
pipes		EMASESA
Transformation of materials	In parallel with demolition	Fermovert, overseen by
		EMASESA
Analysis of the results on	Sept 2022 – May 2023 (M36-	EMASESA, with support
procurement approach and	44)	from IDENER
development of best practice		
guidance on CDW		
classification.		

## **1.3. CityLoops tools/processes tested**

#### 13) Quality assessment of CDW

The quality assessment is a standard classification that aims to set a guideline in order to increase the amount of bids for public infrastructure projects that contemplate CDW valorisation. In spring 2021, using the tool developed, a pilot area will be selected to compare the performance of conventional raw material versus CDW, including the physical properties within different static and dynamic contexts. Through this feedback process, the Quality Assessment tool will be iteratively improved. The classification will be applied to demolition material from multiple pipe replacement sites. Based on the result, FERMOVERT, the waste treatment company, will treat the material accordingly so that it can be used as construction aggregates.

The tool can be seen here: <u>CityLoops Tool Factsheets</u>



# 2. Demo action 2: Optimising clean points

## 2.1. Short description

Digital tools have been developed to optimise the use of Seville's five clean points for collection of CDW from citizens and small producers. Data will be shown through a web portal, with one interface for citizens to instruct them to the clean point best suited to receive their CDW, and one interface for city managers to understand the quantity of CDW at each clean point and plan for future scenarios of city growth to open new clean points. Data collected on the stocks and flows of CDW through the cities' clean points will be used to continuously optimise their management. The collected CDW will be treated by FERMOVERT if need be, to ensure its safety and quality for further future uses. LIPASAM, the waste management company of Seville, plans to analyse the composition of the CDW collected in Clean Points, in order to evaluate the potential uses of the material recovered and be able to take decisions with the aim of recuperating costs for the clean points management and CDW treatment. Finally, an awareness campaign will aim to introduce these tools to the public and encourage proper handling of CDW, in order to avoid the common practice of illegal dumping of CDW.

## 2.2. Activities

Activities	Timeline	Responsible partner
Development of digital tools	Oct 2019 - Mar 2021 (M1-	IDENER
	18)	
Preparation and	Mar 2021 (M18)	LIPASAM
procurement of awareness		
campaign		
Launch and use of CDW	Mar 2021 – Sept 2023 (M18-	IDENER, supported by
optimisation tool, by citizens	M48)	LIPASAM
and by city managers		
Awareness campaign	May 2021 – Sept 2022 (M20-	1) Contracted
1) Prevention of illegal	M36)	communications consultant,
dumping		overseen by LIPASAM
2) Correct segregation and		2) EMASESA, supported by
management of CDW for		City Council of Seville,
large generators.		LIPASAM.
Analysis of the results	Sept 2022 – May 2023 (M36	LIPASAM, supported by
(potential measures to	– M44)	IDENER



implement	in	the		
management of	<sup>i</sup> clean j	points,		
future clean poi	nt expa	insion,		
etc.)				

## **2.3. CityLoops tools/processes tested**

#### 14) CDW flow optimisation tool

This software tool was developed by IDENER and will be piloted by LIPASAM to model different scenarios regarding waste transport and routes as well as optimal use, management and upscaling of the clean points. The objective is to improve the experience and increase the use of clean points for CDW by citizens and small producers like SMEs. Different scenario simulations will be used to plan for future city development and additional clean points. The nature of this tool and fact that clean points also receive other waste streams make it well suited for expansion to optimising management of other material types in the city of Seville.

#### 17) Awareness campaign on CDW management

One communication campaign targets citizens/ SMEs - focused on prevention of illegal dumping. It will accompany the launch of the digital tools (tools 14, 15, 16), so that users are aware and encouraged to use the tool to improve their experience using the clean points.

A second campaign targets large generators of CDW (construction/ demolition contractors) - focused on the correct segregation and management of CDW.

The tools can be seen here: <u>*CityLoops Tool Factsheets*</u>

# 3. Demo action 3: Data driven decision making and Best Practice Guidelines for CDW Management in Seville

### 3.1. Short description

IDENER has developed digital tools to integrate available data on environmental, economic and social development in Seville municipality in order to facilitate data-driven decision-making and better understanding of the impacts of policies and initiatives on citizen wellbeing, and to



ensure the city is on the right track towards the sustainable development goals. Citizens will also be able to access information about their waste generation, and how city initiatives are impacting a series of sustainability and wellbeing indicators.

A "city simulation" has been performed to estimate the impact of specific actions and policies on specified indicators including an analysis of the current population satisfaction. The digital tools are not only focusing on CDW, but analysis carried out during the inception phase by the City Council of Seville, EMASESA and LIPASAM are covering other areas concerning wellbeing and population satisfaction, such as sustainable public transport, management of urban trees, the wastewater management in the urban environment, and the collection of others waste fractions keys to improve the circular economy. These initiatives will be measured and monitored using the digital tools mentioned in order to understand how they impact in the wellbeing of the city and citizens. Based on that, the tools will fuel data driven decision making, where the city can determine and prioritize potential actions to improve wellbeing and population satisfaction as well as the Sustainability Goals. A report will explain how the wellbeing is calculated and how the data can be used for decision making process.

Based on the experiences in CityLoops demonstrations and the data visualised through the city simulation platform, best practice guidelines for construction and demolition waste management will be developed. These guidelines are expected to feed into a new Waste Management Plan for the city of Seville.

Activities	Timeline	Responsible partner
Development of wellbeing	Oct 2019 - Mar 2021 (M1-	IDENER
monitoring tool	18)	
Development of city	Oct 2019 - Mar 2021 (M1-	IDENER
simulation platform,	18)	
including integration of		
Seville's other digital tools		
Report explaining how	Sep 2021 – May 2023 (M24-	IDENER
wellbeing is calculated and	M44)	
how the data can be used for		
decision making processes		
Development of best practice	Mar 2021 – May 2023 (M18-	IDENER, with support from
guidelines for waste	M44)	LIPASAM, EMASESA and
management based on		Seville Municipality
experience of CityLoops		
demonstrations and		
analysed data		

## **3.2.** Activities



lf	after	analysis	it	is	Sept	2022	_	Sept	2023	LIPASAM, with suppor	t from
cor	nsidered	d appr	opria	ate,	(M36-	·M48)				IDENER, EMASESA	and
inc	orporati	on of le	earnir	ngs						Seville Municipality	
into	new W	aste Mana	igem	ent							
Pla	n for th	e municipa	lity								

## 3.3. CityLoops tools/processes tested.

#### 15) Wellbeing monitoring tool

This software tool will collect and analyse data on public services, public transportation, air pollution, CO<sub>2</sub> emissions, waste generation, and other circularity indicators (see Evaluation Plan) and find correlations to better understand the current wellbeing of the city and citizens, and based on this will determine potential improvements, e.g., to waste management practices. A "city simulation" has been performed to estimate the impact of specific actions and policies on specified indicators. This includes the execution of an analysis of the current population satisfaction. A methodology to standardise the wellbeing indicators has also been developed.

The tool will also have some data and visualisation available for citizens, to engage them in more circular behaviour and inform them of forthcoming city initiatives, such as new separate waste collection routes. The interface for city managers will also be used to update data, evaluate results for prioritising and planning, and simulate some actions or improvements, in order to see how changes may impact the wellbeing of the district/ city.

#### 16) City simulation platform

IDENER has developed a central virtual platform to host all of the software tools developed in Seville for CityLoops and the open data generated within the project. The digital platform will be used by citizens as a source of information and also by local government partners to help decision making processes. This platform will improve data exchange between the partners of the city and enable dialogue about the potentials of urban development concerning the handling of CDW and soil beyond formal governmental organisations. The idea is to arrange dialogue events, but it is uncertain when this can take place due to Covid. For now the platform will be used for dissemination events. The results will also be used to inform a new municipal waste management plan.

The tools can be seen here: <u>*CityLoops Tool Factsheets*</u>



# 4. Expected outcomes evaluation

The expected outcomes of CityLoops demonstrations include:

- 2-3 sites in which underground pipe replacement was carried out with recycling of unearthed CDW,
- Local re-use of CDW and/or soil for combined climate-adaptation and recreational purposes by FERMOVERT, using material from public construction projects, and
- Reduced illegal dumping and abandonment of CDW and increased reused and recycled CDW, due to the awareness campaign and improved management and use of clean points.

In the future, circular procurement will be a standard in all of EMASESA's projects, and demand for reuse and recycling of construction and demolition waste will be a central focus point in the tender process. It is expected that the municipality will be able to calculate the environmental effect of different CDW actions and waste management approaches through tools developed in CityLoops. The wellbeing of citizens will inform city decisions on service provision, including waste management. Finally, a new Municipal Waste Management Plan will incorporate circular principles based on the best practice CDW Management Guidelines produced in CityLoops.

Further information on Seville's demonstrations can be seen at: <u>https://cityloops.eu/cities/seville</u>

## 5. Planning & Decision Making Guidelines

Experiences from the process on CDW valorisation and recycling will feed into the CityLoops guidelines. The CityLoops planning and decision-making guidelines will be tested in Seville in the development of new Guidelines for CDW management which could feed into a new Municipal Waste Management Plan. They will also be used in future construction projects.

Factsheet for Planning and Decision Making Guidelines



# 6. Business Cases

FERMOVERT is in charge of the transformation and selling of CDW in Seville. Potential valorisation options to reduce the landfilling of CDW will be evaluated, taking into account the placement of treatment plants. This will also define the characteristics that such CDW must fulfil in order to be used in construction works.

A business case will be prepared according to the template prepared in CityLoops, e.g., assessing the possibility of reusing CDW as filling elements in EMASESA's construction works.

Factsheet for Business Cases

## 7. Risks

Potential risk	Mitigation approach
If large amounts of pollution are found in the	There are many ongoing pipe replacement
materials surrounding the pipelines, it may	projects, so another alternative site can be
prevent their recycling, or limit the potential	chosen as a demonstration. Separation of
future use to low-value options.	material at site can support that non-polluted
	materials can be revalorised higher in the
	waste hierarchy.



CityLoops is an EU-funded project focusing on construction and demolition waste (CDW), including soil, and organic waste (OW), where seven European cities are piloting solutions to be more circular.

Høje-Taastrup and Roskilde (Denmark), Mikkeli (Finland), Apeldoorn (the Netherlands), Bodø (Norway), Porto (Portugal) and Seville (Spain) are the seven cities implementing a series of demonstration actions on CDW and OW, and developing and testing over 30 new tools and processes.

Alongside these, a sector-wide circularity assessment and an urban circularity assessment are to be carried out in each of the cities. The former, to optimise the demonstration activities, whereas the latter to enable cities to effectively integrate circularity into planning and decision making. Another two key aspect of CityLoops are stakeholder engagement and circular procurement.

CityLoops runs from October 2019 until September 2023.





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