

Replicate

Final conference



Donostia/San Sebastián

26th March 2021



donostiasustapena
fomentosansebastián



This project has received funding from
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DONOSTIA/SAN SEBASTIÁN LIGHTHOUSE CITY – Project Results and Impacts

Nora Mendoza, Fomento San Sebastián

BLOCK I: SUCCESSFUL CITY MODELS FOR TRANSFORMATION OF DISTRICTS

REPLICATE Project

REPLICATE

REnaissance of **PL**aces with **I**nnovative **C**itizenship **A**nd **T**echnology.

VISION

To increase the quality of life of citizens across Europe by demonstrating the impact of innovative technologies used to co-create Smart City services for citizens and to test the optimal process for replicating successes in cities and across cities

SCC1 SMART CITIES LIGHTHOUSE

CALL: SCC-01-2015 - Smart Cities and Communities solutions integrating the energy, transport and ICT sectors through “lighthouse” projects (large scale demonstration projects)



REPLICATE Project

COORDINATOR Fomento de San Sebastián (38 partners)

- 3 lighthouse cities: Donostia/San Sebastián, Florence, Bristol
- 3 fellow cities: Essen, Lausanne, Nilüfer

BUDGET

- € 29.3 million

5-YEAR PROJECT (60 MONTHS)

- Y1-Y2-Y3 Implementation
- Y4-Y5 Monitoring
- Start date: 01/02/2016



Donostia / San Sebastian, Florence and Bristol have collaborated before up to 2015 in the project STEEP-Systems Thinking for Comprehensive City Efficient Energy Planning

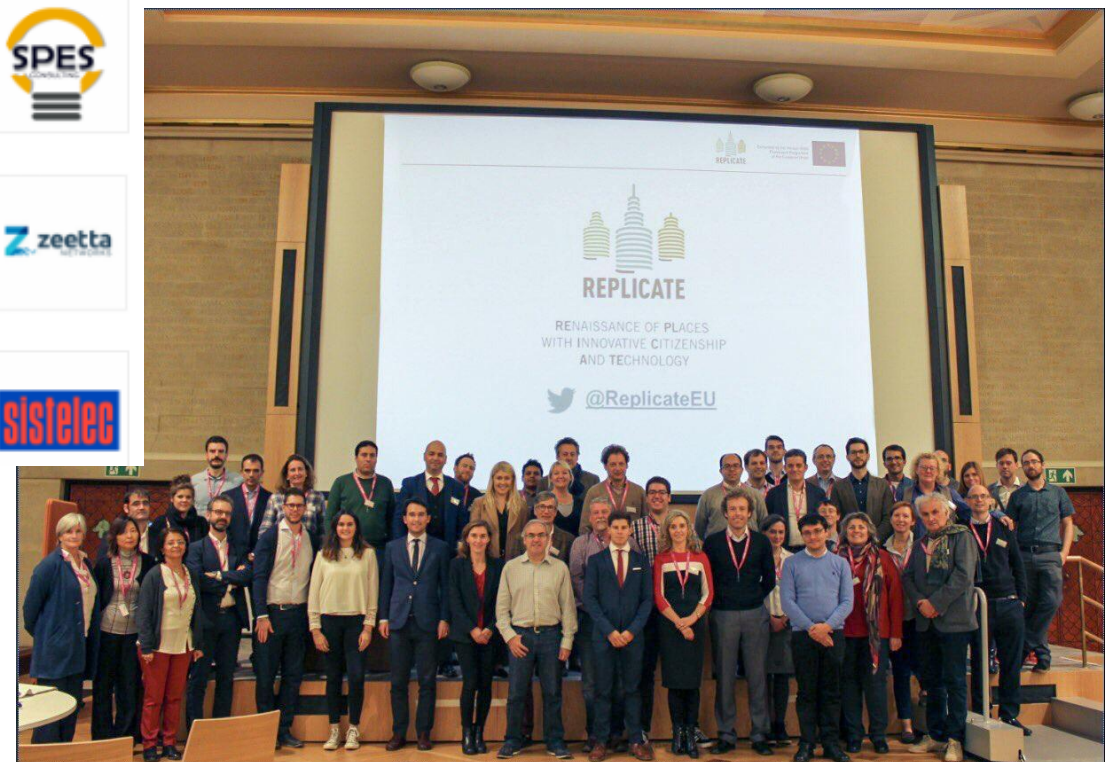




REPLICATE Consortium



Project Team





REPLICATE Project

Donostia / San Sebastian Lighthouse City/ Urumea Riverside District

OVERVIEW

District close to zero emissions: district branding in sustainability

- Residential area (Txomin, Antzieta, Martutene) + Industrial park (Polígono 27) + Nature park (Ametzagaina)
- Surface area: 200 hectares
- Industrial park: 350 companies + 4500 people
- Nature park: carbon reservoir

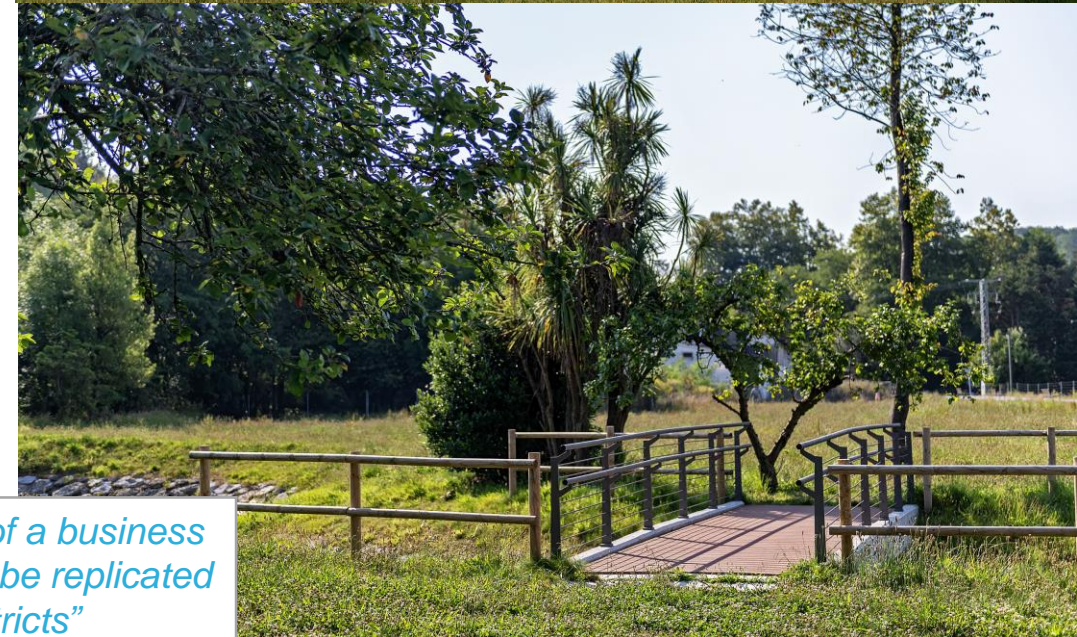
Comprehensive strategy for a smart district

To improve transition to smart city in three areas:

- Energy efficiency
- Sustainable mobility
- ICT & infrastructure



“Development and validation of a business model for a sustainable city to be replicated in other towns and districts”





Smart Txomin / Transformation of a District

PAST

- Urumea River: the backbone of the area and subject to flooding
- Developed in the middle of the 20th century: inefficient buildings, connection problems
- Location for industry, a prison, a sewage treatment plant, etc.



TRANSITION TO A SMART DISTRICT

- Smart City Plan
- Energy Master Plan Urumea. Pilot Action Plan (REPLICATE)
- Special Urban Plan (2018)
- Implementation of Smart City Project
- One of the last great urban developments in the city
- Space for experimentation and pilot projects
- Smart Donostia Strategy and Projects



Txomin year 2014



District transformation



Smart Txomin / Transformation of a District / From planning to implementation

Implementation of different activities with an integrated vision in order to:



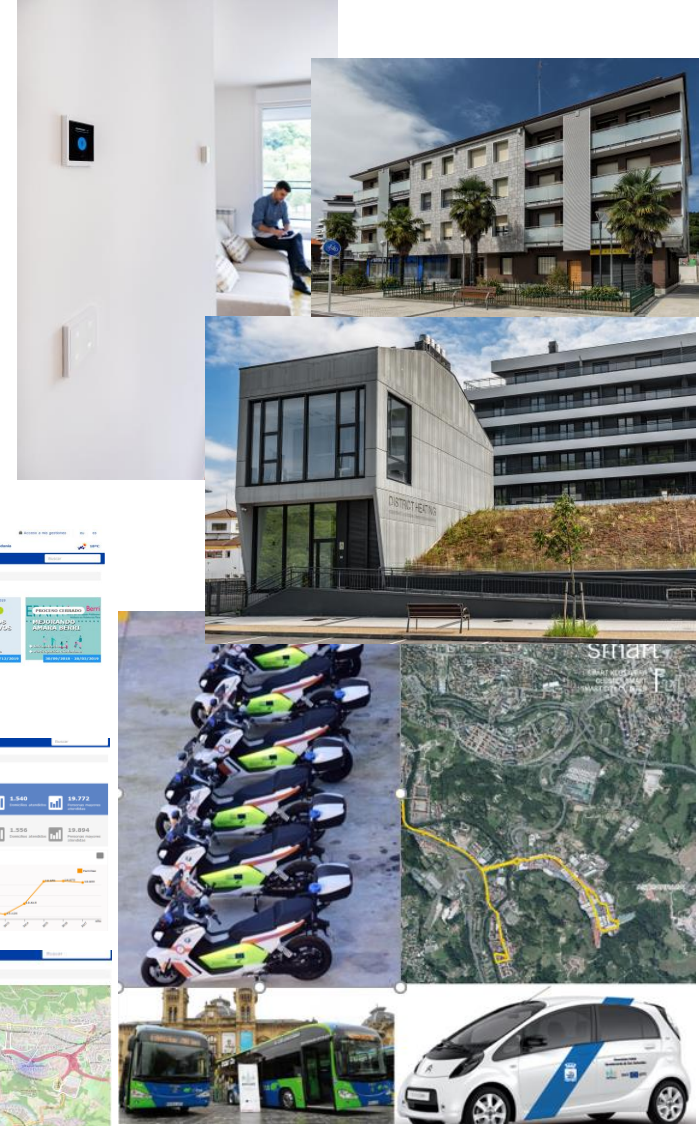
Increase resource and energy efficiency, use more renewable sources of energy to boost local resilience, reducing greenhouse gas emissions in urban areas



Foster the sustainability of the urban transport, improving the connection of the district to the city centre in terms of mobility



Develop several ICT tools and IP services to improve city management and foster citizen participation through open data and implement smart infrastructure and connectivity interventions to generate a complete smart district





REPLICATE/ Energy efficiency actions



BUILDING RETROFITTING

Energy renovation of established housing and connection to District Heating
156 households + 34 commercial premises in 10 doorways

ACTIONS

- Insulate roofs
- Insulate façades using ETIS (External Thermal Insulation Systems) and ventilated façades system
- Change windows for windows with thermal break and low-emissivity glass with argon gas that reduces heat loss and noise
- Provide the necessary pipework for the heating network

BENEFITS

- Improved comfort
- Connection to District Heating (DH): heating and domestic hot water
- Reduction in CO2 greenhouse gas emissions 95.85 Tn/CO2 per year (45,5 Tn from the refurbishment and 50,45 from the DH) and energy savings
- Noise reduction and increased efficiency
- Improvement of the energy rating
- Buildings with homogeneous aesthetics integrated with newly built homes
- Revaluation of housing





REPLICATE/ Energy efficiency actions

DISTRICT HEATING

Centralised thermal energy system for domestic hot water and heating for 1,389 new homes and 156 retrofitted homes



Municipal Ownership through Fomento de San Sebastian with a public private partnership business model

ACTIONS

- Thermal energy generated centrally and distributed via a network of pre-insulated steel pipes with hot water to each building
- The central unit has a power of 7,400 kWh, with 2 biomass boilers of 1,400 kWh and 2 gas boilers for peak demand
- Each building has a second network to each consumption point that allows its use as in an individual installation, with the advantages of centralised production

BENEFITS

- Improved comfort
- Lower risks as there are no combustion elements in the building
- Sustainability guarantee: biomass of nearby forest origin
- User-friendly monitoring platform for citizens
- Reduction in CO2 greenhouse gas emissions
- 97-99% of biomass use during coldest months in 2020





REPLICATE/ Energy efficiency actions

DEMAND SIDE PLATFORM

Tool to enhance end user energy consumption awareness and increase the energy producer's management and knowledge



ACTIONS

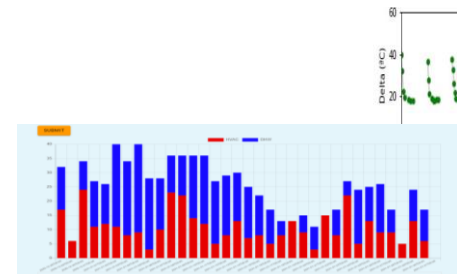
- DSP objectives:
 - Enhance end user energy consumption awareness supported by usage profiling and deliver particularized energy saving hints to promote behavioural changes
 - Increase the energy producer's (DH operator) management and knowledge about real end-user's energy needs by means of consumption type (HVAC heating – DHW Domestic Hot Water) distinction and day ahead energy demands forecasts

Main functionalities of the DSP

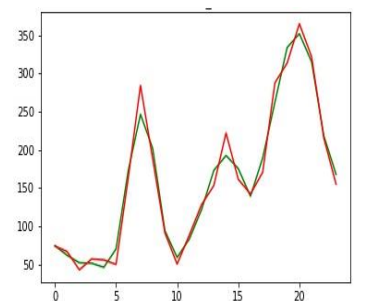
- Benchmark: Daily and weekly dwellings consumption profiling (clustering)
- Consumption patterns
- Challenges for weekly savings in energy consumption
- HVAC (Heating) & DHW (Domestic Hot Water) consumption split
- Global energy consumption and station based forecast (day ahead)

BENEFITS

- Tool for residents and DH operator
- New services that the usage of the Machine Learning is able to generate
- Solution did not require installation of additional sensors (discrimination of heat and hot water through algorithms)



HVAC (Heating) & DHW (Domestic Hot Water) consumption split



Global energy consumption forecast (day ahead)





REPLICATE/ Energy efficiency actions



SMARTHOMES

Social housing in Txomin - 11 blocks with 162 homes and 2 pilot homes

ACTIONS

- Minimum energy demand - built with Passivhaus criteria and Renewable energies
- Integrated technological solutions for:
 - ✓ Building managers - to optimize the management and maintenance
 - ✓ Occupants/residents - to optimize the usage of resources, increase awareness and achieve economic savings
- Building level monitoring and SmartHomes level monitoring (non-intrusive)
- Management platform - 3 displays:
 - ✓ SCADA (Supervisory Control And Data Acquisition)
 - ✓ Platform for tenants
 - ✓ Public web



BENEFITS

- Knowledge generator: transfer positive results and success stories to the neighbourhood, other districts and other cities
- Monitoring to improve and boost energy efficiency
- Environmental sustainability



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REPLICATE/ Sustainable mobility actions



ELECTRIC BUSES

2 electric buses to connect the district (Urumea Riverside District) with the city center and 2 charging stations

ACTIONS

- One of the most demanding experiences a electric bus has ever experienced
- Electric buses have been tested in extreme conditions
- Performance has been improved (capable of doing 210km a day during 5 consecutive days)
- Municipal bus fleet renewal process → Objective:
 - 90% of the 12 meters bus fleet in a hybrid-electric fleet in the next three years
 - 100% of the bus fleet hybrid or electric by year 2030

BENEFITS

- Noise reduction
- Users value positively the effort from the Municipality to be more efficient
- Demanding experience, valuable lessons learnt
- CO2 emissions reduction:
 - ✓ 473,06 Tn/CO2 since July 2016
 - ✓ 173 Tn/CO2 per year 2 electric buses & 240 Tn/CO2 3 electric buses and hybrid buses in Lines 26 and 21





REPLICATE/ Sustainable mobility actions

MUNICIPAL ELECTRIC FLEET

4 electric vehicles for maintenance, 6 electric motorbikes



ACTIONS

- 4 electric municipal vehicles and charging (infrastructure), few technical maintenance activities
- 6 electric motorbikes (4 other e-motos out of REPLICATE), good performance

BENEFITS

- Noise reduction – improvement of quality of life
- Fewer maintenance activities
- CO2 emissions reduction:
 - ✓ 39 Tn/CO2 since February 2016 EV and February 2018 e-motos
 - ✓ 18 Tn/CO2 per year





REPLICATE/ Sustainable mobility actions

PRIVATE ELECTRIC VEHICLES

6 electric taxis



ACTIONS

- Agreements for data provision with 6 e-taxis
- Collection of quantitative and qualitative data:
 - ✓ Surveys to taxi users
 - ✓ Application for mobile devices to gather info. Daily information gathered

BENEFITS

- Noise reduction
- Taxi drivers and users satisfaction
- Gradual change to electric vehicles expected
- CO2 emissions reduction:
 - ✓ 69,63 Tn/CO2 since February 2019
 - ✓ 38 Tn/CO2 per year



Nuevo informe

Consumo medio (kWh)

Kilómetros totales (Km)

Kilómetros recorridos (Km)

Velocidad media (Km/h)

Capacidad batería (opcional)

Recargas intermedias (kWh)

Recorrido urbano 0%

Fecha del informe

Enviar informe

Usuario

Ter apellido (todo en minúsculas y sin acento)

Contraseña

Introducir password

Entrar

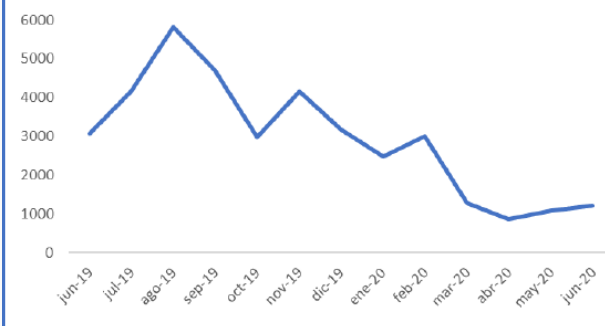
☒ Guardar credenciales

Sobre este proyecto:

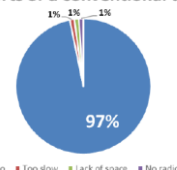
REPLICATE. Renaissance of Places with Innovative Citizenship And Technologies. H2020-SCC-2015. Grant agreement ID: 691735

donostia san sebastián

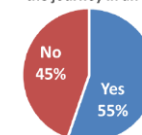
© 2018 Copyright: Tecnalia



Have you noticed any lack of the comforts of a conventional taxi?



Did you realize that you have made the journey in an EV?





REPLICATE/ Sustainable mobility actions

SMART MOBILITY PLATFORM

Smart mobility platform deployment



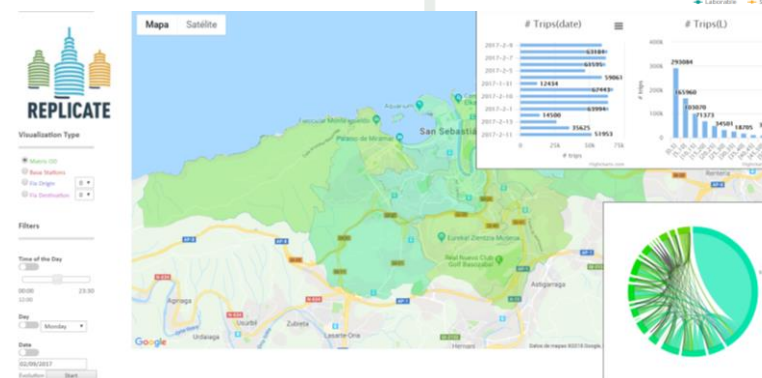
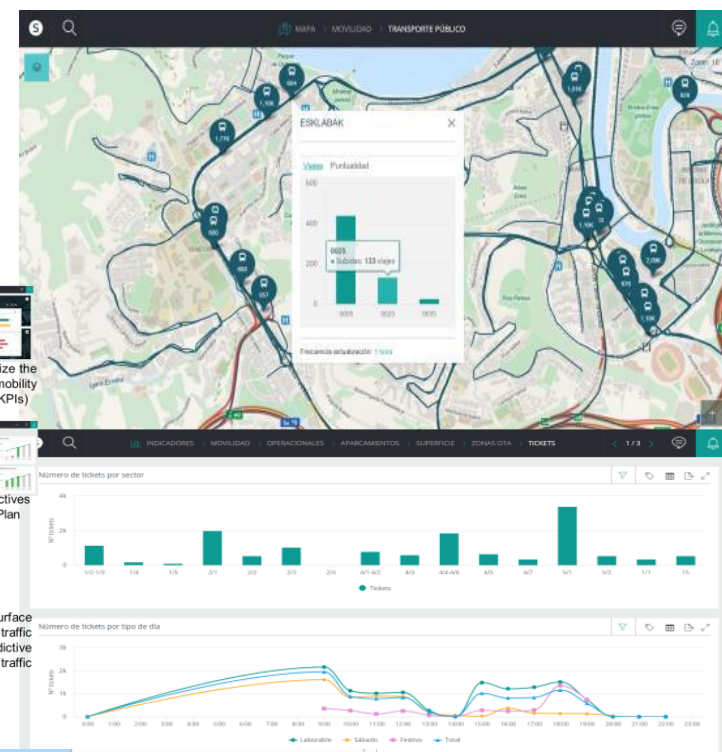
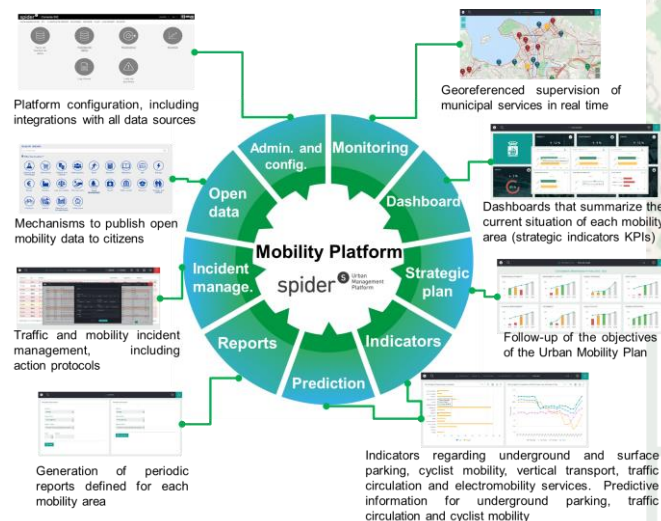
ACTIONS

- Indicators in the Smart Mobility Platform to manage the services of private and public bicycle, circulation and traffic, underground parking, public transport and electromobility
- Real-time georeferenced monitoring and supervision functionalities
- Dashboards, indicators, urban mobility reports and statistics related to the services

DEVELOPMENT OF SERVICES FROM MOBILITY DATA

Aggregation of the characterization of urban mobility based on operational information from mobile network company

- Aggregated and anonymized information from traffic and pedestrian movements across the cities





REPLICATE/ ICT- Infrastructures actions

SMART CITY PLATFORM

Smart City platform deployment and integrated services

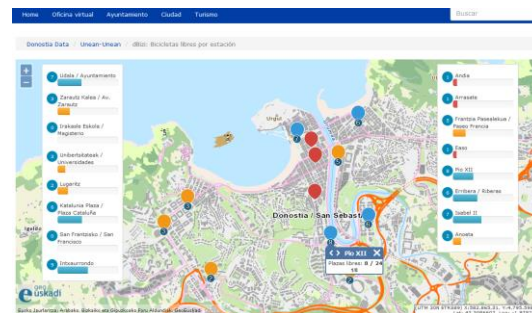
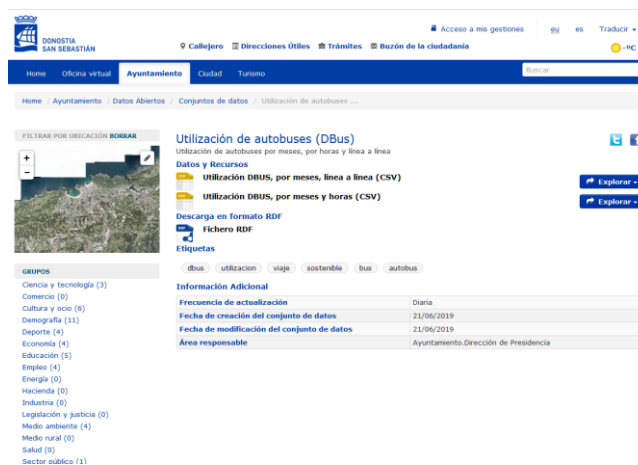


ACTIONS and CHARACTERISTICS

- Deployment of a Smart City Platform
- Friendly interfaces for consultation
- Data analysis based on business intelligence
- Dashboards for municipal staff
- Open Portal for citizens
- Data sources integrated: Municipal management databases, public bus information, smart lighting, Covid-19 related data, among others

BENEFITS

- Improve municipal management
- Increase transparency
- New data integration and additional services development



Donostia data

Observatorio COVID-19: Donostia/San Sebastian en datos

Cómo afecta a la economía, a las ayudas sociales, al medioambiente, a la movilidad...

Unean-unean

¿Sabes cuántas bicicletas libres hay en el Boulevard?
¿Necesitas venir en coche y te interesa saber la ocupación de los parkings y tráfico?



Más información útil para el día a día

Fotografía de la ciudad

¿Sabes cuántas bicicletas circularon el año pasado por nuestros bide-gorris?
¿Alguna vez te has planteado conocer tu ciudad en cifras?



Más información global de la ciudad

Transparencia municipal

¿Quieres saber cuáles son los ingresos y gastos del Ayuntamiento?
¿Sabes cuáles son las obras públicas en vigor?
¿Conoces los diferentes procesos participativos?



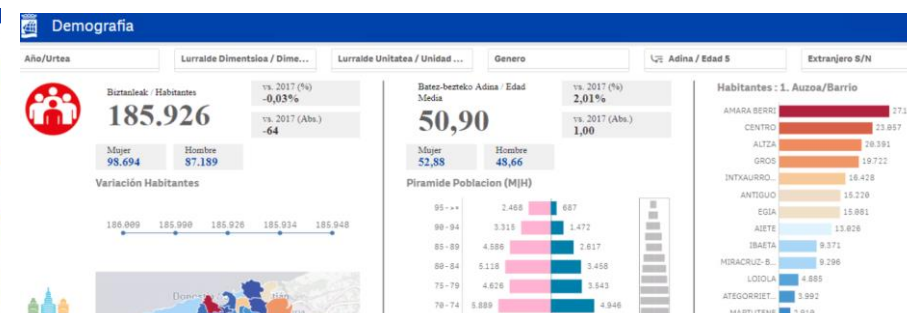
Más información de Transparencia municipal

Open Data - Datos Abiertos

El Ayuntamiento de Donostia / San Sebastián aumenta su transparencia poniendo los datos públicos en formatos digitales, estandarizados y abiertos a tu alcance.



Más información sobre Open Data - Datos Abiertos





REPLICATE/ ICT- Infrastructures actions

SMART CITY PLATFORM

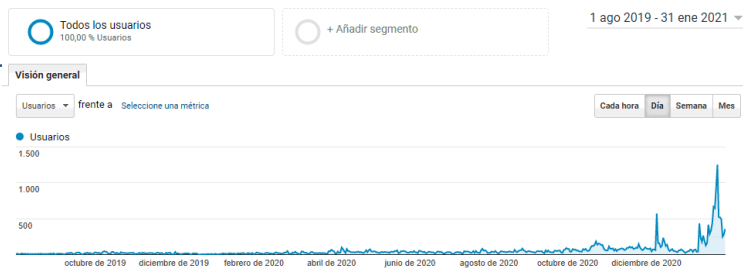
Smart City platform deployment and integrated services

Connected data in the Platform

- 7 Real time data sources
- 8 DDBB data sources
- 3 External data source

Replicate integrated data: **360.768.494**

Public e-bikes	5.872.972
Surface Parkings	10.006.338
Underground Parkings	9.338.811
Municipal buses	128.241.244
Mobility data	87.869.184
Traffic loops	106.469.945
Smartlighting	13.000.000



Open Data:

From August 2019 to January 2021:

- Published Datasets: 210
- Nº visits 31.323
- Nº Page views 100.613

Donostia Data:

From August 2019 to January 2021

- Nº visits 5.091
- Nº Page views 45.544

Federated Data (LOD):

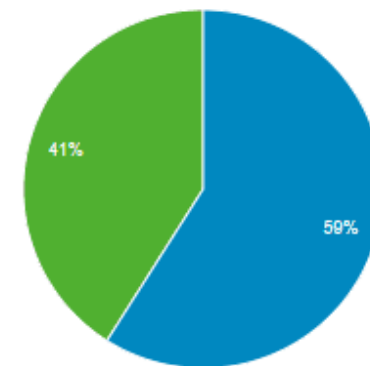
opendata.euskadi.eus

[Datos.gob.es](https://datos.gob.es)

europeandataportal.eu



■ New Visitor ■ Returning Visitor





REPLICATE/ ICT- Infrastructures actions



CITIZEN PARTICIPATION PLATFORM

Citizen participation platform

ACTIONS and CHARACTERISTICS

- The platform has a public and a private part
- Processes are divided in different phases
- Four participative processes have been launched

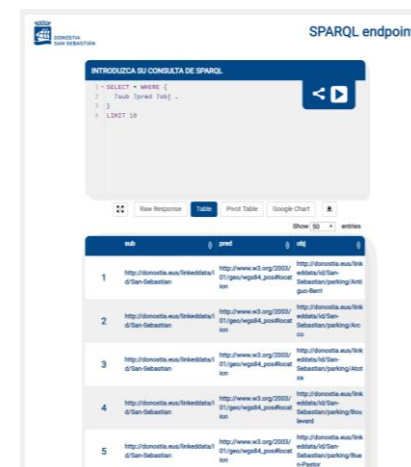
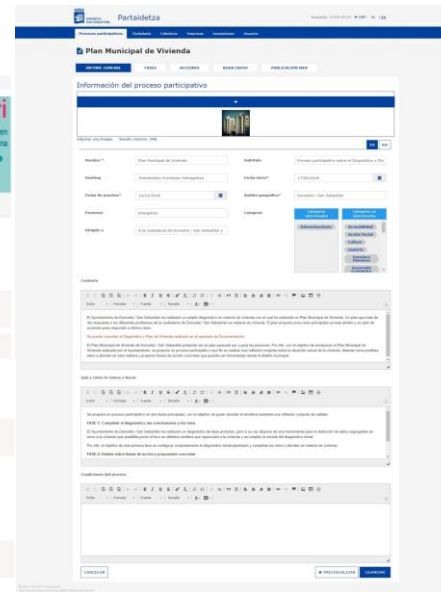
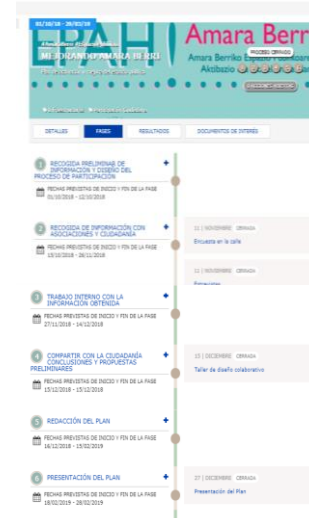
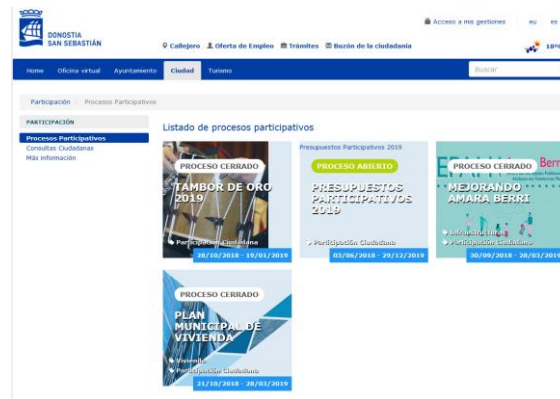
BENEFITS

- Increase of citizen involvement in Municipal decisions
- The platform has been deployed in other Municipalities and institutions

LINKED OPEN DATA

Publication of data in Linked Open Data format

- Publication of structured data from the city of San Sebastian to interconnect with other data available from other cities
- San Sebastian OpenData portal is federated with the OpenData portals of Spain (datos.gob.es) and Europe (europeandataportal.eu)



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REPLICATE/ ICT- Infrastructures actions



HIGH SPEED MOBILE NETWORK

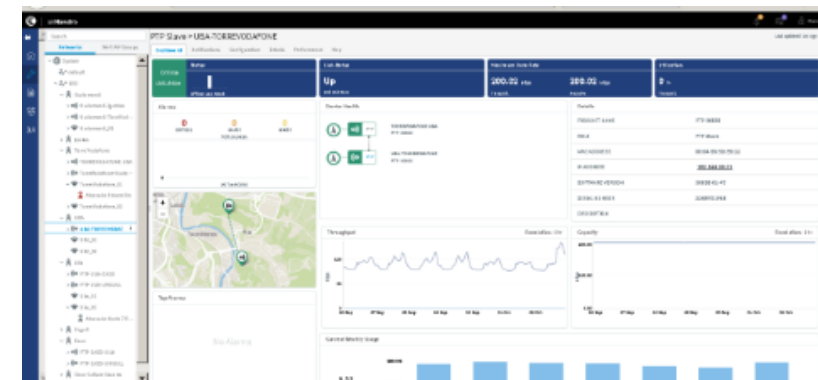
A wireless communication network throughout the Urumea Riverside District deployed

ACTIONS and CHARACTERISTICS

- Support of the connectivity of the district with the entire city
- The communication backbone network has been equipped (reliable service)
- Services divided in two:
 - ✓ Txomin - Martutene: Traffic Light regulators, Control post of the Municipal Police, Videosurveillance cameras, Flood light for Civil Protection
 - ✓ Industrial area P27: Subscribers for access in the whole area to the municipal Wi-Fi network

BENEFITS

- Network capacity and security increased
- High levels of availability and operativity
- Automated updates of network devices
- Permanent monitoring





REPLICATE/ ICT- Infrastructures actions



PUBLIC SMART LIGHTING

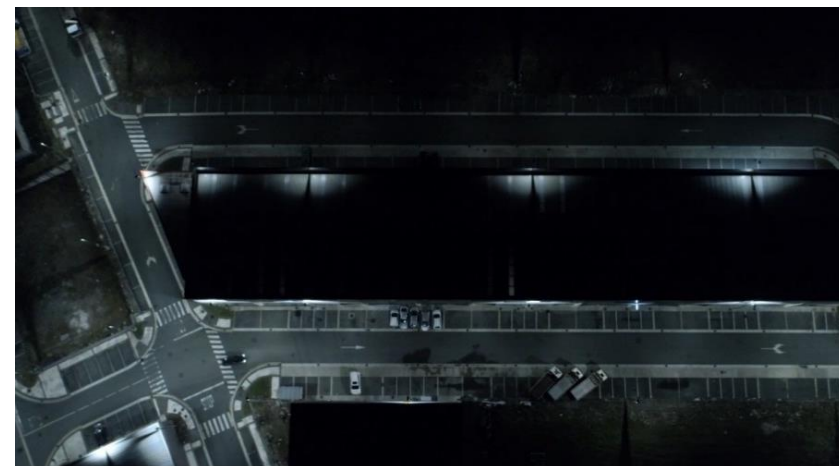
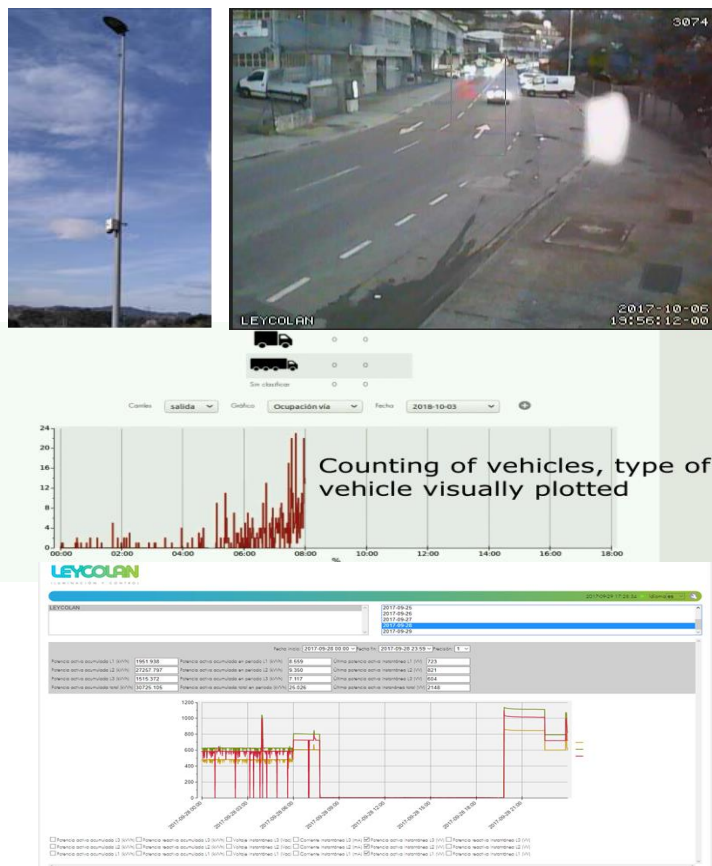
Intelligent Public Lighting system and IP services in Poligono 27

ACTIONS and CHARACTERISTICS

- Replacement of 90 sodium-vapour luminaries with LED technology and detections systems
- Intelligent systems and IP services
 - ✓ Vision cameras
 - ✓ Audio IP
 - ✓ Rain sensor
 - ✓ Vehicle counter

BENEFITS

- Savings in energy consumption and emissions reduction
 - ✓ 69,2 Tn/CO2 since January 2017
 - ✓ 20 Tn/CO2 average per year
- Reduction of electricity and maintenance costs
- Management of the system- adaptable to real needs
- Security of the area increased
- The product is being commercialised in other cities and countries





REPLICATE/ Citizen engagement and Communication and Dissemination Activities



Kick of meeting in San Sebastian 2016



Working groups



Videos



Flyers



Study Visits



Meetings with neighbors



Pilot meetings



BCN Smart City Expo



More than 1.500 Communication and dissemination activities

(by all the consortium)

Impacts on more than 12,8 Mill. people (by D&C activities of all the consortium)

www.replicate-project.eu

info@replicate-project.eu



@ReplicateEU



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REPLICATE/ IMPACTS

INCREASE OF QUALITY OF LIFE

Citizen engagement

Comfort housing

CO2 emission savings

Improvement of public transport service

Noise reduction

Increase of the “green image” perception of the citizens

Increase of transparency

Citizens involvement in municipal decisions

Better connectivity

Security improvement

Job creation





REPLICATE/ IMPACTS

EMISSION REDUCTION

- A total reduction of **1841 Tn/CO2** obtained from the different initiatives (during project lifetime):
 - ✓ District Heating (773 households): 1122 tCO2 reduced
 - ✓ Retrofitting (156 households): 68,11 Tn/CO2 reduced
 - ✓ 2 e- buses: 473,09 tCO2 reduced → 3 e-buses 606,53 tCO2
 - ✓ 4 e-cars: 22,09 tCO2 reduced
 - ✓ 6 e-motorbikes: 16,49 tCO2 reduced
 - ✓ 6 e-taxis: 69,63 tCO2 reduced
 - ✓ Public Lighting : 69,8 tCO2 reduced

ACHIEVED

- A total reduction of **793,34 Tn/CO2** per year obtained from the different initiatives:
 - ✓ District Heating (773 households): 500 tCO2 reduced
 - ✓ Retrofitting (156 households): 45,5 Tn/CO2 per year
 - ✓ 3 e-buses 173 tCO2
 - ✓ 4 e-cars: 9,5 tCO2
 - ✓ 6 e-motorbikes: 6,5 tCO2 reduced
 - ✓ 6 e-taxis: 38 tCO2 reduced
 - ✓ Public Lighting : 20 tCO2 reduced

PER YEAR



REPLICATE/ REPLICATION AND SCALABILITY

TRANSFORMATION OF THE DISTRICT

- ✓ Project to promote the transformation of the Txomin district into a smart district
- ✓ Additional complementary actions are being implemented in the district itself, which help towards developing and consolidating Smart Txomin

REPLICATION AND SCALABILITY POTENTIAL

- ✓ The project is being scaled up and replicated in other neighbourhoods and at a city level thanks to the lessons learned from REPLICATE and its successful stories
- ✓ Example of success for other cities

SOLUTIONS EXPLOITATION

- ✓ Opportunity for the partners to test and implement solutions for products/services that were in a pre-market phase (at the beginning of the project). Opportunity to develop these products/services and to market the solutions in other cities
- ✓ Exploitable results: solutions deployed under REPLICATE project in LC San Sebastian are already being commercialised by pilot industrial partners (Eurohelp, Sistelec, Leycolan)



REPLICATE/ CONCLUSIONS

Donostia / San Sebastian Lighthouse City « Development and validation of a sustainable City Business Model to be replicated in other cities and districts »

- A Lighthouse project **successful adventure** at all levels (city level, local partners, consortium, other lighthouse projects and Europe)
- Urumea Riverside District: a **reference smart and sustainable** district, district **branding in sustainability** and **quality of life for citizens** (energy efficiency and reduction of greenhouse gas emissions, sustainable mobility, city management improvement and foster citizen engagement and participation)

European Commission Vice President Maros Sefcovic visit to San Sebastian pilot district





REPLICATE/ CONCLUSIONS



- Integrated innovative solutions implemented and monitored for a real district transformation



- Competitive improvement opportunity for local companies (Replicate team partners): new products and services, real and monitored testbed in a lighthouse city, exploitable results, qualified employment



- In scalability and replication process. Smart cities and implemented solutions continue beyond REPLICATE

- **Covid-19 period:** opportunity to take advantage of developed solutions (monitoring and open data). Minimal general affection except in public transport use

Donostia / San Sebastian Lighthouse City
« Development and validation of a sustainable
City Business Model to be replicated in other
cities and districts »





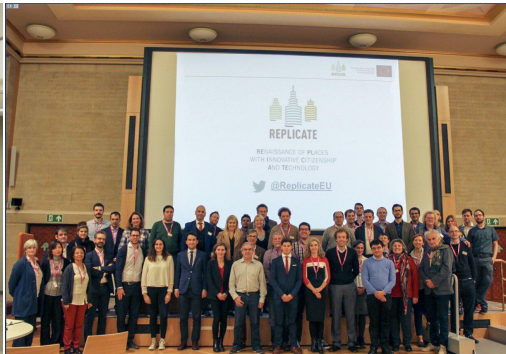
REPLICATE/ CONCLUSIONS



- Share experiences, difficulties and solutions between cities and with expert partners
- Transversal work to speed up and boost the replication process
- Consortium experts transversal support in monitoring, business models, cross-cutting, etc.
- Meetings, visits, City-to-City Learning

Donostia / San Sebastian Lighthouse City
« Development and validation of a sustainable
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DESARROLLO ECONÓMICO DE SAN SEBASTIÁN
DONOSTIAKO GARAPEN EKONOMIKOA
SAN SEBASTIAN ECONOMIC DEVELOPMENT



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See you soon!

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26th March 2021



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