

SMART GREEN

According to the latest United Nations' forecasts, 70 % of the global population will live in cities by 2050. This fact has promoted the development of Smart Cities (or sustainable cities), that have the ultimate goal of offering management solution to the main environmental services and systems of a city, making the most of the opportunities offered by ICTs.

In this sense, SICE proposes solutions for the control of urban environmental pollution, weather control, waste management and water consumption control through smart irrigation systems, all of which is included within its **SMART GREEN** vertical.

In regard to the problems of environmental pollution, SICE's solution provides control of the monitoring of air quality parameters to be controlled, which provides the administration the necessary information to adopt solutions that seek to reduce the concentration of pollutants.

In regard to Municipal Solid Waste (MSW), improving the garbage collection service and, in general, the achievement of a more efficient waste management, which is one of the main challenges cities are currently facing. The goal of SICE's MSW smart management system is to manage and improve the quality of the waste collection service, integrating sensorization elements and management software in the existing infrastructure.

SICE's smart irrigation system allows to manage the programming of the irrigation of green areas considering the weather conditions, which results in better water management.

All of these solutions are integrated in **KALIOPE**, the integrated management platform for all the smart systems of a territory designed by SICE, based on Quality of Service (QoS) indicators that are easily measured and support the decision-making process, which is capable of establishing active communication channels with the citizen and enables the improvement of the coordination and efficiency of the services rendered.

KALIOPE thus becomes the core and fundamental piece that integrates all the services and systems of each project.

SMART CONCEPT BY SICE

SICE's new SMART CONCEPT seeks to break down the barriers of smart cities and commit to a broader concept, providing this same intelligence to a group of municipalities, a region, a community or even, in the future, a country. In short, regions or territories sharing common characteristics, their own identity, or certain elements or ties that bring them together somehow. These ties could be tourism, a shared natural environment, the same social strategy or structure, etc.

Many of the proposals included in SICE's **Smart Concept** have been implemented and have been providing services to citizens for a long time. The current goal is to provide these services with more intelligence and, above all, interconnect them with the goal of achieving sustainable development.

SICE has been developing and applying these technologies for years, thus becoming a benchmark pioneering company in the Smart concept.

AIR QUALITY

This air quality surveillance and information system measures data on concentrations of gases, particles and meteorological data and provides real-time information on the current state of air quality.

The system consists of monitoring stations that acquire the concentration values of air pollutants: NO_x, SO₂, CO, O₃, BTX, particulate matter (PM10 and PM2.5), VOCs, etc., weather parameters and noise levels.



Air quality information is provided to the public through different channels:



- Website
- App
- Changing information panels
- SMS messages
- etc.

SICE also integrates surveillance networks with mathematical simulation models for short-term analysis and prediction.



Real-time surveillance of the concentration values of environmental pollutants enables the establishment of protocols of action in the case of alarms for high pollution levels.

PARKS AND GARDENS

Smart irrigation management system, which allows monitoring of water consumption and management of irrigation programs in parks and gardens.

Thanks to the data obtained by the field sensors (humidity levels, salinity, temperature, wind speed, etc.) and the visualization and analysis of this information in real time, it is possible to optimize irrigation programs, which implies energy and water savings.

This system also allows the detection of possible breakdowns and leaks.

WASTE MANAGEMENT

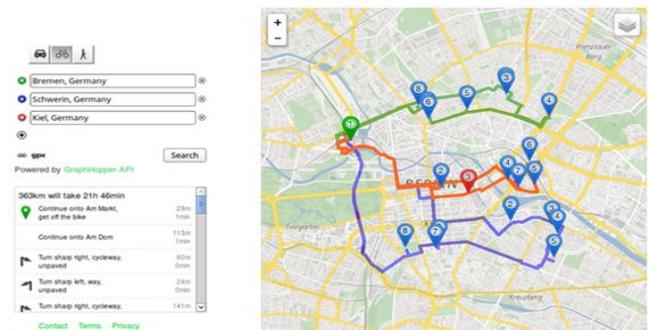
Smart Municipal Solid Waste (MSW) management system, which integrates everything from collection and transportation to treatment.

This system includes volumetric sensors in the waste containers, which record in real time their fullness.



The system analyzes data, based on needs, in order to increase or decrease the frequency at which they come by depending on the capacity and condition of the containers.

It also allows to optimize the waste collection routes, which positively impacts the efficiency of the waste transport operations and the reduction of CO₂.



This improvement in the service management results in lower maintenance costs.

Programa	Estado	Agua	Repar	Estado	Temperatura	Humid	Salinidad	Velocidad
28820001	Programador 1 - Camino de Las Flores 1.0	On	1	On	15.0	65	0.0	0.0
28820002	Programador 2 - Camino de Las Flores 1.0	On	1	On	15.0	65	0.0	0.0
28820003	Programador 3 - Retiro Carabido	On	1	On	15.0	65	0.0	0.0
28820004	Programador 4 - San José de Calabazas	On	1	On	15.0	65	0.0	0.0
28820005	Programador 5 - San José de Calabazas	On	1	On	15.0	65	0.0	0.0
28820006	Programador 6 - San José de Calabazas	On	1	On	15.0	65	0.0	0.0
28820007	Programador 7 - San José de Calabazas	On	1	On	15.0	65	0.0	0.0
28820008	Programador 8 - San José de Calabazas	On	1	On	15.0	65	0.0	0.0
28820009	Programador 9 - San José de Calabazas	On	1	On	15.0	65	0.0	0.0
28820010	Programador 10 - San José de Calabazas	On	1	On	15.0	65	0.0	0.0
28820011	Programador 11 - San José de Calabazas	On	1	On	15.0	65	0.0	0.0
28820012	Programador 12 - San José de Calabazas	On	1	On	15.0	65	0.0	0.0
28820013	Programador 13 - San José de Calabazas	On	1	On	15.0	65	0.0	0.0
28820014	Programador 14 - San José de Calabazas	On	1	On	15.0	65	0.0	0.0
28820015	Programador 15 - San José de Calabazas	On	1	On	15.0	65	0.0	0.0
28820016	Programador 16 - San José de Calabazas	On	1	On	15.0	65	0.0	0.0
28820017	Programador 17 - San José de Calabazas	On	1	On	15.0	65	0.0	0.0
28820018	Programador 18 - San José de Calabazas	On	1	On	15.0	65	0.0	0.0
28820019	Programador 19 - San José de Calabazas	On	1	On	15.0	65	0.0	0.0
28820020	Programador 20 - San José de Calabazas	On	1	On	15.0	65	0.0	0.0
28820021	Programador 21 - San José de Calabazas	On	1	On	15.0	65	0.0	0.0
28820022	Programador 22 - San José de Calabazas	On	1	On	15.0	65	0.0	0.0
28820023	Programador 23 - San José de Calabazas	On	1	On	15.0	65	0.0	0.0
28820024	Programador 24 - San José de Calabazas	On	1	On	15.0	65	0.0	0.0