



SMART CITY
Laguna



PRESENTS

SMART CITY
Laguna

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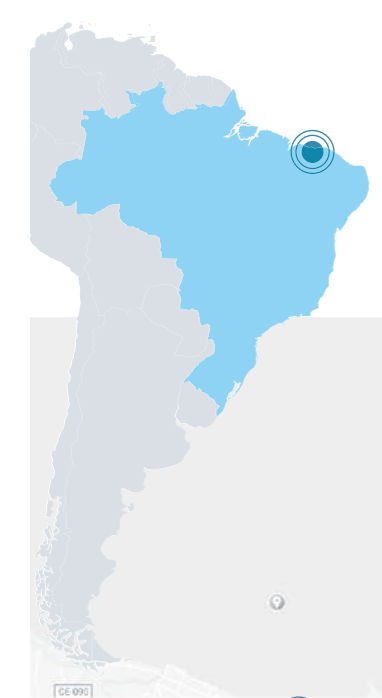
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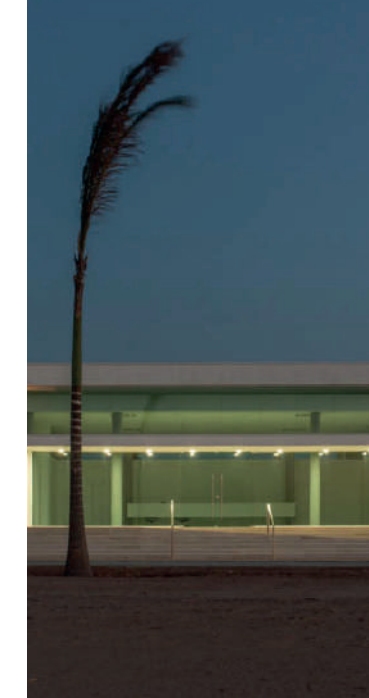
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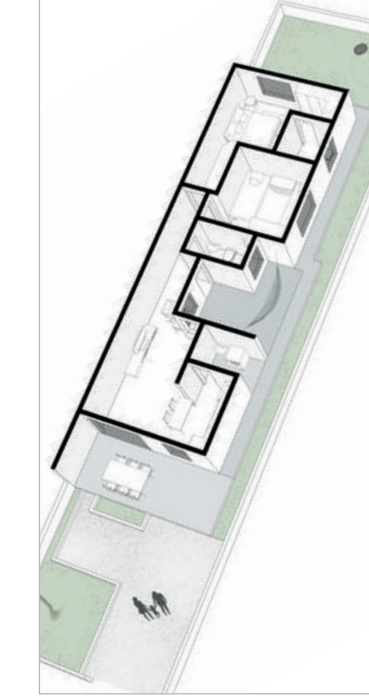
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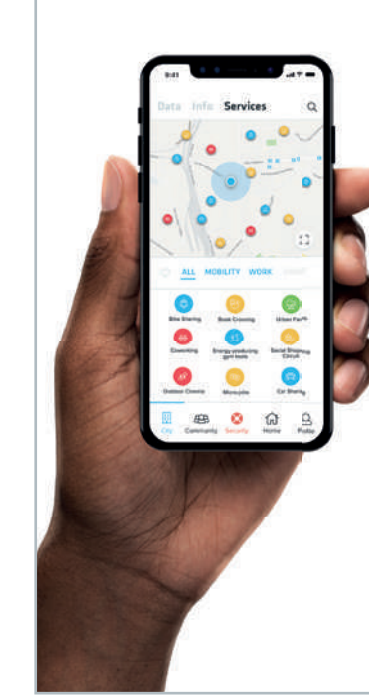
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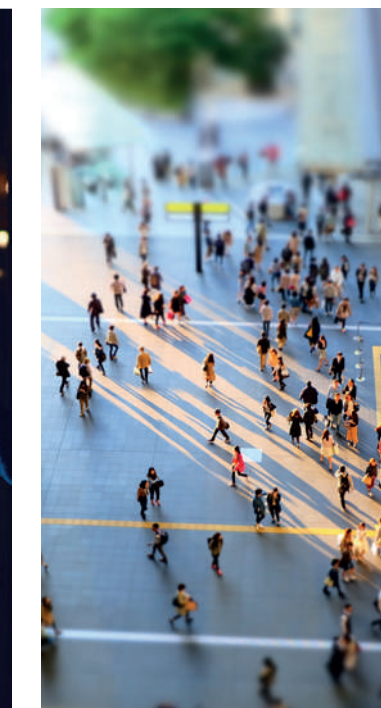
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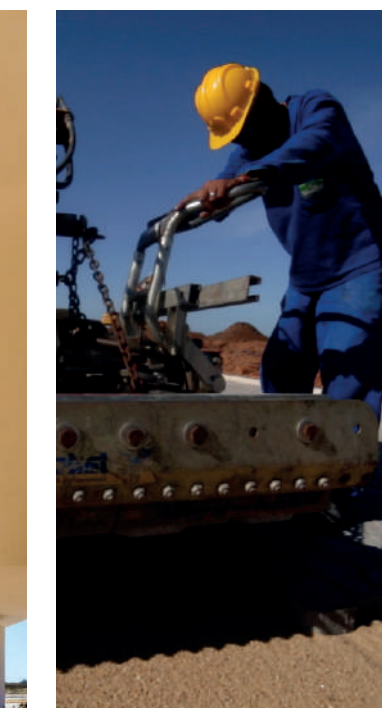
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What is a Social Smart City?

The Social Smart City is an evolved version of the original smart city concept. It provides citizens with a high standard of infrastructure, innovative services, and quality initiatives and technologies. It is a resilient, inclusive, and affordable project with intelligent urban ecosystems designed to guarantee all social groups have a better quality of life.

Smart technologies are implemented in conjunction with sustainable urban planning. This fosters responsible resource use and energy consumption, reduced pollution, and improves the quality of services provided to citizens (e.g. mobility, connectivity, social inclusion). Smart solutions and best practices currently available on the market are selected and integrated into the design of urban environments. In this way, it is possible to demonstrate how technological innovation in the urban context is more affordable, sustainable, and socially inclusive for residents compared to traditional neighborhood developments.

The first Social Smart City in the world is called Smart City Laguna. It is an entire city developed by SG Desenvolvimento and currently under construction in Croatá (Municipality of São Gonçalo do Amarante) just 55 km from Fortaleza, Brazil.

SG Desenvolvimento is realizing this pioneering project with the objective of building a planned and integrated city with smart solutions. These innovative solutions are related to urban planning, architecture, infrastructure and services, information technologies, resource management, and social projects. The objective is to improve the quality of the urban, human, and natural environments offered to residents. The Social Smart City project uses a visionary and sustainable financial model based on innovative approaches and economies of scale. It is capable of transforming the ordinary into something truly revolutionary.



Why São Gonçalo do Amarante?

Smart City Laguna is located in one of the fastest growing regions in Brazil: the municipality of São Gonçalo do Amarante, in Ceará. It is strategically located near the Port of Pecém, a major industrial complex, and also the most beautiful beaches of Ceará. The region has enormous potential in terms of economics, industry, and tourism.

The project helps to meet the demand for housing in a rapidly developing region.



Strategic location

PORT OF PECÉM

A major international port first opened in 2002 and capable of receiving the latest generation of container ships (capacity of 18 thousand containers). Shortly, it will be under the management of the Rotterdam Port authority (Holland).

EXPORT PROCESSING ZONE (EPZ)

The EPZ is an industrial district where companies operate with total tax exemption and was the first of its kind in Brazil with operations starting in 2013. At least 80% of the installed companies' incomes are the result of their exports.

STEEL COMPANY OF PECÉM

With an investment of US\$ 5.4 billion, it is the second largest private investment in Brazil. It has the capacity to produce three million sheets of steel per year. Production began in July 2016 and reached its peak capacity in a record time of 4 months. The operation accounts for 12% of the state's GDP.

DIGITAL BELT

Today there are more than 3,500 km of fiber optic cables installed in the belt. It forms the foundation of Planet's technological platform and ensures that quality internet service is readily available.

TRANSNORDESTINA

Extending 1,700 km, this railroad will connect the main ports of Northeast Brazil, Pecém, and Suape (state of Pernambuco), and increase the industrial and commercial potential of the entire region.

TOURISM

The tourist attractions of the West Coast region go beyond famous beaches such as Paracuru, Taíba, Cumbuco, Lagoinha and Flecheiras. Due to the ideal wind and wave conditions the region is also known internationally as a paradise for surfing, kitesurfing, and windsurfing. The state of Ceará has an average year-round temperature of 30-degrees. In addition, it has extensive cultural diversity, parks and waterfalls for greater contact with nature, and craft trade centres. The wind conditions, geography, and climate make for an ideal setting for sports on the beach, in the mountains, or in the hinterland.

Smart City Laguna

The design of the Smart City Laguna emphasizes the interaction between the built and natural environment, placing particular attention on providing residents with a quality living environment. The project intends to preserve and create new areas of ecological interest within the urban context, while maintaining a balance between the natural and built environments.

The project is sensitive to local needs and conditions. A park and lake will serve as a central feature in the community and is designed to be permanently wet and easily maintained. A riparian forest and open green spaces will surround and protect the lake. The park also provides residents with a public space for socializing, leisure, exercise and recreation, and cultural activities.

The first Social Smart City in the World will have approximately 620 thousand square meters of green area. Living in the Smart City Laguna means having access to extensive green spaces and high quality services.

What sets the Laguna apart?

It offers a balanced mixed-use development plan including: green spaces, institutional services, residential, commercial, industrial, and smart mobility. This diverse community features modern urban planning with wide roads designed to ensure fluidity and full mobility. Furthermore, Smart City Laguna has been thoughtfully planned to specifically avoid the phenomenon of the suburban city. Instead it incorporates vitality, innovation, culture, enhances the environment, social inclusiveness, while creating opportunities related to new technologies. This

will be implemented through various initiatives, for example: an onsite industrial facility will provide all the community's concrete pavers, responsibility for public administration for a portion of the Innovation Hub will be handed over to the Municipality of São Gonçalo, online communities and networks will be created, and an integrated monitoring system will benefit all residents.

Smart City Laguna also has two important community centres: one for sports and another for demonstrating innovation solutions in the community (located in the smart square). This allows residents to develop positive relationships with one another and promotes the integration and cooperative coexistence of everyone, facilitates a collaborative economy, and active citizens.

Economic Sustainability

An urban environment with integrated digital and smart solutions is conducive to the formation of local informal and sharing economies. These dynamics have a positive influence on the livability of the neighborhoods, social inclusion, and the regional economy.

It is also possible to optimize infrastructure construction costs, take advantage of the economic benefits offered by renewable energy systems, while residents can benefit from reduced management and maintenance expenses.

Four macroareas and one application

To make a city truly smart, it is necessary to have a holistic approach. Technologies such as high speed internet infrastructure and Wi-Fi sensors alone are not enough to create the transformation that Planet wishes to achieve. In order to build a smart city, it is also important to simultaneously address energy, culture, information, and social aspects related to residents.

Planet has defined the smart city based on four interrelated macroareas. Many solutions rely on more than one macroarea increasing the degree of interconnectedness and 'smartness' of the neighborhood. The macroareas are as follows: Ecosystem Resources, Built Environment, Technological Systems, and Society.

Smart City Laguna is the city for today and the future, where the available technologies are integrated and interact together. Citizens are provided with a safe, social, and service-rich urban environment in which sharing and collaborative economies play a strategic role.

The various technologies inserted in the Smart City alone fail to interconnect and create a holistic system. For this reason, the Planet App was created to structure, interconnect and extend the effectiveness of the various technologies. It is a downloadable application for residents, and gives them access to the smart solutions and services available in the smart neighborhood.

Planet App



Commercial Center

Studies carried out in the region have demonstrated that the area lacks active, diversified, and organized commerce within a 55 km radius of the Smart City Laguna site. It will create an immense and organized economic structure with the potential, in the short-term, to become a center of commercial activity and municipal services for a region with a population of 600 thousand people.

The Commercial Center and the Laguna community will provide employment and housing options for the local workforce. Workers will have the opportunity to settle in a planned urban centre consisting of businesses and services that are oriented towards social living and leisure, and improve convenience and the quality of life for residents.

Finally, the Center has been integrated into the Smart City Laguna with the intention of making it easily accessible to workers commuting on foot, bike, or by car without compromising the flow of traffic.



Smart Mobility

Urban mobility is one of the biggest challenges facing today's cities. At Smart City Laguna, proper urban planning is only a portion of a more complex system of decentralization and diversifying functionality. Specifically, mixed-use development involves distributing residential, commercial, corporate and institutional areas so that they are easily accessible to everyone. When city services and functions are homogeneously distributed, the level of security in the community improves. Together with a network of cycling paths and wide sidewalks, citizens can easily reach essential services in the city reducing their dependence on a vehicle.

Smart City Laguna has been planned to ensure that pedestrians, cyclists, public transport, and cars and motorcycles each have their roadway systems without generating conflicts and congestion. Wide roads with quality infrastructure will allow all means of transportation to circulate in an organized way. The cycle paths are strategically laid out and the sidewalks are wide and shaded to allow pedestrians to walk comfortably and safely. The project also considers car and bike sharing solutions, to reduce traffic congestion from personal cars and consequently air pollution.

The project's public road network comprises around 30% of the development, while typical urban projects include only the minimum 20% as determined by law. This gain means that streets are wider encouraging fluid vehicle traffic, pedestrians and cyclists have a quality and safe network of paths, and infrastructure is available for alternative means of transportation.

Innovation Hub

The word “hub”, in the tech world, refers to a nerve center that receives and re-transmits signals between various stations. In the case of physical spaces, hubs are places suitable for meeting and interacting with different people, which consequently fosters opportunities to create, initiate, and collaborate. The combination of innovation and high connectivity creates a place much grander than the traditional “shared work space”. This type of space increases the capacity to create original ideas and solutions.

The Innovation Hub is a pavilion with an area of approximately 800m² which offers flexible spaces for various activities, as well as exposing citizens to the transformative solutions that make their community smart.

Some of the innovative technologies implemented in the community will be featured at the Hub, giving citizens the opportunity to learn more and experiment with them. The Innovation Hub is also a space that brings together potential participants for a “new economy” model. A space where knowledge is free and where citizens are encouraged to develop and build new solutions and products. It is where for example: boundaries are without limits, the community connects, assets can be shared and productive forces collaborate, technology is available for everyone, and creativity is the common language. The Innovation Hub represents the social and smart heart of the city.



Innovation Hub: the social heart of the community

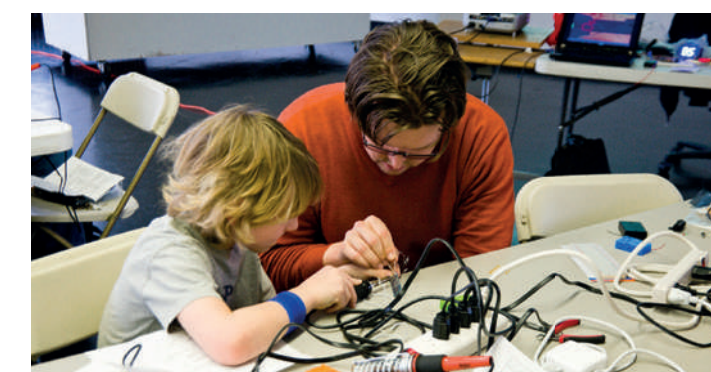
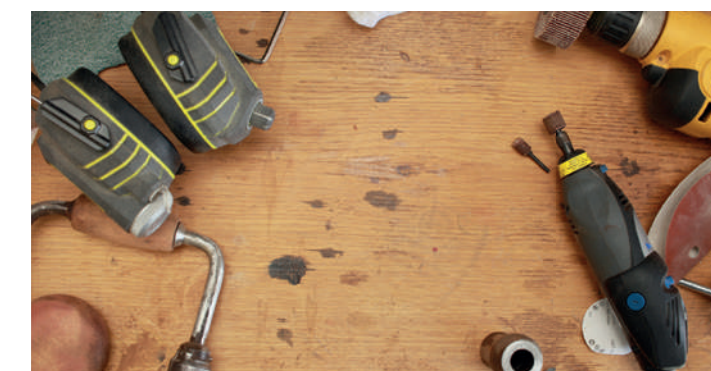
The success of the Social Smart City is based on the participation of its residents.

To provide a promising tomorrow and contribute to solving the greatest challenges facing the planet, one strategy is to replicate projects that have already had a significant impact on people's lives.

Planet thus chose to collaborate with the English company Impacton to select successful projects to apply at Laguna. Residents will be able to participate in these activities and benefit from services that will contribute to collective empowerment.

The activities planned in the Innovation Hub will be adapted to the local conditions and needs. They will promote social interaction, the education and diffusion of information among the population, and stimulate the economic and sustainable growth of citizens and future small businesses.

The following are examples of such projects.



Multicultural cooking events

Themes: food, cultural inclusion

Magic happens when a culturally diverse community comes together to share recipes, cook collaboratively, or even coordinate cooking marathons. Food is a key component of our daily life, and every country, community, or group has very specific roots related to how they think, perceive and elaborate traditional recipes. Cooking marathons and competitions allow people of every age and background to come together, learn and collaborate, and share their cooking techniques. Community members can sit around the same table for a day and share stories, memories, insights and positive emotions helping to foster deep connections even between the most diverse cultures.

Upcycling leftovers into new local products

Themes: food, employment

Why throw away food when you can turn discarded fruit and vegetables into chutneys, jams and sauces to redistribute or sell locally? It's very important to engage with every community member and install a zero food-waste culture. A very effective method involves setting up local collection centres where everyone can drop off fruits or vegetable leftovers, to be then used to make preserves. These centres can also offer skills and training to unemployed people, who can then help with the production and distribution of products both locally and to other customers. It's also possible to combine recycling, by reusing jars and plastic tops.

Active citizenship programs in open spaces

Themes: security

The safety, security, and health of a community are all directly correlated with the quality of the living conditions there. Studies demonstrate that poor health and underused public spaces are some of the biggest drivers for crime and violence. Active citizenship programs focus on stimulating local communities and residential areas through initiatives that create social, environmental, urban, and cultural value. There is a focus on bringing people together regardless of their age or background. Active citizenship initiatives include for example: street painting, activities with kids and elders, community markets, or temporary spots for reading.

Local handyman network

Themes: employment

Every neighborhood, family, or individual needs help from time to time with different tasks. People have different capacities or schedules and may not have opportunity to complete such work. Building a community of local handymen or groups that share tasks allows every household to easily access help when needed. A transparent system allows residents to choose handymen close to their home helping to strengthen a connection and trust between them. Task-sharing networks can include members interested in being paid for their services, as well as those who simply wish to contribute to the wellbeing of the community.

Fab-labs and makerspaces

Themes: education

These spaces foster project based learning, invention, creativity, and offer opportunities to build something from scratch. There is a need for these kinds of spaces as traditional education systems often do not explore these skills fully, notwithstanding their importance for the future. Fab-labs and makerspaces are places where people of any age and background can learn about digital technology, design, coding, modelling and even robotics. Participants are exposed to a collaborative environment where knowledge is shared, and where learning is done through doing. The ultimate goal is to present participants with different learning styles and transmit crucial skills that they can then apply to any creative or working environment.

A space for social innovation

The Innovation Hub and the connected smart square together form an inclusive public space that implements smart solutions, services and best practices. The square includes various nuclei with different functions, for example: a playground, relax area, outdoor gym, and event area.

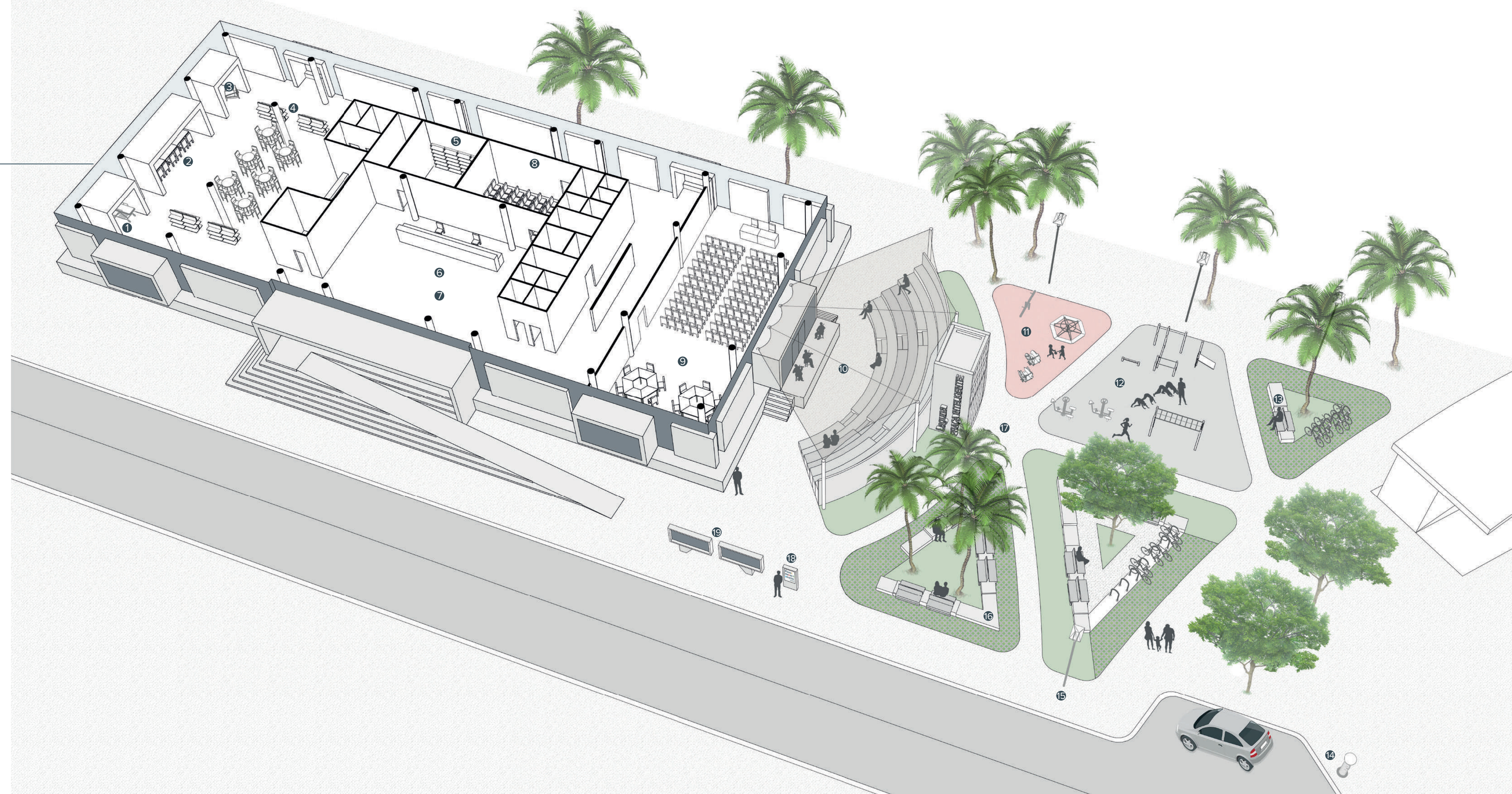
Quality technological infrastructure together with the smart square and the Innovation Hub create a space which catalyzes smart urban processes. People gradually become available to build new relationships and begin active citizenship unleashing habits that generate shared economies and virtuous models of social innovation.

This space will use energy and water resources efficiently, respect the environment, and bring people together. For example, the square will integrate technologies such as smart lighting, a charging station for electric cars, and a smart bench.

The square represents an urban space that truly fosters a sense of belonging in a community. It serves primarily two purposes: it demonstrates a new way of living and building urban spaces, and on the other hand promotes aspects of the new smart city.

Legend:

- Health armchair ❶
- Meeting room ❷
- Library of objects ❸
- Bookcrossing ❹
- Library ❺
- Free wi-fi ❻
- Beacon ❼
- Children's cinema ❽
- Conference room (flexible for the use of different functions such as: space for the community, pop up market, workshops, courses, etc.) ❾
- Events area ❿
- Playground with equipment that produces energy ⓫
- Fitness area with energy-producing equipment ⓬
- Smart bench ⓭
- Charging station for electric cars ⓮
- LED Lighting ⓯
- Urban Furniture Designed for All (DfA) ⓰
- Video surveillance system ⓱
- Informational interactive Totem ⓲
- Community bulletin board ⓳

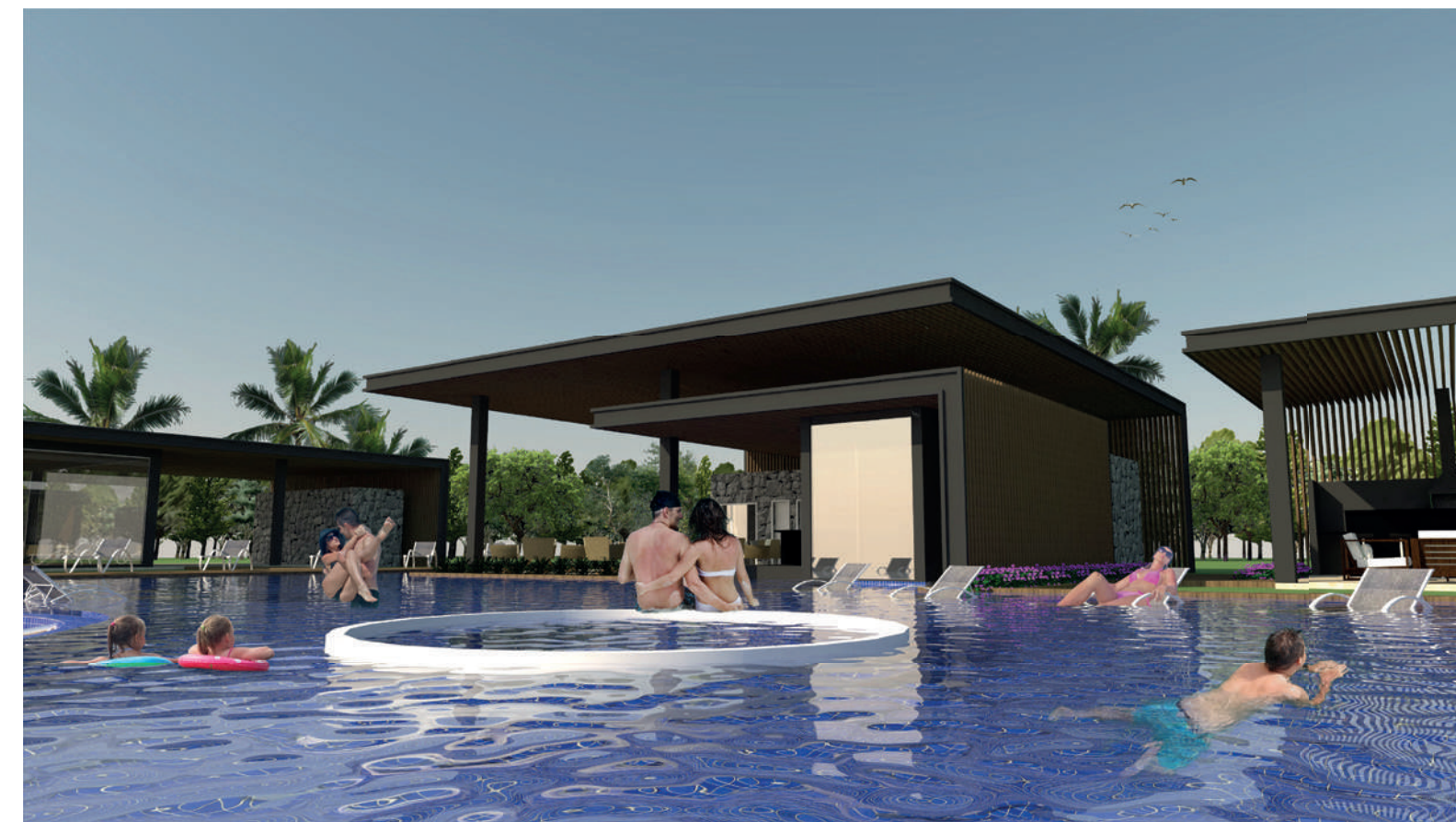
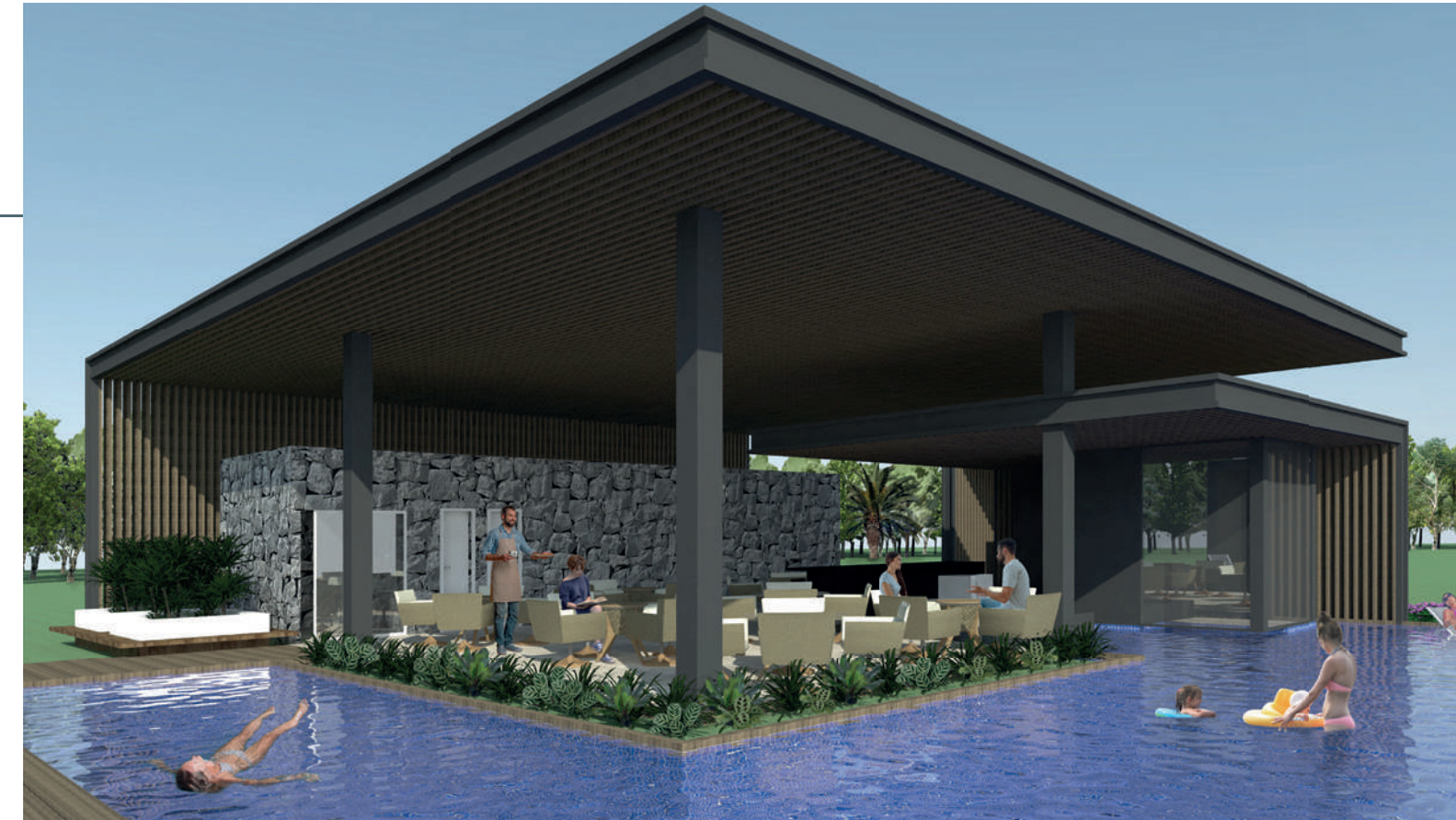


Sports Hub Club Planet

The first Social Smart City in the world will have a sports hub called Club Planet meant for socializing, recreation, and sports. The structure was designed by the architectural studio Marcelo Franco Associated Architects and will produce its own electricity, harvest rainwater for reuse purposes onsite, and have spaces which favor natural ventilation and lighting.

The sports facilities will be completely integrated with the lagoon feature, combining unique natural beauty with leisure activities. It ensures that guests have access to a healthy and balanced environment where they can enjoy physical and recreational activities, and interact socially.

Club Planet will be equipped with a swimming pool, wet bar, restaurant, sauna, ballroom, games room, gym, relax area, changing rooms, playground, sports courts, bbq area, and camping.



Landscaping at Smart City Laguna

The landscaping at Smart City Laguna has been designed by Sergio Santana, a renowned Brazilian landscape architect and urbanist. He graduated from Louisiana State University and Harvard University, and then remained in the United States coordinating several landscaping offices there. During his career he has worked with many notable architects including Burle Marx, one of the greatest landscapers of the 20th century. In 2008 he founded his own office in São Paulo called Sergio Santana Planning and Landscape Design, and today is considered one of the most expressive landscapers in Brazil.

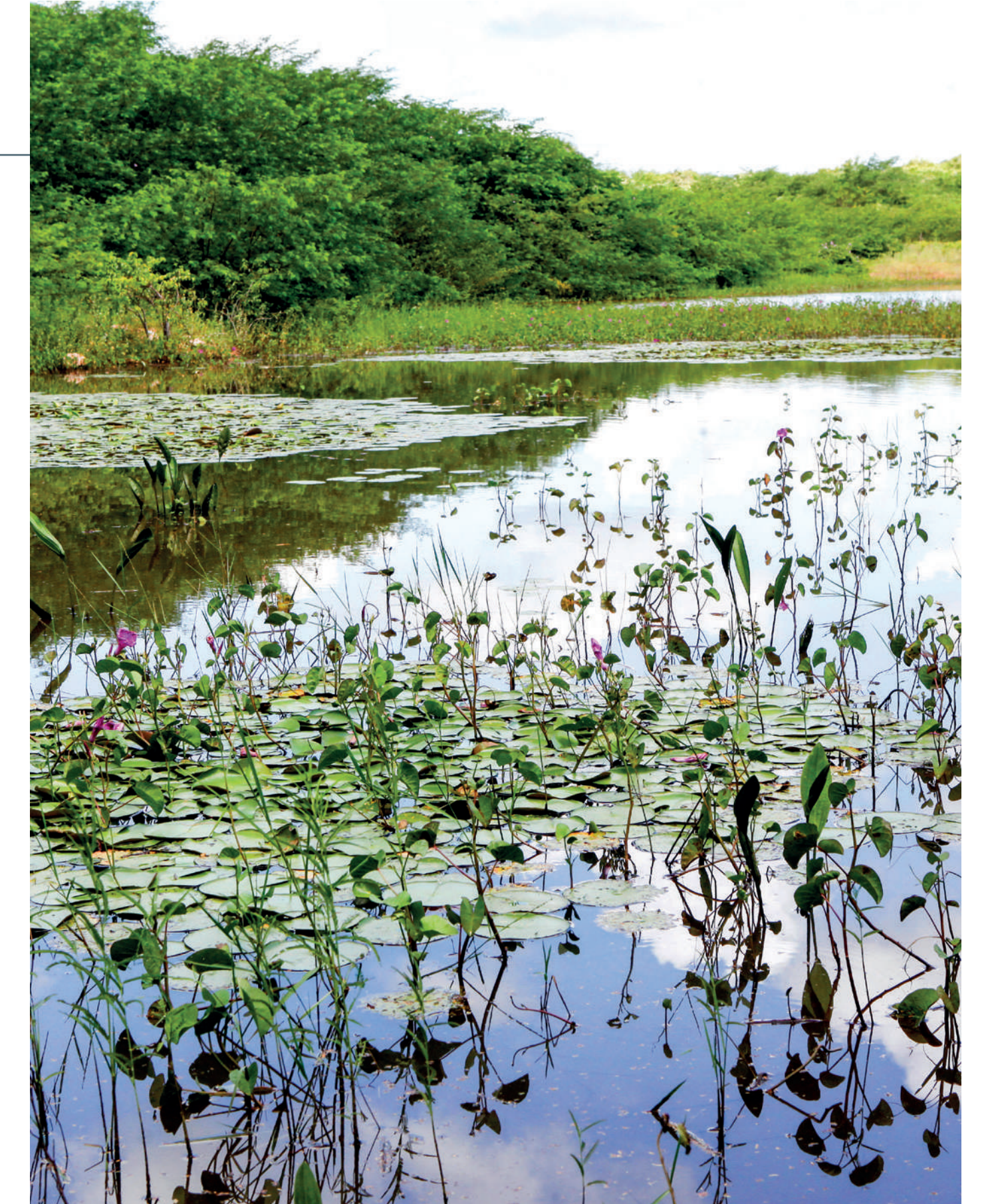
"The landscaping and landscape at the Smart City Laguna was designed using some basic concepts:

- *Sustainability: our idea is to design the landscape with native species that will be developed with the minimum water consumption possible. The species will be chosen to reach maturity without the need of constant pruning.*
- *Aesthetic considerations: we will pursue a visual enrichment through colors and textures.*
- *Biodiversity: we will use floristic and fruit species to attract birds.*
- *Comfort and visual reference: we will create spaces for residents using various forests and vegetation groups. Vegetation will be fundamental as an urban visual reference.*



In summary, the landscaping will complement the urban design, enriching the daily life of the residents. Smart City Laguna will be a special place to live!"

Sergio Santana



Flamingo Lake ▲



Architecture and urbanism

The intention of this new development is to revolutionize the way we build social housing developments. Often, they are constructed in areas at risk, with precarious houses all built the same and equipped with basic infrastructure. They are monotonous and service deprived from an urban planning point of view.

Planet's proposal is to design homes with standardized dimensions but with quality materials, while maintaining harmony with the unique culture and characteristics of the region. It is breaking away from standardized communities in favor of diversified functionality and zoning to promote access to services and leisure in the city. Its inhabitants will be able to integrate more easily into the communities in which they live.

Therefore, it is proposed that the city is constructed with:

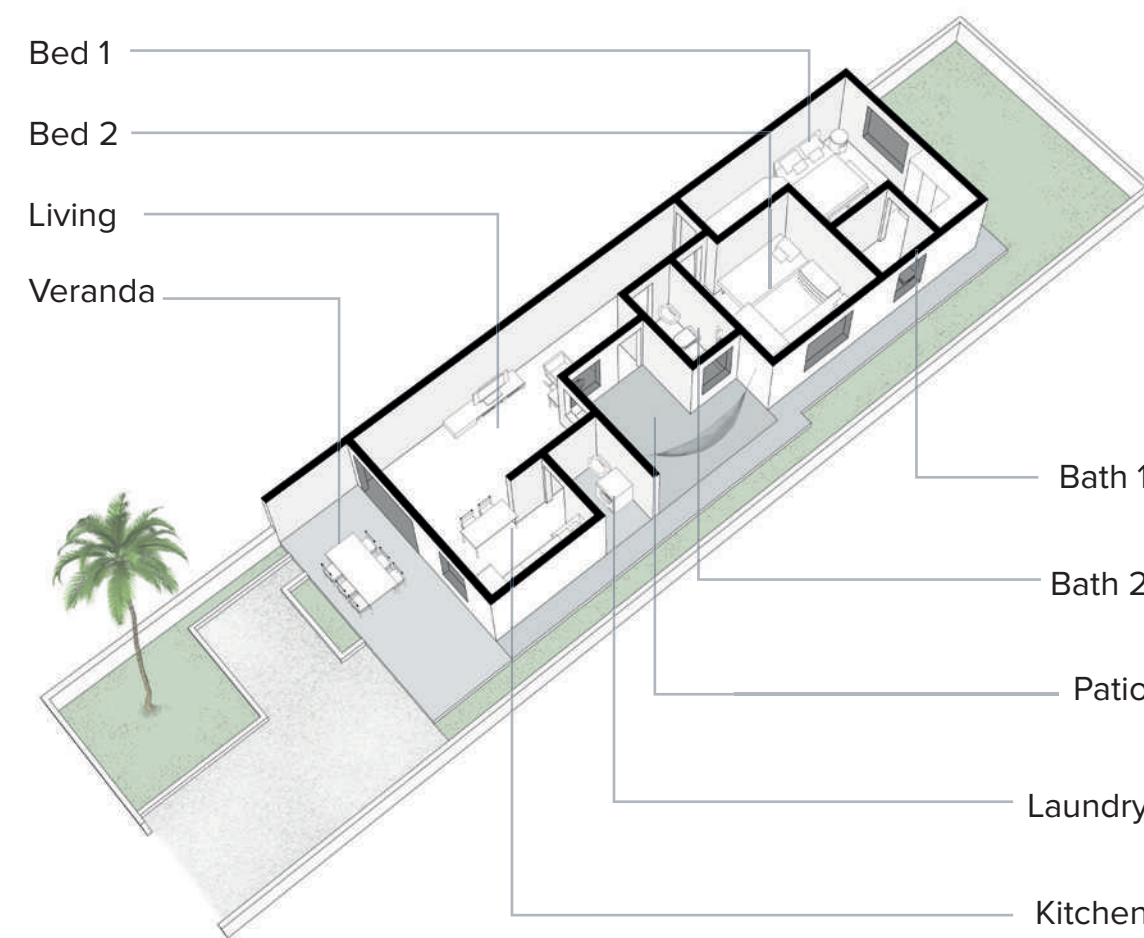
- a varied model of functional and bold architectural homes in harmony with their environment, contrary to the current status quo for social housing;
- diversified zoning and with services and leisure activities equally distributed throughout the city to improve accessibility for residents.
- smart solutions which offer comfort to residents and help them to conserve resources;
- sustainable accommodation which is comfortable for residents and serves as a starting point for establishing good relationships with the surrounding neighborhood.

Types of houses

All houses will be built to maximize natural ventilation and lighting, to reduce energy consumption. There are 5 housing models available inspired by economically valid and social housing principles.

Interior Design

Planet offers different interior finishing options for some home models, allowing clients to balance quality and cost for the interior design of their home.



Example of a finished home



Planet's Smart Home

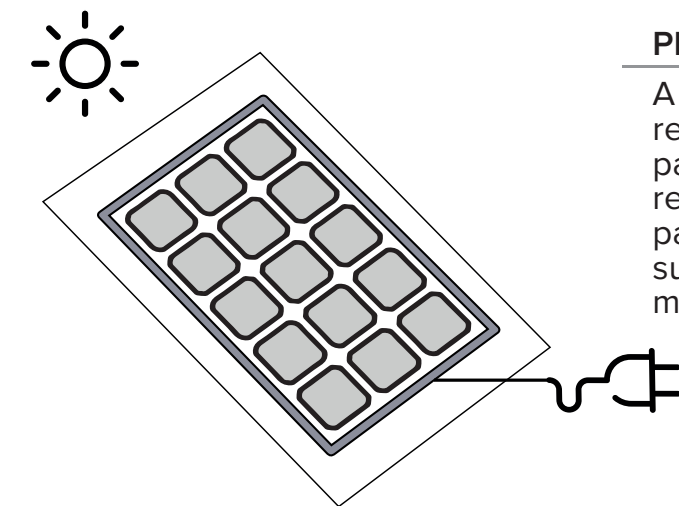
Your home can become a responsive environment where homeowners can manage and communicate with appliances and devices. Users are able to customize their environment and maximize their comfort.

Planet has developed the Planet App to help residents integrate the different functions and services of their home. It allows residents to remotely; turn on and off devices, monitor utility consumption, and ensure their home is secure and safe.

As a result residents enjoy a improved quality of life while having more leisure time.

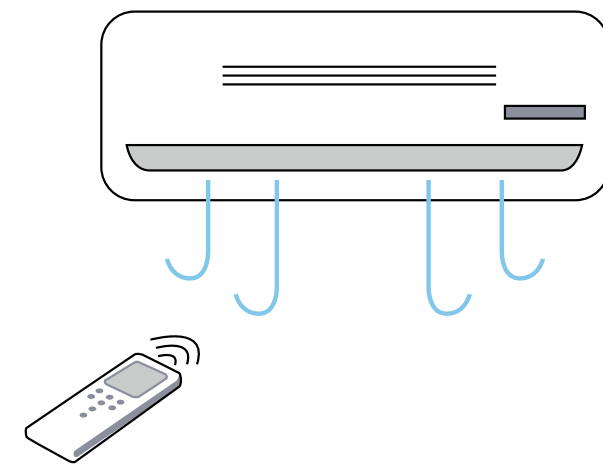
The following solutions are integrated with the Planet App and are available for purchase by residents for prices that are lower than market value. This is possible because the products are acquired in large quantities, producing economies of scale and reducing costs.

The optional smart home solutions are further described hereafter.



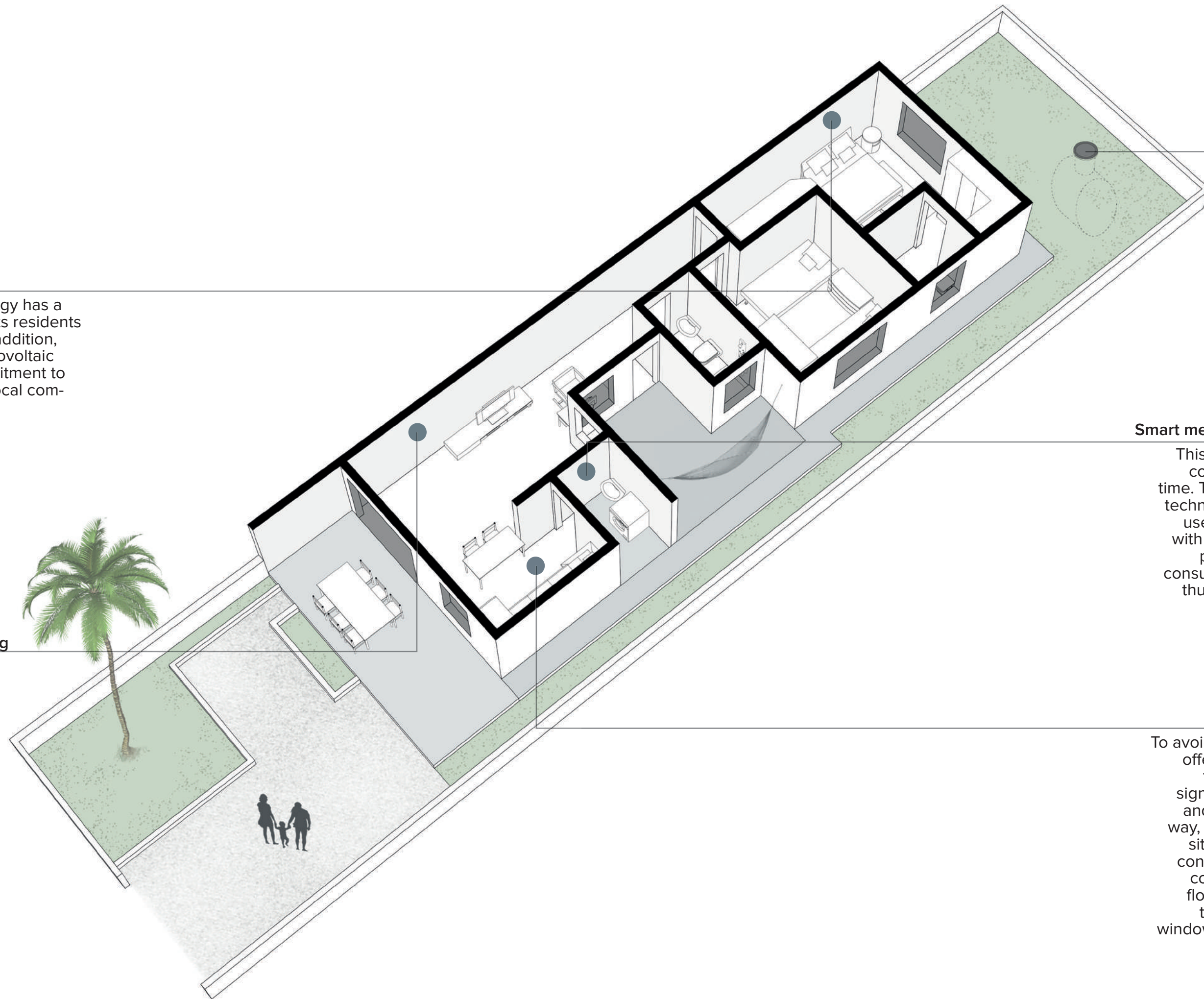
Photovoltaic panel

A home which harnesses solar energy has a reduced energy demand and thus its residents pay less for their electricity bills. In addition, residents who choose to have photovoltaic panels at home are making a commitment to sustain the environment and their local community.



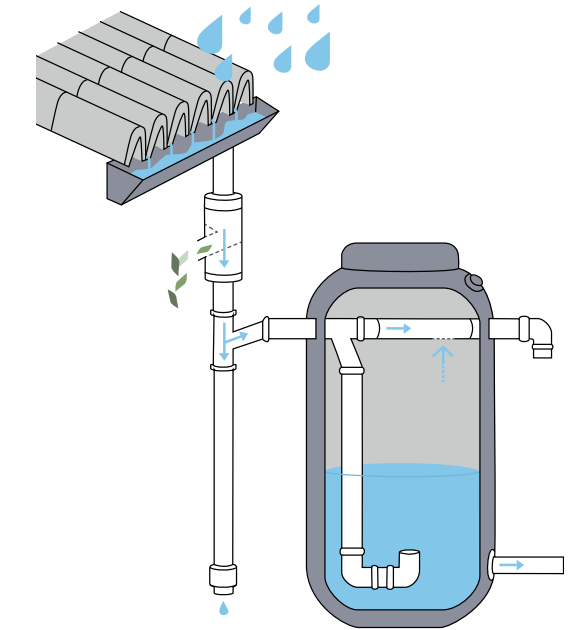
Remotely controlled air conditioning system

Split air conditioners are known for their convenience and comfort. Its various functions can be controlled remotely for ease of use.



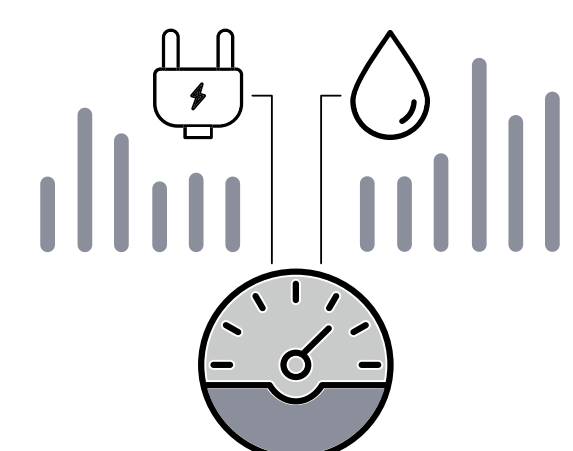
Rainwater harvesting and reuse

Capturing and using rainwater is a simple way to save money and help to conserve water resources. The system recovers rainwater that is collected from the home's roof and existing eavestroughs and is stored in an underground tank. The rainwater can then be reused for irrigation or external washing purposes.



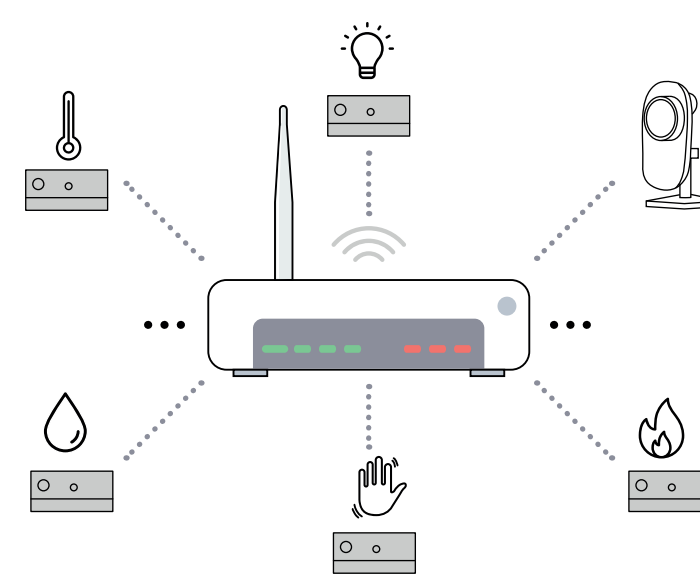
Smart metering for water and electric consumption

This device measures the electricity and water consumption in regular and short intervals of time. The smart meter uses remote management technology and offers a series of benefits to the user and provider, such as automatic updates with energy consumption data. The Planet App permits the user to also easily monitor their consumption in real-time from their smartphone, thus helping residents to adopt more efficient behaviors and save on their utility bills.



Router

To avoid unwanted surprises in your home, Planet offers several protection and security devices that connect with the router. It receives the signals from the devices and sends an audible and/or a visual warning to the resident. In this way, they will be warned if there is a dangerous situation and will always remain aware of the conditions of their home. The devices that can connect to the router include: smoke sensor, flood sensor, motion sensor, vibration sensor, temperature and humidity sensor, door and window opening sensor, siren, smart power plug, and internal and external cameras.



Best Practices Kit for residents

Best practices are well documented techniques that offer efficient and effective means to realize a given task, activity, procedure. As a part of the Social Smart City project the best practices kits are distributed to residents to help reduce municipal waste, food waste, water consumption, and to promote healthy eating habits. The kit consists of a box containing informative booklets, written in informal and friendly language, as well as gifts to encourage the uptake of the best practices among citizens.



Planet App

The Planet App is an application designed specifically for Smart City Laguna that will allow residents to enjoy new digital services and to learn about the smart city. It serves as the city's control panel and permits residents to access information regarding their community, from an interpersonal to city wide scale. The application consists of five areas:

Profile

Each user has their own personalized profile, which they can fill in according to the amount of information they wish to share: personal data, family members, hobbies, interests, and professional information. The profile enables the Planet App to assist users to become more engaged in community life.

City

The Planet App allows citizens to receive information on what is happening in their urban environment such as: weather reports, air quality, business information, view local camera feeds, neighborhood administrative information, and bike or car sharing programs.

Community

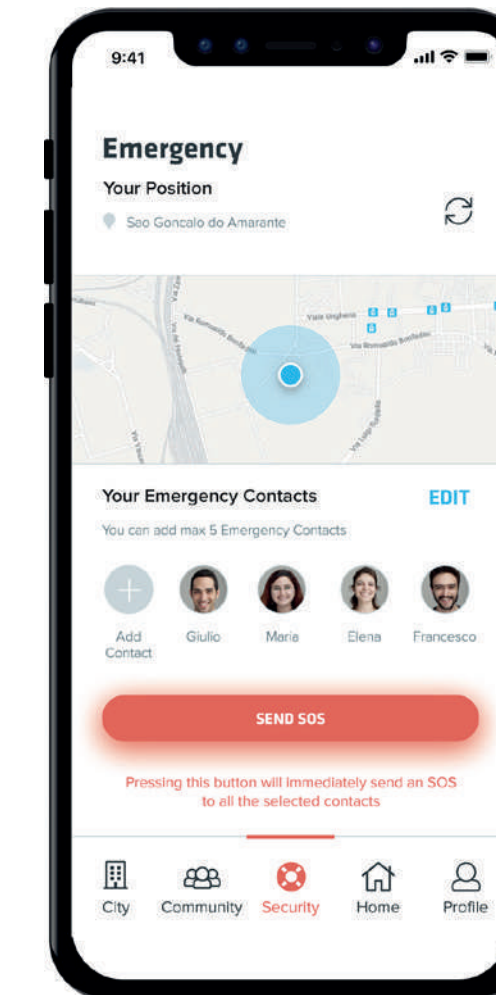
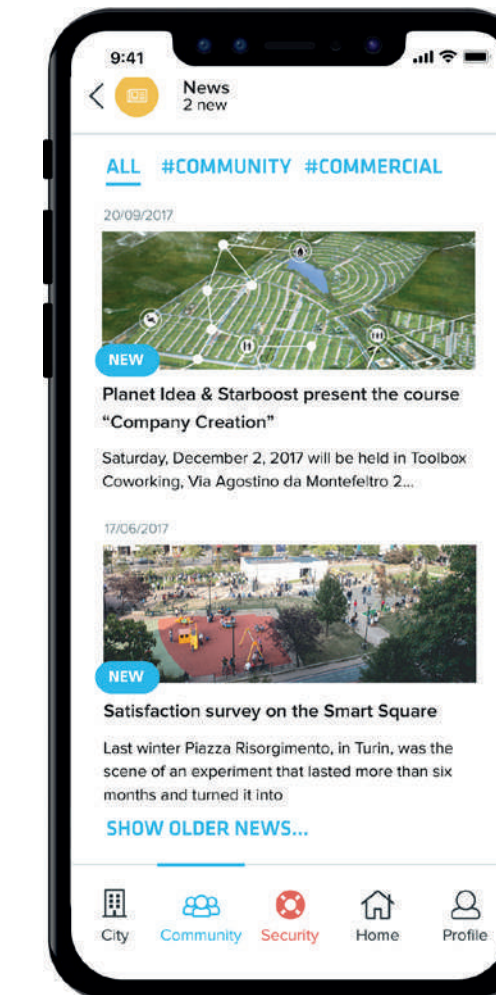
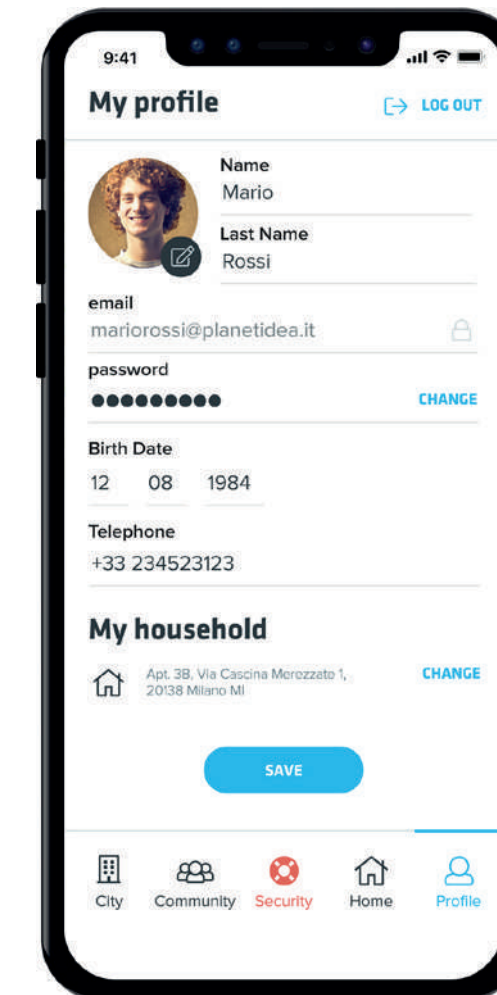
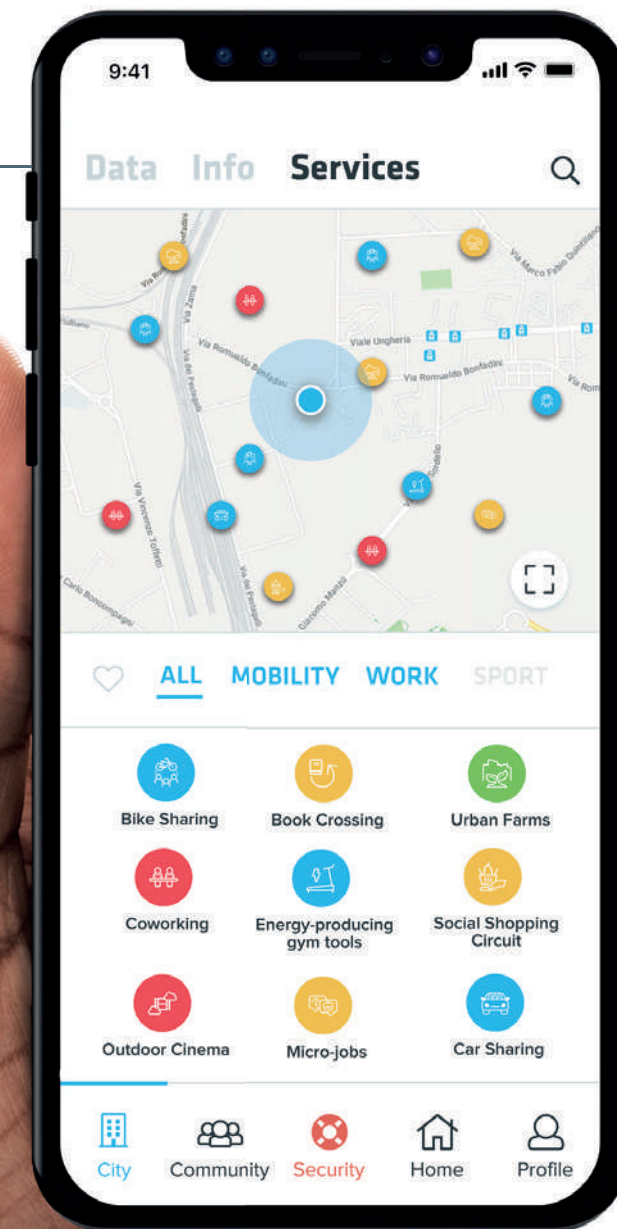
The Planet App is designed to help citizens connect with each other. It keeps citizens up-to-date on the events and activities in the neighborhood by simplifying the interaction between residents. This powerful tool supports the creation of social groups and communities, making the city more inclusive and participatory.

Security

The smart city is a safer city. The Planet App offers features that enable citizens to feel more safe and connected. In the event of an emergency, a user can press a SOS button on their mobile to quickly alert their emergency contacts and get help. Users can customize their emergency contact list, including relatives or friends. Within the Planet App, the user can also access surveillance videos of their neighborhood.

Home

The home becomes an interactive environment. Residents can remotely control and manage their smart devices, customize their home's environment settings, and access personal data such as electricity consumption. The Planet App also offers the possibility to install additional devices for their smart home control system. For example, cameras or sensors that monitor temperature, smoke, or water leaks. The Planet App can also manage utility consumption, activating devices and services only when necessary.





Planet dedicates the streets and avenues of Smart City Laguna to personalities who, thanks to their work, ideas and discoveries, have made a significant contribution to Brazil and the world.

Everything around you

78%
residential

7.300
lots distributed according to a mixed-use design

1
Sports Hub

11
neighborhoods

620.000
m² of green space

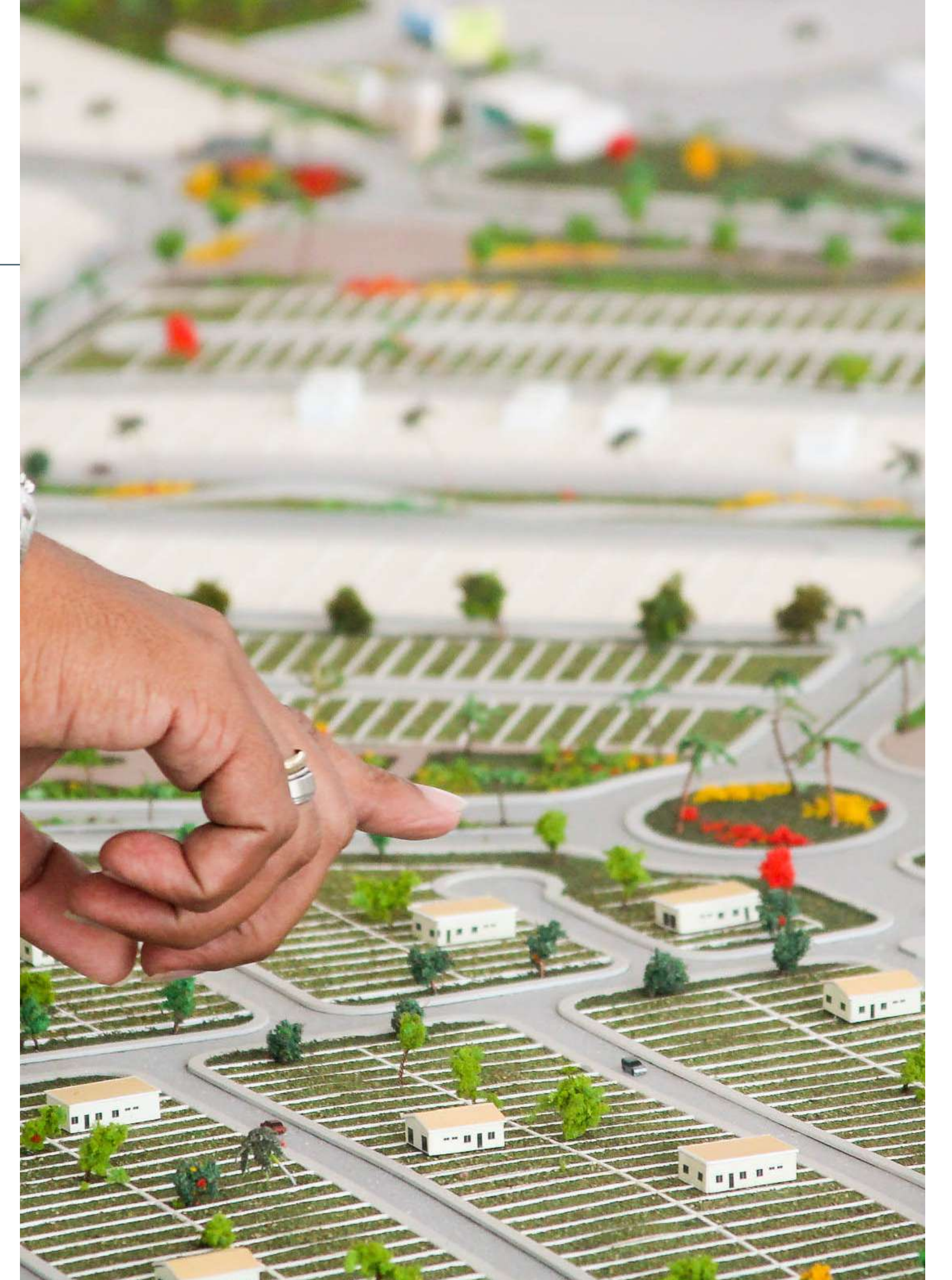
330
hectares of total area

7%
light industry

15%
commercial

1
Innovation Hub

25.000
future residents



Areas and macroareas

Ecosystem Resources

Nature
Air
Soil
Water
Energy



Built Environment

Architecture
Urban Functions
Infrastructure
Public spaces
Mobility



Technological Systems

Operations and Administration
Data and Sensors
Network and Devices
Materials
Life cycle

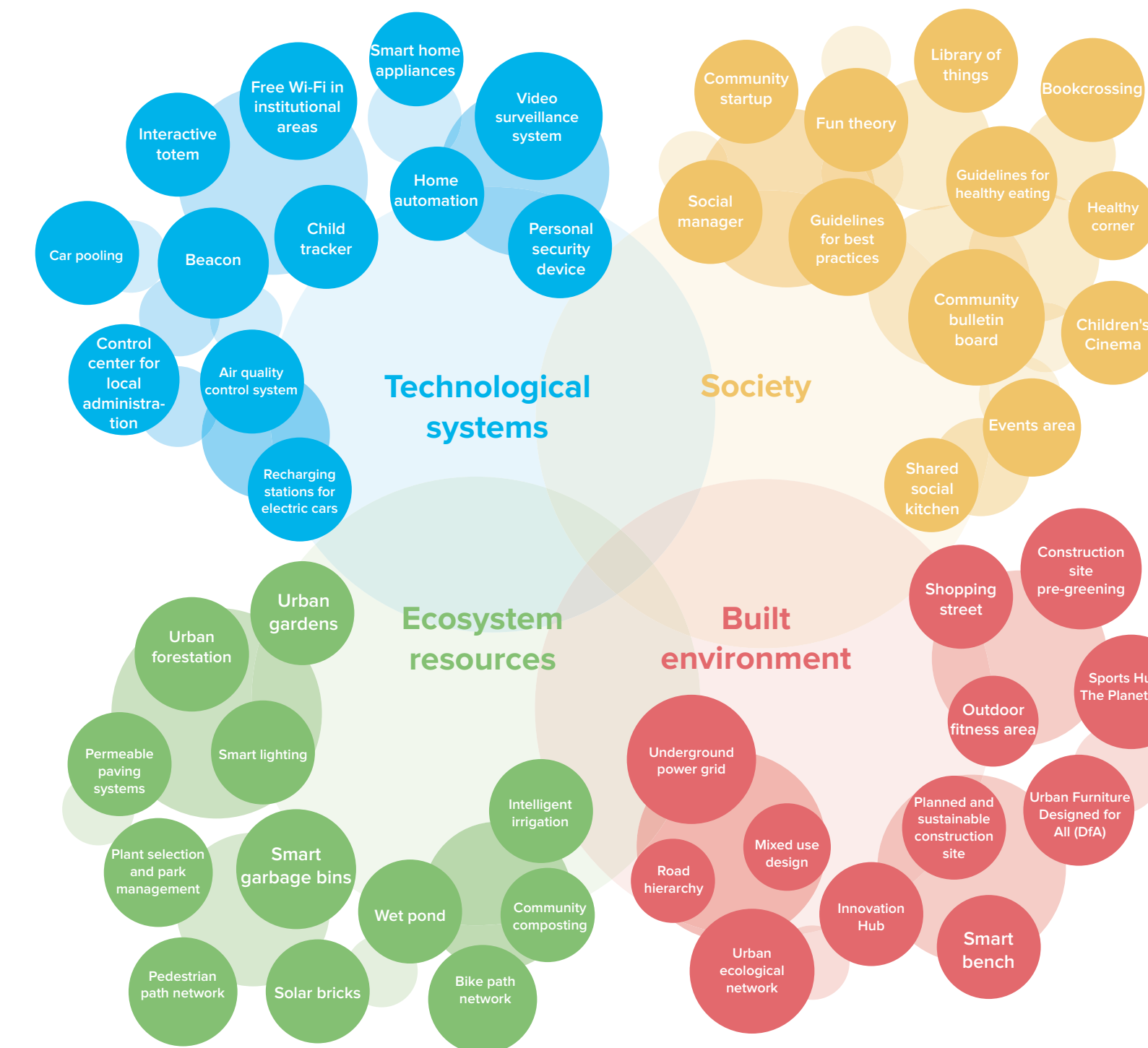


Society

Community
Wellbeing
Education
Economy
Security



Holistic Design



The Competence Center has selected smart products, ideas, and best practices from around the world based on Planet's 4 macroareas. There are currently over 200 solutions in the catalog and it continues to grow. The most appropriate solutions have been identified and integrated into the Smart City Laguna project.

The Technology Readiness Level (TRL) is a measure of a technology's maturity, and has been developed by the European Commission. It is based on a scale of values from one to nine, where one is the lowest level (i.e. basic principles) and nine is the highest (i.e. successful operation of the system in the field). Planet's Research Center monitors scientific advances in international research, and the technological evolution of products or services. Only solutions with a high level of technological maturity are inserted into the catalog, in other words products and services already available on the market.

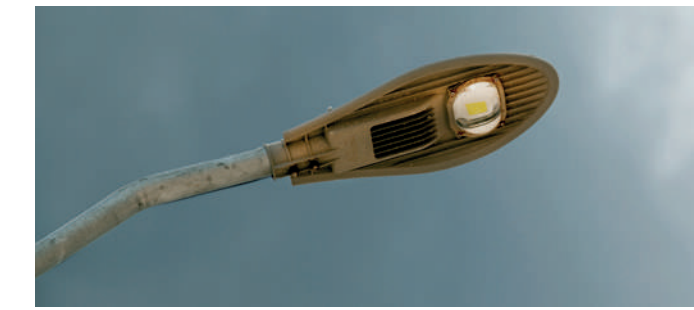
To ensure a well rounded project it's necessary to have a balance between the smart solutions in the 4 macroareas, as represented in the included bubble chart.

Ecosystem Resources

The city is an ecosystem in which humans play a crucial role in defining the flows of matter and energy and in regulating the relationships between the various constituent parts.

The development of a smart city must consider practices that protect and maintain the quality and health of natural resources, while being economically and socially sustainable. Ecosystem resources should be planned with an interdisciplinary approach that address issues ranging from pollution control to the management of green areas, water bodies, and all other elements that sustain the territory.

Residents of a smart neighborhood designed by Planet will live in a healthy and green environment.



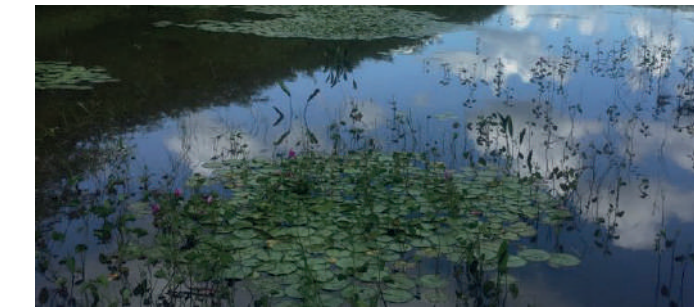
Smart lighting

Smart City Laguna's public lighting system exclusively uses LED bulbs. The principle advantage is economic savings as it consumes 70% less energy than compared to mercury vapor light bulbs. This technology is more sustainable and requires less maintenance, meanwhile improving visibility and safety for residents. It is important to note that Smart City Laguna's main street, Imperial Avenue, and the project's second phase will be equipped with an underground electric grid. This solution will be deployed in collaboration with ENEL.



Urban forestation

The Laguna will incorporate urban forestation in a series of parks and an extensive green belt. When planning a new development, urban forestation can be adopted to help offset greenhouse gas emissions, purify the air, and reduce noise pollution. Through photosynthesis a larger tree at its maximum growth rate can absorb about 36 kg/year of CO2. Planting trees in the city also contributes to increasing urban biodiversity, reducing the heat island effect, and can dramatically improve the aesthetics of an urban landscape.



Wet pond

A wet pond is an artificial basin that collects and stores rainwater maintaining a permanent pool of water. During a storm event runoff is directed towards the pond where it is held and treated through sedimentation and biological processes. The pond is sized to temporarily accommodate excess volumes of water during storm events, thus helping to delay stormwater runoff peaks. The systems reduce runoff volumes, delay peak flows, removes pollutants, provide natural habitat for aquatic animals, and can be used for recreational purposes.



Permeable paving systems

These paving systems improve the permeability of urban environments reducing the impact of runoff from storm events. It is considered a sustainable stormwater management practice as it reduces hydraulic overloading on receiving water bodies and/or sewer systems. It also reduces the influence that urban areas have on soil and water quality, and the biogeochemical cycles. Due to continued rapid urbanization and the consequent expansion of non-permeable surfaces a critical point has been reached whereby even normal meteorological events present soil and water quality related issues.



Plant selection and park management

Plants that need trimming and irrigation are often avoided in favor of native and drought resistant species suitable in the local environment. Such low maintenance plant species have economic and environmental benefits due to their reduced maintenance needs and water consumption. Discontinuous targeted pruning can also be used in the smart city. This practice involves selective pruning following careful planning and results in significantly lower management costs.



Urban gardens

Urban vegetable gardens can be a significant component for a smart city proposal. The impact that vegetable gardens have depend on the specific socio-economic and environmental conditions in a community. Benefits include an improved connection with food systems, physical and mental health advantages (e.g. fresh quality produce), social opportunities, economic savings as a result of food self-sufficiency, and reduced ecological footprint. Distributing many medium-sized community gardens throughout a city can strengthen social relations and a sense of community. Urban gardens are also interactive places of learning and teaching.



Solar Bricks

Glass bricks that are equipped with photovoltaic cells, a battery, and LED lights that can be installed directly into a flooring system.



Community composting

Through a turning process the organic waste material becomes useful nutrient rich compost.



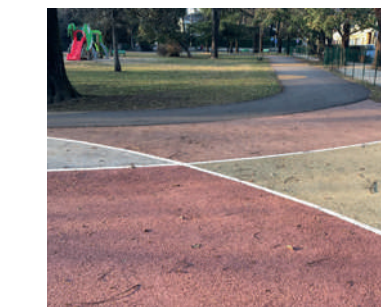
Intelligent irrigation for urban gardens

It waters green spaces making use sensors and online information. They automatically regulate the amount of water used depending on real-time weather and soil conditions.



Smart garbage bins

They improve the management of waste by both citizens and waste collection companies.



Pedestrian path network

Constructing a network of pedestrian paths connects the different areas of the city. In this way pedestrians can efficiently and safely travel throughout their community.



Bike path network

Building a network of bicycle lanes alongside pedestrian paths, and rest areas throughout an urban area offers a safe and healthy alternative to using a vehicle.

Built Environment

Planet is rethinking the way we live in the city. Designing fluid, multipurpose, and sustainable spaces can help to improve the quality of life for residents.

Regardless of the size of an urban area or the number of its inhabitants a system of services will be available to meet the daily needs of everyone.

Small public areas for residents will mediate the transition between their homes and larger urban spaces thus fostering social integration in the neighborhood. These intermediate spaces promote a gradual transition from the individual to the collective scale.



Underground power grid

Every city under new construction or subject to major restructuring should be equipped with multiservice physical infrastructure. The underground multiservice physical infrastructure consists of: adequate installation spaces, access points, and a signal distribution network. Smart City Laguna's main street, Imperial Avenue, and the project's second phase will be equipped with an underground power grid. This system avoids electrical discharge issues, reduces the risks related to lightning, and improves the aesthetics of the city.



Urban ecological network

A city that is carefully planned can maintain a healthy level of ecological biodiversity. One strategy is to create a network of connected urban green spaces with different surface areas and functionalities. Typically large highly naturalized core spaces are linked to smaller areas with continuous natural corridors. They foster the mobility of animals and the genetic exchange essential to maintaining biodiversity. Connecting urban core areas with the suburban environment is particularly important as it encourages the movement of different animal species in a more open system.



Innovation Hub

It is a place where citizens can learn about and experiment with a selection of innovative products suitable for their neighborhood. It offers an opportunity to learn about the advantages that innovations bring to everyday life, thus promoting technological literacy. The hub is an open space which promotes the exposure and investment towards local innovations. This solution helps to promote the community as a technological park able to attract financing and generate economic returns for residents and investors.



Sports Hub - The Planet Club

The Sports Hub is a multifunctional space designed to provide residents with opportunities for leisure and physical activities. Residents can develop various skills through participating in sports and in the process promote positive self-esteem, respect for others, reduce violence, and stimulate independence and autonomy.



Road hierarchy

Designing a road hierarchy means planning road networks based on their purpose and traffic volumes. Main roads accommodate high volumes of traffic and directly and efficiently link different neighborhoods and key areas in a community. Meanwhile, local roads within a neighborhood are smaller, limit velocity, and encourage walking and biking.



Mixed-use design

Mixed-use spaces create a more balanced and functional urban environment. They are a fusion of different zoning (e.g. residential, commercial, light industry) strategically dispersed in a community. Citizens living in a well designed mixed-use space have a more fixed presence in their community because they can easily access a rich diversity of services and goods close to home. Residents are less dependent on travelling by car, thus reducing greenhouse gas emissions. These urban environments are brought to life by local inhabitants creating communities that are socially inclusive, safer, healthier, and more enjoyable.



Smart bench

The smart bench provides Wi-Fi and USB charging stations to its users.



Urban Furniture Designed for All (DfA)

Designing for All follows seven fundamental principles: fairness, flexibility, simplicity, perception, tolerance, low physical effort, and sufficient measurements and spaces.



Planned and sustainable construction site

This process ensures that sub-services and infrastructures are fully operational throughout all phases of the sites development.



Construction site pre-greening

This is a best practice that involves planting grass and vegetation before or in conjunction with a sites construction.



Outdoor fitness area

It is a public area in the open air dedicated to wellness, relaxation, and physical fitness.



Shopping street

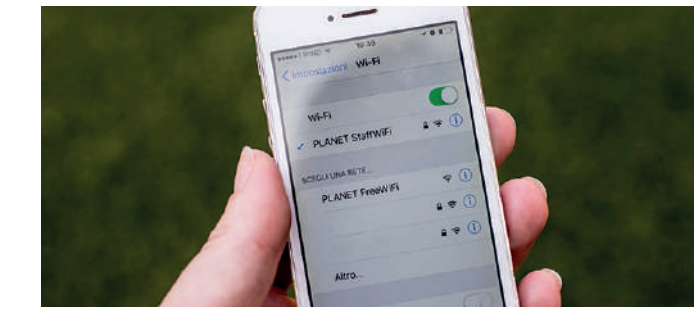
It is a large, lively, and dynamic public space serving as a reference point for residents and a space to spend free time.

Technological Systems

Most innovative technological solutions entirely rely on digital networks to function and be fully enabled. Therefore, advanced digital infrastructure is an essential prerequisite for the development of smart services.

Public Wi-Fi hot-spots, building automation, and real-time data monitoring systems are but a few examples.

Living in a highly connected neighborhood with technological services that improve the quality of life for residents will become an achievable dream for everyone.



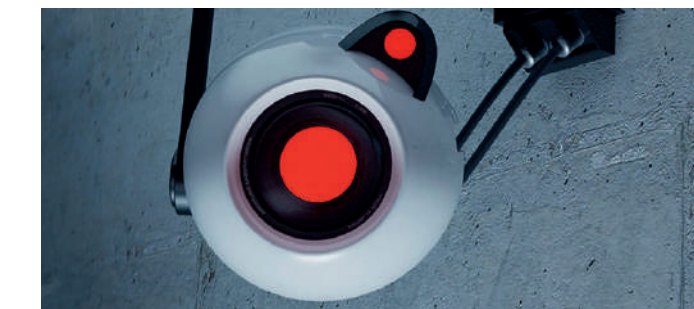
Free Wi-Fi in institutional areas

Connectivity within a smart city is fundamental to ensure the seamless operation of smart solutions present in the urban context. Providing free Wi-Fi to residents gives everyone the possibility to access and benefit from smart services and information collected from the neighborhood.



Interactive totem

The interactive totem is a device that allows users to obtain information about the surrounding environment and available services in a simple and immediate way. It is an instrument that permits direct dialogue between citizens and administrators. The totems are usually in the form of interactive screens permitting users to navigate and exchange content, connect to wireless networks, and it serves as a reference point in the city.



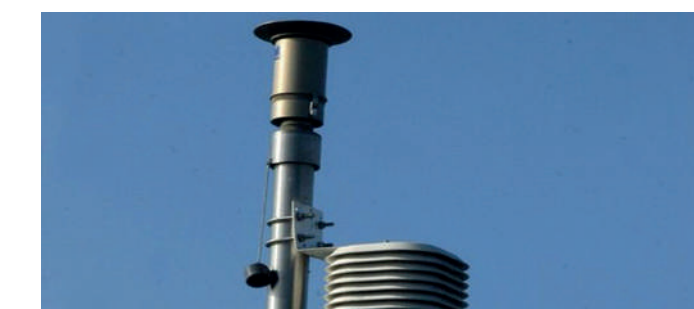
Video surveillance system

Video surveillance ensures citizens are safe and reduces acts of vandalism in both public and private settings. Webcams in public spaces discourage violent acts between citizens and destruction of public and private property. In the Smart City Laguna each resident can monitor in real time, through the Planet App, the video monitoring of the block where they live.



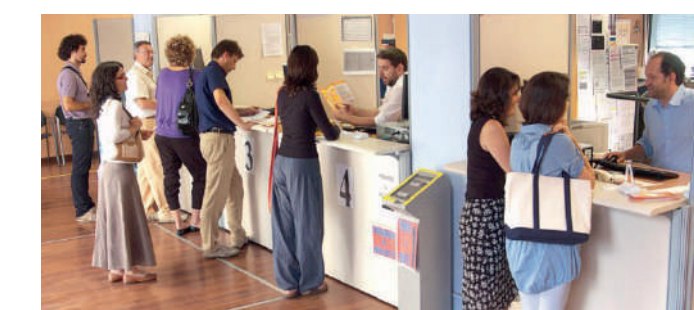
Recharging stations for electric cars

Electrical distribution stations are used for recharging electric cars, motorbikes, and bicycles. Electric vehicles are enjoying a greater presence on the automotive market due to the increasingly widespread use of clean energy and a progressive departure from fossil fuel powered mobility. Zero emissions, noise reduction, increased range, and decreased battery costs are just some of the factors contributing to the current success of electric mobility.



Air quality control system

Data collection units are among the various systems needed for monitoring outdoor air quality. They are installed at strategic points throughout a city and collect data regarding various pollutants. This information is regularly sent to a control center that prepares the data for visualization at interactive points installed throughout the Smart City. Citizens are also able to monitor air quality through special front-end mobile applications so they remain up to date.



Control center for local administration

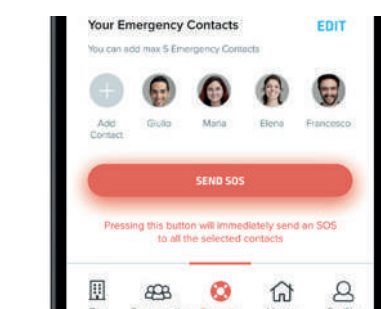
A local administration and community centre can provide important services to citizens close to where they live. With administrative hubs strategically placed throughout a neighborhood, citizens can carry out basic administrative practices close to home and benefit from emergency services.



Beacon
Beacons allow you to receive useful information quickly and easily on your mobile phone.



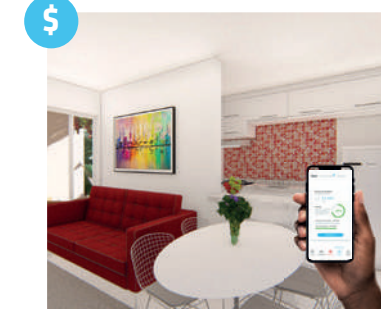
Car pooling
Through the Planet App application, a user makes a vehicle available to other commuters who share the same travel route. In exchange the drivers are compensated financially to cover their expenses.



Personal security device
This function is available with the Planet App, and permits residents to report dangerous situations and ask for assistance or rescue.



Child tracker
The child tracker is a device that allows you to monitor your children's activities in the area.



Home automation
Residents can remotely control settings, turn on and off domestic appliances, monitor utility consumption, and verify their home is safe and secure.



Smart home appliances
Autonomous devices and custom systems for home that can be controlled remotely.

Society

Improving social inclusion in a community is the specific goal of the society area. For a city to be smart it must provide quality infrastructure, a digital platform to support its services, and equally importantly it must nurture an intelligent community.

Living in a smart city is much more than just owning a home. Rather it is an opportunity to actively participate in the life of the community, creating new experiences and reshaping the way of life there. It is a context in which all citizens contribute together to create a safer and more sustainable city.

The fundamental prerequisite of each project is to consider people as the center of the city, and their education and involvement become fundamental tools for the city's evolution. The smart neighborhood is a place where citizens discover innovative solutions that encourage virtuous behaviors, and with time are passed onto future generations.



Community startup

Facilitates the process of developing a community among residents in a new neighborhood. The startup process includes planning and running meetings and designing tools to define services and collaborative activities. The process continues with the establishment of a legal entity such as a neighborhood association and/or committee. This entity assumes responsibility for managing common areas in the neighbourhood (social kitchen, urban gardens, community spaces, etc.) and then evaluates activities to improve future programming.



Guidelines for best practices

Consumption patterns heavily depend on lifestyle choices which are often adopted by citizens due to a lack of information. Creating and disseminating guidelines can help to promote behavior changes, encourage the reduction of resource consumption, and increase the awareness of local entities (e.g. companies, public establishments, schools, associations) and citizens. This implementation can take place through posters in public areas and best practice kits delivered to citizens.



Social manager

The social manager is responsible for facilitating the growth of communities and providing residents with planning and governance tools that encourages the sharing of services and experiences. They provide information and support to create courses, group workshops, events, and other social interactions between citizens. This qualified staff member acts as a property manager, develops relationships with tenants, and involves the residents themselves in managing common spaces.



Fun theory

Fun theory is a communication and awareness campaign which can be applied in many forms in an urban context. The concept is to use playful games to generate awareness and promote positive and sustainable behaviors. This is a learning-by-doing approach where fun facilitates the dissemination of knowledge.



Library of things

It is a physical space where you can rent or exchange specific objects and equipment that do not require daily use. Instead of throwing out objects that are no longer needed, the library of things offers the possibility to lend or donate them for the benefit of the entire community. It is a shared-economy tool that encourages citizens to reduce, recycle, and reuse objects.



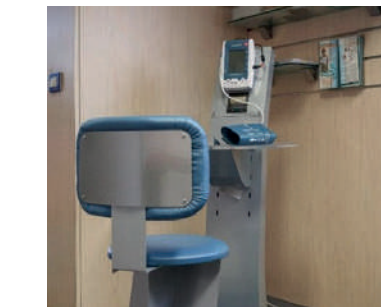
Bookcrossing

Anyone who has a book that they have read can donate it for others to read, and in exchange take a new book. Books are stored in predefined places throughout the community so that they can be read by others. The bookcrossing project aims to stimulate social relationships within an apartment or neighborhood where books can become an opportunity for dialogue between people. This initiative simply requires a place to store the books and an accompanying explanation describing the practice.



Guidelines for healthy eating

Promoting an adequate nutritional education with attention to the quality of raw materials.



Healthy corner

Armchair that makes basic health tests quickly and effectively, issues a complete report, allows you to search a medical center for a qualified diagnosis and stores the data in a personal folder.



Children's Cinema

Exhibition of films for children and young people.



Events area

Place for presentations and group meetings.



Shared social kitchen

It is an open space to cook, socialize, exchange cultures, reduce expenses, and learn about local products.



Community bulletin board

It is designed to foster community engagement and incite dialog and brainstorming between residents concerning local issues.

Instituto Planet



The Planet Institute manages projects of public interest for the Smart City Laguna and will be fundamental in the management of the city. It will carry out educational programming for local residents and will assist the public administration to comply with the norms established by the Master Plan laid out by the municipality of São Gonçalo do Amarante. Currently it offers free and permanente services open to the public such as the Planet Library and Planet Cinema. In addition, they also run various courses and activities including: entrepreneurship, crafts, English lessons, social training courses, native seed distribution, and special events (e.g. Football Day). Since 2016 the Planet Institute has been apart of the lives of more than 2 thousand people including children, youth, and adults.

The Planet Institute provides opportunities to share spaces and services with the neighborhood. It enables residents to carry out many daily activities without them necessarily having to personally own a specific item/service or have the expertise or financial resources to carry it out. The objective is to encourage residents to develop a sense of identity and belonging where they live: in other words transform citizens from beneficiaries of a service to engaged actors in their own lives and in their community.

Laguna is an entire modern and intelligent urban space designed, planned, and developed with a focus on people. Residents will have the unprecedented and sublime human experience called "Living beyond the home" or in Portuguese:

**VIVER
ALÉM
DEMORAR**



Collaborative Living

Collaborative coexistence is a proposal for a more holistic lifestyle that involves the house, neighborhood, and entire city. Further, it means sharing spaces and services between residents which stimulates cooperation, friendship, and in general good neighborliness.

Living in a Social Smart City means having more than just a home. Rather, it means having many residents assume active roles in city life, creating new experiences, adopting new ways of life, and together building a rich and sustainable society.

The "Living Lab" concept is a new vision of entrepreneurship which truly brings together public and private spaces using technologies that integrate people rather than isolating them.

Laguna will ensure that all income groups have access to proper infrastructure, a good quality of life, and positive social coexistence. This is possible through innovations in the provision of services (i.e. a high standard of services but with reduced costs), and using a management system that promotes awareness among the population towards a truly social and economically sustainable community.

The proposed model provides assistance to the public administration to comply with the norms established by the Master Plan, specifically created for the urban core of the Social Smart City. The purpose is to foster a new culture and way of life, reduce waste, optimize time and resources (e.g. create shopping groups, urban gardens, car sharing), and use innovative technologies and social networks which favor the development and management of these initiatives.

I have many dreams!

I am from Croatá and one day I saw many people arrive here and they started to build many things. Sometimes, when I passed in front of the construction site I wondered what that great, organized, and beautiful place could be. I did not know what it was, but I knew what I heard from many people: "This is not for you." I never understood what they meant.

One day a friend of mine from school told me that there would be a free English course in Croatá, at the Smart City, and I couldn't believe it! She told me that the course was for people over 10 years old and that anyone could sign up.

I was very happy to find out about this and rushed to apply and to start towards my dream. I imagined myself learning to speak English in class and then traveling around the world.

I waited for the selection, but when the results came out my name was not on the approved list. It made me sad, but I understood that there were only a few places available and for such courses there is always a lot of competition for spots. I kept a close eye on that place and waited for another opportunity. Then, the Planet Institute opened a new class for the English course the following year. I registered again and waited anxiously for the coordinator's call. One day my phone rang while I was at school and could not answer. After class I responded to the phone call, and it was exactly what I had been waiting for. The coordinator of the Institute answered the phone and wanted to interview me as part of the selection process. Through my wide smile I answered all the questions promptly and told her that I had already tried to get in the previous course but did not

get accepted. I also told her that I had a dream of going on an exchange program in another country, but that many people had told me I couldn't because there are no opportunities here. I always wanted to learn English so one day my dream could come true. Then, she explained to me the selection process and asked me to wait for the results. After a few days of anxiety I saw my name on the official list: I got accepted!

On the first day of class I prepared myself to visit that beautiful place that many people had said was not for me. When I got there I met friendly people who welcomed me and made me curious to learn more about it.

In the classroom, the coordinator played some videos that explained the project and I was delighted! A Smart City is being built in my hometown! That construction site that I observed without understanding what it was will become the first Social Smart City in the world! This city is still under construction but is already bringing many opportunities for everyone in the region. I also discovered they offer many courses, for example: handicrafts, football, entrepreneurship, and English lessons (the course I am now in). This city is truly fantastic and through the social projects of the Planet Institute I can for the first time believe in my dream. One day I will go on a student exchange program in the United States, to experience another country, to speak another language, and to be able to improve the life of my family.

Yes, this city is for me and for everyone who dares to dream!

My name is Samyra Sampaio, I am from Croatá, São Gonçalo do Amarante, in the state of Ceará – Brazil and I am 15 years old.



Planet in Brazil: A unique challenge

My name is Susanna Marchionni and I'm from Turin, Italy. As co-founder of Planet Holding and CEO of SG Desenvolvimento, I was responsible for the acquisition of the property where the Smart City Laguna project is currently under development. My activity as a real estate agent began 20 years ago in Italy but for the past 8 years I have expanded my horizon to include in the real estate sector in Brazil.

Structuring Planet Holding in Brazil was a unique challenge. Being an executive in a typically male dominated sector is not easy, in addition to the fact that I come from the other side of the world without a mastery of the local language. Other challenges included adapting to the extremely different culture, food, climate, and a completely different form of communication and way of doing business between people. To complicate things, our group arrived to the Brazilian market during a serious economic crisis.

It gets even more complicated when considering the fact that our project is bold and disruptive. It is a model that involves concepts and innovations that break down barriers and, therefore, arouses many suspicions. We overcome these challenges by recognizing and involving the general public, and as a result we have achieved significant sales and have received many relevant awards from respected institutions. It has been wonderful to

see the curiosity, excitement, and participation from the general public and clients during project presentations at universities and conferences.

This project serves as a model for real estate and social development that we intend to replicate. We will continue to revolutionize the way cities are built in Brazil by planning urban environments where people are engaged in city life through education, culture, and social inclusion. We are also working to minimize one of the biggest problems of our daily lives: insecurity. Improving public safety and alleviating emerging and urgent housing needs can result in dramatic and surprising positive social changes.



Susanna Marchionni

Co-founder of Planet Holding and CEO of SG Desenvolvimento



About us



The Planet Group is headquartered in England, Italy, and Brazil.



English company that controls the sub-holdings of the group.



English company that operates in the housing market, using smart concepts, and manages the specific companies that develop real estate projects.



English company that provides personalized services and products to citizens of smart cities and owns the Planet App.



Italian company offering engineering services and integration of systems for designing and managing smart cities, through the Competence Center.



Brazilian company that works inspired by Planet Group's vision of communicating with its public in a smart and innovative way, through an unprecedented model of commercial management.



The Planet Institute manages the projects of public interest for Smart City Laguna and will be fundamental in the management of the city.



Brazilian company responsible for carrying out and developing the Smart City Laguna project. Its founders have 25 years of experience in the real estate market and in civil, national, and international construction.



Quality Infrastructure

The design of Laguna is possible due to a combination of technology, experience, and quality. The most modern building tools and techniques are used to create a truly unique real estate development.

The highest priority is to provide residents with an efficient infrastructure that has minimal maintenance needs. The streets of the Smart City are being constructed with interlocking concrete pavers by SG Premoldados, a Planet Group company. Before the pavers are laid, the soil is evaluated and properly prepared and compacted.

SG Construtora, another company in the Planet Group, builds the concrete paving system with a fast-mechanical process, using special equipment. The machine manipulates a layer of concrete blocks (about 1m²) from a pallet and places it immediately in the designated location.

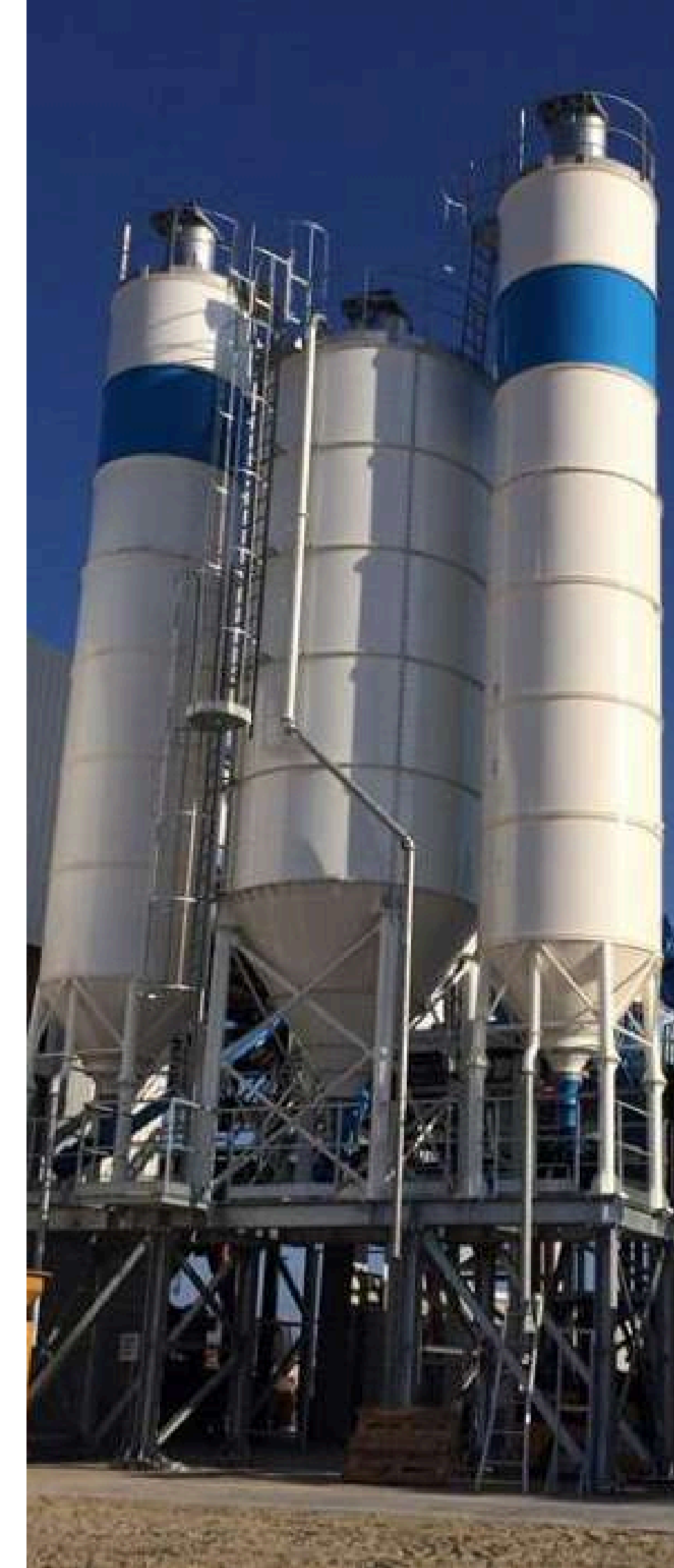
Other important features of the interlocking pavers include:

- non-slip surface which maintains a high coefficient of friction even when wet. This improves safety on slopes and curves for vehicular and pedestrian traffic.

- lighter and more homogeneous color significantly reduces the heat they absorb. This improves thermal comfort by reducing the formation of heat islands in large highly paved urban areas.

- lighter color and fine finish reflects much more light than other types of pavement, generating savings of up to 30% in public lighting.

- the pavers are placed on a bed of stone dust or sand which allows rainwater to quickly infiltrate through serving as an important flood control measure.



Smart City Ecopark

Ten hectares of the Smart City Laguna will be devoted towards the Smart City Ecopark, forming an entrepreneurial and technological center for businesses. The infrastructure includes high resistance interlocked concrete pavers, a drainage system for stormwater, a water and sewage network, and a green belt that will separate it from the residential and commercial areas. The complex will have a technically advanced infrastructure and is destined to become a center for smart businesses with proposals in favor of a sustainable and local economy.

The Smart City Ecopark forms a part of the mixed-use zoning that has been planned for the Smart Social City. It will attract investors, help stimulate economic development, and support innovative and emerging activities such as startups and professional training projects. The first company installed in the complex is SG Premoldados, which also provides the interlocked pavers of the entire smart city.

The venture is a unique investment opportunity that is secure and promises high economic returns. There is also a private incentive program, sponsored by SG Desenvolvimento, which reduces the lot pricing (per m²) by up to 50% compared to pricing for the Commercial Center. The incentive plan also foresees an evolution of discounts that reach up to 25% of the financing balance, according to the business installation and startup schedule. Entrepreneurs can also benefit from municipal tax incentives which reduce the ISS (services tax) and state and federal tax advantages, according to the type of activity.

SMART CITY
Ecopark



◀ November 2017

June 2017 ▼



▲ November 2017



◀ November 2017

November 2017 ▼



▲ January 2017

August 2016 ▶



Timeline

48

330 hectares acquired



Project defined as a "Social Smart City"



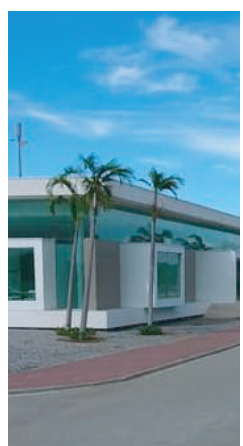
APRIL

2014

The project was presented during EXPO2015 in Milan



The plots went on sale and the Innovation Hub was inaugurated



JULY

2015

Infrastructure development



JANUARY

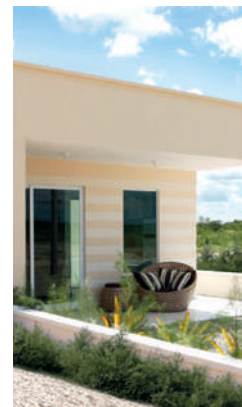
The construction of the SG Premoldados facility was completed



FEBRUARY

2016

Development of buildings



MARCH

1.400 plots sold



MARCH

2017

Beginning of Phase 2 sales plan



Launching of the APPLICATION



NOVEMBER

Laguna is presented at the Smart City Expo World Congress, in Barcelona



SMARTCITY EXPO WORLD CONGRESS

Award granted by the Engineers Union of the State of São Paulo (SEESP)



DECEMBER

2017

2.000 plots sold



Planet the Smart City participates at Smart City Expo Curitiba



FEBRUARY

Report on Economic Value



Participation at Smart City Business America, in São Paulo



APRIL

2018

Awarded the InovaCidade 2018



Launching of the children's book Pedrinho and the Smart City



Project Delivery



2021



towards the 25,000 inhabitants

49




Partners

Planet has established a network of partnerships with more than 40 important national and international companies. Together they share similar objectives and offer their know-how, working proactively towards the creation of smart neighborhoods with the commitment to integrate innovative structures into their products and services. The main partner are as follows:





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