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Porto Leve – A Mobility and Safety Intelligent Infrastructure Urban Solution for Porto Digital

PLENARY 1
Science Parks Shaping New Cities

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EXECUTIVE SUMMARY

One of the problems in recent years due to the rampant growth of urban centers is the urban mobility. In Brazil, this reality is not different. The Porto Digital Technology Park (PD) leads with this problem through its project called Porto Leve.

Porto Leve Project expects to: improve mobility, safety and comfort of people; contribute to the attractiveness of the park; strengthen the environment as a place of reference in the deployment and testing of innovative technologies; improve the life quality of people and contribute to make PD a smart region and to make Recife a smart city.

The paper will describe the details of the Project, its results, how it has been implemented, the difficults faced, the benefits it has provided for the environment, how it has contributed to make Recife become a smart city, providing a better quality of life and the next steps that will be done.

1. INTRODUCTION

The rampant growth of urban centers has caused a number of problems, such as: air, noise, and visual pollution, sanitation, traffic, unemployment, marginalization, among others. One of the problems highlighted in recent years is the urban mobility. The option for the car, which seemed to be the ideal solution for a long time, led to the paralysis of traffic, and has generated environmental problems of pollution and occupation of space, causing mass chaos in large urban centers. Only in Brazil, the fleet of cars and motorcycles grew by 400% in the last ten years[1]. In Recife, between 2011 and 2012, the growing fleet of Recife was 8.2%. This means that the city receives an average of 174 new cars per day, which gives an average of 3.800 more cars per month, making the worrying situation for the region. If the scenario continues like this, the city will reach more than 1 million of cars until 2020[2]. It means that in 8 years it will reach the double of the actual fleet.

[1] Mobilize – Mobilidade Urbana Sustentável. Available at: http://www.mobilize.org.br/sobre-o-portal/mobilidade-urbana-sustentavel/. Access: may/31/2013

[2] Jornal Diário de Pernambuco. Available at: http://blogs.diariodepernambuco.com.br/mobilidadeurbana/2012/05/recife-mais-de-um-milhao-de-carros-ate-2020/. Access: may/31/2013

Comparing these data to the number of habitants the situation becomes worst. In Brazil, in its more crowded cities, the number of vehicles matches at least half the population, in other words, a car for every two people, such as the following cities: São Paulo, Curitiba, Brasília, among others, as showed in Table 1. Such indices are similar to those of developed countries such as Germany and the United States, where the average is less than two people per vehicle.

Table 1 - Brazilian statistics data[3]

CITIES	POPULATION	VEHICLES	HABITANTS/ VEHICLE
Belém	1.392.031	170.672	8,15
Belo Horizonte	2.375.444	888.198	2,67
Brasília	2.562.963	1.249.928	2,05
Curitiba	1.746.896	855.982	2,04
Fortaleza	2.447.409	422.537	5,79
Goiânia	1.256.514	468.368	2,68
Manaus	1.802.525	232.583	7,75
Porto Alegre	1.409.939	548.031	2,57
Recife	1.536.934	327.287	4,69
Rio de Janeiro	6.323.037	2.385.822	2,65
Salvador	2.676.606	459.753	5,82
São Paulo	11.253.503	5.103.295	2,20

The national average is 1 car for every 5 Brazilians, that proportion was almost twice less than two decades. In recent years, with the improving economy, more people have access to the car. The number of vehicles in circulation in the country grows at much higher rate than the population. Since 2004, when the economy got rid of hyperinflation, the fleet increased 54.8%, reaching 34.856 million vehicles in 2011. In the same period, the population is estimated at 192.3 million people, up 5.7%[4].

In Recife, from 2001 to 2011, the number of people per car fell 37%. This means that in 2001 there was one car for every 10.7 habitants, while in 2011 it was one for every 6.7 habitants. It is estimated that in 2014 there will be further growth in this number, also due to be one of the cities that will host the World Cup, further increasing the flow of vehicles on roads[5].

Today, the average of Recife is 1 car for 4,69 people, less than the proportion of the country. On the one hand it is a good new, once the country is developing fast and more people can buy a car. On the other hand, this rampant growth has not kept the same pace of the cities needed regarding the safety, comfort and sustainability.

Porto Digital is a technology park located in the neighborhood of Bairro do Recife, in Recife, which is geographically an island and, like the rest of the city, is also facing mobility issues, such as: (i) lack of parking spaces; (ii) Mobility difficulties in neighborhoods of Bairro do Recife, Santo Amaro and Santo Antonio, and; (iii) The long time people spend searching for vacant in public or private parking lots (average: 40 minutes). Being a historic area and protected in a federal level, the constructions carried out in Bairro do Recife must be approved by IPHAN (Institute of National Historical and Artistic Heritage), respecting the local historical characteristics, thus hindering some possible solutions to this problem, as the construction of new parking spaces, large towers of garage buildings.
Being a urban technology park, Porto Digital is also responsible for improving mobility, safety and comfort of workers, entrepreneurs, visitors, tourists, among the various types of public circulating in

[3] Portal Brasil – Available at: http://www.portalbrasil.net/brasil_cidades_estatisticas.htm. Access: jun/04/2013

[4] Economia&Negocios – Available at: http://economia.estadao.com.br/noticias/economia,pais-tem-1-carro-para-cada-5-habitantes,109273,0.htm. Access: jun/04/2013

[5] FolhaPE – Available at: http://www.folhape.com.br/cms/opencms/folhape/pt/edicaoimpressa/arquivos/2012/11/08_11_2012/0040.html. Access: jun/04/2013

the region, towards the consolidation of the park. Thus, Porto Digital Technology Park has created a project called Porto Leve to provide an intelligent infrastructure with special services to the urban environment of Bairro do Recife, based on innovative technologies and environmentally sustainable.

The objective of the project is to contribute to make Porto Digital a smart region, providing a better quality of life, consequently, contributing to make Recife a smart city. The idea is to transform the urban environment of Porto Digital in a safe place for people and their property, and promote easy access through an infrastructure of parking for private vehicles and functional transport environmentally friendly to make the mobility easy in the region, integrated to the Public system of urban transport (buses and taxis).

The paper will describe the details of Porto Leve Project, its results, how it has been implemented, the difficults faced, the benefits it has provided for the environment and the society in general, how it has contributed to make Recife become a smart city, providing a better quality of life for the population and the next steps that will be done.

2. DEVELOPMENT

2.1. Smart Cities Development

Smart cities are those that adopt a series of effective practices aimed at improving the quality of life, economic development and environmental preservation, contributing for a sustainable development.

Sustainable Development is the development that seeks to meet the needs of the current generation without compromising the future generations to meet their own needs, means enabling people now and in the future, to reach a satisfactory social and economic development level and human and cultural achievement doing at the same time, a reasonable use of land resources and preserve the species and the natural habitats[6].

These cities are usually well planned and managed. Thus, we can highlight some of the main practices that can be adopted by sustainable cities:

- Effective actions aimed at reducing the emission of greenhouse gases in order to combat global warming.
- Measures aimed at the maintenance of common natural resources.
- Planning and quality of public transport services, mainly using clean energy sources.
- Encouragement and planning actions for the use of non-polluting means of transport such as bicycles.
- Actions to improve urban mobility, significantly reducing vehicle traffic.
- Creating efficient systems aimed at waste recycling.
- Application of educational programs aimed at sustainable development.
- Urban planning efficient, especially taking into account the long term.
- Facilitation of a dynamic and sustainable local economy[7].

In this context, smart cities bring to the reality the necessity of a sustainable conscience to ensure the well survival and growth of the future generation.

2.2. The role of a Technology Park for a Smart Habitat

[6] Amadora 21 - Available at: http://www.cm-amadora.pt/PageGen.aspx?WMCM_PaginaId=42786 . Access: may/31/2013.

[7] Sua pesquisa.com – Available at: http://www.suapesquisa.com/ecologiasaude/cidades_sustentaveis.htm. Access: jun/04/2013

Modern technologies represent the major factor responsible for the disequilibrium in the environment, because they are based on intensive use of energy resources and emission of pollutants [8] . However, technological innovation can also be responsible for developing green technologies and reducing the adverse effects on the environment.

Innovation and investment in green technology is the key to the issue of sustainable development, because it has the potential to make a step forward in the dilemma between economic growth and environmental quality[9].

As defined by the International Association of Science Parks (IASP), Scientific and Technological Park is an organization whose main goal is to increase the wealth of the community by promoting the innovation culture and competitiveness of enterprises and institutions based on its knowledge. To achieve these objectives, a Science and Technology Park stimulates and manages the flow of knowledge and technologies between universities, research institutions and development - R & D, companies and markets, facilitates the creation and growth of enterprises based on innovation by incubating and spin-off processes, and provides other value-added services and support services of high quality[10].

The adoption of innovative and environmentally sustainable technologies in a scientific and technological park can serve to improve mobility, safety and comfort of the community, also contributing to make its region a smart habitat. In addition, the park can also serve as place where these new technologies can be experienced and tested in order to facilitate to be implemented in the city, consequently, contributing to make its city a smarter city.

2.3. Porto Digital Technology Park

The main "hotbed" of knowledge and development of ICT applications in Pernambuco is Porto Digital (PD), a urban Technology Park located in Recife, Pernambuco, Brazil. PD is the result of an innovation environment in Pernambuco which was consolidated in recent decades along with the coordinated effort of the university, the productive sector and the government, in order to insert the industry of ICT in the economic matrix of the State. Sector of high growth potential, ICT is also the basis for increasing the competitiveness of a region.

Porto Digital is the main component of ICT in Pernambuco. Its goal is to implement public policies for the development of the State, urban regeneration, social inclusion, strengthening of the ICT pole and other poles through the use of these technologies. With 13 years of existence, PD is a leading technology pole of the country. PD has generated for the state arround 7.055 jobs, attracted 536 entrepreneurs and 240 institutions among universities, government agency, research centers and development and technology companies with national and international levels. Companies of all sizes have already been installed in PD and are producing new solutions and new technology products.

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[8] ANDRADE, T. Inovação tecnológica e meio ambiente: a construção de novos enfoques. *Ambiente & Sociedade,* São Paulo, v.7, nº.1, 2004. Available at: <http://www.scielo.br/pdf/asoc/v7n1/23538.pdf>. Access on July 2011

[9] CORRÊA, C. R. *et al.* Inovação tecnológica e meio ambiente no Brasil. Available at: <http://www.poseconomia.ufv.br/docs/TextoDiscussao09.pdf> Access on July 2011

[10] MIRANDA, Z. A. I. & NEGREIROS, R. Parque Científico e Tecnológico como mecanismo indutor de desenvolvimento sustentável. *Revista de Gestão Integrada em Saúde do Trabalho e Meio Ambiente*, São Paulo, v.2, n.4, 2007. Available at: <http://www.interfacehs.sp.senac.br/index.php/ITF/article/viewFile/141/163> Access on July 2011.

As a result of the success of all its actions, PD was elected by AT Kearney[11], one of the largest consulting companies in the world, as the largest technology park in the country in number of companies and sales in 2005. In 2007, PD was recognized as the Best Technology Park and Habitat for Innovation in Brazil by the National Association of Entities Promoting Innovative Enterprises, ANPROTEC[12], which represents the interests of business incubators, technology parks and innovative enterprises in Brazil. The recognition came with the National Award for Innovative Entrepreneurship in 2007. Moreover, in 2008, Porto Digital was the only Brazilian technological park to join the first edition of Learning by Sharing from IASP (International Association of the Science Parks) that featured four parks around the world. And in 2009, the Business Week, the largest business magazine in the world, noted PD as one of the places where the future was being created. Recently, the park won from the INPI – (National Institute of Industrial Property), the first Geographical Indication Seal for the IT service area. The seal certifies that the software produced in Porto Digital has certified quality.

To manage the park, it was created in 2001 the NGPD – Management Unit of Porto Digital, a social, private and nonprofit organization. This organization has a role in the success of Porto Digital. NGPD is the agent for implementation of public policies to promote the structure and evolution of the Technology Park, through the implementation of public and private resources.

NGPD's main objective is to increase the positive environmental factors in order to improve the innovative capacity and competitiveness of enterprises and of the cluster as a whole. To do this, its main roles are: (i) to generate original ideas, (ii) to develop innovative projects, from original ideas, (iii) to joint operating agents, so that projects can be implemented -including sponsors, government, enterprises, universities, and (iv) to attract innovative ICT-based companies.

Currently, NGPD has around 43 projects and manage R$111.925.353,52 in order to improve the park environment. This year, 2013, it obtained its ISO 9001 in project management area, which proves its expertise in manage projects.

Given the above, it is understood that PD is a valuable asset of Pernambuco state, with the potential to contribute to improve standards of production efficiency in the ICT sector and therefore to improve the level of the park environment infrastructure.

This view gains strength and foundation on the current situation, where cities needs to be rethought and redesigned to face its current problems related to the rampant growth. Moreover, given the fact that the velocity of the growth is very fast, it is inherent the concern to develop in order to integrate the technology production to the conservation of the environment. Thus, given the constant need to provide better solutions to this scenario and the global concern for the environment, NGPD created the Porto Leve Project, a mobility and safety intelligent infrastructure urban solution, in order to improve the quality of the park infrastructure.

In this context, it is noticed the importance of Porto Digital for the economic, ecological and social development, not just for the ICT cluster, but also for Recife city and for the Pernambuco State. One of its various roles is to work in disseminating knowledge and promoting an environmental eco-friendly culture.

2.4. Porto Leve Project

The Porto Leve Project is a a mobility and safety intelligent infrastructure urban solution which objective is to provide special services in the urban environment of Bairro do Recife neighborhood, based on innovative technologies and ecologically sustainable, to improve mobility, safety and comfort of workers, entrepreneurs, visitors, tourists, among the various types of public circulating in the region, towards the consolidation of the Technology Park Porto Digital.

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[11] AT KEARNEY. Desenvolvimento de uma Agenda Estratégica para o Setor de "IT Off-shore Outsourcing". Brasília, 2005.

[12] ASSOCIAÇÃO NACIONAL DE ENTIDADES PROMOTORAS DE EMPREENDIMENTOS INOVADORES. Panorama de Incubadora de Empresas e Parques Tecnológicos 2006. Brasília> ANPROTEC, 2005. Available at: http://www.anprotec.org.br/ArquivosDin/Panorama_2005_pdf_11.pdf. Access: July 2011.

Porto Leve Project expects to: (a) improve mobility, safety and comfort of workers, entrepreneurs, visitors, tourists and the general public that circulate in the region, (b) contribute to the attractiveness of the Technology Park, generating a positive impact in attracting investments and in the image of Porto Digital, (c) strengthen the environment of Porto Digital as a place of reference in the deployment and testing of innovative technologies applied to the urban environment, (d) improve the life quality of people who frequent the region, and finally, but not least, (e) contribute to make Porto Digital a smart region, consequently, contributing to make Recife become a smart city.

The project consists in 3 axis: (i) The Mobility System; (ii) The Security System and (iii) The Study Center, as illustrated in Figure 1:

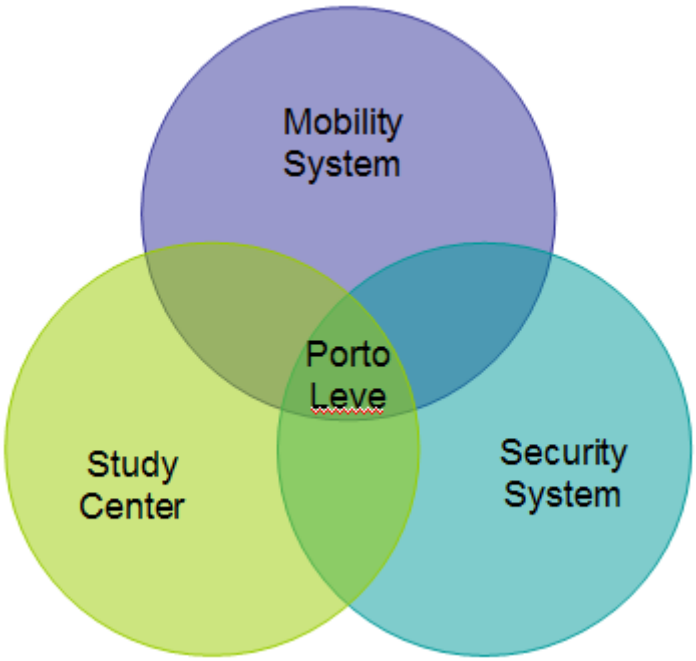

Figure 1 - Porto Leve project and its 3 axis

The Mobility System

Due to the lack of spaces in the public parking and the geographical distribution of the ventures of the Bairro do Recife, many people need to make small and medium routes within the Park. These paths are mostly to gatherings and business meetings between companies, as well as dining at restaurants located in the neighborhood, as well as for use of other services available on site (bank, post office, notary, etc.).

Furthermore, the presence of important centers of concentration of people and services like: TJPE, City of Recife, CESAR, Federal Police, Customs Shopping Palace, Secretariat of Science and Technology, IRS, among others, require many shifts in Bairro do Recife. These offsets when performed by private vehicles face the problem of not find parking places near their destinations, and when performed by bus, leave people far from the desired location by forcing them to do the rest of the journey on foot causing further inconvenience and loss of time.

Due to this lack of parking spaces for vehicles and difficulties to move, arriving by car at the Porto Digital is increasingly difficult. The search for vacant parking lots in public or private, close to the place of destination, can consume up to 40 minutes, causing inconvenience to people and damage resulting loss of time, stress, pollution and unnecessary congestion in the neighborhood environment.

To facilitate access for people with private vehicles, this step provides the deployment of an integrated system to support the mobility in the neighborhood of Bairro do Recife, covering the following modules:

i. A smart parking system

The smart parking system consists in the deployment of 2 private parking in strategic locations of the park, allowing the user to leave your car and then walk or bike or take an electric car to its final point of destination. Parking lots shall be installed in existing buildings in the neighborhood, located at strategic points, and use innovative technologies to control and management of vacancies and payment of parking.

ii. A bicycle sharing system

The bicycle sharing system consists in the Implementation of the 10 bike stations shared with 10 bikes per station, 100 bikes in total. Each parking will also have a smart station bike rental, allowing the user to leave your car and move into the neighborhood by bicycle.

The intelligent bike rentals stations will be deployed in strategic places so that people can continue their travel to final destination or move faster and comfortable in their movements within the neighborhood. The bikes system will be managed by a software that will control the whole process of renting and returning.

The rental stations will be installed next to bus stops, public parking lots and private and local high concentration of people, whether for work (technology companies of the park, city hall, federal revenue, etc.) or for pleasure (Shopping Centers , tourist places, etc.), forming an intelligent network of locations for pickup and return of the bicycle, providing a network of routes that meets all trips made within the neighborhood. Moreover, the rental bikes can be used for the other public, such as: tourists and patrons of bars and restaurants that visit the neighborhood.

iii. Car sharing system

There will be 3 electric cars, compact, for 2 people, to be circulating between the smart parking and the special public spaces that will be created for them. It will be working in the same way of the bike sharing system explained above.

The car sharing system will provide a location and automation embedded system that allow for its unlocking and release and use by the user accredited.

iv. An intelligent system of information about urban mobility

The intelligent system information about urban mobility will bring for its users information about: availability of parking spaces, traffic and public transport routes.

For the parking spaces information, it will be developed a computerized system that will inform in real-time about the occupancy status of all parking (public and private) in the Bairro do Recife. With this system, a visitor or worker who goes to the park can see and even schedule (private parking) spaces for your vehicle through mobile phone or internet. It will also be deployed message boards on the corners and on the streets of the neighborhood, informing drivers about the existence of vacancies in the streets.

For the traffic information, it will be developed a dynamic map with updated information in real time about traffic in the neighborhood of Recife, and their access routes between major entrepreneurial centers of the city. The system will be based on information provided by smart cameras associated with OCR technology (Optical Character Recognition), which allows

identification and monitoring of cars on the main roads from their boards, and information provided by the GPS system of public transportation.

For the public transport routes, it will be implemented a system for automatic answering to the public transportation users, enabling them to consult and construct routes of access and exit of the Porto Digital and neighborhoods. Integrated into the GPS system of the bus fleet of the Metropolitan Region of Recife, the system will allow obtaining real-time information regarding public transport provision. The user can access and search the best routes (considering time and transportation cost), availability of buses, timesheet and still be accurately informed in relation to the waiting time.

The Security System

To have an appropriate environment for the proliferation of companies and synergistic relationships that can contribute to the consolidation of Porto Digital, it's needed to guarantee to the whole community a safe and free of any urban violence environment, as well as identifying and controlling vehicle access to the neighborhood. The Porto Digital, to be located on an island, with a limited number of entrance and exits, has ideal conditions for deployment of a vehicular monitoring system able to identify the entry and exit of vehicles on the island, as presented in Figure 2.

Figure 2 - Porto Digital map and possible cells information places

This step includes the implementation of a security system and management of the movement of vehicles in the area where is located the technology park of Porto Digital, based on the identification and control of the movement of vehicles, including the following modules:

i. Identification of entry and exit of vehicles in the park

This module consists in the development of a vehicle tracking system that identifies the entry and exit of all vehicles in the Porto Digital. This system will provide information related to the safety and supervision of vehicles operating in the neighborhood, allowing traffic managers to and public safety agencies, conducting continuous actions of irregular vehicles approach and combat vehicle theft in the region and monitoring the behavior fleet that transits and stays in the neighborhood, allowing studies of the movement of vehicles in the region.

Furthermore, this system will provide a very rich statistical database with the vehicles profile that circulates in the neighborhood, identifying transiting arrival and departure and transit pass.
It is planned four monitoring points located in the access bridges to the island of Bairro do Recife, integrated with traffic management agencies.

ii. Vehicular Identification and Blocking

This module provides the development of an application to identify and localize vehicles and block them, which is based on identification of cells installed at strategic points and traffic lights in the neighborhood, creating a network of intelligent vehicles interaction with the network traffic signal, enabling the centralized control by the Transit Company, without the need for wiring installation timing and communication besides enable the deployment of special services, such as: identification of average speeds of the roads in the neighborhood, identification and information of faster routes, etc.

Besides the vehicles of workers of the companies located in the Porto Digital, all buses that frequent the neighborhood will receive a CHIP identification, allowing experiments to be performed in real-time adjustment of the network timing signal control with priority for public transport and ambulance at the traffic lights.

This module is designed for vehicles of users working in Porto Digital environment and buses and fleets that roam the neighborhood. This system is based on radio frequency cells and on chip technology that identifies and block the vehicle, which allow users to equip their vehicles with a locking device location and low cost and advanced technology capable of enabling a variety of applications such as: lock the vehicle in case of theft / larceny, vehicle location and tracking for statistical purposes of movement, interaction with the vehicle control systems and the network traffic signal prioritization of traffic signal timings to improve the movement of public transport.

This step provides for the deployment of 10 communication cells and 300 identification devices for use in vehicular fleet of buses circulating in the neighborhood and interested users.

The Study Center

The creation of a Study Center for Technologies Applied to Urban Mobility is necessary not only as a motivator for a new imagination about public transport in the metropolitan area of Recife, but mainly as a base and core sharing referrals, cases, projects and technological innovations, favoring the dissemination of knowledge and the generation of new businesses related to the field of urban mobility and sustainable development.

The exhaustion of the public transport model, the mobility chaos already installed and felt by all segments of the population, the disproportionate growth of the fleet of individual vehicles with respect to saturated road infrastructure in all medium and large Brazilian cities, requiring new and immediate solutions to the commuting population.

There is a growing societal pressure for alternatives and in this context, the government and the business sector will be increasingly pressured by consistent and lasting solutions. This, however, necessarily requires new concepts and practices of sustainable garb and the constant search for new ideas.

Grows, thus the importance of Porto Digital to contribute to the debate, producing information, opening new business opportunities, and become, in partnership with the business sector, a reference to induce the production of technological innovations and promote prospecting new businesses and new demands for the sector.

This step provides the creation of the Study Center for Technologies Applied to Urban Mobility acts primarily on the promotion and dissemination of knowledge focusing on stimulating the creation of technologies and solutions to the issue of urban mobility.

The center aims to produce, promote and disseminate knowledge on urban mobility, public transport and sustainable development. Its main strategic actions are: (i) preparation of research to encourage new business and sector interest, (ii) creation and delivery of technical assets, with own contents and from others, about innovation and technology applied to public transportation, urban mobility and sustainable development induced by transport, (iii) promoting debate and fostering proposals for

improving urban mobility, and (iv) encouraging and promoting corporate citizenship by business segment.

Researches will be developed, prepared technical documents and statistics, statements and periodic reports, encouraged and promoted the academic events and seminars about the areas of the Study Center.

This will all be possible through the creation, structuring and systematic update of a digital collection on urban mobility technologies applied to public transport and sustainable development in web environment, offering tools filters, searches and multimedia modules. In order to do this, the Study Center provides ongoing research and content production. The collection will be free and available to anyone with Internet access.

In addition, the Study Center for Technologies Applied to Urban Mobility will feature services, advertising and media, in order to broaden the dissemination of their actions and encourage discussion about the topics covered.

2.5. Results of Porto Leve Project

The project began in March, 2012, having already been installed 10 stations of bicycles, with 100 bicycles in total, spread across the Bairro do Recife neighborhood and 2 others that make connection with it: Santo Amaro and Santo Antonio, as shown in Figure 3. One of the parking spaces with 54 places is working too, containing a bicycle virtual station inside it.

The implementation of the bike sharing system required a lot of interaction with external and public actors what made the project delay around 6 months. This interaction was necessary once the bike stations were installed in public sidewalks and squares and also in the area of a Shopping Center. So, it was need their authorization before install the bike stations. However, this problem was outlined and bike sharing system is working very well, with a very good use by the population. Since its launch on 8th January, 2013, in just 4,5 months of its execution, it has 13.745 people registered in the system, with 3.683 passes selled and 15.682 trips done.

Figure 4, Figure 5 and Figure 6 can show the bike stations 2, 3 and 6, respectively, and Figure 7 can show people using the bike in the launch day.

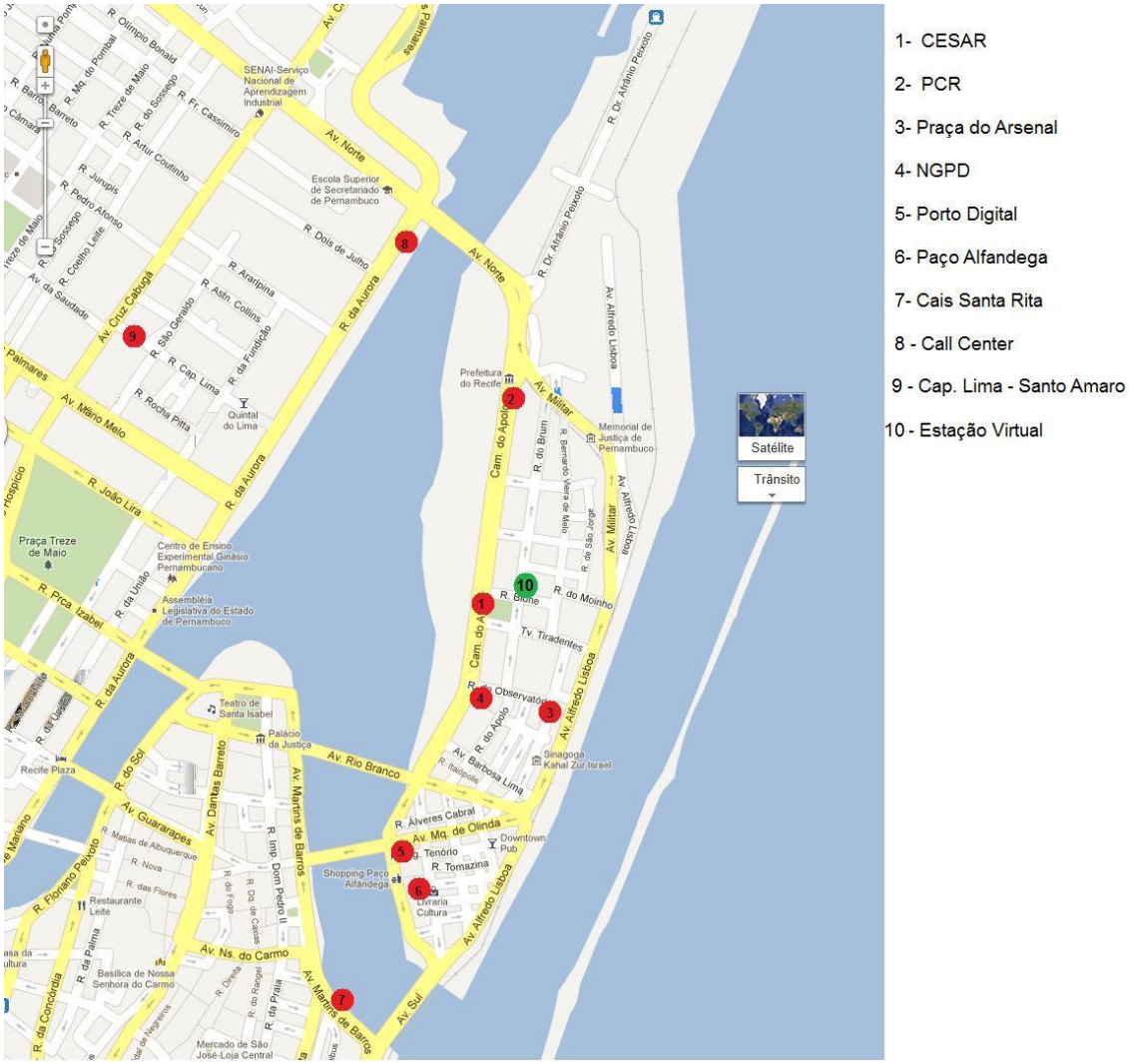

Figure 3 - Bicycles Stations Places

Figure 4 - Bicycle Station 2

Figure 5 - Bicycle Station 3

Figure 6 - Bicycle Station 6

Figure 7 - People using the bicycles

The results of the bike sharing system were so positives that influenced the population and pressured the public authorities for similar initiatives. As a result of this, 2 new projects were promoted after the Porto Leve launch.

The first one was implemented by the City Hall of Recife, through the departments of Tourism and Leisure and Urban Mobility. They introduced the Mobile Bike Lane for Tourism and Leisure. It is a mobile mounted bike lane in the city that works on Sundays and holidays and has about 25 km of extension. Moreover, the project was concerned with the safety and comfort of the population, with 102 uniformed traffic operators to guide drivers and agents of the Company of Traffic and Transportation Urban are set on the opening hours of the action.

The second one was the extension of the bike sharing system through a project called BikePE that will have 70 bike stations, with 700 bikes in total and will reach 3 cities and 20 neighborhoods. All bikes will be installed until October, 2013. Now, the center of Recife already has 8 bike stations installed and being used by the people.

Despite the intention of the public power and Porto Digital to integrate the Porto Leve and BikePE systems, they were not born integrated, because the bureaucracy needed to make it happen. However, it is already being solved and soon the systems will be integrated.

The smart parking system has a management system that controls automatically the cars that enter and exit from it. The electric cars are not installed yet. They need to be imported and some researches about the best brands and prices are been made.

The second smart parking is not implemented yet due to the difficulty that is being faced to find a good place located in Bairro do Recife neighborhood that presents around 150 parking places. Every month people make a survey in the neighborhood to check if there is a new free space to rental.

The intelligent system of information about urban mobility is being implemented. After that it will be tested and then available for people use it.

The cameras were already installed in the bridges of Bairro do Recife to check the cars that comes in and out from the island. The antennas were installed in some specific point to change the data necessary when identify the cars, between the cameras and the management system. The whole system is being tested and will be working soon.

The study center is already operating. Researches are being made by experts in the topic of urban mobility and some examples in the world were highlighted in the first results. In February, 2013 it was performed the International Mobility Seminar – MobIT. It had around 200 participants, with online transmition that attracted 587 visits in the 2 days of the seminar. All material was made following the visual identity of the event and the standards of quality and sustainability of the Porto Digital. It has complied with the purpose of planning that pointed to the use of recyclable materials. The paper used in the program folder, block and board was the Port Take Reciclato (recycled paper) and binders to reuse canvases advertising to demonstrate this concern.

Also as a result of the Center actions it was published the first edition of the MobIT magazine with 2.000 copies that were distributed to the public institutions, companies from Porto Digital, partners, among others.

Every two months is generated a reports with the results of the publicity and advertising services and press releases sent to dissemination of the Center actions, with an average of 60 insertions in the media bimonthly.

It is also being developed a website for disseminate the actions of the center. Is should be activate in September, 2013.

This project is still in progress and all of its actions were started in someway. It is expected that even when all the actions be implemented the project can continue. That's why it also has an iniciative that plan actions to make it self maintained after the initial resources finish.

3. CONSLUSION

This paper introduced the importance of having a mobility and safety intelligent infrastructure urban solution for Porto Digital Technology Park, how it was implemented, dealing with the main problems currently faced by the urban park and, at the same time, with the problems faced by the city due its rampant growth.

The Porto Leve solution presented in this paper brings innovative and environmentally sustainable technologies, it can be easily observed in the bicycle sharing system; in the smart parking system, in the car sharing system, in the intelligent system of information about urban mobility (availability of parking spaces, traffic, public transport routes) and in the use of recyclable materials to produce the material os its seminars done through the Study Center actions.

The project expects to improve: (i) the problem of the lack of parking spaces through the introductions of new park places through its smart parking system; (ii) the problem of mobility difficulties in neighborhoods of Bairro do Recife through its bike sharing system, electric cars system, and (iii) the long time people spend searching for vacant in public or private parking lots (average: 40 minutes), with its intelligent system of information about urban mobility.

In order to make all of this working and stimulate people use, the project also though about the security issue promoting its security system, through the Identification of entry and exit of vehicles in the park and the Vehicular Identification and Blocking system.

Among the results already achieved by the project we can highlight the creation of 2 new similar projects by the public sector: the Mobile Bike Lane for Tourism and Leisure project and the BikePE project. Both are being widely accepted by the population. It is a fantastic result once it can prove that the actions done by Porto Digital can serve as an experiment to be, posteriorly, widely expanded or implemented by the city.

By providing improvements in mobility, security and convenience of park workers, the project is improving the quality of life of these people and besides this, it also can contribute strongly to the attractiveness of the park, positively impacting on attraction new companies and investments, and thereby contributes to a better corporate image.

The project is still in progress, however, it has already shown its potential to contribute to make Porto Digital a smart region, providing a better quality of life, consequently, contributing to make Recife a smarter city. It is transforming the urban environment of Porto Digital in a safer place for people and their property, and making easier the access in the park through an infrastructure of parking for private vehicles and functional transport environmentally friendly.

The next steps are: (i) to implement the rest of the project, specially the car sharing system and the intelligent system of information about urban mobility, (ii) try to improve the plan to make it self sustainable after finish the initial resources and (iii) continue trying to stimulate the public sector to make Recife a smarter city.