SMART CITY SCAN FOR ROMANIA

Fourth Edition, June, 2020

Accelerating the digitization of cities, after pandemic.

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Thank you to our partners!

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1. INTRODUCTION

The present report, planned in quiet, predictable times, sees the pattern during a period which overturned perceptions, priorities and whole strategy. Smart City passed, over the past few months, first in a secondary framework, so that later, gradually, to return to attention, with creative thinking, which saw the opportunities and usefulness of smart solutions, including in fighting an unseen enemy. The banal intelligent video surveillance has become the most important solution in some states for monitoring the movement of virus carriers and their contacts. Smart cities, this time -- from another continent, have developed real municipal war rooms, with all the sensory systems integrated into a single interface, to control the effects of the pandemic. Cities suddenly saw themselves stuck in everything that means development, traditional or intelligent, and works, from the crub to the smart pole, were stopped. Slowly, the panic wave has passed, the management prioritized resources and the Smart City area developed, conditionally under circumstances, the safety component, more than the figure in any municipality plan, at the beginning of 2020.

How has the pandemic been translated at the level of the Romanian big, medium and even small municipalities? With a little of all: elan, retreat, panic, trust, nerves and suspicion.

Our interactions with the municipalities, in the attempts to produce this report, meant months of silence, relative respect for the legal deadlines for responding to requests for information, and a hard work, on the last hundred meters, of responsible who have also seen the opportunity of image generated by the presence in the current report. We also talked with mayors who presented us in detail the Smart City strategy, but also with public persons who, if we called them today, would answer us by asking what we want from them.

The certainty is that, for reasons that vary from need, competitiveness, obligation or even fear of falling behind, Romanian municipalities, which more difficult than easy, find the resources needed to develop Smart City in times of pandemic. It is all about finding the right motivation.

2. SMART CITY MARKET NEWS

The turn-key smart solutions integrator Vegacomp Consulting, continues the Scan of the Smart City projects in Romania, with the fourth edition, based on the data collected, valid on May 31, 2020, which comes precisely at a time when the lights were concentrated on the public administrations in Romania. This edition provides a development, starting from a solid basis of the first three reports, and presents a measurable view of progress over the past year, together with new information about developments and local strategies in municipalities, but also an optimized filtration in Smart City market, which is proving to continue to grow, even in a pandemic context.

"We could open this report with the idea that Smart City it is going always forward, regardless of the global context, but it would be false. Smart City not only goes forward, but also it is proving to be an essential help, especially in difficult contexts. Today's technologies and smart solutions quickly find new roles, cover new niches and contribute more than ever to our health and safety, of all. Only now, human learn truly to use intelligent resources to ensure not only evolution but even existence. And this thing, keeping the proportions, sweats from strategies of the Romanian municipalities. And many of them are now learning Smart City in need, after the early adopters train has already left the station and we see an explosion of Smart City projects," says Cornel Barbut, CEO, Vegacop Consulting.

The Smart City market, at global level, is continuing to grow rapidly, with an estimated average annual growth of 20% until 2025, when the market is expected to reach $2 trillion, according to several sources, including Smart Cities World. In 2025, it is estimated that 50% of Asia's smart cities will be Chinese cities, while Europe will have the biggest investments in Smart City projects in the world. India aims to reach the milestone of first 100 Smart Cities in 2022.

If we ask if there is any city 100% intelligent in the world, now we can only say that more studies have been carried out in this regard. Perhaps the most famous of them is the CIMI, made by IESE, cities in Motion Index. The latest date from 2019, representing the sixth edition and analyzes 174 cities from 80 countries, after 10 core indicators and complying with the ISO 37120 standard. The study estimated that Europe will have 300 Smart cities in 2020[1]. There are around 1.000 cities in the world with a population of over 500.000 and the question is justified – when will all these cities become smart? Or, at least, when will 80% of them become intelligent?

1.(https://www.ieseinsight.com/doc.aspx-?id=2124&ar=&idi=2&idioma=2)

Similarly, we ask ourselves: When will we have the first intelligent city in Romania and what will it be? We are seeing a competition between cities, in present - which is extremely beneficial. And after in Romania we past the pilot projects phase, especially through the laboratory in Alba Iulia, we are oscillating between Smart City development strategies and projects with European funds, including Smart City components. The focus, in the next period, is on infrastructure and open data, according to the Digital cities challenge report, according to which a city like Kavala wants to offer in 2030 City as a Platform services. Cities and public administrations say that they are now more or less lacking the support of central authorities and each seeks and tries to develop on its own at local level. Strategic design is one of the challenges for administrations. Several strategies of Smart City have been carried out in Romania since 2009, but unfortunately without much results. So far, at least.

As a matter of fact, we are launching the challenge to the cities that will make such strategies, not to do them according to the model of the PMUD (sustainable urban mobility plans) with more than 100 pages, many of them taken literally from city to city. In 30 – 50 pages, or even less, you can describe the essential things and actions to be taken.

We have great hopes of seeing the Smart City strategies in Arad and Iasi completed and implemented, as they enjoy the European support of the Intelligent Cities Challenge[2] alongside 39 other European cities:
- AR@Digital: Open. Educatated. Innovative. The Digital Transformation Strategy for the city of Arad – July 2019, 79 pages[3]
- Iași, a growing digital housepower and entrepreneurship – July 2019, 88 pages[4]

The major challenge for today's Romanian cities it is the speed of implementation. Looking at the Netherlands, which is the third-degree country of innovation in Europe, according to the Global Innovation Index (GII) published by INSEAD in August 2019, we see that the state is engaged in all sorts of innovative actions, in partnerships with private firms[5] we clearly see that Romania also needs to overcome bureaucracy, but also to change mindsets in all environments, both public and private, this leads to a significant speed of project implementation.

If in the first edition of March 2018 the number of Smart City projects in Romania identified in the report was 216, and we present a market evaluated at EUR 30 million in the second edition of autumn 2018, We are already discussing a Smart City market that exceeded 300 projects carried out in Romania, while in March 2019, in its third edition, it reached 331 initiatives in the project stage, being implemented or already completed. Today we are marking 594 projects of Smart City and a market evaluated by multiple sources at over 120 million euros, which shows and confirms a substantial growth of the Smart City market in Romania.

As news from the market of Smart City in Romania, we emphasize the extension of smart city development to the first two communities in smart villages - Ciugud in Alba county and Luncavita in Tulcea county, as well as to the first intelligent county: Cluj – Smart Territory (https://www.cjcluj.ro/proiecte.php?id=117) followed, at the level of intent, by Ilfov county. At the same time, we have the first fully digitized public institution in Romania, at the Urban Mobility Division of sector 4, which proves it can be possible.

2 .https://www.digitallytransformyourregion.eu/cities)
3. https://www.intelligentcitieschallenge.eu/cities/arad
4. https://www.intelligentcitieschallenge.eu/cities/iasi

5.(See as an example the project mentioned in page 26 where the State financially supports 8 Dutch IMM, specialized in urban landscape and the greening of premises/buildings, to internationalize their products and services)

3. WORK METHODOLOGY

The methodology of this release has been optimized, by collecting data from three sources of information and checking it: city halls, suppliers, media. We sent addresses to over 324 city halls in Romania, of whom only 87 were answered in 2 or even 3 rounds. We have put at Bucharest 7 city halls in this report. The report shall include information from city halls and other sources during the period from 9 April to 15 June 2020.

The processing of the data collected has followed up and re-checked the information collected in the previous three editions. Such, there are cases where Smart City solutions were noted in the first edition of 2018, but no longer appear in this edition of 2020, as is the case in Seini. There, a renewable power plant was built through biomass, with funds from the World Bank and only 5% co-financing from the city hall in 2014, but in the meantime, this power plant it is in loss and represents a burden for the city hall, according to local representatives.

Information from city halls was also backed up by a second layer of data from city hall sites, from smart city solution providers, also media appearances related on Smart City projects communicated. As a final step, we have a set of information obtained through direct interviews with representatives of Smart City solutions providers in Romania, some of which are not communicated through the media.

The present version, the fourth edition of the Smart City X-Ray in Romania, already gather information about 87 big, medium and small cities in the country that currently have 594 Smart City projects in the plan phase, ongoing or already completed. We consider a 10% margin of error in collecting our data – that is, we estimate that there are actually more Smart City projects, about 10% compared to those we identified – because today, The Smart City projects are run by non-centralized city halls and there is a lack of communication between departments. For example, there are many projects that have been carried out recently in the area of smart lighting, but not all are Smart City projects.

Vegacomp Consulting will update and consolidate annually all information published in this new version of the document, in order to present permanently a correct image of the development of Smart City in Romania.
The identified Smart City projects retain their classification, in the same six Smart City verticals - Smart Economy, Smart Mobility, Smart Environment, Smart People, Smart Living and Smart Government, that are in line with European Union reporting

What is a Smart City project?

"A smart city is a place where traditional services and networks are made more efficient by using telecommunications and digital technologies for the benefits of its citizens and the economy" [1]

We have included in this X-Ray of Smart City projects that have the following characteristics:
- They're for the inhabitants of a city
- They are carried out in partnership with the city hall
- Perform at least three simultaneous functions, for example, changing an old light bulb with an LED-based one is not a Smart City solution, unless the design also includes tele-management and remote control options for LEDs.
- They bring a clear improvement over traditional solutions, for the comfort of the inhabitants
- It is integrable - it can be added to city hall applications or third party applications
- It is scalable - it can be replicated quickly and easily to other city halls as well

1. https://ec.europa.eu/digital-single-market/en/policies/smart-cities

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What projects are not Smart City?

- Replacement of conventional street lighting bodies with LED lights, as a one-off action
- Replacing traffic lights with other traffic lights with LED, just because they look better and have less power consumption. To be a Smart City solution, they need to communicate their permanent status to a dispatch and to communicate with neighboring traffic lights, for a mechanism adapted to traffic and for proper fluidity.
- Installation of a number of safety cameras in a city is not Smart City solution, if it is a closed system and the cameras communicate to a closed circuit dispatch. The solution is Smart City if images include other automated usage options such as: Fire/smoke alert, red traffic light crossing alert and other possible scenarios.

What other projects are Smart City?

We have so far considered a Smart City project only those that have passed through town halls, as being for the city and centralized by local government, but we see an increase in private projects made for the city, that meet all other requirements of a Smart City project. We now mention just 3 examples: air quality monitoring projects, car & bike sharing – renting of bicycles or cars
(https://www.citylink.ro/)
or infrastructure with electric car filling stations.

We aim to consider this kind of Smart City projects in the next edition of Smart City Scan in 2021.

4. TOP CITIES LISTED IN THE REPORT

The list of cities that are enrolled in Smart City competition is in an accelerated development. If in the last edition of 2019 there were 45 cities, this year we have 87 cities, shown in the following ranking, with the mention that in Bucharest we have had 7 city halls (a total of 92 city halls present):

Looking at the top 10 smart cities in the country, we notice the distance of Cluj to the second place, followed by Timisoara on the podium. The next group of 7 cities with 15-19 projects is very close, from which we expect significant increases in the near future.

We note that the number of people from city halls dedicated to Smart City projects and infrastructure is increasing, but also that seven cities are fighting to become the first intelligent city in Romania.

We will only move to the next stage of Smart City development when in Romania we have at least one person dedicated to Smart City projects and when we have new jobs such as data Manager or infrastructure Manager in the city hall.

Iași
19

Oradea
17

Piatra Neamț
15

Cluj Napoca
54

Arad
19

Timișoara
26

Alba Iulia
106

Sibiu
16

Brașov
18

București Sector 4
18

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Nr.	City	Total projects	Smart Economy	Smart Mobility	Smart Environment	Smart People	Smart Living	Smart Governance
		594	84	188	42	29	121	130
1	Alba Iulia	106	24	17	8	8	24	25
2	Cluj Napoca	54	4	20	7	3	12	8
3	Timisoara	26	5	9	1	1	6	4
4	Arad	19	2	5	1	5	1	5
5	Iasi	19	2	5	1	0	7	4
6	Brasov	18	1	6	1	1	3	6
7	Bucuresti Sector 4	18	2	7	0	0	5	4
8	Oradea	17	1	8	1	0	4	3
9	Sibiu	16	5	5	0	0	2	4
10	Piatra Neamt	15	1	6	2	0	3	3
11	Deva	14	1	3	1	0	8	1
12	Galati	13	2	6	1	1	2	1
13	Baia Mare	11	2	4	1	1	1	2
14	Bucuresti	11	1	7	0	0	1	2
15	Constanta	11	1	5	1	0	4	0
16	Avrig	10	2	0	5	0	3	0
17	Botosani	10	2	2	0	1	2	3
18	Giurgiu	9	1	2	0	1	1	4
19	Focsani	8	1	7	0	0	0	0
20	Satu Mare	7	1	2	0	1	0	3
21	Slatina	7	0	7	0	0	0	0
22	Targu Mures	7	0	5	0	0	0	2
23	Craiova	6	0	4	0	0	0	2
24	Hunedoara	6	0	1	1	0	3	1
25	Odorheiu Secuiesc	6	0	3	0	0	1	2
26	Ramnicu Valcea	6	0	3	0	0	1	2
27	Resita	6	2	3	0	0	0	1
28	Sfantu Gheorghe	6	1	4	0	0	0	1
29	Bucuresti Sector 3	5	0	0	0	1	1	3
30	Buzau	5	0	2	0	0	0	3
31	Drobeta Turnu Severin	5	0	1	0	0	1	3
32	Pitesti	5	0	3	0	0	1	1
33	Slobozia	5	0	3	0	0	1	1
34	Aiud	4	1	1	0	0	1	1
35	Bacau	4	1	0	0	0	1	2
36	Bucuresti Sector 1	4	0	0	3	1	0	0
37	Suceava	4	0	3	0	0	1	0
38	Braila	3	0	2	0	0	1	0

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5. THE PANDEMIC FORCED CITIES TO BECOME MORE INTELLIGENT

From 5G robots to information applications, people are no longer alone in the battle for pandemic control, and smart developments so far find new applications, essential to safety and health.

The technology industry has been mobilized in an exemplary fashion in these months, faced with difficulties, and it has shown it can be a real help in everyday life through a variety of novel solutions. And here we are talking about a variety of means, from following the degree of infection online to even drive-through tests in motion for the greatest flow of tests in a short time.

And the exit from the pandemic will be intelligent, supported by technology and the minds behind smart solutions that make our lives safer. Solutions that will, in fact, remain accessible and helpful[1]. And the pandemic had its most clearly visible effects in cities. All this period, cities have shown that they are living, intelligent bodies and respond with rapid, dynamic change to the challenges generated by the pandemic

As a matter of fact, the shape of tomorrow's city is already taking shape, with a series of changes triggered by the events of the last months. New urban trends include:

* reversing the trend of densification
* the limited relevance of the distance between home and work, driven by smart communications solutions
* intensifying the development of a digital infrastructure
* developing an urban architecture that allows socialization from distance

The new normality will translate the current moment and will be the basis of urban concepts in the future. And urban architecture will have as a building block the smart, sustainable component [2]

The pandemic is kept under control globally and from dedicated "war rooms" centers where smart technologies work to control the spread of the virus and the required reaction level of response.

India is a very good example where command centers include a variety of intelligent systems, such as CCTV video monitoring systems, GIS geographic mapping and GPS vehicle location.
Smart City adds health and safety and demonstrates that when there is an intelligent interface, which aggregates information transmitted by multiple systems with different roles, its utility becomes essential.[3]

During this period, the following four development priorities have been identified in Romania:
1. Digitization of public institutions, in particular - sharing information online with citizens to solve as many problems as possible: Smart governance
2. Health – tele-medicine solutions: Smart living
3. Security – monitoring, maintaining social distance: Smart living
4. Education – moving online: Smart People

During the pandemic, Smart City events market has evolved and passed online, with at least two constant events appearing with many followers, which also confirm changes to Smart City solution providers through online transitions and video content:
* UrbanizeHub Romania – Urban Talk Live 18 Video about Smart City (https://urbanizehub.ro/orasele-viitorului/ and https://www.facebook.com/search/top/?q=urban izehub%20romania)
* Romanian Smart City Association (ARSC) - 5 online events type webinar https://www.facebook.com/Asociatia RomanaSmartCity

1.https://www.smartcity.press/covid-19-smart-city-technology/
2. https://www.theguardian.com/world/2020/mar/26/life-after-coronavirus-pandemic-change-world

3.https://www.moneycontrol.com/news/business/real-estate/coronavirus-war-rooms-integrated-command-and-control-centres-in-smart-cities-5112681.html

6. CITIZENS' OPINIONS ABOUT THE SMART CITY SOLU TIONS ALREADY IMPLEMENTED

Smart cities are primarily about smart people, but they aim to increase the quality of life and make people happy. From our experience so far, we have noticed that there are quite few people who really know about the Smart City projects implemented in their city and fewer to use them.

This year 2020, we had the opportunity to see the reaction or impact of using technology for the city, where the city hall does not use technology for people although there are technologies and solutions on the market. We are talking about air quality monitoring solutions, which are part of the vertical Smart Environment of a smart city. On the one hand, local (city halls) and central (the national Environment Agency) authorities have installed a number of air quality monitoring stations, but some of them do not work. We have only included in this report the stations installed by city halls. Mutual cooperation and support should be between the 100 national authorities-installed (http://calitateaer.ro/public/home-page/?__locale=ro) stations and air quality monitoring stations installed by the private environment. The effects of people's involvement for the city were seen earlier this year in Bucharest, where the two private air quality monitoring networks, https://aerlive.ro/ and https://airly.eu/map/en/, played a crucial role and helped citizens mobilize to "wake up" authorities in taking action, when in some evenings of January pollution parameters were very high in Bucharest. Practically, this air quality experience shows and confirms that Smart City projects are for people and with people.

But what do the young people in Romania say about Smart City projects? An interesting project was proposed by the Bucharest 6th district city hall, which together with the Romanian Association of Smart City, carried out two editions, in January 2019 and February 2020, of a project called Smart City 2030: https://orasulinteligent2030.ro/.

In several visits, respectively, in 6 and 12 secondary schools in 6th District of Bucharest, discussions were held between specialists and high school students on the subject of Smart City. It is interesting how the priorities seen by the high school students in 2020 for the development of Bucharest are related to Smart Environment and Smart Mobility, and how they want to become involved civic, if they are helped.

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7. FINANCING SOURCES FOR SMART CITY PROJECTS

Recently we have seen the European funds used massive for Smart City projects. Many city halls used European funds for infrastructure projects such as water, lighting or video surveillance and added elements specific to a Smart City project. It is therefore quite difficult to draw from such a project the value dedicated to a Smart City project.

Consequently, the cumulative value of all Smart City projects present in this report is not clear, having only a few projects with clear values for each project. Instead, we are certain that the aggregate value of all the projects involving the Smart City projects identified in this report is 1.644.966.939 euros, cumulated from 195 projects.

Besides the European Structural Funds, we have two cities, Arad and Iasi, which have gained the support of the European Commission through the smart cities challenge, which is much more than a source of funding, through the experience, knowledge and information that the two cities have benefited from.
We would like to have such competitions in Romania too, but for now we are looking and it would be good to learn from these kinds of events, such as:

1. Germany: A paid-for pilot project in the City city, as they call Ruhr:
https://business.metropoleruhr.de/en/projects/citytechruhr/

2. Us: QBE leading cities – a Start-up competition for Smart cities with effect until June 15, 2020 and total prizes of $125 000:
https://vimeo.com/417053808?fbclid=IwAR1BsLQKQW9w-fgeIIyxRFmzFcKh9FD_X9dMsMaEUJp6xJwCZNcYip6fr7kk

3. India: Smart City Hackathon 2020, a prize competition on March 19-20, 2020
http://www.hackathon.poornima.org/

The European Commission has also helped three other cities in Romania (Cluj – Napoca, Suceava and Focsani) through the grow Smarter program: https://grow-smarter.eu/home/ . Focsani also participated in the IRIS project to address energy and mobility services in cities that are cheaper, more accessible and more reliable and contribute to a better and more sustainable quality of life: https://irissmartcities.eu/.

Smart cities projects and Communities were funded by the Horizon 2020 research and innovation program, with the aim of bringing together cities, industries and citizens to demonstrate solutions and business models that are scaled and replicated and bring measurable benefits in energy and resource efficiency, new markets and jobs. http://irissmartcities.eu/.

Other sources of financing used for Smart City projects were the Ministry of Environment and AFM, through which more than 400 electric buses were or are being purchased in Romania, including their own loading stations.It is gratifying to see recently the increase in Smart City projects funded from the local budget and the motivation of the funding for the coming period, especially after this pandemic, is linked to needs and benefits.
According to Siemens, to implement the smart technologies identified in the three areas analyzed (connectivity, transport and energy), the city of Alba Iulia should invest EUR 227 million in Smart City projects and the value of the benefits, including indirect ones, would amount to EUR 532 million, aggregated over a period of 35 years (https://www.wall-street.ro/articol/IT-C-Tehnologie/212352/valoarea-in-bani-a-unui-oras-inteligent-siemens-dezvaluie-roi-al-alba-iulia.html#gref)

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There is a clear need to class the costs in the city halls on a budget line called Smart City, as an investment in the city, at least for projects financed from the local budget. The city of Cluj has been deployed in Romania over the last three years, following the leadership model of the big cities, such as Amsterdam, New York, Dubai, Singapore or Taipei and the share of local budget funding in relation to European funding is increasing

Effect of recent city Council financial difficulties, private companies have not invested in Smart City projects any more than a little.
It is natural to ask where the sources of funding for Smart City projects will come from in the coming years if so much is being said about Smart cities.

Well, the European Union has announced for the period 2021-2027, many European funds directed toward the "Smart cities" pole. An interesting example of a EUR 20 million Smart City project funded by the European Union in November 2019 is POCITIYF – Positive Energy CITY transformation Framework:
https://eu-smartcities.eu/news/pocityf-project-raises-stakes.

It remains to be seen how agitate and smart the city hall representatives are, in order to attract as much money as possible in the next few years
In other countries there are several innovative models for financing Community projects. In our case, the attempts to help with funding are interpretable, due to the sad history and political failure of the last few years, but we hope to catch up in the coming period with people implementing projects from all the existing backgrounds. An increase in the diversification of funding sources that reduces dependence on European funds and increases creativity and productivity.

8. SMART CITY STRATEGIES – X-RAY

The multitude of Smart City projects is somewhat pleasing for Romania, but it is time to look more and more at their vision, mission and integration at local and central government level..

After Targu Mures's first Smart City Strategy attempt in 2010, The project, implemented with the Targu Mures project - Digital European City, (https://www.tirgumures.ro/pdf/oras_info.pdf), starting from a vision of a unique Visa card for all city services, but it was not completed, followed by Oradea, with the 2016 – 2020 strategy, Cluj, Sibiu and other cities. Unfortunately, looking at the four cities mentioned and their strategies, is it natural to ask what happened to these written strategies? How much of them were made or useful to the community? Today, there are more than 10 cities that have a strategy developed by Smart City and other cities that have set themselves up. The last two cities to tender for such a strategy are Resita and Medias and we expect the number to increase.

We are still calling for the following Smart City strategies to be carried out and monitored as professionally and pragmatically as possible, because we have seen strategies with 333 pages (in Constanta) and 38 pages (in Brasov). The market and citizens need concrete things and not stories written on paper with copy and paste - see urban mobility plans, which have more than 100 pages and most are the same. At the level of a smart city development strategy, we note district 4 in Bucharest, which, although it does not yet have a written or published strategy, has formed a team of people dedicated to Smart City projects. The 4th district city hall began accessing the Smart City area in 2015 with the first Smart City pilot project in Romania in partnership with Telekom Romania and Cisco, which included Bucharest in the list of the 100 Smart cities proposed by CISCO globally. Then it continued, and it now has 18 Smart City projects and a team with which it develops and implements Smart City projects further

In the context in which central authorities are late to come up with a vision and a concrete proposal for development and strategy at national level (See other models such as China or India), local authorities (city and village city halls, but newer county councils) they are free to dare and propose a personal and personalized vision to the community for its digitization.

After the Ministry of Communications and information society launched the Smart City Guide in December 2016, (https://www.comunicatii.gov.ro/wp-content/uploads/2016/12/Ghid-Smart-City.pdf) began to set up a working group that had its first and last meeting on 12 February 2019. We expect the current Ministry of MCTI – Ministry of Transport, Infrastructure and Communications to have a vision for the country for urban developments in the next 5 years.

9. SMART CITY PROJECTS RANKING BY VERTICALS

Vegacomp Consulting continues to rank Smart City projects according to Europe-wide verticals and has developed a national Smart City vertical ranking, depending on the number of projects implemented so far.
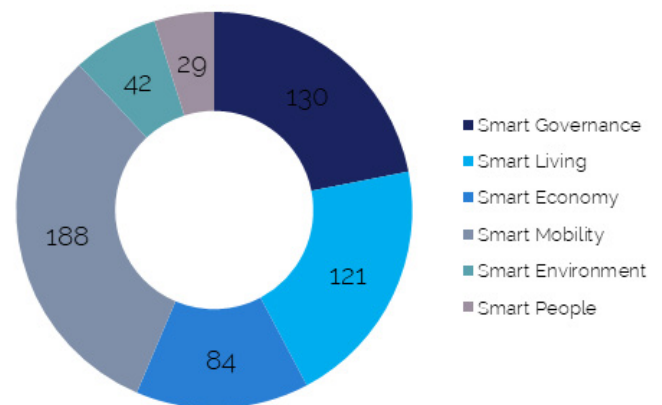
The old leader is also confirmed by this issue –Smart Mobility vertical, which is currently taking off significantly, including in the context of the increased focus on safety and health, which is reflected in transport – covered by no less than 188 projects, more than 100 more than in the previous reporting. Remote next is Smart governance, with 130 projects, vertically up from the third position. The podium is complemented by Smart Living, with 121 projects, falling with one position. Next is Smart Economy, which holds fourth place with 84 projects. The last two positions are disputed by also Smart Environment, with 42 projects and Smart People, respectively, with 29 initiatives.

The position of a clearly strengthened leader remote from the followers reflects the desire and need to find a solution to a major problem in Romania, the lack of mobility infrastructure, it is emphasized by the rules of social distance and the effects of the pandemic, which make intelligent transport a priority for the safety of the inhabitants.

Smart City verticals

- Smart Governance
- Smart Living
- Smart Economy
- Smart Mobility
- Smart Environment
- Smart People

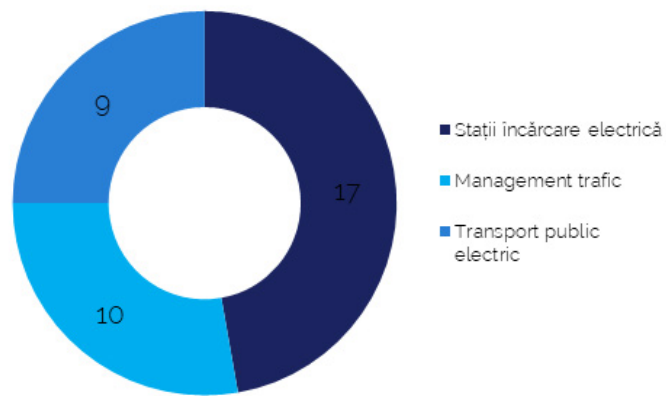# 10. SMART CITY SOLUTIONS ADOPTED IN ROMANIA BY VERTICALS

The most popular Smart City solutions identified in Romania and, at the same time, the most commonly used solutions worldwide include: Traffic management system, modern and intelligent stations, smart street lighting, smart parking, Video monitoring and public WiFi service provision.

SMART MOBILITY

The leader of the latest editions, as a project adoption, keeps his position and even distanced himself massively from the next vertical, which shows Romania's priority over the last 3 years

Projects generally involve more efficient and faster transport, but the focus is essentially on electricity – charging stations for electric vehicles and purchases of electric transport dominate this vertical, and a positive aspect is the important presence of traffic management systems, among the first solutions adopted. The interest for the past is less popular solutions to optimize and pay the parking, and the bike sharing solutions also lose ranking positions, a feature of a market maturity and a passage beyond the simple solutions in the Smart City area – this contradicts, partially boasts the momentum of the charging stations.

As Smart Mobility is the leader of the new report, the solution deserves more dedicated space to explain the utility, benefits and rationale for an ever-increasing adoption. Beyond being merely another alternative to the usual means of transport, Smart Mobility is a concept built on the principles of flexibility, efficiency, safety, low environmental impact technology and integration, regardless of the variety of transport modes.
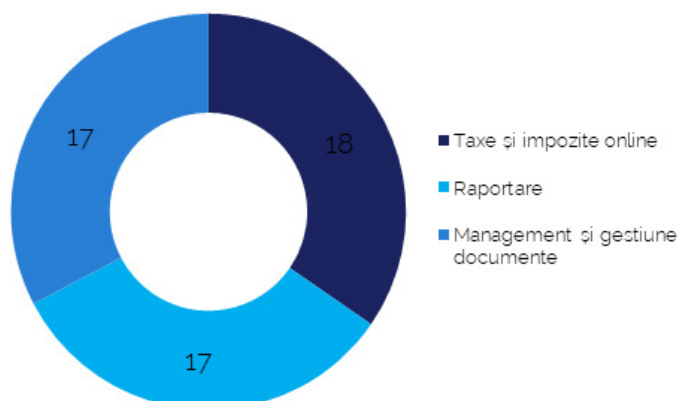
More and more cities see benefits in these pillars on which Smart Mobility is founded, as a direction and they start to integrate vertically from the municipal planning phase by optimizing and improving urban mobility plans, obsolete in format and obsolete in utility. Each city has a limited road structure and Smart Mobility brings efficiency through optimization – transport consolidation, monitoring, planning and traffic management, alternative transport, sensors and computer applications designed to measure congestion and offer alternatives.

On the border between smart mobility and eco-efficiency there are also the increasing number of initiatives for "green" transport, which are increasingly found in Romania. Examples include not only charging stations for electric cars, whether public or private, or load stations and bus fleets but also municipalities' plans to migrate from a fleet of functional public transport means by fossil fuels to an electric fleet or, in the first instance, hybrid.

Donut chart:
- 17 — Stații încărcare electrică
- 10 — Management trafic
- 9 — Transport public electric

SMART GOVERNANCE

And in the area of Smart governance, more responsibility and involvement is emerging in relevant local solutions with a clear purpose – efficiency, and a step further away from the city's timid application attempts, with a map, a few photos and phone numbers. At national level, smart governance is starting to mean more automation, the online shift of municipal flows, and more doors open at any time, from a laptop or smartphone, to the inhabitants. The fight, at the level of the preferred solutions, is tight in three between electronic collection of taxes, reporting by citizens and managing and making documents more efficient.

Chart values: 18, 17, 17

Legend:
- Taxe și impozite online
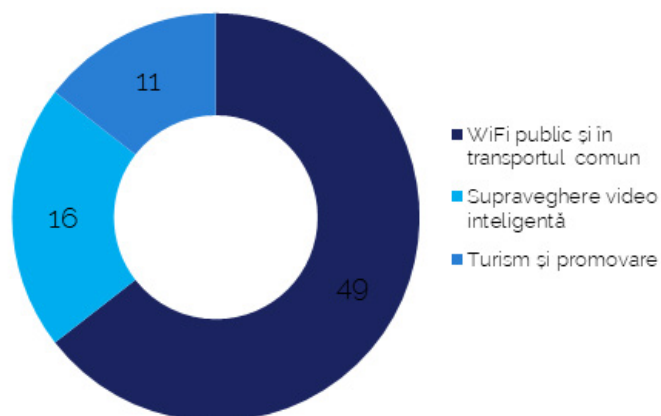- Raportare
- Management și gestiune documente

SMART LIVING

In Romania of 2020, the Smart living component could be divided into two main categories: Free WiFi and the rest. Adoption of any other solution, including intelligent video surveillance, is only a quarter closer to the explosion of free WiFi solutions.

In fact, the easy entry point to the Smart world, the installation of a WiFi router and free access to a park, public building or tourist area, is firmly dominated by Smart living vertical. Somewhat surprising, promotion and tourism solutions are also taking place on the podium and, this time, we also make a special mention of a set of solutions outside the podium – the wise solutions in the health and medical field, very close to getting third place, to be followed in the future, they are very good for major adoption increases.

Chart values: 11, 16, 49

Legend:
- WiFi public și în transportul comun
- Supraveghere video inteligentă
- Turism și promovare

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SMART ECONOMY

With a constant presence in top 3, in the first editions, as early as March 2019 the vertical Smart economy was leaving the podium and, in 2020, it still holds the same place 4. What is free Wireless for Smart Living is Smart public lighting for Smart Economy. The solution dominates authoritarian the category, far from the following most popular options – the utility management and the intelligent component designed to develop the event and promotion areas.

Legend:
- ■ Management si dispecerat utilitati — 12
- ■ Evenimente și promovare — 6
- ■ Iluminat public inteligent — 48

SMART ENVIRONMENT

Technology is evolving to both enhance and protect the environment and to provide the population with more and more intelligent elements in open, public spaces.

At national level, such solutions involve a level of complexity above average, and adoption is still limited geographically or in terms of addressing. We see that solutions are taking the ground for smart waste management – considerably more than the previous report, renewable energy and monitoring of the various environmental parameters. This vertical contains virtually the greatest success in terms of the impact of Smart City solutions on citizens through air quality stations. The example in Bucharest, with private air quality monitoring networks that helped citizens at the beginning of 2020 to move both Bucharest City Hall and the Environment Ministry to take measures, is perhaps the greatest success of the impact of Smart City projects in Romania. It is notable that these air quality monitoring stations were mounted without PMB consent and therefore we have not included them among the Smart City solutions in this report except those that were put in agreement with the city hall.
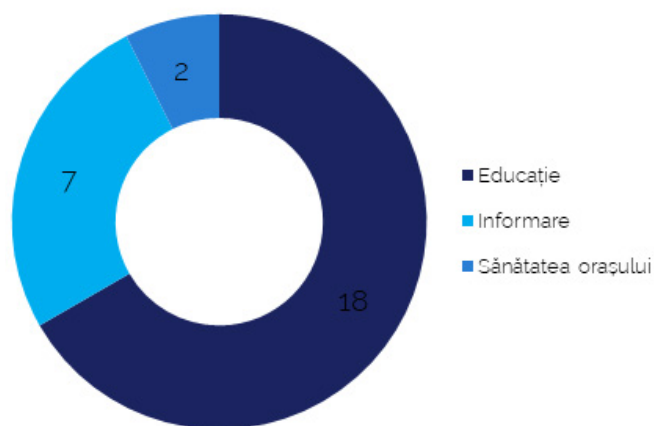
SMART PEOPLE

Education and information for the public is one of the global priorities in the Smart City area, but in Romania it is the third consecutive time that the data collected shows it as the last adopted, implemented on a one-off basis, often as a pilot project, in educational establishments with the resources to innovate and in communities that are more open to new, efficient and measurable.
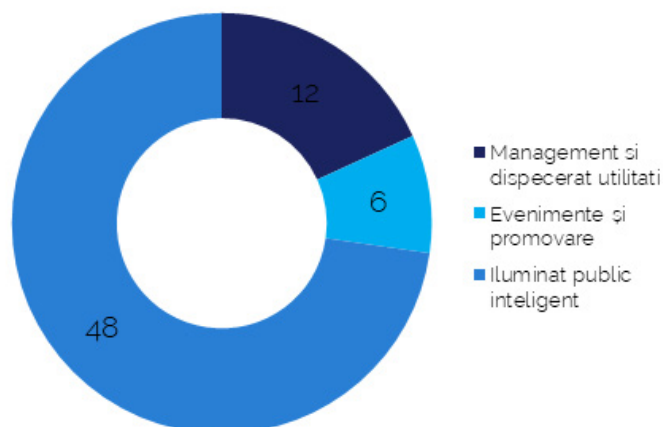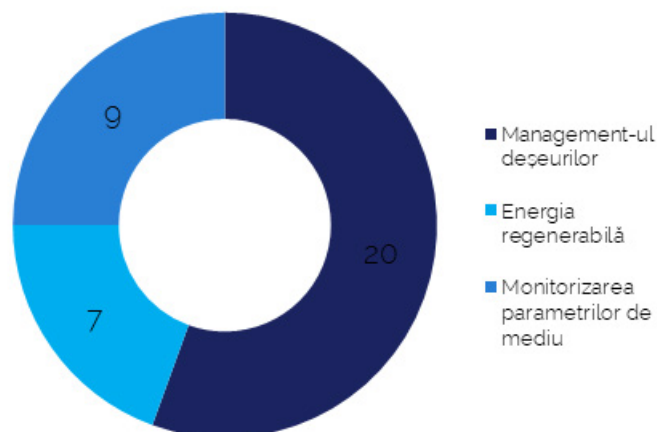
Areas that take shape, although they do not have a significant development in the measured period compared to other vertical areas, include information systems for citizens, along with information about the general health of the city.

Legend:
- ■ Educație — 18
- ■ Informare — 7
- ■ Sănătatea orașului — 2

Legend:
- ■ Management-ul deșeurilor — 20
- ■ Energia regenerabilă — 7
- ■ Monitorizarea parametrilor de mediu — 9

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The theme of smart cities has been extended in Romania to smart communities and it is normal that from big cities the technologies should be used by small and medium-sized cities. Thanks to a mayor with a generous team we have in the country the first Smart Village, where?
In Ciudad village in Alba Iulia county

(https://newsweek.ro/smart-city/comuna-ciugud-pro-motor-al-conceptului-smart-village-in-romania).

In Ciugud is the biggest golf course in the country and deserves to be visited, outlining as an example and a laboratory for many others communities in the country.

Another village follows,
the village of Luncavita in Tulcea County
(https://www.facebook.com/WebinarSmartCity/vid-eos/202078784331714)
and we hope that there will be other communities that will dare to plan and realize development for and with citizens, with great expectations in the agriculture area 2.0

12. LESSONS LEARNED FROM SMART CITY PROJECTS

There have been many pilot projects implemented in Romania, without clearly saying how many of them have not worked or are no longer working. In the world of IoT, for example, it is known that 75% of IoT projects fail, but it is not bad. The process of learning from these pilot projects is important.

The Smart City project lab called Alba Iulia was a good trampoline for some projects and generated a flight of free pilot projects.

Collaboration and integration between multiple companies or solutions has proven not to be so easy. More efforts are needed, both from local authorities and from private companies. The city hall working in the Smart City direction has somehow gone past the step called City Manager (official public administrator), but it has a lot of trouble with the human staff (specialists) and with public tenders. The toughest example for the Smart City market seems to be the tender for the Smart City Strategy in Bucharest. The contract was published in December 2017 and the contract was signed by the Bucharest City Hall on July 25, 2018 with Deloitte for the sum of 500 000 lei. So far we have no knowledge of this contract or Smart City Strategy for Bucharest.

(https://www.mediafax.ro/social/gabriela-firea-a-semnat-cu-deloitte-contractul-pentru-strategia-de-smart-city-a-capitalei-17368941).

We learn that municipalities should at least take the following measures:
- To call on specialists to draw up specifications
- To give tenderers time to participate in the tender - best, 30 days

From the implementation of Smart City solutions, we see that some solutions meet the need of the citizens, but it bothers other inhabitants.
The first example is the electronic catalog, which helps parents a lot, but has sometimes become a factor of stress for children.
The second example is the smart pedestrian traffic light, that button located on some pedestrian crossings. It helps a lot the pedestrians, but some drivers are unsatisfied, especially when there is heavy traffic.

Another lesson is learned for the private sector too: Companies need to work with other companies to deliver solutions to cities (B2G), but newer to some customers (B2B). City solutions need to be open data, interoperable (easily interconnected with other suppliers) and scalable (replicated easily and quickly to other cities/communities). The more Romanian companies cooperate and cooperate with each other, the more the speed of project implementation in Romania will increase.

As we are in Romania, at the beginning of the road with Smart City and Smart Communities projects, we believe that we need to share both the successes and the failures in this industry in order to increase the speed of development.

INNOVATE NETWORKS. RE-DESIGN BUSINESS

13. SUPPLIERS OF SMART CITY PROJECTS

We have now seen in Romania as the most active global providers of Smart City solutions on DELL technologies with safe City solutions, after seeing Siemens and CISCO involved in the previous years. We also see an exit from this Smart City market by ZTE.

In Alba Iulia there were 45 companies that tested Smart City solutions, and in this edition we have identified 104 companies providing Smart City solutions, of which the first three companies are Telekom Romania with 26 projects, Cluj IT Cluster very active with 21 projects and Orange with 15 projects implemented. It comes behind Electrogrup, part of e-Infra group who has the Direct One company and NETCITY Telecom company and it shows the biggest ambition trough his dedicated team of Smart City projects.

Ranking of first 10 Smart City solutions provider:

Besides companies, there are also Smart City NGOs and clusters involved in the market. Among the active NGOs, we list ARSC – the Romanian Association for Smart City, which has over 250 members, UrbanizeHub (https://urbanizehub.ro/) and Pitesti Smart City: (https://www.pitestismartcity.ro/).

The first highly involved cluster is the Cluj it cluster, https://www.clujit.ro/about-us/, which is approaching 100 members, and since 2019 the cluster SCORE – Smart cities of Romania cluster has emerged: https://www.scorcluster.ro/.

Nr.		Total projects	Smart Economy	Smart Mobility	Smart Environment	Smart People	Smart Living	Smart Governance
		295	48	79	24	14	64	66
1	Telekom Romania	26	4	7	2	1	12	0
2	Cluj IT Cluster	21	4	2	1	2	6	6
3	Orange	16	6	0	2	1	4	3
4	Electrogrup	12	0	8	2	0	1	1
5	Life is Hard	12	1	2	0	3	5	1
6	Industrial Software	8	0	0	0	0	0	8
7	Microsoft	6	2	2	0	1	0	1
8	Intrarom	6	2	1	1	0	2	0
9	Integrisoft Solutions	6	0	0	0	0	0	6
10	Huawei Technologies	6	1	2	1	0	2	0

14. SHARING KNOWLEDGE ACROSS THE CITIES

In the last two years, the Smart City event market has changed quite a lot, some conferences have disappeared, others have appeared. Besides the Smart City solution providers we also have media providers or absolutely necessary information about the Smart City market in Romania.

» As below, List of entities identified as involved in organizing Smart City events for all those who want to learn more about Smart City in concrete terms and possibly choose the right event for the launch or presentation of Smart City solutions:

- **ARSC, Romanian Association for Smart City**, Smart City leader with a lot of events that we remember the most important from 2019 to today:
  » A Smart City caravan with 9 cities visited in 2019: https://caravana.romaniansmartcity.ro/
  » 11 december 2019: Smart City industry Awards gala with over 400 participants, where THE ROMANIA 2030 CHARTER was launched (https://romaniansmartcity.ro/carta-romania-2030/)
- **SNSPA** (seven annual editions of Smart cities conferences, the last one being on December 5-6, 2019: http://smartcitiesevents.eu/events/conferences),
- **Smart Cities of Romania** (five annual expo-conferences editions "Smart cities of Romania", the last one being on October 23, 2019: https://romaniasmartcities.ro/)
- **Concord Communication:**
  » November 2016: Different City, Smart City, for the different Angle Cluster with the support of the Dutch Embassy in Bucharest: http://www.differentsmartcity.com/
  » 9 editions of the Smart City debate 2017-2020, in 5 cities: Bucharest, Alba Iulia, Iasi, Brasov and Calarasi, with the support of the Dutch Embassy: http://www.differentsmartcity.com/;

- **The Dutch Embassy** with an impressive series of events to date:
  » **Smart Mobility For Pipera – Business Neighborhood Initiative**, two editions, June 2016 & June 2018, https://www.facebook.com/DutchEmbassyRomania/posts/1986624848014511 ;
  » **Jump To Smart 1.0 Smart Cities' Romania** - Rapid and Innovative Solutions, International Conference in Bucharest in June 2017: https://www.jumptosmart.ro/copy-of-home and in Mamaia in October 2017: **Constanta – Port of Business opportunities "Smart"**: http://www.romania-smart.ro/conferinte/conferinta-jump-to-smart-2-0?fbclid=IwAR0ionFO-nZXrL-rHGnaQCh52QXC5_aCRzdaf0bRHNPuzf2yX0Y-TUKfg3dfo ;
  » **Smart Moving Bucharest** – mission of a Dutch expert to identify the situation of bicycle transport in Bucharest, July 2017, , https://www.cycling.nl/en/news/172-fact-finding-mission-bucharest-romania ;
  » **Cluj Innovation Days**, May 2018, https://2018.clujinnovationdays.com/ ;
  » **A national Smart City debate -Alba Iulia, October 2018**, https://smartcity.concordcom.ro/acasa/detalii-eveniment-alba-iulia/
  » **Urban Talks Timisoara**, September 2018, October 2019 https://urban-talks.com/timisoara-2018/ ;
  » **Bike Show, Bucharest, March 2019**, http://salonulbicicletei.ro/ ; **Urban Talks Bucharest, Conference & Hackathon**, may2019, https://urban-talks.com/bucharest-2019/ ;
  » **Romanian Cities: from green spaces to green infrastructures**, Bucharest, May 2019 http://asop.org.ro/uncategorized/keynote-speakers-conferinta-anuala-asop-romania-2019-bucuresti/ ;
- **AHK România** with seven editions of the Cities of Tomorrow organized by the Romanian Chamber of Commerce and industry – German: https://www.citiesoftomorrow.ro/

INNOVATE NETWORKS. RE-DESIGN BUSINESS

- **The Diplomat** with four Smart transformation Forum, the last one being on September 26, 2019: https://smart2019.thediplomat.ro/
- **H.appy Cities** with 3 events: Transport. How (not) we move in a moving city – Bucharest, October 2, 2019; Where are we still parking? – event held simultaneously in Bucharest and Iasi, November 6, 2019; People for cities – Bucharest, February 5, 2020.
- **Business Review** with two editions of Rising Future: Smart Cities, the last one being on November 27, 2019 in Bucharest: https://business-review.eu/br-events/rising-cities-smart-future-2019
- **GOVNET** Conferences with 2 events: The future of urban mobility in Romania 2018 and Smart Utilities Romania 2017 - Building Future Cities Infrastructure
- **DELL Technologies**: Dell Smart Forum 3 October 2019 and Dell safe City, 14 November 2019, both in Bucharest

Among the media providers for the Smart City market we mention:
- **Mobile communications:** https://comunic.ro/smartcity/
- **Good News:** https://www.goodnews.ro/category/smart-cities/
- **Smart City Blog:** https://smartcityblog.ro/

and magazines:
- **Smart City Magazine**, Romanian Association for Smart City (4 numbers in 2019)
- "**Find out what a Smart City is. Getting started Guide**", , ARSC, 2019
  - » An annual supplement to the Smart City solutions Guide, in 2018 and 2019, edited by Concord Communication together with the Newsweek Romania Magazine

In this event market a training area (Preparing a Smart Workforce) is also beginning to emerge and it is absolutely necessary to train future specialists.

The first Romanian book about Smart City was published in 2018, is written by Catalin Vrabie and Eduard Dumitrascu, two authors very involved in the country's Smart City market and with foreign participation in recent years, is called „SMART CITIES. From idea to implementation or how technology can shine the urban environment" and printed by Universul Academic Publishing together with University Publishing House.

After the first courses called "Introduction to Smart City" by ARSC in February and June 2018, followed by 3 series in 2019, The "Smart City 2030" project was followed by ARSC in partnership with the City Hall of district 6 in 2 editions, January 2019 in 6 high schools and February 2020 in 12 high schools. In this educational project several lecturers talked to high school students what an intelligent city means and the projects proposed by the high school students for a smart city in Bucharest 2030 were awarded. SNSPA is the first academic institution to award diplomas recognized by the Ministry of Education for the specialization "Public Innovation and Smart City strategies. The first course is scheduled for 26-30 October 2020 http://smartcitiesevents.eu/events/courses.

15. A SELECTION OF SMART CITY SOLUTIONS FOR THE CITIES

WORKING TOGETHER ON INTEGRATED SOLUTIONS

The Dutch approach to Smart Cities

Kingdom of the Netherlands

The Netherlands – a small and densely populated delta nation – was one of the earliest urbanised countries. Over the centuries, the Dutch have found creative new ways to manage complex urban situations. Through original, holistic spatial planning the Dutch have developed a high quality of city living that is well-balanced with its agricultural landscape.

But urban areas throughout the world face similar issues and challenges. That is why we can learn from each other. On the one hand, the Netherlands is able to help other countries rise to the societal challenges they face in areas such as spatial planning, urban development, water management, logistics, and infrastructure

On the other hand, other countries can help us to solve the societal challenges we face in the Netherlands. It is important that we all share our knowledge and expertise on an ongoing basis. We must offer mutual support as we all strive to create the Smart Cities of the future. Globalization is a very important factor in today's world as many of us face similar challenges that are a direct result of globalization.

Smart City Initiatives in the Netherlands
http://www.smartcityembassy.nl/

Strengths of the Dutch:

- Close cooperation with policy-makers, private sector, and knowledge institutes;

- Smart solutions are deeply embedded in society;

- Some of the world's leading companies are present;

- World class digital & physical infrastructure;

- Working test-beds;

- Strong civil society.

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Netherlands and Romania, partners for Smart and Green Cities

Kingdom of the Netherlands

The Dutch Embassy in Bucharest has "smart and green cities development" as one of its priorities. Since 2016 a number of events, seminars, trade missions, and bilateral exchanges between the Netherlands and Romania have been either directly organized by the embassy or supported in different ways

Smart Mobility For Pipera – Business Neighborhood Initiative, editions, June 2016 & June 2018,
https://www.facebook.com/DutchEmbassyRomania/posts/1986624848014511

"Different City, Smart City" Conference
Bucharest, November 2016,
http://www.differentsmartcity.com/

Jump To Smart 1.0 Smart Cities' Romania Rapid and Innovative Solutions, International Conference - Bucharest, June 2017,
https://www.jumptosmart.ro/copy-of-home

Smart Moving Bucharest – Fact-finding mission related to biking in Bucharest, July 2017
https://www.cycling.nl/en/news/172-fact-finding-mission-bucharest-romania

"Different City, Smart City" National Debate 2017 – 2020, Bucharest, October 2017
http://www.differentsmartcity.com/

Jump To Smart 2.0, Constanta – Seaport of Smart Business Opportunities, Mamaia, October 2017,
http://www.romania-smart.ro/conferinte/conferinta-jump-to-smart-2-0?fbclid=IwAR0ionFO-nZXrLrH-GnaQCh52QXC5_aCRzdaf0bRHNPuzf2yX0YTUKf-g3dfo

Cluj Innovation Days, May 2018,
https://2018.clujinnovationdays.com/

IP "Cycle the Dutch way", representatives of Bucharest and Constanta municipalities visited the Netherlands, together with a group of colleagues from seven Central and Eastern European countries, May 2018,
https://english.rvo.nl/subsidies-regelingen/projecten/ip-cycle-dutch-way-hungary

National Debate Smart City
Alba Iulia, October 2018,
https://smartcity.concordcom.ro/acasa/detalii-eveniment-alba-iulia/

Urban Talks Timisoara
September 2018, October 2019
https://urban-talks.com/timisoara-2018/

Salonul Bicicletei, Bucharest, March 2019
http://salonulbicicletei.ro/

Urban Talks Bucharest, Conference & Hackathon
May 2019,
https://urban-talks.com/bucharest-2019/

Romanian cities: from green spaces to green infrastructures, Bucharest, May 2019
http://asop.org.ro/uncategorized/keynote-speakers-conferinta-anuala-asop-romania-2019-bucuresti/

Urban Landscapes Romania is a public-private partnership consisting of a mix of companies and organisations that complement each other to promote green urban solutions in Romania. With expertise and experience ranging from design to implementation and management, green solutions are developed to provide economic opportunities, environmental value and a high quality of life in urban contexts. The initiative was launched in May 2019 and will be active until 2022
https://www.facebook.com/urbanlandscapesromania,
https://www.youtube.com/channel/UCD7nK9CpJ8Gq-7KKWydXdgsw/featured?view_as=subscriber

WeMakeTheCity Festival, Amsterdam 2019
support Romanian journalist's participation,
https://wemakethe.city/en/programme

For more information about past and future events and activities of the Dutch embassy in Romania you can contact our Economic Affairs Department at +40212086047 or BKR-EA@minbuza.nl.

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CITIES HAVE A NEW ENERGY WITH ENEL X

STREET FURNITURE

PUBLIC ELECTRIC TRANSPORT

ALSO PUBLIC TRANSPORT GOES GREEN!

Pushing sustainability for our urban environments, Enel X is strongly committed with **electric mobility**, both for private and **public** transport.

Thanks to the pioneering experience and significant investments done in electric mobility infrastructure for private use, today Enel X is ready to offer sustainable solutions also to public administrations, promoting the transition to electric mobility also for public transport.

With some examples around the world (for example, in Chile with an e-bus fleet in Santiago de Chile and many other related services), Enel X innovative offer is complete and flexible and ranges from the

installation and management of e-charging infrastructure (batteries and charging infrastructure) to the supply of green energy (100% from renewable sources) together with fleet management and consumption optimization tools thanks to the new demand response opportunities.

Moreover, through partnerships with key operators such as e-bus suppliers, the solution can be provided **"turnkey"** including also the supply, management and maintenance of electric buses vehicle fleet, offering to Public Administrations the possibility to benefit from a very innovative and sustainable service with no impact on investments and a very optimized and effective service level.

A CITY THAT COMMUNICATES

Our innovative Enel X proposal also encompasses street furniture. In Santiago, Chile, we promoted the public transport transition to electric mobility with a fleet of electric buses and related services. This gave Enel X the opportunity to find another

application for its key values of innovation, efficiency and integration: smart stations/ shelters and a system of variable message screens or totems for urban communication and media advertisement.

For example, below some of the solutions created:

- **"Enel X JuiceShelter"**: our new concept for a bus waiting platform that turns into a smart or multi-purpose area. It integrates video surveillance cameras (e.g. with alarms for lost items, people counters, etc.); USB sockets for charging smartphones/tablets; sockets for recharging bikes or electric scooters; info points or advertising displays; integrated photovoltaic panels; WiFi hotspots, and much more.

- **"Enel X JuicePark"**: the smart photovoltaic parking shelter that recharges cars, scooters, bikes, and applicable also to plus public electric buses.

- **"Enel X eBench"**: smart bench, also provided off-grid, with wi-fi hot spots, USB ports to recharge smartphones and tablets, environmental monitoring sensors, LCD displays and possible addition of a defibrillator.

- **"Enel X eBike Sharing"**: solution to recharge private electric bicycles and bike sharing services managed through a digital platform providing booking and payment services.

- Solutions for **digital display/totems** to communicate, inform, or advertise in synergy with the entire infrastructure.

- **"Enel X MultiPole"**: halfway between public lighting and street furniture, the perfect example of integrated solution and technology: a multifunctional pole, available also off-grid thanks to the integration of PV and mini-wind power, able to provide smart public lighting and a multiple range of services enabled by sensors such as videoanalysis, public videosurveillance, info-point and advertising through LCD or LED displays.

b2g.ro@enel.com
https://www.enelx.com/ro/ro

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THE NEW ENEL X OFFER

The new offer goes beyond efficient public lighting, embracing a much wider range of innovative services.
We are the largest Italian ESCO and we are active in over 3,300 municipalities all around the world.

PUBLIC LIGHTING

ARCHITECTURAL LIGHTING

ENERGY EFFICIENCY FOR PUBLIC ADMINISTRATION

Energy efficient solutions for public buildings (offices, schools, sports centers, etc.)

Public video surveillance
Urban flows monitoring
Connectivity
Environmental monitoring

SMART CITY

Smart street furniture

STREET FURNITURE

Electric mobility solutions for public transport and related infrastructure

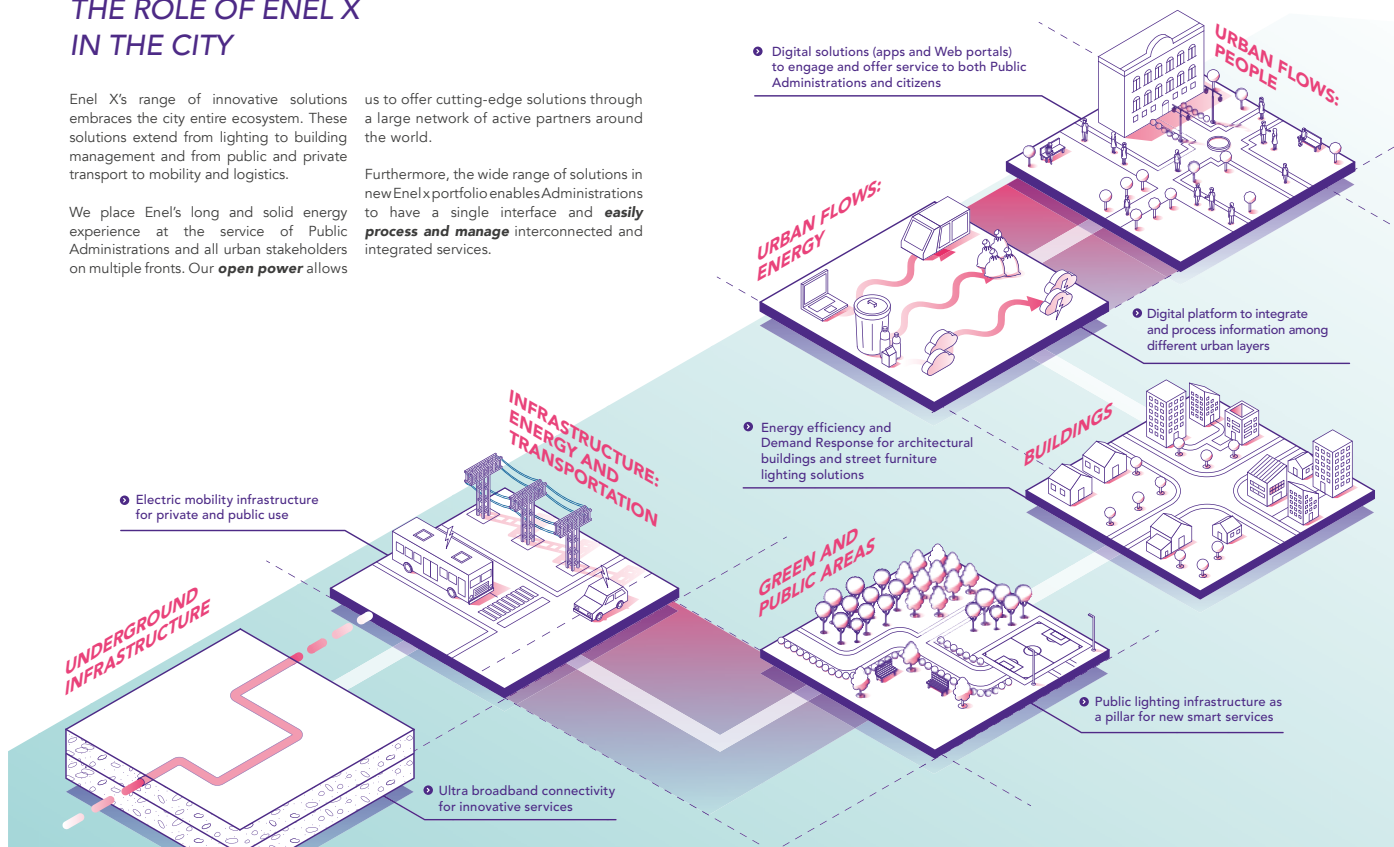**ELECTRIC PUBLIC TRANSPORT**

CITY

THE ROLE OF ENEL X IN THE CITY

Enel X's range of innovative solutions embraces the city entire ecosystem. These solutions extend from lighting to building management and from public and private transport to mobility and logistics.

We place Enel's long and solid energy experience at the service of Public Administrations and all urban stakeholders on multiple fronts. Our *open power* allows us to offer cutting-edge solutions through a large network of active partners around the world.

Furthermore, the wide range of solutions in new Enel x portfolio enables Administrations to have a single interface and *easily process and manage* interconnected and integrated services.

Digital solutions (apps and Web portals) to engage and offer service to both Public Administrations and citizens

URBAN FLOWS: PEOPLE

URBAN FLOWS: ENERGY

Digital platform to integrate and process information among different urban layers

Energy efficiency and Demand Response for architectural buildings and street furniture lighting solutions

BUILDINGS

INFRASTRUCTURE: ENERGY AND TRANSPORTATION

Electric mobility infrastructure for private and public use

GREEN AND PUBLIC AREAS

UNDERGROUND INFRASTRUCTURE

Public lighting infrastructure as a pillar for new smart services

Ultra broadband connectivity for innovative services

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INTRAROM
an Intracom Telecom company

Intelligent IoT & Smart City Orchestration Platform - Intrarom's uiTOP

Unified IoT Orchestration Platform - Intrarom's uiTOP - implements a horizontal IoT layer that enables management and control of Intelligent Things from different vertical domains such as Smart Lighting, Smart Parking, Waste Management and Noise Monitoring (in the context of the Smart City), Smart Home, Smart Health, Transport, Logistics, Energy and Utilities. uiTOP leverages powerful open APIs enabling the communication with a wide range of sensors and devices as well as smart applications.

office@intrarom.ro
http://www.intrarom.ro/

uiTOP™ KEY FACTS

>20K SMART RULES IN USE

>4.5M DAILY TRANSACTIONS

CONTROLLING THOUSANDS OF SMART ASSETS

NUMEROUS INSTALLATIONS IN SMART CITY & UTILITIES

The Unified Management & Control environment provides full monitoring & control of all the offered Smart Cities services

SMARTER CONNECTED SOCIETIES

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All information from the sensors will be wirelessly and securely transmitted and monitored from uiTOP platform, providing continuous updates, reports and visualization on a GIS environment. Actions (devices on/off, lights dimming etc) can be manually controlled from the dashboard or triggered automatically from user defined rules and thresholds. Users with controlled rights can access the web based dashboard from various devices including PCs, tablets, mobile phones etc.

Future connection of uiTOP to other Smart Cities projects active in the Smart City will add great value in terms of unified control and ease of use.

Within the pilot project in Alba Iulia, Unified IoT Orchestration Platform - Intrarom's uiTOP - managed a complex Smart City system consisting of the following:

Smart Lighting based on LED technology

Smart Parking

Environmental Monitoring

Traffic Monitoring

Smart Safety

Public WiFi hotspots

Steinbeis Transfer Management
Steinbeis Network Romania

Key driver for smart city development is innovation. Steinbeis Network Romania is established in order to stimulate innovation processes in Romanian industry by facilitating access to latest technologies. It is the business sector what has to present solutions to make cities smart. Steinbeis Network Romania helps enterprises to develop such solutions – and helps public administration bodies to implement those.

Technology Transfer by Steinbeis Network Romania

Technology transfer is the process of conveying results stemming from scientific and technological research to market and to wider society, along with associated skills and procedures. Easiest example of technology transfer is the interaction between business entities and universities, the one that results in innovative solutions and products.

Steinbeis Network Romania and Smart City Concept

From smart city key areas, the following ones are prioritary for STM: smart energy; smart building; smart mobility; smart infrastructure; smart technology. Common to all areas is a continous learning process anytime, anywhere supported and enhanced through technological devices. This feature is characteristic to ubiquitous computing environments which occur by using any device, in any location, and in any format. Such connectivity stimulates creation of innovative networks, e.g. Learning Energy Efficiency Networks. With help of Steinbeis, members learn to identify most efficient measures to reduce energy consumption. Same methodology can be applied in all key areas.

Triggering Smart Cities

Steinbeis supports enterprises in becomming innovative.

Services for Smart Cities

* evaluating regional/municipal competitveness and recommending most effective actions with long-term impact on smart specialization;
* designing and implementing strategic projects that create fertile environment for investments and actions that are essential for fulfilling stakeholders/investors interests;
* better connection and alignment of local businesses and education providers to international market trends.

Steinbeis in Romania

Steinbeis Transfer Management (STM) in Bucharest is head office of a growing network of technology transfer centers which are located at universities from Alba Iulia, Bucharest, Cluj-Napoca, Galati and Timisoara. Partners and customers of STM benefit from interdiciplinary competencies and transnational connections. For more than 15 years STM follows the principles and methodology of Steinbeis model Germany. Steinbeis is an international network spanning roughly 1,100 technology transfer enterprises. This network encompasses 6,000 experts. STM is connectd directly to technology transfer centers from Stuttgart region (D), Vienna (A) and Uzhgorod (UA).

For more info:

www.steinbeis-romania.com

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Vegacomp
CONSULTING

Beyond Asset – Asset Management Software

Beyond Asset is software that allows its users to optimize the management, monitoring and maintenance of their infrastructure, equipment and associated spaces.

The power of BeyondAsset 5 lies in its ability to deploy in a simple way and incorporate all of the profession's regulations, methods, and management policies. The platform adapts to organizations of small size, up to larger organizations, connecting several hundreds of stakeholders both internal or external. With a flexible architecture and being fully web-based, the tool enables each user to choose the modules adapted to their job.

Beyond Asset 5 Features Managers, consultants, owners: all users can choose their own features and adapt the tool to their current organization

For more information, please contact us
mariana.garstea@sixense-group.com

Know your inventory

Identify and locate the point, linear, surface, or solid infrastructure and their equipment Complete and share related information, documents, photos Know about current activities, have access to technical information and work history

Track it

Periodically update the information on the field module: visit forms, detailed inspections on plans, implementation of inspection and maintenance manuals' regulations or specifications Provide a tool for operation crews to transmit in real-time: incidents, alerts or schedule future work Retrieve data in real time from: SHM, NDT, and high capacity inventory gathering

Evaluate

Synthesize feedback from the field, monitor the status of predefined indicators or thresholds Use deterioration models of materials and equipment Define decision matrices, risk analyses or life cycle management

Decide

Visualization of all assets and prioritization of actions based on indicators and models Let BeyondAsset 5 automatically generate work and repair priorities and schedule Create and compare multiple annual budget scenarios

Maintain and build

Plan the work and assign teams or external service providers Follow the progress of the activities, perform audits in the field Use the Electronic Document Management to streamline the exchanges during projects. Update the knowledge base at the end of work

Share

Temporary and controlled access for external service providers for inspection and maintenance activities Define user and groups to allow public or restricted access Use the integrated office automation tools: ad hoc and automated reports, scheduling, internal messaging, manage tasks, and electronic management of documents

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integrisoft

How do we build a SMART city without SMART management?

INTEGRISOFT Solutions is one of the most relevant companies in Romania which develops software applications for the local public administration, having over 600 implementations in 400 public institutions of medium and large size, with almost 4000 active users.

We strongly believe that we are the refference provider of Smart City digital integrated solutions.

We grant our clients a 15 years experience in data integration, valuable knowledge and know-how aquired in the IT industry.

The Integrisoft success story was built exclusively on trust and performance criteria, having the support of a proffesional team and of some strategic partnerships developed all over the country.

National coverage solution

Avansis – The integrated system for Public Administration

BENEFITS:

- Uniqueness of information
- Speed in accessing information
- Workflow automation
- Better services for citizens
- Electronic services for citizens, mobile front office & automatically integrated web with s pecific back office

office@integrisoft.ro

Integrated System Components

Mobile/tablet access

Integrated electronic archive

AvanTAX — Integrated system for revenue collection

AvanTAX VENITURI — Automated revenues accounting

AvanCONT — Complete budgetary accounting

Other components
- ANL contract management
- Road management
- Relationship with owner's association

AvanPATRIMONIU — Patrimony Management

AvanURBIS — Urban planning

AvanSOCIAL — Complete and integrated social assistance system

AvanMAP — Interactive map

AvanRLSV — Green Space Book

AvanDOC — Documents management

AvanREGIS — Agricultural Book

Avansis – the up to date, TODAY's solution

The Advantage is YOURS!

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Vegacomp CONSULTING

NATIONAL COMMUNICATIONS STUDIES AND RESEARCH INSTITUTE

SMART SOLUTIONS IN THE DIGITAL AGE

National Communications Studies and Research Institute – I.N.S.C.C. Bucharest is the certified Național Research-Development Institute for Communications field, having a tradition of more than 60 years, with the main mission to promote communications tehnologies, systems and service, by a hight level expertise in all the domains of communications respectively: radiocommunications, optical commmunications, communications sistems and networks for e-services, telemonitoring and network security.

For this purpose, I.N.S.C.C. is involved in world-classs Research and Development works, in colaboration with universities and other institutions, by a highly experienced team of scientifique researchers, who carry out complex projects in wireless tehnologies, Radiofrequency systems, photonic communications, broadband networks for tele –assistance and telemonitoring services.

The I.N.S.C.C. team has diverse and interdisciplinary capabilities for approaching the most actually and future domains of communications and to be a confident and open partner, for your smart solutions in the digital age

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Oriented to the most advances in communications tehnologies, I.N.S.C.C. focuses on research areas with a high potential for innovation and efficiency in to improving quality of life, namely:

- structure, characteristics and performances of broadband networks for supporting the new digital services;
- characteristics and performances of broadcastings systems;
- applications, experimental platforms and systems for integrated-services developments;
- security probllems and performances for broadband communications infrastructures;
- efficient use of radiospectrum resources.

The INSCC's recent research projects cover a wide range of communications issues and technologies. They include:
- spectrum dynamic access models with 5G mobility applications;
- a DVB-NGH model for inserting 5G networks;
- advanced solutions for mHealth systems and applications development;
- platforms for home assistance for the elderly;
- a platform for ambient-intelligent-environment-applications development;
- emerging access solutions based on Free-Space Optical technologies;
- LiFi communications for SmartHome and SmartCity applications;
- technologies, networks and support for integrated services applicable to the implementation of SmartCity;
- multimodal-technologies integration for mobile-services security; and
- applicable security technologies and solutions for the Internet-of-Things.
- The INSCC's scientific research results have been presented in numerous articles, books and papers at national and international conferences.

The INSCC's scientific research results have been presented in numerous articles, books and papers at national and international conferences.

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16.CONCLUSIONS

In the third year of analysis of the Romanian Smart City market, we see a greater focus on medium and high complexity solutions – a relatively normal evolution, once solutions with a low adoption barrier have already been widely implemented.

We note the detachment of Smart Mobility vertical and the Romanians desire for greater mobility, followed by the fighting for combat the bureaucracy and transparency of public institutions, leading this Smart City project explosion in the last year (594 versus 330).

There is also a set of simplicity champions
– free public WiFi and intelligent street lighting
– which will hardly be detronted, at least in numerical terms.

We also see an increased appetite for everything in the field of charging stations for electric motor vehicles, this makes us hope for a cleaner future traffic.
Authorities have started to go hand in hand with concrete and budget efficiency and have opened up more and more lines foro online payment solutions for taxes and duties, efficient document management, but also easier reporting by the public.
Health and education, although at a lower level, it is growing in promise, which makes us believe in an even more advanced society in the coming period.
The growth of the Smart City market in Romania has reached the first Smart Village in Ciudad/Alba, but also in the first county – Cluj – Smart Territory and we will see where it will go in the next few years.

Smart City strategies have increased and more vision is expected for our cities' development, with smart strategies, concisely and rapid implementation. In the following period, an acceleration of the speed of execution and implementation of Smart City projects is expected.
Collaboration is the key to success. Shared between all those involved, city halls, academia, suppliers, NGOs and clusters, financiers.

With all the challenges we face in this country, we believe that the 19-covo pandemic helps us to rush to use technologies to improve quality, safety and comfort of life and move to a higher level of integration of projects, data and lessons learned for Smart City projects.

Founded in 2004, Vegacomp Consulting, a turn-key integrator, builds on a team of over 27 years of experience in telecommunication, especially in fiber optic networks, in Romania and internationally, and focuses its projects on solutions development that combine telecoms and energy. Vegacomp Consulting brings forth innovative solutions for the development of future networks, generated by its own R&D Department, both in the country and abroad. The company has been focusing its work on LoRa technology for the past two years for Smart Parking and Smart Metering sensors and has been active in the Smart City industry since 2015.
More information is available at:
www.vegacomp.ro.

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