


# THE ROAD TO SMART CITY

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**New York, Tokyo, Dubai, Singapore, London, Paris, Seoul, Reykjavik, Toronto, Hong Kong, and Amsterdam have been recently named the world's smartest cities by IESE Cities in Motion Index. But what defines a smart city? A city can be considered smart if it uses its technological and communications potential to improve citizens' living standards, enhancing the quality of services like energy, transportation and utilities. Let's try to place Lviv on the map of smart cities.**

For the last few years, Lviv is transforming from the cultural and coffee capital to the center of the IT industry. But the question whether Lviv can satisfy the needs of its citizens and become a truly digital city being able to catch up with its European peers remains open. In 2015, Lviv became the first Ukrainian city to adopt a strategy of the city's urban development. Sustainable urban development means that every urban problem in the city has to be viewed in three dimensions: economic – the city must sustain itself; ecological – the city has to improve the ecological situation, not vice versa; human rights – the city must ensure equal rights and opportunities when it comes to the use of

space for all its inhabitants, regardless of their age, state of health, and the way they move around the city. While Lviv is still miles away from being a smart sustainable city, there are a few things that prove it's undeniable progress: 50 km of bike lanes, leisure and recreational areas, playgrounds, and public spaces. Julian Chaplinsky, Chief Architect of Lviv, shared his opinion on the state of Lviv smart development options: "Lviv has many

chances to become a smart city. Not necessary the same as Amsterdam or San Francisco, but it certainly has some good intentions. The city has already made first steps: in particular, the Department of Development of Lviv City Council is discussing the real problems of city development and implementing technological solutions like issue of various types of certificates online. Every city has its own problems and challenges. When big cities manage to solve one problem, another arises. The rapid development of cities in China has lead to deterioration of ecological conditions, which affects people's health. There is no city that would make a perfect prototype Lviv could easily follow. We should develop our own model, unique for our city with all its specialties. However, when it comes to historical development, it would be useful to learn from Rotterdam, Copenhagen, Krakow and Vienna."

2015 gave rise to many technological initiatives in Lviv: for the first time Lviv City Council has started reformation of public transport system, infrastructure and began e-government initiatives. Let's take a look at what projects have managed to be deployed, and what initiatives are still waiting in the wings.



## LITTLE PARIS, UKRAINIAN SILICON VALLEY, OR JUST SMART LVIV?

Tending to be an IT center of Ukraine, Lviv still has a huge room for smart city innovations to be improved. The lack of proper business infrastructure is one of the problems that Lviv entrepreneurs and regular citizens have to deal with, in particular, the lack of office buildings, event halls, difficulties with transport and energy infrastructure.

To provide a platform where citizens can share ideas and foster the development of smart city initiatives, there is a common practice to launch Smart City Labs. Such specialized labs already exist in Amsterdam, Barcelona, Tartu, and other cities. While Lviv is on its way to smart city status, there are first initiatives from Lviv City Council with the support of the Lviv IT Cluster: an annual Ideathon, which aims to find and support the best social and urban-focused startups; Lviv Open Challenge – a project that gathers technological smart city solutions; Tech Battle – a student project competition, etc. Such events unleash creativity of the Ukrainian youth and give rise to projects like City Rental.

City Rental has recently won the Ideathon 3.0. The project offers a convenient and transparent platform for a short-term lease of communal and private premises. The platform will help to optimize the utilization of communal urban space, like schools, libraries, multimedia libraries, gyms etc. At the moment, such spaces are difficult to find: sometimes people who need them don't even know they exist. Also, communication with premise owners is often a problem. A desire to make city rental easy and transparent inspired a team of Lviv Polytechnic students to work

on the solution. Team\_d, as they call themselves, created a platform where all the city facilities are listed and easy to book. It's a win-win for citizens, who can easily rent a place for an event, and profitable for premise owners.

Lviv startup uMuni developed a complex solution for smart cities: cloud evaluation of cost systems, which tracks energy, gas and water consumption. The system is already used at Lviv municipal facilities. "Using the data provided by uMuni the city can save up to €30 million with minimal costs," tells Zenyk Matchyshyn, the startup's CTO. uMuni is a smart resource optimization system for enterprises, factories, offices, and municipalities. With the system, such agencies can track energy consumption data, operations in the building, and equipment conditions, and react immediately if any abnormal energy consumption, e.g. a leak appears. Lack of business infrastructure is another thing that stands between Lviv and its smart city status. Living in a medieval city is wonderful up until you have to search for a modern workspace that

would satisfy your team's needs. In the past few years, companies escape from the overloaded city center to the outskirts: the intersection of Stryiska and Naukova streets has become a center with a high concentration of IT companies. Following the rapid business growth and the need for adequate infrastructure development, Lviv IT Cluster partnered up with key real estate and investment companies to launch Innovation District IT Park. In less than 3 years, the project worth \$ 160 million, will completely change the visual look of the city: 6 class A office buildings, 1 business center, university labs, as well as a multifunctional center with a variety of leisure areas and conference rooms. The project's construction has just begun, but over 60% of office areas have already been pre-booked, which only confirms the need for superb workspace facilities. Located at the intersection of Stryiska and Chmoly streets, the future IT Park will be conveniently reachable from the airport, railway station, universities and the historic center.

## FROM POINT A TO POINT B

Lviv has already developed a dispatching system which tracks buses and trams allowing to conveniently plan your trips. The first step in transport system reformation was developing tracking apps, like EasyWay, TRMWCHQ for trams, CityBus for buses, etc. Public transport in Lviv is equipped with GPS-trackers, so to find out the exact location of your next bus, you can also send a free SMS with the number of the bus stop to this number: 2214. However, the main problems remain unsolved: poor bus conditions, absence of passenger counting systems, lack of parking, lack of e-ticket system, etc.

Last autumn, together with Cisco, one of its largest clients, SoftServe partnered with the Lviv City Council to implement a pilot project of installing smart parking system in Lviv. At the first stage, the company launched a prototype system analyzing occupied spots within the three biggest parking spaces located in the city center. "We have installed few video-sensors to monitor parking situation on Mitskevych Square, Shevchenko Avenue, and Slovatskoho Street," comments Maksym Opryshko, Product Manager at SoftServe. "The first step in this project is to collect and analyze data about parking, average time spent on finding a free spot, peak load, etc." Further steps of this initiative include developing a mobile application for Lviv citizens that will navigate them towards the nearest free parking spot and process cashless payments for parking. Information on free spots availability is supposed to be updated in real time. "So far 9 sensors were installed at the busiest parking areas, which helps to analyze information about the number of cars



in Lviv and collect the data about the overall number of payments. Without the help of IT companies, we wouldn't manage to implement the pilot project. Not every city has such an advantage – strong support from the IT sector," shares Marta Romanyak, Head of IT Department at Lviv City Council.

Lviv has an extensive public transport network that includes buses, trolleybuses, and trams. Due to the historical background of Lviv, and the specifics of the city's infrastructure, the main focus is put on the electric transport. New trolleybus and tram routes are planned to be launched by 2020. By the way, in 2013 Wi-Fi routers have been installed in trams operating in Lviv. The project turned out to be successful, and since 2018, all trams in Lviv offer free Wi-Fi. However, the lack of a universal ticket and a digital payment system still makes the life of passengers complicated and the revenue of public transport companies non-transparent.

Implementation of the electronic ticket system for every type of public transport has long been in the works. In 2018, Lviv City Council has signed a contract with the European Bank for Reconstruction and Renovation which aims to help launch the project. At the moment 5 companies have applied for a tender with their own solution for e-ticket system: Ridango AS, Estonia; Mikroelektronika, Czech Republic with SoftServe Lviv; JVCA and Onur Turkey; BPG AG Swiss with Renome Smart Ukraine; Almayiva and AEP Swarco Italy. All companies have to meet the requirements of EBRD: have experience of implementation of such a project in public transport and the total cost

of the project should be no less than €5 million. In 2017, PrivatBank has launched a pilot project for payment of in trams and trolleybuses with the help of electronic tickets. To do this, you need to download Privat24 mobile app and scan the QR code. Since such a system is not convenient for users of other banks, starting from March 2019 you can also buy an e-ticket via SMS. Also, at the moment a 90-minute ticket system is being tested. With such ticket, you can change between electric transport without having to buy an extra ticket every time.

Like every big city, Lviv suffers from traffic jams, especially during rush hours. UaWebcams allows checking real-time cameras on the main roads, avenues, and squares. The access to UaWebcams may help to avoid traffic that obviously saves time; the app gives updates about queues to a skating rink or a shop or situation on the streets.

## CHAT WITH THE OFFICER

To simplify the communication between Lviv citizens and local government, Lviv City Council with the help of IT Cluster companies work on a portal of Lviv citizen. The portal is a part of smart government system aimed to make Lviv City Council services available online. Citizens will be able to use more than 200 services via a computer or smartphone: like changing the place of registration or receiving a needed report. Marta Romanyak tells: "Unfortunately, as online regulations don't work at the state level, for now, it is impossible to automate all the services. However, we are able to digitize 90% of administrative services".

## GREEN LVIV

In 2017, students of the innovative degree program Internet of Things, launched by Lviv IT Cluster and local tech companies at Lviv Polytechnic, won the Ideathon organized by Lviv City Council with their project Clean City. The app includes a map with all trash containers in Lviv

and uses geolocation to show the closest one to the user. Moreover, Clean City allows users to share feedback, or mark that a container is too full. With this app, the developers are trying to solve the garbage problem in Lviv and control the containers that are overflowing.

Electric cars are getting more popular in Ukraine, and in Lviv in particular. Citizens switch to electric cars hoping to contribute in the fight against air pollution and environmental protection. Go To-U is the biggest electric vehicle charging network created by a team of Ukrainians. The app allows drivers to find the closest charging station and book it in advance. According to Go To-U, there are 62 charging stations around the city, and over 6600 electric cars in Ukraine, which proves that EV charging stations are in high demand. Go To-U was one of the ten startups at ClimateLaunchpad Global Grand Final; the project is approved by the Horizon 2020 Programme. At the moment, in addition to Ukraine, Go To-U works in Poland, Austria, Georgia, Kazakhstan, and Thailand.

Lviv is a city with unlimited potential. It possesses the necessary resources to become a modern smart city – a strong IT sector which provides tech solutions, the community of smart people who drive incredible changes, a generation of young entrepreneurs who have a flow of creative ideas. The first steps on the road to smart city have already been made and the more united efforts of business, IT and government will be, the faster we will go. "I predict a great future for Lviv. The precondition for that is a free and democratic society, and educated youth," Julian Chaplinsky, is confident. And so are we.