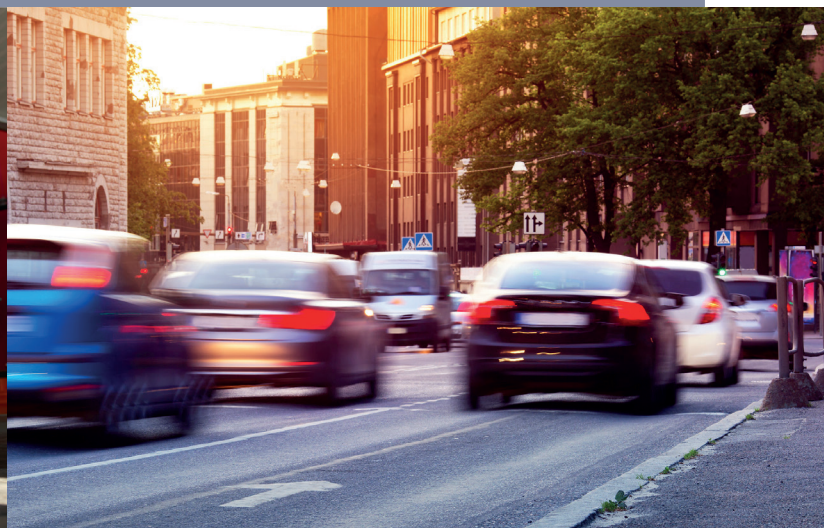


# Going Small to Go Big

Why cities and startups are natural partners for driving the next wave of innovation that has the potential to improve the lives of billions of people.



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# Preamble

Cities are the powerhouses of the global economy, generating approximately 80% of global GDP, while occupying a fraction of the planet's surface area – just 2%. Global cities also consume a disproportionate percentage of global resources – estimated at 70% of global energy and 75% of the world's natural resources and are responsible for ~75% of the planet's carbon emissions. (Resource Flows and the Governance of Infrastructure Transitions, 2013)

The United Nations estimates that by 2050, 68% of the world's population will live in cities. (United Nations, 2018)

As the world's population continues to grow and increasing numbers of citizens choose to live in cities, it is becoming crucial for cities to identify and implement new solutions and technologies which will help to reduce their impact and resource consumption, whilst improving the quality of living and environmental footprint of its citizens.

Moving in a seemingly parallel universe, we have witnessed an explosion of startups and new innovations attempting to tackle the entire range of human needs and problems. Many of the largest and most successful have grown into household names, driving huge leaps in innovation in areas such as mobile computing, artificial intelligence, communications, transportation and renewal energy.

On the face of it, startups and cities are natural partners when it comes to driving innovation and solving the 'wicked problems' that have the potential to improve the lives of millions of people.

So why is it that we don't see many more examples of startups and cities successfully collaborating to test and deploy new and innovative solutions?

We set out to explore two questions in this whitepaper:

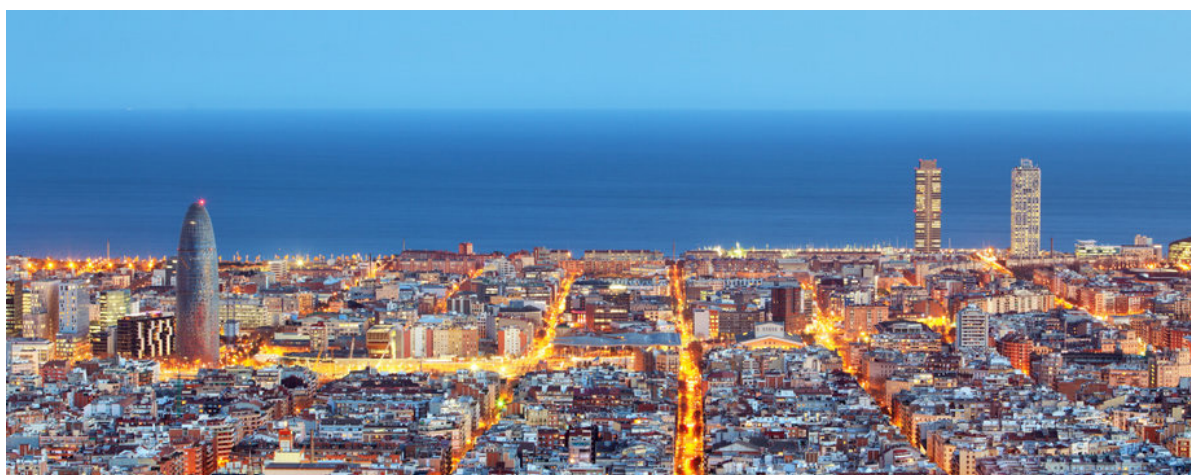
1. What are the obstacles faced by startups and cities in collaborating?
2. What role does prototyping play in helping to communicate challenges, develop potential solutions and drive co-creation?

Along the way, we have interviewed cities, founders, and startup representatives with proven experience in collaborating in the public space, as well as developing the Urban Mobility Innovation Framework 1.0 which identifies 10 areas of engagement to help cities better identify and connect with startups offering innovative solutions and looking for potential collaborators and buyers.



# Key Takeaways

- 1.** There is a strong desire amongst both cities and startups to work more closely together to develop solutions to the challenges facing urban areas, and we have spoken with representatives who have presented their insights and learnings from successful collaborations. Many (primarily larger) cities have established dedicated programs to attract and support startups.
- 2.** Cities need to make a concerted effort to educate startups and innovators more proactively on the challenges they are facing, as well as providing better visibility into processes, decision-making, and timelines.
- 3.** To increase their chances of success, startups should make more of an effort to better understand the needs, challenges, and success criteria of cities.
- 4.** To gain a foothold with cities, startups should think of or position themselves as services providers to cities - rather than focusing exclusively on developing a product to sell.
- 5.** Evidence indicates that when cities are looking to address their most urgent challenges or problems (e.g., Covid-19, climate-change, or e-mobility) collaboration with a startup is one of their best options. The use of agile methodologies, quicker turnaround times and general cost-effectiveness means that startups can offer solutions which are potentially 12-24 months ahead of larger competitors.
- 6.** There is a clear need for a framework to help better segregate and communicate challenge areas and narrow the focus on execution, which we have addressed through the Urban Mobility Innovation Framework 1.0
- 7.** There is a general lack of awareness of the role that prototyping and co-creation should play in the innovation journey, especially when dealing with the complex and multi-dimensional challenges facing cities, and innovators can benefit massively from leveraging tools like design thinking, story-telling and rapid prototyping.
- 8.** One of the issues identified is the need for facilitators who understand both worlds and who can play the role of matchmaker between cities and the start-up world. Taking regional variation into account, facilitators can play an important role in aggregating knowledge, highlighting synergies for innovation, funnelling talent and building bridges between ecosystems.



# Overview & Partners



Co-funded by the  
European Union



## About EIT Urban Mobility

EIT Urban Mobility is an initiative of the European Institute of Innovation and Technology (EIT). EIT Urban Mobility engages people, connects communities, accelerates market opportunities and re-imagines public spaces. An innovation community to educate and inspire mobility solutions for 21st century cities.

Our programmes support our vision of creating more liveable urban spaces. By fostering innovation and transformation, we can improve people's quality of life, decarbonise mobility and make Europe's economy more competitive.

This partnership is all about inspiring and enabling the move towards more liveable urban spaces, dedicated entrepreneurial talent and competitive mobility businesses. Together we aim to build a prosperous future for our cities.

[www.eiturbanmobility.eu](http://www.eiturbanmobility.eu)



## About UnternehmerTUM

• UnternehmerTUM is a unique platform for the development of innovations. UnternehmerTUM actively identifies innovative technologies and initiates new business through the systematic networking of talents, technologies, capital and customers.

- UnternehmerTUM offers founders and start-ups a complete service from the initial idea to IPO. A team of over 250 experienced entrepreneurs, including scientists and investors, supports start-ups with business creation, market entry and financing – also with venture capital.
- For established companies, a team of experienced consultants offers access to the UnternehmerTUM ecosystem. UnternehmerTUM has many years of expertise in the development of innovation strategies and the implementation of technology-driven business ideas.
- Founded in 2002 by the entrepreneur Susanne Klatten, the non-profit oriented UnternehmerTUM gGmbH is the leading center for innovation and business creation in Europe with more than 80 high-growth technology start-ups every year – including Celonis, Konux and Lilium.

[www.unternehmertum.de](http://www.unternehmertum.de)



## MAKERSPACE

### About UnternehmerTUM MakerSpace

UnternehmerTUM MakerSpace is one of Europe's leading prototyping spaces. With two high-tech prototyping spaces in Munich, spread across 3000 sqm., we offer the tools, methodologies, and experience to help innovators and entrepreneurs successfully prototype and build their phys-tech innovations. Our mandate is to help both startups, as well as established companies accelerate their development processes by leveraging agile methodologies, and by supplying both equipment & expertise.

In addition, we offer a whole portfolio of technology education programs in numerous fields including digital manufacturing, 3D printing, electronic and hardware prototyping, VR/AR, applied statistics, small-batch manufacturing, etc.

[www.maker-space.de](http://www.maker-space.de)

# The Future of Cities

In 2019, the Joint Research Centre (JRC), which is the science and knowledge service of the European Commission (EC) published a report titled 'The Future of Cities'. It identified many of the key challenges cities will need to address to meet the challenges of the coming decades.

We have taken the liberty of extracting some relevant extracts of this report and outlining them below, however, this document should be on the top of the list for entrepreneurs, innovators, startups, and anyone interested in improving the quality of life in cities.

The full report is available for download at: <https://publications.jrc.ec.europa.eu/repository/handle/JRC116711>.

## Future Trends

### 1.

Most European cities are expected to cover greater areas than in the past, and cities will have to increasingly recognise the importance of optimising how their public space is both designed and used. An ageing EU population will require the further adaptation of infrastructure and services <sup>[1]</sup>

### 2.

2. Cities will increasingly apply new technologies and innovation across a wide range of sectors, from transport and mobility to citizen engagement. This technology will need to be interoperable and integrated, and its implementation done in an inclusive way to benefit the overall functioning of cities. <sup>[2]</sup>

### 3.

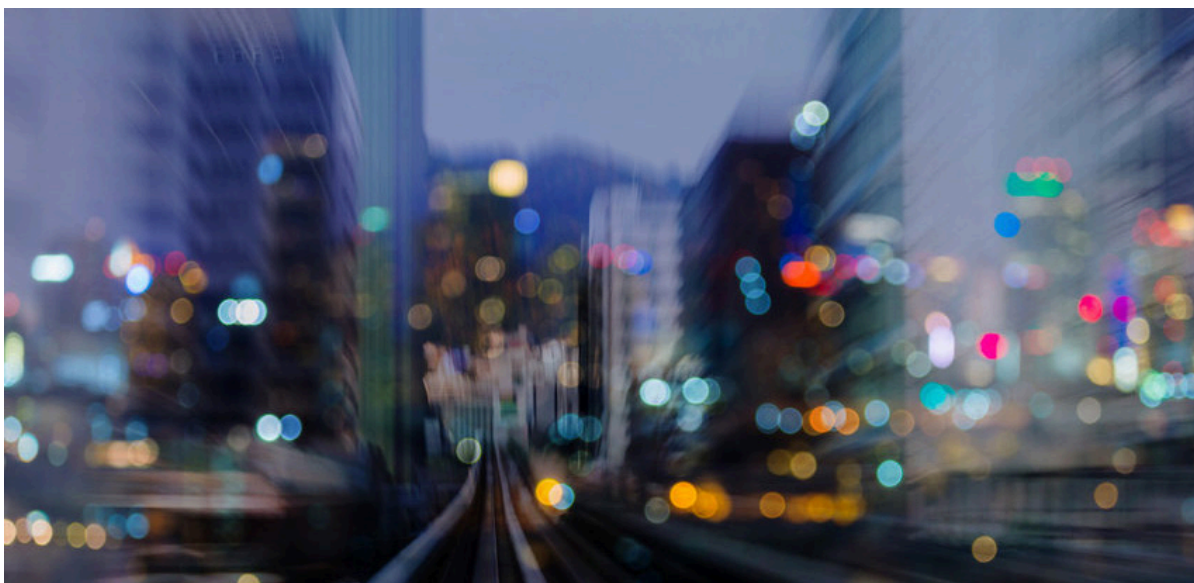
The dominance of personal cars should be drastically reduced in favour of more efficient public transport, shared and active mobility, and new working patterns. <sup>[3]</sup>

### 4.

Cities will still need to cope with existing major issues such as providing sufficient affordable housing to an increasingly varied population, ensuring inclusiveness and integration among its communities, and reducing environmental impacts. <sup>[4]</sup>

### 5.

Citizen engagement in policy processes is growing and should become more prevalent in the future. New forms of urban governance are already being stimulated in many cities, and the importance of city networks is expected to further increase. <sup>[5]</sup>



## Main Messages

### 1.

Cities are key sites where innovation and technological advancement happens. While this is a major opportunity for cities, both social and technological innovation should be further stimulated, and progress should be made alongside new forms of social engagement, urban governance and cultural creativity. <sup>[6]</sup>

### 2.

The appropriate management of new technologies and data is crucial. New tools and methods for better knowledge management are particularly important for enhancing the capacity to translate data into meaningful and relevant support to inform policy decisions. The use of real-time, consistent and reliable data (including big data and non-conventional sources) is essential and requires greater transparency and towards citizens. Housing availability and affordability remains under threat due to changing acquisition and rental patterns, including new forms of financial investment that see strategic opportunities for the conversion of volatile assets into physical ones in cities. This challenges obsolete social housing measures which would have to be re-thought to reduce social polarisation and conflicts. <sup>[7]</sup>

### 3.

Cities are essential hubs for both the implementation of global agendas and for citizens' engagement in policy decisions. While committed to providing a good life for their citizens, cities can push forwards behavioural and institutional changes that will benefit all, taking an active role in global governance. Several European cities are at the forefront of issues such as governance and citizen engagement, innovation and creativity. <sup>[8]</sup>

### 4.

The fight for sustainability will be greatly influenced by what happens in cities. While cities usually place greater pressure on natural resources, they perform better in the use of resources and have a greater potential for energy efficiency. Actions on environmental sustainability, including climate change, are already being taken by many cities. <sup>[9]</sup>

### 5.

Cities and city networks have a large collective power to act and to scale up solutions quickly and efficiently. Their influence can be significant, from supporting global commitments to providing efficient local solutions. The EU has successfully created an environment of sharing of good practices between cities, both within and outside Europe. In this sense, cities also have a certain responsibility to act towards societal change. <sup>[10]</sup>

### 6.

There is a risk of polarisation both within and between cities. On the one hand, being unable to take stock of the issues highlighted will lead to even more inequalities within a city. On the other hand, a diverging path between cities falling behind and cities capitalising on emerging trends may cause additional social and economic imbalance between different urban areas. <sup>[11]</sup>

### 7.

The close linkage between space/service/people is at the core of cities' capacities to respond to people's needs and to manage new challenges in a wider context, beyond administrative boundaries and sectorial domains. A truly holistic approach is needed to optimise the provision of services and create an intelligent interaction between the city and its inhabitants while maintaining or enhancing quality of life. <sup>[12]</sup>

<sup>[1]</sup> <sup>[2]</sup> <sup>[3]</sup> <sup>[4]</sup> <sup>[5]</sup> <sup>[6]</sup> <sup>[7]</sup> <sup>[8]</sup> <sup>[9]</sup> <sup>[10]</sup> <sup>[11]</sup> <sup>[12]</sup> Joint Research Centre (2019), 'The Future of Cities' Available at: <https://publications.jrc.ec.europa.eu/repository/handle/JRC116711>.

# City Partner Interviews



**Amsterdam**  
**Ilona Kempes**

Project Lead Startup in Residence @ CTO Office, City of Amsterdam

**“In 2015, we started thinking about how we could make the procurement process easily accessible for entrepreneurs.”**

**Please start by telling us a bit about yourself and your responsibilities / main area of focus.**

I work for the innovation team at the city of Amsterdam. We run programs involving collaboration between the innovation market and the government, and an innovation lab where we connect startups and entrepreneurs to challenges.

**What is the added value of working with startups vs. established companies? What motivated you to seek out and collaborate with startups?**

In 2015, we were looking for ways to innovate, specifically with procurement. We realised that if we can allocate a small part of our procurement budget to startups, we can have a really big impact, because the amount of money we spend on procurement is huge. We started thinking about how we could make the procurement process easily accessible for entrepreneurs. Now, the whole metropolitan region and other cities in the Netherlands are using this method. There's a lot of risk but we are able to provide a secure environment where startups can test and learn.

**How were the startups or innovators identified? Is there a specific process that you follow?**

We start with market research, so we know what

potential solutions exist and what type we are looking for. We then work with scouting companies who search for specific startups and understand what we really want. They know which ones exist in the Netherlands and in neighboring countries.

**Can you describe an example of a collaboration or a specific project you worked on?**

I think our most successful project was 'Global Guide Systems'. The challenge was to replace the labor-intensive monitoring of canals, so we know how many ships there are, at any specific moment in time. Working with Waternet, Global Guide Systems developed a monitoring system by deploying sensors on bridges. After a successful pilot, the system is now used to monitor all channels, and we are investigating how we can scale this to other regions.

Another successful example was a route optimization tool developed by the startup SKIALabs to make the neighborhood of Dapper less busy. There are many other interesting examples, like the Great Bubble Barrier. This startup develops air bubble curtains under water to curtail the movement of waste and debris, while allowing fish to swim through. It's amazing.

**What are the main challenges you've identified in startup collaboration?**

It's sometimes hard to manage expectations. Often startups they think I am the city - as if I know all 18,000 people who work for the municipality - which is obviously not the case. Also, startups really want to move fast, but as a city we often move a lot slower. And not every project will be a success. Sometimes a startup is not a good fit.

### **What were the learnings from the project?**

One thing we find difficult is when we cannot be the solution owner, we can only host the program. We as a city are not always the project owner, but at the same time we really want to support.

### **What are your best practices? Do you have any recommendations for other cities who may perhaps just be getting started on this innovation journey?**

I think it's good to have someone as a contact to answer questions from startups or entrepreneurs. Also, think about innovation as smaller projects or maybe more locally - maybe in neighborhoods or opportunities for collaboration in existing programs.

### **Is there a specific challenge or problem area in which you are currently looking for solutions?**

Mobility is a really hot issue. Our last program was around this theme. Also sustainability and the circular economy are really big at the moment in the Netherlands, specifically circular construction with materials such as wood.

### **What do you see as your biggest challenges over the next 10 years?**

One challenge is housing - there's a shortage and there's not enough space. Also, phasing out oil and benzene and transitioning to new forms of energy will be a big challenge. Another challenge is the pandemic - how are we planning to be resilient in future pandemics or emergency situations?

### **Do you offer any funding opportunities (prizes, monetary or resources) for startups?**

We don't have a direct funding program for startups. We have 10K for a pilot, but if a startup is really in need of funding, we link them up with partners we have in that particular landscape.



**“The challenge was to replace the labor-intensive monitoring of canals, so we know how many ships there are, at any point in time.”**



## Copenhagen Marius Sylvestersen

Director of Copenhagen Solutions Lab

Leading digital transformation at the city of Copenhagen to provide sustainable solutions since the UN Climate Change Conference in 2009

<https://cphsolutionslab.dk/>

**“If you are looking for a solution that is not yet on the market - something that solves a new problem or challenge - you need to work with the startup community.”**

### **Please start by telling us a bit about yourself and your responsibilities and main area of focus.**

I'm responsible for the Solutions Lab within the smart city of Copenhagen. We are placed within the technical and environmental department, responsible for the running, maintenance, development and sustainability of the city. Our aim is to make the city work with data and new technology. We bring together the innovation from startups and universities and the power from larger companies to develop solutions for urban environments.

### **What is the added value of working with startups vs. established companies? What motivated you to seek out and work with a startup?**

If you are looking for a solution that is not yet on the market - something that solves a new problem or challenge - then you need to work with the startup community. When we needed accurate, localized, detailed measurements of the air quality in Copenhagen, we realised we weren't able to get this from old-world technology, so looked to Google as a partner. They utilized IIoT, but made it that much more mobile with the Google Street View car and other infrastructure and algorithms.

### **How were the startups or innovators identified? Is there a specific process that you follow?**

You don't necessarily have to have a tender. You can just say "we are thinking about a problem in area and we want to invest in this area. We haven't got the budgets in place, but we would like to know what is possible." Depending on the problem, you

could either open a market dialogue or start a more structured process to actually start working on some of the issues. You can then narrow down. But really, onboarding companies is a job in itself - there are so many interesting companies out there.

### **Do you have any suggestions of how people can better inform themselves in the problem space?**

I think it's really about being able to turn your city inside out and share with industries and universities some of the major problems you are facing. We need to describe these problems to the outside world to make them a driving force for innovation.

To understand the problems basis, you really need a whole team drilling down these problems, trying to formulate them in an in a very accessible manner and to build consensus around the solvency. How do we become carbon neutral, for example, if we don't know what carbon neutrality is, and if we don't even know what carbon is.

### **You mentioned that you are looking to startups to solve problems for which there is no readymade solution yet, and if you were to hazard a guess, how much time does a startup have before the established players catch up? 12, 18, 36 months?**

I think it's a great question, and is worth someone investigating further. It depends on the type of technology that you are using. My guess would be they have a year or two, perhaps three, head start. But even though they will eventually be caught up by these bigger companies, that could be a really good proposition for them. It gives the startups

reason to supply new types of services and could see the bigger companies investing in them.

**Describe an example of the collaboration or specific project you worked on and any challenges or learnings from the project.**

The air quality case has been quite successful. We went from early-stage innovation - just understanding the problem space - into citywide deployment of technology. A current problem we are trying to solve is around is crowd sensing. If you know where people are, you know where there would be congestion and you know where people would throw garbage, and so on. We've been trying to find different technological possibilities in this space.

**What are your best practices / recommendations for other cities?**

I would recommend cities hire people that understand the private sector and can build platforms for collaboration. You need people who understand the different types of organizations and the legal framework around building up successful partnerships.

When you have that in place, then I would really urge cities to again understand their own problems and communicate these problems to outsiders, who might not know much about the public sector, but have knowledge around technology or data.

Then really nurture the ecosystem you have - the startup communities, the startup lofts and innovation centers, the foreign direct investment groups and venture capitalists. Make sure they are able to deliver value and are scalable.

**Is there a specific challenge or problem area in which you are currently looking for solutions?**

The green transition is a challenge with a lot of interesting possibilities and problems to solve - like the resources we use and their traceability, the effects of climate change and much heavier rainfall, congestion and mobility, traffic pollution and so on.

**What do you see as your biggest challenges over the next 10 years?**

1. Developing output models for CO<sup>2</sup>
2. Mobility (especially MaaS/intermodality)
3. Design of traffic islands (car-free locations)
4. Carbon-capture technologies
5. Traceability of waste and materials
6. Urban flows
7. Data on ultra fine particles (UFP)
8. Digitalization of citizen engagement
9. Removing 430,000 tons of vehicular CO<sup>2</sup>
10. Digital twins for building operations (especially peak load)
11. Climate resilience (heavy rain)
12. Transportation of people and goods while closing down the inner city for cars

**Should we be encouraging startups to act as service providers for cities, instead of trying to come to the city with a specific product? What are your thoughts on this?**

The startup companies that are successful in interacting with the city are those that don't only bring a product or ready-made solution, but actually come to understand the problem and really translate to us how our problem can be solved by their technology - having this curiosity around what is actually on the minds of cities and using their entire skill set. I think it's preferable that you have the investment where the actual problem is and not in like a centrally located unit that is put in the world to do innovation.

And I think it's very important to coach the new generation, they are actually driven by the ability to create change and impact through their company. Many would likely be very keen on understanding this, some would gravitate more to the technical aspects.

**“The startups that are successful in interacting with the city are those that don't only bring a product or ready-made solution, but come to actually understand the problem.”**



## Munich

### Uwe Montag, Manuela Hiesch

#### IT Strategy - Smart City

[www.muenchen.digital](http://www.muenchen.digital)

**“Startups are thought-leaders in their field and it’s very important for us to have our finger on the pulse of developments, so we can find solutions that are not yet established.”**

#### **Can you tell a bit more about your role and your current projects in the area of urban mobility and smart cities?**

**Uwe Montag:** I work in the IT department of the City of Munich, concerned with our Smart City strategy. I’ve worked on „Smarter Together“ with Lyon and Vienna, involving smart data platforms and sensors for mobility and air quality, and “CUT” (Connected Urban Twins) working with Hamburg and Leipzig to build simulations, visualizations and scenarios using data.

**Manuela Hiesch:** I am responsible for topics such as e-government and open government, and two projects involving startups. The first, “Apps for MUC”, is a competition for app solutions from startups, and the second, “WerkSTADT”, is a participatory innovation hub bringing together citizens, startups and established companies.

#### **What is the added value for a city when working with startups compared to established companies? What motivated you to actively work with startups?**

**Uwe:** Startups always come into play when there is no real solution for the city yet. Startups are thought-leaders in their field and it’s very important for us to have our finger on the pulse of developments so we can find solutions that are not yet established.

#### **How were the startups or innovators identified? Have you developed a specific process?**

**Uwe:** A good way to get in touch with the startup community is through classic meeting places (hackathons, bar camps, etc.). There are more formal

opportunities as well, like an innovation competition where you explicitly approach startups to apply. There’s not much to be won in terms of money – simply a collaboration with a city department, in which the startup can prove whether their solution is viable. We also developed an “open call”. It’s a call for innovation where we seek applicants to think along with us and contribute ideas.

**Manuela:** For the Apps4MUC competition we created an objective evaluation catalog and point system. This helped us make a pre-selection based on comparable subjects, even if the applications themselves were quite different in their ideas. Competitive documents and requirements are published in advance to give all interested parties equal chances of participation. All projects that reach the point threshold are presented to a jury of experts, from respective areas like IT and Economics.

#### **Can you also name a specific project or collaboration and tell us a little bit about that? Especially interesting if you have an example of a specific startup.**

**Uwe:** Yes, one good example and one not so good. First, through one of our open calls, we set up a living lab in the Neuaubing-Westkreuz district of Munich dealing with intelligent streetlight poles, looking at air quality and pollutants. The open call was won by the Munich-based startup HawaDawa. They had a good approach and we bought 5 sensors from them.

In the not so good example, a startup applied for the topic of traffic management, won the category and installed their technology. But at some point, things went wrong – either they lost focus or ran

out of money, so we had to stop in the middle. It was negative in the sense that we didn't have any solutions, but it was also a good experience to learn that you can't always rely on startups still being alive in two years' time.

**Manuela:** We support startups by giving them access to expert knowledge from the city and we provide support of up to €20,000 per solution. We also try to integrate startups within our government network by advertising their ideas on our internal blogs and intranet to see if departments are interested in their solutions.

### **What can you share as best practices or recommendations for cities that would now also like to work together with startups?**

**Manuela:** The city should identify and provide someone with sufficient resources to focus on startups, as this requires focus and time. It is also important to ensure transparency as to who is the relevant contact person and who has decision-making authority. The most important thing is for the city to dare to try something that may not work.

**Uwe:** Small and clearly defined areas where a startup can easily try out solutions really helps. A startup doesn't have years of time – they want to try out their technology within 2 to 5 months and then sell the product, and when it's too complex, it's very difficult to maintain motivation. You also need buy-in from the top. You have to convince the right people in the city that a trial-and-error approach is very important for building up expertise and knowledge.

### **What do you see as the major challenges for cities in general over the next ten years? And what would be the output by which the city of Munich would define success?**

**Manuela:** I think that the topic of digitization will continue to occupy us for a very long time. The challenge for the city is to remain innovative and to keep up with developments. If we don't manage to stay digitally attractive, even participatory innovation competitions won't be interesting for startups in the future.

**Uwe:** The inner city is a common piece; it needs to become more livable. We must at least mitigate

the issue of „traffic gridlock“. The solution doesn't have to be hyperloop tubes or elevated trains – perhaps simply in the direction of IT, like intelligent controls and incentive systems.

### **Is the general aim then to improve the quality of life in the city, without restricting mobility?**

**Uwe:** How do you define quality of life? If you ask a package delivery person they'll say, „My quality of life is improved if I can stop anywhere and deliver my packages.“ It's a complex issue.

The second challenge is climate change – it's about energy management, the conversion of city centers, climate-friendly traffic. A third challenge in Munich is city growth and urban densification. However, there are other cities with the exact opposite problem – people want to get out.

### **Does the City of Munich or maybe a specific department offer any funding opportunities? It could be resources, prize money or money for prototyping; do you offer anything as a department?**

**Uwe:** As a department, it's project-related at the moment. We have these open calls in areas where there is money.

**Manuela:** Winners of „Apps for MUC“ are rewarded with up to €20,000. The Department of Labor and Economic Affairs also offers business development support as well as innovative competitions with possible financial rewards.

**Uwe:** These competitions are highly visible and provide an opportunity for startups to be seen – a reference for them to build upon.

**“The city should identify and provide someone with sufficient resources to focus on startups, this requires time and focus.”**



## Formerly at the City of New York

### Adrienne Schmoeker

Government Innovation & Transparency Strategist

Advisor at Urban AI and Board member at IssueVoter

Currently running a consultancy advising urban tech startups, designing data innovation programs, leading community-based technology discussions and consulting on government technology initiatives.

**“Climate change is a big challenge for cities around the world, but there are tremendous opportunities for innovation to help us change how we live and work in cities under challenging climate“**

#### **Please start by telling us a bit about yourself and your responsibilities or main area of focus.**

I spent over five years working for the city of New York, formerly as the Deputy Chief Analytics Officer and the Director of Civic Engagement and Strategy for the Mayor’s Office of Data Analytics. Prior to that, I worked at a startup, responsible for helping to expand the company to new markets. If I hadn’t worked at a startup before, I think it would have been much harder for me to understand where startups were coming from within my role at the city. My work for the city involved building relationships with different startups and encouraging them to take part in citywide programming and things like innovation hackathons, as well as managing the open data program of which many users were startups themselves.

#### **What is the added value that you’ve seen of working with startups vs. established companies? What motivated you to seek out and work with startups?**

Established companies understand how the city works through decades of engaging in government contracts, so they can skip the learning curve of “how does government operate” and get straight to work. But the downside of always working with the same companies is it can reduce opportunities to hear new ideas and bring new people to the table. The mindset of startups to think in new ways and be disruptive can be helpful.

#### **How were the startups or innovators identified? Is there a specific process**

#### **that you follow?**

We went to where the startups were. I already knew a little bit about the different communities and hubs that startups were a part of, whether it was incubator programs, accelerator programs, university-based programming, or even just email lists. I then sent out a message to these different groups and took the time to meet them. You have to take the time to build relationships and trust.

#### **Can you describe an example of a collaboration or a specific project you worked on.**

I was helping the NYC Parks Department to design and develop a data jam, taking some new data and seeing what different data scientists could discover with that data. We planned this event and decided to hire a civic tech nonprofit startup to help us; they did a truly fantastic job at hosting and running the event and also helped to bring their community to the table. I think that was one of the first paid engagement projects they ever had, so it was a bit of a learning experience for everyone involved, mostly around how to work together. Startups can be super flexible and use free software, while the teams working in government can’t just join any Slack channel or any unsecure collaborative document. Figuring out those cyber security hurdles was part of the challenge.

#### **What can a city do to drive engagement where startups are incentivised to work with them?**

I think there are a few different things that cities can do. One is to actively build relationships with startups and help them to understand how the city

government works. The City of New York is such a massive, complex organization. It has more than three hundred thousand employees! We're serving nearly nine million people who live in New York City. It's no surprise that the City as an organization is very hard to navigate. For this reason I often considered myself a guide to city government for startups: OK, I'm your entry point, I understand technology, I understand startups. Let me help you understand which city agencies you should be thinking about working with and which people within those teams you might want to build relationships with, if you're looking to actually work with New York City government. Another thing cities can do to drive engagement with startups is making sure that information about procurement is written in plain language, easily available, and actually understandable to startups.

### **What are some of the main challenges you've identified in startup collaboration?**

I think that it's less about the challenges in working with startups and more about seeing the challenges inherent in collaboration between two very different organizations: small, agile organizations (like startups) and a large, complex, bureaucratic organization (like the City). Sometimes startups don't realize the number of stakeholders and processes involved when working with a large organization; the number of sign-offs that have to happen for example, even if you think something should change, it doesn't mean you can change it right in that moment, a few different groups may have to review and approve the change. If I were to go back and manage these types of collaborations again, I would be more explicit about our organizational differences across processes and signoffs.

### **What were the learnings from the project?**

Give the startups an entry point into government; establish guides via staff who are dedicated to building real relationships with the startup sector. We hosted office hours at different accelerators and incubators, so startups could come in and explain their ideas and I could answer questions and provide feedback. Additionally, ensure that your procurement process is written in plain language and is understandable to startups, they can understand how feasible it is to actually acquire paid work with you. And lastly, provide open data. If startups have the talent and tools to analyze that data, they can

understand some of the pain points that government might not even be aware of.

### **What did strategy did you employ in communicating challenges or problems that you were looking to solve?**

The fact that my role existed to build relationships with startups provided a means of communicating our challenges. I would give presentations, for instance helping to educate the startup community on how government works. I also had a colleague who built a procurement guide for startups, making the process understandable. If both parties are coming from a place of trust, hopefully you can figure out a way to work together. When I worked at the CTO's office we also launched innovation challenges and helped design and host hackathons and data jams for City agencies—facilitating these 'problem solving' spaces was also a helpful way for startups to start engaging with us.

### **What do you see as your biggest challenges over the next 10 years?**

Climate change is a big challenge for cities all around the world, but there are tremendous opportunities for innovation to help us change the way that we live and work in cities under a challenging climate. Housing is also a big challenge in New York City, and figuring out how to help small businesses who are the heartbeat of our city. Other challenges include gun reform and figuring out ways to bring a voice to minority communities. A challenge for us as a government is figuring out how we can leverage technology and innovation to aid participation by our residents—tapping into their ideas and expertise. How can we activate our democracy by enabling residents to help us solve urban problems? There are so many challenges and they're going to be around for a while, but there are also a lot of dedicated community groups tackling every one of these issues, which is really inspiring.

### **Did you offer any specific funding opportunities, remuneration, be it in terms of resources, cash or something to startups in general? Was there a program around that?**

Yes. The CTO's office has a moonshot program. We asked startups to submit applications to solve a particular problem and then we award them a small procurement – a maximum of twenty thousand dollars

# Startup Partner Interviews



**Felyx**  
**Daan Wijnants**  
Head of Public Affairs

Felyx offers electric mopeds with the aim of delivering fast, fun and sustainable transport to EU cities  
[www.felyx.com](http://www.felyx.com)

**“Cities can be a reliable partner as long as you are honest about what you can offer and comply with contracts.”**

**Tell us a little bit about yourself, your background, the team, and what you’re doing.**

My job at Felyx is Head of Public Affairs so it’s my responsibility to make sure that we expand our shared moped operation to different cities both in the Netherlands and abroad. Currently we have about 3000 e-mopeds in the Netherlands and we aim to expand to Germany in the summer. We must have collaborated with at least 40 cities up to now.

**What would you say is the main difference in working together with cities and to address the first question, what are the benefits of working with cities?**

I think the main difference is that cities have much more public interest. They are in control of the public domain so they don’t want a cluttered appearance with vehicles parked everywhere, and they don’t want to have an unsafe vehicle operator on the roads. That is something you don’t really have with companies. It’s your interest versus theirs. I think in both the Netherlands and in Germany, cities are very open to our proposal. They’re eager to hear what we have to offer and as long as we abide by the arrangements, we don’t have any issues. Cities can be quite trustworthy as long as you are honest about what you can offer and comply with contracts. But you have to discern yourself from the other operators.

**When launching in Europe, how did you make your initial assessment of which cities to reach out to?**

That’s done by our market validation team. They make an estimation as to what might be an interesting city for Felyx from a business perspective and then they ask me to make sure we can actually get a permit or form of agreement. Once that is done, there is a lot of operational work. Sometimes, I do make some decisions, for example that it makes sense to speak with ‘City X’ or whatever, just to test what’s possible. Sometimes, it’s a matter of throwing out a large net and seeing what fish you can catch.

**Your role is to get in touch with cities, do you have a huge contact network or how do you go about this?**

It’s not that difficult. German cities usually have somebody that deals with mobility or traffic and then it’s simply a matter of sending them an email and explaining our proposal. And then we usually end up meeting in person.

**What does your first engagement look like? Is it a contract or an agreement? What is the main thing which everything else builds around?**

Sometimes, it’s a proposal that we draft, but usually the city comes up with something or I share some

of the examples we've worked on with other cities and then they use that as a template. Usually it's just a document that says "Felyx can operate and we have these regulations regarding vehicle size, service area, parking and data sharing, and we will have regular meetings to discuss how everything goes".

### **But it's on a case by case with no fixed high-level framework per se, right?**

No, not per se. It would be helpful in the long run, but European frameworks usually take a lot of time to come into fruition and always have to deal with every aspect of a matter.

There is some federal legislation (like traffic code) that we have to deal with on national levels of course, but apart from that, a city can just bilaterally decide what they want to agree on with us. But this case-to-case process is starting to converge now because, as you can imagine, these cities are not only contacted by me but also by all the other e-mobility operators.

### **So, it's a bilateral decision in the end?**

I would say so, yes. We always give a proposal of our service area and our terms, and if the city finds that they miss something or would rather exclude certain areas, we can easily adapt it. The municipality has of course a much better feel for it, they ultimately know much more about the city and its individual situation than we do!

### **What are specific challenges which have cost you a lot of time or effort while collaborating with cities?**

Finding the right person to discuss our proposal with is a matter. Sometimes a city is not very willing to accommodate another operator if there are already several operators active, which is the case in the larger German cities. You have to demonstrate your worth.

### **Are there any learnings you would like to share?**

Make sure that you get to the right person as quickly as possible. Sometimes you think you've got the right person but then it turns out not to be the case so you have to always check whether someone can actually decide on your proposal. Also, having the proper documentation – especially in different languages – really helps.

### **Did you have any hurdles or encounter problems somewhere?**

In some European cities it's more difficult because they are understaffed and for instance my Portuguese is nonexistent... so then you have to work with an interim person, and that takes even longer. And sometimes, cities are unwilling to accommodate a foreign company from a legal point of view.

### **Is it thinkable for e-mobility startups to join their forces in one city or region?**

That happens! In Germany, there is a coalition of different e-scooter operators which we will join later this year. Ultimately, we all want the same thing, so it does make sense to collaborate more and join forces to make sure that everyone can start business more easily.

### **Have you participated in any form of tendering processes?**

Not yet. Usually, they don't exist for our vehicle type. But I think a tender is actually a pretty good way of working because it creates accountability; the city have a document in case you don't do what you've promised!

### **Does it also involve building prototypes or presenting prototype setups or something?**

You need to be quite large to be able to operate in shared mobility because ultimately, the profit can be gained from scalability. You need a large fleet with a relatively small amount of people to be able to make money. It's becoming more difficult because there are now several large players that influence things like pricing, and they have all the permits right now.

### **How would you describe your experience with reaching out to cities and working through the process?**

I think 90% of the cities are quite welcome to discuss our proposals. Sometimes it takes a bit of time to find the right person, then you have to sell the story of your company and demonstrate what you want to bring to the city.

**“Currently, we make case-to-case arrangements with cities. They have a much better feel for the city's individual situation.”**



## Startup in stealth mode

**Daniel Wolpert**

Founder & CEO

The startup is building a city-centric (open source & open data) platform to manage the shift towards Mobility as a Service by leveraging data and orchestrating public and private mobility services in concert to the streets and infrastructure on which they rely.

**“We are working to put cities at the forefront of the transition towards Mobility as a Service and empower them to orchestrate what is happening on their streets.”**

### **Tell us about yourself, your background, your team, and what you're doing.**

In 2015 I moved to Silicon Valley to work in Research and Development for Mercedes Benz and then Deutsche Bahn. At both companies I worked on innovative mobility projects and in close collaboration with startups and universities. This combined with the impressions, the inspiring people, and the overall spirit of Silicon Valley – where everything seems possible – made me want to start my own startup. My first attempt was to develop and implement a charging infrastructure for micro mobility (e-scooters, e-bikes, etc.) to make the so-called „lime juicers“ obsolete, who even today have to collect the vehicles, charge them up and then put them back on the streets. But shortly after learning more about micro mobility, how people were using it, and how cities struggle with it, I realized that this is not the only infrastructure that is missing. As a result, we widened our scope towards Mobility Management in the context of Mobility as a Service (MaaS). What makes us unique is that we focus on local management and regulation of public and private mobility services, which means that cities are taking the lead in the transition to shared mobility.

While travelling back and forth between Silicon Valley and Germany, I realized that California and the cities there were at least one or two years ahead of us in terms of shared mobility. So, I started talking to cities in Germany – listening to what their problems are, where they stand and seeing if our intended solutions might be a fit for them.

In 2019 we launched our first prototype. Right now, we're a team of five and in the middle of a pi-

lot phase with our first major city. When it comes to working with the public sector startups need a long breath. What we see as the biggest challenges in working with cities is the 1-2 years lead time that cities and municipalities need to get their budget allocated and the tender process where we as startups have to compete with long established and resourceful companies. It's a hurdle because you often have to have prior project experience, which most startups simply won't have.

### **You've been working with a mid-sized city in Germany. Can you explain a bit more about how you were able to overcome reluctance and convince the city that it was worth taking the risk?**

The city must want it! Convince them of your USPs and of the additional value that they won't get with a bigger company.

It also requires a lot of resilience from the team on the startup side. For people coming from the private sector (especially startups) cities and their processes are often difficult to understand and comprehend. For many cities, agile development, open data, and open source are still quite new or completely unknown. Sometimes the engineers quickly want to test or develop something and it's just not possible because it's not been budgeted, data isn't available, or the circumstances are not clear. It definitely takes some time to get tuned in on both sides.

**We use this analogy in the project where we compare cities to tankers or container ships - they're extremely slow but in many ways, they are also quite efficient. On the other side, startups are**

### **the speed boats, which are very agile.**

I agree. Cities tend to stick with whatever they implement for a very long time. This can be cost-effective in many cases, but when it comes to software, they need to be agile and adapt to trends much faster to remain attractive to their citizens and competitive with privately offered alternatives. Therefore, cities and startups must find ways to dock together – in tandem, they can move things forward.

### **There's a lot of innovation happening in bigger cities like Munich, Barcelona, Paris, which are well known. Is there a specific reason why you chose to pilot in a smaller city?**

That's the niche we wanted to get into, because unlike large cities, smaller cities often don't have the financial and human resources to build their own solutions. On the other hand, they are less complex, and it is easier to become "the solution" since there is less or no competition. It's win-win.

### **So what are you working on, what is your project looking to achieve?**

Urban mobility is shifting towards MaaS and if this remains uncoordinated, it could quickly become a nightmare to cities, mobility users and -providers alike. To avoid this, we are working on a scalable, city-led mobility platform that combines Mobility Management with MaaS and is based on open standards. Our solution puts cities in the lead of this transformation, so they can orchestrate what is happening on their streets. At the same time, it aims to prevent a proliferation of incompatible platforms and isolated mobility solutions, while avoiding cannibalization of public transportation and instead seeking to complement it.

In addition, we are trying to ease the collaborative burden between different city departments. In the beginning, I just assumed the city was one customer, but each city consists of many different stakeholders. Without connecting those internal dots, you end up with silos.

### **What recommendations would you give to a city that is interested in working with a startup, based on your experience? What advice would you give to cities and city stakeholders taking their first steps in collaborating with startups or new innovation partners?**

Give startups a low point of entry to enable them to prove their viability as a partner. Open communication is also key. Get the startup to sign an NDA, but then be open with them about your data, what you are doing and what your problems are, because it doesn't help if the city reveals it step by step.

### **Are there any trends or bigger challenges that you see on the horizon for cities over the next 10 years? Or interesting points that you have come across in your discussions with cities, which the average person may not be aware of.**

If cities don't want to be dominated by the big tech companies, they will need to develop an open (source) ecosystem. In terms of data, the big tech companies already have so much information, they don't necessarily need any more information from a city for their businesses to work – so it's in the city's best interest to provide an open ecosystem on which startups and cities themselves can build cross-functional and cross-regional solutions. The same time cities should increasingly rely on open-source software to avoid being dependent on the proprietary software, know-how and agendas of large corporations. But for that to happen, internal and external silos need to be broken down, technical expertise must be acquired, and the city's mindset must change. Collaboration will be key, standardized interfaces for interoperability need to be developed, public-private partnerships fostered, and data needs to be open. If cities balk, something like what we see in the U.S., where Uber, Lyft and some of the other big tech companies already dominate large parts of the mobility ecosystem, could happen here as well.

### **You talked about monetization of information. What would your recommendation to a city or municipality be? How do we create a win-win situation, where cities are able to benefit and monetize and at the same time, it's open for startups and innovators to build services on top of?**

I have a feeling that many cities have no idea on how to monetize their data and therefore just keep it and nothing happens with it. To me the best way to monetize their data is to make it open data. This fosters innovation and keeps the cities attractive and competitive in the long run.

**“If cities don't want to be dominated by the big tech companies, they will need to develop an open ecosystem.”**



**Urban Radar**  
**Philippe Rapin**  
Co-founder & CEO

Plan and manage curb space in cities to reduce congestion from urban freight.  
[www.urbanradar.io](http://www.urbanradar.io)

**“When politicians and operations people in cities are aligned, then it’s a good way to promote better use of data and AI.”**

**Tell us a little bit about yourself, your background, the team, and what you’re currently developing.**

Urban Radar is a platform for cities and transportation planners to help make sense of all the new means of mobility that exist in the streets. We help cities understand the traffic patterns in their cities so they can make decisions about regulations, infrastructure, or investment. This is the opposite of costly and outdated planning that is typically done by surveying.

We also focus on urban logistics which is a key challenge for cities: Some of them are not aware of this, they have no clue of what’s happening on the roads in terms of logistics at a granular level, despite all the impact it has on congestion and air quality.

**What were your learnings and your main challenges in the past and what are the projects on which you’ve engaged with municipalities and governments?**

We work in cities all around the world: Versailles, Barcelona, Copenhagen. Urban Radar provides visualization, analytics, and predictions for mobility. Cities see transportation as a challenge because they don’t have the right tools, but they are willing to be innovative and willing to experiment with solutions. The second challenge is how to contract.

**That’s something we’ve heard from other startups as well - it’s always a new procurement process in every city, as there are no standards, so there’s always a new contract to be set up.**

Yes, because every city is different, every city has

different needs and every city will have different rules for contracting and working with innovation. One of the challenges that any startup working with cities faces is scalability. How can you scale when you have to do so much customization, even at agreement or contract level?

**How satisfied have cities been with your solution so far?**

We have had a lot of success. How many different people can use our solution is one of our KPIs. We want a politician to be able to measure the success of his policies as well as we want planners to be aware of the technical details of mobility in the city, so they can make more targeted decisions.

**Are you focused on the long-term planning of where the city will be in 20 years? What is the focus?**

No, it’s about understanding what’s happening today! Especially with new trends like e-scooters. Cities don’t know what to do with them yet in terms of regulation, contract management, parking and safety. Yesterday, a client was telling me that they have data from 2005, so 15 years ago – it’s not accurate. These surveys often cost around €1,000,000, but as soon as you conduct them, they’re outdated. We try to fill this gap. Our data input is partially sensor-based and partially dynamic from vehicles.

**What are the main challenges and hurdles that you’ve faced in your collaboration with cities?**

First, identifying innovators within the cities – we need a champion with sufficient influence in the city that is willing to spend time internally to challenge the status quo. Then, you have the problem

of different understanding of time frames with a city compared to a startup.

Another point is the maze of funding options: From EU level down to a local level, there are multiple ways and mechanisms of funding and every country and city will be different in terms of autonomy of spending. And then, because it's public sector, if the total project cost is too large, it's required to be an open tender. These are all hurdles when collaborating and contracting with cities and it requires a bit of expertise.

### **So, do you participate in tenders?**

Sometimes we do, either as a lead or as a subcontractor. It's very time consuming for a startup as a tender takes some time to prepare and then you have to wait for the results – sometimes six months.

### **Have you identified any shortcomings in startups delivering solutions to cities?**

Because startups usually have a targeted use case and move quickly, it's constantly a game for startups to stay relevant to a city while keeping up with how quickly the industry evolves. For example, we have an AI prediction solution, but do cities need that now? No, unfortunately, many cities are not ready to hear about AI yet.

### **What you have identified as your best practices for how to approach this challenge of working together with cities?**

I think knowing cities or knowing the industry is important. I've seen startups who were very naive collapse. You need a solid plan because working with cities takes time. Nobody comes with a magic wand and has a commercial success in six months, so you better be funded or have a plan for a few years. You also need to be open. As a tiny part of a complex ecosystem, it's very beneficial to network with other startups to collaborate and share.

### **You're working on AI and you said that many cities don't seem to be ready yet to apply AI – can you sum up the current state in this field and the reasons why they aren't?**

People think that cities in general are slow and bureaucratic, but actually, they're mostly just being practical. When we started Urban Radar, we pitched our solution and a politician just said: "That's

great, but with the elections coming up, people are unhappy because of all the e-scooters." The guy didn't care about long-term AI solutions when his short-term goal was to first alleviate chaos in the streets. It's comparable to a pyramid of needs. And that is our approach since: First of all, we need to make cities understand what can be done if they proactively use more data and if they analyze this data in a different way.

### **What can cities do to make their employees understand AI better and work more effectively and efficiently with it?**

When politicians and operations people in the cities are aligned, then it's a good way to promote better use of data and AI. Training and education should not be on coding of AI itself, but rather on the results and how helpful they can be for a city and all its deciders.

As Urban Radar, we mostly talk to people who are result-oriented. Those people don't specifically care how we do it but they care about costs and reliability: Everything that isn't done manually, is cheaper in the long run and can be updated more easily.

### **So what kind of data is suited the most for this purpose?**

What you need is a lot of data – reliable data, secure sources of data and a secure flow of data.

And then comes the technology layer of the algorithm, the service capacity and so on, but that's nearly secondary. Many companies heavily relying on AI do not tell you that they do so. They'll even use AI for their own business models, except they don't talk about it. Our challenge is: How can we become essential to a city without giving details of how we do it technically? We need our tools to be used. It's our job to make those tools super accessible.

### **What are your long-term goals?**

We want to create a shared value for both the private and public sector by setting up streams of data on which we can show the benefits for both the industry and the city. In the field of urban logistics, that would translate to higher business efficiency, less congestion and better air quality in cities.

**“Some cities are not aware of what's happening on their roads in terms of urban logistics, despite all the impact that it has.”**



## Veniam Robin Chase

Co-Founder & former CEO at Zipcar

Co-founder at Veniam

Veniam is an intelligent networking platform for the Internet of Moving Things. Our software enables transfer of ten times more data for video telematics, fleet operations, industrial IoT, or connected vehicles.

[www.veniam.com](http://www.veniam.com)

**“If cities could have procurements that were less prescriptive, I think they would get novel solutions at a faster pace.”**

### **Why do you think it is so challenging for cities and startups to find each other and work together?**

Cities are often unable to clearly articulate what they want. One of the reasons I initiated the Shared Mobility Principles was to recognize and promote a shared vision that both the private and public sectors could agree upon. These stated shared values would create more trust and agreement between them.

The second point is that startups pretty much live month-to-month and city procurement processes are work at a much slower cadence. Additionally, cities are by nature risk averse. Their regulatory regime built over time, seeks to preserve the status quo, and protects specific industries.

I think there are good reasons to regulate big companies like Uber and Lyft, but many measures were taken to protect existing taxi service providers. It was an opportunity for cities to relook at their existing regulatory infrastructure, which had historical basis, and they didn't. Instead, they made other rules and just piled rules on rules.

### **What are some ways that cities can use to make themselves more attractive as partners for collaboration?**

Cities could set aside a certain amount of money expressly for pilots. And by saying that it's a pilot, the city is implying that the effort is intended to be learned from, with adaptation and iteration. Risk is presented as learning, and hopefully there actually is learning.

One of the reasons why I had challenges accelerating startups in the past was insurance: Some kind

of 'grace period' would be good, in which the insurance is bought up to a certain amount or the startup is willing to carry a portion of the risks. Also, could we make some exceptions to some laws or rules at city level where risk is minimal? There are examples of rules that only make sense above a certain scale and that don't make sense at a smaller scale on which startups operate.

### **Many startups have identified procurement as the biggest obstacle for working with cities. Is this a challenge you've faced?**

Generally, startups do not look to do government work because they know it's painful. If cities could have procurements that were less prescriptive and more outcome-oriented, I think they would get novel solutions. The process would also need to move at a faster pace.

I know of one instance where an urban innovation expert went to several departments in a major city and said, "Give me your number one problem, and let's assign a 50-100k euro budget. We'll put out a request for proposal (RFP) explaining the problem and available budget, and we'll see what responses we get." And as a result, they got some very innovative solutions to those problems. This was also a pilot into procurement processes. If the startup did the pilot for this amount of money and if it delivered as promised, they automatically were rolled into a longer term procurement.

In general, a city should ask itself who the target audience for the startup product or services is: Is it for the city government to make their operations simpler, better, or more efficient? Or is it for the city denizens to buy and pay for and use in their

lives? (Carsharing would be an example of this.)

### **Do you have any other thoughts on innovation in this space?**

One of the things I learned when I worked in public transportation is that there are some services that need to be monopolies in order to succeed. Cities generally do a poor job of helping startups by saying: “We can’t play favorites and choose just one, so we’re going to help these ten companies that are providing a specific service.” – most of these will fail because none of them will gain the critical mass required to either provide a quality service, or the volume necessary to support the development structure. Ride sharing, for example, requires a critical mass: It needs to have a robust regional offering within one sole provider. It seems monopolistic, but there’s probably no other way it can ever succeed.

As we talk, I feel like the two key issues really are 1. the speed of procurement, and if we think about startups and innovation, it’s also 2. the specificity of procurement that needs to be much more open-ended: Here’s a problem, please come up with a creative way to solve it – which is not how RFPs are written. A solution could be doing these smaller trials, designing pilots into procurement.

The status quo is the major way that cities operate – they aren’t looking to reinvent things, they are just looking for continuity. It’s the path of least resistance because there is so much going on. Breaking out of the cycle of daily operations needs its own budget and its own people in charge of that process.

### **What can cities do to make themselves more attractive for innovation?**

In city governments, small and large, there are processes that are screaming for digital improvement, but how do we get that accomplished? What hinders cities from looking at their processes or ways of operating and evaluating what is ripe for improvement? Is there a mechanism to help cities have an ongoing rotation of current problems and a budget – focusing on things that need to be digitized and improved - right now? Often, a certain department doesn’t have the budget, and is therefore never able to proactively think about solving a problem.

### **Is it that cities are perpetually in fire-fighting mode?**

Yes, they’re often just trying to make sure that things are working and it’s ubiquitous. I was on the Massachusetts State Department of Transportation Board, and I recognized that every monthly meeting was always filled with mundane realities of making things work, and there was never any time or space left to think about where we wanted to go and whether we were making progress towards those goals? And I think it’s probably the same within a city. I’m sure that that’s how the city officials who work in those departments feel.

### **What are you working on now and what do you see as issues in the future?**

All around the world, right at this moment, electric micro-mobility has the potential to transform us from a car dependent and unhappy transit society into a multimodal, satisfied society. We have to reallocate street space so it is not just cars that get 90% of the space. We also need to think about regulatory requirements that demand car use, or car ownership, or driver’s licenses without alternatives for people who can’t or don’t want to take on the expense of car ownership and yet can’t safely use any alternative on our streets. We have to consider our priorities: Addressing climate change? Ensuring mobility for those who are currently locked out? Improving public health? But how do we disrupt the power of existing momentum?

Shared mobility principle number two is: ‘Move people, not cars’. As long as we remain focused on how to move cars as quickly as possible, we will never get to the solutions for getting people to where they need to go.

Personal car ownership as a model does not belong in the future. Going anywhere in your personal two-ton piece of metal that sits around for 95% of the time will never be sustainable. And 50% of people at any moment are trapped because there’s only one car in their household, or they don’t have a license, or they just don’t have the money for it.

What I am really trying to elevate now is that we are too focused on making car-only mobility work. Recentering on fundamental goals and building more flexibility – How do we start pushing those things and opening up space for them?

**“Move people, not cars. As long as we remain focused on how to move cars as quickly as possible, we will never get to the solutions for getting people to where they need to go.”**



## Vivacitylabs

### James Hill

#### Business Development Director

Our AI sensors gather detailed and anonymous data on travel modes and patterns to support transport network optimisation.

[www.vivacitylabs.com](http://www.vivacitylabs.com)

**“It’s about giving governments the best tools possible, which in the end directly helps you and me – the citizen.”**

#### **Tell us a little bit about yourself, your background, the team, and what you’re working on.**

We’re a UK startup and we’ve just gone through a funding round of £5 million, to develop a smart junction control product and then expand internationally.

Two years ago, we started a small project with the EU called “SynchroniCity”, where we used our camera-based AI-driven solution together with Bluetooth sensors to identify links between air quality and different vehicle types.

We’ve worked with Manchester, Helsinki, Antwerp and Eindhoven and are now looking to expand into Australia and New Zealand and the Nordics and Benelux countries. This is because of the ease of doing business in those regions, and their uptake of technology.

#### **How does it work with the different municipalities, going from contact to contract?**

We start off highly local with small pilot projects, using two or three sensors, when a city just wants to see how many cyclists or pedestrians there are. By analyzing their data, we prove to the municipality that it’s the right thing to do, say, to create a cycle lane or footpath. Then, they often want to expand the technology across the city because our sensor network gives them the ability to interact with their road network in a beneficial way.

Our collaboration with the city of Mechelen in Belgium is quite interesting because they’re looking into smart street lighting. They want to detect a pedestrian or cyclist or car and then adjust the

street lights accordingly. It’s about energy saving and improving traffic experience.

#### **Can you tell us a bit more about how the technology works? Is it a camerabased system or does it rely on another technology?**

It’s a video-based system. It’s a first-of-its-kind technology and there’s a few unique selling points. Firstly, for GDPR compliance reasons, all the processing is done within the unit itself, so whatever the camera sees, it processes on the unit and only sends out anonymous data. Secondly, within the one unit, our sensors can do what traditionally three or four pieces of equipment do. And normally with all this other equipment you have to dig up part of the road. Ours is simple to install and integrates within street furniture, like street lamps.

A lot of technology that is used for monitoring within our cities is quite old, so we’re bringing it up to the 21st century and enabling municipalities to get real time data. We give them the ability to be proactive rather than reactive with their spaces.

#### **How is the first contact with municipalities established?**

We are quite lucky now in the fact that we have written a lot of whitepapers and we are seen as leaders, so we do get a lot of inbound interest. But if you want to get out there, you’ve got to make outbound calls, do the research, find the right people to speak to and then build trust. A lot of municipalities have had their fingers burned by testing technology before which hasn’t worked, so it’s about building that trust again – you have to show that what you can deliver what you promise.

**It's interesting that you talk a lot about proof of concept - it seems that building prototypes is an integral part of your initial work?**

Yeah, absolutely! People aren't used to having this piece of equipment suddenly turn up out of nowhere that can do it all! Pilot projects are about adjusting requirements and building or refining use-cases. And the city gets to learn what the capabilities are and what else they can use the technology for, so it really is educational for both sides. Ultimately, it's not a business-to-business sale, it's business-to-government, so it's about a partnership mentality.

**What are the benefits that you see of working with cities?**

When selling into cities, you have to go through lots of different layers of procurement, which is tricky. And cities have to be slowly guided into adopting new technologies, which can be a challenge.

However, the good thing about working with local governments is the fact that it's a long term partnership and once your technology is proven, the city will probably become a better business angel than any other business out there, because they will help you as much as you are helping them to understand what is best for the city and region.

And local governments talk to each other – they're not competing against each other, unlike businesses. That enables us to do a lot of development work, which at the end of the day helps the end user, which is you and me, the citizen! We elect local governments, so it's about giving them the best tools possible to be able to deliver for us.

**Once you've demonstrated your solution, are you able to scale?**

Absolutely! Pretty much 90% or 95% of our clients have expanded their network within the first twelve months after a pilot project.

**Have you joined forces with other start-ups or companies?**

Yes, within the EU project "SynchroniCity" we worked with two other companies; "iSensing", who made a Bluetooth tracking device, and "Tracsis", who developed air quality sensors and a dashboard to visually overlay all data feeds.

**What have been the main challenges in working together with municipalities? What were the biggest hurdles, and what have you learned from them?**

Under the circumstances of Brexit, we have to deal with different legal frameworks now. And even within the EU, there was a case where a city government and its national government had opposing views on their interpretations of EU law in terms of GDPR and our compliance to it. We had to learn that some governments function in a more segregated way than they do in the UK. But that's just part of our learning curve as we expand internationally.

When entering a new marketplace, we shouldn't just do it the way that we think is right. We should listen to the people who we are doing business with, and hopefully we will find a good middle ground.



**“You've got to make outbound calls, do the research, find the right people to speak to and then build the trust.”**

# The Urban Mobility Innovation

**01** Making public transportation more attractive

**02** Improving the driving experience, traffic predictability and reducing congestion

**03** Efficient and scalable final-mile (mobility & delivery) services

**04** Improving the parking experience

**05** Accelerating the shift to electromobility

**06** Moving towards 'zero accidents', improving public safety

**07** Improving the quality of life, accessibility & equality

**08** Reducing cities' environmental footprint

**09** Reduction, transportation & recycling of waste

**10** Building better (digital) services



*Frameworks topics are randomly numbered, order does not denote priority.*

# on Framework 1.0

It has been demonstrated that one of the biggest barriers to successful collaboration between startups and cities is the challenge presented by the dramatically different approaches to working, culture and yardsticks.

## A simple goal:

To simplify the exchange of information between cities / municipalities & startups / innovators.

## How?

- a. By developing a framework which enables cities and startups to easily identify areas of collaboration, expectations and outcomes, and define a common language.
- b. Inspired by the theory of Jobs-to-be-done (JTBD) – Understand the core challenges of metropolises and use the ‘job’ as the unit of analysis.
- c. The framework can be implemented at any stage in the innovation journey (idea, MVP, product-market-fit, proven solution, etc.)
- d. Engender a systems approach and solve people problems, = find people solutions.
- e. Equip startups and cities with the methodology, tools and specific rapid-prototyping techniques to quickly develop and iterate promising solutions.

By simplifying the dialogue around innovation in the mobility space and providing cities, municipalities and startups with a common framework for positioning innovation and co-creation projects, we have developed the Urban Mobility Innovation Framework 1.0 – a collection of innovation spaces which form a natural basis for collaboration between cities and startups/innovators.

## The Topics:

### 01 - Making public transportation more attractive

It is clear that the need to reduce the environmental footprint of the transportation industry involves greater numbers of urban residents switching to using public transportation. So how do we make public transportation more personalized and attractive? How do we reduce the barrier to ‘switching’? How does public transport need to evolve to become the first choice of the urban commuter?

### 02 - Improving the driving experience, traffic predictability and reducing congestion

The reality is, that the automobile will be a mainstay of urban transportation systems for the foreseeable future, both for individuals as well as the myriad of industries which rely on point-to-point transportation for their ongoing business needs – taxis, transport services, craftsmen, delivery drivers, as well as public transportation and essential services. The question thus becomes ‘how do we reduce the environmental and health impact of automotive transportation using smart systems, e-mobility and reduce the amount of time accelerating, braking, idling and overall traffic congestion?’ Is it possible to turn daily driving into a pleasant and relaxing experience?

### **03 - Efficient and scalable final-mile (mobility & delivery) services**

The explosion of e-commerce and delivery services over the past couple of years has led to increasing numbers of delivery vans and courier drivers on city streets. At the same time, final-mile mobility services such as e-scooters, bike- and car-sharing have become popular with residents due to their availability, convenience, and affordability. Originally coined by the telecommunications industry, the last-mile problem describes the difficulty of connecting individual homes and businesses to a central network, acknowledging that this stage of a network represents the highest costs and challenges, as well as introducing the highest level of complexity.

The challenge facing many cities is how to integrate all these offerings into a seamless, connected offering which benefits the public, whilst preserving road and pedestrian spaces.

### **04 - Improving the parking experience**

The search for a parking space can be one of the most frustrating aspects of car ownership. Studies estimate that up to 50% of traffic congestion is caused by drivers cruising around in search of a cheap parking space (Kodransky and Hermann, ITDP, 2011), at the same time, parking occupancy varies wildly (20-100%) depending on the time of day. Most crucially, shops, retail establishments and businesses depend on the availability of convenient and cost-effective parking. The question cities should be asking themselves how they can best play the role of matchmaker, bridging supply and demand?

### **05 - Accelerating the shift to electro-mobility**

Electro-mobility is expected to be one of the defining mobility technologies of the next decade, with an expected market share of 40% of all new vehicles sold in Europe powered by batteries by 2030. <sup>1</sup>

Falling production costs, higher battery storage capacity and tightening emissions regulations will lead to a proliferation of e-mobility vehicles, spanning a range of sizes and classes. While this development will help to reduce emissions and particulate matter in cities, providing the required infrastructure (charging stations, electricity network upgrades and parking infrastructure) will be a challenge for cities across the globe. The challenge facing cities is staying ahead of the curve of public e-mobility adoption.

### **06 - Moving towards 'zero accidents', improving public safety**

Providing a high level of public health and safety is one of the hallmarks of a robust and resilient city. At the same time, there is a public acknowledgment that every injury or fatality should be treated as one too many, and that improvements in technology need to translate into a reduction in accidents and loss of human life. The question is, is it possible to turn a city into a zero-accident, zero-incident metropolis?

### **07 - Improving the quality of life, accessibility & equality**

There is currently a major public debate around urban issues such as housing, equality, and access to services, which are the foundation for a basic quality of life. One of the most popular frameworks for sustainable development is doughnut economics, promoted by Kate Raworth. The challenge facing cities is how to provide a good quality of life, cost stability and economic opportunity while at the same time pursuing climate-change and environmental sustainability goals.

## 08 - Reducing cities' environmental footprint

Cities consume ~75% of the world's resources and generate a roughly similar percentage of its emissions. As the percentage of the global population living in cities increases, cities will be on the lookout for ways to reduce their environmental footprint - some of which will come about because of the shift to electromobility, however there is still much progress to be made around reducing energy consumption, the effective use of natural resources, implementation of a circular economy and long-term sustainability and resilience in the face of climate change.

## 09 - Reduction, transportation & recycling of waste

Public perception, availability of information and traceability within the supply chain, are making citizens increasingly aware of their consumption footprint and its impact on the environment. Recent legislation banning single-use plastics is causing consumers to focus on waste minimization at source, the overall reusability and recyclability of products and engagement with the recycling and waste disposal processes. Cities are currently on the lookout for solutions to tackle the issues of recyclability of solid waste, particulate and UFP matter and carbon capture and storage.

## 10 - Building better (digital) services

Consumers are becoming accustomed to sleek digital products, intuitive user interfaces and massive leaps in technology providing services that were previously unthinkable. Meanwhile, many processes within cities are long overdue for an upgrade, yet often, city representatives are unable to dedicate time and resources to solving these issues due to other pressing issues. The challenge is, how can startups and innovators ideate, develop, and build the next generation of public services in areas such as citizen engagement, e-governance, and mobility?

Over the coming years, we plan to regularly update and promote the Urban Mobility Framework amongst both cities, municipalities, and startups as a way to build a bridge between the needs and challenges of cities, and the creativity, ambition and agility of startups.

We believe that by providing a platform which fosters two-way communication, combined with educating startups and innovators on the challenges and pressures faced by cities, we will be able to accelerate the quantity and quality of startups engaged in urban mobility and city challenges.



1 (Deloitte, <https://www2.deloitte.com/uk/en/insights/focus/future-of-mobility/electric-vehicle-trends-2030.html>)

# The Link to Prototyping and C

In the landmark book 'Design Thinking Research' (Hasso Plattner, Christoph Meinel & Larry Leifer), the authors talk about the role of prototyping in helping to solve 'wicked problems'. A 'wicked problem' is defined by Rittel and Webber as 'a type of problem whose solution unifies the different needs and perspectives of diverse stakeholders'.

## So why does prototyping play such a central role in innovation?

Research shows that when solving complex problems, a person's working memory is the principal limitation - imagining a complex model or shape requires concentration and limits the brain's ability to consider all aspects of the problem. The result is often that the problem solver modifies their approach to cope with this resource limitation - it is not possible for the brain to execute complex work in parallel, rather, this must happen sequentially.

This is where prototyping comes into play - by regularly building a representation of the solutions being generated, the innovator frees up mental capacity to focus on the increased complexities which a successful solution demands.

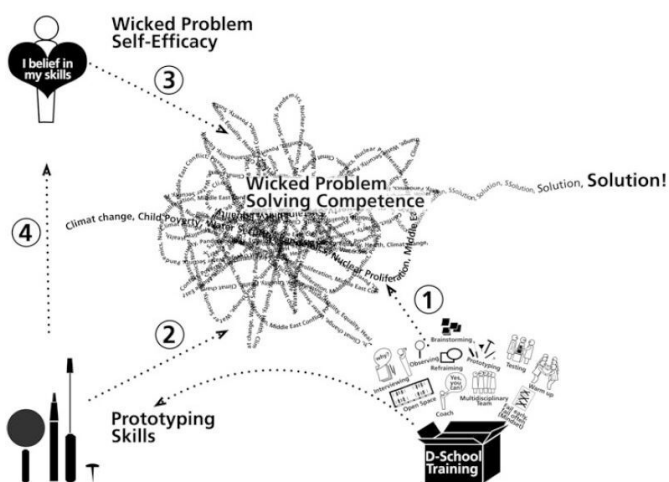


Image Source: Design Thinking Research, Plattner, Hasso, Meinel, Christoph, Leifer, Larry (Eds.), 2016



# Co-creation

Most of the world's really important problems which must be solved are wicked ones. Because wicked problems involve several stakeholders, with different interests this makes it difficult to solve them (Rittel and Webber 1973).<sup>[1]</sup>

According to Rittel and Webber (1973), a wicked problem is a type of problem whose solution unifies the different needs and perspectives of diverse stakeholders. You can only “tame” this type of problem but – per definition – a wicked problem is insoluble.<sup>[2]</sup>

Given that there is no ultimate test for a solution, the only possibility is a confrontation of the user with a prototype and to test the proposed solution and to analyse the resonance and feedback towards the prototype and the idea behind it. Once the prototype, the service or the product is considered by users and stakeholders as desirable, you can assume to have found one of the “better solutions.”<sup>[3]</sup>

The biggest impact for solving design problems is the working memory, because the working memory connects information from the long-term memory with the short-term memory.<sup>[4]</sup>

Solving complex problems exclusively in the mind is possible only to a certain extent. This is, because of the limitations of the working memory. For thinking, complex problem solving needs enormous resources. Merely to “invoke” a more complex shape in the mind requires capacities and concentration. Once this capacity is committed then it is not possible to go back to the further development of this shape. Here external representations are a big support. The sketching and the three dimensional modeling of a paper model, for example, are supportive of the thinking and again to dispose resources for problem solving (Dörner 1995; Wiese and Wiese 2012). An overload of the working memory in solving problems find expression in a too huge simplification on too few influencing variables of a draft problem (Ehrlenpiel 1993). As a consequence, the problem solver modifies his procedure to fit his limited resources and will work with his simplified representations of the problem and approximate problem-solving strategies (Klauer et al.). It is not possible that complex draft work can be executed in parallel, but rather sequentially.<sup>[5]</sup>

Furthermore, it is preferable to work on already known solutions. This implies that a problem solver who works with an overloaded working memory tends to reduce the complexity of a problem and to solve it in a less complex way than the problem would require.<sup>[6]</sup>

It is clear that the current and future challenges faced by cities fall into the category of ‘wicked problems’, and as such, can only be solved by applying creativity, prototyping skills and self-efficacy.

<sup>[1]</sup> <sup>[2]</sup> <sup>[3]</sup> <sup>[4]</sup> <sup>[5]</sup> <sup>[6]</sup> Plattner, H., Meinel C., and Leifer L., (2016), *Design Thinking Research*, Springer





## Footnotes

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