# It works! But now what? Upscaling smart city experiments

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Creating Tomorrow

**It works! But now what? Upscaling smart city experiments**

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**The city as lab**

People and organizations everywhere are working to make the city more sustainable, more circular and climate-proof. Sustainable innovations are not for sale, we have to make them ourselves by trial and error to find out whether a new approach works or not. Major cities around the world have embraced experimentation as a way to discover future directions: the city as a living laboratory where new technologies and concepts are tested in the fields of mobility, sustainable energy, sustainable construction, logistics, and so on. Such experimentation projects are supported by governments through a wide array of subsidies and other measures.

**Why is scaling up difficult?**

In my research team, we are wondering if all this experimentation really leads to a more sustainable city? Pilot projects are by definition small-scale, they can fail, and that's okay because you learn from them, and the lessons can be used in a subsequent project. But in our research into upscaling smart city pilots, we found that many successful pilots are not continued, so their impact remains very limited. Why is it so often not possible to convert successful experiments into large-scale implementation?

Scaling problems are looming in a specific pilot project that I work on, Resilio[1] (figure 1). In this project, we are developing "smart" blue green roofs in some neighbourhoods in Amsterdam. Such roofs can store up to 80 mm of water, and, importantly, the water level on the roofs can be managed with a smart valve linked to a digital system.  Smart roofs help to prevent flooding: when a very heavy rain shower is approaching, the smart system opens the valves, and empties the roof, and so frees up water storage capacity on the rooftop. Thus, such roofs can become a tool in urban water management. Also, blue-green roofs may increase biodiversity in the city because you can grow a richer vegetation compared to conventional green roofs. They also help to cool buildings during summer, and may reduce the urban heat island effect. A promising project, so it seems.

*Figure 1 Resilio: Blue green rooftops*

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[1] https://www.uia-initiative.eu/en/uia-cities/amsterdam
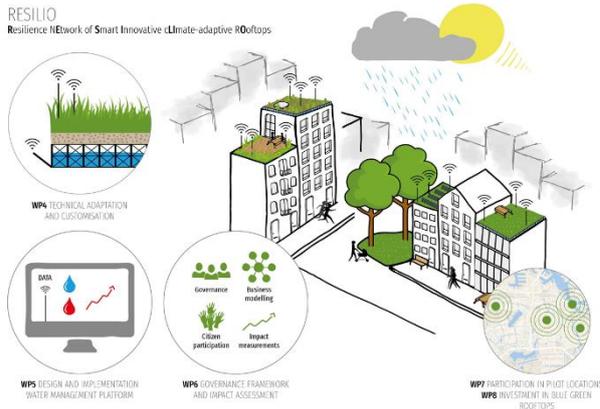
But will it scale up after the pilot phase? A key problem is that these roofs are several times more expensive than normal roofs. The extra investment is carried by the real estate owners –in our project, these are social housing corporations. But the benefits are mainly social –higher biodiversity, less flooding, better water management- and hard to capture or monetize. So far, this is not a problem because the pilot project is 80% funded by an EU subsidy (through UIA, Urban Innovative Actions[2]), and this is why the housing corporations wanted to join. But to scale this up, we need to develop a viable business case. We are now developing scenario's in which the roof owners will be rewarded for installing such roofs, for instance through cuts in water taxes, by subsidies, or otherwise. And we are exploring other kickbacks such as increased property values or the commercial exploitation of rooftops.

**Barriers to scaling**

So back to the more general question: why is it difficult to scale up urban innovations? The first important reason is that in many such projects, all money and attention goes to the experiment, and too little - or not at all - is thought about phase 2: upscaling. At the end of the pilot, the money will be used up and there are no structural resources for upscaling. Rather than trying to scale up, it is often easier to look for the next subsidy and start a new pilot.

Another threat to upscaling is the "not invented here syndrome": the passionate innovation team believes in the new approach, but for upscaling other people and parties must also participate. And they also see disadvantages, threats, risks, or think they argue that other solutions are better.

Scaling up also becomes difficult if the experiment / pilot project is not really supported by the decision-makers within the organizations involved; Managers are usually enthusiastic about pilots because they don't cost a fortune, they generate positive publicity, and in any case give the impression that their organization is innovating. But when the pilot is successful and the moment of implementation/scaling has come, they often put on the brakes because the financial and operational consequences are drastic.

Scaling-up can also be hampered if the innovation team is too far removed from the day-to-day operations. Then the resistance to upscaling is already built into the experimental phase; Operational departments, which have to keep things running, are reluctant to implement new approaches, especially radical ones. The trick is to find a good balance between exploration (discovering new things, innovating) and exploitation (performing daily operational tasks). For this it

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[2] https://www.uia-initiative.eu/en

is important to involve the operational departments in pilot projects from the outset. Incidentally, this may mean that more radical experiments will no longer have a chance: too threatening.

Sometimes upscaling does not get off the ground because collaborating partners have very different interests in upscaling and implementation. We see this in Resilio, where the public water management company is very keen on upscaling blue green roofs, because it helps them to adapt to climate change. But for the housing corporations, upscaling is very expensive.

And finally, banks are reluctant to finance smart city innovations because they entail higher risks, deploy new, unknown technologies, and it's often not clear what the revenue streams will be.

**Four hints**

Lastly, four tips that can promote upscaling:

- Regularly put the theme of upscaling on the agenda in the innovation team; it often turns out too late that team members have very different perspectives
- Make sure that the innovation team does not only consist of (technical) enthusiasts; also involve citizens, users and operational departments that will be affected.
- Ensure that decision-makers in the organization (s) remain involved, informed and involved in the pilot project
- Engage with funders and financers in an early stage.

**For further reading:**

Neuroni, A,C., S. Haller, W. van Winden, V. Carabias-Hütter and O. Yildirim, Public Value Creation in a Smart City Context: An Analysis Framework, In Bolivar, M. P. R. (2019), Setting Foundations for the Creation of Public Value in Smart Cities, Springer, https://link.springer.com/chapter/10.1007/978-3-319-98953-2_3

Winden, W.  van and D. van der Buuse (2017), Smart City Pilot Projects: Exploring the Dimensions and Conditions of Scaling Up, Journal of Urban Technology 24 (4), 51-72, http://www.tandfonline.com/doi/abs/10.1080/10630732.2017.1348884?journalCode=cjut20