RUINATION · VOL. 1 (2026) · PUBLISHED 5 NOVEMBER 2026

WORKING PAPER

Q/A AILiner panel discussion

Thomas Berker

Centre for Technology and Society, Department of Interdisciplinary Studies of Culture, Norwegian University of Science and Technology, Trondheim, Norway

Corresponding author: thomas.berker@ntnu.no

Contribution to the AILiner panel discussion, Madrid, 5 November 2026

Collections Episteme · Metabole

Keywords ruination · infrastructure · maintenance · sewer networks · asset management · digitalisation · tacit knowledge

How to cite Berker, T. (2026). Q/A AILiner panel discussion. *ruination*, *1*. https://ruination.kultwiki.net/article/view/7

Q1. If we look 50 years ahead, how might sewer networks change? Will we still need the same networks we have today?

> • *Could decentralized treatment and Blue Green Infrastructure significantly reduce the need for conventional sewer infrastructure?*
> • *How might climate change, demographic shifts and changing urban water demand reshape networks?*
> • *Which parts of today's infrastructure are likely to remain essential? Which one will change?*

My discipline teaches a simple lesson: infrastructure almost never gets replaced, it gets either actively maintained or it is ruined by the lack of maintenance. Infrastructures are built on an installed base (Star and Ruhleder 1996). The question "will we still need the same networks?" is usually asked about the visible layer, such as treatment plants, sensors, digital twins. But the buried network, the pipes in the ground, is the part that outlives every innovative vision. Thus, if decentralized treatment and blue-green infrastructure is implemented then it will be **added**, not substituted. This will result in hybrid systems, with the conventional network as the backbone that everything else is built on. What will change most is not the pipes but the regime around them: climate stress, shrinking and ageing cities that have to decide which districts to keep served and which to retire. This retirement decision is then where it gets extremely political. But the trunk lines remain essential.

Q2. How can we make sewer networks more resilient and adaptable to uncertain future conditions?

> • *What characteristics should future networks have to accommodate changes in climate and urban development?*
> • *What does an adaptable sewer network look like in practice?*

In my discipline we resist firmly the idea that adaptability is a design property you build in once. It is a special case of what we call the design fallacy (Stewart and Williams 2005), the idea that emergent properties can be designed in from the beginning. Adaptability is such an emergent property. This is because it is a practice, not

a feature. This practice keeps the network legible, accessible, and repairable. Practice theory teaches us that stable practices depend on skills, norms, and material tools supporting the practice (Shove, Pantzar, and Watson 2012). Thus, there has to be systems of skill transfer and preservation, a political will (which allocates resources), and there are also physical properties that support flexibility and adaptability. A network designed for maintenance - with access, redundancy where it's cheap, and documentation that survives staff turnover - adapts better than a network marketed as "smart." Important in this context is that the material network, the competences, and the normative commitments have to change together. Change only one - e.g., modernise the material base without keeping competences or resource allocation in sync - and the network loses the property of resilience and adaptability.

Q3. Should utilities continue prioritizing the rehabilitation of existing assets, or increasingly invest in adapting and transforming their networks?

> • *How can utilities balance the preservation of infrastructure value with the need to prepare for uncertain futures?*
> • *Are utilities investing too much to maintain infrastructure that might become obsolete?*

This question contains a false binary as long as it insists on transformation being the opposite of rehabilitation. In reality both the rehabilitation without transformation and "greenfield" transformation are the extreme points of a continuum. Similarly, preservation of infrastructure value and preparation for uncertain futures do not have to be polar opposites. Not investing in existing infrastructure comes with cost beyond the material value. Writing off infrastructure is cheap for the people who decide it - because it has been paid for before - and expensive for those who have to learn to live without this infrastructure. Obsolescence claims should therefore always be treated as unproven claims with costs (for someone) attached, not as predictions of the future.

Q4. What are the possible futures for urban infrastructure management, and which one is most desirable?

> • *Will utilities 1) largely continue current practices, 2) move toward digital twins and AI driven optimization or 3) are we going to have self-healing network?*
> • *What could influence future developments?*
> • *What could lead to radical changes?*

Of the three scenarios, in line with what was said above, I am critical towards claims of radical innovation. "Self-healing networks" is a metaphor that hides labour because nothing heals magically by itself, in one way or another you have to add work and energy to it to heal, entropy makes sure of this. Digital twins and AI optimization have a real potential to be useful, but our research on how digitalisation of infrastructures is performed in everyday life (in our case remote operation and maintenance of a building portfolio), makes me warn about what could be called its "counterfeit" version: a dashboard or app that performs what Haraway (1988) has called the "God's eye trick", by promising a total view of all that happens, which gives god-like control. In reality, the maintenance of these tools sucks up resources that would be needed to care for the maintainer and to strengthen the relation between the maintainer and the maintained assets. The desirable future would instead be a future where maintenance is visible, funded, and skilled, with digital tools in service of that relation rather than as its replacement.

Q5. How much data do we really need to improve asset management decisions?

> • *Can existing data and relatively simple models already deliver substantial benefits?*
> • *Can existing data and AI already deliver significant benefits?*
> • *Do we have enough data? Is data availability a problem? Does more data necessarily mean better decisions?*

I will leave this for the experts.

Q6. Beside technology, what will drive the transformation of urban infrastructure management and what are the main barriers preventing it?

> • *Is the transformation going to happen by itself? What will be the trigger? Backlog of investments, rising failures in services ?*
> • *Do we need stronger policies and regulatory requirements?*

Here I would like to focus on the human dimension. If the current demographic development continues we will see rising retirement rates in an ageing society. And with the workforce, tacit knowledge about the network retires which is an erosion of maintenance competence one simply cannot magically reverse through digitisation. This is at least true as long as budgets prioritise novelty and neglect upkeep. Maintenance is invisible until something breaks, which is why it loses budget fights against something politicians can claim as their doing. Here we need policy, indeed. We need maintenance accounting that makes the real cost of backlogs visible on the balance sheet.

Q7. Let's dream for a minute. You are the mayor of your city and the head of the water utility and you have the power to change things.

> • *What needs to happen over the next 10 years to move toward the desired future of infrastructure asset management?*

Three moves: First, structurally protect maintenance funding so it cannot be traded against glamour projects. Second, implement additional support for the competence pipeline: apprenticeships, documentation practices, and time for maintainers to hand over what they know. This would mean to treat knowledge maintenance as seriously as pipe maintenance. Third, for every new digital system we buy, account at purchase for the true costs including expertise needed to run and maintain it, and the expertise that is destroyed by it.

Q8. What are the concrete takeaway messages for AILINER and the consortium; what do you think is key to consider for the project? Any last message before we go home?

Three recommendations: First, the project's outcomes will and should be judged not by their demo performance but by what happens to them after the funding stops. Who will use, maintain, improve them? Think about this now, carefully! Secondly, be aware of the knowledge dimension: the AI must keep the humans' judgment in the loop and augment it, not replace it. Third, a slogan: an asset-management system is not an asset but a relation between things, between people, and between things and people that has to be maintained. If these relations are not maintained, the assets turn more or less slowly into ruins.

References

Haraway, Donna. 1988. “Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective.” *Feminist Studies* 14: 579–99.
Shove, Elizabeth, Mika Pantzar, and Matt Watson. 2012. *The Dynamics of Social Practice: Everyday Life and How It Changes*. SAGE Publications Ltd.
Star, Susan Leigh, and Karen Ruhleder. 1996. “Steps Toward an Ecology of Infrastructure: Design and Access for Large Information Spaces.” *Information Systems Research* 7 (1): 111–34.
Stewart, James, and Robin Williams. 2005. “The Wrong Trousers? Beyond the Design Fallacy: Social Learning and the User.” In *Handbook of Critical Information Systems Research*, edited by Debra Howcroft and Eileen M. Trauth, 195–221. Edward Elgar, Cheltenham.