Bringing the river Dijle to life: Immersive and visualisation tools

City of Mechelen

INTRODUCTION

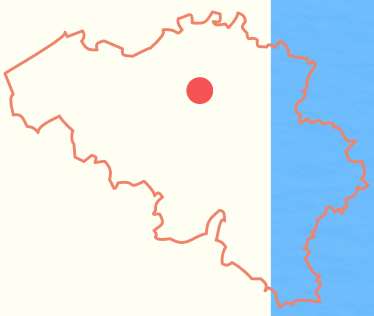
Imagine trying to picture your street after a full climate transformation, using nothing but a simple map. No map can really capture the scale, the detail, the multperspective of interests and for all the feel of the transformation. That's the gap Mechelen set out to close.

Masterplan Binnendijle is Mechelen's overarching city renewal project, centred on the river Dijle. Running from March 2024 through 2026, it uses a layered participation approach, which combines several distinct participation tracks, including a citizens' assembly (see: Citizens' Assembly on the River Dijle), co-creation workshops, expert tables, and baseline studies.

Here, we cover one specific layer within that approach: **the immersive and visualisation tools Mechelen used to make the river's transformation tangible and easy to understand.** These included XR-based experiences (extended reality, covering both augmented and virtual reality), AI-supported visualisations, sensory installations, mobilizing video-mapping on buildings, on-site walks and boat trips, dedicated outreach to hard-to-reach groups, and even a voice for non-human "stakeholders" like plants and animals.

These immersive tools tackled a specific, practical problem. A 2D plan or a classic architectural render rarely shows what climate adaptation, biodiversity restoration, impact of waste, river transformation, or redesigned public space will actually feel like. Residents often struggle to picture it. Mechelen wanted to close that gap: **make the transitions easier to visualise and understand, more emotionally accessible, and genuinely inclusive**, so a diverse range of people could engage with them meaningfully.

Gathering input wasn't the goal here. That happened through the Citizens' Assembly, the baseline measurement, the explorative research and the co-creation sessions it fed into. **It was about getting people involved, in a low-threshold way.**



BELGIUM



ENGAGEMENT LEVEL

- **Inform**
- Consult
- Involve
- Collaborate
- Empower

MANDATE

The **City of Mechelen** initiated the use of immersive and visualisation tools. The **Masterplan Binnendijle team** designed and developed them, with technical support from **Thomas More University of Applied Sciences** for what concerns the use of AI and 3D-rendering of design. For the immersive booth design and artistic videomapping **third parties** were contracted.

Political backing was strong. Specifically, the steering group approved the procurement of the immersive booth and artistic videomapping themselves. **Real budget and city resources** went specifically into building this kind of visual and immersive infrastructure, not just into participation as a general idea.

These tools didn't produce recommendations of their own. They supported a process that did: the Citizens' Assembly and its co-creation sessions, where the actual goal was to formulate concrete recommendations. The tools helped residents grasp what was at stake, before they took part in that process and helped shape those recommendations themselves. They invited a wider public to take part, to open their minds on the different perspectives of interest.

Because of that, **the city's promise on follow-up applies to the assembly's recommendations, not to these tools directly.** Project partners, experts, and city management reviewed those recommendations, including input shaped with help from these tools, and where legal, financial, spatial, or organisational obstacles stood in the way, the city explained those obstacles openly to participants, rather than letting the input simply disappear.



PROCESS DESIGN

Unlike the Citizens' Assembly, this participation format never really stopped. It ran throughout Masterplan Binnendijle, from March 2024 through 2027, resurfacing again and again across more than **100 separate participation moments**: info markets, exhibitions, guided walks, boat trips, school programmes, and neighbourhood events.

This toolkit combined several technologies. XR experiences let people step into a possible future version of the riverbanks. AI-generated visualisations turned design ideas into concrete images, quickly and affordably. 3D models and sensorial installations, including an immersive booth with sound, temperature, and even wind, made climate adaptation something people could feel, not just see. A wider circle of experts, such as ecologists, designers, safety experts, artists, and heritage specialists, added thematic depth throughout, while community organisations helped bring the tools into their own networks.

The tools were designed for inclusion from the start, following what the city calls its **Inclusive Design Wheel** (see: Masterplan Binnendijle).

VISUALISATIONS OF URBAN PLANNING

Thomas More University of Applied Sciences led the technical development, building the **XR and AI tools** specifically to keep inclusive design affordable and genuinely accessible for a wide variety of participants. External design offices supplied the underlying visual content that powered the XR experiences. Thousands of residents experienced the tools. Other examples are a **moving render** and a **3D sketch of the future swimming zone**.

BASELINE MEASUREMENT ON LOCATION WITH CITIZEN DIALOG KIT

No better visualisation than the location itself. To get insights from the visitors (e.g. resident, user, passerby) an o**nline connected measuring device with a questionnaire** was mounted on an attractive information totem that explained the various ambitions of the project. The mounted **Citizen Dialog Kit** invited visitors to answer some questions. This measurement happened mostly some months before the explorative research on site and the co-creation that followed afterwards. The data obtained were used to further investigate on polarizing topics, explore wants that needed more specifications or engage groups that were underrepresented in the demographic data.

Through the project the Citizen Dialog Kits were used to capture how people experienced the wants and needs on site, how they responded on proposals, visualisations. The use of this tool on location **made complex design choices far easier to understand and easier to discuss** between policymakers, projectpartners, stakeholders, residents, target groups and designteam. The strong quantified data and the output of the citizen assembly did put the city in a more comfortable, moderating role.
With this low-threshold way of measuring we engaged random people visiting the location and get insights beyond the ‘usual suspects’.

Over 3,100 people completed a dedicated feedback survey through the Citizen Dialog Kits.





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IMMERSIVE BOOTH

A mind is like a parachute: it only works when it's open.

To open more minds to river restoration, the city of Mechelen created an immersive booth that **lets visitors experience what's at stake**. The theme covers restoring biodiversity along the riverbanks, adapting to a changing climate, and the benefits for social cohesion and wellbeing.

A film shows how **different archetypes of people, plants and animals** each imagine the ideal river. Visitors feel the difference as well as see it: a cool breeze accompanies scenes of lush green, while a wave of heat comes with images of paved streets. Audio stories go deeper into what different plant and animal species need to thrive.

The booth has **travelled to several exhibitions and co-creation sessions**. There it helped spark conversation and made the discussions that followed more open and constructive.

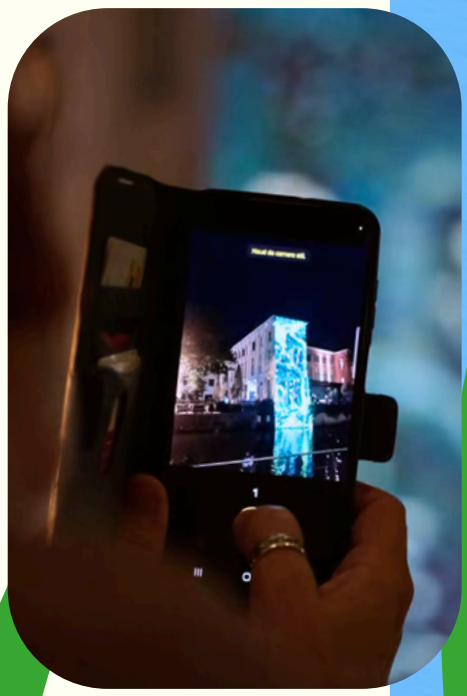


ARTISTIC VIDEOMAPPING TO MOBILIZE

To kick off a river clean-up and invite residents to an exhibition of the final river designs, the city of Mechelen brought in an artist.

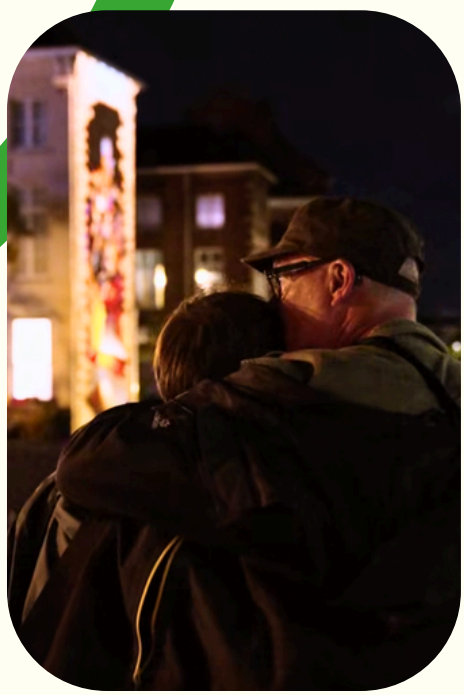
The result was **a video animation projected onto a building on the riverbank**. It showed the river's transformation from a neglected stream full of litter into a place people want to spend time.

The animation caught people's attention: **100 residents joined the clean-up**.









OUTPUT & FOLLOW-UP

The positive response to these innovative techniques went beyond enthusiastic feedback. The City of Mechelen now sees several of them as **policy-relevant innovations** with value well beyond this single project. Rather than remaining a one-off pilot, the tools have become **a fixed part of how Mechelen organises co-creation and presents final designs to its residents.** The city is now exploring how to scale up these visualisation and immersive tools within a **realistic budget**.

RESOURCES

Costs varied considerably by technology. AI-generated images were relatively inexpensive to produce. **VR experiences** cost more, because creating convincing VR content takes significantly more hours of work.

For the **immersive tools**, the City of Mechelen set aside a dedicated budget of €30,000. This covered the immersive booth: its audio and video content and the physical experience of heat and cooling wind.

A separate budget of €12,500 went to the **artistic video on the river's transformation**. This included its production, the video mapping on the building and the projections over several evenings. Three artists worked on the production, and additional technical equipment and staff were needed for the video mapping.

The Citizen Dialog Kits were rented. Prices depend on the number of devices and the rental period.

Beyond the core participation team, many others contributed to the project. Within the city, these included colleagues from communication, mobility, environment, heritage and social services. They worked alongside researchers from Thomas More, ecologists, artists, a local art school and external parties contracted to produce the booth's video and audio content. Together, the city and Thomas More also built up a lasting set of infrastructure: XR and VR equipment, 3D modelling tools, immersive installations and the Citizen Dialog Kit itself.

The demand for high-quality visual material also reached beyond the city's own teams. Mechelen wrote it directly into the specifications for the external design bureaus working on the different sites. Visualisation is now a standard requirement whenever the city procures design work for this project.

STRENGHTS

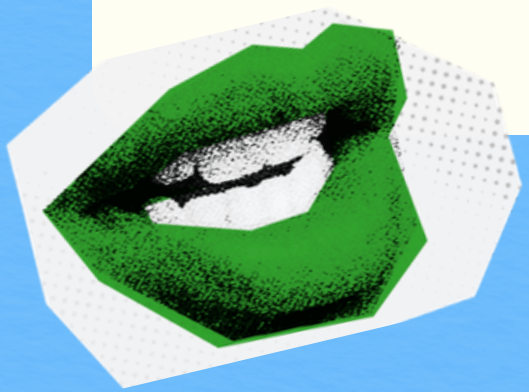
- The tools made education and participation more **accessible, comprehensive, and tangible**.
- The tools **sharpened public awareness of the real trade-offs** behind climate adaptation, not just the general idea of it.
- The tools themselves became their own **media story:** the city produced dedicated videos on the immersive booth and its personas, rather than just mentioning the tools in passing as part of a wider project.

CHALLENGES

- Building and running the toolkit took **a lot of time.**
- The tools **depended heavily on external design firms**, whose choices about materialisation shaped what was actually possible.
- The **personas and scripts** behind the immersive experiences needed **real craftsmanship**. A poorly built persona doesn't say much of anything.
- Each installation needed its own **technical setup** and the **right physical conditions** to actually work.

FINAL RECOMMENDATIONS

- Before building anything, **define needs and specifications precisely**. Each one should be specific, measurable, achievable, relevant, and time-bound.
- Set a **realistic timeframe** from the start. These tools take longer to build than people expect.
- **Choose viewpoints and personas carefully**, to engage as many participants, and as many genuine insights, as possible.
- Invest in **professional facilitation** and **technical support**. A small internal team can't improvise this.
- **Follow up throughout the process**, not just at the end, to catch problems with materialisation or scripts early.



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