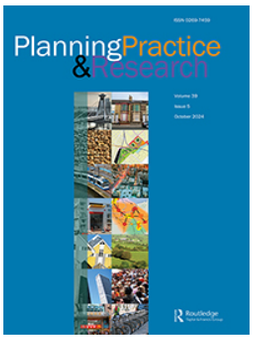

Planning Practice & Research

ISSN: (Print) (Online) Journal homepage: www.tandfonline.com/journals/cppr20

Implementing transformative resilience in urban regeneration: recommendations for local planning practice

Grete Swensen, Oddrun Helen Hagen & Abid Mehmood

To cite this article: Grete Swensen, Oddrun Helen Hagen & Abid Mehmood (25 Sep 2024): Implementing transformative resilience in urban regeneration: recommendations for local planning practice, Planning Practice & Research, DOI: 10.1080/02697459.2024.2398366

To link to this article: https://doi.org/10.1080/02697459.2024.2398366

PLANNING PRACTICE & RESEARCH
https://doi.org/10.1080/02697459.2024.2398366

Routledge
Taylor & Francis Group

PRACTICE REVIEW

Implementing transformative resilience in urban regeneration: recommendations for local planning practice

Grete Swensen[a], Oddrun Helen Hagen[b] and Abid Mehmood[c]

[a]Department of Heritage and Society, Norwegian Institute for Cultural Heritage Research, Oslo, Norway; [b]Department for Mobility, Institute of Transport Economics, Oslo, Norway; [c]School of Geography and Planning, Cardiff University, Cardiff, UK

ABSTRACT

Large regeneration and transformation projects generally include a longer timespan as an aspect that makes way for more uncertainty and unexpected changes. We introduce transformative resilience as a place-based approach that can help planners and practitioners adapt to changes and challenges in urban regeneration and can be used proactively to bring certain pliability into planning, implementing and decision-making processes. This allows for intermittent actions to regularly evaluate the outcomes and include the involvement of relevant parties. Based on findings from a comparative study carried out in Norway on two former industrial sites situated in historic cities undergoing transformation, we discuss how planners can prepare for unexpected and unforeseen challenges.

ARTICLE HISTORY
Received 2 April 2024
Accepted 26 August 2024

KEYWORDS
Transformative resilience; urban regeneration; planning and decision-making; transformative regeneration; adaptive reuse

1. Introduction

Recent decades have witnessed a steady transformation of former industrial areas into new, mix-use neighbourhoods as evident in many cities and towns in Europe, including Norway. In the aftermath of implementing the 'creative city' discourse anchored in culture-based activities (Florida, 2002), many cities and towns have developed their own versions of neighbourhoods based on similar ideals. Although case studies are inherently context specific, the comparative study of two former industrial sites presented here is showing a series of similarities with transfer value to other parts of Scandinavia and Europe.

Today, there is much accumulated knowledge from similar experiences. A common feature of these urban regenerations is their complexity and extended timeframe, from the industrial closure to their operationalisation in practice, which necessitates room for continuing adjustments. Adaptations are a common part of planning and implementing, but sometimes, major occurrences at the societal, political or environmental level or other unforeseen changes and challenges can lead to a largely different course of events and actions than expected. These aspects make the planning processes of urban

CONTACT Grete Swensen grete.swensen@niku.no

regeneration especially challenging, necessitating flexibility and predictability as well as including ongoing learning. To be fully justified, transformative resilience should be considered broadly in view of significant aspects such as economic revitalization, sustainable development, environmental benefits, risk mitigation, community engagement, and social cohesion. However, the discussion of transformative resilience here is focused on adaptive reuse of industrial heritage sites.

The broader aim of this paper, from practice point of view, is to discuss *transformative resilience as a place-based approach that can help planners adapt to changes and challenges in urban regeneration, which can be used proactively to bring more flexibility into the planning and decision-making processes*. As a practice paper, it offers experiential insights for planning practitioners and policy makers, among others. For this purpose, we use the findings from a comparative study carried out in Norway on two former industrial sites situated in historic cities undergoing transformation, analysing experiences in cultural heritage (adaptive reuse of industrial buildings) (Swensen, 2021; Swensen & Sirowy, 2023; Swensen & Granberg, 2024) and urban design (promoting sustainable mobility, i.e. walking and cycling) (Hagen & Rynning, 2021).

Within the context of this paper, we refer to resilience in planning as society's ability to maintain important processes and functions when facing unexpected occurrences, including the ability to adjust to changes (Folke *et al.*, 2010; Davoudi *et al.*, 2013; Mehmood, 2016; Sharifi & Yamagata, 2018). From a spatial planning perspective, we agree with Hillier (2016) that resilience needs to embrace the adaptiveness and transformation of social, economic, political and ecological temporalities and not be constrained by specific political agendas. In this respect, Asadzadeh *et al.* (2023) argue for the need to reconsider the existing discourses, structures, tools and practices by operationalising transformative resilience in urban governance and planning systems. According to Hodgson (2010), transformative resilience adds a particular place-based dimension to the adaptive capacity and sensitivity to the opportunities and limits a place offers.

Therefore, we refer to the transformative resilience framework (Asadzadeh *et al.*, 2023) with a place-based perspective to prepare and strengthen planners for handling both the anticipated as well as unexpected changes and challenges in planning and decision-making processes of urban regeneration. This would enhance learning capacities and flexibility in the planning and implementation procedures whilst influencing and improving practice. This paper is novel as an attempt to tread away from the conventional disaster risk reduction notion of resilience thinking towards a place-based adaptive and regenerative approach in planning practice and to prepare the practitioners for unforeseen and unexpected challenges.

The data in this study were acquired through qualitative methods, including case study, which involved a range of data sources and analytic strategies (Curran & Perecman, 2006; Cresswell, 2007; Bartlett & Vavrus, 2016), supplemented by an intertextual plan study integrating visual and textual representations. The underlying inference ensured that the selected cases were both similar and distinct enough as examples of the same general phenomenon (Swanborn, 2010).

A prime source for information was interviews – unstructured but supported by an interview guide – including focus group interviews and participant workshops. Focus groups were utilized with the character of a conversation between the participants to produce reflections on subject matters, mediating discussions and exchanges of different

opinions (Fog, 1995; Knight, 2002). The principal interviewees were municipal planners who had been involved in the initial stages of the planning processes, who recommended relevant interviewees among multiple stakeholder groups such as associations, landowners, volunteers, citizens etc.

Other important data sources included planning documents, on-site observations, historical photos and documents, information from the local history literature, as well as photo-documentation of the transformation process.

Participant meetings, including reference group workshops, played an essential part. They were largely representatives of developers, municipal planners, administrators and various user groups from both cities. A series of thematic online meetings included group discussions. These provided a flow of relevant facts from the ongoing regeneration projects and served as arenas for obtaining feedback to preliminary research findings. Three workshops were carried out with an international expert group which provided important input to the research process. The COVID-19 pandemic subsequently required a change of course vis-à-vis the intended extensive degree of on-site fieldwork, including creative method testing, but it was partly compensated by active use of online digital communication (for more detailed information on data and methods, see Appendix, Table A1).

The selection of the two separate sites in this comparative case study was based on a set of criteria: the sites had accommodated former industrial production; the facility was recently closed down; the sites were situated close to former historic city centres; and the cities were situated on the margins of the Greater Oslo Region (see Table 1).

Below we start by presenting our understanding of transformative resilience and its capacity to link to practical planning processes, followed by an outline of some characteristics in Norwegian planning at the municipal (local) level based on findings from the two regeneration projects in question (see Table 1). Some positive experiences and provisional problems undergoing the resolution process are highlighted based on complexities associated with the adaptive reuse of industrial heritage and ways to facilitate sustainable mobility, here focusing on walking and biking, in the examined cases; two out of many themes and issues related to urban regeneration. These are used to discuss further whether transformative resilience is a salutary approach for dealing with the various changes and challenges and bringing more pliability into the planning of extensive, long-term urban transformation projects. A set of practical recommendations to be considered is presented in the final, concluding part.

2. Approach: linking resilience thinking and planning practice

Anthropologists Abram and Weszkalnys (2013) describe planning *as imagining something to happen in the future and then acting accordingly to make the wishes for the future come true*. When referred to as practitioner of the planning profession being town planners, architects, environmental consultants or economists, their doings are often adopted as taken-for-granted practices, hereby approaching planning from a rationalistic angle as a set of activities, procedures, models and regulations. A second additional approach is to consider planning as 'inherently optimistic and future-oriented' (.) *as 'the idea of the promise of a planned future at the heart of much planning activity'* (Abram & Weszkalnys, 2013, p. 3). Planning stands out as particularly complex in situations where a clash of

Table 1. A brief introduction of the two case studies and their timeline.

Klosterøya, Skien (case 1)

Figure 1. Map: Geovekst/N.A. Hafsal, M. Kristiansen, NIKU, O.H. Hagen, TØI.

Verket, Moss (case 2)

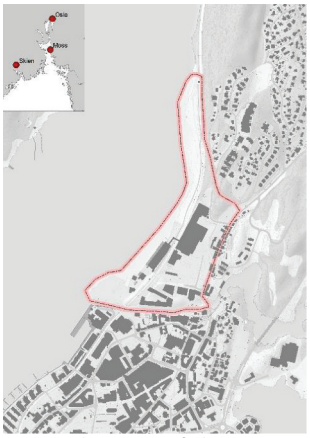

Figure 2. Map: Geovekst/N. A. Hafsal, M. Kristiansen, NIKU, O. H. Hagen, TØI.

The two cases are located within the larger region of Oslo in the south-eastern part of Norway (see more on background information in the Table A1). The former industrial sites are being transformed into city centre extensions and attractive and vibrant districts. Both are within close walking distance to the centre of well-established historic towns, including attractive locations near rivers and nature recreational areas. These factors contribute to making the sites suitable for a dense and multifunctional development, including residential buildings, offices and diverse services, schools and cultural institutions. Certain former industrial buildings have been adapted for new functions. New transport links for walking and cycling will connect the sites and urban neighbourhoods. The long-term development perspective involves major decision-making on the municipal political level. Klosterøya is to be completed in 2025 and Verket in 2038. The red polygon in Figure 1 and Figure 2 marks the study areas.

The timeline: From the closure of industrial activities to the present

Klosterøya, Skien (case 1)	*Verket, Moss (case 2)*
2005: Closure of the factory	2012: Closure of the factory
2006: Feasibility study proposed by the owner	2013: Notification of the start of planning
2006: Notification of the start of planning	2014/2015: Architectural competition and parallel assignments
2010: The municipality approved the Area Zoning Plan and a quality programme for regeneration	2015: The municipality approved the Area Zoning Plan for the regeneration
From 2010: First developments realized based on the Area Zoning plan.	2015: First development realized based on the Area Zoning plan.
2017: Detailed Zoning Plan approved for the northeastern part.	2019: Detailed Zoning Plan approved for the southern part.
2019: Detailed Zoning Plan approved for the southwestern part.	2019: Detailed planning for the middle part began.
	2021: Detailed planning for the northern part began.
	2022: Detailed Zoning Plan approved for a new bridge connecting the site to the centre.

interests may occur, whether because of the many actors involved, diverging goals, attractive localities, the long-term duration of the project in question or other concerns. When council planners present their visions for urban transformation, they create a strong expectation that this promise of a planned future will be fulfilled (Abram & Weszkalnys, 2013). Many years later, when such projects are reaching their final stages, it is not unlikely that some occurrences – both minor and major – have necessitated considerable changes. Urban planners must take into consideration that changes are likely to happen in long-term urban regeneration and that they need approaches that may help them deal with

transformational changes and challenges and ensure learning capacities and flexibility in the planning process. We suggest transformative resilience as an appropriate, place-based approach for planning practice.

We depart from a socio-ecological understanding of resilience (Meerow *et al.*, 2016), where resilience is the 'ability (. . .) to change, adapt and, crucially, transform in response to stresses and strains' (Carpenter *et al.*, 2005, p. 241). Rejecting resilience as a status quo (the engineering perspective of resilience) and acknowledging it as a dynamic process is at 'the core of resilience planning paradigm' (Eraydin & Taşan-Kok, 2013, p. 15).

Folke *et al.* (2010) have signified adaptability and transformability in resilience thinking as key tenets of complex socio-ecological dynamics. Although adaptability relates to adjustments to internal and external planned or unplanned changes, transformability refers to the capacity to reshape new multiscalar development trajectories. In a similar vein, Davoudi *et al.* (2013) regard transformability as the potential to seek a more desirable path to minimize uncertainty. In natural systems, transformation can often be radical yet unavoidable and may sometimes lead to collapse (Gunderson & Holling, 2002). However, in complex socio-ecological systems such as cities, transformative capacity can be enhanced through individual or collective intent, ingenuity, institutional learning and innovation. Hence, transformative potential has the tendency to steer the regeneration initiatives towards more desirable and planned outcomes (e.g. by engaging with key actors) to capitalize on opportunities and reduce vulnerabilities.

Resilience offers a lens for analysing different problems and provides a framework with space for framing and addressing solutions to the complexities and uncertainties inherent in urban systems (Turner & Singer, 2014; Sharifi & Yamagata, 2018). Sharifi and Yamagata (2018), p. 22) state that a resilience-oriented approach to planning ' . . . involves regular and iterative processes of monitoring, assessment and scenario making'. It includes analysing potential future changes to identify uncertainties and complexities and preparing for how to accommodate them. Furthermore, resilience in planning recognizes participation and bottom-up approaches as a central component of the process, where various stakeholders are continuously involved in feedback loops of learning and adaptation (Sharifi & Yamagata, 2018, p. 22).

From a strategic spatial planning perspective, transformative resilience elevates the capacity of governance mechanisms to anticipate changes, avoid prospective disruptions, and strategically steer urban communities towards more sustainable futures. However, questions remain as to how the approach to transformative urban resilience could guide the processes of regeneration in a given locality or neighbourhood to put ideals and hypothetical optimism into reality. Many models exist in the urban regeneration literature and practice. For example, the World Bank's urban regeneration decision toolkit proposes a four-stage solution comprising scoping, planning, financing and implementation (Amirtahmasebi *et al.*, 2015). However, the toolkit seems to disregard the need for the active participation of people and local communities in the process. Similarly, Rey *et al.* (2022) have given a detailed account based on five key steps in the urban brownfield regeneration process (i.e. backgrounds, initiators, guidelines, legal basis and realization),

but there is very little focus on the transformative potential and impacts of such projects on community life in the long term. Subsequently, Trippl *et al.* (2024) argue for the shocks and crises as opportunities for transformation into radically different or desired trajectories. Still, their focus remains on unpredictable impacts and sudden shocks rather than strategic steering.

Based on these observations, there are certain attributes that could be accounted for through a non-linear framework of multi-stage actions based on transformative urban resilience approach to discern the processes of regeneration and adaptive re-use of places needing revival. These characteristic attributes are given as below:

- **Ideation**: This is a carefully choreographed yet ongoing process of identifying a challenge, setting up goals to address the challenge and scoping for a potential way forward while appreciating the path dependence.
- **Participation/Engagement**: Participation here refers to the initial (and rather informal) involvement of willing actors to help transform ideas into practice, whereas engagement allows deeper (and more formal) commitment to interact and help achieve the desired goals.
- **Planning/Forethought**: This adds a critical element to the careful consideration for proper plan making process with more inclusive and transformational objectives.
- **Governance/Determination**: This offers a certain aspect of commitment for coordination and consensus from relevant stakeholders including the public, private and civil society actors.
- **Appreciation/Recognition**: This refers to the moment when plans start taking shape, actors show a willingness to accept the change, and tangible outcomes begin to emerge.
- **Effectuation**: This is the step where the transformation project is operationalized, yet the finishing touches continue through common agreements and understandings of key actors.

On the surface, these may appear as utopian sequential constructs. However, as the key phases listed in Table 2 and practice experiences of two former industrial sites in Table 3 and 4 show, this could very much serve as a practice-based framework for continuous interaction that can help instil a sense of place, identity and inclusion among the communities.

3. Findings

3.1. Planning for an uncertain future in a Norwegian local context

The current planning practice of urban transformation projects in Norway can partly be described as piece-meal domineered, consisting of a series of phases, of which some are subject to the Planning and Building Act (PBA), while others are not. We refer to six specific phases, to which the key attributes of transformative resilience have been linked in a dialogic manner (see Table 2).

Important considerations take place in the early stages – before the formal planning begins. At the shutdown of the two key industrial businesses in the examined cases, neither site was designated for urban regeneration in the municipalities' overall plans. Hence, the shutdown created an atmosphere of uncertainty in terms of the future – an uncertainty that may implicitly affect the early planning phases. The early stages, which are primarily in the hands of the owners, who decide what can be sold, destructed or reused, largely influence the extent of adaptive reuse of industrial remnants within the site. Ideation and planning/forethought begin in these early stages. Central locality and the scarcity of available sites for urban regeneration and development were the key factors for transforming these sites into dense, appealing and vibrant districts.

The phase of informal planning included thematic assessments, feasibility studies and architectural competitions, in which future scenarios for urban regeneration were developed. Many decisions are made in this phase. However, there is a risk that preparing for the first planning phase, where higher-level directions and guidelines must be drawn up, is overhasty, thereby overlooking its importance.

On the municipal level, ensuring influence in the development of essential urban areas, including gaining political approval, is imperious. The formal planning phase often begins with formal interactions between the developer and local planning authorities. Clarifications are made relating to requirements for assessments, coordination and participation. The interactions are followed by a public notification of the start of planning. Then, the development of the planning proposal is followed. The overarching intentions for the development are envisioned on the principal level – formally in the course-meshed area zoning plan and through other documents and processes proceeding the plan. The area zoning plan undergoes public consultation formalities, which may lead to minor or major adjustments for the granting of political approval. The area zoning plan is followed up later with more detailed zoning plans (each run as a separate planning process) and building applications.

Long-term projects necessitate certain degrees of 'bit-by-bit development'. Area regulation may allow for some parts of the areas to be developed directly, but also for a number of clarifications and details to be resolved in subsequent zoning plans. Variations in detailing provide flexibility (or, ambiguity) for development and enable incremental site development.

In accordance with contemporary practice, many urban planning initiatives involve private enterprises and a variety of public and private stakeholders, which has also been the case here. At the start of urban regeneration processes, it is an advantage that various actors, users and stakeholders are involved broadly and beyond the minimum requirements for participation, including through temporary activities. The municipal planner's role is to coordinate and integrate as many sector-dependable factors as possible.

The fact that these areas do not have many users when the planning starts and that the user changes during the projects' time-span generates other challenges. It may often take a while to ascertain who the main user groups in the neighbourhoods are, and it can potentially make user participation difficult.

Table 2. Main phases.

Main phases, including final completion	Subject to the Planning and Building Act	Key attributes of transformative resilience
Anticipating closure of industrial production. – An extensive tidying-up process is starting up. – Assessing parts of machinery, infrastructure and machinery with future potential. – Managing socio-psychological effects of redundancy among former employees. – Primarily an internal process. – Extensive decision-making done within a restricted deadline.	**No**	**Ideation** Planning/ Forethought
Informal planning – Ideas of transformation from industrial to mixed-use, urban neighbourhood. – Feasibility studies and architectural competition.	**No/Yes** – Might take place before or as part of the formal planning and decision-making processes	Ideation **Participation/ Engagement** Planning/ Forethought
First stage of formal planning process is entered. – Setting up formal and informal collaborations between private developer(s) and public authorities. – Formulate the intentions for regeneration/ transformation/development: must be both sustainable and convincible. – Inviting diverse resource groups (people) to participate to ensure that the projects are well anchored locally.	**Yes** – Commencement of work on the plan – Public notification of the start of planning	Ideation Participation/ Engagement **Planning/ Forethought** Governance/ Determination
Preparing documentation and risk assessments. – Essential background for preparation of the area zoning plan. – Developing the planning proposal. – Includes presenting the plan for a public hearing to gain final input and potential objections. – Preparation for acceptance by politicians at the municipal level.	**Yes** – Participation and coordination with stakeholders – Public consultation process for planning proposal	Participation/ Engagement Planning/ Forethought **Governance/ Determination**
Gaining political acceptance at municipal level – building process is starting up. – The development project enters a period with 'bit-by-bit development'. – First developments realized directly based on the area zoning plan. – In accordance with the initial area plan, detailed plans for subsequent plans will follow. – The municipality's planners regularly supervise each 'zoning plan'. – The site will, for a long period, be marked by continuous development and construction work.	**Yes** – Building notices to neighbours. – For detailed zoning plans: Commencement of work on the plan, public notification of the start of planning, participation and coordination with stakeholders, public consultation process, consultation of planning proposal.	Ideation Participation/ Engagement Planning/ Forethought Governance/ Determination **Appreciation/ Recognition** Effectuation
The final completion. – A final deadline is estimated at the very start (i.e. when the idea is first aired). – The deadline is not a signed agreement but primarily an implicit goal to reach for. – There is a shared understanding that large transformation projects involve unpredictability.		**Effectuation**

Table 2 charts the six stages of a typical urban regeneration planning process in Norway. Based on the close-up examination of the planning documents, supported by information from interviews, we have found that key decisions have often taken place

before the formal planning process started and that large transformation-projects include phases that only partly are subject to the Planning and Building Act. It is therefore necessary to elaborate further how adequate steps can be put into practice in order to ensure that the final outcomes of the transformation that are taking place are sustainable in the long run and can maximize benefits to the various users of these areas. This is what we consider the transformative resilience approach can add to contemporary planning practice (see part 4 and 5).

3.2. Adaptive reuse of industrial heritage and facilitating sustainable mobility – successful measures and persistent challenges

Large regeneration projects on post-industrial sites hold the potential for adaptive reuse of industrial heritage and for facilitating sustainable mobility. There are a series of examples and experiences to share from the two cases, including challenges that are still to be addressed, as the tables and illustrations below reflect (see Tables 3 and 4; Figures 3–10).

Table 3. A selection of positive examples and challenges concerning adaptive reuse of industrial heritage and NGO involvement.

Adaptive reuse of industrial heritage	
Use of historic traces.	
Positive examples: – Rapid rebuilding/reconstruction of the old factory chimney in brick, including establishing a new square – demonstrates the chimney's symbolic value **(Case 1, Klosterøya)** (see Figure 3).	Successful restoration of the old industrial building, 'Hollenderiet' – awarded the Municipality's prize for best building tradition 2021 **(Case 1, Klosterøya).**
Challenges: – Only fragments of the industrial past are understandable for the public **(both cases).** – Densification/compact building is taking part along the river, and the art centre in the former industrial building 'Spriten' is partly affected. The long-term effects are hard to predict **(Case 1, Klosterøya)** (see Figure 4).	The integration of former industrial structures in a transformed cityscape under construction is given less attention **(both cases).**
Attracting and involving new users.	
Positive examples: – Adapting the former industrial building 'Spriten' into an art centre was among the first initiatives – functioned as a 'door opener' to the former closed off industrial site **(Case 1, Klosterøya)** (see Figure 5). – The planned public garden around the listed industrial building (P5) will function as the 'gateway' to the transformed neighbourhood **(Case 1, Klosterøya).** – Innovative local initiatives to strengthen natural diversity through urban gardening and agriculture, by linking the site's medieval history to contemporary needs **(Case 1, Klosterøya).**	– Adapting the mechanical hall into a cultural arena ('Scenen') was one of the first major changes at the site. The intention was to open the former closed industrial site to the public **(Case 2, Verket)**. – The building M:6 is part of the former paper factory that has been transformed into an office cooperative, providing flexible and attractive options for small firms **(Case 2, Verket)** (see Figure 6). – A part of the local museum in Moss is situated in the oldest part of Verket and brings visitors to the area.
Challenges: – How to ensure the long-term predictability of urban gardening – How to promote ad hoc initiatives among various user groups	– How to instigate short-term use of existing buildings and structures while waiting for final decisions to take place

The table is based on examination of data from planning documents, personal interviews, focus group interviews, workshop discussions and on-site observations

Figure 3. Reconstruction of chimney and old industrial building. Photo: O. H. Hagen.

Figure 4. Former industrial building used as an art centre. The ionic building is 'lost' into the surrounding densification. Photo: O. H. Hagen.

Figure 5. (left): the art centre 'Spriten' in a former industrial building in Klosterøya. Photos: O. H. Hagen

Figure 6. (right): Office cooperative in M:6, former industrial building in Verket. Photos: O. H. Hagen.

As the figures and tables mediate, the two sites undergoing transformation include successful measures as well as some prevailing challenges. Our reflections are based on systematizing data collected through a set of different qualitative methods, such as personal interviews, focus group interviews, workshop discussions and on-site observations (more information on data and methods, see Table A1). While our assessment of industrial heritage's role in the two examined cases provides examples of adaptive reuse of industrial heritage sites, they primarily relate to the preservation of specific objects such as industrial buildings. Very few

technical industrial monuments are usually earmarked for the future preservation, and attempts to reconstruct and mediate the former industrial landscape have only partly been tested out (for more information, see Swensen & Sirowy, 2023). The integration of former industrial structures into a transformed cityscape under construction is often given minimal attention, mostly due to the amount of time, monetary costs and efforts involved both on the part of the planners and the developers.

Concerning sustainable mobility within the regenerated sites, considerable weight has been placed on building easily accessible active travel options such as pedestrian and bicycle tracks and bridges, thereby providing attractive and convenient recreational areas which benefit a wider section of the population (for more information, see Hagen & Rynning, 2021). However, the planned walking and biking solutions do not always account for future changes in active mobility. Furthermore, ways to provide pleasant and user-friendly environments and encourage sustainable travel behaviors during the long-lasting construction periods are apparently not always a priority and remain as problems waiting for solutions.

Table 4. A selection of positive examples and challenges concerning facilitating sustainable mobility and biodiversity.

Facilitating sustainable mobility	
Positive examples:	
– A shared walking and biking track encircles the site and links its eastern and western parts together via adaptive reuse of two former industrial transport tunnels **(Case 1, Klosterøya)** (see Figure 7). – A pedestrian bridge is planned across the main river and will improve connections between Klosterøya and other parts of the city. – Another, shorter pedestrian bridge is planned across the waterfall with locks and sluices close to the listed industrial building (P5) **(Case 1, Klosterøya).**	– Accessibility to public transport is implemented by building a stairway, hereby linking the neighbourhood to the busy main road **(Case 1, Klosterøya)** (see Figure 8). The old railway track will be turned into a walking and biking route **(Case 2, Verket).** – Separate walking and biking paths are planned to reduce potential conflicts between pedestrians and those cycling **(Case 2, Verket).** – Important cooperation has taken place between municipality planners, developers and NGOs in rehabilitating the natural habitat and diversity connected to the river and the waterfall in Verket, which facilitate walking in pleasant surroundings **(Case 2, Verket)** (see Figure 9).
Challenges:	
– Accessibility through the large transformation sites is continuously changing **(both cases).** – The main artery, Klostergata, connecting Skien and the neighbouring town Porsgrunn, is a barrier to pedestrians and bicyclists in the area **(Case 1, Klosterøya)** (see Figure 10). – High numbers of people walking and cycling on shared tracks cause conflicts between pedestrians and cyclist **(Case 1, Klosterøya).**	– Planned walking and biking paths are questioned as to ambitious for the local context in the detailing and effectuation **(Case 2, Verket).** – The railway will be in use until a new route opens **(Case 2, Verket).** – Large areas are designated to permanent/temporary parking of private cars **(both cases)**, and at present, the public square is functioning more as a parking lot than a public meeting point **(Case 1, Klosterøya)**.

The table is based on examination of data from planning documents, personal interviews, focus group interviews, workshop discussions and on-site observations

Figure 7. Adaptive reuse of a former industrial transport tunnel. Photo: O. H. Hagen.

Figure 8. The stairway linking the neighbourhood and Klostergata. Photo: O.H. Hagen.

Figure 9. The river in Verket. Photo: I.M. Ødegaard.

Figure 10. Klostergata with 'Spriten' to the left. Photo: O. H. Hagen.

4. Discussion – transformative resilience as a practice-based framework for continuous interaction

As pointed out by Abram and Weszkalnys (2013), planning is fundamentally a question of promises about an uncertain future. Planning documents should be read on two levels: First, they must be understood on a practical/rationalistic level of today regarding the tasks and challenges that must be solved soon. Then, there is the second level, which includes challenges and promises involving a future situation that is outside the reach of planners to predict in detail. An important implication of planning on these two levels is that it makes promises and raises expectations for the future. When council planners present their visions to the public, they create a strong expectation that this promise will be fulfilled (Abram & Weszkalnys, 2013, p. 9). Years later, when such projects are approaching the final stages, it is not unlikely that some considerable changes have occurred. But the question remains as to how to address this uncertainty.

Resilience has been receiving substantial attention in the academic, policy, practice, and political circles as a concept, an aspiration, and a process to help maintain relative

stability of socially, economically, politically, and environmentally complex systems (such as cities and communities) (Davoudi, 2018, 2019). As a multifaceted concept applied in various contexts and research disciplines, there is a risk that resilience ends up as a vague and diluted concept with neither practical nor theoretical interest. However, transformative resilience can specifically guide the processes of urban regeneration, renewal and adaptive reuse in a sustainable and strategic way. Instigating more resilience thinking in practical planning holds the possibility of making the faraway future more manageable. Resilience in transformative terms can hereby function as a constant reminder that changes are likely to occur; however, in what forms, when and where are unknown.

It is worth noting some limitations and potentials of the approach here. First that in our research transformative resilience has only been suggested as a context- and case-specific, yet place-based framework to help inform practice. Secondly, it is best adapted to the projects where long-term goals are prioritised as opposed to the short-term results. The strategic view can integrate social and cultural aspects, though not just the structural and power relations but also the reluctance or resistance on the part of some stakeholders. Yet, the approach has the potential to integrate the existing mechanisms to balance the adjustment and recovery needs through planning and coordination, and bring interdisciplinary and inter-sectoral insights to facilitate transformative regeneration and adaptive reuse.

When returning to our main question—*how transformative resilience can help planners adapt to changes and challenges in urban regeneration*—we pay attention to the two major challenges that came across. The first concerns the initial, informal phase, in which major decisions affecting the development are made. The second challenge that major regeneration projects encounter is their longer duration from when the first plans are conceived and approved to the final completion and delivery.

The importance of the initial, informal phase lacks recognition. Different major actors, such as landowners, developers, municipal planners and politicians, can have differing overarching goals that influence the urgency in getting the planning process to be completed fast. The speed of this creative step should not be enforced. This can adversely affect the initial informal phases, which generally are extra important because the projects at this stage are still in their creative stages, leaving room for discussions, informal civic engagement and exchange of ideas. At this stage, pathways are imagined, multiple decisions are made and hence, the key attributes of transformative resilience such as ideation, participation/engagement and forethought should be solidly anchored to strengthen the foundation that the regeneration projects are based on. Setting up an initial phase that creatively considers alternatives and longer-term adaptive planning and design strategies that account for and recognize future changes can prove successful in accommodating the uncertainties and complexities (Sellberg *et al*., 2015; Sharifi & Yamagata, 2018).

As regards the challenge that strategic regeneration projects encounter as a long-lasting interim phase of continuous construction works and continued detailing. This phase starts when political decisions have been reached including the start of the building process and lasts until final completion. During a transformation period that might extend up to 15–20 years or more, the overarching intentions may only partly be manifested in practice. The reasons for these deviations can be unexpected occurrences at the societal or environmental level or new knowledge acquired through the detailing that might change both goals and intentions as well as the resulting (tangible and

intangible) impacts on the built environment. This is often the case for large regeneration projects, where adaptability to change is necessary. What is lacking is an inbuilt evaluation of how the development and changes to the original plans affect its surroundings. A key issue when changes occur is the need to ensure as much predictability as possible, including transparency. An option is to carry out evaluation regularly throughout the various phases of the prolonged development, where various stakeholders are continuously involved in feedback loops of learning and adaptation. This involvement is an essential part of resilience-based planning (Sharifi & Yamagata, 2018). Regular evaluations are not statuary in the Plan and Building Act, though it is not unlikely that some forms of evaluation will take place. Key attributes of transformative resilience, such as appreciation/recognition and effectuation, involve appropriate ways to include voices of all concerned actors and stakeholders.

The main weaknesses that have become apparent through the case studies we have carried out relate to a noticeable lack of preparations for continuous, ongoing changes in the long-term transformation projects. Some of these challenges are highly predictable: On regeneration sites with existing buildings and structures, it is indispensable that a set of alternative forms of use and financing for complex and nontraditional buildings and structures are taken into consideration at the initial planning phases, preferably in advance. Ensuring early on that planned interventions are socially, technically and economically feasible is critical. Although the exact types of challenges that would occur may be unpredictable, it is highly likely that some changes or adjustments have to be made. Foresight is more likely to be ensured if planners early raise key questions like the following: What kind of changes can the planned solutions and further processes withstand? What kind of flexibility should be ensured to manage change and uncertainty? How do delays and dependencies affect site development? What changes can be accommodated? What kinds of temporary solutions can work and within what time perspective? What will the consequences of these be?

5. Conclusion: practical advice for future projects

Based on the framework of the transformative resilience tested on the case study sites, we suggest measures of what and how practices need to be changed and adapted to achieve both predictability and flexibility and accommodate changes and uncertainties when former industrial areas are regenerated and transformed into new uses. This means ensuring that long-term, overarching objectives are met. It also includes that unexpected events are handled quickly because collaboration models, exchange of ideas, evaluation methods and so forth are well established or because one adapts and learns from changes that occur. Transformative resilience can contribute to creating long-term visions for an area, providing new strategies and functioning as part of guidelines ensuring that larger societal goals are reached. It can include a greater control procedure by raising questions about what already are known as uncertainties – and how the planners (society) can be best prepared for facing such uncertainties.

Based on the findings of this study and to more effectively address the uncertainties associated with the transformative regeneration of industrial sites, future projects should observe the following key planning recommendations:

(1) It is important in the initial phase to consider and weigh alternative scenarios for the development and not make hasty decisions. These factors should be considered in terms of how well they may deal with future changes.
(2) The possibilities of adaptive reuse of existing technical-industrial buildings and structures should be examined by an independent party, in collaboration with local civil society, before the actual planning process starts.
(3) The key intentions for the development should be sufficiently secured throughout the project.
(4) Continuous dialogue with different stakeholders might ensure that the development continues in accordance with the key intentions, despite changing conditions.
(5) Involving various actors in temporary activities can ease the difficult process of adjusting to long-lasting construction activities in development projects. Involvement can contribute to place attachment and identity building.
(6) Promoting stakeholder dialogue requires that more attention be paid to developing new methodological approaches for user participation. It may also include applying innovative tools to identify potential new users because the step-by-step development process affects when new users can join in.
(7) A key issue in these types of long-lasting development projects is the need to ensure as much predictability as possible, including transparency. One option is to carry out evaluations regularly throughout the main phases of the development.

Within the specific scope of this paper exploring urban transformations and place-based regenerations through adaptive reuse of former industrial sites in Norway, the emphasis has been on the implications of transformative resilience of urban regeneration initiatives. The transformative lens allows integrating sustainability dimensions into planning and policy initiatives. It permits assessing the sense of making, shaping and keeping places resilient. It also institutes a recognition of the transformative potential to comply with the needs and capacities of the local communities to sustain such transformations (Mehmood *et al.*, 2020).

The transformative resilience framework is of particular benefit to the situation of regenerating old/abandoned industrial buildings, technical-industrial structures and sites for its context-specificity within the complex adaptive systems such as the cities. It helps better prepare, predict and forecast the interventions and adjustments to deliver effective outcomes. For planners, it offers measures to attain stability in a dynamic socio-political environment by aligning with values and needs of local communities in the interest of social and economic equity. Finally, in a resource-constrained world, the approach helps guide sustainable use of social, economic, cultural and environmental capital to overcome major obstacles, improve institutional practices and adopt change.

Acknowledgments

This is part of the interdisciplinary research project Sustainable Adaptation – Resilience in Urban Regeneration [ADAPT]; an interdisciplinary research project funded by Research Council of Norway [2019–2022]. It included 11 researchers from four research institutes. In addition to investigating how cultural heritage has been integrated, a comparison of energy-efficient solutions

in old buildings has been carried out. Other research themes were how urban gardening and agriculture potentially can be integrated in area plans and how the transition to environmentally friendly transport solutions can be solved in the planning.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Funding

The work was supported by the Norges Forskningsråd [294584].

ORCID

Oddrun Helen Hagen http://orcid.org/0000-0003-1669-322X

References

Abram, S., & Weszkalnys, G. (2013) Elusive promises: Planning in the contemporary world. An introduction, in: S. Abram & G. Weszkalnys (Eds) *Elusive Promises: Planning in the Contemporary World*, pp. 1–34 (New York, Oxford: Berghan).

Amirtahmasebi, R., Orloff, M., Wahba, S., & Altman, A. (2015) *Regenerating Urban Land*. World Bank Group. Available at https://urban-regeneration.worldbank.org (accessed 27 March 2024).

Asadzadeh, A., Fekete, A., Khazai, B., Moghadas, M., Zebardast, E., Basirat, M., & Kötter, T. (2023) Capacitating urban governance and planning systems to drive transformative resilience, *Sustainable Cities and Society*, 96, pp. 104637. doi:10.1016/j.scs.2023.104637.

Bartlett, L., & Vavrus, F. (2016) *Rethinking Case Study Research: A Comparative Approach* (New York: Routledge).

Carpenter, S. R., Westley, F., & Turner, G. (2005) Surrogates for resilience of social–ecological systems, *Ecosystems*, 8(8), pp. 941–944. doi:10.1007/s10021-005-0170-y.

Cresswell, J. W. (2007) *Qualitative Inquiry and Research Design: Choosing Among Five Approaches*, 2nd ed. (Thousand Oaks, CA: Sage Publications).

Curran, S. R., & Perecman, E. (eds.) (2006) *A Handbook for Social Science Field Research. Essays and Bibliographic Sources on Research Design and Methods* (Thousand Oaks, CA: Sage Publications).

Davoudi, S. (2018) Just resilience, *City & Community*, 17(1), pp. 3–7. doi:10.1111/cico.12281.

Davoudi, S. (2019) Resilience, uncertainty, and adaptive planning, *Annual Review of Territorial Governance in the Western Balkans*, 1, pp. 120–128. doi:10.32034/CP-TGWBAR-I01-10.

Davoudi, S., Brooks, E., & Mehmood, A. (2013) Evolutionary resilience and strategies for climate adaptation, *Planning Practice & Research*, 28(3), pp. 307–322. doi:10.1080/02697459.2013.787695.

Eraydin, A., & Taşan-Kok, T. (Eds.) (2013) *Resilience Thinking in Urban Planning, GeoJournal Library* (Dordrecht: Springer Netherlands). doi:10.1007/978-94-007-5476-8.

Florida, R. (2002) *The Rise of the Creative Class* (London: Hachette).

Fog, J. (1995) *Med samtalen som utgangspunkt* (København: Akademisk Forlag. (With the conversation as the basis)).

Folke, C., Carpenter, S. R., Walker, B., Scheffer, M., Chapin, T., & Rockström, J. (2010) Resilience thinking: Integrating resilience, adaptability and transformability, *Ecology and Society*, 15(4). doi:10.5751/ES-03610-150420.

Gunderson, L. H., & Holling, C. S. (2002) *Panarchy: Understanding Transformations in Human and Natural Systems* (Washington: CABI, Island Press).

Hagen, O. H., & Rynning, M. K. (2021) Promoting cycling through urban planning and development: A qualitative assessment of bikeability, *Urban, Planning and Transport Research*, 9(1), pp. 276–305. doi:10.1080/21650020.2021.1938195.

Hillier, J. (2016) Performances and performativities of resilience, in: R. Beunen, K. Van Assche, & M. Duineveld (Eds) *Evolutionary Governance Theory: Theory and Applications*, pp. 167–183 (Cham: Springer International Publishing).

Hodgson, A. (2010) Transformative resilience: A response to the adaptive imperative. Paper compilation to *Investigations of the International Futures Forum*. Available at https://www.decisionintegrity.co.uk/DIL%20Transformative%20Resilience%20-%20Hodgson.pdf (accessed 22 August 2023).

Knight, P. T. (2002) *Small Scale Research* (London: Sage Publications).

Meerow, S., Newell, J. P., & Stults, M. (2016) Defining urban resilience: A review, *Landscape and Urban Planning*, 147(2016), pp. 38–49. doi:10.1016/j.landurbplan.2015.11.011.

Mehmood, A. (2016) Of resilient places: Planning for urban resilience, *European Planning Studies*, 24(2), pp. 407–419. doi:10.1080/09654313.2015.1082980.

Mehmood, A., Marsden, T., Taherzadeh, A., Axinte, L. F., & Rebelo, C. (2020) Transformative roles of people and places: Learning, experiencing, and regenerative action through social innovation, *Sustainability Science*, 15(2), pp. 455–466. doi:10.1007/s11625-019-00740-6.

Rey, E., Laprise, M., & Lufkin, S. (2022) *Neighbourhoods in Transition: Brownfield Regeneration in European Metropolitan Areas* (London: Springer Nature). Available at https://library.oapen.org/handle/20.500.12657/50967

Sellberg, M. M., Wilkinson, C., & Peterson, G. D. (2015) Resilience assessment: A useful approach to navigate urban sustainability challenges, *Ecology and Society*, 20(1), pp. 43. doi:10.5751/ES-07258-200143.

Sharifi, A., & Yamagata, Y. (2018) Resilience-oriented urban planning, in: Y. Yamagata & A. Sharifi (Eds) *Resilience-Oriented Urban Planning. Lecture Notes in Energy*, Vol. 65 (Cham: Springer). doi:10.1007/978-3-319-75798-8_.

Swanborn, P. (2010) *Case Study Research. What, Why and How* (London: Sage Publications).

Swensen, G. (2021) Between visions and realities – testing shared governance in the adaptive reuse of industrial heritage, in: E. D. McClellan, S. Yongjun, & C. Chandler (Eds) *Urban Communication Reader IV: Cities as Communicative Change Agents*, pp. 291–316 (Lausanne: Peter Lang Publishing, Switzerland).

Swensen, G., & Granberg, M. (2024) The impact of images in the adaptive reuse of post-industrial sites, *The Historic Environment: Policy & Practice*, 15(1), pp. 101–129. doi:10.1080/17567505.2024.2311005.

Swensen, G., & Sirowy, B. (2023) Resilience thinking in museums: Industrial heritage, urban regeneration, and civic engagement, *Museum & Society*, 21(3), pp. 36–56. doi:10.29311/mas.v21i3.4408.

Trippl, M., Fastenrath, S., & Isaksen, A. (2024) Rethinking regional economic resilience: Preconditions and processes shaping transformative resilience, *European Urban and Regional Studies*, 31(2), pp. 101–115. doi:10.1177/09697764231172326.

Turner, M., & Singer, R. (2014) Urban resilience in climate change, in: S. von Schorlemer & S. Maus (Eds) *Climate Change as a Threat to Peace. Impacts on Cultural Heritage and Cultural Diversity*, Vol. 19, pp. 63–81 (Lausanne: Peter Lang Publisher, Switzerland). doi:10.3726/978-3-653-05205-3.

Appendix

Table A1. Background information about the cases, data and methods.

Background information about the two cities		
City facts	Klosterøya, Skien	Verket, Moss
Inhabitants[a]	Municipality of Skien: 55000 inhabitants The region: 110,000 inhabitants	Municipality of Moss: 50000 inhabitants The region: 63000 inhabitants
Distance from Oslo	130 km southwest of Oslo 2 hours and 14 min by train	60 km southeast of Oslo 41 min by train
Site facts	**Klosterøya, Skien**	**Verket, Moss**
Size of development area	0.14 km^2	0.306 km^2
Localisation in the city	An island centrally located south of the city centre with a main road of Skien running through	Centrally located by the waterfront north of the city centre
Former uses	Monastery until the 16th century Industrial activity 1850–2005 Closure of the factory in 2005	Industrial activity 1704–2012 Closure of the factory in 2012
Planned development	Extension of the city centre Mixed use: Residential, offices, commercial activities, entertainment, public high school, theatre and more	Extension of the city centre Mixed use: Residential, offices, commercial activities, entertainment, private primary school and more
Ownership and developer	The industrial company made the feasibility study and Area Zoning Plan, then sold land to various landowners and developers for further development	One developer bought the land before industry closure and plan and development the site
Planning and building process	Parallel processes for Area Zoning Plan and city centre plan First phases built based on the area zoning plan More detailed zoning plans in the making for other parts of the site	Parallel processes for Area Zoning Plan and city centre plan First phases built based on the area zoning plan More detailed zoning plans in the making for other parts of the site
Documents studied		
Documents studied	**Klosterøya, Skien**	**Verket, Moss**
Documents from the regeneration process included in the study	2006: Klosterøya feasibility study (Norske Skog, 2006) 2010: Area Zoning Plan Klosterøya (Skien Municipality, 2010a)[b] 2010: Klosterøya 2020. Quality program (Asplan Viak, 2010) 2011: Master zoning plan for the City Centre (Skien Municipality, 2010b) 2017: Detailed zoning plan for the north-eastern part of Klosterøya (Asplan Viak, 2017) 2019: Detailed zoning plan for the southwestern part of Klosterøya (Klosterøya Vest, 2019)	2011: Municipal master plan 2011-2022, (Moss Municipality, 2011) 2015: Area Zoning Plan Verket (Moss Municipality, 2015a)[c] 2015: Master plan for the City Centre (Moss Municipality, 2015b)
Documents from the cultural heritage management on municipal and county level	1991: Municipal plan for cultural heritage (Skien Municipality, 1991). 2013: Imprint of Skien. Municipal plan for cultural heritage 2013–2024. (Skien Municipality, 2013)	2009: Municipal plan for cultural heritage buildings, environments and cultural landscapes 2009-2021 (Moss Municipality, 2009) 2017: Municipal plan for cultural heritage buildings, environments and cultural landscapes *2017–2029* (Moss Municipality, 2017).

(*Continued*)

Table A1. (Continued).

Background information about the two cities		
City facts	Klosterøya, Skien	Verket, Moss
Specifications of participants in guided fieldwork, interviews and digital meetings/workshops.		
Data collection	**Klosterøya, Skien**	**Verket, Moss**
Guided fieldwork, incl. on-site documentation	One guided fieldwork (participants: one municipality planner and members of the research group); including on-site observations and photo-documentation One guided fieldwork (participants: one municipality planner, the project's expert group, members of the research group); including on-site observations and photo-documentation On-site photo documentation by researchers	One guided fieldwork (participants: one developer representative, a former industrial worker now employed by the developer, members of the research group) On-site documentation by researchers and student
Interviews and focus group interviews	One group interview (participants: one municipality planner, one former municipality planner involved in the initial planning stage/current in the county administration, one developer representative, one interest group representative, members of the research group) One group interview (participants: one planner working for the developer in the initial planning stages, one representative from the county administration, two interest group representative, members of the research group) One focus group interview (participant: four former factory employees, members of the research group)	One digital interview (participants: one municipality planner involved in the whole process, one municipality planner that joined in the implementation phase, members of the research group)
Digital meetings/ workshops	Developer presentation of the ongoing development	Developer presentation of the ongoing development
	Cross-case and various thematic discussions with various actors involved in the two cases (representatives from the municipalities, county administrations, developers, and interest groups)	

[a]Data on inhabitants per 2021, Statistics Norway 2022.
[b]Including land use plan, planning provisions, plan description and impact assessment.
[c]Including land use plan, planning provisions and plan description and impact assessment.