PADST

Public Administration Capabilities for Digital and Sustainable Transition

D3.4 POLICY BRIEF (II):
TOWARDS TWIN TRANSITION GOVERNANCE IN ESTONIAN CITIES

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List of Abbreviations

DoA	Description of Action
EC	European Commission
ER	Experienced Researcher
ESR	Early-Stage Researcher
KUL	KU Leuven
NGO	Non-governmental organisation
TalTech	Tallinn University of Technology
WP	Work Package

Executive summary

City governments across Europe are under increasing pressure to lead the twin transition – the simultaneous pursuit of digital transformation and ecological sustainability. While both agendas are politically prioritized and often rhetorically linked, we still know little about how cities in Europe approach and implement the twin transition.

This policy brief focuses on Estonia and synthesizes findings from a study of **Tallinn and Tartu**, Estonia's two largest municipalities, to assess their readiness and approach to the **twin transition**. The report reveals that while both cities engage in digital and green initiatives, the **twin transition is not strategically conceptualised, coordinated and implemented** at the municipal level.

Key insights:

- **No strategic framing of twin transition**: Neither city has formally adopted the twin transition as a strategic concept. Connections between digital and green agendas occur **pragmatically**, often through project-level synergies rather than deliberate policy design.
- **Digitalisation is perceived as complete**: Both cities consider their digital transformation to be at an advanced stage, with most services digitised. Digital tools are used to optimise services and support green goals, but **digitalisation is not pursued as an explicit strategic objective**.
- **Green transition faces legitimacy challenges**: Particularly in Tallinn, the term "green transition" is politically sensitive and often reframed as public health or wellbeing challenge. Tartu shows stronger leadership in green policy, but both cities face **limited public and political support.**
- **Resource and capacity constraints**: Municipalities struggle with **limited financial, human, and analytical resources**, partly a legacy of Estonia's hollow state governance model. This hampers their ability to lead or scale the twin transition efforts.
- **Emergent functional coupling through innovation**: Some initiatives such as Tartu's redesign of public transport using digital data and biogas buses demonstrate **functional coupling** of digital and green goals. However, these remain **isolated examples**, not part of a broader strategic framework.
- **Coordination gaps across governance levels**: Both cities express frustration with **national-level inertia**, especially regarding legal frameworks and energy policy. Municipalities see themselves as enablers but lack the authority, tools and access to key resources to drive systemic change.
- **Need for institutional innovation**: While some structural changes have occurred (e.g., creation of strategic management offices, new digital and green transition positions), they are often **project-based and temporary**, limiting long-term impact.

The report concludes that **Estonian cities require stronger strategic framing, institutional support, and multi-level coordination** to realise the potential of the twin transition. Without deliberate integration and capacity-building, digital and sustainability efforts will remain fragmented and under-leveraged.

Introduction

As global and European agendas increasingly emphasize the importance of integrating digitalisation and sustainability – known as the twin transition – city governments are expected to play a leading role in driving systemic change. This policy brief draws on a study of Estonia's two largest municipalities, Tallinn and Tartu, to assess how digital and green agendas are understood, implemented, and coordinated in practice. The findings reveal that while both cities engage in digital and sustainability initiatives, these efforts are not consciously aligned under a twin transition framework. Instead, connections between the two domains emerge pragmatically, often through project-level innovations or efficiency-driven improvements.

The report highlights critical challenges facing Estonian cities, including limited legitimacy for green policies, resource and capacity constraints, and fragmented governance structures. At the same time, it identifies promising practices, such as Tartu's data-driven redesign of public transport and Tallinn's evolving circular economy strategy, that demonstrate the potential for aligning the two transitions.

By examining the current state of play in Tallinn and Tartu, this brief aims to inform national and local policymakers about the institutional, political, and operational shifts needed to move from fragmented efforts to a strategic twin transition agenda.

This policy brief is a key output of Work Package 3 of the PADST project: a joint pilot research initiative on public sector innovation capabilities for digital and sustainable transformations. The policy implications presented here are based on interviews and document analysis (see Appendix 1). This policy brief complements another PADST project policy brief that focuses on lesson-drawing from 10 European cities (D3.4). The empirical data was gathered from February to November 2024. The policy brief builds on the following PADST project results:

- Veiko Lember, Peeter Vihma, Erkki Karo, Marc Kristerson, Rainer Kattel, Anna Kurth, Veronika Bylicki, Joep Crompvoets, Stefan Dedovic, Albert Meijer, Emma Pullen, and Erna Ruijer. 2025. The Twin Transition Puzzle: Can City Governments Align Digital and Sustainability Regimes? UCL Institute for Innovation and Public Purpose (IIPP) Working Paper (WP 2025-12), https://www.ucl.ac.uk/bartlett/publications/2025/jul/twin-transition-puzzle.
- Meijer, A., 2024. Perspectives on the twin transition: Instrumental and institutional linkages between the digital and sustainability transitions. Information Polity, 29(1), pp.35-51. Available at: https://journals.sagepub.com/doi/full/10.3233/IP-230015.
- Veronika Bylicki, Rainer Kattel Anna Kurth (2025) Directionality and Public Sector Capabilities for the Twin Transition in Local Government. UCL Institute for Innovation and Public Purpose (IIPP) Working Paper (WP 2025-5), https://www.ucl.ac.uk/bartlett/ucl-institute-innovation-and-public-purpose/directionality-and-public-sector-capabilities-twin-transition-local-governments
- Dedović, S. and Crompvoets, J., 2025. Exploring the Practices of the Local Government Twin Transition: The Case of Leuven. In International Conference on Electronic Participation (pp. 225-240). Cham: Springer Nature. Available at: https://link.springer.com/chapter/10.1007/978-3-032-02515-9_14

- Erna Ruijer, Marten Knol, Peeter Vihma, Veiko Lember (2025) A fair, inclusive and just Twin Transition? A multiple case study on how local governments safeguard social justice in their digital and sustainable transitions. EGPA Conference Paper, unpublished.
- Peeter Vihma, Veiko Lember and Marc Kristerson (2024) Diverging legitimacies in the twinning of sustainability and digital transitions: opportunity or constraint for the public administration? Unpublished manuscript.
- Albert Meijer, Emma Pullen, and Erna Ruijer (2024). Co-creation workshop on twin transition with the city of Utrecht. Unpublished minutes.

Brief overview of the context

Environmental issues played a significant role in Estonia's re-independence movement, especially through activism against Soviet mining plans in the 1980s. This led to the formation of the Estonian Green Movement and later the first Green Party, briefly placing environmental concerns at the center of politics. The 1995 Sustainable Development Act and the 2005 strategy document Säästev Eesti 21 reflected early efforts to institutionalize sustainability. However, environmental politics gradually lost momentum, becoming a niche concern with limited electoral success.[1] Despite frequent mentions in strategic documents and EU-driven initiatives, sustainability has remained secondary to economic and security priorities, especially since 2010.

In contrast, **digitalization** and related policymaking has enjoyed strong and sustained legitimacy. Estonia's digital roots trace back to Soviet-era cybernetics and were accelerated in the 1990s through Nordic integration, internet banking, and the Tiger's Leap initiative.[2] The digital agenda united diverse actors from civil servants, engineers, to visionaries, each promoting it for modernization, efficiency, or democratic renewal. This broad support laid the foundation for Estonia's start-up culture and global reputation as a digital society. Digitalization continues to be seen as a key driver of socio-economic development.

Tallinn, Estonia's capital and largest city, has a population of approximately 450,000 and a complex political and administrative landscape shaped, until recent years, by long-term single-party dominance. Its governance is marked by decentralized city government structures. Tallinn was named the European Green Capital in 2023. As the economic centre of the country, it is home to several unicorns. Having won several international awards, it is also considered as a leading city on digitalization in a generally advanced e-governance context. While Tallinn has made notable progress in areas such as circular economy or development of green spaces, the overall green transition remains a challenge.

Tartu, with around 100,000 residents, is characterized also by a decentralized governance model and years of single-party dominance, though within varying political coalitions. Its smaller scale facilitates cross-departmental collaboration, and it is widely recognised as a national leader in green policy. Tartu, is the second-largest city in Estonia and is a main university town of the country. The city has progressively embraced green initiatives and has been pioneering several green and digital initiatives within the Estonian context. Tartu's initiatives – such as the redesign of its public transport system using digital data and biogas buses – demonstrate a pragmatic approach to integrating digital tools with sustainability goals, even in the absence of a formal twin transition strategy. Tartu is a member of the European Climate-Neutral and Smart Cities Network.

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[1] Vihma, P., 2011. Maheporgandist auramõõtmiseni. Eesti ökokogukondade tüüpid [From mild grown carrot to measuring auras. A typology of Estonian eco communities]. A.-A. Allaste (Ed.), Ökokogukonnad retoorikas ja praktikas, pp.67-100.

[2] For an overview, see Velmet, A., 2020. The blank slate e-state: Estonian information society and the politics of novelty in the 1990s. Engaging Science, Technology, and Society, 6, pp.162-184.

Key twin transition governance insights

Lack of Strategic Framing for the Twin Transition

In both Tallinn and Tartu, the twin transition is not recognised as a strategic concept. While both cities engage in digital and green initiatives, these efforts are pursued separately, without a unified framework or deliberate strategic approach to link them.

Connections between digital and sustainability agendas occur pragmatically, typically at the project level. For example, digital tools are used to optimise public services or support data-driven decision-making, which may incidentally contribute to environmental goals. However, these synergies are not the result of intentional twin transition planning, but rather reflect operational efficiencies or innovations emerging within individual departments.

> *Life has shown that /.../ digital solutions in many areas are incredibly useful and help us achieve efficiency. That is why we have used them extensively. But we don't have any digital city strategy /.../ We don't have any vision that Tartu must be digital in one way or another. On green issues, we have an energy and climate plan, where it is very concretely established in which direction we want to move, what are the activities, how we want to get there. (High ranking civil servant, Tartu)*

This pragmatic approach may come at a cost. This kind of fragmented approach makes it harder to achieve broader, long-term twin transition impact. Without a shared strategy or coordinated structures, cities may overlook chances to use digital tools to support sustainability goals or to create pathways towards ecologically sustainable digital transition.

Digitalisation perceived as complete

In both Tallinn and Tartu, digital transformation is perceived to be at an advanced stage. Most core public services and processes have already been digitised, and digitalisation is not treated as a strategic objective in its own right. This mature digital landscape has fostered a service-oriented mindset, where digital technologies are embedded into routine operations rather than pursued as transformative innovations. Instead, digital tools are used pragmatically to optimise service delivery, improve administrative efficiency, and support specific policy goals, including, at times, sustainability.

> *Data monitoring is increasingly embedded in policy making and decision-making processes. Sure, decisions are not always made based on them. Gut feeling is always stronger than data on a complex topic. But despite this, we have an increased number of sensors around the city, among other things thanks to various EU measures. We receive real-time information. (High-level urban planner, Tartu)*

Importantly, both cities express a healthy scepticism toward digitalisation as a universal solution. While digital tools are valued, their limitations are acknowledged – particularly in areas requiring political judgment or complex coordination. There is also concern about over-reliance on data-driven approaches in contexts where policy decisions are inherently political.

Green transition faces legitimacy challenges

In both Tallinn and Tartu, the advancement of green policies is constrained by limited political and public legitimacy, with the issue particularly pronounced in Tallinn. The term "green transition" itself is often considered politically sensitive or even taboo, requiring strategic reframing – typically as public health, wellbeing, or urban quality improvements – to gain traction within local debates and policymaking.

This reflects a broader societal challenge in Estonia, where environmental issues are frequently perceived as costly, distant, and disruptive, rather than as opportunities for local improvement. As a result, green initiatives struggle to secure widespread support unless they are directly linked to visible, short-term benefits for residents.

In some aspects, Tartu demonstrates comparatively stronger leadership in green policy, with a clearer strategic orientation and a reputation as a national forerunner. Other municipalities, including Tallinn, actively seek guidance from Tartu on successful green initiatives. For example, "Tartu City Energy and Climate Action Plan" (2021) can be seen as ambitious and is viewed positively by experts working in the area. Despite (or because) of its ambitions, the implementation of the plan has lagged, partly due to the "compromises" with the city council who tends to be more careful in promoting change. Hence even in Tartu, the green agenda faces political constraints, and its advancement depends heavily on the presence of committed individuals, so-called "green champions", within the administration.

This highlights the democratic limitations of green policymaking in the context of limited input legitimacy. Elected officials are bound by the preferences of the electorate, which often prioritises immediate economic or social concerns over long-term environmental goals. This dynamic reinforces the need for careful framing,

inclusive dialogue, and strategic communication to build legitimacy for sustainability transitions.

Resource and capacity constraints

Both Tallinn and Tartu face significant limitations in financial, human, analytical and control over physical resources, which directly impact their ability to lead or scale digital and sustainability initiatives. These constraints are rooted in Estonia's thin-state governance model, shaped by the post-1990s wave of privatisation and a minimalist public sector ethos. As a result, municipalities have limited ownership of physical assets, reduced in-house service capacity, and a small pool of civil servants tasked with managing increasingly complex policy domains.

Human capital is particularly strained. In both cities, individual civil servants often manage multiple portfolios that, in larger administrations, would be handled by dedicated teams. This multitasking limits the time and expertise available for strategic planning, innovation, and data analysis. While new positions – such as data management experts and climate coordinators – are being introduced, many are project-based and dependent on temporary EU funding, raising concerns about long-term institutional capacity.

Analytical capabilities are also of concern. Tartu, for example, collects more data than it can effectively analyse, and both cities report a shortage of staff with advanced data skills. This gap undermines efforts to make evidence-informed decisions and hinders the integration of digital tools into sustainability planning.

Financial constraints further compound the challenge. Although EU funding supports innovation projects, cities struggle to secure local funding for scaling and mainstreaming successful initiatives. Budget limitations often force trade-offs, with green options side-lined in favour of cheaper, conventional alternatives.

Emergent coupling through innovation

Although neither Tallinn nor Tartu has formally adopted the twin transition as a strategic framework, both cities demonstrate functional coupling between digital and sustainability goals through project-level innovations. These initiatives illustrate how digital tools can support environmental objectives, even in the absence of integrated planning.

A notable example is Tartu's redesign of its public transport system, which used digital data to optimise routes and improve service efficiency. This initiative not only increased public transport usage but also enabled a full transition to biogas-powered buses, significantly reducing the city's carbon footprint. Similarly, digital modelling and simulation are being applied in urban planning, mobility, and circular economy efforts, allowing for more informed and resource-efficient decisions.

However, these examples remain isolated and ad hoc, rather than components of a broader strategic agenda. The lack of institutional structures to support cross-sectoral

innovation means that successful projects are often dependent on individual champions or temporary funding, rather than embedded in long-term governance frameworks.

Coordination gaps across governance levels

Both Tallinn and Tartu report persistent challenges in coordinating digital and sustainability transitions across governance levels, particularly with the national government. While municipalities are actively engaged in local innovation and service delivery, they often lack the legal authority, regulatory flexibility, institutional support and scale needed to drive systemic change.

Municipal leaders describe their role as enablers, providing the environment for innovation but not possessing the mandate to lead transitions independently. Key policy areas such as energy, mobility, and urban planning are heavily influenced by national legislation and the routines of private enterprises. This limits cities' ability to implement ambitious green or digital initiatives, even when local capacity and political will exist.

Frustration is especially evident in areas where national-level inertia blocks local experimentation. For example, Tartu's attempt to introduce bike-priority streets was halted due to legal constraints, and both cities cite difficulties in adapting zoning and parking regulations to support sustainability goals. While Tartu has occasionally served as an advisor to the national government on green issues, this relationship is informal and inconsistent.

Need for institutional innovation

While both Tallinn and Tartu have taken steps to strengthen their administrative structures, such as creating strategic management offices and introducing new roles focused on digital and green agendas, these changes are often project-based, temporary, and fragmented. As a result, they lack the permanence and authority needed to drive long-term, integrated transition efforts.

For example, Tartu launched an ambitious Climate Assembly in 2022 as the first of its kind in Estonia Yet, only 2 of the 66 proposals had a digital component. Furthermore, more substantial or ambitious propositions by the Climate Assembly were rejected 'not because of ideological reasons, but financial', according to the deputy major.[3]

Many of the newly created positions, including data management experts, climate coordinators, and digital service leads, are funded through external sources such as EU projects. Once project funding ends, these roles risk being discontinued, undermining continuity and institutional learning. This reliance on short-term funding limits the ability of cities to embed twin transition goals into core governance routines.

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[3] Source: https://www.err.ee/1609205057/tartu-kliimakogu-loomine-ei-ole-eriti-suurendanud-elanike-kaasamist

> *All these European support objects are issued with both green and digital goals. They want some kind of innovation, I would say. If we collect rainwater in ditches somewhere, then some kind of analysis is wanted for these rainwater systems, so that we have data which is measurable, analyzable and the [rainwater] composition can be controlled. In a similar way we have most things with sensors. (Road Maintenance Service officer, Tallinn)*

Moreover, while some structural innovations such as the recent creation of Tallinn's Strategic Management Office aim to coordinate digital and sustainability strategies, they often operate with limited mandate and authority, functioning more as soft coordinators than empowered decision-makers. Budgetary control and strategic direction remain tied to political leadership and city council decisions, which are subject to shifting priorities and electoral cycles.

Conclusion - policy implications

The twin transition remains a complex governance challenge where no clear blueprints exist. But if Europe and Estonia are serious about making it a real policy priority, the public sector – including city governments – must develop institutional conditions and capabilities that are fit for the twin transition purpose. The experiences of Tallinn and Tartu offer valuable lessons on the practical realities, constraints, and opportunities involved in advancing the twin transition at the local level. Based on research from the PADST project, the following policy implications emerge:

Align digital upgrading with green objectives: To fully tap into the potential of digitalisation in supporting green objectives, cities should begin by asking: What systemic digital capabilities are needed to advance our sustainability goals? This kind of thinking could help ensure that digital efforts stay connected to evolving environmental priorities. It also encourages collaboration across departments and creates room for innovation that directly supports sustainability.

Pursue the twin transition strategically: To unlock the full potential of the twin transition, cities must move beyond rhetorical and ad hoc connections and begin to institutionalise digital and green integration as a core element of urban development strategy. To move from scattered innovation to systemic transformation, cities should develop mechanisms to scale, replicate, and institutionalise not just new technologies and processes, but also the institutional practices that enable innovations to emerge.

Legitimate the twin transition through engagement with citizens and stakeholders: To strengthen the green agenda, cities must invest in public engagement, narrative reframing, and coalition-building, while also seeking stronger support and enabling frameworks from national-level institutions.

> *Today, the approach is hopefully moving increasingly toward a more bottom-up process, where changes and decisions about changes come from the bottom up. This means that citizens, businesses interacting with the city, as well as city government employees, can all make proposals on how things could work better. (High-level IT officer, Tallinn)*

Improve multi-level coordination: Limited multi-level coordination mechanisms and shared strategic frameworks undermines the potential for integrated transition governance. Municipalities call for clearer national guidance, more enabling legislation, and the establishment of competency

centres to support local transition implementation. To strengthen twin transition efforts, Estonia must invest in vertical coordination, ensuring that national policies empower cities to act, and that local innovations inform broader regulatory reform.

Institutional innovation: Although there are numerous innovative projects (EU projects, citizen assemblies, experiments), their results are rarely source of policy learning or scaling. Interfaces between temporary organizations and permanent bureaucratic structures (departments, council) need to be strengthened. To enable effective twin transition governance, cities must move beyond ad hoc organisational adjustments and invest in systemic institutional innovation. This includes establishing permanent cross-cutting units, integrating digital and green objectives into strategic planning and budgeting processes, and ensuring that new roles are supported by long-term funding and clear mandates.

Appendix 1

List of interviewees:

Interviewee	City
Strategic planning officer	Tallinn
Digital service officer	Tallinn
Strategic management officer	Tallinn
High-level urban environment and public works officer	Tallinn
Transportation officer	Tallinn
Circular economy officer	Tallinn
Strategic management officer	Tartu
Urban design officer	Tartu
Climate expert	Tartu
Digital service officer	Tartu
Strategic management level officer	Tartu
Road maintenance officer	Tartu
Environmental expert	Tartu

Interviews were conducted from February to December 2024.