Action Plan template

The Action Plan is a key learning component within the UDT training programme. It is designed to help participants apply the programme's learnings directly to their city's context, ensuring that the theoretical knowledge acquired is translated into practical strategies. This document will be developed gradually throughout the programme, allowing participants to continuously refine and expand their plans as they gain new insights and get feedback from trainers and peers. By the end of the programme, the Action Plan will provide a framework that cities can build upon for future UDT use cases.

In this context, the Action Plan is intended to be an informal, working document. It does not require formal approval by the city government before the end of the programme. Instead, it serves an exercise in strategic planning, providing a foundation for cities to develop more formalised plans post-training.

The structure of the Action Plan is designed to be completed in stages, aligning with different moments of the training programme. For instance, project objectives should be drafted before the in-person training, while other sections will be filled in as the programme progresses. This iterative process ensures that the Action Plan evolves in response to ongoing learning and collaboration. The document includes key sections such as the city's vision for digital twins, detailed project objectives, stakeholder analysis, diagnosis of potential bottlenecks, strategic actions, and a roadmap for implementation.

This is a proposed structure for each city's Action Plan. However, it can be adapted by participants so that it best fits its needs. The template includes a fictional example (in *Italics*) to illustrate each section.

City: *Eurocity*

Challenge: *Reduction of traffic congestion and pollution in Downtown District*

Executive summary

a. **Overview**: briefly describe the purpose and scope of the Action Plan, including the urban challenge it wishes to address.

   The Action Plans aims to address traffic congestion and pollution in Eurocity's Downtown District using a digital twin. This involves creating a real-time model to simulate traffic patterns and pollution levels. The model will help city planners and decision-makers in the city council, through its Transport Department and Environmental Agency understand and manage urban mobility and environmental impact more effectively.

b. **Objectives**: state the main goals the city aims to achieve with this Action Plan.

   The primary goals are to reduce car use by 20% and decrease emissions of NO2 and PM2.5 by 25% in the Downtown District over the next three years. These targets will contribute to a cleaner, healthier and more sustainable urban environment in Eurocity.

c. **Key stakeholders**: identify the main stakeholders involved in the project, including internal department and external partners, as well as their role in it.

- *City departments and agencies:*
    - *Transportation Department: Oversees the development and implementation of traffic management strategies. Will be one of the primary users of the digital twin, and will also integrate mobility date to it.*
    - *Environmental Agency: monitors pollution levels and integrates data into the digital twin.*
    - *Digital Agency: coordinates digital initiatives, ensures data interoperability, and will be in charge of the development of the digital twin, by procuring it to TechSolutions*
    - *City leadership: the deputy mayors for Mobility and Environment will be making the final decisions on traffic restrictions, designed based on the insights produced by the digital twin.*
- *External stakeholders:*
    - *TechSolutions: technology provider responsible for developing the digital twin infrastructure and applications, under the leadership and in coordination with the Digital Agency.*
    - *Regional government: owns part of the air quality data, as it is the owner of the air quality monitoring stations and mobile sensors in the city.*
    - *Eurocity University: provides research support and expertise in data analysis and modelling to the city government.*
    - *Downtown District's residents and local businesses: beneficiaries of improved traffic conditions and air quality.*

1. City information

Provide basic information about the city:

- **Number of inhabitants**: *1.2 million*
- **Size of the municipal budget**: *€2.5 billion annually*
- **Main city challenges**: *Eurocity faces significant challenges related to traffic congestion and air pollution, particularly in the Downtown District. The high volume of vehicles not only causes severe traffic delays but also contributes to elevated levels of nitrogen dioxide (NO_2) and particulate matter (PM2.5), which pose health risks to residents.*
- **Overall role of digital twin in the city's strategy**: *The digital twin is an integral part of Eurocity's strategy to enhance urban sustainability and quality of life. By providing real-time data and predictive analytics, the digital twin will enable city officials to optimize traffic management and implement effective pollution control measures. This initiative aligns with the city's broader goals of reducing carbon emissions, improving public health, and promoting sustainable urban mobility.*

2. A vision for the digital twin

Articulate your city's vision for the digital twin as a tool for evidence-based policy-making. What are the main challenges and opportunities you aim to address the digital twin? How do you envision the digital twin supporting your city government's policy goals? Who will be the primary users of the digital twin (which departments or policy areas), and how will it benefit their work?

What outcomes do you expect from implementing the digital twin? How will the digital twin integrate with existing city data and systems?

Eurocity's digital twin aims to address the critical challenges of traffic congestion and air pollution in the Downtown District. By leveraging real-time data and predictive analytics, the digital twin will optimise urban mobility and environmental management, providing a robust tool to enhance city planning and operational efficiency. This initiative offers an opportunity to improve the quality of life for residents by reducing traffic and emissions.

The digital twin supports Eurocity's policy goals of enhancing sustainability, improving public health, and increasing urban efficiency. It will inform evidence-based policy-making and strategic planning, aligning with broader objectives to create a more livable and sustainable urban environment. The primary users of the digital twin will be the Transportation Department and the Environmental Agency, who will use the system to monitor traffic patterns, manage congestion, track pollution levels in real-time, and simulate the effects of policy interventions (e.g. traffic restrictions, street pedestrianisation) before actually implementing them.

The digital twin will transform policy-making by providing city officials with a comprehensive view of urban dynamics and the possibility to assess public interventions' impact before implementing them. For instance, it will simulate the impact of proposed traffic regulations, such as congestion pricing or new bike lanes, and infrastructure changes like road expansions or public transit improvements. This allows policymakers to predict outcomes and optimise strategies before implementation. It will also facilitate scenario planning, enabling the city to prepare for emergencies, such as pollution spikes or traffic incidents, by testing various response strategies. Additionally, by integrating data from multiple sources, the digital twin will help identify correlations and causal relationships, supporting more effective and targeted policy interventions.

3. Project objectives

The purpose of this section is to help participants start defining the specific challenge they would like to develop and focus on during the training programme. This involves identifying the concrete urban challenge the digital twin aims to solve, the expected outcomes, and the key elements necessary for successful implementation.

a. **Problem description**. What is the specific problem or challenge you want to address through a digital twin use case? Why is this problem relevant for your city?

Eurocity's Downtown District suffers from severe traffic congestion and elevated levels of nitrogen dioxide (NO_2) and particulate matter (PM2.5) pollution. These issues cause significant delays for commuters, increase the risk of respiratory illnesses among residents, and negatively impact the overall quality of life. The digital twin aims to address these problems by providing real-time traffic and pollution data, allowing city officials to develop targeted strategies to reduce congestion and improve air quality. This problem is relevant to Eurocity as it affects both public health and public space use, making it essential to find sustainable solutions.

b. **Expected output**. What data and insights do you expect the digital twin to produce? How will these outputs help in solving the identified problem?

The digital twin is expected to produce comprehensive data on traffic patterns, vehicle counts, and pollution levels in the Downtown District. It will generate predictive analytics to forecast

traffic congestion and pollution hotspots, and provide scenario simulations for proposed traffic management and pollution reduction measures. These outputs will enable city planners to implement more effective traffic regulations, optimise public transportation routes, and design better urban infrastructure, thereby directly addressing the identified problems of congestion and pollution.

c. **Target audience**. Who are the primary users of the information produced by the digital twin? Which municipal department or policy-makers will benefit most from these insights?

The primary users of the digital twin will be the Eurocity Transportation Department and the Environmental Agency. These departments will use the digital twin to monitor real-time traffic and pollution data, develop and test new traffic management strategies, and assess the effectiveness of environmental policies. Additionally, policymakers and urban planners will benefit from the insights provided by the digital twin, allowing them to make informed decisions that improve urban mobility and air quality.

d. **Data required and owners.** What data is required to produce the expected outputs of the digital twin? Who are the owners of these data sources, and how will you access them?

To produce the expected outputs, the digital twin will require traffic data from street sensors, CCTV cameras, and GPS data from public transportation. This is owned by the city, through its Transportation Department. Pollution data will be sourced from air quality monitoring stations and mobile sensors deployed throughout the Downtown District. These air quality monitoring stations and mobile sensors are owned by the regional government, which also owns the data produced by them. Therefore, a data-sharing agreement and protocol will need to be established with the regional government to ensure access to this crucial data. The Transportation Department and the Environmental Agency will collaborate with the regional government to ensure data accuracy and availability. Within the city, the Transportation Department will provide mobility data, while the Environmental Agency will focus on pollution data. Data integration will be ensured by the Digital Agency.

e. **Digital twin governance**. Who will be responsible for developing and managing the digital twin? Which municipal department will oversee its development and use? How will collaboration between the municipal department in charge of development and the one that will be making use of the information produced?

The development and management of the digital twin will be overseen by the Eurocity Digital Agency. The Transportation Department will lead the integration of mobility data, while the Environmental Agency will handle pollution data. Collaboration between these departments and the company TechSolutions, the technology provider, will be crucial for the successful implementation of the digital twin. A taskforce will be set up to facilitate regular coordination meetings that ensure alignment and delivery of goals by all stakeholders.

f. **Funding**. How much do use case might cost? What are the potential sources of funding for your digital twin project? How will you secure the necessary financial resources?

The estimated cost for the digital twin project is €2 million. Potential funding sources include the municipal budget, grants from the European Union, and partnerships with private sector stakeholders. The Eurocity Digital Agency will secure the necessary financial resources by

applying for relevant grants, negotiating partnerships, and allocating municipal funds dedicated to urban innovation and sustainability projects.

g. **Other stakeholders involved**. Who are other key stakeholders (inside and outside the municipality) that might need to be involved in the use case? What roles these stakeholders play in the development, implementation and use of the digital twin?

Key stakeholders in the digital twin project include Eurocity University, which will provide research support and expertise in data analysis and modelling. Local businesses and residents of the Downtown District will also play a crucial role, as they will be the primary beneficiaries of improved traffic conditions and air quality. Regular stakeholder engagement sessions will be conducted to gather feedback and ensure that the project meets the needs of the community.

4. Diagnosis: bottlenecks and obstacles

The purpose of this section is to help participants identify potential bottlenecks and obstacles that could hinder the implementation of the Urban Digital Twin (UDT) use case outlined in the previous section. This involves assessing whether the necessary requirements and capacities are present within the city administration. By identifying these challenges early, participants can develop strategies to address them, ensuring a smoother implementation process.

a. **Vision**. Is there a shared vision for, and understanding of, the digital twin among all key departments and stakeholders involved within the municipality (political and technical offices; data/IT department; user departments…)? How will you align different understandings to ensure a cohesive approach and buy-in of the initiative?

Our departments have different understandings of the digital twin's potential. The Transportation Department views it as a tool to optimise traffic flow, while the Environmental Agency focuses on monitoring pollution levels only. The Digital Agency sees it as an opportunity to enhance data integration and smart city initiatives, through citizen participation. These varying perspectives create a challenge in aligning our goals and ensuring all departments are on the same page. Overcoming this requires structured workshops to unify our vision and demonstrate the comprehensive benefits of the digital twin.

b. **Digital twin governance**. Who is responsible for decision-making related to the digital twin use and applications? How are roles and responsibilities distributed? Are there the coordination mechanisms in place between the department in charge of developing the digital twin and the department that will be making use of its insights? Is there a space for coordinating efforts between different departments and external partners?

We face a challenge in defining clear roles and responsibilities for the digital twin project. The Transportation Department will lead on traffic data, the Environmental Agency on pollution data, and the Digital Agency on overall coordination. However, bureaucratic silos and lack of inter-departmental communication are hindering progress. Establishing a robust governance framework with regular coordination meetings and clear decision-making protocols is essential – and we currently lack this.

Additionally, aligning our internal resources with those of TechSolutions, the external technology provider, requires planning and cooperation.

- Political leadership. Are key political leaders committed to the project? Do they understand the potential of digital twins? If not, why not?

Securing strong political support is critical but challenging. Currently, the decision sits with two different Deputy Mayors: the one in charge of digital and mobility, and the one responsible for environment. The Deputy Mayor for mobility and digital recognises its potential to improve urban management. The Deputy Mayor for Environment, however, is sceptical, concerned about the cost and the potential lack of immediate results. This scepticism stems from a lack of understanding of the digital twin's benefits and fear of political backlash. Continuous engagement with political leaders, in particular with the Deputy Mayor for Environment, showcasing short-term wins, and aligning the project with broader political agendas are necessary to maintain commitment and support.

- Internal alignment. Are all relevant departments engaged and working together? Are there any conflicts or silos between the departments involved that could hinder the project? How is inter-departmental cooperation facilitated? What resources will be provided to support internal alignment and ensure that all departments have a clear understanding of their role?

Ensuring all relevant departments are engaged and working together is challenging. The Transportation Department and Environmental Agency often have conflicting priorities, with one focused on mobility and the other on environmental health. These conflicts hinder our progress. Facilitating inter-departmental cooperation involves creating a unified vision, setting shared goals, and providing resources for joint initiatives. A clear political direction, which is currently lacking, would also facilitate things. In general, regular workshops and cross-departmental exchange sessions can help foster a collaborative environment. Moreover, clarifying roles and responsibilities through detailed documentation and structured communication channels is essential to prevent misunderstandings and overlaps.

- External partnerships. Does the city have the internal capacities to develop the digital twin on its own, or does it require external support? Do you have established partnerships with relevant external stakeholders (e.g. research institutions, private providers)? What is the role of these external partners? Are there any potential conflicts of interests or challenges in working with external partners?

Our city lacks the internal capacity to fully develop the digital twin and relies heavily on external support from TechSolutions and, to a lesser extent, Eurocity University. TechSolutions focuses on delivering a technically sound product but may have commercial interests that conflict with our budget constraints. Ensuring data ownership and avoiding vendor lock-in are critical. Eurocity University provides research support but may prioritise theoretical research over practical solutions, potentially misaligning with our urgent needs. Establishing clear agreements on data sharing, roles, and responsibilities, alongside regular communication and mutual accountability, will help align our goals and manage potential conflicts.

- Embedment into policymaking process. Are there established procedures in the city government for using data-driven insights in decision-making? How will the insights from the digital twin be integrated into the policymaking process by the user department? Are there any barriers (administrative or political) to ensure that data-driven insights are incorporated into decision-making? What support will policymakers need to effectively use digital twin insights?

There is a lack of tradition in the city administration to use data-driven insights for policymaking. Strategic and political decisions on traffic congestion, which directly impact emissions, are usually based on political agendas and community demands rather than data and evidence. This approach hinders the effective use of digital twin insights. To integrate these insights, we need to develop comprehensive training programmes for policymakers and establish streamlined processes for incorporating data into decision-making. Demonstrating the effectiveness of data-driven approaches through pilot projects and fostering a culture of innovation within the administration will contribute to overcome this barrier.

b. **Funding**. Is there sufficient funding allocated for the digital twin project or use case? Are the sources of funding secure (can they be sustained over time)? Are there any financial constraints that could limit the project's scope or sustainability? What alternative funding sources (grants, EU funding, partnerships…) can be explored?

Securing and sustaining sufficient funding for the €2 million digital twin project is challenging due to competing budget priorities like housing and infrastructure maintenance. To ensure budget allocation, strong political buy-in is essential. This requires making a compelling financial case by demonstrating cost savings and improved public health outcomes, and politically aligning the project with city priorities. Engaging political leaders, showcasing pilot successes, and aligning the initiative with the city's strategic vision are crucial. Alternatively, potential public-private initiatives include partnerships with tech companies like TechSolutions (which might invest in the project with certain data- and technology-ownership conditions), collaborations with local businesses. EU grants might also be considered for pilots.

c. **Data**.

- Data infrastructure. Is your city's data infrastructure capable of supporting the digital twin, including collecting, integrating and processing increasing data volumes and complexity? If not, what capacity is needed?

Our current data infrastructure is not fully capable of supporting the digital twin's requirements due to limited data storage capacity, outdated processing systems, and inadequate data integration capabilities. We require significant investment in high-capacity servers, advanced data processing software, and enhanced network infrastructure to handle large volumes of real-time data efficiently. Additionally, we need technical expertise to manage these upgrades and ensure seamless integration. Collaboration with TechSolutions can facilitate this process by providing cutting-edge technology solutions and expert knowledge in data infrastructure, ensuring our systems are robust and scalable. TechSolutions will also assist in training our staff to manage and maintain the new infrastructure, ensuring long-term sustainability.

- Data ownership and governance. Does the municipality have full control over the data required to develop, implement and maintain the digital twin? Is there any agreement with the stakeholders (public or private) that own the data? What are the protocols for data access and sharing with external stakeholders (either data owners or processers)?

We need to ensure availability of and access to data required for the digital twin, and a crucial part of it is on the regional government's hands. Our municipality must establish comprehensive agreements with the regional government, which owns the air quality monitoring stations and mobile sensors, to ensure seamless data access. These agreements should include clear terms on data sharing, ownership rights, usage limitations, and responsibilities for data maintenance. Protocols need to ensure data integrity and legal compliance by outlining standards for data accuracy, security measures, and privacy protections. All stakeholders, including city departments and external partners, will be bound by these protocols. The data governance framework must include representatives from the Transportation Department, Environmental Agency, Digital Agency, and legal advisors. This framework should define roles, responsibilities, and procedures for data management, ensuring consistent and lawful data handling practices.

- Regulations and legal considerations. Are current data-related process in the municipality GDPR-compliant? Are there local or national regulations that must be considered to implement the digital twin (related to e.g. data-sharing, data ownership)?

Ensuring compliance with GDPR and other regulations is a major challenge due to the complexity of data protection laws and the significant penalties for non-compliance. One particularly challenging local regulation is the "Data Sovereignty Act," which mandates that all data collected within the city must be stored on servers physically located within municipal boundaries. This requirement complicates the integration with cloud-based services used by TechSolutions and increases infrastructure costs. Compliance involves conducting thorough legal reviews, developing robust data protection strategies, and implementing secure data storage solutions. Establishing a dedicated legal team to monitor compliance and address legal issues is essential. Engaging with legal experts and consulting with regulatory bodies early in the project can help navigate these challenges and ensure smooth implementation.

b. **Procurement**. If the municipality requires the services of an external provider for the development of the digital twin, what criteria are used to evaluate bids and select suppliers? Are these criteria aligned with your project goals and needs? What are the operational responsibilities of the external providers? How is data ownership, technology ownership and control over the information produced managed in the procurement contracts?

The procurement process for Eurocity's digital twin project is challenging due to an outdated framework that is not suited for cutting-edge technology acquisition. Lengthy bidding processes often favour providers who meet bureaucratic criteria over technological fit. Current evaluation criteria focus on cost over innovation, risking selection of cheaper, less capable providers. In addition, procurement contracts inadequately address data ownership and technology control, leading to vendor lock-in and vague operational responsibilities. To overcome these issues, we need a revamped procurement process with clear, tech-focused evaluation criteria, enhanced transparency, and detailed contracts

outlining data ownership, technology control, and specific operational responsibilities, supported by legal and procurement experts.

5. Strategic actions and timeline

This section outlines the strategic actions required to address the challenges identified in Section 4 and achieve the goals outlined in Section 3. Participants should identify and devise concrete actions and works lines by analysing the specific challenges and opportunities within the city context. For this, participants may consult with colleagues and key stakeholders, review best practices from other cities, and incorporate the learnings and insights gained during the training. Strategic actions should be procedural, beginning with foundational steps and progressing through to final implementation and evaluation stages.

	Goal	***Action***	***Timeline***
Develop a unified vision for the digital twin	*Ensure all departments and partners are aligned in their understanding and objectives for the digital twin, as well as on the initial role distribution. For instance, the Transportation Department will focus on optimising traffic flow, while the Environmental Agency will prioritise reducing polluting emissions.*	*Conduct workshops and meetings with all key municipal stakeholders, including the Transportation Department, Environmental Agency and Digital Agency to develop a unified vision for the digital twin project.*	*Months 1-3*
Establish a governance framework	*Facilitate coordinated efforts and clear accountability across all involved parties. For instance, the Digital Agency will coordinate data integration, while TechSolutions will handle technical implementation.*	*Create a governance task force comprising representatives from the Transportation Department, Environmental Agency, Digital Agency, TechSolutions, Eurocity University, and legal advisors. Define roles, responsibilities, and decision-making protocols.*	*Months 2-4*
Secure political buy-in and funding	*Ensure sustained financial and political support for the project. For example, securing a €500,000 grant from the EU's Horizon Europe programme and a €1 million investment from the local business GreenTransport.*	*Present the digital twin project to political leaders, highlighting its benefits such as reducing traffic congestion and improving air quality. Apply for grants from the European Union, establish public-private partnerships with local businesses like GreenTransport, and allocate municipal funds.*	*Months 1-6*
Upgrade data infrastructure	*Build a robust and scalable data infrastructure capable of supporting the digital twin. For instance, upgrading the city's data centre to handle real-time traffic and pollution data from thousands of sensors.*	*Invest in high-capacity servers, advanced data processing software, and enhanced network infrastructure. Collaborate with TechSolutions for technology solutions and staff training.*	*Months 3-9*

Establish data sharing agreements and protocols	*nsure seamless access to all necessary data while maintaining data integrity and legal standards. For example, creating a data-sharing agreement with the regional government for access to air quality data from 50 monitoring stations.*	*Negotiate and formalise data-sharing agreements with the regional government and other external data owners. Develop protocols for data access, security, and compliance.*	*Months 4-10*
Enhance data governance	*Ensure consistent and lawful data handling practices. For example, establishing a data governance board to oversee data quality, privacy, and security.*	*Set up a centralised data governance framework with clear policies for data management, involving representatives from the Transportation Department, Environmental Agency, Digital Agency, and legal advisors.*	*Months 5-12*
Align procurement processes	*Secure the best possible partners and technology solutions for the project. For instance, updating procurement policies to prioritise vendors with proven experience in smart city solutions and data analytics.*	*Revise procurement criteria to focus on technological innovation, long-term value, and alignment with project goals. Ensure transparency and fairness in the selection process. Develop detailed contracts outlining data ownership, technology control, and operational responsibilities.*	*Months 12-18*
Train policy-makers	*Build capacity for data-driven policy-making within the city administration. For example, conducting workshops for city council members on using digital twin data to formulate sustainable mobility policies.*	*Develop and deliver training programmes for policymakers to utilise data-driven insights effectively. Include practical sessions on integrating digital twin outputs into decision-making processes.*	*Months 12-24*
Develop the use case and implement measures	*Showcase short-term wins and build confidence among stakeholders. For example, digital twin-informed traffic restrictions in a specific area like the Central Business Area to optimise traffic light timing and reduce congestion.*	*Implement small-scale traffic and mobility measures to demonstrate the digital twin's capabilities and benefits. Use these projects to gather feedback and refine the system.*	*Months 18-30*
Monitor and evaluate progress	*Ensure the project stays on track and meets its objectives, allowing for continuous improvement. For example, generate monthly reports on project performance.*	*Establish monitoring and evaluation frameworks to track the progress and impact of the digital twin project. Use key performance indicators (KPIs) such as reduction in traffic congestion, decrease in NO_2 and PM2.5 levels, and public satisfaction surveys.*	*Months 18-36*
Reduction of car traffic and polluting emissions	*Ensure the achievement of the use case's initial results*	*Reduce car use by 20% and decrease emissions of NO2 and PM2.5 by 25% in the Downtown District over the next three years*	*Month 36*