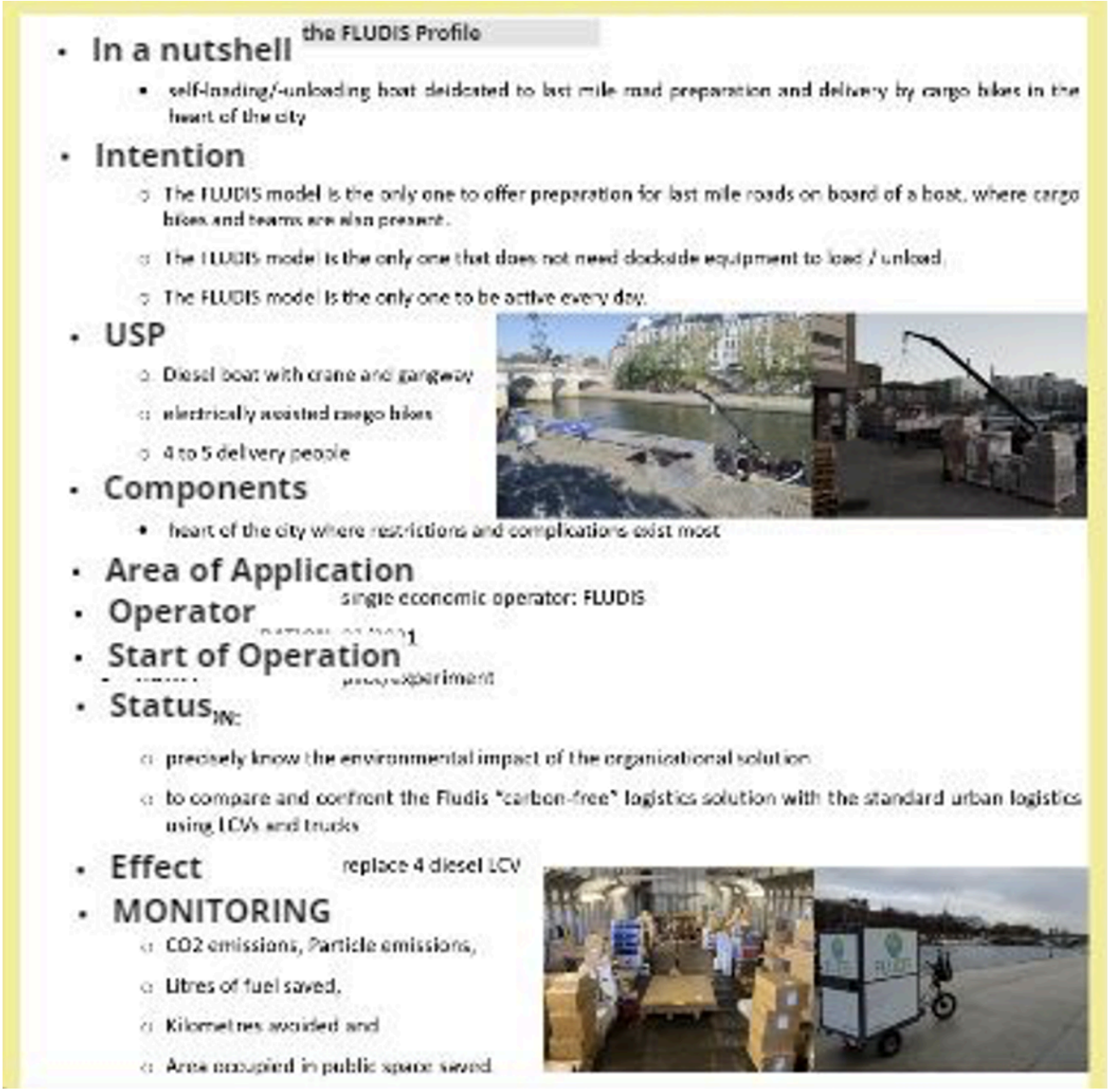
A Short Guide to the Preparation and Initiation of New Urban Logistics Testbeds



1. Introduction

This document is an abridged version of a guidebook for decision makers and practitioners who want to test innovative urban logistics solutions in their cities. Both this document, but even more so the detailed guidebook, provide guidance for the individual process elements necessary for the planning, implementation, evaluation and transfer of so-called "testbeds". Detailed descriptions and checklists are provided for potential followers. Both documents have been produced during the Awaken Sleeping Assets Project (ASAP) and are available for public use on the project's website: www.smarturbanlogistics.eu. ASAP investigated innovative urban logistics solutions in Hamburg, Paris, Stockholm, and Vienna by examining over 10 "testbeds," all operating on the principle of repurposing underused or inactive urban infrastructure and resources for logistics.

1.1 Definition of Testbeds

Defined as composite abstractions akin to Living Labs, testbeds focus on specific subsystems, facilitating insight into their functionality through prototypes and real components. Urban decision makers, including policymakers and administrators, recognize the importance of understanding the potential of testbeds, considering them essential for piloting innovative urban logistics solutions before implementing permanent regulatory or infrastructural changes. Particularly crucial for novel solutions where prior experience is lacking, testbeds offer a controlled environment to assess the acceptance and impacts of alternative urban supply and disposal methods, aiding evidence-based adjustments to regulations and processes. This approach is underpinned in our guidelines by a structured, multiperspective framework, exemplified both generally and through a concrete case study. While the overarching institutional and legal framework for freight transport is set at international and national levels, cities wield significant influence over logistics and freight transport through strategies such as implementing target system-related testbeds, notwithstanding their comparatively limited scope compared to passenger transport.

1.2 Preparation and Initiation of Testbeds (PIT)

This document serves as a short guide outlining vital steps for launching or transferring a testbed, emphasising the pivotal role of a strong impetus and meticulous preparation. As cities grapple with multifaceted transformations across various dimensions like living standards, environmental preservation, and service quality, the need for efficient logistics emerges as a critical economic and locational factor. Balancing the imperative of smooth freight transport with minimising its adverse impacts on the environment and quality of life becomes imperative. With freight transport now designated a priority area in future transport policies owing to its dynamic growth and associated challenges such as logistics coordination and technological advancements, the impetus for testbed initiation can stem from diverse sources including political strategies, local resource management needs, or observations of successful testbeds elsewhere. The guide aims to provide decision-makers with a strategic tool and orientation framework, drawing upon processes refined in consultation with representatives from Hamburg, Stockholm, and Vienna, and based on the FLUDIS testbed implementation in Paris. Envisaged as a guide for both public and private entities interested in implementing testbeds for alternative logistics solutions, the deliverable advocates for the exploration of existing infrastructural assets and emphasises knowledge exchange for sustainable urban development. Structured to mirror the implementation journey from ideation to evaluation and knowledge transfer, the content outlines six subprocesses essential for testbed implementation, offering insights primarily from the perspective of city administration stakeholders.

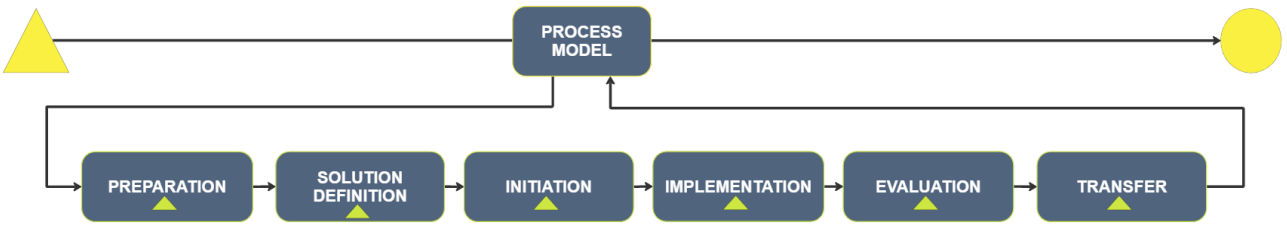


Figure 1: Testbed Preparation and Initiation Process Map

1. **Preparation:** Establishing understanding and support for PITs among stakeholders and decision makers is crucial, necessitating alignment with existing plans and strategies, as well as clear

delineation of responsibilities within the city administration. This phase may require restructuring decision-making structures to suit the specific focus of the PIT.

2. **Solution Definition:** A shared understanding of the logistics landscape and desired outcomes is pivotal, facilitating effective communication and stakeholder engagement. The solution definition can be initiated either by the city or through stakeholder workshops
3. **Initiation:** This phase involves engaging stakeholders, defining the measure, determining the PIT type and location, exploring potential funding sources, and establishing testing frameworks. Initiatives may originate from either private entities or the city itself.
4. **Implementation:** Leveraging insights from earlier phases, temporary implementation occurs, necessitating political support, financing, and customer engagement. Data collection for analysis and evaluation commences from the outset.
5. **Evaluation:** Continuous and final evaluations are vital for informing subsequent steps and potential transfers to other urban areas. Precise definition of the target system and budget allocation for evaluation are paramount.
6. **Transfer:** Lessons learned from PITs inform the transferability process, accounting for contextual variations. Insights from implementation processes should also be shared, simplifying future implementations elsewhere. These subprocesses form a comprehensive framework for PIT implementation, serving as a practical guide for city administrators and stakeholders alike.

The PIT model, described in comprehensive details **here,** acts as a practical guide for city administrators and diverse interested stakeholders, offering a structured approach to testbed implementation, fostering consistency and comparability.

2. PIT Approach

The Preparation and Initiation of a Testbed Manual (PIT Approach) targets urban planners, transportation experts, logistics professionals, technicians, service providers, and consultants seeking to implement innovative logistics testbeds in urban settings. Drawing inspiration from business process modelling and the business model canvas, the manual elucidates the elements and underlying logic of the PIT model, serving as a procedural guide for planning, implementing, and transferring testbeds.

2.1 First Steps – Preparing the Ground

The initial steps, not part of the process model, offer preliminary guidance and activities to streamline the subsequent process model, ensuring essential documents, information, and contacts are collected or activated beforehand. Involving relevant stakeholders and aligning topics and steps ensures broad agreement, vital for acceptance and support. Stakeholder involvement should occur from the outset or through reflective workshops, facilitating a participatory process. In this process a **structured preparation** is achieved through a series of different workshops that are described below. .

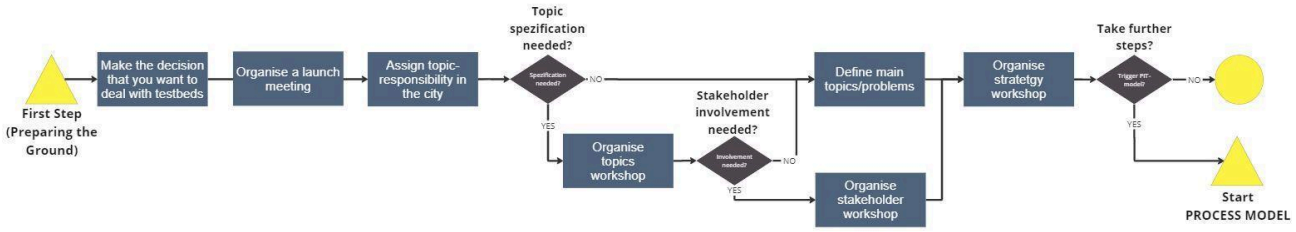


Figure 2: PIT First Steps

After a **decision** pro testbed is made, the **launch meeting**, typically led by an external consultant or the city project leader, initiates the process by examining the city's traffic, spatial, and economic landscape. Key figures representing the city politically and administratively, as well as relevant organisations, are carefully selected, with the group size capped at 10 to ensure effectiveness. The meeting's primary goal is to define or confirm a relevant urban freight transport topic for discussion, along with identifying stakeholders for the subsequent workshop. If multiple topics are deemed relevant, prioritisation is determined, or further workshops are scheduled as needed. Results are documented, outlining the selected topic, invited organisations/individuals, preparation tasks for the **stakeholder workshop**, and any city-specific agenda items. The stakeholder workshop, building upon the outcomes of the launch meeting, aims to engage relevant actors and stakeholders in the ongoing process. Participants discuss viable solutions, explore potential collaboration, and address outstanding questions.

Preparatory discussions with key stakeholders and on-site assessments may precede the workshop. The main goals of the workshop are to familiarise stakeholders with the advantages of testbeds for tackling freight transport issues, to present selected topics and their motivations, gather participant input on the chosen topics, review and refine existing solution approaches, assess stakeholder interest and contributions, and outline the necessary follow-up actions.

In a next step, preparing for the **topics workshop** entails structured analysis of logistics, action areas, and desired effects, possibly utilising existing testbed profiles or canvases. The topics workshop, is often initiated by the city but can also arise from freight-related issues brought forth by other actors or interest groups, serves as a nexus for addressing urban transportation challenges. Attendees typically include representatives from pertinent city departments (e.g., economy, transport, energy, climate, environment) and relevant local organisations (e.g., city marketing). During this session, the PIT process is officially initiated, potential freight transport topics are examined, one or more topics are selected for further scrutiny, and key stakeholders and interest groups, including various urban development and administrative units, are identified. Decision categories include the application area, type of action, logistics function, target group, and target system, facilitating clearer communication and stakeholder engagement. If available, existing TESTBED PROFILES and TESTBED CANVASES are useful here.

At the final **strategy workshop**, participants establish tasks, responsibilities, and a timeline, culminating in decision-making, guided by an assessment of testbed feasibility and impact that incorporates insights gathered from previous meetings. Oversight for this meeting is provided by an external consulting team or a city-appointed party, with attendees from previous sessions, stakeholders, relevant administrative units, city strategies, and political decision-makers. Potential outcomes of the strategy workshop encompass decisions to implement feasible testbed measures, formation of a working group to refine discussed topics and solutions, resolution to conduct in-depth feasibility analysis, planning of concrete projects possibly through project applications, integration of topics into broader urban development plans or mobility strategies, initiation of comprehensive freight transport strategy or concept development, or decisions not to pursue freight transport topics further due to infeasibility.

2.2 PIT Logic

The three elements (1) **PROCESS MODEL**, (2) **TESTBED PROFILE** and (3) **TESTBED CANVAS** allow a testbed to be presented and analysed from different perspectives with different focal points. This allows different target groups/stakeholders to work with it. At the same time, analysis is possible at different levels of detail. The PIT elements ensure focus, enable flexibility and guarantee transparency. Access via the PIT model thus provides support and makes work easier for people involved in the planning and implementation of testbeds in urban areas. The key to this is the embedding of the elements in a logic that describes the application and interlocking of the elements. This logic is explained in the next step using the PIT content map. If you require a more detailed explanation of the entire process and PIT approach, please visit: **xxx**

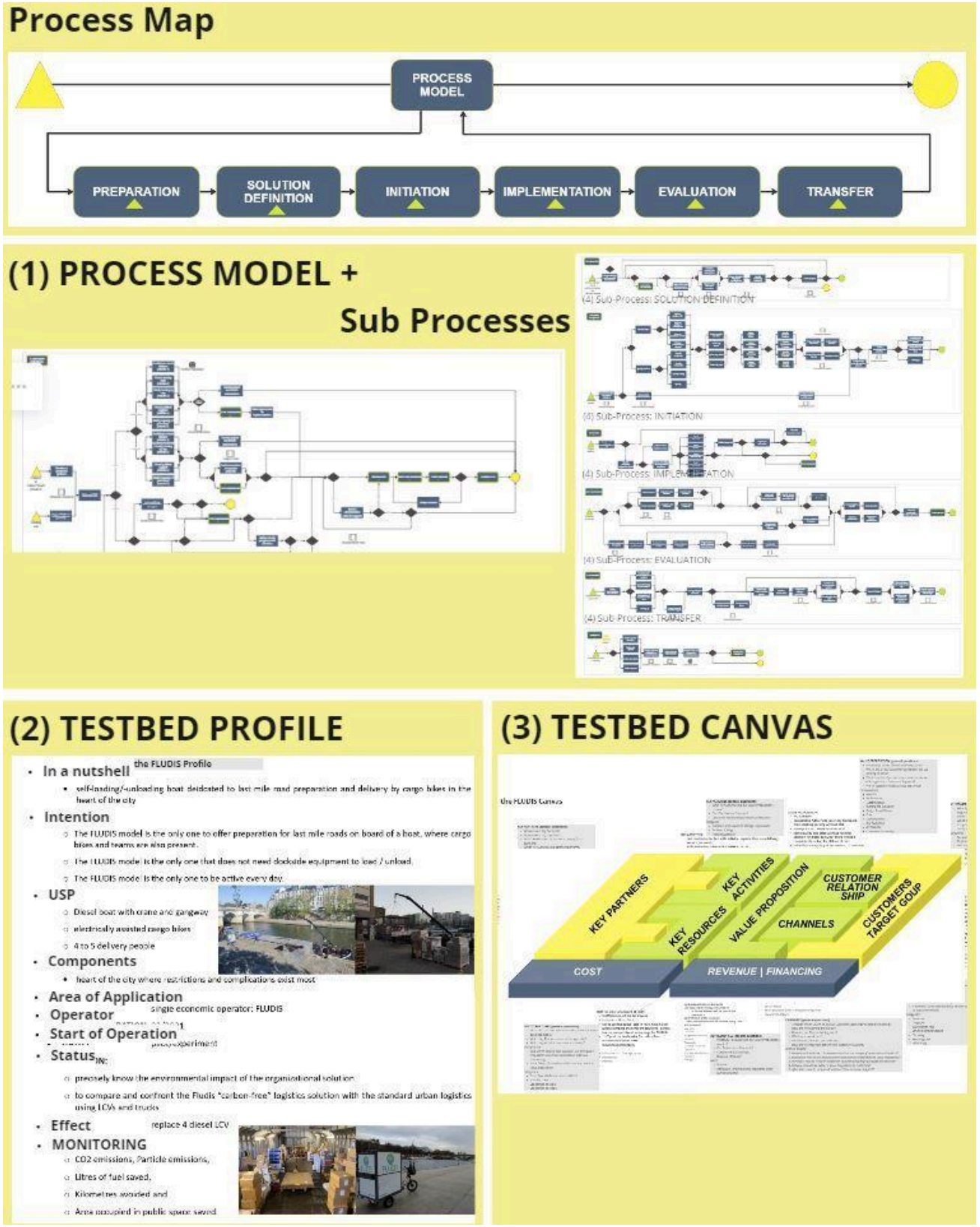


Figure 3: PIT- Content Map

2.3 PIT Elements

The PIT Model Elements illustrate and explain both the process of planning and implementing a testbed and the testbed itself. The three basic elements of the PIT model are presented below (for a more detailed

description refer to **here)**. A basic distinction is made between process models and test bed descriptions (test bed profile and test bed canvas).

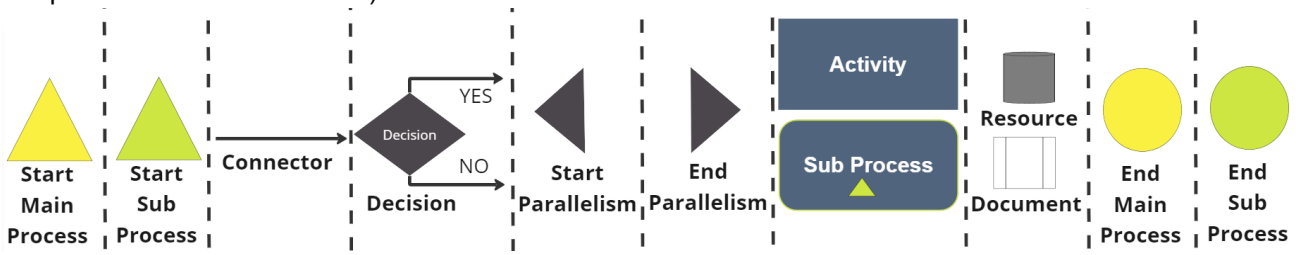


Figure 4: Process Model Elements

As shown in Figure 4 the workflow activities are visually represented. Starting with a green or yellow triangle denoting the beginning and ending with a green or yellow circle. Main processes (yellow) cover the entire testbed process, while sub-processes (green) relate to specific activities and can occur multiple times within a main process. Activities occur sequentially or in parallel, with decisions made and resources utilised, such as databases or documents like checklists. Grey triangles indicate parallelism, and sub-processes can be triggered within processes, leading to the next activity. Connectors illustrate the flow through the process.

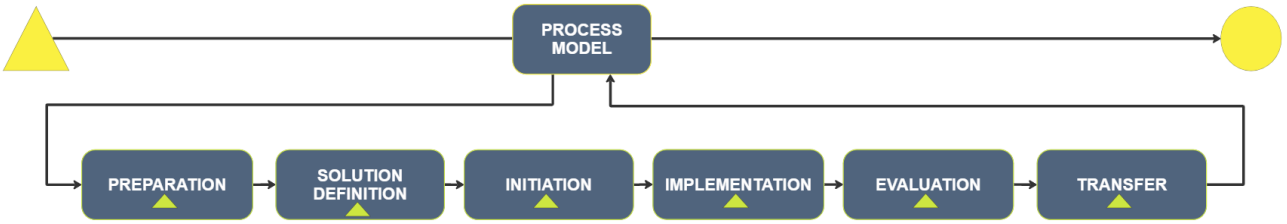


Figure 5: Process Model Map – Shortend Representation Standard Process and included Subprocesses

(1) The **PROCESS MODEL** comprises the standard process and its detailed sub-processes. The standard process encompasses all steps from inception to completion, covering activities from initial testbed considerations to evaluation and transfer. The individual steps such as Preparation, Solution Definition, Initiation, Implementation, Evaluation, and Transfer, the sub-processes are described in detail in an extended version of this document. For more detailed information please refer to that document. In the comprehensive document a separate **checklist** is provided for each process (standard and sub-processes). As demonstrated below for the Standard Process, these checklists contain basic questions, considerations and information that are important for the implementation of the corresponding process. They include, for example, responsibilities, competencies, allocation of resources, communication and other fundamental aspects that may also be relevant for arguments to politicians.

The implementation of a testbed requires the involvement of many stakeholders and the development of a storyline in order to be able to prepare a correspondingly stable set of arguments. The standard process represents the backbone of the entire process model and maps the entire process from the initial examination of a testbed through to its possible transfer to another area. A testbed must address different interests, objectives and requirements. Ideally, it provides answers to potential questions from many stakeholders or contributes to the target system of urban strategies. A checklist that addresses key aspects or objectives of a testbed in advance makes the work of the actors involved easier and creates a basic understanding of the process of the PIT process model. This allows the relevant steps to be taken in advance and information to be obtained. This can speed up the process.

CHECKLIST STANDARD Process

- **Where does the initiative for a new testbed come from?**
  - Citizens, trade, lobby, economy
  - Politics
  - Administration
  - Funding program
    - National, European
- **Why should a new testbed be established?**
  - is there a problem/complaint
  - a requirement has to be met
  - a certain goal is pursued
  - political program
  - one wants to be a pioneer
- **Who has to be involved from the beginning?**
  - politics
  - administration
  - potential partners
  - Funding agencies
- **With whom or by whom should the testbed be implemented?**
  - Company, City, Citizens
- **Is there experience with the partners who want to implement?**
- **Who is responsible for what in the process and who will take the lead?**
- **What resources are needed and are they available?**
  - Staff, Budget, Time
- **Which criteria must be met for a testbed to be implemented?**
- **Which criteria must not be met for a testbed not to be implemented?**

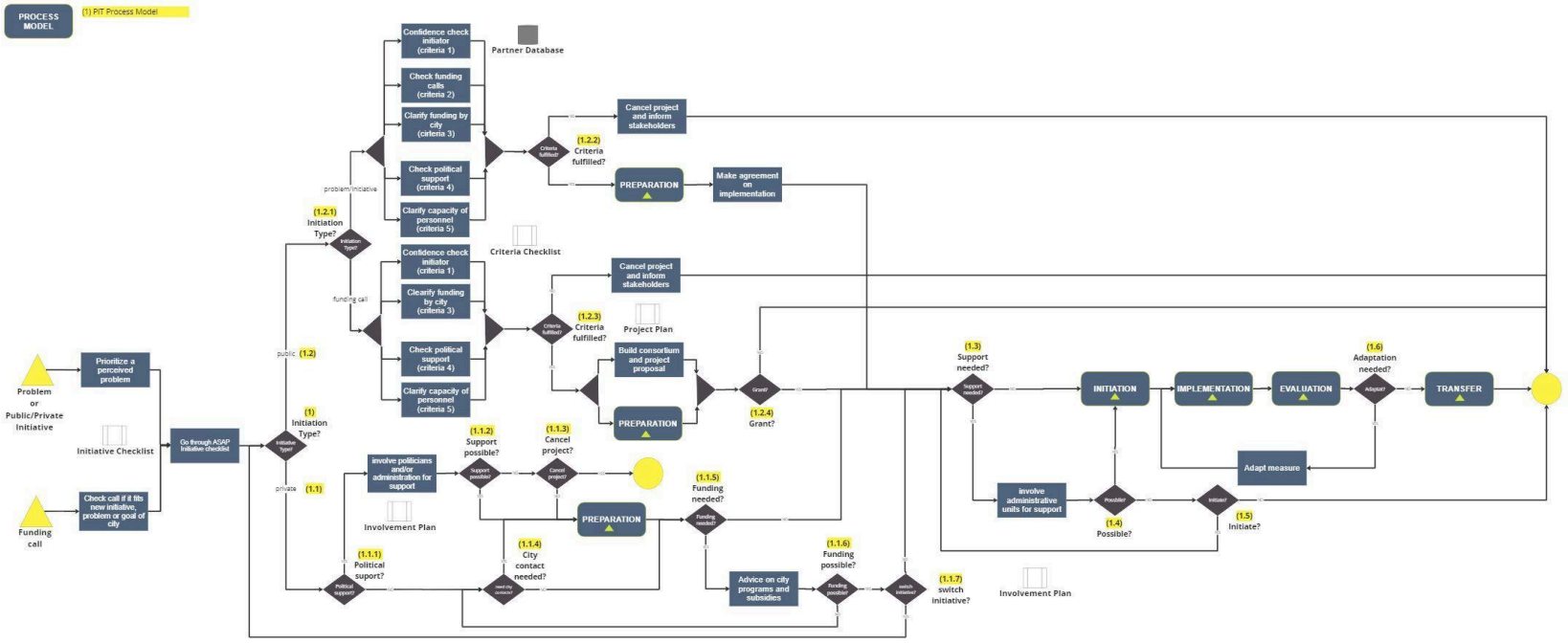


Figure 7: PIT PROCESS MODEL- Complete representation Standard process

(2) The **TESTBED PROFILE** provides a quick overview into the **"what"** of a testbed. It contains the essential components of a testbed and allows a uniform comparison of different testbeds that are prepared using the testbed profile. The preparation of the content is based on common best practice presentations and should be kept as brief yet as informative as possible. In combination with the testbed canvas, a comprehensive insight into the design of a testbed and the underlying considerations and parameters is provided. The scope of a testbed profile is presented and explained below.

- **In a nutshell:** Brief description of the testbed in one or two sentences to understand what it is about.
- **Intention:** Description of the underlying objective of the testbed (e.g. reduction of emissions, traffic, testing of new solutions, etc.)
- **Unique Selling Proposition (USP):** Presentation of the key aspects that make the testbed special and how it differs from other approaches.
- **Components:** Presentation of the essential components that are relevant for the implementation and operation of the testbed.
- **Area of application:** Description of the geographical location and area of application of the testbed.
- **Operator:** Description of the operator structure and the underlying consortium.
- **Start of operation:** Specification of the concrete time periods for planning and the time of the start of operations.
- **Status:** Description of whether the testbed is in a project, pilot or commercial implementation phase.
- **Effect:** Description of the effects achieved with the testbed (for example: Replacement of four diesel vehicles, 20% reduction in delivery traffic, etc.)
- **Monitoring:** concrete description of the parameters examined as part of the testbed to evaluate the impact of the testbed (for example: kilometres driven, diesel consumed, square metres of public space used, etc.)

(3) The **TESTBED CANVAS** provides an insight into the **"how"** of a testbed. It is modelled after the business model canvas, and offers a comprehensive view of a testbed's operations, even in cases where a business model isn't required. It provides insight into all relevant information for a testbed's success, covering key considerations in a structured manner. This structured approach ensures alignment of components and potential success, allowing for flexible adjustments as needed. By utilising the testbed canvas, development or changes to a testbed can be tracked transparently, promoting structured and transparent analysis throughout implementation. See Figure 6 for an overview of its components.

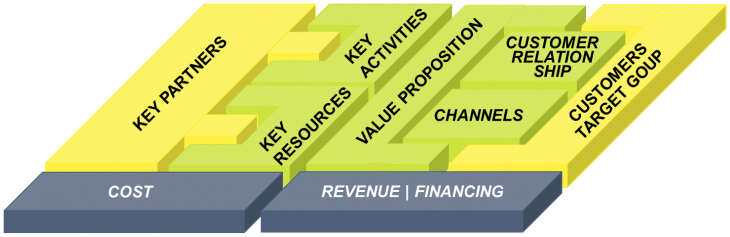


Figure 6: Testbed Canvas[1]

Presenting a testbed with the nine components of a business model canvas allows for a comprehensive analysis of implementation criteria from various angles, revealing potential dependencies between components. These components offer insights into key economic drivers, potentially leading to a successful testbed:

- **KEY PARTNERS:** Who can contribute additional know-how etc so that it can focus on its core activities? Which partners are needed for successful implementation and a functioning operation?
- **KEY ACTIVITIES:** What unique strategic actions does the company/testbed take to implement its offering?
- **KEY RESOURCES:** What unique strategic resources must the company/testbed have in order to be competitive?
- **VALUE PROPOSITION:** What is compelling about the offering? Why do customers/target groups buy or use it?

[1] Own graphic, adapted from „Business Model Generation", Alexanders Osterwalder, Wiley 2012, www.businessmodelgeneration.com [15.10.2023]

- **CUSTOMER RELATIONSHIP:** How do you interact with the customer/target group on their journey?
- **CHANNELS:** How are these offers advertised, sold and delivered? And why? Does it work?
- **CUSTOMERS | TARGET GROUP:** Who are the customers/target groups? What do they think, see, feel, do? For whom does the testbed provide added value?
- **COST:** What are the company's/testbeds most important cost factors? How are they linked to revenue?
- **REVENUE | FINANCING:** How does the company/testbed generate revenue from the value proposition?

3. PIT Checklist

Cities face diverse challenges in balancing quality of life, environmental concerns, and efficient logistics. Freight transport is increasingly prioritised in urban mobility strategies due to its rapid growth, fueled by factors like online trade. However, incomplete data and numerous stakeholders complicate decision-making. Testbed initiatives can be initiated by various actors and motivations, aiming to address local issues or emulate successful practices. The presented PIT model offers a standardised framework for planning and implementing testbeds, comprising 3 elements (1) process model, (2) testbed profile and (3) testbed canvas. These elements, influenced by business process modelling and strategic management tools, allow for comprehensive analysis and engagement with stakeholders at different levels. Ultimately, the PIT model enhances transparency and efficiency in urban testbed projects, aiding those involved in their development and execution. The Checklist below summarises the process.

Sustainable Urban Logistics Testbed Checklist
✔ **COMMITMENT** to freight transport and logistics.
✔ **MINDSET** for innovation and “stories” for policy.
✔ Clear **UNDERSTANDING** of processes and requirements as well as knowledge of stakeholders.
✔ **ANCHORING** of the topic in all thematically relevant administrative units.
✔ A **NEUTRAL BODY** as topic scout, moderator, mediator, catalyst, multiplier and ambassador.
✔ Recombine existing **KNOW-HOW** of city employees in the existing administrative structures and strengthen it with external expertise.
✔ Goal-oriented teams with strong **IMPLEMENTATION COMPETENCE**, clearly defined pilot projects with a comprehensive know-how pool and direct contact to decision makers.
✔ Create **INTERNAL and EXTERNAL FRAMEWORKS** for testing new concepts. Identify and overcome barriers to innovation internally.
✔ Bring interests and goals to a **COMMON LEVEL** of collaboration.
✔ Create binding time horizons and thus **PLANING SECURITY.**

Table 1: Sustainable Urban Logistics Testbed Checklist