RAIL4CITIES

Consolidated impact analysis tool

Deliverable 4.2

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1 Executive summary

This report presents a comprehensive framework for the evaluation and management of social, economic, and environmental impacts related to station-level interventions. Combining rigorous economic evaluation methodologies—such as Cost-Benefit Analysis (CBA)—with broader, more holistic approaches like Sustainable Return on Investment (S-ROI), the project offers a multidimensional perspective on value creation that extends beyond traditional financial metrics.

Central to this work is a specialized digital tool designed to streamline the collection, validation, and consolidation of data across multiple interlinked Excel worksheets. This tool automates critical processes, enhances data integrity, and guides users through a structured workflow encompassing activity registration, cost tracking, impact estimation, and outcome analysis. The tool's design prioritizes usability and operational efficiency, supporting municipal technicians and stakeholders in managing complex datasets and performing sophisticated evaluations with greater confidence and accuracy.

To facilitate effective adoption, the report delineates the minimum technical knowledge and skills required, including familiarity with cost-benefit methodologies and the use of financial proxies within S-ROI frameworks. It also emphasizes the importance of organizational commitment and active participation from a diverse set of stakeholders—ranging from public administration and private sector entities to experts in mobility, sustainability, urban planning, and the local community. Such a participatory approach ensures that the tool's outputs are grounded in real-world contexts and can drive meaningful, sustainable transformations.

A detailed case study focused on the Ottignies station in Belgium demonstrates the practical application of the methodologies and tool. This example validates the system's capacity to replicate previous analyses and generate actionable insights that inform decision-making and strategic planning.

Ultimately, the tool serves as a repository and translator of the scientific research and knowledge generated throughout the project—such as the Sustainable City Promoters (SCPs), modelling methodologies, spatial analyses, and station-specific evaluations—making this knowledge tangible, accessible, and transferable to end-users. This approach ensures that valuable expertise is not lost but effectively leveraged to support sustainable development goals.

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2 Introduction

This report provides a comprehensive examination of the methodologies, tools, and practical applications developed to evaluate and manage the social, economic, and environmental impacts associated with station-level activities. By integrating rigorous economic evaluation methods such as Cost-Benefit Analysis (CBA) with broader frameworks like Sustainable Return on Investment (S-ROI), the report captures a wide range of outcomes beyond traditional market values.

At the heart of this work lies a specialized digital tool designed to facilitate efficient data management, validation, and consolidation across multiple interconnected Excel worksheets. Through automation and a structured workflow, the tool ensures data integrity and operational efficiency while guiding users through all key stages—from activity registration to comprehensive impact calculation.

The tool functions as a holistic system supporting the monitoring, analysis, and evaluation of project activities, structured into several interrelated modules that assist users in data entry, strategic planning, cost analysis, and outcome assessment.

To enable effective adoption, this report outlines the minimum technical requirements, knowledge, and skills necessary for municipal staff and practitioners to engage confidently with the tool's methodologies and functionalities.

Furthermore, the report emphasizes the importance of fulfilling critical case study prerequisites—ranging from data quality to stakeholder engagement and organizational commitment—to ensure meaningful, reliable, and actionable results that align with sustainable transformation objectives.

Finally, the practical application of the methodologies and tool is demonstrated through a case study centered on Ottignies station in Belgium, illustrating the tool's capacity to replicate, validate, and support real-world project evaluation and decision-making.

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3 Overview methodologies

This section outlines the methodological foundations used to assess the impacts of station-level activities, combining elements from Cost-Benefit Analysis (CBA) and Sustainable Return on Investment (S-ROI). While CBA provides a rigorous economic framework based on monetizing costs and benefits over time, S-ROI complements it by incorporating broader social and environmental outcomes that may not be easily captured through traditional market values.

Additionally, these methodologies are operationalized through the integration of the SAIT Tool and the SCP Model, which support the calculation of social impacts, reference costs, and long-term monitoring via KPIs. Together, they enable a more comprehensive and sustainability-oriented evaluation of interventions.

3.1 Summary of CBA and S-ROI Principles

3.1.1 CBA

Cost-Benefit Analysis (CBA) is an economic evaluation method used to assess the efficiency of public or private interventions by comparing their associated benefits and costs in monetary terms over time. The analysis aims to determine whether an investment leads to a net positive contribution to social welfare, taking into account both direct and indirect effects. It is commonly applied to infrastructure projects, environmental policies, social programs, and other long-term initiatives.

The fundamental metric in CBA is the **Social Net Present Value (SNPV)**, calculated as:

$$SNPV\ of Impacts = \sum_{t=0}^{T} \frac{\Delta(Bs_t - Cs_t)}{(1+r)^t}$$

Equation 1. SNPV

where:

- *SNPV* represents the Sustainable Net Present Value
- *T* is the maximum time horizon defined within the outcomes
- Bs_t are the impacts defined as benefits
- Cs_t are the impacts defined as costs
- *r* is the discount rate
- *t* is the time period

A project is considered economically viable if SNPV>0, indicating that the present value of benefits outweighs the present value of costs.

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An alternative indicator is the Benefit-Cost Ratio (BCR), also referred to as the Profitability Index (PI):

$$BCR = \frac{\sum_{t=0}^{T} \frac{\Delta(Bs_t)}{(1+r)^t}}{\sum_{t=0}^{T} \frac{\Delta(Cs_t)}{(1+r)^t}}$$

Equation 2. BCR

If BCR>, the investment is considered to yield a positive return.

In the context of sustainable solutions, traditional CBA may face limitations due to its focus on strictly quantifiable economic metrics.

3.1.2 S-ROI

When projects involve broader social or environmental impacts—such as public health improvements or long-term behavioural changes—complementary methods like Social Return on Investment (S-ROI) are valuable. S-ROI incorporates qualitative and intangible benefits, often identified through Theory of Change (ToC) frameworks, offering a more holistic assessment of value creation.

a) Theoretical approach of the simplified methodology

A brief summary of the procedure or steps followed in the S-ROI methodology presented in Deliverable 2.2 is provided below. The methodology would consist of two steps:

1. **Identification of costs and benefits.**

   - Identify all costs associated with implementing the proposed solutions, including direct costs such as materials or labour.
   - Identify potential benefits resulting from the implementation of the solutions, such as increased health benefits and emission reductions, through the Theory of Change (TOC) (Theory of Change in Ten Steps - NPC, n.d.) for each solution. These benefits are represented as the long-term outcomes for each solution.
   - Quantify both the costs and benefits as accurately as possible, considering available data and estimations. For this purpose, you can use either Reference Costs or Financial Proxies.

2. **Quantification of the S-ROI ratio.**

   - Calculate the S-ROI (Simplified Return on Investment) ratio by dividing the total benefits by the total costs incurred.
   - The formula for S-ROI is:

$$S - ROI = \frac{\Sigma\ Benefits}{\Sigma\ Costs}$$

Equation 3. S-ROI ratio

   a. Evaluate the resulting ratio to determine the overall efficiency and effectiveness of the proposed solutions implementation. A higher S-ROI indicates a more favourable return on investment, while a lower ratio suggests less efficiency in relation to costs.

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b) Qualitative example

The chosen example is "Implementation of solar panels in big parking lots." Below is the qualitative procedure for calculating the impact following the steps outlined in the previous section presenting the simplified methodology.

Step 1: Identification of Costs and Benefits

- Costs: these include expenses related to the price of the solar panels.

$$Cost(€) = Solar\ panels\ surface\ (m^2) \cdot Cost\ of\ solar\ panels\ per\ m^2(€/m^2)$$

- Benefits: in this case environmental benefits: amount of reduction of kWh produced with non-renewable energies. In this case, it would be assumed that the kWh generated by the solar panels are the ones replaced or reduced from those produced by non-renewable energies.

$$Reduction\ of\ kWh\ non-renewable\ sources(kWh) = Solar\ panels\ surface\ (m^2) \cdot Solar\ panels\ production\ per\ m^2(kWh/m^2)$$

Equivalent in sustainability scale of this saving in production with non-renewable energies (tCO2eq), and economic benefit.

$$Reduction\ of\ pollutants\ (tCO_2eq) = Reduction\ of\ kWh\ non-renewable\ sources(kWh) \cdot Pollutant\ ratio(tCO_2eq/kWh)$$

$$Benefit\ (€) = Reduction\ of\ pollutants\ (tCO_2eq) \cdot Economic\ impact(€/tCO_2eq)$$

Step 2: Quantification of the S-ROI Ratio

Using the simplified S-ROI formula:

$$S-ROI = \frac{\Sigma\ Benefits}{\Sigma\ Costs}$$

If we assume, for example, that the costs are €500,000 and the benefits are €700,000.

$$S-ROI = \frac{700.000\ €}{500.000\ €} = 1.4$$

An S-ROI ratio of 1.4 indicates that for every euro invested in the solar panels, there is a return of €1.40. This suggests a positive return on investment and indicates that the project is sustainably viable.

Once the methodology and the example have been presented, it should be mentioned that this is the simplest way to implement the S-ROI methodology. In this approach, only costs, benefits, and the ratio are calculated. Even though it is a simplified method, it still requires data input, although significantly less than the original methodology.

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3.2 SAIT Tool and Integration

The following figure (Figure 1) outlines the general methodology used to calculate the impacts of activities carried out at the stations.

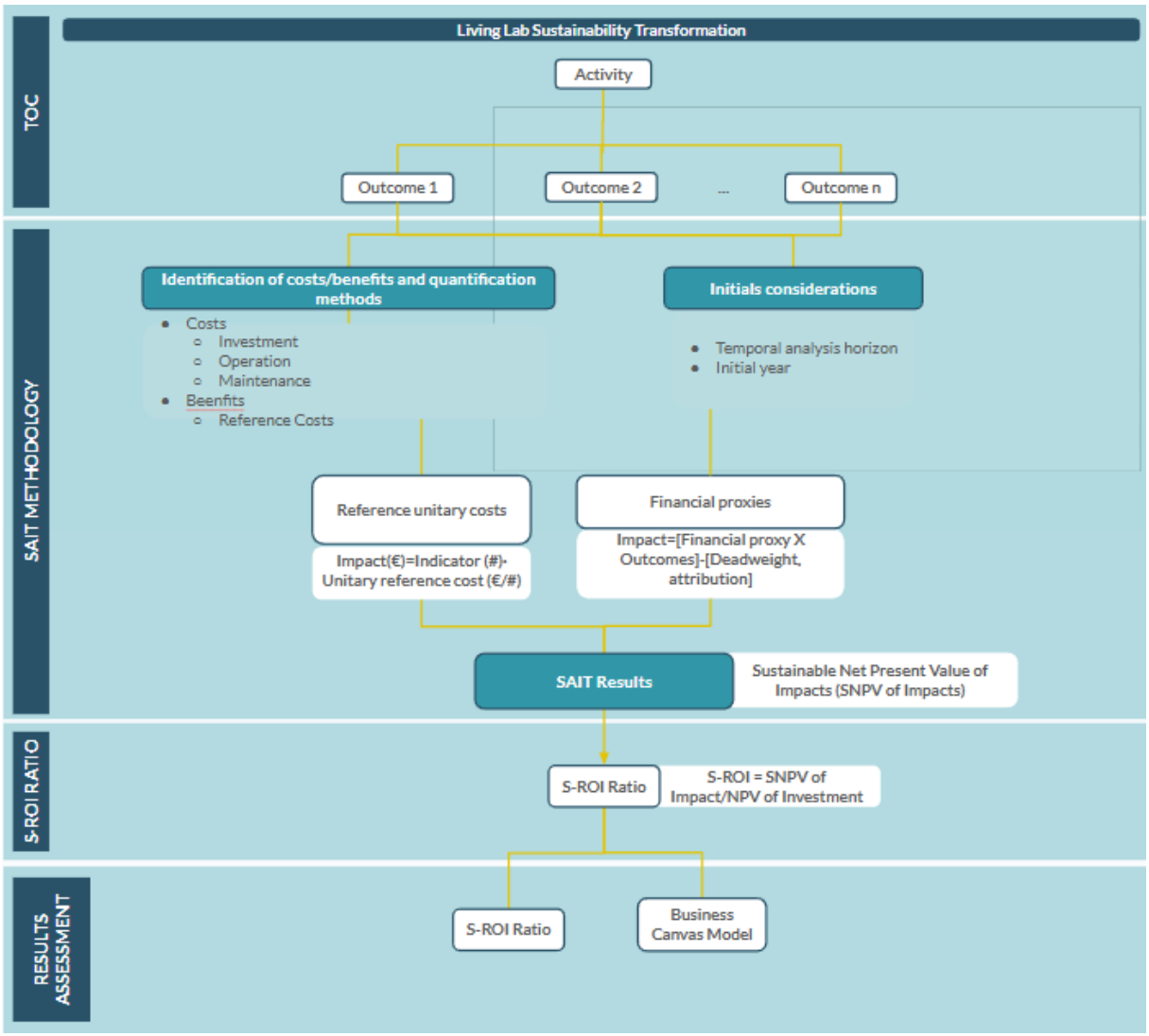

Figure 1. General scheme of the implemented methodology

As shown, the SAIT methodology has been implemented in the analysis, particularly in the calculation of the Social Net Present Value (SNPV).

Additionally, the figure below (Figure 2) illustrates the process for assessing a social impact, specifically an externality such as climate change, using the SAIT tool. This structured approach includes the following steps:

- Introduction of a reference cost (e.g., social cost of carbon)
- Input of the relevant indicator, in this case, tonnes of emissions
- Calculation of annual cash flows based on the projected changes
- Final computation of the Social Net Present Value (SNPV)

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EXTERNALITIES

Climate change

Time horizon	**10**	*years*
Indicators	**Difference in tones of emissions (positive if increase, negative if decrese)**	
Carbon dioxide (CO2)	**-42**	*T*
Nitrous oxide (N2O)	**-3,5**	*T*
Methane (CH4)	**-20**	*T*
Reference Costs		
Carbon dioxide (CO2)	250	*€/T*
Nitrous oxide (N2O)	100	*€/T*
Methane (CH4)	450	*€/T*
Climate change Impact		
Carbon dioxide (CO2)	**-10.500**	*€*
Nitrous oxide (N2O)	**-350**	*€*
Methane (CH4)	**-9.000**	*€*

Year	Annual cash flow
0	0
1	19.850
2	39.700
3	59.550
4	79.400
5	99.250
6	119.100
7	138.950
8	158.800
9	178.650
10	198.500

Total Annual Cash Flow	**1.091.750**	*€*
SNPV of Climate Change	**1.091.750**	*€*

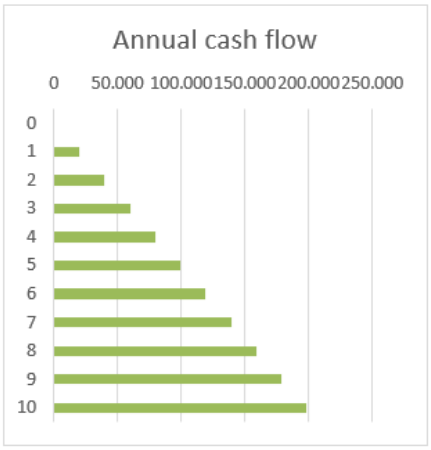

Figure 2. Extract the impact calculation method of the SAIT Tool

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4 Tool Concept and Objectives

4.1 Goal of the Impact Analysis Tool

This tool has been designed as a comprehensive system to monitor, analyse, and support the implementation and evaluation of activities developed throughout the project. It brings together several interrelated pages, each structured to guide users through data entry, strategic planning, impact tracking, cost analysis, and outcome evaluation.

Beyond its technical functions, the tool serves a broader strategic role:

- To organise and make operational the project's activities through structured processes (e.g., Business Model Canvas, Activity Costs, Impact Chains).
- To facilitate evidence-based decision making by integrating data collection, KPIs, and S-ROI (Social Return on Investment) analysis.
- To enable transparency and replicability through standardised formats and guided user inputs.
- To ensure that all outputs—such as the SCP Model), generated methodologies, spatial analyses, and assessments of monitoring stations—are not only captured but made tangible and transferrable.
- To avoid the loss of scientific and technical knowledge by transforming it into applicable formats that can be easily shared and used by end-users and stakeholders.

In this way, the tool acts not only as a monitoring and planning system but also as a vehicle for knowledge transfer and long-term impact.

The transformation of stations into sustainable, multifunctional hubs requires coordinated action and a shared vision among the key stakeholders involved. Given the range of actors — including municipal authorities, the railway company, local businesses, and surrounding communities — leadership is best assumed by the stakeholder with the greatest strategic interest and institutional capacity to manage long-term urban development. In most cases, this would be the municipal authorities in close partnership with the railway company.

These two actors are uniquely positioned to align transport infrastructure with urban planning objectives, and to coordinate the interests of other stakeholders. Public-private partnerships (PPPs) may offer a viable mechanism for mobilising the necessary initial capital investment, with contributions from both public sources (e.g., regional or national infrastructure funds, EU funding, or green finance instruments) and private entities (e.g., commercial developers or impact investors).

The initiative can thus be driven by a coalition led by the municipality and the railway operator, with the support of national funding schemes and private investment, justified by a robust cost-benefit or S-ROI analysis demonstrating long-term social and economic returns.

4.2 Requirements from methodologies

This section outlines the minimum technical requirements, knowledge, and skills needed by municipal staff to effectively use the tool. It aims to clarify the baseline conditions for successful adoption, ensuring that users can engage with the methodology and functionalities with confidence.

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Technical Requirements

- A standard desktop or laptop computer.
- Operating system: Windows (recommended) or macOS.
- Microsoft Excel (version 2016 or later), as the tool relies on built-in formulas, automated charts, and macros.
- Internet access is optional, only required for downloading updates or accessing supplementary support materials.

Minimum Knowledge and Skills

- Basic to intermediate proficiency in Microsoft Excel, including the use of cell editing, dropdown menus, filters, and worksheet navigation.
- Ability to interpret visual information presented through tables and graphs, including radar charts and comparative performance indicators.
- Capacity to follow structured instructions provided in the user guides integrated within the tool.
- Prior knowledge of Cost-Benefit Analysis (CBA) methodology, particularly in relation to categorising and interpreting investment, operational, and maintenance costs.
- Familiarity with Social Return on Investment (S-ROI) concepts, especially the use of financial proxies and the interpretation of S-ROI ratios.
- Analytical reasoning skills to assess the quality of inputs and understand their implications in terms of strategic decision-making.

Organisational Prerequisites

- Availability of dedicated time (minimum of 1–2 hours per week) for regular use, data input, and result interpretation.
- Clear assignment of internal responsibilities, designating one or more staff members to manage data entry, validation, and analysis.
- General understanding of the broader objectives of the project or intervention to ensure alignment between data inputs and expected outcomes.

4.3 Requirements from Study Case

The successful implementation of the case study relies on fulfilling a set of essential requirements that ensure the reliability, relevance, and impact of the analysis conducted with the tool. These requirements encompass data quality, technical expertise, and organizational commitment, as well as active involvement from a broad range of stakeholders. This holistic approach guarantees that the case study not only generates robust and actionable insights but also supports the sustainable transformation goals of the project site. The following sections detail the key prerequisites necessary to achieve these objectives.

Data Requirements

- Clear definition of the activities or interventions to be analysed.
- Detailed quantitative data on costs (investment, operational, and maintenance) associated with each activity.
- Identification and description of relevant outcomes at short, medium, and long term.

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- Supporting data or validated references for outcome monetization via reference costs or financial proxies.
- Spatial or contextual data to enable integration with spatial analysis where applicable.

Organizational and Strategic Commitments

- Commitment from the case study site (e.g., train station or urban area) to pursue a sustainable transformation aligned with project objectives.
- Active participation from all relevant stakeholders, including:
    - Local citizens and community members to ensure grassroots involvement.
    - Experts in mobility, sustainability, and urban planning relevant to the area.
    - Public administration representatives to guarantee regulatory compliance and institutional support.
    - Private companies or entities interested in potential funding and investment opportunities.
- Willingness to document challenges, lessons learned, and to share knowledge for broader transferability.
- Engagement of monitoring and evaluation personnel to ensure continuous improvement and accountability.

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5 Tool Architecture and functional design

This section provides a detailed explanation of the tool designed to assist users in managing, validating, and consolidating structured data across various Excel spreadsheets. By automating error detection, applying business logic, and guiding the user through a predefined sequence of steps, the tool ensures data integrity and significantly reduces manual processing time.

The following pages describe the purpose and functionality of each worksheet, explain the role of key buttons and macros, and highlight common errors and how they are handled. The aim is to offer both technical insight and practical instructions to help users navigate the tool effectively and efficiently.

5.1 System Architecture Overview

The architecture of the tool is presented below, providing a general overview of its structure.

A workflow diagram has been developed for each of the sheets—similar to a frontend development strategy that outlines all the elements to be displayed on a page and how the user interface interacts with them. These diagrams identify the following components:

- ❑ Sheet input
- ❑ Sheet output

Stage INPUTS/OUTPUTS

- ❑ Process or methodology followed, divided in:
  - Objectives — **Objectives**
  - Questions to be answered — **Questions**
  - Mid-outputs of the process — Mid-Outputs
- ❑ User inputs — **User**
- ❑ Suggestions or our inputs — **Our Inputs/Suggestions** / Sources

The workflow—and consequently, the tool—has been structured into five sequential stages, each addressing a key component of the overall methodology. The stages are as follows:

1. Stage 1: Activities and Impacts
2. Stage 2: Impact Calculation – Monetization
3. Stage 3: Impact Calculation – S-ROI Ratio
4. Stage 4: Implementation Roadmap
5. Stage 5: Monitoring of the Impacts

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This structured approach ensures clarity, consistency, and traceability throughout the analysis and decision-making process. Subsequently the stages are described in detail, as well as referenced with the Toolkit pages.

The Tool has been developed following a structured and modular architecture, as described above. Responsibility for the ownership, administration, and long-term maintenance of the tool will remain with CIMNE-CERCA, the institution that led its design and implementation. This includes ensuring the tool's technical updates, user support, and potential future adaptations.

5.1.1 Stage 1: Activities and Impacts

Stage 1 focuses on the creation of activities and the identification of their sustainable impacts at the station (Figure 3). To achieve this, three subtasks have been defined, each corresponding to one of the following pages: Activities and Impacts – 1, Activities and Impacts – 2 and Activities and Impacts – 3.

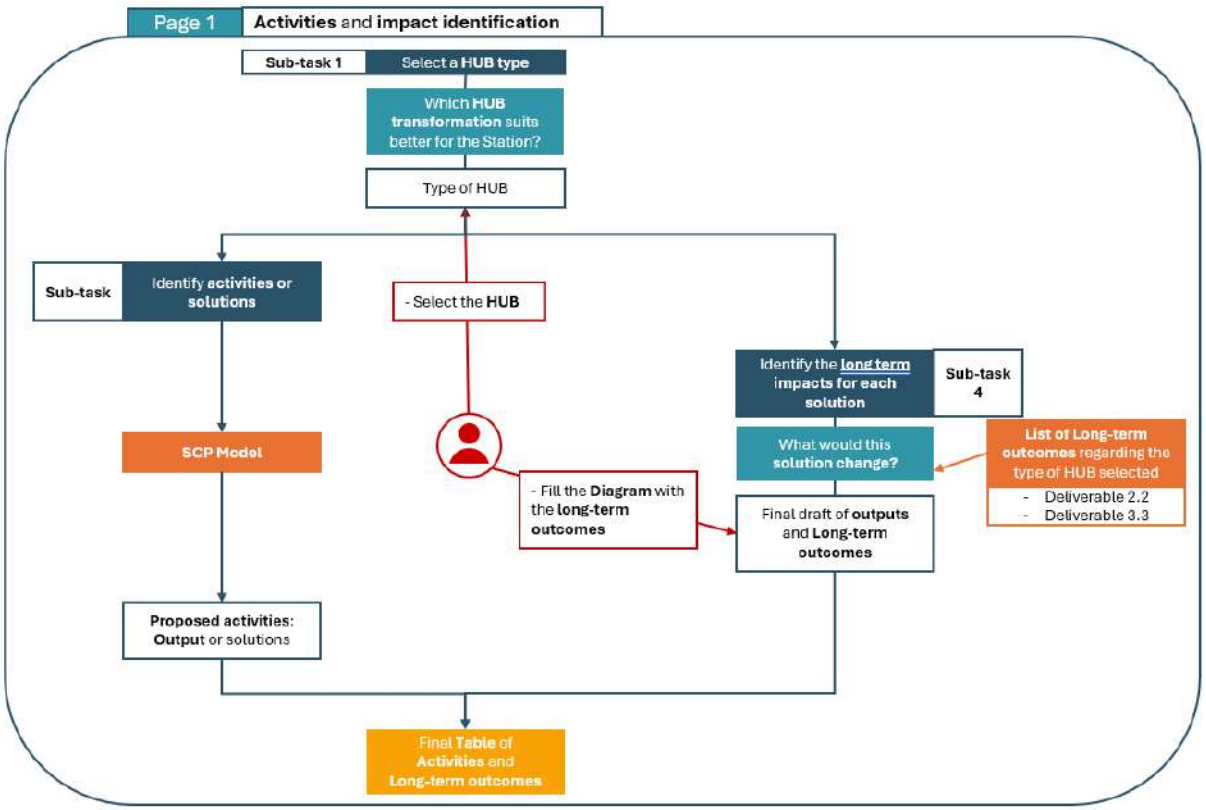

Figure 3. Stage 1: Activities and impacts workflow

- **Subtask 1** (Activity and Impacts – 1): The user begins by selecting the transformation path for the station. This involves choosing relevant *Fields of Action* and *Transformation Components*, which are part of the SCP (Sustainable City Promoters) model to be used in the following step.
- **Subtask 2** (Activity and Impacts – 2): On the left side of the diagram, the user applies the SCP model to identify potential solutions for each of the previously selected transformation components. This is done using a methodology that includes radar charts and structured criteria to guide solution selection.

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- **Subtask 3** (Activity and Impacts – 3): On the right side of the diagram, the user moves on to define the long-term outcomes of the selected activities. This is done using the *Theory of Change (ToC)* methodology, which helps articulate the expected impacts over time.

The final output of Stage 1 consists of a set of defined **activities** and their associated **long-term outcomes**—which represent the anticipated sustainable impacts of those activities at the station.

5.1.2 Stages 2 and 3: Economic Impact Calculation

Stages 2 and 3 together form the core of the economic impact assessment.

Stage 2 (Figure 4) focuses on the economic valuation of the proposed activities by monetizing their associated costs and benefits. It uses the outputs from Stage 1 (activities and long-term outcomes) as inputs for a two-part assessment:

- **Subtask 1 (Activity Costs – 1):** On the left side of the diagram, the user identifies the costs associated with implementing each activity. These include **investment**, **operation**, and **maintenance** costs. This information is compiled on the page *Activity Costs – 1* and provides a complete overview of the financial requirements for each activity.
- **Subtask 2 (Activity Costs – 2):** On the right side of the diagram, the user quantifies and monetizes the **benefits** linked to the **long-term outcomes** identified in Stage 1. To do this, the user selects the most appropriate valuation approach, either through **financial proxies** or **reference costs**, depending on the nature of each outcome and available data. This task is carried out on the page *Activity Benefits – 2*.

The **final output of Stage 2** is a set of **annualized costs and benefits** for each proposed activity, which serves as the input for the economic performance analysis in Stage 3.

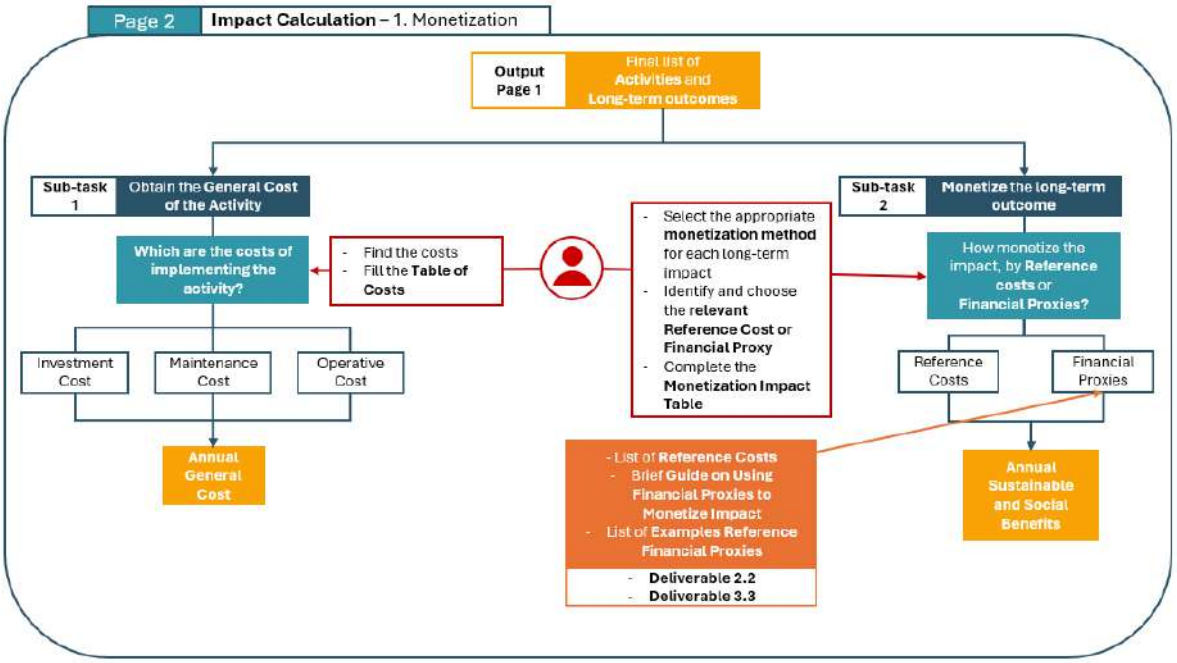

Figure 4. Stage 2: Economic Impact Calculation – Monetization workflow

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Stage 3 (Figure 5) builds upon the outputs generated in Stage 2—namely, the annualized **costs** and **benefits** of each proposed activity—with the objective of calculating the **Sustainable Return on Investment (S-ROI) ratio** for each solution.

- **Subtask 1 (Activity Costs – 3):** In this step, presented on the page *Activity Costs – 3*, the tool uses the annual cash flows (costs and benefits) to compute the **S-ROI ratio** for each activity. This ratio provides a quantitative measure of the economic performance of each solution, helping prioritize actions based on their cost-effectiveness and impact potential.

The **output of Stage 3** is the **S-ROI ratio** for each proposed activity, which serves as a key decision-making metric for comparing and selecting interventions.

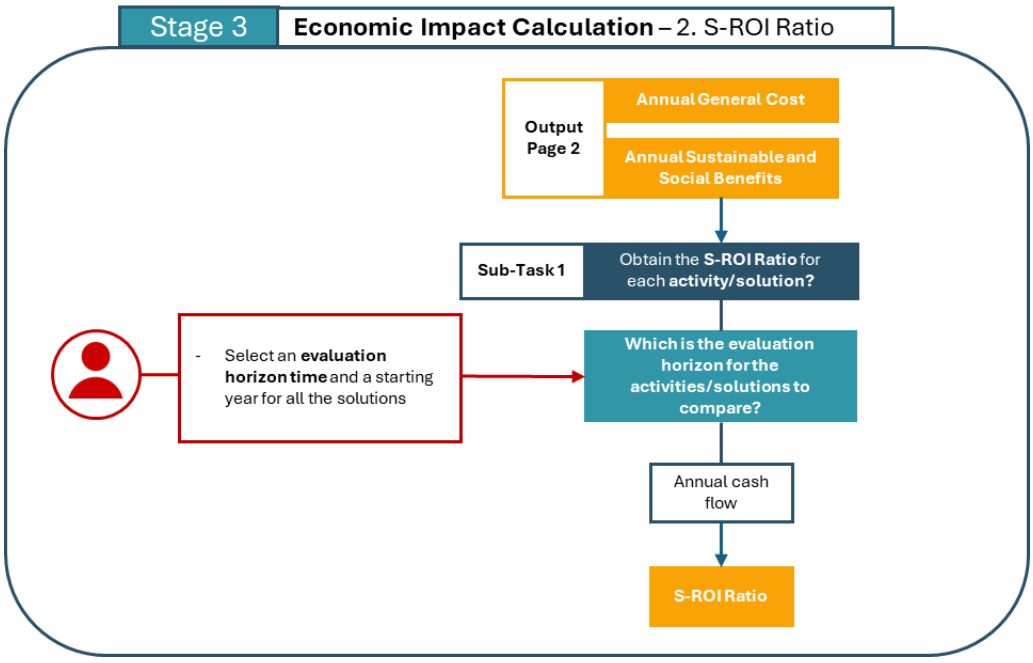

Figure 5. Stage 3: Economic Impact Calculation – S-ROI Ratio workflow

5.1.3 Stage 4: Implementation Roadmap

The objective of this stage (Figure 6) is to define a clear pathway for the sustainable transformation of the station. It builds upon the Business Model Canvas framework previously introduced in Deliverable 3.3.

- **Subtask 1 (Implementation Roadmap):** Using the different blocks of the Business Model Canvas, the user identifies the appropriate economic and business model needed to successfully implement the transformation activities.
- The output consists of a fully completed Business Model Canvas for each activity, with all blocks properly defined to guide the implementation strategy.

This structured approach ensures that the financial, operational, and strategic aspects of each activity are well understood and planned before execution.

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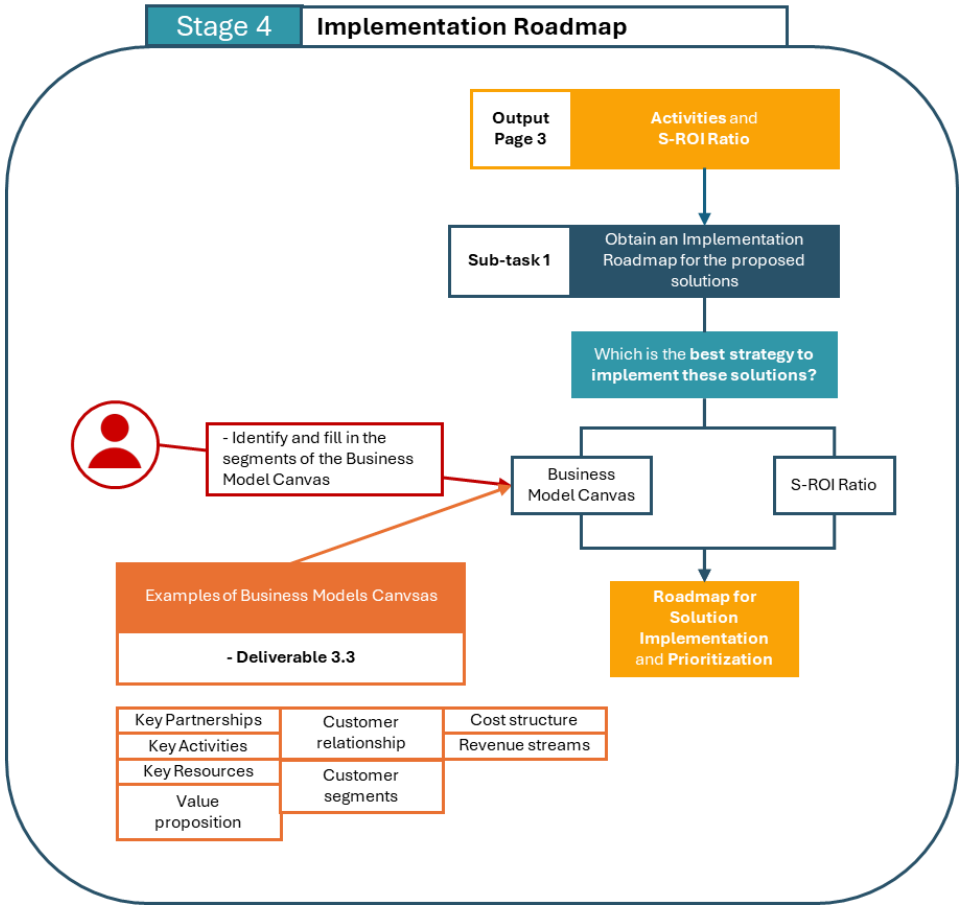

Figure 6. Stage 4: Implementation Roadmap wokflow

5.1.4 Stage 5: Monitoring of the impacts

The goal of this stage (Figure 7) is to enable continuous **tracking of the actual impacts** once the proposed solutions have been implemented at the station. The tool has been designed not only to support planning and implementation, but also to ensure a structured **follow-up process** to assess whether the expected impacts are being realized over time.

- **Subtask 1 (Monitoring):** In this final step, the user is required to input updated values based on new measurements or observations related to the station's condition. These values correspond to the **Key Performance Indicators (KPIs)** defined in **Stage 1**.

As the user enters new data, the **radar chart**—the same one used in Stage 1 during the creation of the activities—is automatically updated. This provides a visual comparison between the **initial expectations** and the **current performance** of the station.

This stage is also based on the **SCP (Sustainable City Promoters) model**, just like Stage 1, and therefore completes the methodology by linking planning, implementation, and long-term impact monitoring in a continuous improvement cycle.

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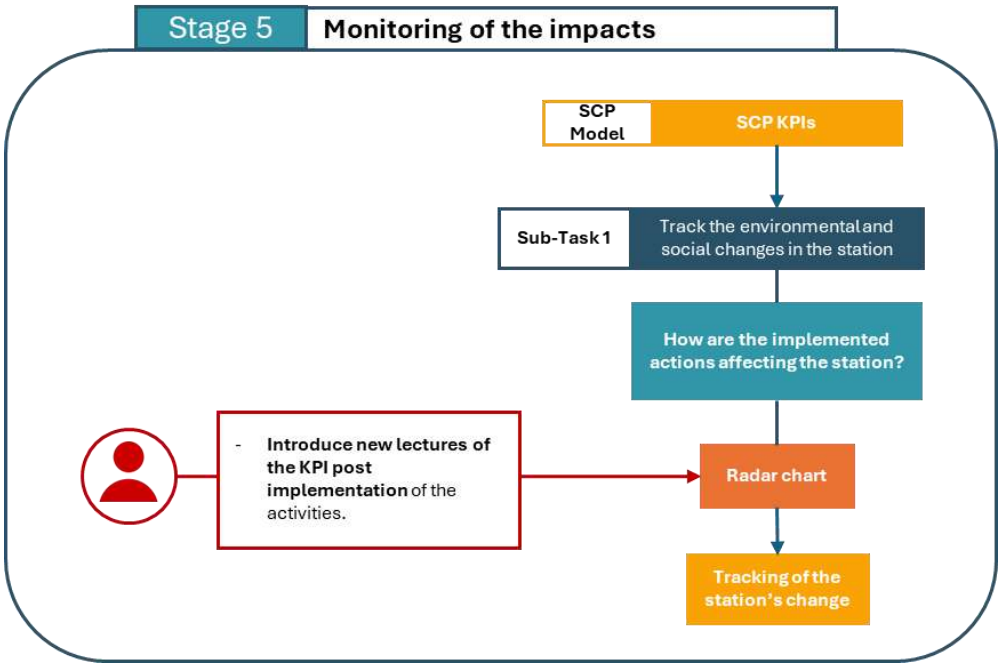

Figure 7. Stage 5: Monitoring of the impacts workflow

5.2 Key Functional Modules

This section provides a detailed functional description of each page that makes up the tool, outlining their specific purpose, main functions, role within the overall workflow, and key elements. The aim is to offer a clear understanding of how the different components interconnect to support the sustainable transformation process, from initial assessment to activity design, economic evaluation, strategic planning, and ongoing monitoring.

5.2.1 Page 1: Activities and Impacts – 1

- **General Purpose:** Allows the user to select components within various Fields of Action to evaluate their performance and impact using Key Performance Indicators (KPIs).
- **Main Function:** The user selects one or more components, and the tool automatically assigns related KPIs to each. It also provides access to a KPI Library to help the user better understand the metrics.
- **Role in the Overall Workflow:** This page serves as the starting point for creating activities aimed at the sustainable transformation of the train station. The selections made here are reflected in the next page for deeper analysis.
- **Key Elements:** Multi-select list of components, automatic KPI assignment, button to access the KPI Library.

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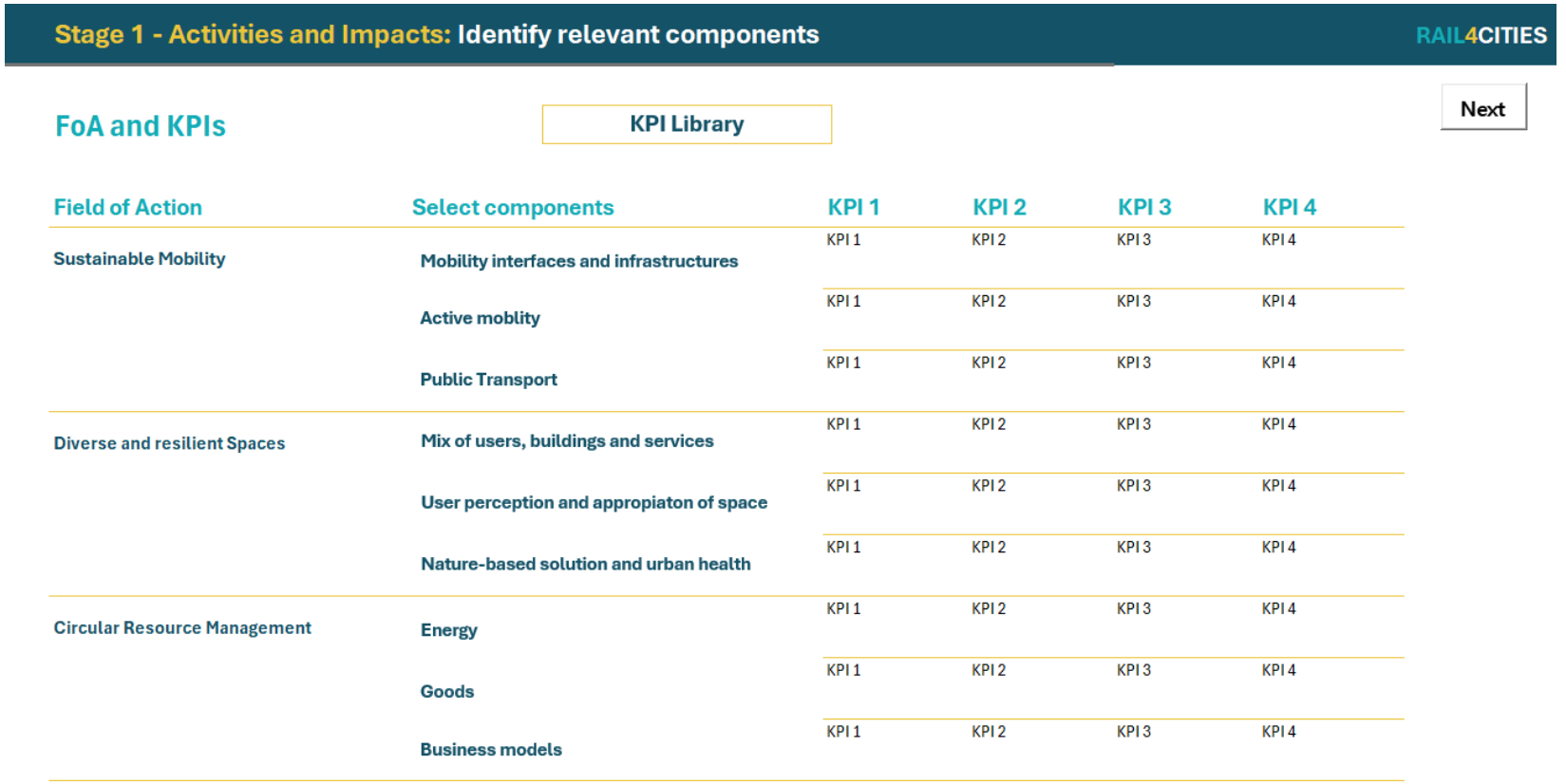

Figure 8. Toolkit page 1: Activities and Impacts – 1

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5.2.2 Page 2: Activities and Impacts – 2

- **General Purpose:** Based on the previous selection of components and KPIs for each Field of Action, this page allows the user to rate the current status of the train station for each KPI and generate radar charts that highlight weaknesses and areas for improvement.
- **Main Function:** The user evaluates assigned KPIs using scaled values that are then visualized through radar charts. Based on the results, the user can identify station shortcomings and use the "Solution Proposal" table to propose specific solutions using a methodology based on the SCP (Sustainability Change Process) model.
- **Role in the Overall Workflow:** This page transforms the previous selection into a visual and strategic diagnosis that allows the user to define concrete actions for progressing toward sustainable transformation.
- **Key Elements:** KPI value tables, radar charts, input fields for observations, issues, and solution proposals based on the SCP model.

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Stage 1 - Activities and Impacts: Station Pathway

Back

Sustainable Mobility

						Scale 1-10			Solution Proposal			
Component	KPI	Unit	Minimum Value	Current Value	Goal	Min. Value (1)	Current Value	Goal (10)	Weakness or Issue detected	Solution Proposed	Boundaries	What to change to overcome the boundaries?
Mobility interfaces and infrastructures	KPI 1		1	10	15	1	7	10		Community social allotment		
	KPI 2		2	15	35	1	5	10				
	KPI 3		2	15	35	1	5	10				
	KPI 4		2	15	35	1	5	10				
Active moblity	KPI 1		2	15	35	1	5	10				
	KPI 2		2	15	35	1	5	10				
	KPI 3		2	15	35	1	5	10				
	KPI 4		2	15	35	1	5	10				
Public Transport	KPI 1		2	15	35	1	5	10				
	KPI 2		2	15	35	1	5	10				
	KPI 3		2	15	35	1	5	10				
	KPI 4		2	15	35	1	5	10				

Figure 9a. Sustainable Mobility

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Diverse and Resilient Spaces

						Scale 1-10			Solution Proposal			
Component	KPI	Unit	Minimum Value	Current Value	Goal	Min. Value	Current Value	Goal (10)	Weakness or Issue detected	Solution Proposed	Boundaries	What to change to overcome the
Mix of users, buildings and services	KPI 1	mg	5	10	35	1	3	10				
	KPI 2	mg	5	10	35	1	3	10				
	KPI 3	mg	5	10	35	1	3	10				
	KPI 4	mg	5	10	35	1	3	10				
User perception and appropiaton of space	KPI 1	mg	5	10	35	1	3	10		**Youth cultural centre**		
	KPI 2	mg	5	10	35	1	3	10				
	KPI 3	mg	5	10	35	1	3	10				
	KPI 4	mg	5	10	35	1	3	10				
Nature-based solution and urban health	KPI 1	mg	5	10	35	1	3	10				
	KPI 2	mg	5	10	35	1	3	10				
	KPI 3	mg	5	10	35	1	3	10				
	KPI 4	mg	5	10	35	1	3	10				

Figure 9b. Diverse and Resilient Space

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Circular Resource Management

						Scale 1-10			Solution Proposal			
Component	KPI	Unit	Minimum Value	Current Value	Goal	Min. Value	Current Value	Goal (10)	Weakness or Issue detected	Solution Proposed	Boundaries	What to change to overcome the
Energy	KPI 1	mg	5	17	35	1	5	10				
	KPI 2	mg	5	19	35	1	5	10				
	KPI 3	mg	5	16	35	1	4	10				
	KPI 4	mg	5	10	35	1	3	10				
Goods	KPI 1	mg	5	10	35	1	3	10				
	KPI 2	mg	5	28	35	1	8	10				
	KPI 3	mg	5	10	35	1	3	10				
	KPI 4	mg	5	10	35	1	3	10				
Business model	KPI 1	mg	5	10	35	1	3	10				
	KPI 2	mg	5	10	35	1	3	10				
	KPI 3	mg	5	10	35	1	3	10				
	KPI 4	mg	5	10	35	1	3	10				

Figure 9c. Circular Resource Management

Figure 9. Toolkit page 2: Activities and Impacts – 2. a) Sustainable Mobility; b) Diverse and Resilient Space; c) Circular Resource Management

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5.2.3 Page 3: Activities and Impacts – 3

- **General Purpose:** Identify and record long-term outcomes resulting from the activities defined in the previous page (Activities and Impacts – 2).
- **Main Function:** Enables classification of outcomes into short, medium, and long term following a logical hierarchy based on the Theory of Change methodology. It supports automated data entry with validations and linkages between outcomes to ensure consistency.
- **Role in the Overall Workflow:** The long-term outcomes identified here will serve as the basis for quantifying economic benefits in the next page (Activity Costs – 2), connecting strategic planning with financial analysis.
- **Key Elements:** Input fields with dropdown lists for different types of outcomes, automatic validations for correct hierarchy, buttons to add outcomes, tools to organize and clean the table.

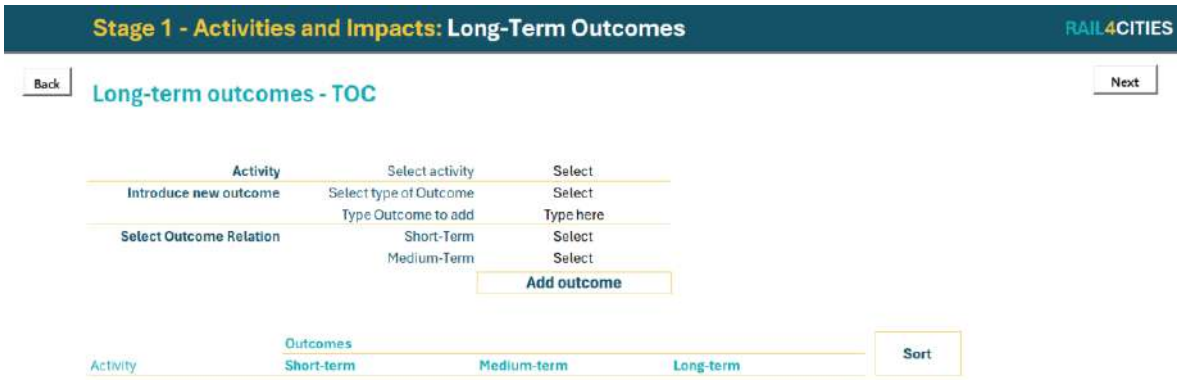

Figure 10. Toolkit page 3: Activities and Impacts - 3

5.2.4 Page 4: Activity Costs – 1 (General Costs)

- **General Purpose:** Record and organize general costs related to project activities to ensure a clear and consistent economic data foundation. These costs are based on the activities defined in previous pages.
- **Main Function:** Facilitate structured cost entry per activity, cost type, and concept, validate the information, and automatically add it to a sortable table for later use.
- **Role in the Overall Workflow:** Serves as the basis for capturing costs associated with the previously created activities, preparing economic data to be monetized and evaluated in the subsequent pages (Activity Costs – 2 and 3).
- **Key Elements:** Entry form (activity, cost type, concept, description, annual cost), button/macro to add costs with validation, table with record limit and automatic sorting, alerts for incomplete data or table limits.

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Figure 11. Toolkit page 4: Activity Costs - 1

5.2.5 Page 5: Activity Costs – 2 (Monetized Costs Linked to Long-Term Outcomes)

- **General Purpose:** Record and classify costs associated with activities and their long-term outcomes defined in Activities and Impacts – 3, using a specific monetization method.
- **Main Function:** Allow selection of the activity, linked long-term outcome, and monetization method (Reference Costs or Financial Proxies) to then add the data to the corresponding table, consolidating the monetized benefits that will feed the financial analysis.
- **Role in the Overall Workflow:** Connects the definition of activities and outcomes with their economic valuation, enabling monetary quantification of expected benefits and generating inputs needed to calculate the S-ROI in the next page.
- **Key Elements:** Dependent dropdowns for precise selection (activity, outcome, method), automatic tables separated by monetization method, field validation to avoid incomplete entries, dynamic insertion and automatic row formatting.

Figure 12. Toolkit page 5: Activity Costs - 2

5.2.6 Page 6: Activity Costs – 3 (S-ROI Calculation)

- **General Purpose:** Calculate the Social Return on Investment (S-ROI) for each activity by integrating costs from Activity Costs – 1 and monetized benefits from Activity Costs – 2 over a user-defined time horizon.
- **Main Function:** Import and consolidate cost and benefit data, distribute them annually according to the time horizon, apply adjustments such as deadweight and attribution, and calculate the S-ROI ratio (total adjusted benefits divided by total costs) for each activity.

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- **Role in the Overall Workflow:** Provides the final quantitative evaluation of the project's social and economic impact, supporting decision-making, activity prioritization, and validation of the social return generated.
- **Key Elements:**
    - Analysis Parameters (Top section):
        - Initial Year (D5): Start year for the analysis (e.g., 2025)
        - Number of Years (D6): Time horizon for the analysis (e.g., 10 years)
    - **Automatic Summary Table:** Generated by executing the corresponding macro; displays for each activity:
        - Activity name
        - Total costs accumulated during the period
        - Total accumulated benefits
        - S-ROI ratio (Total benefits / Total costs)
    - Individual Blocks by Activity: Detailed breakdown includes:
        - Costs by type: initial investment (year 0), annual operating and maintenance
        - Associated benefits, listed and summed to obtain annual total benefit
        - Annual cash flow with columns for year, total cost, total benefit, and net flow (benefit minus cost)
        - Final summary per block with the final S-ROI ratio

This structure enables a clear and detailed analysis of the social and economic return of each activity over time.

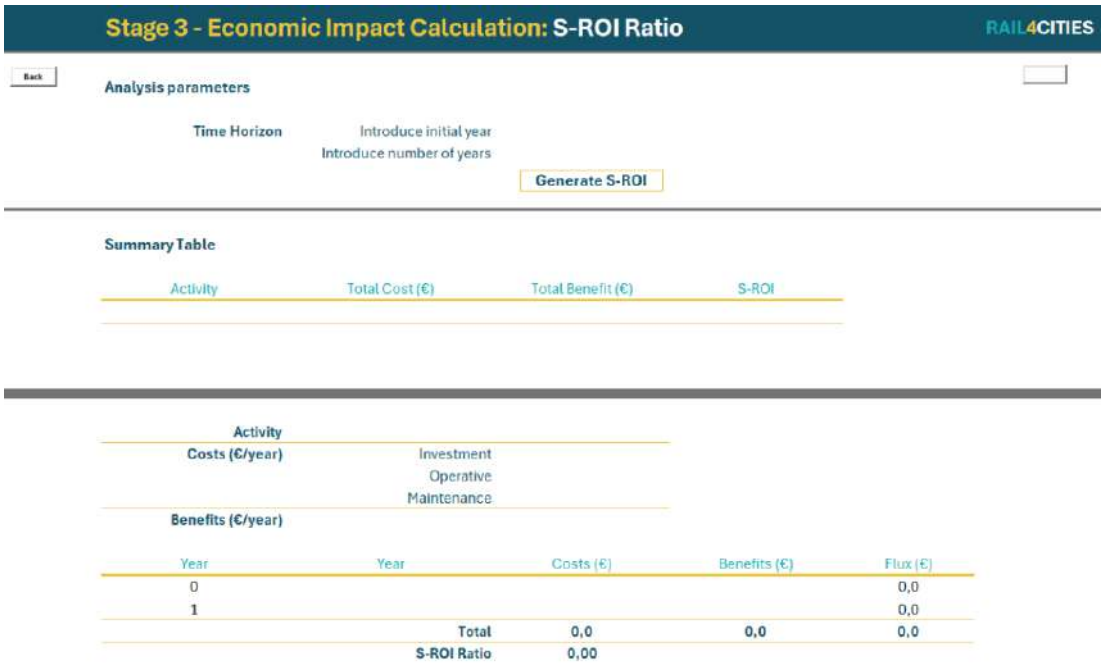

Figure 13. Toolkit page 6: Activity Costs – 3

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5.2.7 Page 7: Implementation Roadmap (General Overview)

- **General Purpose:** Act as a centralized control panel to manage and visualize the status of all project activities, facilitating monitoring and direct access to their respective Business Model Canvas.
- **Main Function:** Display an up-to-date list of activities, their progress status (e.g., "Draft", "In progress", "Completed"), and allow quick navigation to each activity's canvas or the creation of new activities via interactive buttons.
- **Role in the Overall Workflow:** Acts as a bridge between economic management of activities (costs and benefits) and strategic planning (business model), centralizing key information for tracking and updating. It is the main interface from which the user can control overall project progress.
- **Key Elements:**
    - Table listing activities automatically extracted from Activity Costs – 1
    - Activity column: name of the activity
    - Status column: status of the Business Model Canvas (Not started, In progress, Completed)
    - "Go" button for direct access to the individual canvas

Figure 14. Toolkit page 7: Implementation Roadmap

5.2.8 Subpage Business Model Canvas (Individual Canvas per Activity)

- **General Purpose:** Provide a visual and interactive space where users can build and modify the business model for each registered activity, supporting comprehensive strategic design.
- **Main Function:** Allow users to input, organize, and view the Business Model Canvas elements distributed across its 9 classic blocks, with a panel for quickly and structurally adding new items.
- **Role in the Overall Workflow:** Links strategic planning (business model) with execution and evaluation of activities, allowing each activity to have a defined business model as the foundation for its implementation and assessment.
- **Key Elements:**
    - Visual canvas with 9 blocks: Key Partners, Key Activities, Key Resources, Customer Relationships, Channels, Customer Segments, Cost Structure, Revenue Streams
    - Top panel for entering new items in specific blocks
    - Button to add items quickly and neatly

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- Easy navigation to the general overview via “Back” button

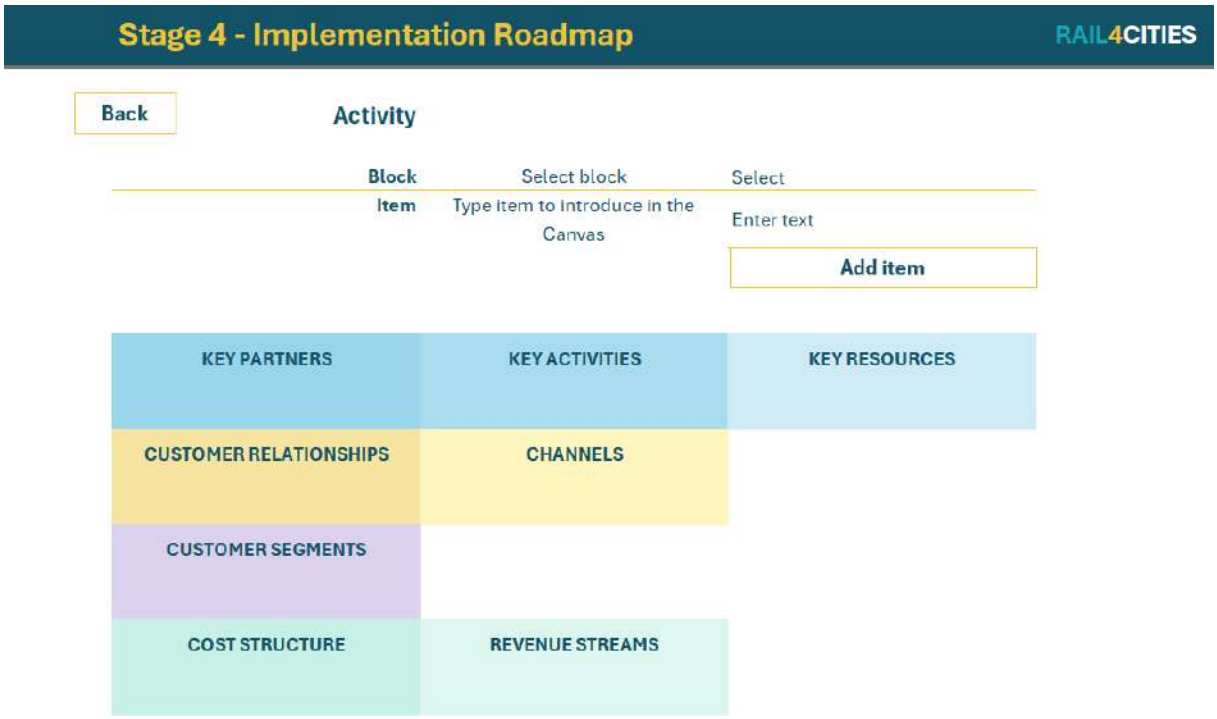

Figure 15. Toolkit subpage: Implementation Roadmap

5.2.9 Page 8: S4. Monitoring

- **General Purpose:** Allow visual and comparative tracking of KPIs in three key areas, making it easier to evaluate their evolution over time.
- **Main Function:** Display tables with historical KPI data and automatically generate radar charts to visualize changes and trends.
- **Role in the Overall Workflow:** Serves as a monitoring tool to validate results and support decision-making based on measurable indicators.
- **Key Elements:**
    - Visualization of KPIs grouped into three strategic areas
    - Easy incorporation of new measurements while maintaining format
    - Automatic update of radar charts to compare periods
    - Macros that automate data and chart management

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Sustaniable Mobility

Add new measurment | Update Charts

Component	KPI	Unit	Minimum Value	Initial Value	Goal	Measure	Min. Value (1)	Initial Value	Goal (10)	Measure
Mobility interfaces and infrastructures	KPI 1		1	10	15	9	1	7	10	6
	KPI 2		2	15	35	9	1	5	10	3
	KPI 3		2	15	35	9	1	5	10	3
	KPI 4		2	15	35	9	1	5	10	3
Active moblity	KPI 1		2	15	35	9	1	5	10	3
	KPI 2		2	15	35	9	1	5	10	3
	KPI 3		2	15	35	9	1	5	10	3
	KPI 4		2	15	35	9	1	5	10	3
Public Transport	KPI 1		2	15	35	9	1	5	10	3
	KPI 2		2	15	35	9	1	5	10	3
	KPI 3		2	15	35	9	1	5	10	3
	KPI 4		2	15	35	9	1	5	10	3

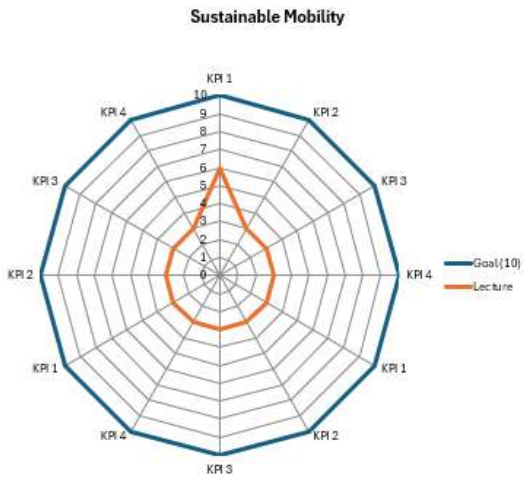

Figure 16a. Sustainable Mobility

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Diverse and Resilient Spaces

Add new measurment | Update Charts

Component	KPI	Unit	Minimum Value	Initial Value	Goal	Measure	Min. Value (1)	Initial Value	Goal (10)	Measure
Mix of users, buildings and services	KPI 1	mg	5	10	35	9	1	3	10	2
	KPI 2	mg	5	10	35	9	1	3	10	2
	KPI 3	mg	5	10	35	9	1	3	10	2
	KPI 4	mg	5	10	35	9	1	3	10	2
User perception and appropiaton of spac	KPI 1	mg	5	10	35		1	3	10	-1
	KPI 2	mg	5	10	35		1	3	10	-1
	KPI 3	mg	5	10	35		1	3	10	-1
	KPI 4	mg	5	10	35		1	3	10	-1
Nature-based solution and urban health	KPI 1	mg	5	10	35		1	3	10	-1
	KPI 2	mg	5	10	35		1	3	10	-1
	KPI 3	mg	5	10	35		1	3	10	-1
	KPI 4	mg	5	10	35		1	3	10	-1

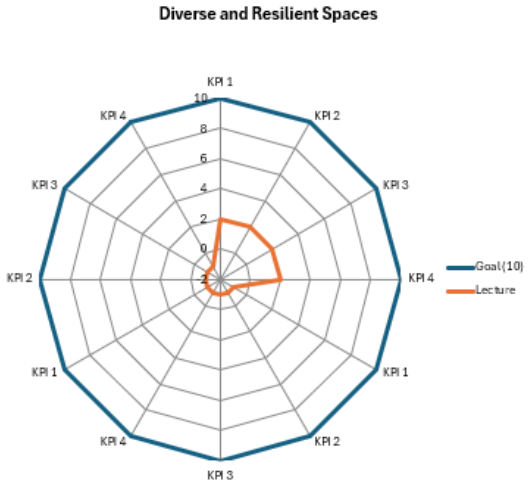

Figure 16b. Diverse and Resilient Spaces

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Circular Resource Management

Add new measurment | Update Charts

Component	KPI	Unit	Minimum Value	Initial Value	Goal	Measure	Min. Value (1)	Initial Value	Goal (10)	Measure
Energy	KPI 1	mg	5	17	35		1	5	10	-1
	KPI 2	mg	5	19	35		1	5	10	-1
	KPI 3	mg	5	16	35		1	4	10	-1
	KPI 4	mg	5	10	35		1	3	10	-1
Goods	KPI 1	mg	5	10	35		1	3	10	-1
	KPI 2	mg	5	28	35		1	8	10	-1
	KPI 3	mg	5	10	35		1	3	10	-1
	KPI 4	mg	5	10	35		1	3	10	-1
Business model	KPI 1	mg	5	10	35		1	3	10	-1
	KPI 2	mg	5	10	35		1	3	10	-1
	KPI 3	mg	5	10	35		1	3	10	-1
	KPI 4	mg	5	10	35		1	3	10	-1

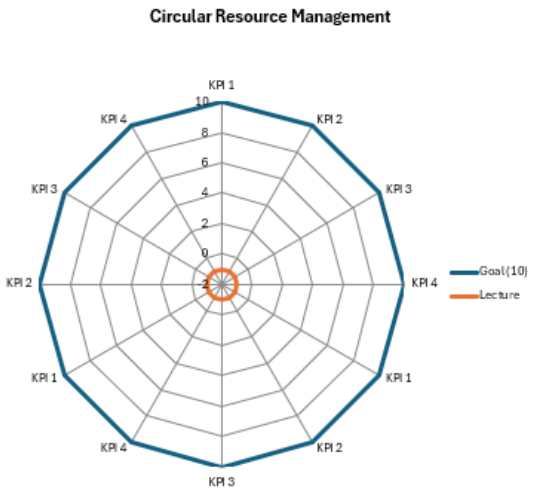

Figure 16c. Circular resource Management

Figure 16. Toolkit page 8: Monitoring: a) Sustainable Mobility; b) Diverse and Resilient Space; c) Circular Resource Management

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5.3 Integration with SAIT (other tools or models)

In addition to the S-ROI methodology itself, this tool is built upon two fundamental methodological frameworks:

1. **SAIT (Social Impact Assessment Tool)**

As discussed earlier in the Overview methodologies Chapter of the current document, the SAIT methodology is based on Cost-Benefit Analysis (CBA) applied to the assessment of social impacts of transport infrastructure. It relies on the calculation of impacts through reference costs and the projection of annual cost-benefit cash flows over a defined time horizon to estimate the Social Net Present Value (SNPV). A more detailed explanation of this methodology is provided in Section 3.

Both elements are reflected in the current tool, specifically in the following sheets:

- Activity Costs - 2: where benefits are entered using reference cost values.
- Activity Costs - 3: where annual cost and benefit flows are included, leading to the calculation of the S-S-ROI Ratio for each activity. This ratio represents the sustainable profitability of the investment.

2. **SCP Model**

The SCP Model is described in Deliverable 4.1 and has been implemented in the following parts of the tool:

- Activity Impacts - 1: All Fields of Action (FoA) and their components, as well as the use of Key Performance Indicators (KPIs) for each, are derived directly from the SCP framework.
- Activity Impacts - 2: The SCP methodology has been applied in both the Activity Design Table and the radar charts, providing a structured way to conceptualize and visualize each activity's performance.
- Monitoring: This page uses the SCP model to monitor actions and activities carried out at the station level through the FoAs, their components, and KPIs, all of which are visualized using radar charts.

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6 User Interface and Workflow

6.1 User Journey and Key Interaction Points

This user guide compiles detailed explanations of all the key sheets included in the tool, offering a step-by-step reference for users to correctly navigate and operate each section (access the Impact Analysis Tool). From registering activities and tracking outcomes to estimating costs and calculating social impact (S-ROI), each sheet is designed to support different phases of project planning, implementation, and evaluation. Whether you're filling out data forms, organizing results, or analyzing financial and social returns, this guide will help ensure consistency, accuracy, and ease of use across the entire workflow.

6.1.1 Activities and Impacts - Page 1

Objective

This page allows you to select components within different Fields of Action and define up to four KPIs (Key Performance Indicators) for each component. These KPIs are essential for evaluating the performance and impacts of each component and will be used on the next page for further analysis.

Detailed Use of the Page

1. **Component Selection**
    - In the "Select components" column, click to select the components you want to evaluate within each Field of Action.
    - You can select one or multiple components depending on the scope of your project or interest.
2. **Defining KPIs for Each Component**
    - Once a component is selected, you can manually enter up to four key indicators in the columns labeled KPI 1 to KPI 4 that you consider relevant for measuring the performance or impact of the component.
    - KPIs should be clear, specific, and measurable to facilitate later analysis.
    - You may leave some fields blank if you do not wish to define all 4 KPIs for a given component.
3. **Using the KPI Library Button**
    - If you need help choosing or understanding which KPIs might be relevant, click the KPI Library button.
    - This will open an organized list showing the Fields of Action, components, and suggested example KPIs for each.
    - Use this library as a reference to get inspiration or validate your KPI definitions.

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Tips for Efficient Use

- Define KPIs that are relevant, measurable, and truly reflect the impact or performance of the component.
- It is not mandatory to complete all 4 KPIs if not necessary, but try to include at least one for each selected component.
- Consult the KPI Library to help you formulate appropriate KPIs.
- Remember that the KPIs defined here will serve as the basis for the analysis on the next page, so it's important that they are accurate and consistent.

Important Note

The KPIs defined on this page will be used in **Activities and Impacts - Page 2** to conduct a detailed analysis of the impacts and results associated with each component.

6.1.2 Activities and Impacts – Page 2

Objective

This page allows for a detailed analysis of the KPIs defined on the previous page for each component and Field of Action. It enables users to visualize current performance against targets using radar charts and to record concrete proposals to improve results.

Detailed Use of the Page

1. **Review and Editing of KPIs**

   - Each row corresponds to a KPI defined for a specific component. Typical examples include entries like "Number of bicycles" or "Number of bike parking spaces."
   - For each KPI, you will see three key values to complete or review:
     - **Minimum Value**: The baseline or minimum expected value for the indicator.
     - **Current Value**: The currently measured or estimated value.
     - **Goal**: The target value you aim to achieve.
   - These values are automatically scaled on a 1 to 10 scale to facilitate comparisons and visualizations.

2. **Visualization with Radar Charts**

   - On the right side of each KPI table, Radar Charts are automatically generated to graphically represent current performance relative to the minimum and target values.
   - These charts help visually identify strengths and areas for improvement within each Field of Action and component.

3. **Solution Proposals and Qualitative Analysis**

   - In the right-hand table (**Solution Proposal**), for each KPI there are fields where the user can:
     - Identify weaknesses or problems associated with the indicator.
     - Propose specific solutions or actions to improve results.

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- Define limitations or barriers hindering progress.
- Suggest changes or necessary measures to overcome these barriers.

- This section is key to documenting the diagnosis and planning effective strategies.

4. **Strategic Use of the Page**

- Use this page as a foundation to create a clear and detailed action plan for each component.
- The combination of quantitative data (values and charts) with qualitative analysis (discussions on barriers and solutions) supports informed decision-making.

Practical Tips

- Carefully review each KPI and ensure the values reflect accurate and up-to-date data.
- Use radar charts to quickly detect which indicators require urgent attention.
- Be clear and specific when describing weaknesses and solutions so the team can act effectively.
- Save your work frequently to avoid losing changes.

6.1.3 Activities and Impacts – Page 3

Objective

This page allows you to record and organize *Outcomes* related to activities, classifying them into *Short-Term*, *Medium-Term*, and *Long-Term* categories. These are structured in a logical hierarchy to facilitate analysis and tracking.

Detailed Use of the Page

1. **Selecting the Activity (cell D6)**

- In cell D6, select the activity for which you want to record Outcomes.
- This selection activates and updates the following fields to align with the chosen activity.

2. **Selecting the Outcome Type (cell D7)**

- In D7, choose the type of Outcome you want to add:
  - **Short-Term**: Immediate result. Just enter the new Outcome text in cell D8.
  - **Medium-Term**: Intermediate result. A dropdown will appear in D9 to select the associated Short-Term Outcome.
  - **Long-Term**: Long-range result. Two dropdowns will appear:
    - **D9**: Select a related Short-Term Outcome.
    - **D10**: Select a Medium-Term Outcome associated with the selected Short-Term.

3. **Recording the Outcome (cell D8)**

- Type the descriptive text of the new Outcome you want to register.
- This text represents the specific desired result for the selected activity and time frame.

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4. **“Add Outcome” Button**

- Click the **“Add Outcome”** button to validate and insert the new result into the Outcomes table starting at row 16.
- The system will check that all required fields are completed and that hierarchical dependencies are valid (e.g., you cannot add a Medium-Term Outcome without an associated Short-Term one).

5. **Sort Button (next to the Outcomes table)**

- This button performs two key functions to organize the data:
  - **Groups Outcomes by activity**: Sorts the table so that results related to the same activity appear together.
  - **Filters the table to show only complete rows**: Hides any rows that do not include a full Outcome chain (Short-Term, Medium-Term, and Long-Term). This allows you to focus on complete result chains for clearer analysis.

Logic of the Table

- Outcomes are organized into separate columns:
  - **Column B**: Activity
  - **Column C**: Short-Term Outcomes
  - **Column D**: Medium-Term Outcomes
  - **Column E**: Long-Term Outcomes
- The hierarchy is preserved: each level depends on the previous one (Long-Term depends on Medium-Term, which depends on Short-Term).

Additional Features and Functionality

- Automatic Validation: The system prevents you from adding medium- or long-term outcomes without their respective prerequisites.
- Automatic Reset: After adding an Outcome, the input cells (D6 to D10) reset to their default values:
  - D6 and D7 return to “Select”
  - D8 returns to “Type here”
  - D9 and D10 return to “Select”

Common Error Messages and Their Meanings

Message	Meaning
“Please complete all required fields.”	Required data is missing in cells D6–D8.
“Please select an existing Short-Term outcome.”	You're trying to add a Medium-Term Outcome without selecting a Short-Term one.
“Please select both a Short-Term and Medium-Term outcome.”	For a Long-Term Outcome, required dependencies are missing.

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Recommendations for Optimal Use

- Make sure to complete the hierarchy in order: Short → Medium → Long to maintain logical structure.
- Use clear and specific descriptions for Outcomes to ensure easy interpretation later.
- If unsure, review the existing values in the Outcomes columns to understand what's already registered and how your new Outcome fits in.
- Save your file regularly to avoid losing entered data.

6.1.4 Activity Costs – Page 1

Objective

This page allows you to record and organize general costs associated with different project activities. Through a guided form, users can enter new costs in a standardized way, ensuring data consistency and facilitating future analysis.

Detailed Use of the Page

1. **Data Entry (cells D6 to D10)**

At the top of the sheet, you'll find a small form made up of the following cells:

- **D6 – Activity**

  Type or select the name of the activity to which the cost applies. If you have already entered this activity before, you can reuse it and add more than one cost for the same activity.

- **D7 – Cost Type**

  Select the type of cost from a dropdown list with the following options:

  - Investment Cost
  - Operative Annual Cost
  - Maintenance Annual Cost

- **D8 – Concept**

  Enter a general concept or title for the expense. Example: "Training materials."

- **D9 – Description**

  Add a short but clear description explaining the nature of the expense. Example: "Purchase of manuals and worksheets for the workshops."

- **D10 – Annual Cost (€)**

  Enter the numerical value of the cost in euros. Only positive numbers are allowed. If any of the fields display the text "Select" or "Enter text," it means they still need to be completed or edited.

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2. **“Add Cost” Button**

   - Once all fields in the form are completed, click the **“Add Cost”** button to insert the new entry into the table.
   - The system will automatically:
     - Validate that all fields are correctly filled in.
     - Insert a new row with the cost into the **General Costs** table.
     - Clear the form and reset all fields to their default values to allow for new entries.

3. **Viewing Registered Costs**

   The entered costs appear listed in a table with the following structure:

Column	Content
B	Activity name
C	Cost type
D	Cost concept
E	Cost description
F	Annual cost (€)

4. **“Sort Costs” Button**
   Located next to the table, this button allows you to automatically sort the registered costs for easier reading.

   When clicked, the system:

   - Sorts alphabetically by activity name.
   - Within each activity, sorts by cost type.

   This hierarchical order helps you easily review all costs associated with each activity.

Additional Features and Functionality

- Automatic Validation

If you try to add a cost with empty fields or an invalid value, an error message will appear indicating what is missing or needs to be corrected.

Recommendations for Optimal Use

- Make sure to follow the logical order: first select the activity, then the cost type, and finally complete the details.
- Use clear and concise descriptions to make it easier to review costs later.
- Avoid entering non-numeric values in D10 to prevent errors during validation.

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6.1.5 Activity Costs – Page 2

Objective

This page allows you to record and organize monetized costs associated with activities and their Long-Term Outcomes, linking them to one of two available monetization methods: **Reference Costs** or **Financial Proxies**. Records are automatically placed into one of two tables depending on the selected method.

Detailed Use of the Page

1. **Select the Activity (cell D7)**

   In cell D7, select the activity for which you want to register a monetized cost. The available options are automatically sourced from the *Activities and Impacts – Page 3* sheet.

2. **Select the Long-Term Outcome (cell D8)**

   After selecting the activity, a dropdown list will appear in cell D8 containing the Long-Term Outcomes associated with that activity. This ensures you can only link valid and relevant outcomes to the selected activity.

3. **Select the Monetization Method (cell D9)**

   In this cell, choose how you wish to monetize the outcome:

   - Reference Costs: Use standard values or previous studies as the cost basis.
   - Financial Proxies: Use financial approximations to estimate the economic benefit.

   Each method corresponds to a different table within the sheet.

4. **"Add" Button**

   Click the **"Add"** button to validate and insert the new entry. The system will verify that all fields are correctly filled and add the entry to the appropriate table based on the selected monetization method.

Table Logic

Once benefits are submitted to their respective tables (with *Activity* and *Long-Term Outcome* fields completed), the user must manually fill in the remaining columns.

5. **Reference Costs Table**: registers estimated benefits using reference values.

   Relevant columns:

   - **Column B**: Activity
   - **Column C**: Long-Term Outcome
   - User must manually fill in:
   - **Column D**: Reference cost used (€/#)
   - **Column E**: Indicator (#)
   - **Column F**: Annual economic value (€)
     - Automatically calculated as: Reference Cost × Indicator

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6. **Financial Proxies Table (located after Reference Costs): r**egisters estimated benefits using financial proxies.

Relevant columns:

- Column B: Activity
- Column C: Long-Term Outcome
- Column D: Description of the financial proxy used
- Column E: Indicator (#)
- Column F: Annual value of the proxy (€/year·#)
- Column G: Deadweight (%): Percentage of change that would have occurred anyway, without the project intervention
- Column H: Attribution (%): Portion of the impact that can be attributed solely to the activity, excluding external factors
- Column I: Annual economic value (€)
    - Automatically calculated as: Value × Indicator × (1 - Deadweight - Attribution)

Additional Features and Functionality

- Dynamic Row Insertion: Tables automatically expand when new records are added, without overwriting other areas.
- Automatic Validation: Records cannot be added if any required field is empty or contains invalid values (e.g., "Select").

Common Error Messages and Their Meaning

Message	Meaning
"Please complete all required fields."	One or more fields are empty or unselected.

6.1.6 Activity Costs – Page 3

Objective

This page aims to calculate the S-ROI (Social Return on Investment) for each activity by combining its costs and monetized benefits over a defined time horizon. The S-ROI ratio evaluates the social profitability of an intervention using the formula: S-ROI = Adjusted Total Benefits / Total Investment Costs.

Detailed Use of the Page

1. **Automatic Data Import**

The sheet automatically imports information recorded in *Activity Costs – Page 1* and *Activity Costs – Page 2*, including:

- General costs per activity: initial investment, operational costs, and maintenance costs.
- Monetized benefits, derived from:
    - Reference Costs (avoided or equivalent costs).

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- Financial Proxies (estimated economic value of social or environmental impacts). Data is grouped by activity and organized by type of cost or benefit.

2. **Definition of the Time Horizon**

   The user can define the number of years to analyze (e.g., 5 years). This setting directly affects the calculation of annual flows and is structured as follows:

   - Year 0: Corresponds to the time of investment or project start-up. Only investment costs are considered.
   - Years 1 to N: Correspond to the operational phase, including:
     - Operational and maintenance costs.
     - Estimated benefits associated with monetized Long-Term Outcomes.

3. **Annual Distribution of Costs and Benefits**

   Each activity has its own calculation table where the following are recorded:

   - Annual costs, broken down by type.
   - Adjusted annual benefits.

4. **S-ROI Calculation**

The system calculates the S-ROI ratio individually for each activity by PRESSING THE **"Generate S-ROI"** BUTTON after entering the time horizon and starting year values:

- All adjusted benefits over the time horizon are summed.
- Investment costs (mainly in Year 0) are summed.
- The S-ROI ratio is calculated as: S-ROI = Adjusted Benefits / Total Costs

This result indicates how many euros of social value are generated for every euro invested.
To perform the calculation, press the **"Generate S-ROI"** button.

Key Concepts

- Year 0: Investment year. Only initial costs are accounted for.
- Years 1 to N: Operational stage with recurring costs and annual benefits.
- S-ROI Ratio: Social return indicator. A value of 3 means that for every euro invested, three euros of social value are generated.

6.1.7 Implementation Roadmap Page (General Summary)

Objective

This sheet serves as a control panel to view and manage all activities that are developing their Business Model Canvas. It allows users to check the status of each activity, access the corresponding individual canvas, and create new activities.

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Detailed Use of the Page

1. **Creating New Canvases**
    - Business Model Canvases are created for each activity by clicking the “Create Business Model” button.
    - Below, a list will appear with the name of each activity.
2. **List of Canvases by Activity**
    - A list of activities working on their Business Model Canvas is displayed.
    - The current status is shown for each activity, which can be:
        - Not started
        - In progress
        - Completed
3. **Accessing the Individual Canvas**
    - Each activity has a **“Go”** button that opens the sheet with the corresponding canvas directly.
4. **Using the Help Button**
    - On the “Implementation Roadmap” sheet, there is a “Help” button that opens a sheet with a complete example of a Business Model Canvas.
    - This sheet shows the structure and explains each block of the canvas to guide the user in correctly developing their business models.

6.1.8 Business Model Canvas (Individual Canvas per Activity)

Objective

This sheet allows users to build and visualize a complete business model for a specific activity, using the standard Business Model Canvas approach.

Detailed Use of the Page

1. **Canvas Structure**
    - The 9 blocks of the Business Model Canvas are displayed in a visual layout, with color-coded sections for easier reading:
        - Key Partners
        - Key Activities
        - Key Resources
        - Customer Relationships
        - Channels
        - Customer Segments
        - Cost Structure
        - Revenue Streams

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- Each block is shown as a separate table with a pastel-colored background to facilitate visual identification.

2. **How to Add Information to the Canvas**

- At the top panel, select the Block that corresponds to your entry.
- Type the content in the Item field.
- Click the "Add Item" button to insert the text automatically into the corresponding table.

You can use the **"Back"** button at the top to return to the "Implementation Roadmap" sheet.

Usage Tips

- Write specific and descriptive phrases when adding items.
    - Avoid: "NGOs"
    - Better: "Collaboration with local NGOs for activity outreach"
- Limit the content to 3–4 items per block to maintain visual clarity.
- If in doubt about the purpose of a block, use the "Help" button on the sheet to access definitions and examples.

6.1.9 Sheet S4. Monitoring

Objective

This sheet allows for a visual and detailed monitoring of KPIs (Key Performance Indicators) across three strategic areas using data tables and automatically generated radar charts. It facilitates the evaluation of progress over time and comparison between different measurements.

Detailed Use of the Sheet

1. **KPI Table**

- Each row corresponds to a KPI introduced at the beginning of the project.
- For each KPI, you'll see the values entered in the sheet **Activity and Impacts - 2**:
    - Minimum Value
    - Current Value
    - Goal

2. **Radar Charts**

- To the right of each KPI table, you'll find **Radar Charts** that graphically represent current performance in relation to the minimum and the goal.

Page Features

- Add New Measurement
    - **Button: "Add New Measurement"** — runs the macro AddNewMeasurementColumn.

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- This action duplicates the last data column to the right, copying the editable header “Date,” column width, and cell formatting.

- Update Charts
- Button: “Update Charts” — runs the macro CreateMultipleRadarCharts.
- The macro deletes the old charts and generates new ones with the latest data, positioning and formatting both charts and titles correctly.

Recommendations for Efficient Use

- Each time you add a new measurement, press the “Update Charts” button to refresh the charts with updated information.
- Use the “Add New Measurement” button to maintain the format and structure of the columns.
- Manually edit the header “Measurement” to include the corresponding date for each new measurement (e.g., “06/25”).

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7 Insights from Pilot Applications

For the practical application of the tool, the case of the Ottignies station in Belgium has been selected. This case was originally presented in Deliverable 3.3. Based on the results shown in that deliverable, the tool has been used to replicate those outcomes. The aim is to demonstrate how the same conclusions can be reached using the tool.

In the case of Ottignies station, through spatial analysis and meetings with local stakeholders and experts, it was decided to explore the implementation of a community social allotment and a youth cultural centre.

In Deliverable 3.3, the process begins with the identification of long-term outcomes. These outcomes are listed below (Figure 17 and Figure 18).

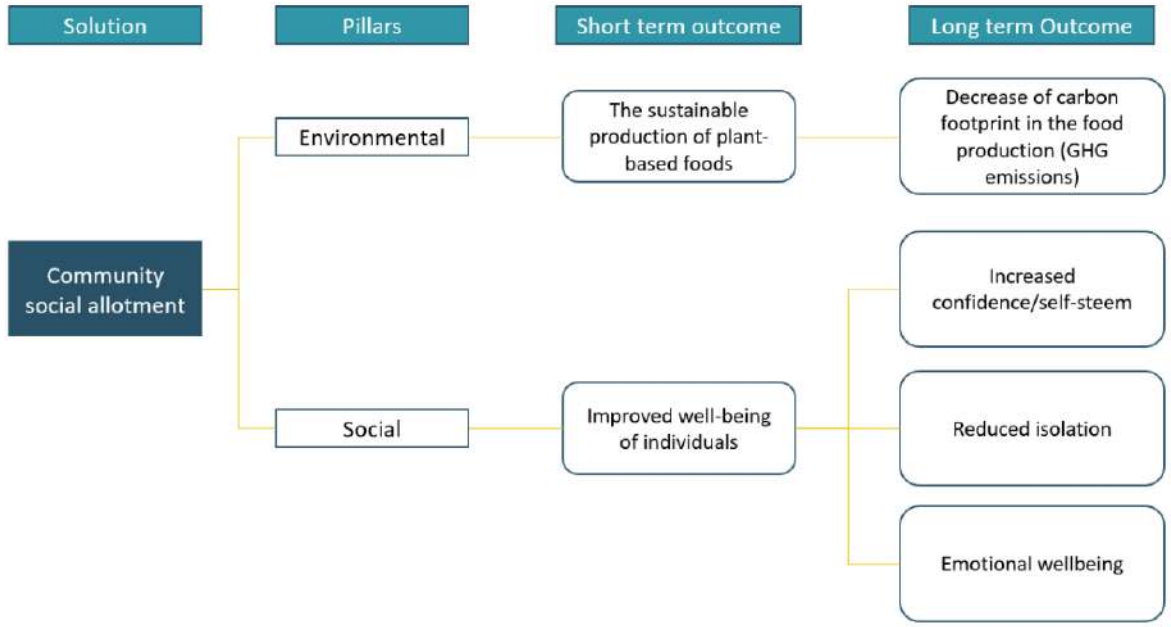

Figure 17. Community social allotment: TOC outcomes (Source: D3.3)

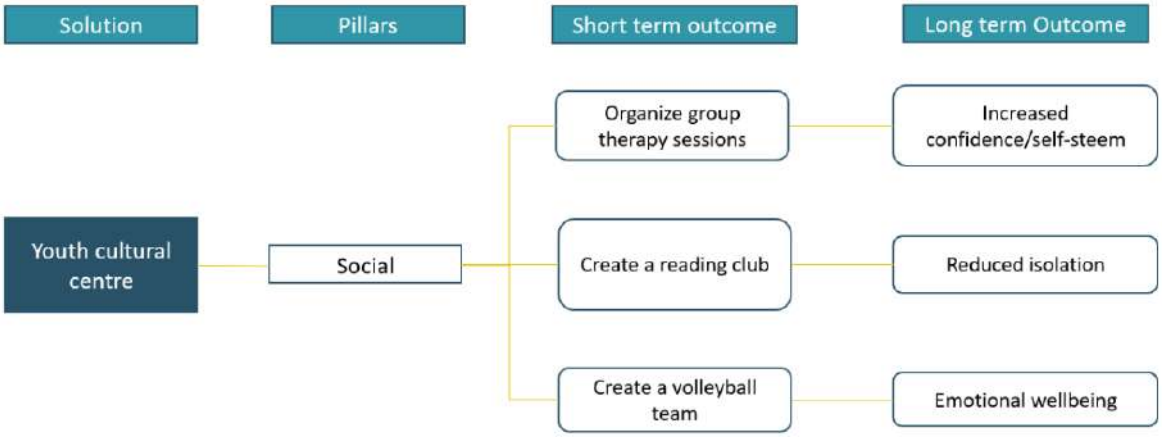

Figure 18. Youth cultural centre: TOC outcomes (Source: D3.3)

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Now, using the tool — specifically the "Activities and Impacts - 3" page, where the Theory of Change (ToC) methodology is implemented — the long-term outcomes identified in Deliverable 3.3 have been incorporated (Figure 19).

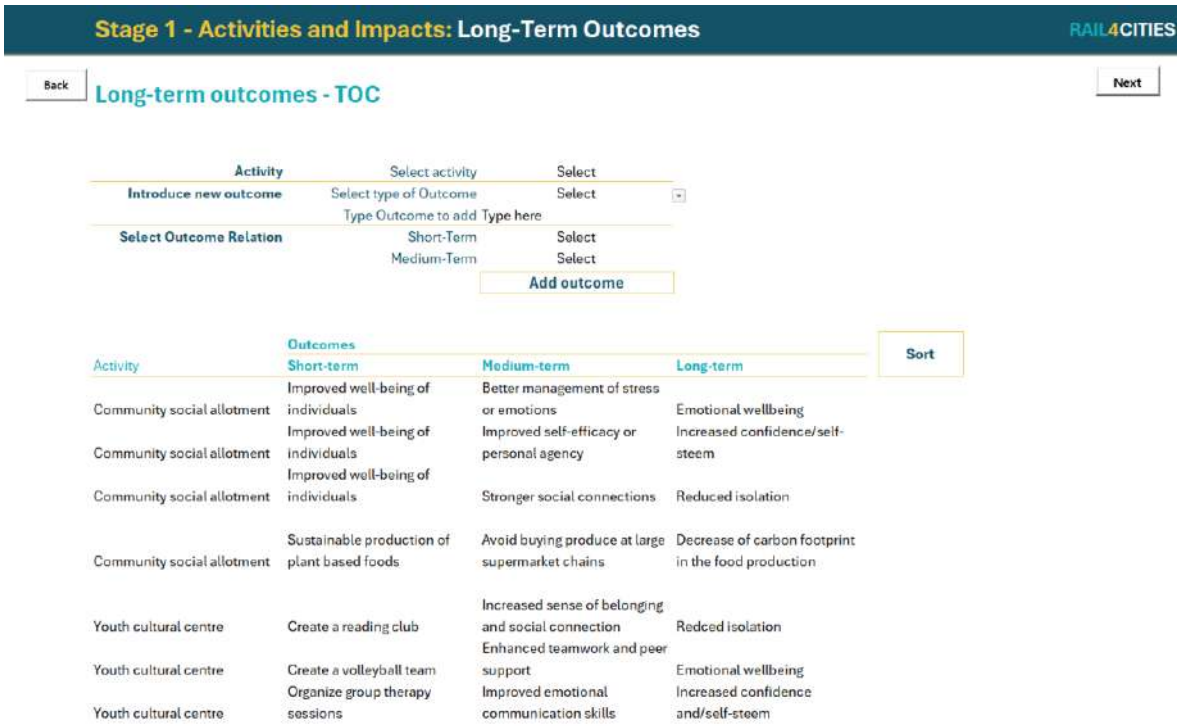

Figure 19. Community Social allotment and Youth cultural centre: TOC outcomes (Source: R4C Toolkit)

The next step corresponds to Stage 2: Economic Impact. Below are the estimated costs of the two proposed activities for the Ottignies station.

Concept	Cost	Description	Cost (€/year)
Administrative Costs	Water, refuse collection, business rates, insurance	Water, rent, rubbish collection, business rates and insurance and apply to the whole garden area.	4.604
Garden maintenance	Maintenance of the food growing area	Costs involved in maintaining the garden area such as repairs to infrastructure and Skip hire.	655
Consumables	Seeds, petrol, compost, pots, garden implements	Annual costs for items used for food and plant production, such as seeds, compost and petrol.	1.068
Replacement tools	Small garden tools	Directly attributable to the food growing area and include items such as secateurs, watering cans, gloves and sharpening tools. A similar outlay is made on such small tools each year.	227
Personnel costs	Professional gardener	Costs associated with the salary of a professional responsible for the proper management of the allotment.	48.960

Table 1. Considered costs for the community social allotment (Source: D3.3)

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Short-term outcome	Rationale	Considered cost	Cost (€/year)
Cost of building maintenance	-	3% of building cost	31.500
Cost of group therapy	Group therapy enhances emotional wellbeing by providing mutual support, social connection, and a safe space to share experiences, guided by a professional.	It is considered to hire a full-time psychologist to carry out these therapy sessions. The average salary of a psychologist in Belgium.	25.000
Cost of reading club	A reading club promotes emotional wellbeing by encouraging emotional expression, empathy, social connection, and relaxation through shared reading experiences and discussions.	It is considered to hire a person once a week to carry out the sessions. One-fifth of the average salary in Belgium has been considered.	4.900
Cost of participating in a volleyball team	Young people increase their self-esteem through taking part in a team activity where peers support each other, and coaches become mentors	The price of the annual membership for a volleyball team in Belgium has been considered.	2.400

Table 2. Considered costs for the youth cultural centre activities proposed according to the long-term outcomes (Source: D3.3)

Additionally, the youth cultural centre has got an investment cost of 1.050.000 €. The results of inputting these costs into the tool can be seen below (Figure 20).

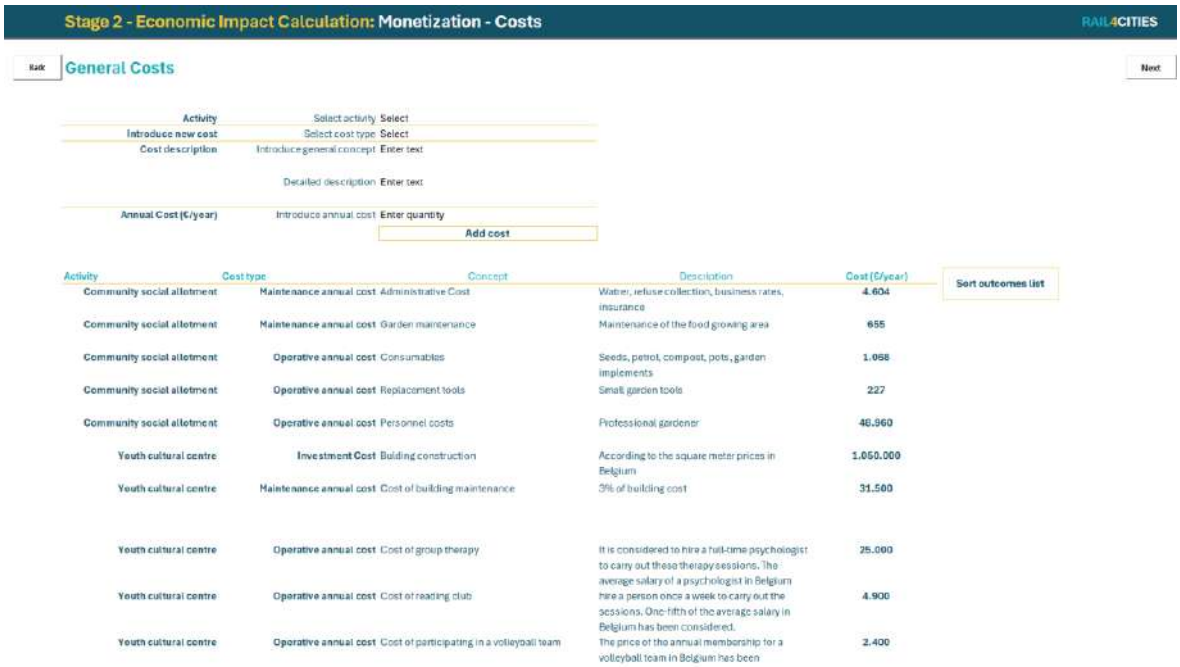

Figure 20. Activities costs (Source: R4C Toolkit)

For both activities, financial proxies have been used. These can be found in the following tables (Table 3 and Table 4).

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Long term outcome	Financial Proxy	Rationale	Indicator	Value (€/year)	Deadw-eight	Attribution	Adjusted value (€/year)
Increased confidence /self-steem	10% of Belgium QALY Depression	Improves emotional wellbeing and mental health, enhancing quality of life and reducing costs associated with psychological issues.	76	2.966	40%	30%	67.627
Reduced isolation	24% of Belgium QALY Depression	Reduces mental health risks and improves social participation, contributing to overall greater wellbeing.	76	7.203	40%	30%	164.237
Emotional wellbeing	10% of Belgium QALY Depression	Improves quality of life and reduces psychological problems, boosting productivity and social integration.	76	2.966	40%	30%	67.627

Table 3. Financial proxies methodology for the community social allotment long-term outcomes (Source: D3.3)

Long term outcome	Financial Proxy	Rationale	Indicator	Value (€/year)	Deadw-eight	Attribution	Adjusted value (€/year)
Increased confidence /self-steem	10% of Belgium QALY Depression	Improves emotional wellbeing and mental health, enhancing quality of life and reducing costs associated with psychological issues.	76	2.966	40%	30%	112.712
Reduced isolation	24% of Belgium QALY Depression	Reduces mental health risks and improves social participation, contributing to overall greater wellbeing.	76	7.203	40%	30%	218.983
Emotional wellbeing	10% of Belgium QALY Depression	Improves quality of life and reduces psychological problems, boosting productivity and social integration.	76	2.966	40%	30%	112.712

Table 4. Financial proxies methodology for the community social allotment long-term outcomes (Source: D3.3)

Once identified, the benefits were also entered into the tool. This can be seen in the following screenshot from the "Activity Costs - 2" page (Figure 21).

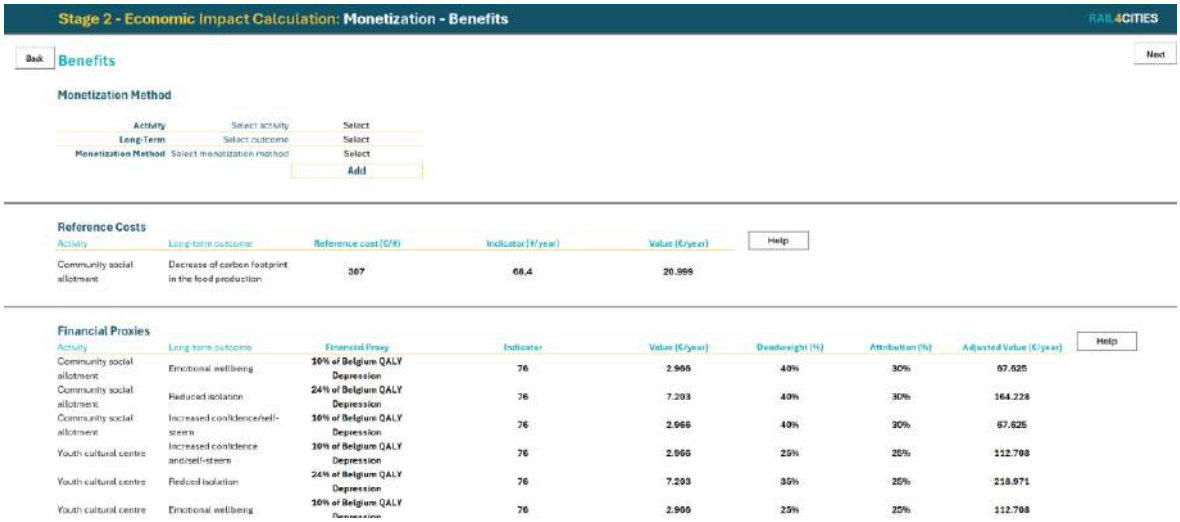

Figure 21. Activities benefits (Source: R4C Toolkit)

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The final step in completing the economic impact analysis is the calculation of the S-ROI ratio. First, the results obtained in Deliverable 3.3 for both proposed solutions are presented.

The S-ROI ratios obtained were 5.80 for the *Community social allotment* (Table 5) and 2.63 for the *Youth cultural centre* (Table 6).

Year	Horizon year	€/tCO2-eq	Enviornmental Benefits €	Social Benefits €	Costs (€)
2025	1	307,00	20.978	299.492	55.514
2026	2	311,00	21.252	299.492	55.514
2027	3	316,00	21.593	299.492	55.514
2028	4	321,00	21.935	299.492	55.514
2029	5	325,00	22.208	299.492	55.514
2030	6	331,00	22.618	299.492	55.514
2031	7	336,00	22.960	299.492	55.514
2032	8	341,00	23.302	299.492	55.514
2033	9	346,00	23.643	299.492	55.514
2034	10	351,00	23.985	299.492	55.514
		Total	**224.475**	**2.994.915**	**555.141**
			S-ROI Ratio	**5,80**	

Table 5. S-ROI calculation ratio for the Community social allotment (Source: D3.3).

Year	Horizon year	Social Benefits €	Costs (€)
2025	1	444.407	1.113.796
2026	2	444.407	63.796
2027	3	444.407	63.796
2028	4	444.407	63.796
2029	5	444.407	63.796
2030	6	444.407	63.796
2031	7	444.407	63.796
2032	8	444.407	63.796
2033	9	444.407	63.796
2034	10	444.407	63.796
	Total	**4.444.068**	**1.687.960**
	S-ROI Ratio	**2.63**	

Table 6. S-ROI calculation ratio for the Youth cultural centre long-term outcomes (Source: D3.3)

Using the tool, by entering a 10-year time horizon and the starting year in the "Activity Costs - 3" tab, the S-ROI report was automatically generated.

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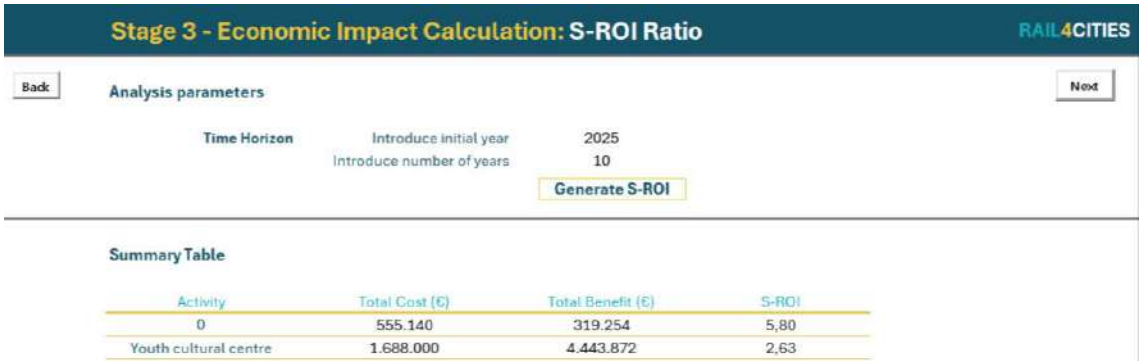

Summary Table

Activity	Total Cost (€)	Total Benefit (€)	S-ROI
0	555.140	319.254	5,80
Youth cultural centre	1.688.000	4.443.872	2,63

Activity		Community social allotment
Costs (€/year)	Investment	0,0
	Operative	50.255,0
	Maintenance	5.259,0
Benefits (€/year)	Decrease of carbon footprint in the food production	20.998,8
	Emotional wellbeing	67.624,8
	Reduced isolation	164.228,4
	Increased confidence/self-steem	67.624,8

Year	Year	Costs (€)	Benefits (€)	Flux (€)
0	2025	0,0	0,0	0,0
1	2026	55.514,0	320.456,0	264.942,0
2	2027	55.514,0	320.730,0	265.216,0
3	2028	55.514,0	321.071,0	265.557,0
4	2029	55.514,0	321.413,0	265.899,0
5	2030	55.514,0	321.686,0	266.172,0
6	2031	55.514,0	322.096,0	266.582,0
7	2032	55.514,0	322.438,0	266.924,0
8	2033	55.514,0	322.780,0	267.266,0
9	2034	55.514,0	323.121,0	267.607,0
10	2035	55.514,0	323.463,0	267.949,0
	Total	**555.140,0**	**3.219.254,0**	**2.664.114,0**
	S-ROI Ratio	**5,80**		

Activity		Youth cultural centre
Costs (€/year)	Investment	1.050.000,0
	Operative	32.300,0
	Maintenance	31.500,0
Benefits (€/year)	Increased confidence and/self-steem	112.708,0
	Redced isolation	218.971,2
	Emotional wellbeing	112.708,0

Year	Year	Costs (€)	Benefits (€)	Flux (€)
0	2025	1.050.000,0	0,0	
1	2026	63.800,0	444.387,2	
2	2027	63.800,0	444.387,2	
3	2028	63.800,0	444.387,2	
4	2029	63.800,0	444.387,2	
5	2030	63.800,0	444.387,2	
6	2031	63.800,0	444.387,2	
7	2032	63.800,0	444.387,2	
8	2033	63.800,0	444.387,2	
9	2034	63.800,0	444.387,2	
10	2035	63.800,0	444.387,2	
	Total	**1.688.000,0**	**4.443.872,0**	**0,0**
	S-ROI Ratio	**2,63**		

Figure 22. S-ROI results for the Ottignies activities (Source: R4C Toolkit)

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As can be observed, all annual cost and benefit flows, as well as the final S-ROI ratios, match the tables and results previously shown from Deliverable 3.3.

Finally, using the Canvas pages implemented in the tool, within the Implementation Roadmap stage, the canvases for both activities have been generated (. These canvases are based on the ones presented in Deliverable 3.3.

Figure 23. Business Model Canvas for the Community Social Allotment (Source: R4C Toolkit)

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Figure 24. Business Model Canvas for the Youth Cultural Centre (Source: R4C Toolkit)

With all these steps, the impact analysis process for the activities at Ottignies station in Belgium — originally carried out in Deliverable 3.3 — has been replicated using the tool developed in this project.

Following the implementation of this case study and the matching results, it can be concluded that the tool has been correctly designed and developed in alignment with the impact assessment methodology defined in this project.

Therefore, it is confirmed that the tool works as intended and represents a reliable and essential aid for assessing the impacts of sustainable transformations in railway stations.

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8 Conclusions and outlook

The development and deployment of the integrated evaluation tool mark a significant advancement in the systematic assessment of social, economic, and environmental impacts related to station-level projects. By integrating established economic evaluation methods like Cost-Benefit Analysis with the Sustainable Return on Investment framework, the tool provides a robust, multidimensional platform for comprehensive impact analysis.

This system successfully automates and structures complex data workflows, reducing errors and improving the reliability of analyses. It empowers municipal technicians and project managers to handle diverse data inputs, perform nuanced calculations, and visualize outcomes effectively. However, the successful use of the tool depends on ensuring that users possess the requisite technical knowledge—particularly in economic evaluation methodologies—and that organizational structures support ongoing training and capacity building.

The case study conducted at Ottignies station confirms the tool's practical applicability and its ability to generate reliable, relevant insights that can inform sustainable urban planning and policy decisions. Moreover, the participatory involvement of multiple stakeholders—including local authorities, private enterprises, experts, and citizens—proved essential in contextualizing data and fostering shared ownership of outcomes.

Nevertheless, challenges remain. Data availability and quality continue to be a limiting factor in certain contexts, and further enhancements to the tool's user interface and functionalities could facilitate broader adoption. Additionally, ongoing support and collaboration among stakeholders will be critical to maintaining momentum and ensuring that the tool evolves to meet emerging needs.

Looking forward, efforts should focus on expanding the tool's capabilities, improving integration with other planning and monitoring systems, and promoting knowledge transfer across municipalities. By doing so, the tool can serve not only as an evaluation instrument but also as a catalyst for sustainable transformation, translating scientific research into actionable strategies that deliver social, economic, and environmental benefits.

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