Identifying Institutional Barriers and Enablers for Sustainable Urban Planning from a Municipal Perspective

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Abstract: Steering towards a path of sustainability and resilience in urban environments depends greatly on effective institutions, governance and strategic planning. National governments are increasingly expanding municipal institutions' mandates by delegating decision making on land-use planning and urban development to local and regional levels. This trend poses municipalities with a complex challenge of setting clear sustainability targets and lifting the institutional barriers inside and outside of their organisation. Based on the business motivation model (BMM), this study presents the results of a thematic analysis identifying barriers and enablers characterizing the institutional capacity base of a municipal organisation in the context of sustainability at an urban level. The results show that the most relevant barrier is the lack of standardisation in sustainability-related working practices, whereas the main institutional enablers relate to flexible working directives that promote the development of innovative projects. This points towards a strong need for a more integrated, dynamic and powerful development approach for sustainable urban areas on a local level.

Keywords: barriers; enablers; sustainability; sustainable urban planning; institutional capacity

1. Introduction

By 2050 the world’s population is projected to reach 10 billion people, from which 67% is expected to live in urban areas, growing from a 54% share of urban dwellers in 2016 [1]. Furthermore, the ongoing urban transition increases the pressure on the earth’s resource base and often generates social negative externalities and diseconomies of agglomeration [2,3]. These factors have exacerbated the need to steer the transformative force of cities towards sustainability [3].

This paper understands sustainability as the process which allows humans to satisfy the basic needs of present and future generations, while reducing poverty and safeguarding the ecological support systems [4,5]. In an urban setting, this entails the recognition of the interlinked effects of economic and socio-cultural considerations while striving for enhancing environmental quality, economic efficiency and human well-being, all embedded within an Institutional component [6,7]. In this context, effective institutions, governance and urban planning become primal for achieving urban resilience and sustainability [3]. The ability of any city to take programmatic action towards sustainable urban development, climate change adaptation and other related concerns, is constrained by the governance capacity of its local authorities [3]. This highlights the importance for municipalities to overcome institutional constraints by means of a broader institutional capacity base [2].

At a local scale, national governments have often delegated the responsibility of land-use planning and development to municipal authorities [8,9]. This means that local...
authorities, such as municipalities, represent the core institutional unit in charge of the decisions and regulations concerning the neighbourhoods, inhabitants, and built environment of their respective jurisdiction [10]. Nonetheless, local authorities tend to operate within an institutional void, where the complexity of governance jeopardizes the clear definition of roles and responsibilities in relation to the decision-making process of urban development [10]. Moreover, local governments are usually siloed and poorly coordinated, which leads to ineffective decision making and policy development [2,10]. As a result, sustainable urban development poses a complex challenge for governmental organisations. That is further exacerbated by the fact that the lack of a uniquely agreed definition of sustainability [11] makes it difficult to set targets and measure progress [2,12,13].

Previous research has recognized that institutional barriers for adopting urban sustainability practices are multidimensional in nature [14]. Furthermore, they can arise from a wide range of influential factors which exist both within and beyond the organisational boundaries of the involved actors [2,8,10,12,15]. From the municipal authorities’ point of view, these influential factors can be translated into two main challenges for achieving practical implementation of urban sustainable planning. The first challenge covers the need to enhance the municipalities’ linkages with external governance and jurisdictional contexts [10,16]. This includes aligning or even going beyond national-level regulations, involving and engaging political actors and ensuring financial resource availability [2,12,15]. The second challenge encompasses the need to enhance their institutional capacity, which refers to the ability of governmental organisations to respond and manage current sustainability-related challenges through decision making [17]. This capacity is ultimately dependent on components such as leadership, organisational cultures, technical practices and context-relevant knowledge [8,16].

Overcoming institutional constraints has been identified as an important enabler for engaging in effective sustainable-oriented decision-making processes [2,18]. Thus, institutional capacity building is considered to be a necessary requirement to engage in planning and implementing sustainable initiatives [16–19]. Unfortunately, existing literature in this field is lacking an exhaustive characterisation framework to guide the categorisation and subsequent analysis of the different elements conforming to this internal institutional capacity base. Because most scholars select different analysis levels, research methods and theoretical perspectives [20], the identified barriers and conclusions from different research projects are generally highly context-specific and difficult to compare and generalize [19]. Consequently, this hinders their potential as general decision-aiding tools that facilitate organisations in making decisions.

To address the shortcomings of existing institutional characterisation frameworks to support municipalities in moving towards sustainable urban planning, the work presented in this paper aims to provide an inclusive characterisation of the institutional capacity base of a municipality for promoting a transition towards sustainable urban development. By applying the standard internal influencers categorisation from the business motivation model (BMM) [21] to a Dutch municipality, existing institutional barriers and enablers for engaging in sustainable initiatives are identified, which allows to understand and characterise its internal institutional features and capabilities. Although the research work concerns a specific municipality, the outcomes can be generalized to other municipalities with similar dimensions and organizational structures. Based on this institutional assessment, recommendations will be made towards institutional capacity building as a means to increase the readiness of a municipality to pursue its sustainability aspirations.

The next sections describe the theoretical background of this study and the undertaken research strategy. Finally, the results are presented followed by discussion points, conclusions and recommendations for future research on the field.
## 2. Background

### 2.1. Institutional Capacity Base for Sustainable Development

In general terms institutions can be regarded as the “rules of the game”. This means a set of stable, abstract and impersonal rules governing the relationships between separate social constituents [22]. In view of this, organisations can be understood as institutional arrangements aimed to enable conscious and deliberate coordination of activities within identifiable boundaries [22]. Therefore, organisations act as governance structures, which operationalise and implement the rules of the game as defined by the institutional environment in which they operate [22].

This paper understands institutional capacity as the capacity of organisations to fulfil their objective of effectively implementing and operationalising the rules of the game in the context of urban sustainability. Previous research has recognised the importance of including an institutional dimension in the context of urban sustainability assessment [13,23,24]. The institutional component reflects on the governance processes and linkage promotion between environmental, social and economic concerns [24]. In addition, in sustainability practice, the institutional dimension requires knowledge on procedures and organisational structures, such as relations of work, hierarchies, lines of command, division of labour, channels of communication, values and attitudes present within their organisational boundaries [15].

Institutional factors could act as inhibitors for the adoption of sustainability-oriented practices [25]. In this regard, the institutional capacity base determines the extent of the ability of a given organisation to mobilise resources to respond to and manage current economic, social and environmental challenges [17,20,26]. This requires a broader institutional capacity base [2].

Institutional capacity is described through three main dimensions: knowledge resources, relational resources and mobilisation capacity [19,26]. These depend on a wide variety of factors across different levels within the organisational environment. Because of this multidimensionality, there is not a unanimous model to characterise the practical repercussions of institutional capacity within organisations willing to promote urban sustainable development. The existing literature provides different models to address the topic. For instance, the identification of key challenges in relation to the institutional limitations [10], the definition of Five Factors for urban sustainability [12] or the Three-level analytical framework describing institutional components influencing sustainable development. Micro-level refers to monetary and human resources within the organisation. Meso-level, in turn, encompasses organisational norms and decision rules. Finally, macro-level covers the networks of stakeholders and legal contexts around the organisation [15]. To further describe this landscape Table 1 displays a comparison of the main characteristics of existing institutional analysis frameworks.

These frameworks show substantial differences regarding the characterisation and categorisation of the institutional components, thereby conditioning the ability to implement institutional assessments regarding the capacities of any organisation to engage in urban sustainable development. Therefore, the need to support the institutional assessment process becomes essential for any organisation in order to coherently increase its institutional capacity base [27].

| Study | Geogr. Scope | Institutional Level | Scope | Framework of Analysis | Main Objectives | Main Conclusions |
|-------|--------------|---------------------|-------|-----------------------|-----------------|------------------|
| [25]  | EU and UK    | All levels of governance structures. | Internal and external | Institutional factors from the Taxonomy of barriers for Sustainability Assessment: | Investigate and identify the barriers and incentives to sustainability assessment and the adoption of assessment tools. | The identified barriers and incentives should be used to inform and guide decision-makers during the development |
- Lack of cooperation and information sharing
- Disjuncture between policymakers and practitioners
- Organisational culture
- Fragmentation of roles within an organisation
- Limitation of jurisdiction
- Lack of data
- Political acceptability of tools
- Lack of visible targets and inertia of the built environment

Three-level framework:
- Micro level
- Meso level
- Macro level

Examine why there is a pronounced gap between political visions on SD and the reality of policymaking, with a focus on institutional factors determining the function of Impact Assessments.

There is the need to strengthen institutional arenas for social learning to allow ambitious political decisions to integrate sustainability concerns in policy documents.

This paper builds upon existing literature on barriers for sustainable action, to identify main levers by which said barriers may be transformed into enablers of it, thereby triggering and sustaining action at the local level.

The study identified enablers for action, such as leadership, collaboration and the ‘institutionalization’ of climate change response. These should be facilitated by re-working institutional structures, organizational culture and policy-making procedures towards patterns of climate change policy development.

Identify existing barriers to adaptation described in literature and compare them to the experienced ones in the Dutch governance context. To reduce and manage the number of barriers they proposed seven clusters of barriers to adaptation.

In agreement with literature on adaptation to climate change, barriers related to dealing with conflicting timescales are the most important type experienced in the Netherlands. In addition, research on barriers to adaptation is still in its infancy and much more needs to be learned about their nature and influence on the governance of adaptation to climate change.

Explore the constraints to adaptation in the specific context of local government, as the impacts of vulnerabilities are experienced at the local level.

It highlights the importance of adaptation for Local government...
and a case study involving three Australian municipalities. Identify constraints recognised by climate change literature and use the empirical study on planning for climate adaptation to present the barriers as identified by local government participants. Focus on the political nature of local planning in practice.

In addition, it shows the need for Local governments, to shift from a mitigation into an adaptation focus, to push for reform in the planning frameworks at higher levels of government which currently hinder local adaptation and to embed climate adaptation into a wider range of council functions.

By synthetizing the findings from three papers, the present thesis aimed to develop the Five Factors conceptual framework to provide new practical insights into the strategic planning processes in Swedish municipalities and assist researchers and practitioners working on urban sustainability. The thesis focuses on the role of municipal organisations in sustainable urban development and how the strategies and policies development processes are organised. This includes how other stakeholders participate in such processes.

The thesis conclusions hovers around the development a framework for understanding general characteristics that shape and influence strategic planning processes for urban sustainability in municipalities. The five factors provide a conceptual framework that aims to improve the comprehensiveness of strategic work, which may be relevant to communities in other contexts facing up to similar strategic challenges. This builds upon findings that show how five municipalities approach the same issue, independently from contextual factors such as population or size. Nonetheless, non-context-specific characteristics of municipalities may be neglected in literature on urban sustainability.

2.2. Internal Influencers from the Business Motivation Model (BMM)

The BMM is a set of built-in concepts which define the core aspects of business plans [21]. It is a neutral and simple methodology that allows its specification to be extended to different organization types. Hence, in the context of this study, the BMM is applied because of its potential as a general cross-discipline framework to analyse and characterise institutional capacities at a municipal level in the context of sustainable urban developments.

The BMM covers two main aspects regarding business plans: (1) Ends and Means, which describe organizational goals and objectives, as well as the strategies and tactics for achieving them; and (2) influencers, which define the constraints and conditions giving shape to the aforementioned elements, including the assessment of its impact over the organizational ends and means [21]. It is built over motivation, which is a basic cornerstone of organizational practice. Figure 1 displays the interrelations of all the elements covered by the BMM. This encompasses the aspirations of an organization...
communicated through its vision, and the plans on how to realize said vision, communicated through its mission [21].

![Diagram of Business Motivation Model](image)

Figure 1. BMM v1.3 Overview [21].

A key component in the BMM is the entity Influencers. In general, influencers represent the elements that can hinder or assist the organization in realizing its aspirations. The BMM considers two types of influencers: external and internal. This study was conceived as an internal assessment focusing on the internal influencers, which are defined as the factors and conditions existing within the organizational boundaries [21]. According to the authors’ point of view, these are particularly relevant for sustainability challenges due to two main reasons. First, they provide the basis for characterising the institutional factors capable of hindering/promoting organisational learning and adaptation towards a broader institutional capacity base. Second, they depend exclusively on the organizational dynamics, and therefore can be changed/adapted within a proactive stance, as opposed to a reactive attitude determined by external influencers.

3. Materials and Methods

The research design consisted of a dual approach. Initially, by means of a desk study, the landscape of existing models characterising the institutional capacity inside organisations steering towards urban sustainable development were identified. For this objective, existing literature was reviewed by using the search engine Google Scholar and using search terms such as institutional barriers AND urban sustainability. Subsequently, these results were complemented and updated by means of a more focused search on specific journals: (1) Sustainability, (2) Land; (3) Planning Practice and Research; and (4) Urban Studies. They were chosen due to their potential affinity with the content of the work. For this last search, only the results from 2016 onwards that matched the following search terms were considered: government organisations AND urban sustainability OR sustainability AND local planning OR institutional capacity AND climate change OR climate adaptation AND barriers. The results of the aforementioned inquires provided the basis for defining the landscape of characterisation models described in Table 1.
In addition to the desk study, a study case was performed on the municipal organisation from the city of Apeldoorn, located in the province of Gelderland, The Netherlands, that possesses a population of 162,445 inhabitants (2019). Hence, this research followed an inductive thematic analysis approach based on a qualitative research approach. This provides the tools to analyse and generate knowledge about real-world problems which take place as the result of the experiences and interpretations that humans make of their reality [28], such as the barriers and enablers for urban sustainability transitions within a municipal organisation.

The research process followed the iterative model described in Figure 2. This approach, adopted from [29], considers a retroactive effect of each subsequent phase into the preceding ones. Hence, the final result is the convergence of the cyclical dependencies generated by iteratively performing the different steps and readjusting intermediate results along the process.

![Figure 2. Data analysis process—iterative model (adopted from [29]).](image)

The data collection consisted of 12 in-depth interviews supplemented by information obtained from official documentation within the municipal organisation. These sources are suitable for an inductive thematic analysis since they provide free-flowing raw data which has the potential to be later identified and coded into adequate themes [28]. The interviews were focused on understanding the motivation and context of the municipality, as well as its current capacity base for sustainable urban development. Under this premise, they revolved around three main topics: (1) the vision of the city council for the development of the built environment; (2) current translation of said vision into goals and strategies; (3) details of the implementation of strategies into workable programs/projects.

These semi-structured interviews enabled the adoption of a particular line of inquiry while allowing the inclusion of specific knowledge and expertise from any given respondent [28]. In addition, they were administered individually in a face-to-face setting where the interviewee received an informative introduction with an overall description of the purpose and the research process. The interviewees were chosen by means of judgement sampling, preferred when a specific limited set of people possess the information the research ought to acquire [30]. In this case, the purpose was to reflect on the relevant knowledge domains within the organisation. Consequently, the chosen sample was formed by experienced and knowledgeable officials from the functional units of the municipality who were directly involved in the planning, management and development of the urban built environment. Hence, the sample was formed by respondents from three main units: (a) Unit of projects, real state and land (engineering office and project management)—6 respondents; (b) unit of spatial living environment
The data analysis was divided into three interrelated phases: (1) data processing, which transforms the raw data from the interviews into organized and manageable chunks of information; (2) data reduction, which is performed by coding and categorizing the collected data [30]; (3) drawing of conclusions, which addresses the production of focus points and considerations to be taken by the municipality to facilitate the inclusion of sustainable urban development as a motivator for policy- and decision making.

The codification process required first a definition of coding units, which represents the overall idea of the text it seeks to code so that its meaning is not altered, and no relevant information is left out [30]. In this context, the textual data from the processed interviews were coded into statements, which were the coding units. Statements were used for this purpose because of their ability to represent the expression of an idea or assertion about a particular topic [30]. Subsequently, overarching organizing theme groups were identified from the data statements. These were later aligned with the default categories described in the BMM document, shown in Table 2.

The internal influencers describe the institutional dimensions that impact the realisation of organisational objectives [21]. This means that they can be easily linked to actions within the municipality, thereby facilitating the objective of organisational change/learning to promote urban sustainable development.

Table 2. Categories and definitions in relation to internal influencers [21].

| Category               | Description                                                                 |
|------------------------|-----------------------------------------------------------------------------|
| Assumption             | Something that is taken for granted or without proof.                       |
| Explicit Corporate Value| An ideal, custom, or institution that an enterprise explicitly promotes or agrees with (either positive or negative). |
| Implicit Corporate Value| An ideal, custom, or institution that an enterprise not explicitly declares but is nonetheless understood by some or all of the people in an enterprise. |
| Habit                  | A customary practice or use.                                                |
| Infrastructure         | The basic underlying framework or features of a system.                     |
| Issue                  | A point in question or a matter that is in dispute as between contending partners. |
| Managerial Prerogative | A right or privilege exercised by virtue of ownership or position in an enterprise. |
| Resource               | The resources available for carrying out the business of an enterprise, especially their quality (financial, human, etc.). |

4. Results

This section is divided into three subsections intended to provide a snapshot of the institutional capacity of the municipality. The first two subsections point out respectively the relevant barriers and enablers which were found to determine the municipal capabilities for implementing sustainable urban planning practices. In turn, the last subsection presents the opportunities for improvement discovered during the analysis of the collected data.

4.1. Institutional Barriers

Table 3 presents a complete overview of the identified institutional barriers within the organisational boundaries of the municipality. It describes the findings by grouping individual relevant statements into suitable overarching organising themes. Thereafter, the BMM internal influencers categories are used to encompass all overarching themes and present a comprehensive categorisation of the identified barriers.

The first category in which this study identified barriers for the municipality of Apeldoorn was explicit corporate values. Those relate to the lack of standardised
directives for including sustainability in urban development projects. As a result, sustainability objectives are included in late phases of project design and tendering, where their influence and capacity to steer the outcomes of a project are lower.

The second category where barriers were identified is infrastructure. This category covers the current working procedures of the municipality. In this regard, the identified barriers relate to topics such as the lack of standardised criteria to assess projects on their sustainability performance. Moreover, a narrow vision of sustainability predominates within the municipality, which means that sustainability is usually viewed as a synonym for CO₂ emissions reductions. Consequently, wider environmental impacts are overlooked and the interrelations with social and economic dimensions are neither accounted nor incorporated as project requirements. Furthermore, the municipality operates under a segmented organisational structure, which limits collaboration between functional units, as objectives and budget definition is done independently by the unit. Finally, standardised collaboration practices able to guide potential multidisciplinary projects were not identified. These factors can be evidenced in some relevant statements from the interviews, for instance when asked about the way sustainability is being considered in projects: “For Sustainability I have an indicator, which it is CO₂, but that is a very small perspective for sustainability.” [T-35; Public Space Director]. Or when describing the way of working of functional units within the municipality: “We try to work together but there is no money flowing from the social program into asphalt or concrete projects, and the opposite is also not observed.” [T-34; Public Space Director].

The third category was issues and the identified barriers are related to the difficulty of translating high-level city goals into measurable and traceable project objectives. Thus, the steps and methodologies that should be adopted and implemented to assess the impacts of the built environment over social and economic areas of concern, such as, for instance, people’s productivity, mood and disposition to interact are unclear or inexistent at all. These influential factors can be evidenced in some relevant statements: “…the strategic goals for the city council are too far away from us.” [T-63; Project Leader] and “…choose how to make people healthier or happier, but it’s hard to know how far you will go in your public space to do that.” [T-30; Public Space Director].

Last, within the category managerial prerogative, the main identified barrier covers the fact that individual roles are given the authority to exclude sustainability performance measures from project design and/or tendering processes.

Table 3. Context definition phase—identified barriers for sustainable urban planning.

| Explicit corporate values | Organizing Theme | Basic Theme—Influencer | Ref. |
|--------------------------|------------------|------------------------|------|
| Lacking standardised directives for project sustainability inclusion | Late inclusion of sustainability concerns in the project process. | T-67; |
| Infrastructure | Hindrance on collaboration among functional units | Functional units have separated budgets. | T-07; |
| | | Low integration between functional divisions due to a segmented organizational structure. | T-34; T-33; |
| | | Integral plan development is hindered by budget separation. | T-46; |
| | | No standardised collaboration practices are implemented among functional units. | T-47; T-90; |
| | | Lack of systematically integrated collaboration processes. | |
| BAU approaches to project definition | Traditional tendering criteria (time and cost) are used as regular commissioning procedure. | T-72; |
| Narrow vision of sustainability | Asset management is done through monetary-based analysis. | T-25; |
| | Environmental concerns in asset management are done through CO₂ valuation. | T-35; T-36; |
| | Social concerns are not reflected in criteria used within asset management. | T-73; |
Social benefits from projects unaccounted in project performance assessment.

| Issue | Description | References |
|-------|-------------|------------|
| Overlook of interdependencies between sustainability dimensions | Circularity, sustainability and climate adaptation goals are defined independently from each other. Sustainability operationalization is divided into separated components. | T-05; T-51; |
| Lacking standardised criteria for project sustainability inclusion | Sustainability, circularity and climate adaptation objectives are not consistently included as criteria in project orders (Opdracht). Non-standardised inclusion of sustainability criteria in project orders. No standardised circularity inclusion criteria are defined for project definition processes. | T-61; T-64; T-62; T-51; T-58; T-65; |
| Issues for assessing effects of built environment on sustainability dimensions | Valuation of positive/negative effects of the built environment over social variables is difficult. Effects of the built environment on people’s health, mood and disposition to interact are unclear. The role of heat stress in generating indirect economic effects is unclear. | T-28; T-30; T-31; |
| Issues for operationalizing city goals into measurable project objectives | High level goals are not easily quantifiable through project objectives. | T-63; |
| Managerial prerogative | Permissive actor-led sustainability exclusion | Circularity and sustainability are excluded from project performance measures on given projects. Personal priorities are allowed to exclude sustainability criteria from given project orders. | T-62; T-56; T-65; |

Note: the references to the sources of barriers and enablers correspond to statements obtained through the interviews conducted (see Appendix A, Table A1. Thematic analysis results) and are matched with those existing in the literature. They were given unique identifiers for facilitating the identification tasks.

4.2. Institutional Enablers

Table 4 provides a complete overview of the identified and categorised enablers found within the municipality using the same structure as that adopted in the identified barriers. Firstly, enablers categorised as explicit corporate values cover the fact that as a working directive, the municipality encourages the replacement of fossil-fuelled machinery by electrically powered ones, as an attempt to shift towards cleaner sources of energy. Moreover, on a project basis, a culture of coordination and negotiation between disciplines allows the project team to accommodate a wider set of targets and desired outcomes. In addition, the development of pilot projects serves as bottom-up knowledge sources where innovative designs or contractual models are tested with the objective of accelerating their organisation-wide adoption. Some relevant statements from where these factors arise are: “When they give more space to the building companies, we earn more money, so our incomes are increasing, but there’s also fewer green spaces, less public spaces. So together we make a decision, and in that initial phase, we search together which combination is the best for the city, but also in time and in planning.” [T-69; Project Leader] and “We see those pilots or new ways of working and we pick them up and we say this works; let’s spread it out through the whole unit; let’s make them bigger by communicating about them.” [T-56; Unit Manager].

Secondly, under the infrastructure category, the most relevant enablers lie in working practices, such as participative project governance, which allows citizenship requirements to be included in the project objectives. Regarding the definition of objectives, for both projects and functional units’ yearly programs, the SMART methodology is implemented, which leads to objectives being specific, measurable, achievable, relevant and time bound. This has enabled each functional unit to translate the city council goals into workable objectives. These practices were mentioned by some interviewees: “The way how you manage projects, make it people part of the solution, giving information, or what we are going to do, ask if they have problems that they want to see solved.” [T-35; Public Space Director] and
“…but we always want that the plan here can relate to the goals of the city.” [T-55; Unit Manager].

Lastly, within the category managerial prerogative, identified enablers consist of the flexibility given to team leaders to include alternative criteria in tendering processes, specifically to include a contractor’s circularity knowledge and expertise into the decision process. In addition, the early involvement of particular actors from the municipality allows for sustainability objectives to be considered as part of the project in earlier stages within the design process. Finally, particular actors with influence to update the city’s goals are allowed to take the learnt lessons from innovative pilot projects and steer the redefinition of said goals. This was corroborated by statements such as: “These projects make the city council thinking about the goals and redirect the goals that they now have. These projects are front-runners.” [T-15; Energy Transition Manager] and “This project was unique because we didn’t have a price, but we also didn’t want a price. Actually, we wanted the best contractor who matched our ideals of what we thought of circularity.” [T-70; Project Leader].

Table 4. Context definition phase—identified enablers for sustainable urban planning.

| BMM Internal Influencers | Organizing Theme | Basic Theme—Influencer | Ref. |
|--------------------------|------------------|------------------------|------|
| Explicit corporate value | Internal sustainable working directives | The use of electric-powered assets is encouraged. | T-53; |
|                         | Organisational learning strategies | Pilot projects are used as bottom-up knowledge sources. | T-56; T-89; |
|                         | Pilot projects are used as prototype tests for knowledge generation. | | |
|                         | Project-led functional coordination | Built environment adaptation projects are coordinated with built environment maintenance activities. | T-27; T-86; |
|                         | Multidisciplinary project team implementation | Multidisciplinary project team is assembled with members from all relevant units: (i) Spatial Living Environment; (ii) Projects, real state and ground; (iii) Urban planning; (iv) Land-use planning; and (v) Engineer’s bureau. | T-68; T-69; |
|                         | Trade-offs and negotiation between disciplines is done during project definition. | | T-69; |
| Infrastructure | Operationalisation of goals into measurable objectives | Program goals are quantified by smart objectives. | T-04; |
| Coordination through working division overlap | Combination of functional vs. Geographical unit divisions can provide extended benefits from knowledge sharing. | | T-58; |
| Participative project governance approaches | Citizenship involvement is implemented through participation within the municipality. | | T-29; |
| Traceability of city vision into specific desired results | Program goals on climate adaptation are aligned with city goals. | | T-01; T-02; T-03; T-55; |
| | Program goals on circularity are aligned with city goals. | | |
| | Program goals on sustainability are aligned with city goals. | | |
| | Management and maintenance plans across the functional unit are aligned with the city goals. | | |
| Managerial prerogative | Project-led improvement of long-term goals | Innovative projects are allowed to steer the city goals definition and updating process. | T-15; |
| Flexible use of alternative project definition procedures | Authority from team leaders to undergo alternative tendering processes by implementing contractor’s circularity knowledge in the tendering criteria. | | T-12; T-57; T-70; |
| | Alternative project definition processes are allowed for pursuing circularity objectives. | | |
Flexible inclusion of actor-led sustainability concerns

Initial role of engineer's bureau in project team enables the inclusion of sustainability concerns.

Circularity criteria can be included in early stages of given projects processes.

Note: The references to the sources of barriers and enablers correspond to statements obtained through the interviews conducted (see Appendix A, Table A1. Thematic analysis results). They were given unique identifiers for facilitating the identification tasks.

4.3. Enhancing the Institutional Capacity Base

Supported by emergent themes gathered from the interviews particular paths of action can be identified to integrate urban sustainability issues into the decision-making processes of the municipality. These are presented in Table 5. Overall, the results conform to a desired status of the municipality as a well-suited organisation with a suitable mobilisation capacity able to convert capabilities into concrete change actions. Explicit corporate values are the first category of proposed improvement opportunities. Important items within this category are the reduction in risk-adverse mentality to boost the adoption of change and innovation and the promotion of leadership as the main driver for change.

A second category for improvement is implicit corporate values. Here, the interviewees identified the need to foster a sense of urgency and responsibility inside the organisational culture to steer the development of the built environment towards sustainability. This could act as a motivator for stimulating change and break the status quo.

As far as the infrastructure category is concerned, sustainability practices could benefit from higher levels of coordination between functional units. This includes the development of combined agendas on long-term plans where the implementation of (re)development projects for the built environment can be aligned against a unified vision for the city. Furthermore, achieving financial integration would create a higher resource base for developing more ambitious projects intended to synergistically accommodate sustainability, climate adaptation and circularity objectives. Finally, these objectives should be defined by means of standardised guidelines and principles, thereby enhancing the potential of obtaining positive results.

| BMM Internal Influencers | Organizing Theme | Basic Theme | Ref. |
|--------------------------|------------------|-------------|------|
| **Explicit corporate value** | Attitudes promoting change and innovation | Reducing risk-adverse and conservative mentality can boost pace of change and innovation. | T-16; |
| Leadership | Promotion of personal responsibility as a driver for change | T-18; |
| **Implicit corporate value** | Interiorize motivation and sense of urgency for change and innovation adoption | Need to avoid unresponsiveness to change demands | T-17; |
| | Need to develop pride and sense of purpose as motivators for stimulating change | T-59; |
| | Need to increase awareness on a personal basis, to promote change adoption and innovation | T-81; |
| **Infrastructure** | Coordination of objectives for integrative urban planning | Need to work on a combined agenda (sustainability + circularity + climate adaptation) | T-06; |
| Guidelines and principles for sustainability | Need for guidelines and principles on sustainability and circularity | T-82; |
| Long-term multidisciplinary coordination | Need to integrate built environment projects with long-term initiatives/programs | T-32; |
5. Discussion

The results presented in the previous section display the recognition of the current institutional capacity base and the possibilities to steer organisational adaptation towards the inclusion of sustainability as a target in urban planning. As these features correspond to internal aspects of the municipal organisation, this section examines the extended institutional arena of the municipality and comments on further implications for its capacity base and preparedness for engaging in urban sustainable development. This is carried out by reflecting on the wider multidimensional conception of institutional capacity theory from the literature and the validation workshop with municipal decision-makers.

As outlined before, the theoretical concept of institutional capacity is composed of three dimensions: (1) knowledge resources, (2) relational resources and (3) mobilisation capacity [19,26]. This study focused on a deeper characterisation of the internal factors influencing knowledge resources and mobilisation capacity within a municipal organisation. In relation to the three-tier analysis framework described in Nykvist and Nilsson (2009), this research dealt with factors found in the micro- and meso-levels, both of which analyse internal organisational features [15]. As a result, the macro level, which deals with relational resources, comprising external actors, influencers and linkages with wider societal values and policy networks [15,19], fell out of the scope of the study. In this regard, it has been recognized that institutional conditions for enabling climate action, and by extension sustainable urban development, go far beyond the enhancement of the internal capacity base of a municipal organisation. For instance, setting clear political priorities [26], fostering political leadership and ensuring suitable resource transfers act as enabling factors for improving urban governance processes [2,10,18].

The validation round with municipal decision-makers also revealed the importance of these existing external influencers over the municipal action. For example, they mentioned the strong power of the political agendas, evidenced through the characteristic short-term objectives definition from political actors and exacerbated by the constant change in political parties and mindsets guiding their definition. These shortcomings originated from outside of the organisational boundaries of a local authority leading to barriers for sustainable action due to the lack of long-term perspectives and the lack of awareness and commitment from political actors to address sustainability in urban development initiatives [31]. The municipal decision-makers also mentioned the existence of funding restrictions for municipal action. Strict control and expenditure audits hinder the implementation of sustainable-oriented projects, as they usually represent higher initial costs in comparison to those related to business-as-usual projects. Hence, this imposition of restrictions on expenditure represents a major hindrance for complying with the need of delivering sustainable outcomes. The influence of financial auditors, who through monetary-based assessments are not yet able to understand the added value of a sustainable approach, remain reluctant to accept the associated higher initial capital costs [31].

Finally, the need to implement adequate frameworks for inter-organisational collaboration should be stressed. This factor covers the creation of a shared resource base in coordination with suitable spaces for dialogue and deliberation. This aligns with the findings from previous research, recognizing that reaching a more integrative approach comes as a result of the use of network processes accommodating different cross-sectoral policy framing and multi-level interdependencies [17].
6. Conclusions

By applying a thematic analysis based on the internal influencers from the business motivation model (BMM) to a Dutch municipal organisation, the following main conclusions regarding existing institutional barriers and enablers for engaging in urban sustainable development are worth highlighting.

Firstly, the study revealed that the most relevant barriers within the municipality root from aspects such as the lack of standardisation in sustainability-related working practices. This covers the definition of objectives and targets and their related assessment criteria. Moreover, an important cause is the predominance of a narrow vision of sustainability, thereby limiting the recognition of complex interrelations between environmental, economic, and social aspects. In addition, the study revealed a predominance of the status quo and a low level of collaboration among agents, as municipalities often operate with segregated functional units.

Secondly, in relation to the institutional enablers, the results suggest that the most important enablers can be associated with elements such as flexible working directives that have the potential to lead to innovative project development processes. Furthermore, the SMART methodology yielded positive results in allowing high-level goals to be translated into workable agendas and programs for urban development.

Initial recommendations for enhancing the institutional capacity base for sustainable action should focus on the abatement of risk-adverse mentality and unresponsiveness to changing demands. By doing so, values such as leadership and a sense of responsibility are allowed to rise, pursuant to reduce the power of the status quo and boost the adoption of innovation and change. Furthermore, the infrastructural features of the municipality, which determine their processes and ways of working, should be adapted. Decreasing the fragmentation of the organisational structure could lead to higher coordination and collaboration within the organisation regarding sustainability. In this way, the municipality could accommodate the multidimensionality of sustainability by defining combined agendas, boost knowledge sharing and finally attain financial integration. This would provide an enhanced resource base for funding sustainable urban development initiatives.

7. Limitations and Future Research

As previously discussed, the institutional arena of municipal actors includes not only internal mobilisation capabilities but also the coordination with extended governance networks and societal values. In this context, the importance of achieving a wider participative decision-making process, particularly in the development of the built environment has been agreed on by scholars and political actors alike [17,32–35]. The research presented in this paper was limited only to the decision-makers within the sphere of the Municipality of Apeldoorn as an organisation. Hence, the results do not reflect the inclusion of the visions of a wider range of stakeholders, namely those included in the Iron Triangle composed of businesses, neighbourhood groups and government officials [35].

Recommendations for future research include the need to study external arenas for dialogue and debate on sustainability in urban areas. Hence, it is necessary to increase the governance network and enhance external collaboration. This covers the creation of intermunicipal networks able to boost knowledge dissemination and cooperation [36]. Moreover, a need exists to involve external actors from the energy and building sector, such as real estate developers, contractors, and electricity grid and district heating operators in the discussions. An additional point of attention for future research lies in ways to achieve the engagement of political actors in decision making, as this would allow sustainability long-term objectives to be prioritised, supported and funded as part of the strategies for the development of urban centres [2,26,37].

Finally, further research is needed to determine the degree of generalisability of the outcomes presented in this paper, since they are relevant for municipalities within countries with similar planning and governance structure/mechanisms as those existing in the
Netherlands. Particularly, it would be of interest to consider the effects of different political realities, public infrastructures and cultures present in other countries.

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**Appendix A**

Table A1. Thematic analysis results.

| Id. | Basic Theme | Organizing Theme | Global Theme | Evidence |
|-----|-------------|------------------|--------------|----------|
| T-01 | Aligned goals of climate adaptation working programs and board objectives. | Traceability of City Vision into specific Desired Results | Institutional Aspects | Our goals for climate adaptations have to fit in those strategic goals |
| T-02 | Aligned goals of Circularity working programs and board objectives. | Traceability of City Vision into specific Desired Results | Institutional Aspects | But also, that’s also true for circularity and sustainability |
| T-03 | Aligned goals of Sustainability working programs and board objectives. | Traceability of City Vision into specific Desired Results | Institutional Aspects | But also, that’s also true for circularity and sustainability |
| T-04 | Operationalization of Strategic goals into SMART goals | Operationalization of Goals into measurable Objectives | Institutional Aspects | So that’s how we translate from a higher level to the lower level, to make it also possible to work with it |
| T-05 | Circularity, Sustainability and Climate Adaptation Goals are defined independently from each other | Identification of interdependencies between Sustainability Dimensions | Institutional Aspects | Circularity, climate adaptation and sustainability are three goals, not one goal and every part has its own explanation and not working together yet |
| T-06 | Need to work on a combined agenda (Sustainability + Circularity + Climate Adaptation) | Coordination of objectives for integrative Urban Planning | Improvement Opportunities | I want to combine these three to show everybody that if you want to really achieve something you need to work on these three together and not separated, they are linked together |
| T-07 | Functional units have separated budgets | Factors influencing Collaboration among functional Units | Institutional Aspects | It is the separation of the budgets, where the money is coming from, that’s a difficulty |
| T-08 | Prioritization of flood and drought resilience. | Climate Adaptation and Resilience | Municipality Concerns | Climate adaptation is high goal now, because of the lack of water in the summer time, or too much water in one time |
| T-09 | Prioritization of managing the Heat Island Effect. | Climate Adaptation and Resilience | Municipality Concerns | The Heat stress is a big one |
| T-10 | Reducing CO2 levels | Reduction of Waste and Pollutants | Municipality Concerns | CO2 is a very big one. It is maybe even bigger than climate adaptation |
| T-11 | Definition of what Circularity entails | Learning and Knowledge Sharing on Circularity | Municipality Concerns | Rising now is circularity, because nobody knows exactly what it is, you cannot grab it, you don’t know what it is |
| T-12 | Authority from Team Leaders to undergo alternative tendering processes by implementing contractor’s Circularity knowledge in the tendering criteria | Flexible use of alternative Project Definition Procedures | Institutional Aspects | His knowledge, how determined he is to make this project as circular as possible within the limits and boundaries that we gave him |
| T-13 | Reduce Concrete and Demolition Waste (CDW) | Reduction of Waste and Pollutants | Municipality Concerns | Concrete and Demolition waste (CDW) is about we want to make more circular, so how do we do that? |
| T-14 | Knowledge sharing and collaboration for Circularity | Learning and Knowledge Sharing on Circularity | Municipality Concerns | What can we learn from them, how can we work together to do that? |
| T-15 | Innovative projects are allowed to steer the City goals definition and updating process | Project-led improvement of long-term Goals | Institutional Aspects | These projects make that the city council think about the goals and redirect the goals that they now have. These projects are front-runners |
| T-16 | Reducing Risk-adverse and conservative mentality can boost change pace and innovation. | Attitudes influencing change and innovation adoption | Improvement Opportunities | Why don’t we turn on the nudge a little bit higher? We can achieve so much more than we now do. We are so scary about innovation, or contracting and everything has to be carefully weighted |
| T-17 | Need to avoid unresponsiveness to change demands | Attitudes influencing change and innovation adoption | Improvement Opportunities | Doing nothing is also a risk. Cause everything stays the same |
| T-18 | Promotion of personal responsibility as a driver for change | Leadership | Improvement Opportunities | You need to take the responsibility yourself |
| T-19 | Enhance Biodiversity in Apeldoorn | Conservation of Ecological Value | Municipality Concerns | We want to be climate adaptive in Apeldoorn, I was part on building that strategy on my former role. It is now more diverse, including managing heat in cities and biodiversity |
| T-20 | Heat Island Effect Management | Climate Adaptation and Resilience | Municipality Concerns | We want to enhance biodiversity in our town |
| T-21 | Water Management through soft structures | Climate Adaptation and Resilience | Municipality Concerns | So, the strategy is to build more green areas in our city, that enhances both heat adaptation and biodiversity, and also helps with water management |
| T-22 | Enhancing high quality greenery for city promotion as good living place | Economic Prosperity and City Marketing | Municipality Concerns | The city is well, quite green, so compared to other cities is not that big of a problem. But we want to enhance that aspect of our city, to promote our city as being a nice city to live in |
| T-23 | Supply of housing spaces at lower prices than in the Randstad area | Social Equity and Affordability | Municipality Concerns | We want to be the next city, for nice living, outside the Randstad |
| T-24 | Climate Adaptation and Sustainability as marketing drivers | Economic Prosperity and City Marketing | Municipality Concerns | So that’s why we have those goals about climate adaptation and sustainability. |
| T-25 | Asset Management is done through monetary-based analysis | Narrow vision of Sustainability | Institutional Aspects | Put a value, literally a monetary value on those higher goals or values, in that way, in your decision-making |
| T-26 | Rain water infiltration in the ground | Climate Adaptation and Resilience | Municipality Concerns | When we renew part of the public space, we try to go another way with rain water. Infiltrate that in the ground |
| T-27 | Built environment adaptation projects are coordinated with built environment maintenance activities | Factors influencing Collaboration among functional Units | Institutional Aspects | And we renew our public space every 40 years, just from a technical perspective, then the asphalt has to be renewed, the stone pavement needs to be renewed, so that’s the moment to include other goals |
| T-28 | Valuation of positive/negative effects of the built environment over social variables is unclear | Issues for assessing effects of Built Environment on Sustainability dimensions | Institutional Aspects | It’s harder to put a value on |
| T-29 | Citizenship involvement is implemented through participation within the municipality | Suitability of Project Management approaches for Delivering Project Quality | Institutional Aspects | The way how you manage projects, make it people part of the solution, giving information, or what are we going to do, ask if they have problems, they want to see solved |
| T-30 | Effects of the built environment on people’s health, mood and disposition to interact are unclear | Issues for assessing effects of Built Environment on Sustainability dimensions | Institutional Aspects | Choose how to make people more healthy or more happy, but it’s hard to know how far will you go in your public space to do that |
| T-31 | The role of Heat stress in generating indirect economic effects is unclear | Issues for assessing effects of Built Environment on Sustainability dimensions | Institutional Aspects | What does it mean if the city is too hot at night and you don’t get enough sleep and your productivity is low the other day |
| T-32 | Need to Integrate built environment projects with long-term initiatives/programs | Multidisciplinary Collaboration | Improvement Opportunities | But with those programs you have to create a long-time involvement, I think, to really help people to be less lonely, or participate In their neighbourhood |
| T-33 | Low integration between functional divisions due to a Segmented Organizational structure | Factors influencing Collaboration among functional Units | Institutional Aspects | As I said before, we have a segmented organization, so the managing of public assets is one part of the organization. There is a whole other part of the organization that manages the social aspects of our people |
| T-34 | Functional units have separated budgets | Factors influencing Collaboration among functional Units | Institutional Aspects | We try to work together but, there is no money flowing from the social program into asphalt or concrete, and otherwise also not |
| T-35 | Environmental concerns in Asset Management are done through CO2 valuation | Narrow vision of Sustainability | Institutional Aspects | Sustainability I have, for example, but I have an indicator, which it is CO2, but that is a very small perspective for sustainability |
| T-36 | Social concerns are not reflected in criteria used within Asset Management | Narrow vision of Sustainability | Institutional Aspects | But in social indicators, not loneliness, not inclusiveness, yes, what else do we have? Or the way in which people are involved in their neighbourhood |
| T-37 | Ecological footprint reduction through reduction in CO2 emissions | Reduction of Waste and Pollutants | Municipality Concerns | To reduce carbon dioxide emissions by 25% in 2022 |
| T-38 | Ecological footprint reduction through the reduction in the use of raw materials by 25% in 2022 | Efficient use of Natural Resources | Municipality Concerns | To reduce the use of virgin materials, virgin natural resources also by 25% in 2022 |
| T-39 | Reduction in water consumption for companies/citizens/ agriculture and the municipality itself | Efficient use of Natural Resources | Municipality Concerns | Reducing water and working with water is another program that I work on, but is all related |
| T-40 | Implementation of the Circular Estaffete Program | Learning and Knowledge Sharing on Cirularity | Municipality Concerns | To facilitate they can learn from each other and share knowledge |
| T-41  | Development of Business models for circularity | Promotion of Circular Economy Models | Municipality Concerns | For this project that I mentioned last, they are trying to develop a business model on how it can work |
|-------|-----------------------------------------------|-------------------------------------|-----------------------|---------------------------------------------------------------------------------------------------|
| T-42  | Durability of used materials reduce maintenance costs | Promotion of Circular Economy Models | Municipality Concerns | For me it’s more about the lifespan of the material. The longer it lasts, the better |
| T-43  | Inclusion of Safety concerns for the users | Provision of Safe Urban Spaces | Municipality Concerns | Because it concerns the safety of our users |
| T-44  | Old asphalt reuse in new bottom/between layers | Reduction of Waste and Pollutants | Municipality Concerns | Asphalt is about the old-made asphalt roads. We do this primarily in the bottom layers or between layers |
| T-45  | CDW reuse for foundations of concrete cycling paths | Reduction of Waste and Pollutants | Municipality Concerns | This is a cycling path; this asphalt is laid on a foundation of old broken buildings |
| T-46  | Integral plan development is hindered by budget separation | Factors influencing Collaboration among functional Units | Institutional Aspects | For those projects, they have different interests and budgets, but we try to do an integral plan |
| T-47  | No standardised collaboration practices are implemented among functional units | Factors influencing Collaboration among functional Units | Institutional Aspects | For those projects, they have different interests and budgets, but we try to do an integral plan |
| T-48  | Coping with CDW | Reduction of Waste and Pollutants | Municipality Concerns | How do you cope with waste |
| T-49  | Social Inclusion considerations in the built environment | Inclusiveness | Municipality Concerns | What can you do with inclusion |
| T-50  | Increase the share of renewable energy sources | Renewable Energy sourcing | Municipality Concerns | The use of sustainable energy |
| T-51  | Operationalization of Sustainability through functional division | Identification of interdependencies between Sustainability Dimensions | Institutional Aspects | That’s also a very broad subject and it’s made smaller into divisions |
| T-52  | Economic value of organic wastes (leaves) | Promotion of Circular Economy Models | Municipality Concerns | We can compost them, and that compost gets used in all of the city |
| T-53  | Use of electric machinery within B&O | Internal working directives fostering Sustainability | Institutional Aspects | We are switching now to electric power. We always used diesel power and now, with our tools, with our vehicles, with our buildings we go to electric power |
| T-54  | Enhance social interaction and public activities with public space interventions | Social Equity and Provision of Facilities/Services | Municipality Concerns | You have to make places in the public space where people can meet, where people can sport, where people can play. It means we give extra care to those places who are already a bit left behind |
| T-55  | Management and Maintenance plans across the functional unit are aligned with the City Goals | Traceability of City Vision into specific Desired Results | Institutional Aspects | But we always want that the plan here can relate to the plan here, can relate to the plan here, and also can relate to the goals of the city |
| T-56  | Pilot projects are used as bottom-up Knowledge sources | Organizational learning Strategies | Institutional Aspects | We see those pilots or new ways of working and we pick them up and we say, this works, let’s spread it out through the whole unit, lets make them bigger by communicating about them |
| T-57  | Alternative project definition processes are allowed for pursuing Circularity objectives | Flexible use of alternative Project Definition Procedures | Institutional Aspects | With circularity, is that we said: Ok, it’s not going fast enough, let’s make a separate study in which we pinpoint the top-ten most potentially successful projects |
| T-58  | Combination of Functional vs. Geographical unit divisions can provide extended benefits from knowledge sharing | Factors influencing Collaboration among functional Units | Institutional Aspects | And mostly the more specialised people don’t know the surrounding area that well and on the other side here is more much Knowledge about that specialised function. So, in an ideal world that’s great, and sometimes, maybe in 10% of the cases, you get conflict |
| T-59   | Need to develop Pride and sense of contribution as motivators for promoting change | Attitudes influencing change and innovation adoption | Improvement Opportunities | I’m not only doing this work, no, I’m part of something bigger, and making the city better, we also think that pride is important because it can be stimulant for people to do their job. |
|-------|---------------------------------------------------------------------------------|------------------------------------------------|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| T-60   | Get a proper understanding of the future needs within the public space           | Adaptability to future needs                     | Municipality Concerns    | We are not just maintaining the public space, we are really adding something. We are much more looking towards the future, what it’s necessary                                                                                     |
| T-61   | Sustainability, Circularity and Climate Adaptation objectives are not consistently included as criteria in Project Orders (Opdracht) | Degree of Consistency in inclusion of Sustainability Objectives in Project Scope. | Institutional Aspects   | Sustainability, climate adaptation or circularity, everything is the same, is not named in the project order                                                                                                                                 |
| T-62   | Circularity and Sustainability are excluded from project performance measures on given projects | Degree of Consistency in inclusion of Sustainability Objectives in Project Scope. | Institutional Aspects   | Also, circularity. It is not in every project that we use it, because some things we do it by ourselves                                                                                                                                 |
| T-63   | High Level goals are not easily quantifiable through Project Objectives          | Operationalization of Goals into measurable Objectives | Institutional Aspects   | Therefore, the strategic goals for the city council are too far away from us                                                                                                                                                                                   |
| T-64   | Non-standardised inclusion of sustainability criteria in project orders           | Degree of Consistency in inclusion of Sustainability Objectives in Project Scope. | Institutional Aspects   | Sustainability, climate adaptation or circularity, everything is the same, is not named in the project order                                                                                                                                 |
| T-65   | Personal priorities are allowed to exclude Sustainability criteria from given project orders | Degree of Consistency in inclusion of Sustainability Objectives in Project Scope. | Institutional Aspects   | Like sustainability, is more like to infiltrate the rainwater and that kind of stuff, that we do by ourselves                                                                                                                                                   |
| T-66   | Advisory role of Engineer’s Bureau in project team enables the inclusion of Sustainability concerns | Degree of Consistency in inclusion of Sustainability Objectives in Project Scope. | Institutional Aspects   | In the first stage of the project we are more like advisors, then we can also bring it in                                                                                                                                                                       |
| T-67   | Late inclusion of Sustainability Concerns in the Project Process                   | Degree of Consistency in inclusion of Sustainability Objectives in Project Scope. | Institutional Aspects   | I think it’s more when I get the project, I think more about it. […]                                                                                                                                                                                         |
| T-68   | Multidisciplinary Project Team is assembled with members from R&L, PVG, Stedenbouw, Bestemmingsplan and Engineer’s Bureau | Suitability of Project Management approaches for Delivering Project Quality | Institutional Aspects   | So, making the plans is RL, but a client is PVG, is a project manager of PVG, and he has me for IB, but also, he has here Stedenbouw Bestemmingplan and also IB and I am a part of it, here                                                                                                                                 |
| T-69   | Trade-offs and negotiation between disciplines is done during project definition   | Suitability of Project Management approaches for Delivering Project Quality | Institutional Aspects   | When they give more space to the building companies, we earn more money, so our incomes are increasing, but also there’s less green, less public space, so together we make a decision, and there in that initial phase, we search together which combination is the best for the city, but also in time, in planning                                                                |
| T-70   | Authority from Team Leaders to undergo alternative tendering processes by implementing contractor’s Circularity | Flexible use of alternative Project Definition Procedures | Institutional Aspects   | This project was unique because we didn’t have a price, we didn’t want a price, we wanted the best contractor who matched                                                                                                                                 |
| T-71 | Knowledge acquired from contractor to be used as learning potential for the municipality | Learning and Knowledge Sharing on Circularity | Municipality Concerns | Yes, and we wanted a contractor that … with us. We want to learn. As organization we want to learn from it. |
| T-72 | Traditional Tendering criteria (Time and Cost) are used as regular commissioning procedure | Suitability of Project Management approaches for Delivering Project Quality | Institutional Aspects | Yes, lowest price or combination of planning and price |
| T-73 | Social benefits from projects unaccounted in project performance assessment | Narrow vision of Sustainability | Institutional Aspects | The social cohesion in the neighbourhood, yes how do you measure it? |
| T-74 | Need to achieve financial coordination to allow Circularity, Sustainability and Climate adaptation to be included in project definition | Need for Financial Integration | Improvement Opportunities | But it cannot remain only as a strategy, or a plan, but they need to arrange everything (including financial aspects), to achieve change and actually realize the plans |
| T-75 | Need to adapt the public space to future climate problems | Climate Adaptation and Resilience | Municipality Concerns | The biggest part in public space is to adapt space to future climate problems, because climate is changing |
| T-76 | Importance of flood and drought resilience. | Climate Adaptation and Resilience | Municipality Concerns | Risks for flooding, more rain etc. Also, for more dry periods and urban heating |
| T-77 | Importance of managing the Heat Island Effect. | Climate Adaptation and Resilience | Municipality Concerns | Risks for flooding, more rain etc. Also, for more dry periods and urban heating |
| T-78 | Longer life-span of clay materials as replacement for concrete products | Responsible Material Sourcing | Municipality Concerns | We know that good clay and bricks they can be more than 100 years old because they stay better |
| T-79 | Local production of clay products for replacing concrete ones | Responsible Sourcing of Materials | Municipality Concerns | So, we are thinking about changing the pavement in more circular material. For example, in Holland we need a lot of clay baked pavement. Do you know what it is? Because it’s more local material, we bake it in Holland. We have industries that bake bricks |
| T-80 | Production process concerns for clay products as replacement of concrete | Responsible Sourcing of Materials | Municipality Concerns | In sustainability terms you think in the whole range of steps to make bricks it takes a lot of carbon dioxide because they are baked, they use fuels for baking the clay |
| T-81 | Need to Increase awareness on personal ways of contributing to promote change and innovation | Attitudes influencing change and innovation adoption | Improvement Opportunities | I think it’s very important. Many people are not aware of that they have possibilities to contribute to more sustainability |
| T-82 | Need for guidelines and principles on Sustainability and Circularity | Guidelines and Principles for Sustainability | Improvement Opportunities | So, the first thing is to make aware, to make examples, help them with examples, try and make errors, to develop a way of thinking by trial and error. But you can help them with principles to make … |
| T-83 | Life-cycle considerations in material selection | Circular Use of Materials | Municipality Concerns | So, the chain thinking, not only chain in steps, but also the chain in time. Do you understand? … Yes, The Life cycle, you know the right words. But there is another thing that we help to develop circular principles |
| T-84 | Circularity criteria can be included in early stages of given Projects Processes | Degree of Consistency in inclusion of Sustainability Objectives in Project Scope. | Institutional Aspects | A design that involves circular thinking, so we try to introduce circular thinking in the redesigning of this area |
| T-85 | Change of heating systems for innovative ideas (Heat from surface water?) | Renewable Energy sourcing | Municipality Concerns | The way we want to connect these two is that we think that we can use surface water for heating. The energy in surface water, the surface water is in average 10 degrees or something, so you can take some heat out of the water |
| T-86 | Built environment adaptation projects are coordinated with built environment maintenance activities | Factors influencing Collaboration among functional Units | Institutional Aspects | We not only do this heating system, but we also change public space, because we are already thinking about renewing the public space, redesigning, |
| T-87 | Managing and dealing with people’s expectations and reluctance to change | Participative Governance and Engagement | Municipality Concerns | Yes, that’s quite complex, because it’s not only an engineering thing but it is also social, mental social thing |
| T-88 | No standardised circularity inclusion criteria are defined for project definition processes | Degree of Consistency in inclusion of Sustainability Objectives in Project Scope. | Institutional Aspects | There is not a system to ensure that they make a circular redesigning of it, we only hope that they are trying to include circular thinking in the design. But there is not a system that makes it sure |
| T-89 | Pilot projects (like City Loops) are used as trial and error tests for Knowledge generation | Organizational learning Strategies | Institutional Aspects | But this City loops project will help us to make it more a part of engineering and including a normal part of engineering. So, it’s trial and error. |
| T-90 | Lack of Systematically Integrated Collaboration Processes | Factors influencing Collaboration among functional Units | Institutional Aspects | There is interaction, but it is not systematically integrated. It is more about people who understand each other, because they know what you want to reach |
| T-91 | Parks and areas specific for given age groups | Provision of Facilities and Services | Municipality Concerns | You can try to make places specific for these group of youngsters, where they can do their things, then you are also social |
| T-92 | Urban redevelopment should consider the provision of different services for the community | Provision of Facilities and Services | Municipality Concerns | So, when you are redesigning an area you also need to think about services, you have to think about which pays, about social systems, about economical services, health services and the services are economical of importance |

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