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Urban Heritage Facility Management: A Conceptual Framework for the Provision of Urban-Scale Support Services in Norwegian World Heritage Sites

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Abstract: This study validated the theoretical keypoints obtained from a previously published scoping literature review within the context of three Norwegian World Heritage sites: Røros, Rjukan, and Notodden. The cross-sectional table of the urban heritage facility management (UHFM) framework, which is based on interviews and correspondence, demonstrates the connection between the tasks of the six clusters of technical departments responsible for the provision of urban-scale support services and the modified critical steps of the Historic Urban Landscape approach, in which an additional step for "monitoring and evaluation" was included. UHFM operates at the intersection of heritage preservation, urban-scale facility management, and stakeholder coordination, which requires a careful balance between urban heritage conservation and sustainable urban management practices, thus enabling the preservation of World Heritage status that, among others, fosters sustainable tourism. The three case studies highlighted the significance of UHFM in preserving heritage value, authenticity, visual quality, and significance. Besides providing comprehensive support services that extend beyond the daily tasks of conservators and World Heritage managers, UHFM also allows feedback mechanisms for continuous improvement. This study highlighted the complex relationship between the provision of urban-scale support services and the preservation of Outstanding Universal Value as the core business of World Heritage sites.

Keywords: urban facility management; support services; urban heritage; urban scale; conservation; World Heritage

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1. Introduction

World Heritage (WH) sites are highly valuable assets to humanity because they represent universal value that goes beyond national boundaries [1–3]. To maintain the Outstanding Universal Value (OUV), as the prerequisite of preserving the WH status of protected sites [4,5] and complementary to the daily tasks of conservators, archeologists, academics, and heritage authorities [6], various technical departments in the municipality, county, and national level need to work together in a coordinated manner to achieve the common goals. In accordance with their primary responsibilities, conservators and cultural heritage authorities tend to prioritize the preservation of historic buildings, monuments, and OUV of heritage sites over providing urban-scale support services [7,8]. The delivery of these services is a crucial task that appears not to support conservation efforts directly. However, in order to determine the support services that are required to be provided, it is still crucial to have a comprehensive understanding of the "core business" of the WH site [6].

In the previous study, the scoping literature review of urban heritage facility management (UHFM) highlighted a few discussions and debates amongst academics and

practitioners around urban-scale facility management within urban heritage areas [9]. The previously examined literature mainly discussed facility management (FM) practices of single heritage buildings or a complex of buildings instead of urban-scale facility management (Urban FM). Meanwhile, works of literature in the Urban FM field did not explicitly address historic districts or urban heritage areas nor their relation to urban-scale conservation practices [6,9]. The phenomenon is understandable since Urban FM itself is still a relatively new field in its establishment phase, and it is an expansion of FM discipline within the urban context [10,11]. Most of the heritage-related articles from the examined papers refer to the Historic Urban Landscape (HUL) approach as the latest holistic approach to managing urban heritage [9,12,13]. Although widely recognized as an avant-garde approach, there are many uncertainties in interpreting the HUL approach's operable criteria at the regional and local governance levels [9,13,14]. Many aspects of such an approach could be explained and clarified better using FM and Urban FM as more technical disciplines for the technical departments in charge of providing and delivering urban-scale support services [9].

FM is a branch of management discipline that addresses the tools and services that support the functionality, safety, and sustainability of buildings, grounds, infrastructures, and real estate [9,15,16]. International Facility Management Association (IFMA) also proposed a new definition of FM as a profession, or discipline, that encompasses multiple disciplines to ensure the functionality of the built environment by integrating people, place, process, and technology [15,17,18]. This new definition allowed Urban FM to legitimately become an expansion of the FM discipline since Urban FM is a manifestation of urban-scale facility management. As the definition is applied to a single building, an urban area is also considered a built environment [6,19,20]. The new definition of FM by IFMA also made it possible for the HUL approach, as the latest conservation paradigm, to be incorporated into the Urban FM field since this holistic approach put the people—its main stakeholder—as an important part of the sustainable urban conservation process, especially in reaching consensus on what and how heritage assets should be preserved, within bottom-up heritage policy decision-making [6,9].

UHFM emerged from the expansion of the facility management (FM) discipline into urban-scale facility management (Urban FM) within the context of urban-scale heritage areas [6,9,16]. This development coincided with the emergence of a new paradigm in managing urban heritage areas and historic towns, known as the HUL approach, which was recommended by UNESCO in 2011 [13,21]. This approach advocates for a more holistic and inclusive strategy in managing heritage, aiming to balance the preservation of historical buildings and monuments with the evolving demands of urban development [22–24]. UHFM addresses the complex task of managing urban-scale support services in these unique types of heritage areas. The justification for UHFM establishment is supported by the dual requirement of safeguarding the WH sites' outstanding universal values while ensuring their sustainable development and stakeholders' well-being [6,9]. The HUL approach is a comprehensive framework highlighting the coexistence of heritage preservation and sustainable urban development [22,23]. The HUL approach acknowledged the significance of the historic town as a living environment and dynamic entity. In contrast, the UHFM framework expands on this philosophy by integrating it into the management of urban-scale facilities. WH sites, especially those with urban characteristics, require an advanced approach that goes beyond conventional heritage conservation [25,26], as they preserve exceptional cultural heritage values and attributes. UHFM, as an integration of the HUL approach and Urban FM, provides the opportunity to support the preservation of OUV through the excellent delivery of urban heritage-friendly support services.

UHFM focuses specifically on examining the complex aspects of managing facilities in the context of urban heritage. It acknowledges that the preservation of OUV is not an isolated task but one that requires a coordinated effort in managing various support services crucial for the daily operation of these areas. Thus, UHFM bridges the gap between preserving cultural heritage, ensuring urban functionality, and promoting collaboration among stakeholders. It offers a detailed and practical framework for effectively organizing

support services on a large scale in urban areas. Implementing UHFM into the management of historic towns has the potential to complement the conventional conservation measures undertaken by conservators and heritage authorities at various levels, nationally, regionally, and locally. This integration may deliver urban-scale support services that are in compliance with the preservation of OUV as part of the holistic approach recommended by UNESCO through the HUL approach [9,21].

The UNESCO recommendation proposed a paradigm shift in the preservation of historic buildings. Instead of solely focusing on the physical preservation of buildings and monuments, it suggests a broader approach that considers the entire human environment, including both tangible and intangible aspects, such as increased attention to the well-being of the dwellers in urban heritage areas [12,13,26]. This shift in paradigm, together with the emerging concepts of Urban FM as a people-oriented discipline, resulted in an adjustment of the provision of urban-scale support services in establishing a balance between the efficiency and effectiveness of service delivery while simultaneously preserving the heritage integrity and OUV of WH sites. Therefore, there is a necessity for a framework to implement urban heritage facility management that is capable of adapting to the dynamic characteristics of urban environments. This framework is essential for achieving a balance between preserving heritage values and meeting the demands and standards of modern society. By taking into account the roles and responsibilities of various stakeholders, technical departments, and governance structures, the UHFM framework serves as a tool that allows the involvement of urban-scale support services to contribute and align with the protection of the WH status of the areas under study.

Urban heritage facility managers' tasks extend beyond the routine tasks of conservators and heritage authorities. Support services that may not appear directly connected to historical aspects, in practical terms, might have significant impacts on the visual esthetics, cultural value, and the OUV of protected heritage sites. Tasks such as placing waste containers, choosing between cobblestone or asphalt for road construction, conducting excavation work for underground infrastructure, and installing street furniture in the protected core area of WH sites can present significant complexities. These challenges necessitate both heritage and technical skilled and knowledgeable human resources, which can be managed within the proposed UHFM framework in this study. The UHFM provides clear guidance for support service providers and technical departments, overcoming the difficulty of interpreting the HUL approach, which often showed itself to be confusing at the tactical and operational levels. UHFM operates at the intersection of heritage conservation, urban-scale facility management, and collaboration among stakeholders.

This study examines the complexities of UHFM by analyzing information gathered from three Norwegian World Heritage sites: Røros, Rjukan, and Notodden. The study takes a comprehensive approach, integrating insights obtained from interviews and correspondence with key individuals responsible for managing certain aspects of the studied World Heritage sites, including officials from technical departments, heritage authorities, and governmental bodies at the local, regional, and national levels. Document studies were conducted as an additional source to supplement the interviews and correspondences. The information collected provides valuable qualitative data, insights into challenges, achievements, and collaborative efforts related to managing urban-scale support services in urban heritage areas.

The primary objective of this study is to propose a conceptual framework for UHFM that effectively addresses the complexities of organizing urban-scale support services in World Heritage sites. In order to achieve this, this study aimed to address two research questions: (RQ1) "How can urban-scale support services be efficiently organized in an urban heritage area or World Heritage site by technical departments and other stakeholders, without compromising the Outstanding Universal Value (OUV), visual quality, authenticity, and significance of the protected heritage site?" and (RQ2) "How do the processes and coordination functions of urban-scale facility management support services contribute to preserving the World Heritage status of a protected urban heritage area, considering the

roles of multiple layers of governance, technical departments, stakeholders, and feedback mechanisms for continuous improvement?".

This study investigated the urban heritage facility management practices in the three Norwegian world heritage sites as the case study to validate the theoretical keypoints on how to conduct urban-scale facility management within urban heritage areas.

2. Methods

2.1. Research Design

This research undertakes three case studies in the Norwegian World Heritage sites: Røros Bergstaden, Rjukan Company Town, and Notodden Industrial Heritage area. The selection of case studies has gone through a long process by taking into account many factors, including representing urban heritage areas or historic towns and aspects of comparability, which makes them relevant to be studied to validate the theoretical keypoints obtained from the urban heritage facility management's scoping review process [9]. Urban heritage areas with World Heritage status were selected due to their compliance with international standards in conservation management and the implementation of a comprehensive periodic reporting system at the local, national, and international levels, thus ensuring the availability of standardized and structured data and documented information. Norway was selected as a nation to be studied based on its unique architectural characteristics, extensive experience in managing World Heritage sites, close proximity to the home base of this study research laboratory, well-established network, ease of access, and budget limitations. The main approach chosen was based on (1) semi-structured interviewing, (2) detailed correspondence with technical departments, and (3) document studies of the investigated cases. The results were organized according to (1) a clustering of technical departments and (2) the validation of the 33 UHFM theoretical keypoints.

The urban-scale support services that form the UHFM foundation in the World Heritage context [6] have been incorporated into corresponding technical departments at the municipality *(kommune)* level. Furthermore, interviews were conducted, and correspondences were exchanged with technical departments at the county *(fylkeskommune)* level regarding urban-scale service delivery at WH sites. As an illustration, the WH coordinator *(verdensarvkoordinator)* for Røros Bergstaden and its surrounding areas operates under the jurisdiction of the local municipality *(Røros kommune)* with some coordination function between counties *(verdensarvrådet)* where the circumference of Røros is situated, whereas the WH coordinators for Rjukan and Notodden operate under the organizational structure of the county level *(Vestfold og Telemark fylkeskommune)*. This study is aware that in 2020, Telemark County underwent a merger with Vestfold County to establish the new Vestfold og Telemark Fylkeskommune (VTFK). Nevertheless, in 2024, Telemark was again restored as a county. This study will use VTFK in conjunction with both Vestfold County and Telemark County, considering the specific timeframe of its data collection. In this study, it is noteworthy that all coordinators of WH sites in the Norwegian context collaborate closely with *Riksantikvaren*, the Directorate for Cultural Heritage of Norway. The support services were categorized into six clusters: planning and zoning, public works and infrastructure, tourism, conservation and cultural heritage, environment and sustainability, and urban safety and security. The data for this research were collected and analyzed employing the three selected Norwegian World Heritage sites as case studies and the six categories mentioned earlier. The 33 theoretical keypoints of UHFM, obtained from the UHFM scoping literature review [9], were utilized in this study to provide guidance for the development of interview protocols, correspondences, coding for qualitative analysis, and cross-sectional tables.

Røros Mining Town, located in Trøndelag County (Figure 1), was designated as a UNESCO World Heritage site in 1980 and extended to its circumference in 2010 due to its exceptional universal value under criteria (iii) for bearing unique witness to the adaptation of technology to the requirements of the natural environment and the remoteness of the situation, (iv) for illustrating in an outstanding manner how people adapted to the extreme

circumstances in which they had to live and how they used the available indigenous resources to provide shelter, produce food for their sustenance, and contribute to the national wealth of the country, and (v) for constituting a totality that is an outstanding example of traditional settlement and land use [27,28]. Røros is a remarkable reminder of a lost cultural tradition and an important period in Norwegian history. This picturesque mountainous mining town has been recognized for its well-preserved architectural ensemble, which reflects the socio-economic systems and mining practices of the 17th and 18th centuries, earning it a place on the World Heritage List. Røros, which is distinguished by wooden houses painted in traditional colors, is a remarkable example of how people have adapted to a harsh environment. It plays a crucial role in the Røros Municipality because the town is a thriving hub for community life, cultural traditions, and heritage preservation [28]. Røros is important to Trøndelag County, even outside of its immediate vicinity. It adds to the area's cultural diversity and draws tourists eager to experience the distinctive mining history and charming architecture that characterize this remarkable World Heritage site.

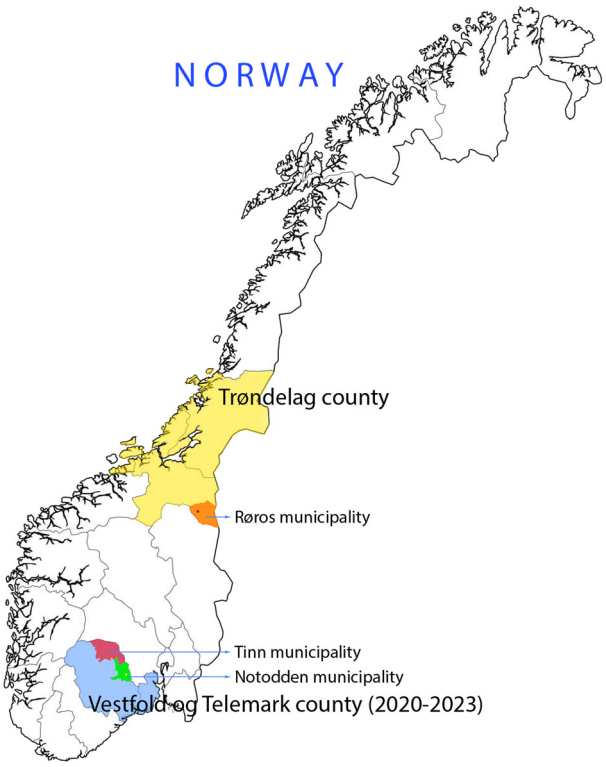

Figure 1. Location of Røros municipality (Trøndelag County) and Tinn and Notodden Municipality (Vestfold og Telemark County).

Meanwhile, an important period in Norway's industrial history is represented by the Rjukan and Notodden Industrial Heritage area, which was inscribed as a UNESCO World Heritage site in 2015. This cultural landscape in Telemark County was essential to the early 20th-century production of fertilizers through the use of hydroelectric power and nitrogen extraction [29,30]. The two towns, Rjukan and Notodden (Figure 1), show how human activity shaped the landscape and are prime examples of inventive industrial urban planning and architecture. This site is inscribed under UNESCO criteria (ii) for demonstrating an exceptional combination of industrial themes and assets tied to the landscape, which exhibit an important exchange on technological development in the early 20th century, and (iv) for its outstanding industrial ensemble comprising dams, tunnels, pipes, power plants, power lines, factory areas and equipment, the company towns, railway lines, and ferry service, located in a landscape where the natural topography enabled hydroelectricity to be generated in the necessary large amounts, stands out as an example of new global industry in the early 20th century [29,30]. This site serves as

a testament to the economic and social changes brought about by the development of hydroelectric power and industrialization. The Rjukan and Notodden Industrial Heritage area in Telemark is a living heritage site today, contributing to the identity of the area and drawing tourists eager to learn more about the industrial and architectural legacy of this distinctive cultural landscape.

2.2. Data Collection

The data needed for this study were collected from semi-structured interviews, exchanging correspondences, and document studies. The interviews and correspondences were conducted from 21 January 2022 to 30 December 2023 and were registered to and approved by the Norwegian Center for Research Data (NSD), which later merged with two other Norwegian organizations to establish the new Norwegian Agency for Shared Services in Education and Research (SIKT).

2.2.1. Semi-Structured Interviews

This study used in-depth semi-structured interviews to address the research questions adequately [31]. A predetermined interview protocol was created to ensure alignment with the research questions, and it has undergone pre-testing and peer review by an academic who also works as a researcher and has a particular interest in one of the World Heritage sites in Norway. The feedback was then integrated into the final interview protocol.

The interviewees were chosen based on their roles and/or administration function in the protected urban heritage sites. The main interviewees comprised eight individuals who have specialized knowledge in conservation and World Heritage site management in the Norwegian context, such as city antiquarians *(byantikvar)*, WH coordinators *(verdensarvkoordinator)*, academics, and staff members of the Directorate for Cultural Heritage *(Riksantikvar)* of Norway (Table 1). The *byantikvar* and *verdensarvkoordinator*, part of the technical department cluster responsible for cultural heritage and conservation in the municipality and county, were given special interviews as they agreed to do so. There are several challenges during the data collection, such as conflicted schedules, language barriers, and impracticalities due to the COVID-19 pandemic. It was then decided to conduct some of the interviews via online platforms (i.e., Zoom meetings, Google Meet, and MS Teams) to overcome most of the challenges. Two interviews were conducted in person, while the remaining six interviews were conducted through one-on-one meetings through live video conferences. Minutes of the meetings were taken, and voice notes and/ or video conferences were recorded with the interviewees' consent. Automatic transcription was generated and used to transcribe the interviews roughly, but further careful audio rechecks were conducted manually to guarantee the accuracy of the transcription. All interviews were recorded in both video and audio formats, except for the two physical interviews, which were recorded solely in audio format.

Table 1. Distribution of interviewees and correspondence.

Institution/Background	**n**	**Knowledge**		
		General	**Heritage**	**Technical**
Municipality (Kommune)	18	Yes	Some	Yes
County (Fylkeskommune)	7	Yes	Some	Yes
Academic/University	3	Yes	Yes	Some
National Authority (Riksantikvaren)	1	Yes	Yes	Some

2.2.2. Correspondence with Technical Departments

Nevertheless, a written correspondence method [32,33] was adopted to increase participation and data collection from the technical departments, especially regarding specific

tasks and support services. The correspondence technique was employed in this study due to the disinclination of the technical departments' resources to accept interview requests, resulting in low response rates during the initial data collection stage. One possible explanation for the low response rate is that the semi-structured interview material included with the interview request application was too broad for certain specific technical departments. This assumption can be drawn based on the frequent comments made during email correspondence, later, where they expressed their reluctance to address questions that belong to the responsibilities and expertise of other technical departments. However, questions related to the responsibilities, authorities, and duties of the respective departments and sections were addressed comprehensively by the contact persons during the follow-up email correspondence. Another possible cause is that language barriers, cultural differences, and the hectic work schedules of the interviewees in various technical departments at the municipality and county levels posed challenges, making conducting lengthy or repeated interviews impractical. As a result, the electronic correspondence method via email was adopted as a more effective and efficient substitute for the interviews. Questions that remained unresolved or those that generated intellectual curiosity needed by this study were investigated further through a series of exchanged emails. The follow-up inquiries were typically answered in written form with explanations or by providing URL links to relevant documents, reports, or official websites.

A more focused set of questions, specifically tailored to each technical department, was developed from the initial semi-structured interview questions. These inquiries were subsequently sent to the relevant technical department responsible for addressing the specific inquiry. Out of the 72 emails in total sent to the academics, *Riksantikvaren*, and various levels of technical staff in the municipality and county of the studied area, 28 emails were responded to and utilized for further communication and data collection for this study. Among those 28 replies, only 21 of them should be considered as correspondence since 7 of the other email responses agreed to participate in the interviews. Another interviewee was being contacted by phone (Tables 1 and 2). The correspondence data and archives were saved in PDF format and categorized based on the different labels and locations of the study case.

Table 2. Interviewees and correspondence coding.

		PLZ	**PWI**	**TOU**	**CCH**	**ESU**	**USS**
Røros (RO)	Røros kommune	RO-PLZ	RO-PWI	RO-TOU	RO-CCH	RO-ESU	RO-USS
	Trøndelag fylkeskommune	TR-PLZ	TR-PWI	-	TR-CCH	TR-ESU	-
	Academics	AC1, AC2	AC1, AC2	AC1, AC2	AC1, AC2	AC1, AC2	AC1, AC2
	Riksantikvaren	RI	RI	RI	RI	RI	RI
Rjukan (RJ)	Tinn kommune	RJ-PLZ	RJ-PWI	RJ-TOU	RJ-CCH	RJ-ESU	RJ-USS
	Vestfold og Telemark fylkeskommune	VT-PLZ	VT-PWI	-	VT-CCH	-	-
	Academics	AC3	AC3	AC3	AC3	AC3	AC3
	Riksantikvaren	RI	RI	RI	RI	RI	RI
Notodden (NO)	Notodden kommune	NO-PLZ	NO-PWI	NO-TOU	NO-CCH	NO-ESU	NO-USS
	Vestfold og Telemark fylkeskommune	VT-PLZ	VT-PWI	-	VT-CCH	-	-
	Academics	AC3	AC3	AC3	AC3	AC3	AC3
	Riksantikvaren	RI	RI	RI	RI	RI	RI

RO = Røros, RJ = Rjukan, NO = Notodden, AC = Academics, RI = *Riksantikvaren*/Directorate for Cultural Heritage, PLZ = planning and zoning, PWI = public works and infrastructure, TOU = tourism, CCH = conservation and cultural heritage, ESU = environment and sustainability, USS = urban safety and security.

The complete responses of the interviewees and correspondences were transcribed and utilized for analysis and coding in NVivo 12 Pro.

2.2.3. Document Studies

During the process of conducting interviews, some interviewees and correspondents occasionally supplied tools, data, information, files, and URL links to provide supplementary information pertinent to this study. Publicly available data were acquired from official websites through the Internet, online databases, and libraries (see Appendix B). The documents consist of nomination dossiers, periodic reporting, Planning and Building Acts, Cultural Heritage Acts, evaluation by advisory bodies, etc. The documents were examined for their capacity to provide a comprehensive analysis of existing records, plans, and reports related to World Heritage sites. Through careful examination of nomination dossiers, periodic reports, management plans, and other documents, researchers can discover valuable insights regarding the historical development, conservation strategies, and difficulties encountered by these sites. These documents serve as a basis for understanding the context, objectives, and recommended management practices for protecting the WH properties. Furthermore, conducting document studies allows for the detection of challenges, inconsistencies, or successes in implemented strategies, providing insights for future improvements [34]. The document studies also enabled this study to understand institutional knowledge, policy frameworks, and the interactions between stakeholders.

2.3. Data Analysis

The empirical analysis primarily relies on an iterative and inductive process [31,35] that involves reading, coding, interpreting, and re-evaluating the transcribed interview notes from the three case studies and their six technical departments. Additionally, it includes input from the national authority *(riksantikvaren)* and academics who have previously been involved or are currently working on the studied and specified World Heritage sites in Norway. The analysis of each case study involved the utilization of open and axial coding techniques in the NVivo 12 Pro environment. The author manually allocated codes, categories, or clusters to each interview during this stage. The coding process utilized the six crucial steps established by the HUL approach, including its additional last UHFM step, and the 33 theoretical keypoints of UHFM as guidance indicators. Furthermore, certain categories were employed in accordance with the research framework. The author and co-authors of this study internally reviewed each case study's coding and transcript. Last, the data were employed for cross-case analysis, pattern matching, grouping, and frequency analysis. In general, there was a strong confidence level in the accuracy of the spoken words during the interviews and the written responses in electronic correspondence.

In order to ensure a high degree of reliability, this study distinguished between construct, internal, and external validity [31,36]. Multiple sources are used for cross-case analysis to ensure construct validity, and a chain of evidence is established through transcripts, as well as visual data and documents presented during the interviews. In addition, the interview and correspondence protocol includes both open-ended and closed questions to ensure the accuracy and reliability of the answers. Internal validity is established by employing pattern matching and constructing explanations based on each individual case. In order to ensure external validity, this study employed a multi-case approach across three Norwegian WH sites, incorporating replication logic within each case. To ensure reliability, this study utilized a comprehensive database containing all interviews, correspondences, interview protocols, and audio and video recordings.

3. Results

3.1. UHFM Cross-Sectional Matrix

The process leading to developing the conceptual framework for urban heritage facility management exposed the complex interconnections and relationships essential for providing urban-scale support services within WH sites (see Appendix A). The cross-sectional table visualized the seven steps of UHFM with the six clusters of technical departments that are responsible for managing the strategic, tactical, and operational levels of urban-scale support services. The table contains a narrative representing the simplified and summa-

rized results of interviews and correspondence with the key stakeholders involved. This comprehensive matrix acts as the primary framework of the study, facilitating the broad spectrum of insights gathered during interviews and correspondence from the stakeholders involved in managing three Norwegian World Heritage Sites: Røros, Rjukan, and Notodden. The table simplifies complex interactions, tasks, and responsibilities into a visually understandable format through data and narratives, with each element symbolizing an important role in providing urban-scale support services.

The UHFM conceptual framework also revealed several missing theoretical keypoints, indicating the unavailability of actions, tasks, or information during the data collection process. The lack of UHFM keypoints revealed considerable facts and information regarding the complexity and challenges involved in providing support services. This framework made it possible to see the big picture and comprehend the narrative of complexities, gaps, and strategic alignments that characterize the UHFM framework in the context of urban-scale Norwegian WH sites. The empirical outcomes of interviews and correspondence were translated and brought concretely to allow for a comprehensive interpretation and discussion in the subsequent sections.

3.2. UHFM Organizational Framework

The organizational framework for UHFM illustrates the complexities involved in managing urban heritage facilities. Due to the complex nature of these organizations, especially in the context of WH sites, it is important to simplify the illustrated interaction to prevent overwhelming the general audience in understanding the framework (Figure 2).

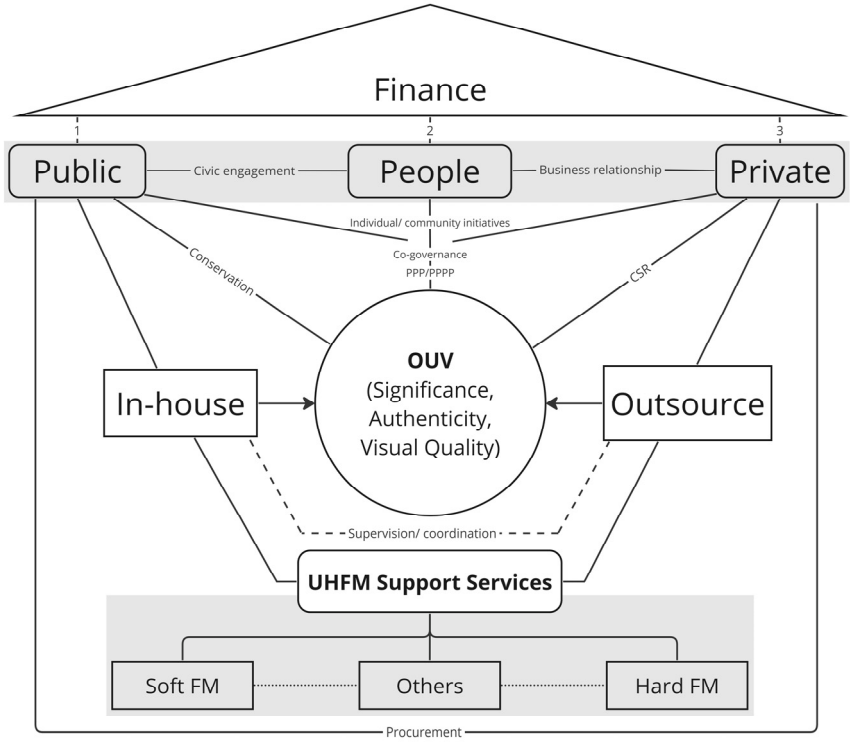

Figure 2. UHFM organizational framework. (1) International, national, regional, and local government funding; private to public funding; sovereign bonds/government paper, etc. (2) Government grant; incentive funds; special taxation; private loan/banking; community funding; self-funding. (3) Private loan/banking; international, national, regional, and local government funding; public to private funding; crowdfunding (people to private funding); public–private partnership (PPP); public–private–people partnership (PPPP).

The UHFM organizational framework prioritizes heritage values as the central focus of urban heritage area conservation. Within the context of WH sites, the OUV serves as

the foundation for inscribing cultural heritage on the WH list, making its preservation and care of utmost importance. The OUV, as the "core business" of the WH site, should not be compromised for the sake of efficiency, budget, or effectiveness as traditionally understood in facility management, including Urban FM. Urban-scale support services must be dedicated to ensuring that urban heritage areas, as a component of the built environment in FM defined by ISO41001 [17], continue to uphold their heritage significance, authenticity, and esthetic quality. The delivery of support services, both in terms of soft FM and hard FM (see Appendix A), by in-house teams and outsourced service providers should be rooted in heritage values and attributes that carry those values.

The key stakeholders in UHFM are categorized into three clusters: the public, people, and private sectors. Generally, technical departments under the municipality *(kommune)* and, to a lesser extent, the county *(fylkeskommune)* administration are responsible for providing urban-scale support services. In the UHFM framework, the public sector includes local, regional, national, and international governing authorities, particularly those with direct responsibilities for cultural heritage preservation. The community plays a role in heritage preservation through various initiatives, both at the individual and collective levels [37,38]. Individuals can support cultural heritage preservation efforts in general or take direct action in caring for cultural heritage, particularly if they own or occupy heritage buildings. Individuals' involvement in support services often entails providing feedback or participating in public hearings on support services related to heritage assets and properties [39]. The private sector is also a significant stakeholder, actively utilizing cultural heritage properties and engaging in corporate social responsibility (CSR) within the cultural heritage context [40].

Civic engagement plays a central role in the interaction of public sector interactions with individuals [38]. The level of community involvement in the conservation of urban heritage areas often determines the success of cultural heritage preservation. While the relationship between the private sector and individuals is usually centered around customer–business interactions, there are instances where the private sector directly supports heritage communities. The partnership between the public and private sectors, known as public–private partnership (PPP), can be expanded to include elements of people through the public–private–people partnership (PPPP) model [41], which involves crowdfunding and co-governance mechanisms for funding and managing urban heritage areas.

Funding is crucial for both general conservation efforts and the provision of urban-scale support services [42]. National, regional, and local policies strictly regulate funding sources for managing urban heritage. Government budgets can be allocated to fund private sector service providers and technical departments. Government grants and subsidies may also be provided to individuals and communities to support the preservation of tangible and intangible cultural assets. However, funding for individuals and communities typically does not directly address urban-scale support services. On the other hand, the private sector is directly involved in providing various types of urban heritage support services through outsourcing mechanisms supervised and/or coordinated by the relevant technical department. Establishing a UHFM organization responsible for coordinating and orchestrating all urban-scale support services in the urban heritage district is one of the recommendations proposed in this study. UHFM professionals hold positions similar to facility managers in the context of large-scale building complexes.

3.3. UHFM Process Flowchart

A process flowchart serves as a simplified representation of a specific process within the realm of urban heritage facility management. It provides a model that depicts the sequential steps and decision points involved in delivering support services on an urban scale within an urban heritage area. Such areas are characterized by specific heritage regulations that differentiate them from other types of urban environments. The flowchart offers a graphical representation of the workflow, interactions among stakeholders, and the sequence of activities (Figure 3). By illustrating and facilitating the comprehension of stages

and procedures in urban heritage facility management, the process flowchart becomes a valuable tool for analysis, communication, and process improvement.

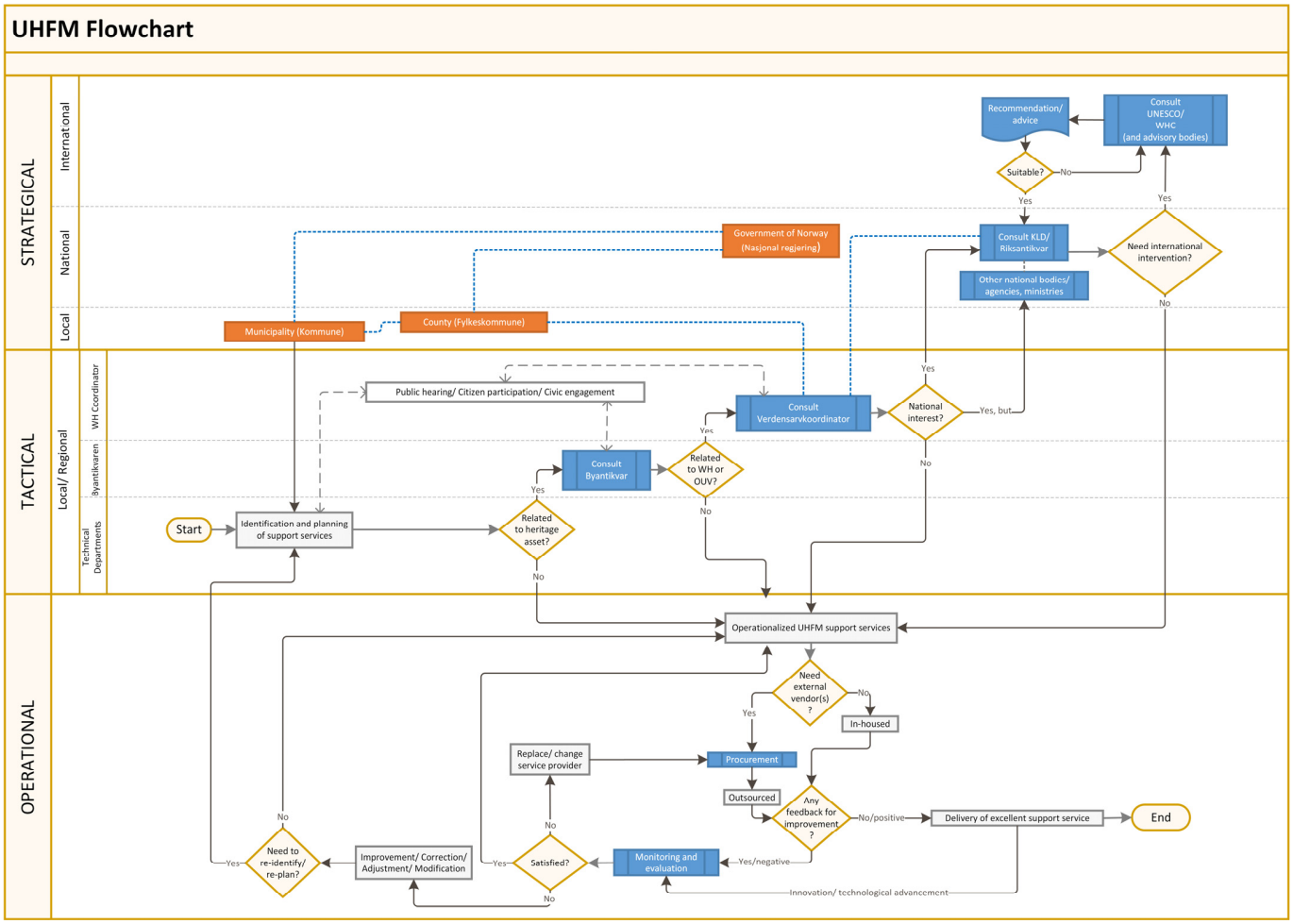

Figure 3. UHFM process flowchart.

The provision of urban-scale support services for urban heritage areas, particularly World Heritage (WH) sites in urban contexts, typically commences with identifying and planning potential support services at the strategic and tactical levels (Figure 3). The responsibility for this initial identification generally lies with governing authorities, such as municipalities and counties, adhering to principles of effective urban governance. Engaging multiple stakeholders, especially through participatory planning processes and public hearings, plays a crucial role in this procedure. Public participation can occur early in the process or be reintroduced through hierarchical consultation involving the cultural heritage department and the WH coordinator, particularly when planned support services may impact the heritage values and characteristics of a World Heritage Site. The identification and planning of support services may undergo a continuous loop based on monitoring and evaluation results, indicating the need for improvement, correction, adjustment, or modification, thereby requiring re-identification or re-planning of these support services. For instance, in the case of Røros, Rjukan, and Notodden, the provision of cobblestone as a substitute for asphalt to enhance visual quality led to complaints from wheelchair and bicycle users, necessitating the re-identification and re-planning of road infrastructure provision to meet the needs of residents through a combination of flat surfaces and cobblestone.

WH coordinators maintain communication forums with their colleagues at other sites and have extensive interactions with *Riksantikvar*, an agency under the Ministry of Climate and Environment (KLD). If the identification and planning of support services have national

significance, the WH coordinator will engage in national-level consultations. KLD serves as a communication and coordination channel with UNESCO, the World Heritage Committee (WHC), and their advisory bodies, such as the International Council on Monuments and Sites (ICOMOS), the International Union for the Conservation of Nature (IUCN), and the International Center for the Study of the Preservation and Restoration of Cultural Property (ICCROM), should intervention and consultation from international institutions be required.

While the identification and planning of urban-scale support services originate at the municipal level, the strategic level in Norwegian WH practice also involves coordination functions with the county level *(fylkeskommune)* and the national level through KLD and *Riksantikvar*. Additionally, several national bodies, agencies, and ministries outside of KLD, including those responsible for railways, education, energy, health, and more, may participate in the coordination hierarchy. Once agreements on the provision of urban-scale support services are reached at the strategic and tactical levels, UHFM support services operationalize at the operational level, considering available resources and potential obstacles. Some support services are performed in-house, while others are outsourced to businesses, professionals, contractors, vendors, and private service providers through a procurement process. During the operationalization of support services, feedback for improvement is typically received from the operational level task forces as the avant-garde team and citizens as end users. This feedback mechanism involves various formal and informal procedures. The absence of feedback may indicate inadequacies in the delivery of support services. Enhancing the process of delivering urban-scale support services in an urban heritage area, particularly within the context of World Heritage Sites, requires continuous stakeholder engagement.

4. Discussion

The ambition of the discussion section was to elaborate the findings from the results section by addressing the research questions regarding the efficient organization of urban-scale support services in an urban heritage area, as well as the processes and coordination functions of the six clusters of UHFM technical departments in preserving the World Heritage status of the studied sites following the proposed UHFM steps as the structure (Table 3 and Figure 4).

Table 3. UHFM cross-sectional matrix.

UHFM Steps \ Department	Planning, Zoning, and Land Use	Public Works and Infrastructure	Tourism	Conservation and Cultural Heritage	Environment and Sustainability	Urban Safety and Security
	Accurate mapping of the topographical features and heritage assets as base maps for all departments					
Mapping Resources	Mapping of land use, values, development zones, building types/patterns, population density	Mapping of infrastructure (roads, bridges, utility networks, urban facilities, etc.)	Mapping of visitor facilities, public space, tourism flow management, interpretation points	Detailed mapping of core and buffer zone of WH sites, archeological sites, cultural routes	Mapping of green spaces, energy consumption patterns, waste management facilities	Mapping of vital infrastructure, emergency services locations, potential natural disasters, surveillance
Missing keypoint(s)	Mapping of the existing partnership and mapping resources using information modeling/BIM-based tools					
	Citizen awareness and engagement, participatory planning, and consensus building for effective decision-making					
Reaching Consensus	Facilitate public input; work with developers for zoning decisions in privately owned development and property	Facilitate public input; collaborate with community groups, academics, and planners to align infrastructure needs	Engage stakeholders in tourism planning, involving local communities and businesses	Collaborate with heritage experts, academics, and communities in heritage management planning; education/developing heritage knowledge; heritage interpretation	Collaborate with environmental advocates and the public for sustainable practices in WH management; education/developing knowledge	Collaborate with law enforcement and communities to identify potential hazards; enhance safety and security measures

Table 3. *Cont.*

UHFM Steps \ Department	Planning, Zoning, and Land Use	Public Works and Infrastructure	Tourism	Conservation and Cultural Heritage	Environment and Sustainability	Urban Safety and Security
Missing keypoint(s)	N/A					
Assessing vulnerabilities	Assess the vulnerabilities specific to the technical department's interaction with heritage assets					
	Assessing vulnerabilities in zoning decisions; social economic assessment	Assess infrastructure vulnerabilities, utility, and maintenance assessment	Identify vulnerabilities in tourist areas; tourism impact assessment	Assess vulnerability of heritage sites; Heritage Impact Assessment (HIA); heritage policy assessment	Assess vulnerability to climate change; Environment Impact Assessment (EIA)	Assess safety and security vulnerabilities; Risk assessment
Missing keypoint(s)	Citizen satisfaction assessment and digital assessment utilizing BIMs (HBIM, UIM/CIM)					
Integrating values and vulnerabilities	Balancing preservation with development and modern needs					
	Ensure zoning regulations align with urban character and heritage preservation	Integrate infrastructure development into urban esthetics and heritage context	Balance heritage preservation with modern urban development needs; improving public participation	Integrate cultural heritage into development plans; adaptive reuse strategies; improving human resources and public participation; improve heritage regulation	Integrate sustainable practices and green infrastructure into urban planning; improving health and well-being	Integrate safety and security measures into urban design; historic preservation guidelines; improving health, safety, and well-being
Missing keypoint(s)	Enhancing efficiency using information modeling (BIM, HBIM, UIM/CIM), IoT, AI, and sensors					
Prioritizing actions	Preserving the OUV of the WH sites through the implementation of sustainable cultural heritage management through the efficient delivery of support service(s)					
	Zoning regulations enforcement; provide development guidance	Infrastructure maintenance and development; preventive maintenance	Sustainable tourism; visitor experience enhancement; cultural heritage interpretation; preserving cultural identity; increasing citizen participation	Heritage conservation; adaptive reuse; preventive maintenance; cultural value preservation; increasing citizen participation	Environmental protection; sustainable heritage practices; enhance physical and social well-being; increasing citizen participation	Public safety and security; emergency response; preventive maintenance; heritage protection from threats
Missing keypoint(s)	Enabling information modeling (BIM, HBIM, UIM/CIM) integration approach					
Establishing Partnerships	Forming partnerships with stakeholders, experts, local businesses, and community groups aligned with the specific goals of each department (collaborative governance and decision-making)					
	Partners with urban planners, community stakeholders, and developers	Work with contractors, utility providers, and community groups for infrastructure and maintenance	Collaborate with heritage organizations, local businesses, tourism boards; public–private partnership in tourism	Collaborate with cultural experts, historians, and conservationists for preservation, adaptive reuse approach; public–private partnership in heritage preservation	Partners with environmental organizations and sustainable businesses for initiatives; public–private partnership in sustainability	Collaborate with law enforcement, emergency services, and community groups for safety
Missing keypoint(s)	Digital information and information modeling optimization and automation					
Monitoring and Evaluation of support service provision	Monitoring and evaluation of support services provided by each technical department					
	Monitoring and evaluation of urban development impact and zoning/land use compliance	Monitoring and evaluation of urban infrastructure performance, maintenance, and effectiveness	Monitoring and evaluation of tourism flows, visitor satisfaction, tourism support services, and impact of tourism on heritage preservation	Monitoring and evaluation of conservation and WH status, and cultural heritage preservation (reconstruction, restoration, and adaptive reuse)	Monitoring and evaluation of energy consumption, carbon footprint, air quality, environment, and waste management practices	Monitoring and evaluation of emergency preparedness and surveillance effectiveness
Missing keypoint(s)	N/A					

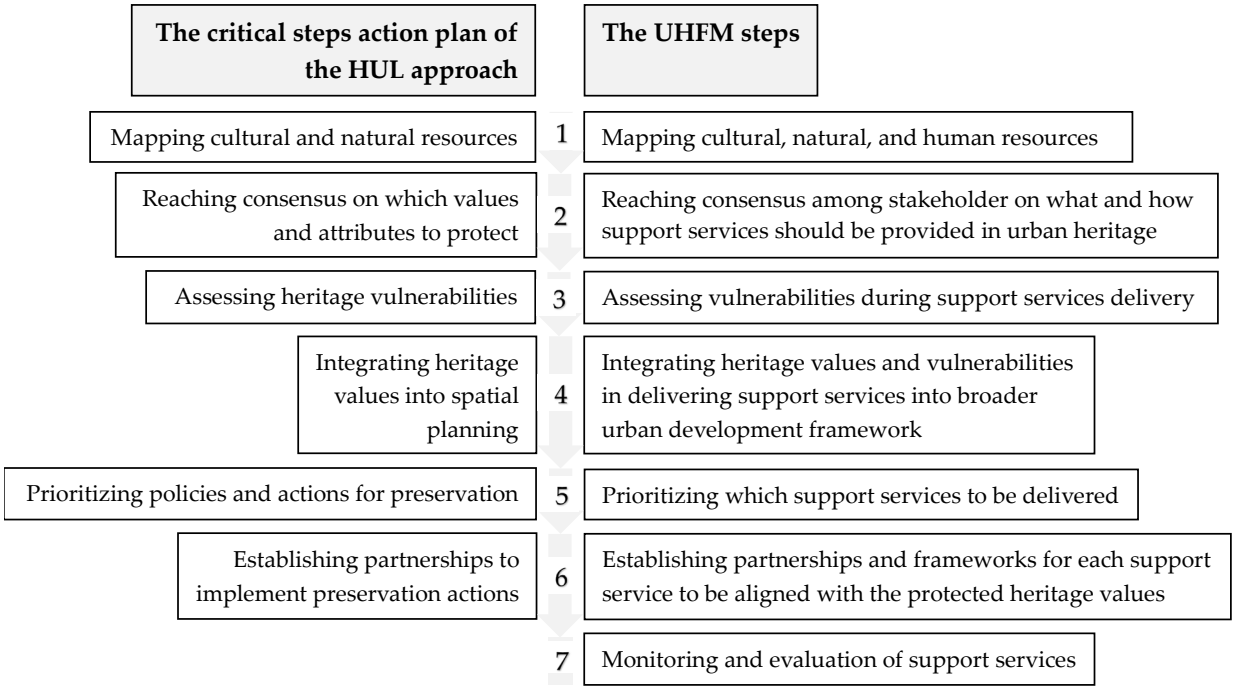

Figure 4. The six critical steps in the action plan of the HUL approach to the UHFM steps.

This section explores various aspects and components of urban heritage facility management (UHFM) using the HUL approach's six critical steps, as reviewed and theoretically studied previously [9], which resulted in 33 UHFM keypoints. Adapting these steps allows for the recognition, identification, and formulation of urban-scale support services in the urban heritage area, which is the focus of this research study. The section is divided into seven main sections to ensure a systematic discussion according to the UHFM steps (Figure 3). Based on the research interviews and the model developed for potential urban-scale support services [6], a comparison is made among three Norwegian World Heritage (WH) sites with urban characteristics, which are Røros Bergstaden—the core city in Røros mining town and its surroundings—The Company Town in Rjukan, and the Notodden Industrial Heritage area in Notodden (see Appendix A). This comparison provides an overall illustration of the UHFM process and its management within the context of good governance in Norway in terms of providing people-oriented urban-scale support services within urban-scale heritage areas without compromising the protected sites' OUV.

As discussed through interviews and correspondence, the conditions shed light on the daily practice of providing urban-scale support services at the three Norwegian World Heritage (WH) sites. Criticisms and potential improvements regarding the provision and delivery of services, as well as coordination between agencies and technical departments, were also explored. Notably, the dynamics and mechanisms of the relationship between public authorities (public), dwellers, citizens, inhabitants, visitors (people), and the private sector (private) emerged as significant aspects in the realm of UHFM.

4.1. Mapping Resources for UHFM

Mapping resources, as the first step in the UHFM steps, serves as a critical foundation for informed decision-making and coordinated efforts across various technical departments. This step involves the accurate mapping of topographical features and heritage assets to create comprehensive base maps for all departments involved in urban management. The cluster of planning and zoning departments ensures precision in mapping land use, development zones, population density, and building types, laying the groundwork for comprehensive urban development. The public works and infrastructure department cluster focuses on mapping vital infrastructure elements such as roads, bridges, utility

networks, and other urban facilities. This type of mapping is crucial for the daily practice of infrastructure development and maintenance. The Tourism department's cluster mainly mapped the visitor facilities, public spaces, and the tourism movement to ensure sustainable tourism planning and to avoid overtourism, thus safeguarding a balance between visitor experience and heritage preservation. The conservation and cultural heritage department's cluster provides detailed maps of the WH sites' core and buffer zones, which is essential for heritage conservation, future adaptive reuse strategies, and general conservation initiatives. The environment and sustainability department cluster contributed to mapping green spaces, energy consumption patterns, waste management facilities, and other environment-related tasks. This mapping integrated sustainable practices into urban planning, promoting environmental health and the dweller's well-being. Based on the raw maps provided by the planning and zoning departments, the cluster of urban safety and security departments mapped the vital infrastructure, emergency services locations, and potential natural disaster zones such as flooding, landslides, and fire hazards. This type of mapping is crucial for enhancing public safety measures, emergency response planning, and safeguarding heritage assets from potential threats. The interconnection between these technical departments ensures a holistic approach to managing the studied WH sites.

The unavailability of utilization of the BIM-based tools to map existing resources and mapping partnerships in the urban-scale support services of the three studied Norwegian World Heritage sites—Røros, Rjukan, and Notodden—during the data collection process can be attributed to various factors, such as the limited technological adoption within the technical departments. Moreover, an inadequate level of awareness regarding the potential advantages of utilizing BIM-based tools to map current resources and partnerships could be a contributing factor. The studied WH sites were also a part of national regulatory and policy frameworks that do not explicitly require or incentivize integrating BIM technologies in managing historic towns in Norway.

4.2. Reaching Consensus on What and How Urban-Scale Support Services Should Be Provided

Throughout the reaching-consensus step, each cluster of technical departments adjusted their specific tasks in providing urban-scale support services to be aligned with the WH mission in maintaining OUV as the prerequisite of the WH status. Collaborative decision-making in the cluster of planning and zoning departments relies on the incorporation of citizen awareness, participatory planning, and consensus-building, which highlighted the significance of integrating the citizens' opinions into the city planning and master plan to guarantee their compatibility with the preference of the WH site's inhabitants.

The cluster of planning and zoning departments, together with public works and infrastructure departments, actively sought public input and collaborated with private developers to establish the land use, planning, and zoning decisions that should be aligned with community goals and preservation of OUV. Meanwhile, the tourism departments' cluster involves stakeholders in the tourism planning process by acknowledging the importance of including local communities and businesses during the reaching-consensus step. By adopting such a collaborative approach, tourism initiatives can be aligned with local interests and positively contribute to the community, thus increasing the sustainability of the WH sites economically, socially, and environmentally. The conservation and cultural heritage department cluster engaged in collaborative efforts with heritage experts, academics, and local communities to develop a strategic heritage management plan, focusing on historical education and the advancement of heritage knowledge, which showed a long-term strategy towards conserving heritage. The environment and sustainability department cluster works with environmental advocates and citizens who are interested in promoting sustainable practices in the WH sites. The urban safety and security department cluster prioritizes cooperation with law enforcement and the dwellers to identify potential risks and improve safety and security protocols to protect the integrity of WH assets as a collective duty to guarantee a safe and protected urban heritage setting.

The presence of all necessary theoretical keypoints obtained from the scoping literature review process in the reaching consensus step within the three studied cases of Røros, Rjukan, and Notodden indicated that these sites have effectively implemented comprehensive strategies for engaging the community and building consensus in the delivery of urban-scale support services. As mandated by the Nordic model, the three sites' authorities have placed citizen awareness as their primary concern, actively engaging in efforts to proactively inform the public about current and future development and urban-scale support services. Consensus-building is a commonly accepted practice in Nordic countries, including Norway, that involves collaborative efforts in planning and decision-making processes. The municipalities in charge of managing these studied WH sites have adopted a participatory planning approach, enabling local communities, developers, and other relevant stakeholders to be involved. Furthermore, the emphasis on developing heritage technical knowledge and heritage interpretation indicates a commitment to open and transparent communication among the stakeholders.

The absence of missing theoretical keypoints in the reaching-consensus step suggests successfully integrated community-centric approaches in managing urban-scale support services within the studied Norwegian WH sites in Røros, Rjukan, and Notodden. The Nordic model, characterized by a trusting community and a commitment to equality, serves a significant role in this step. However, a further study of community involvement approaches and decision-making processes would be required to validate these interpretations.

4.3. Assessing the Vulnerabilities of the WH Sites and Their Relationships with UHFM

An assessment step is necessary to address the potential risks and challenges of delivering urban-scale support services within the context of the studied WH sites in Norway. The assessment of vulnerabilities of the WH sites necessitates a comprehensive assessment of various vulnerabilities tailored to the specific functions of each technical department in providing the required urban-scale support services. This is particularly important for addressing the socio-economic pressures and impacts of climate change, besides the strict compliance to the conservation regulations.

Vulnerability assessment in the cluster of planning and zoning focuses on land use, zoning decisions, and socio-economic factors, which suggests acknowledging the commitment to mitigating potential vulnerabilities that may arise from these decisions. The municipal and county authorities must work together to harmonize zoning regulations in broader urban development initiatives. In the meantime, the assessment of infrastructure vulnerabilities has become an important task performed by the cluster of public works and infrastructure departments. Urban-scale utility and maintenance assessments are conducted to identify vulnerabilities and potential hazards in the urban infrastructure, necessitating the cooperation of various technical departments in the local government to work together within more extensive urban development strategies and ensure the infrastructure's long-term functionality. The cluster of tourism departments assessed the impact of tourism to identify particular vulnerabilities in tourist destinations. This approach acknowledges the importance of tourism in World Heritage sites while aiming to minimize any possible adverse effects on the WH assets. Heritage Impact Assessments (HIAs) are essential in assessing the vulnerabilities of heritage sites for the conservation and cultural heritage department cluster. This action shows a commitment to protecting WH sites' cultural and historical significance. Collaboration with heritage experts, academics, and national heritage authorities is important to ensure the precision and efficacy of these assessments. The environment and sustainability department cluster assessed the vulnerabilities related to climate change in the studied WH sites by carrying out Environmental Impact Assessments (EIAs). Effective vulnerability assessment requires collaboration with environmental advocacy groups and national environmental authorities. Last, the urban safety and security department cluster emphasized the importance of conducting comprehensive risk assessments to identify any vulnerabilities related to the safety and security of residents and visitors, which includes cooperating with law enforcement agencies, emergency ser-

vices, and community groups. Working with local, regional, and national authorities helps ensure that urban safety and security measures align with broader urban development and heritage preservation objectives.

The missing theoretical keypoint found in this step during the data collection is the lack of a mechanism to assess citizen satisfaction and stakeholder feedback. Including citizen feedback in vulnerability assessments could provide valuable insights regarding the effectiveness of urban-scale support services from the end-user's perspective. The operational level of the UHFM team may also provide useful inputs for improving support service delivery in this step. Implementing digital assessment tools and information modeling tools has the potential to bridge this gap, thus improving the overall vulnerability assessment step.

4.4. Integrating Values and Vulnerabilities

Heritage authorities and technical departments employ various measurements to incorporate heritage sites' significance and susceptibilities. One approach involves employing a SWOT analysis, which examines strengths, weaknesses, opportunities, and threats. This analysis allows for the development of strategies by simulating different potential scenarios and determining appropriate solutions. The *Verdensarvkoordinator* and *Riksantikvar*, who are responsible for heritage preservation, can effectively collaborate with the technical departments overseeing road and bridge construction at the local, regional, and national levels. The UHFM organizational framework, obtained from the interview and exchanging correspondence, includes a complex strategy that integrates heritage preservation and urban development. Each technical department serves a distinctive function in this integration, showcasing an awareness of the complex inter-relationship between outstanding universal values and vulnerabilities in WH site management.

The primary responsibility of the cluster of planning and zoning departments is to align land use and zoning regulations with preserving the protected heritage area. This integration acknowledges the importance of land use and zoning decisions in shaping the physical and cultural environment within the core area, buffer zone, and broader urban development. Therefore, the governing stakeholders must work together to ensure that zoning regulations align with the heritage conservation objectives. The cluster of public works and infrastructure departments contributes to urban heritage areas' functional, visual, and historical aspects by integrating infrastructure and physical development vulnerabilities to align with the WH sites' cultural and historical value. The cluster of tourism departments acknowledges that involving the community in tourism planning improves the relationship between tourism initiatives and broader heritage conservation goals to ensure that heritage tourism policies have beneficial impacts on the stakeholders' and citizens' well-being. The cluster of conservation and cultural heritage departments has the role of integrating cultural heritage into development plans and implementing adaptive reuse strategies, thus requiring certain degrees of flexibility in the decision-making process. The flexible approach emphasizes the dynamic nature of conserving cultural heritage, with adaptive reuse being an important strategy. These strategies may ensure alignment with national and international conservation objectives by working closely with heritage experts, academics, and national heritage authorities. Incorporating sustainable practices and green infrastructure into urban planning by the cluster of environment and sustainability departments is essential for promoting the dwellers' health and well-being. This step illustrates an acknowledgment of the mutual reliance between preserving the environment and safeguarding cultural heritage. Coordination with environmental advocacy groups and relevant authorities guarantees the successful incorporation of sustainable practices. The cluster of urban safety and security departments integrates safety and security measures with heritage conservation to protect cultural and historical resources while simultaneously ensuring the well-being, safety, and security of inhabitants and tourists. Coordination with national law enforcement and emergency services is essential to ensure that the safety and security measures align with urban development and heritage preservation strategies.

The keypoint lacking in this step is the systematic integration of information modeling tools or other digital asset management tools to improve efficiency in the integration process. Utilizing digital tools may improve the process of integrating values and identifying vulnerabilities, leading to a more organized and data-driven approach. Incorporating information modeling tools at this step can optimize the overall integration process.

4.5. Prioritizing UHFM Actions

Through the data collection, the respondents were asked about the important factors that need to be taken into account when providing urban-scale support services. Furthermore, they were requested to determine the urban-scale support services that should be prioritized to maintain the WH sites' OUV, heritage significance, authenticity, and visual quality. The respondents from various clusters, in general, emphasized prioritizing maintaining the urban infrastructure, physical urban fabric, accessibility and mobility, and environmental sustainability when planning and implementing urban-scale support services within the realm of UHFM. Several other respondents raised other issues to be prioritized, including matters related to interpretation and education, cleanliness, and waste management.

During the prioritizing actions step, each technical department cluster strategically targets specific aspects that align with their domain as the cluster's priority. The planning and zoning department cluster prioritizes ensuring adherence to zoning regulations and providing guidance for development. This necessitates a robust focus on guaranteeing that development complies with the established regulations and contributes to preserving the urban heritage areas. Effective implementation of zoning regulations requires intensive coordination with other municipal and county sections and bodies.

The public works and infrastructure department cluster prioritizes routine maintenance, development, and preventive infrastructure maintenance. Collaborating with other relevant departments guarantees that infrastructure developments align with the overarching goals of urban-scale heritage preservation. The cluster of tourism departments' priorities are establishing sustainable tourism, enhancing visitor experiences, interpreting cultural heritage, preserving cultural identity, and promoting citizen participation. This comprehensive strategy acknowledges the impact of tourism in shaping the perception and experience of visitors and dwellers of WH sites. The conservation and cultural heritage department cluster prioritizes heritage conservation, adaptive reuse, preventive maintenance, preservation of cultural value, and promoting citizen participation. This comprehensive approach acknowledges the dynamic nature of conserving cultural heritage, integrating preventative measures and strategies for adaptive reuse. Working in collaboration with heritage experts and actively involving the local community in the decision-making related to WH sites ensures a comprehensive approach to preserving urban heritage areas. The priority of the environment and sustainability department cluster is to protect the urban environment within the vicinity of WH sites, improve physical and social well-being, and promote citizen engagement in participating in sustainable heritage practices. The cluster of urban safety and security departments responded with the statement that their priorities are to ensure public safety, security, emergency response, preventive maintenance, and the protection of heritage sites from potential threats. This approach also highlights the commitment to ensuring residents' and visitors' safety and security while protecting valuable heritage assets. Collaboration with national law enforcement and emergency services is necessary for integrating safety measures with broader urban development and heritage preservation strategies.

The keypoint lacking in this step is the intentional incorporation of information modeling tools (such as BIM/HBIM/CIM) into the integration approach to improve efficiency and prioritize actions. Utilizing digital tools could optimize the decision-making and prioritization process, ensuring a more systematic and data-driven approach. Integrating information modeling at this step has the potential to enhance the overall efficiency

of prioritizing actions by improving coordination and communication among technical departments and other stakeholders.

4.6. Establishing Partnerships and Frameworks for Each Support Service and Technical Department's Cluster

Throughout the establishing partnerships step, the majority of respondents from each technical department cluster acknowledges the significance of collaborative governance and establishes strategic partnerships to improve the provision of urban-scale support services in urban heritage areas.

The planning and zoning departments cluster plays a crucial role in establishing partnerships with stakeholders, specialists, local businesses, and community groups. This collaborative approach ensures that zoning decisions and urban planning are in accordance with the diverse needs and viewpoints of the community and other stakeholders. The public works and infrastructure departments cluster establishes partnerships with urban planners, community stakeholders, and private developers. This collaborative effort ensures that the construction of infrastructure is aligned with the visual quality of urban heritage areas, historical context, and the preservation of OUV as the core business of WH sites. The cluster of tourism departments establishes partnerships with contractors, utility providers, and community groups through implementing the PPP scheme. The necessary framework for each partnership was developed accordingly to promote sustainable tourism. Effective communication with a wide range of stakeholders, including local communities and businesses, is crucial for successfully implementing tourism initiatives. The conservation and cultural heritage department cluster establishes PPP specifically focused on preserving heritage through collaboration with heritage organizations, local businesses, and tourism boards. However, the respondents did not mention any form of public–private–people partnership (PPPP) practices in the studied WH sites Røros, Rjukan, and Notodden. This collaborative activity ensures that conservation strategies, adaptive reuse programs, and preventive maintenance are in harmony with the objectives of safeguarding cultural heritage. Coordination with heritage organizations enhances the specialized knowledge contributed to conservation initiatives. The environment and sustainability department cluster forms partnerships with environmental organizations and sustainable businesses, participating in PPP to advocate for sustainable practices. The collaborative approach integrates ecological infrastructure into urban heritage development. The urban safety and security departments cluster establish partnerships and coordination with law enforcement, emergency services, and community groups to improve safety measures. The collective endeavor guarantees incorporating safety and security factors into urban design and historic preservation guidelines.

The crucial aspect not found throughout the interviews and correspondence process in this step is the intentional incorporation of digital information modeling optimization and automation to improve the effectiveness of forming partnerships. Incorporating information modeling tools at this step could improve the overall efficiency of collaborative governance, ensuring a more systematic approach to establishing partnerships and developing a framework with a broader city management plan.

4.7. Monitoring and Evaluation

Within the monitoring and evaluation step, as the proposed additional step differs from the HUL approach, each cluster of technical departments has a crucial role in monitoring and evaluating the efficiency of their specific tasks in providing urban-scale support services to ensure continuous improvement and compliance with heritage preservation goals.

The responsibility of the planning and zoning department cluster is to monitor and evaluate the impact of urban development surrounding WH sites and ensure compliance with zoning and land use regulations, especially in the protected sites' core area and buffer zone, which includes evaluating the impacts of zoning decisions on the broader urban development, including their impact on the urban heritage area. The public works and

infrastructure department cluster primarily monitors and evaluates urban infrastructure's performance, maintenance, and functionality, including roads, streets, bridges, and other infrastructures. Through real-time monitoring, these departments might identify specific areas and objects requiring maintenance or improvement, ensuring that the infrastructure works comply with the WH sites' heritage conservation regulations and guidances. The cluster of tourism departments monitors and evaluates tourism patterns, providing visitor satisfaction and preventing overtourism that might compromise the preservation of WH sites. The cluster of conservation and cultural heritage departments primarily conducts the monitoring and evaluation of the maintenance of WH status and the preservation, reconstruction, restoration, and adaptive reuse of cultural heritage. The environment and sustainability departments monitor and evaluate energy consumption, air and water quality, environmental conditions, and waste management strategies. The urban safety and security departments monitor and evaluate the efficacy of emergency preparedness and surveillance measures. However, none of the respondents mentioned using an urban command center to conduct surveillance and real-time monitoring to improve the safety of the dwellers and visitors, not to mention the security of the protected assets from vandalism and irresponsible tourist activity. The urban safety and security department cluster monitors and evaluates the effectiveness of emergency preparedness and surveillance measures. This comprehensive approach ensures continuous improvement in managing urban heritage areas and WH sites.

The absence of theoretical keypoints in the UHFM scoping literature review process, specifically regarding the "monitoring and evaluation" step in the management practices of Norwegian World Heritage sites, although being mentioned repeatedly by the respondents during data collection, suggests three possible circumstances during the conception of UHFM keypoints. Firstly, it is possible that academic discussions on the "monitoring and evaluation" step were not identified during the scoping literature review process. Secondly, the absence of this important step in the discussion may be attributed to its unintentional oversight during the scoping literature review, which follows a rigorous protocol incorporating the HUL approach as one of the search criteria for filtering relevant literature. Lastly, the process of conducting a scoping literature review might include adding and classifying "monitoring and evaluation" in academic discussions within the category of "assessment", the third critical step of the HUL approach. Subsequently, during the data collection phase, the respondents, through interviews and correspondences, placed particular emphasis on "monitoring and evaluation" in providing urban-scale support services to ensure continuous improvement in service delivery. Assessments are typically conducted at the beginning to determine the type and manner in which support services will be provided. Meanwhile, "monitoring and evaluation" is usually carried out during the operational phase, where inputs, problems, difficulties, and challenges in the provision of urban-scale support services begin to be discovered. Monitoring occurs at the tactical and operational levels, whereas evaluation is carried out at the tactical and strategic levels of UHFM. The majority of respondents' understanding of the differences between assessment, monitoring, and evaluation suggests that they are highly aware of and committed to flexible and adaptive urban heritage facility management practices. It is presumed that these respondents and their institutions have included monitoring and evaluation in their daily practices, thereby improving the general efficiency of urban-scale support services in preserving the OUV and integrity of the WH sites from time to time.

5. Conclusions

The urban heritage facility management (UHFM) framework reveals a deep comprehension of the complex dynamics that govern the delivery of support services on a large scale in WH sites. The exploration, driven by the two research questions on the efficient organization of these services and the role of coordination functions in maintaining the WH status, has resulted in detailed observations from three Norwegian World Heritage Sites: Røros, Rjukan, and Notodden. The UHFM framework contains the primary information

obtained from interviews and exchanging correspondence with key stakeholders. The cross-sectional table between the seven UHFM steps and the six technical department clusters serves as a navigational tool, streamlining the intricate interactions and responsibilities in managing urban-scale support services. This matrix functions both as a visual representation and a condensed narrative, revealing the complexities of stakeholder engagements and the coordination of support services. The detection of crucial elements absent in the UHFM framework serves as a reflection of the difficulties and gaps in the delivery of support services. The gaps between the theoretical keypoints from the scoping literature review process and the conceptual framework obtained from the studied cases reflect the challenges encountered when trying to balance heritage preservation, authenticity, and modern development. The lack of integration of information modeling tools throughout several UHFM steps is particularly interesting, emphasizing the need for improvement and efficiency in future implementations.

The additional step, monitoring and evaluation, allows the UHFM framework to become a powerful and flexible tool adaptable to all possible social, economic, and environmental changes. The ability of this asset to capture the complex connections among technical departments, governance structures, and stakeholders in providing urban-scale support services while maintaining the OUV, visual quality, authenticity, and significance of the studied WH sites makes it a valuable tool in heritage management, alongside the original HUL approach and other existing heritage conservation frameworks addressing the core business of WH sites. The importance of a collaborative and unified strategy, which involves the integration of heritage preservation, management of urban-scale facilities, and collaboration with stakeholders, is emphasized by this study. The UHFM framework effectively tackles both present challenges and serves as a basis for ongoing enhancement and adaptable strategies in the constantly changing field of urban heritage preservation.

The UHFM organizational framework addresses the challenges of managing facilities and how to effectively organize urban-scale support services in an urban heritage area or World Heritage site. The framework highlights the necessity of simplifying stakeholder interactions between UHFM stakeholders by placing heritage values at the center of urban heritage conservation while providing urban-scale service delivery. Within the World Heritage context, the OUV serves as the foundation for inscribing cultural heritage, making its preservation non-negotiable and must not be compromised for the sake of efficiency, budget, or traditional understandings of effectiveness in facility management. The proposed UHFM framework provides insights into coordinating and orchestrating all urban-scale support services in the urban heritage district. In the newly proposed urban heritage facility management field, the UHFM process flowchart provides the workflow steps that must be taken one after another and the decisions that must be made when providing support services on an urban scale inside heritage areas. The perpetual cycle of monitoring and evaluation enables the necessary modifications predicated on input, guaranteeing the continuous improvement of urban-scale service delivery provision.

The proposed UHFM framework plays a role in engaging and benefiting stakeholders and users by fostering a collaborative and informed approach to urban heritage facility management. The framework's capacity to streamline coordination, improve communication channels, and offer a structured comprehension of urban-scale support services will be beneficial to stakeholders, including the public, private sector, and governing authorities. The clarity offered by the framework ensures that stakeholders can actively contribute to the preservation of heritage values while aligning with contemporary needs. Users, including heritage professionals, municipal authorities, and the community, will benefit from a user-friendly and adaptable tool that facilitates efficient decision-making, resource allocation, and strategic planning. The UHFM framework that enables efficient decision-making, resource allocation, and strategic planning will benefit various stakeholders, such as heritage authorities, technical departments, and the community. The UHFM framework promotes a sense of responsibility for the sustainable management of urban heritage areas by highlighting the importance of heritage significance, authenticity, and visual quality.

This study does not intend to make broad generalizations that can be applicable to all types of technical departments, support services, and different types of World Heritage sites outside of Norway. This study was designed to be an initial umbrella study of urban-scale heritage facility management using Norwegian WH sites as a context, which provides the basis for further research in the realm of Urban FM, urban heritage conservation, and detailed parts of UHFM. Various terms in this study are used interchangeably in English and the Norwegian version due to technical and practical reasons. This study represents a progression in the domain of urban heritage management and Urban FM by introducing a framework that addresses the complexity associated with managing urban heritage facilities, specifically focusing on the Norwegian WH sites, which is in contrast to previous studies that typically examined specific aspects of heritage conservation or facility management of protected buildings only. Furthermore, this study offers a conceptual framework that can be applied to various contexts worldwide. This study serves as an invitation for further academic discussion, research, and implementation of the UHFM framework in order to shape sustainable, resilient, and culturally vibrant urban environments for future generations. The results and findings of this study pave the way for future research to replicate similar studies in other non-WH historic towns and urban heritage districts in Norway, as well as in urban heritage areas and WH sites outside of Norway. This will contribute to a more comprehensive understanding of facility management at an urban scale in urban heritage areas.

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Appendix A

Table A1. Hard UHFM Support Services.

Tasks/Urban-Scale Support Services	**Department/Institution/Organization in Charge**		
	Røros	**Rjukan**	**Notodden**
District heating and cooling, district/neighborhood heat management (*fjernvarme*) (1, 2, 5)	Ren Røros Strøm AS, Norsk Varme	Statkraft AS, Norsk Varme, Green Mountain (data center excess heat)	Thermokraft AS, Norsk Varme, (owned by Notodden Energi)
Power provider(*strømleverandøren*) (2, 5)	REN Røros Strøm AS	Tinn Energi ASHydro Energi AS Telemark	Notodden Energi Kraft AS
Energy management(*strømnettet*/power grid) (2, 5)	Røros E-Verk Nett	Stannum	Everket AS
Water supply (2, 5)	Røros kommune, Norsk Vann	Tinn kommune (Rjukan vannverks), Norsk Vann	Notodden kommune (Notodden vannverks), Norsk Vann

Table A1. *Cont.*

Tasks/Urban-Scale Support Services	**Department/Institution/Organization in Charge**		
	Røros	**Rjukan**	**Notodden**
Clean/drinking water system (1, 2, 5)	Røros kommune, Norsk Vann	Tinn kommune, Norsk Vann	Notodden kommune, Norsk Vann
District sewerage system (1, 2, 5)	Røros kommune	Tinn kommune	Notodden kommune
Black water system (1, 2, 5, 6)	Røros kommune, Norsk Vann	Tinn kommune, Norsk Vann	Notodden kommune, Norsk Vann
Neighborhood/district drainage and flood control system (1, 2, 5, 6)	Røros kommune	Tinn kommune	Notodden kommune
Heritage buildings and structures (4)	*Byantikvar*, *Verdensarvkoordinator*, Department of cultural heritage	*Byantikvar*, *Verdensarvkoordinator*, Department of cultural heritage	*Byantikvar*, *Verdensarvkoordinator*, Department of cultural heritage
Core zone and buffer zone (World Heritage sites) (1, 4)	*Verdensarvkoordinator*, *Riksantikvaren* (supervised by WHC/UNESCO), *Verdensarvrådet*	*Verdensarvkoordinator*, *Riksantikvaren* (supervised by WHC/ UNESCO)	*Verdensarvkoordinator*, *Riksantikvaren* (supervised by WHC/ UNESCO)
Urban heritage visual quality (3, 4)	*Byantikvar*, *Verdensarvkoordinator*, Department of cultural heritage	*Byantikvar*, *Verdensarvkoordinator*, Department of cultural heritage	*Byantikvar*, *Verdensarvkoordinator*, Department of cultural heritage
Urban heritage street furniture (2, 3, 4)	Røros kommune	Tinn kommune	Notodden kommune
Outdoor and public lighting (1, 2, 6)	Røros kommune, *Statens vegvesen* (The Norwegian Public Roads Administration)	Tinn kommune, *Statens vegvesen* (The Norwegian Public Roads Administration)	Notodden kommune, *Statens vegvesen* (The Norwegian Public Roads Administration)
Street and road infrastructures and maintenance (1, 2, 6)	Røros kommune, Trøndelag fylkeskommune, *Statens vegvesen* (The Norwegian Public Roads Administration)	Tinn kommune, Vestfold og Telemark fylkeskommune, *Statens vegvesen* (The Norwegian Public Roads Administration)	Notodden kommune, Vestfold og Telemark fylkeskommune, *Statens vegvesen* (The Norwegian Public Roads Administration)
Telecommunication infrastructures (1, 2)	Infonett Røros AS (cable-based telecommunication), Telenor, Telia	Telenor, Telia and ICE	Telenor, Telia and ICE

Clusters of departments: (1) PLZ = planning and zoning, (2) PWI = public works and infrastructure, (3) TOU = tourism, (4) CCH = conservation and cultural heritage, (5) ESU = environment and sustainability, (6) USS = urban safety and security.

Table A2. Soft UHFM Support Services.

Tasks/Urban-Scale Support Services	**Department/Institution/Organization in Charge**		
	Røros	**Rjukan**	**Notodden**
Neighborhood/district cleaning/hidden trash containers (1, 2)	Røros kommune	Tinn kommune	Notodden kommune
The traditional seasonal market, tourist-oriented shop/retailer, town events (3)	*Rørosmartnan* (Christmas market), *Destinasjon Røros*	*Høstmarked/Bygdas dag* (Autumn market), Rjukan Matfestival, *Solfesten* (Sun Festival), Rjukan Turistkontor, visitRjukan AS	*Høstmarked*, Notodden Vårmarked, Notodden Bluesfestival, Tinfosløpet, *Kjentmannsmerket*

Table A2. *Cont.*

Tasks/Urban-Scale Support Services	Department/Institution/Organization in Charge		
	Røros	**Rjukan**	**Notodden**
Conservation law enforcer, municipal police (4, 6)	Røros kommune	Tinn kommune	Notodden kommune
Post office (2)	Posten Bring AS	Posten Bring AS	Posten Bring AS
The main square (1, 2, 3)	Røros kommune	Tinn kommune	Notodden kommune
District command center (6)	-	-	-
Electrical panel, underground electricity distribution (2)	Røros E-Verk Nett, Røros kommune	Stannum, Tinn kommune	Everket AS, Notodden kommune
Conservation helpdesk (3)	The Røros Museum Call Centre, Røros kommune, *Servicetorget*	Vestfold og Telemark fylkeskommune, Tinn kommune, *Servicetorget*	Vestfold og Telemark fylkeskommune, Notodden kommune, *Servicetorget*
Protected heritage park, garden, void, cemetery (1, 2, 3, 4, 5)	*Kjerkgata* (Harald Sohlberg corridor), *Røros Kirke*, *Slegghaugan* (the slag heaps of Røros)	*Rjukan kirke*, *Rjukan torg*	*Notodden kirke*, *Notodden torv*, Admini Notodden
Connection with the general transportation system (1, 2)	Røros Airport, Røros Station/*Jernbanedirektoratet* (Norwegian Railway Directorate), Røros bus terminal	Rjukan station/Norwegian Railway Directorate, Rjukan bus stop	Notodden station/Norwegian Railway Directorate, Notodden *skysstasjon* (public transport terminal)
Heritage funicular, travelator, shuttle/site transportation (1, 2, 3, 4)	-	Krossobanen, Gaustabanen	-
Preservation-oriented parking lot (1, 2)	Røros kommune	Tinn kommune	Notodden kommune

Clusters of departments: (1) PLZ = planning and zoning, (2) PWI = public works and infrastructure, (3) TOU = tourism, (4) CCH = conservation and cultural heritage, (5) ESU = environment and sustainability, (6) USS = urban safety and security.

Table A3. Other UHFM Support Services.

Tasks/Urban-Scale Support Services	Department/Institution/Organization in Charge		
	Røros	**Rjukan**	**Notodden**
Heritage environmental management (4, 5)	*KLD, Trøndelag fylkeskommune*, Røros kommune	*KLD,* Vestfold og Telemark fylkeskommune, Tinn kommune	*KLD*, Vestfold og Telemark fylkeskommune, Notodden kommune
Urban heritage health and safety (5, 6)	Department for culture and public health (*Avdeling for kultur og folkehelse)*, *Sosial og helsedirektoratet*, fylkeskommune, Røros kommune	Department for culture and public health, *Helse og omsorgsdepartementet, Sosial og helsedirektoratet*, fylkeskommune, Tinn kommune	Department for culture and public health, *Helse og omsorgsdepartementet, Sosial og helsedirektoratet*, fylkeskommune, Notodden kommune
Heritage documentation, archiving, digitization, digitalization (4)	The Røros Museum, Røros kommune (*arkiv*/archive)	Norsk Industri-Arbeidermuseum (NIA), Tinn kommune	Norsk Industri-Arbeidermuseum (NIA), Notodden kommune
Urban heritage preservation, restoration, reconstruction, adaptation (2, 4)	Department of cultural heritage (*Avdeling for kulturminner*), *Byantikvar, Verdensarvkoordinator*, *Riksantikvaren*	Department of cultural heritage, *Byantikvar*, *Verdensarv-koordinator*, *Riksantikvaren*	Department of cultural heritage, *Byantikvar*, *Verdensarv-koordinator*, *Riksantikvaren*

Table A3. *Cont.*

Tasks/Urban-Scale Support Services	**Department/Institution/Organization in Charge**		
	Røros	**Rjukan**	**Notodden**
Urban heritage design guidelines comply with the HUL approach (4)	Department of cultural heritage, *Byantikvar*, *Verdensarvkoordinator*, *Riksantikvaren*	Department of cultural heritage, *Byantikvar*, *Verdensarv-koordinator*, *Riksantikvaren*	Department of cultural heritage, *Byantikvar*, *Verdensarv-koordinator*, *Riksantikvaren*
Strategic heritage plan (SHP) (4)	Department of cultural heritage, *Byantikvar*, *Verdensarvkoordinator*, *Riksantikvaren*	Department of cultural heritage, *Byantikvar*, *Verdensarv-koordinator*, *Riksantikvaren*	Department of cultural heritage, *Byantikvar*, *Verdensarv-koordinator*, *Riksantikvaren*
Heritage/tourist-friendly waste management system (2, 5)	Røros kommune	Tinn kommune	Notodden kommune
HBIM, UHIM, HCIM (1, 2)	-	-	-
Heritage-friendly public facilities (2)	Røros kommune	Tinn kommune	Notodden kommune
Customized universal design and accessibilities (2)	Røros kommune	Tinn kommune	Notodden kommune
Urban heritage-related CSR, PPP, and PPPP (N/A)	Trøndelag fylkeskommune, Røros kommune	Vestfold og Telemark fylkeskommune, Rjukan Næringsutvikling AS, Tinn kommune	Vestfold og Telemark fylkeskommune, Notodden kommune
Search and Rescue (6)	The Norwegian SAR/ The Rescue and Emergency Planning Department, Directorate for Civil Protection and Emergency Planning *(Direktoratet for samfunnssikkerhet og beredskap/DSB)*	The Norwegian SAR/The Rescue and Emergency Planning Department, DSB	The Norwegian SAR/The Rescue and Emergency Planning Department, DSB
Emergency preparedness (6)	The Norwegian SAR/ The Rescue and Emergency Planning Department, DSB, Trøndelag fylkeskommune, Notodden kommune	The Norwegian SAR/The Rescue and Emergency Planning Department, DSB, Vestfold og Telemark fylkeskommune, Notodden kommune	The Norwegian SAR/The Rescue and Emergency Planning Department, DSB, Vestfold og Telemark fylkeskommune, Notodden kommune
Tourism (3)	*Destinasjon Røros*, Trøndelag fylkeskommune, Røros kommune	VisitRjukan, Vestfold og Telemark fylkeskommune, Tinn kommune	Vestfold og Telemark fylkeskommune, Notodden kommune
Heritage Education (4)	The Røros Museum, Røros kommune	Norsk Industri-Arbeidermuseum (NIA), Tinn kommune	Norsk Industri-Arbeidermuseum (NIA), Notodden kommune
Interpretation of heritage for public/general audience (4)	The Røros Museum, Røros kommune, Røros World Heritage Foundation (*Røros Verdensarv*)	Norsk Industri-Arbeidermuseum (NIA), Tinn kommune, Norwegian Industrial Heritage Foundation (*Stiftelsen Norsk Industriarbeidermuseum*)	Norsk Industri-Arbeidermuseum (NIA), Notodden kommune, Norwegian Industrial Heritage Foundation (*Stiftelsen Norsk Industriarbeidermuseum*)

Clusters of departments: (1) PLZ = planning and zoning, (2) PWI = public works and infrastructure, (3) TOU = tourism, (4) CCH = conservation and cultural heritage, (5) ESU = environment and sustainability, (6) USS = urban safety and security.

Appendix B

Table A4. List of Document Studies Resources.

Properties	Documents	Year/Date	Institution
Røros Mining Town	Justification for inclusions in the World Heritage list	16 May 1978	Government of Norway
	Advisory body evaluation	15 November 1978	ICOMOS
	Cultural Heritage Act	1978	Government of Norway
	Decision from World Heritage Committee	29 September 1980	WHC—UNESCO
	Planning and Building Act	1985	Government of Norway
	State of Conservation—Bureau of the World Heritage Committee 18th session	26 May 1994	WHC—UNESCO
	Decision's context	26 May 2006	Presentation of the periodic report for sections I and II of Europe
	Decisions adopted at the 30th session of the World Heritage Committee (Vilnius, 2006)	23 August 2006	WHC—UNESCO
	Periodic Reporting—State of Conservation of World Heritage Properties in Europe	2006	WHC—UNESCO
	Advisory Body Evaluation	17 March 2010	ICOMOS
	Advisory Body Evaluation	May 2010	IUCN
	Report of the decisions adopted by the World Heritage Committee at its 34th Session	3 September 2010	WHC—UNESCO
	Decision's context—Evaluations of Cultural Properties—34th ordinary session(25 July–3 August 2010), Brasilia (Brazil)	2010	WHC—UNESCO
	Decision's context—Establishment of the World Heritage List and of the List of World Heritage in Danger	31 May 2010	WHC—UNESCO
	Periodic Report—Second Cycle	19 May 2014	Government of Norway
Rjukan-Notodden Industrial Heritage Sites	Cultural Heritage Act	1978	Government of Norway
	Planning & Building Act	2008	Government of Norway
	Cultural Heritage Act (Amended)	2009	Government of Norway
	Rjukan—Notodden Industrial Heritage Site—Nomination Dossier	2015	Government of Norway
	Advisory body evaluation	12 March 2015	ICOMOS
	Decisions adopted by the World Heritage Committee at its 39th session (Bonn)	8 July 2015	WHC—UNESCO

Table A4. *Cont.*

Properties	Documents	Year/Date	Institution
Rjukan-Notodden Industrial Heritage Sites	Decisions context—Establishment of the World Heritage List and of the List of World Heritage in Danger (Bonn, Germany, 28 June–8 July 2015)	15 May 2015	WHC—UNESCO
	Decision context—Establishment of the World Heritage List and of the List of World Heritage in Danger (Corrigendum)	22 May 2015	WHC—UNESCO
	Decision context—Evaluation of nominations of cultural and mixed properties to the World Heritage list (ICOMOS report for the World Heritage Committee)	April 2015	ICOMOS

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