D3.1 – Review of Existing Certification Schemes and Integration of stakeholder insights

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DELIVERABLE 3.1

Review of Existing Certification Schemes and Integration of stakeholder insights

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Executive Summary

The AccesS project emerges as a critical European initiative aiming to address the fragmented implementation of accessibility standards in the built environment. By combining policy analysis, mathematical modelling, and inclusive stakeholder engagement, the project sets out to develop a unified, flexible, and evidence-based certification framework for accessibility and social inclusion in buildings. This approach acknowledges that current accessibility efforts across Europe, though guided by national laws and international standards, often fall short due to inconsistencies, lack of enforcement, and limited alignment with digital and smart technology trends.

This deliverable involves three integrated pillars. First, a thorough comparative review of national and international accessibility-related legislation and standards was conducted, focusing on physical accessibility, usability, and universal design rather than sustainability frameworks like LEED or BREEAM. This revealed significant variation in scope, definitions, and implementation mechanisms across countries, underscoring the need for harmonization.

Second, a novel quantitative assessment model was developed to evaluate accessibility in a systematic, scalable, and adaptable way. The model introduces a hierarchical scoring structure composed of Disability Types (DT), Assessment Dimensions (AD), and Evaluation Criteria (EC). It allows evaluators to assign weighted scores to specific building features—such as ramps, signage, digital interfaces, or evacuation systems—tailored to the needs of diverse user groups. Scores range from 0 (not applicable) to 5 (best practice), enabling a distinctive, multi-dimensional picture of a building's accessibility performance.

Third, the deliverable prioritizes the active inclusion of stakeholders in the development process. Engagement activities were carried out in six European countries—Cyprus, Spain, the Netherlands, Romania, Greece, and Italy—bringing together a wide spectrum of actors: people with disabilities, urban planners, architects, policymakers, and technology providers. These consultations surfaced critical insights such as the need to include cognitive and sensory dimensions in accessibility standards, the inadequacy of current emergency evacuation protocols, and the potential (as well as the limits) of smart technologies. Participants also advocated stronger enforcement mechanisms and more robust public policies to mandate and fund accessibility improvements.

In terms of certification models, major sustainability frameworks—LEED, BREEAM, and WELL—are examined for the accessibility aspect. Findings indicate that while these systems indirectly promote certain inclusive features (e.g., lighting quality, acoustic design), they largely defer to local codes and lack dedicated criteria for digital or smart accessibility. This represents a major gap in the era of smart buildings and digital transformation. The AccesS framework thus positions itself as a complementary and necessary tool, capable of filling this gap by providing a dedicated assessment of accessibility that includes digital inclusion and assistive technologies.

The methodology also draws heavily from the values of the New European Bauhaus (NEB), which promotes design strategies that are sustainable, inclusive, and aesthetically pleasing. By aligning its principles with NEB—while operating them through measurable indicators and scoring functions, AccesS bridges the divide between aspirational design visions and practical, enforceable standards.

EN 17210:2021, the most comprehensive European standard for accessibility and usability of the built environment, is used as a core technical reference. While EN 17210 provides detailed functional requirements for accessible environments, its lack of a scoring mechanism has limited its application in certification and benchmarking. The AccesS framework enhances this standard by embedding its guidance into a quantitative structure that allows for flexible application across scales—from individual buildings to urban systems—and building types, including those with cultural heritage considerations.

Ultimately, the AccesS certification model represents a significant step forward in aligning accessibility with the broader goals of social equity, digital innovation, and sustainable development. By transforming static standards into a dynamic evaluation system—grounded in lived experiences, validated through stakeholder engagement, and supported by mathematical modelling—the project offers a comprehensive, adaptable, and user-centered approach to inclusive design. It ensures that accessibility is no longer treated as a compliance requirement but as a measurable and improvable dimension of building performance.

This framework will serve as a foundation for the technical development and pilot testing phases of the AccesS project and it is expected to inform future EU policy, certification programs, and design practices. It contributes not only to making spaces more accessible, but also to redefining the built environment as a space that welcomes, supports, and empowers all individuals—regardless of ability.

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List of Acronyms and Abbreviations

Term	Description
AD	Assessment Dimension
ADA	Americans with Disabilities Act
BIM	Building Information Modelling
BRE	Building Research Establishment
BREEAM	Building Research Establishment Environmental Assessment Method
D	Deliverable
DT	Disability Type
EC	Evaluation Criteria
EU	European Union
IEQ	Indoor Environmental Quality
IWBI	WELL Building Institute
LEED	Leadership in Energy and Environmental Design
NEB	New European Bauhaus
SRI	Smart Readiness Indicator
VUM	Virtual User Model
WCAG	Web Content Accessibility Guidelines
WP	Work Package

1 Introduction

1.1 Scope and objectives

The promotion of social inclusiveness and accessibility in the built environment is increasingly recognized as a central pillar in achieving equitable, sustainable, and resilient urban development. Despite growing awareness, the integration of accessibility principles into building design, construction, and certification practices remains fragmented across Europe. While various national legislations and international standards exist to regulate accessibility and inclusive design, inconsistencies, overlaps, and implementation challenges hinder their full potential. The AccesS project aims to address these challenges by laying the groundwork for a unified and adaptable certification framework that promotes accessibility and social inclusion in buildings across different national contexts.

1.2 Structure

Work Package 3 (WP3) of the AccesS project focuses on the development of a coherent and evidence-based framework to assess and promote accessibility in the built environment. The current deliverable synthesizes the findings from Task 3.1 and Task 3.2, which collectively establish the knowledge base for the design of the certification model. Task 3.1 involved a comprehensive review and comparative analysis of existing accessibility-related standards and national legislations across multiple European countries and at the international level. The purpose of this task was to identify best practices, gaps, and transferable principles that could inform the development of the AccesS certification scheme. Rather than focusing on sustainability-oriented certification systems (e.g., LEED, BREEAM), the review was centered on standards and legislative instruments that directly address physical accessibility, usability, universal design, and rights-based approaches to inclusive environments.

In parallel, the project integrated quantitative analysis to support the development of the certification framework. The incorporation of mathematical models provides a systematic and transparent approach to evaluating compliance levels, assigning accessibility scores, and identifying areas for improvement. These models will be crucial in operationalizing the assessment framework and ensuring that it can be flexibly adapted to national regulations while remaining robust and objective in application. The mathematical components explored in this deliverable represent an early effort to formalize key indicators and parameters that could underpin the scoring and benchmarking logic of the future certification scheme.

Equally important in the project's approach is the recognition that effective and meaningful accessibility policies must be co-created with those they affect. As such, Task 3.2 was dedicated to stakeholder consultation and engagement, bringing together a diverse group of actors including representatives of persons with disabilities, older adults, architects, urban planners, policymakers, public authorities, and advocacy organizations. Through a series of workshops and bilateral consultations held across the project's first ten months, valuable insights were gathered regarding perceived barriers, needs, and expectations surrounding accessibility standards and implementation practices. These stakeholder contributions not only validate the findings of the legislative and technical review but also introduce lived experiences and context-sensitive recommendations that enrich the development of a socially responsive certification system.

This deliverable consolidates these three lines of investigation—policy and standards review **(Section 3)**, preliminary modelling **(Section 4)**, and stakeholder engagement **(Section 5)**—into a single coherent report with conclusions and findings described in **Section 6** of this report. The aim is to inform the development of a unified accessibility certification framework that is rooted in legislative best practices, enhanced by quantitative tools, and shaped by the voices of those it is intended to serve. The

outcomes presented here will guide the subsequent phases of the AccesS project, particularly the technical development and pilot application of the assessment and certification system. Furthermore, they contribute to the broader policy discourse on inclusive design by providing a cross-country perspective on legislative readiness, enforcement gaps, and opportunities for harmonization.

1.3 Relation to Other Tasks and Deliverables

This deliverable is closely connected to various tasks, deliverables, and work packages within the AccesS project. It draws from the user needs identified in Work Package 2 (WP2), aligns with the methodological framework set in Deliverable D1.2, and contributes to the development of Virtual User Models (VUMs) and scenario-based simulations in WP5. Moreover, the deliverable introduces preliminary, conceptual links to the New European Bauhaus (NEB) values, the relevance and integration of which will be further explored in Work Package 8 (WP8) and results will be integrated in Task T7.1 to assess accessibility and inclusiveness in realistic contexts.

2 Methodological Framework

2.1 Review of Legislative Documents and Accessibility Standards

The review process was designed to establish a comprehensive and comparative understanding of existing regulatory and normative frameworks relevant to accessibility and inclusiveness in the built environment, which are further analysed in **Section 3**. The methodology combined structured data collection, expert partner input, and comparative analysis. The key steps involved were:

- **Template-Based Data Collection:** A standard template was designed and distributed among WP3 partners to guide the collection of relevant information from national legislations, technical standards, and guidelines. The template included sections on scope, level of enforceability, coverage of disability types, integration with digital accessibility, and references to universal design principles.

- **Country-Level Contributions:** Each partner was responsible for compiling data from their respective countries and institutional networks. This included both mandatory legal documents (e.g., building codes, disability acts) and voluntary standards (e.g., ISO 21542).

- **Desk Research and Document Analysis:** Partners performed systematic reviews of official legal texts, policy reports, and existing certification guidelines. Special attention was given to how accessibility was defined, operationalized, and monitored.

- **Cross-Referencing with EU-Level Instruments:** The review was aligned with overarching EU policies, such as the European Accessibility Act, to ensure consistency in terminology and scope.

- **Review of Reference Frameworks:** Parallel to national inputs, central EU-level reference frameworks such as the **New European Bauhaus Self-Assessment Method** [1] and **EN 17210:2021** [2] were analysed for structure, scope, and scoring methodologies. Key methodological features (e.g., indicator structuring, scale definitions, weighting systems) were extracted to inform later modelling.

- **Synthesis Workshop:** Findings from all contributors were presented and consolidated during an internal methodology workshop, where methodological alignment and potential overlaps with existing frameworks were critically examined and discussed.

2.2 Development of a Numerical Assessment Model

The creation of the numerical accessibility assessment model which will be analysed in Section 4 of this deliverable, followed a bottom-up and iterative process. It aimed to translate qualitative standards and regulatory provisions into a quantifiable scoring framework. The methodology was built in five main phases:

- **Definition of Model Structure:** The conceptual framework was developed to reflect a hierarchical scoring logic based on three layers: *Disability Types (DT)*, *Assessment Dimensions (AD)*, and *Evaluation Criteria (EC)*. Each layer was designed to be modular and expandable.

- **Scoring System Design:** A fixed scale (0–5) was established for each evaluation criterion. The scale definitions were harmonized across all criteria to allow uniform scoring, from "Not Applicable" to "Best Practice/Exemplary". This supported comparability across different types of assessments.

- **Weight Assignment Logic:** Methodological rules were defined for assigning weights to disability types, dimensions, and criteria. These weights were to be context-sensitive and adjustable based on stakeholder input, building typology, or policy relevance.

- **Mathematical Formulation:** A detailed formulation of the scoring function was developed using weighted averages. Each score is computed as a function of the weighted sum of criteria scores, normalized across dimensions and user groups. The equations and variable definitions were validated internally during partner coordination meetings.

- **Integration Readiness:** The model was built with foresight for digital implementation. Provisions were included to allow future integration with software tools, such as Building Information Modelling (BIM) interfaces, Virtual User Models (VUMs), and Smart Readiness Indicators (SRI).

Documentation of the mathematical model development was maintained to ensure traceability and alignment with later validation and piloting phases.

2.3 Stakeholder Engagement Activities

The stakeholder engagement methodology was structured to ensure inclusive participation, consistency across countries, and effective feedback collection. Activities were designed around the following principles: clarity of engagement objectives, diversity of stakeholder groups, and replicability of engagement tools.

- **Stakeholder Mapping and Clustering:** A categorization framework was developed to identify and group stakeholders into four categories: (i) Social and Community Support; (ii) Professional and Technical Experts; (iii) Academic and Research; and (iv) Business, Media, and Sustainability. This ensured broad representation from public, private, and civil society actors.

- **Development of Engagement Toolkit:** A standardized set of engagement materials was created for partners to use during local stakeholder sessions. These included:
  - Workshop templates
  - Discussion guides tailored to each stakeholder group
  - Miro/ Jamboard templates [3], [4] for collaborative activities
  - Feedback collection forms (digital and physical)

- **Implementation of Virtual Workshops:** The methodology prioritized the use of virtual engagement formats to enable wide participation. Tools such as Zoom, Miro, and Microsoft Forms were used to facilitate real-time collaboration and feedback. Breakout rooms enabled focus group-style interactions, and follow-up surveys were used to capture post-event reflections.

- **Documentation and Reporting:** Each partner was instructed to document engagement activities using a harmonized reporting template. This included: participant lists, thematic summaries, visual outputs from collaborative tools, and direct quotes.

- **Validation through Internal Workshops:** An internal validation session was held to review the engagement methodology, identify improvements, and confirm that the approach was adaptable to other geographic or linguistic contexts.

3 Landscape of Accessibility Regulations and Standards

3.1 Integrating Accessibility into Sustainability Certification: A Review of LEED, BREEAM, and WELL

As sustainability certifications play an increasingly influential role in shaping the built environment, understanding how these schemes address (or overlook) accessibility for persons with disabilities is essential for aligning green building objectives with inclusivity goals. This section explores the treatment of accessibility in three of the most prominent sustainability assessment frameworks: LEED (Leadership in Energy and Environmental Design) [5], BREEAM (Building Research Establishment Environmental Assessment Method) [6], and the WELL Building Standard [7], and assesses their current and potential contributions to inclusive design—especially in the context of smart buildings and cities.

3.1.1 LEED and Accessibility: An Indirect and Compliance-Based Approach

LEED, developed by the U.S. Green Building Council, is one of the most widely adopted green building certifications, emphasizing **energy efficiency, environmental impact, and human health**. While its core strength lies in promoting sustainable and cost-effective buildings, its provisions for accessibility remain **indirect, compliance-oriented, and fragmented**.

Accessibility References in LEED

- LEED primarily **defers to local and national building codes**—such as the **Americans with Disabilities Act (ADA)** in the U.S.—for physical accessibility. It does not establish accessibility criteria beyond legal compliance.
- Accessibility considerations appear in credits related to **Indoor Environmental Quality (IEQ)**. Features such as **lighting design**, **acoustic comfort**, and **thermal regulation** may indirectly enhance usability for people with visual, auditory, or cognitive disabilities. However, these are framed around general occupant well-being, not explicitly as accessibility standards.

Limitations

- LEED does not address **smart technology accessibility**, a critical issue in digitally integrated buildings. There are no requirements to ensure that systems like smart thermostats, lighting controls, or automated security are operable by individuals with motor, visual, or cognitive disabilities.
- **Digital interface accessibility**, such as compatibility with Web Content Accessibility Guidelines (WCAG), is not referenced.
- In LEED for Cities and Communities, while access to services like parks and public transit is mentioned, **disabled access is not systematically addressed**, limiting its utility for inclusive urban planning.

Opportunities for Advancement

To enhance its inclusivity scope, LEED could:

- Integrate **Universal Design principles** into its rating criteria.

- Develop new credits for **smart technology accessibility**, ensuring IoT and digital controls are operable by all users.
- Introduce guidance on **digital accessibility standards** for LEED-compliant platforms and control systems.

3.1.2 BREEAM: Sustainability First, Accessibility by Compliance

BREEAM, operated by the Building Research Establishment (BRE) in the UK, is Europe's leading green building assessment scheme. It provides a comprehensive evaluation of a building's sustainability, from energy use and material efficiency to ecological value and social impact. In the area of accessibility, BREEAM adopts a **compliance-based approach**, using existing legislation as its baseline.

Accessibility References in BREEAM

- Accessibility is addressed primarily under the **Health and Wellbeing** category, which includes requirements for **inclusive and ergonomic design**.
- BREEAM mandates adherence to local **accessibility codes** (e.g., UK Building Regulations Part M, ADA), covering aspects such as **accessible toilets, signage, and building entries**.
- Smart systems for lighting, HVAC, and energy management are often employed in BREEAM-certified projects. However, usability for disabled individuals is not explicitly assessed.

Key Features and Gaps

- **Sensory considerations** (e.g., glare control, acoustics, thermal comfort) are embedded in design requirements, indirectly benefiting individuals with sensory sensitivities or disabilities .
- There is a growing focus on **adaptability of spaces**, promoting designs that can accommodate users with changing needs over time—an inclusive design tenet.
- Like LEED, **BREEAM lacks a framework for assessing the accessibility of digital or smart interfaces**, even though such features are becoming increasingly common in sustainable buildings.

Future Directions

To close existing gaps, BREEAM could:

- Include **smart technology usability** in its performance metrics, especially for people with sensory or cognitive disabilities .
- Expand evaluation of **digital and IoT interfaces** to include criteria for assistive technology compatibility.
- More explicitly recognize accessibility as a dimension of social sustainability.

3.1.3 WELL Building Standard: Health-Oriented, Inclusivity-Adjacent

WELL, administered by the International WELL Building Institute (IWBI), is unique among certification schemes for its **human-centered focus**. It evaluates built environments based on their contribution to physical and mental well-being. WELL's approach to accessibility, while more **indirect and wellness-based**, supports inclusivity through its emphasis on **comfort, ergonomics, and sensory environments**.

Accessibility References in WELL

- WELL encourages inclusive strategies under categories such as:

- o **Light**: Recommending appropriate brightness and contrast, beneficial for visually impaired users.

- o **Sound**: Promoting acoustic comfort and noise reduction, supporting users with auditory or cognitive sensitivities.

- o **Thermal Comfort**: Allowing for user control of temperature to accommodate a variety of physical needs.

- In the **Comfort** and **Community** categories, WELL promotes equitable design and **social inclusion**, albeit without accessibility-specific metrics.
- WELL-certified buildings are expected to **comply with national accessibility regulations**, but the standard does not provide a unique framework for digital or physical accessibility.

Advantages and Shortcomings

- WELL offers **robust ergonomic design requirements**, contributing to accessibility for individuals with mobility challenges.
- It does not include criteria for **smart interface usability** or **adaptive technologies** that accommodate users with disabilities.
- Digital services within WELL-certified spaces—such as apps or control panels—are **not evaluated for accessibility compliance**, such as Web Content Accessibility Guidelines (WCAG) adherence.

Potential Enhancements

WELL has a strong foundation for promoting health-aligned inclusivity but could be strengthened by:

- Including **cognitive accessibility considerations**, such as intuitive navigation and stress-reducing layouts.
- Mandating or incentivizing **accessible digital platforms** and interfaces in smart buildings.
- Developing wellness-based criteria for **inclusive smart technologies**, including haptic feedback, multimodal input, and screen reader compatibility.

3.1.4 Cross-Cutting Analysis and Recommendations

While LEED, BREEAM, and WELL each promote **holistic sustainability**, they share several **shortcomings** when it comes to comprehensive accessibility assessment:

1. **Reliance on Legal Minimums**: Each system assumes compliance with building codes (e.g., ADA, Part M), with limited ambition beyond these frameworks.

2. **Smart Tech Accessibility Gaps**: There is little to no coverage of how **digital technologies, automation, or smart controls** can be designed for universal usability.

3. **Lack of Digital Inclusion Standards**: Despite the rise of app-based services and automated systems in smart buildings, certification schemes rarely require compliance with **digital accessibility standards** such as WCAG.

4. **Minimal User Diversity Modeling**: No current framework incorporates simulation or modeling tools (like Virtual User Models) that could test how different user groups interact with smart or sustainable building features.

To ensure accessibility is integrated as a core component of sustainable design, future versions of these certification systems could:

- Incorporate **Universal Design** principles explicitly.
- Require **user interface accessibility** testing and WCAG alignment for digital tools.
- Develop credits tied to adaptive and assistive smart technologies.
- Promote **inclusive co-design processes**, ensuring input from persons with disabilities throughout the certification lifecycle.

The following table describes the Comparative Overview of Accessibility Integration in LEED, BREEAM, and WELL Certification Schemes.

Table 1 Comparative Overview of Accessibility Integration in LEED, BREEAM, and WELL Certification Schemes

Certification Scheme	Primary Focus	Accessibility Focus	Smart/Digital Technology Accessibility	Compliance with Legal Accessibility Standards	Accessibility in Sensory & Cognitive Domains	Key Accessibility Limitations
LEED (Leadership in Energy and Environmental Design)	Sustainability, energy efficiency, environmental impact	Indirect; relies on compliance with local/national codes (e.g., ADA); minimal design-specific accessibility guidance	Not addressed; lacks requirements for UI accessibility, smart controls, or assistive tech	Yes – ADA or equivalent codes are required	Partial (e.g., lighting and acoustic quality can benefit sensory disabilities)	No provisions for smart tech accessibility; limited to physical compliance; indirect benefit only
BREEAM (Building Research Establishment Environmental Assessment Method)	Environmental performance, health, wellbeing	Indirect; includes some inclusive design in "Health & Wellbeing" category; defers to national codes	Not addressed; does not assess usability of smart systems or digital interfaces	Yes – Part M (UK), ADA, etc.	Partially addressed (lighting, acoustics, ergonomic design improve sensory comfort)	Accessibility limited to building code compliance; smart/digital accessibility missing
WELL Building Standard	Human health and wellbeing	Indirect; encourages inclusive and ergonomic environments; no dedicated accessibility section	Not addressed; no criteria for digital accessibility, UI design, or assistive smart technologies	Yes – ADA or similar codes are assumed	Stronger inclusion of sensory comfort (light, sound, thermal); some cognitive accessibility considerations	No integration of smart technology accessibility; lacks dedicated accessibility framework

3.2 The New European Bauhaus and Building Accessibility: A Methodological Perspective from the AccesS Project

The New European Bauhaus (NEB) [1] is not simply a design movement—it is a cultural and political initiative that integrates sustainability, inclusivity, and aesthetics into the transformation of Europe's built environment. Within the scope of the *AccesS* project, building accessibility is framed as a core expression of NEB values, merging functional design with social equity. This section analyses how NEB concepts—specifically inclusiveness and accessibility—are operationalized in the methodological development of the AccesS accessibility assessment framework.

3.2.1 Embedding NEB Principles into Accessibility Methodology

The AccesS methodology directly refers to the **NEB Self-Assessment Method and Tool**,[8] using it as a foundational reference for evaluating and guiding the design of accessible and inclusive buildings. Within this integration effort, the methodology acknowledges the **multi-dimensionality of accessibility** that the NEB champions—not just physical access, but also social equity, stakeholder engagement, and cultural sensitivity.

Specifically, the NEB Self-Assessment Method is built around **key thematic dimensions** relevant to accessibility:

- **Affordability of land and rent regulation**, which influence the ability of all users—including vulnerable groups—to access housing and public spaces.

- **Inclusive quality, equality, and accessibility**, reflecting how design supports usability for all, beyond compliance.

- **Social cohesion and anti-discrimination**, highlighting how the built environment can foster integration or exclusion.

- **Involvement of stakeholders**, aligning with NEB's participatory ethos where communities shape their environments.

In its incorporation of these dimensions, the AccesS framework goes beyond universal design as a technical solution—it aligns accessibility with broader goals of **social justice and democratic participation**, essential to the NEB vision.

3.2.2 From Vision to Measurement: Indicators and Scales

To translate NEB values into practice, the NEB Self-Assessment Tool introduces a **structured taxonomy** of indicators. The AccesS methodology adopts this model as a guide for indicator development and contextual alignment. The NEB approach breaks down indicators into:

- **Indicator**: A specific, measurable criterion (e.g., accessible circulation).

- **Scale**: The level of application (e.g., building, neighbourhood, urban).

- **Type**: Whether the case concerns new builds or renovations.

- **Main Use**: Residential, public, or mixed-use applications.

- **Cultural Heritage**: Whether the site falls under cultural preservation mandates.

- **Weight**: The importance of the indicator in the overall assessment.

This structure provides a **scalable and adaptable backbone** for accessibility assessment, allowing the AccesS methodology to calibrate its evaluation model across building types and societal contexts.

Importantly, the inclusion of **weights and heritage considerations** supports the NEB imperative of context-sensitive design—avoiding one-size-fits-all approaches and instead fostering place-based solutions.

Performance class: Low | Acceptable | Good | Excellent
KPI performance class score (PCS): 10 | 45 | 75 | 100

$$I = \sum_{i=1}^{m} (w_{I.i} \cdot PCS_{I.i}) \Big/ \sum_{i=1}^{m} (w_{I.i})$$

Performance class: Low | Acceptable | Good | Excellent
Inclusiveness dimension thresholds (t_I):
$0 \leq$ $t_{I, Acceptable}$ ≥ 40 | $t_{I, Good}$ ≥ 60 | $t_{I, Excellent}$ ≥ 80 | ≤ 100
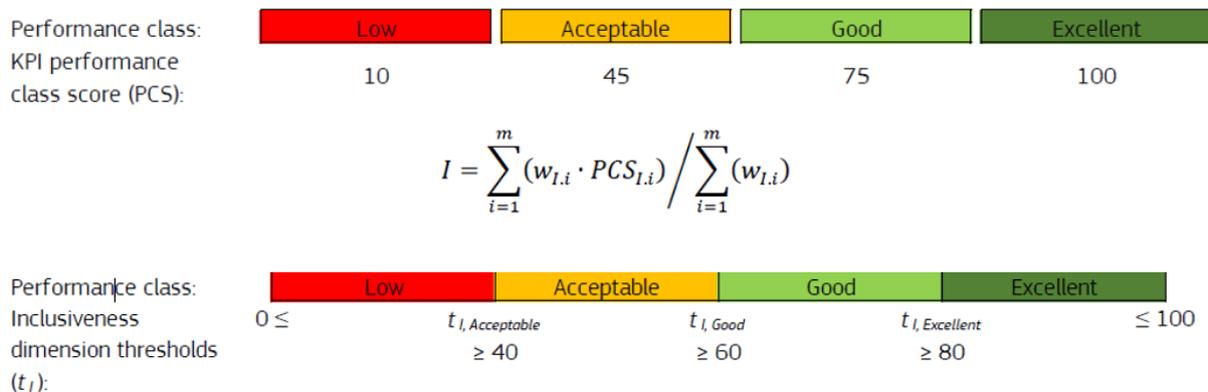
Figure 1: New European Bauhaus Self-Assessment Methodology – Calculation

3.2.3 The Evaluation Gap: NEB's Qualitative Vision vs. Quantitative Needs

The current self-assessment method may benefit from further strengthening its scoring system, as some indicators rely primarily on expert judgment rather than standardized, quantifiable metrics. This limits the consistency and objectivity of the evaluation and suggests a need for a more robust and evidence-based quantification approach.

The AccesS project responds to this by proposing a **scoring-based evaluation framework** that maintains fidelity to NEB values while enabling:

- Comparative analysis across buildings.
- Clear identification of strengths and gaps.
- Transparency and replicability of assessments.

The AccesS scoring system aims to translate NEB principles into **measurable outputs**, allowing for dynamic weighting based on user needs (e.g., disability type, building function). This means that while NEB remains the **philosophical and ethical guide**, AccesS contributes the **technical apparatus** for implementation, monitoring, and feedback.

Although not exclusive to NEB, the movement's advocacy for **holistic design** finds expression in the AccesS methodology's emphasis on **smartness and sustainability**. Accessibility, in this context, is not a stand-alone feature but part of a **synergistic system** that includes:

- Smart controls to support independent use.
- Energy-efficient designs that do not compromise ease of navigation.
- Technologies that personalize comfort and usability for diverse users.

This reflects NEB's **transdisciplinary ethos**, where technological, environmental, and human needs converge in the design of the built environment.

One of the strongest alignments between NEB and AccesS lies in the **participatory development of the methodology itself**. The AccesS field research plan mirrors NEB's call for **co-creation**, involving partners in:

- Refining indicator relevance and weights.

- Testing evaluation models in real settings.

- Adapting the framework to reflect lived experiences.

This participatory process supports the **NEB mission to empower communities**, ensuring that accessibility frameworks are **not imposed top-down**, but rather developed with those they aim to serve—especially people with disabilities and older adults.

The New European Bauhaus provides a **moral and conceptual compass** for rethinking accessibility. Its vision transcends technical compliance, embedding access into the broader goals of **equity, cultural sustainability, and participatory democracy**.

The AccesS project, as presented in the internal WP3 workshop, builds on this vision by crafting a **methodologically rigorous, digitally supported, and context-sensitive accessibility assessment framework**. It brings NEB values into actionable, measurable practice—translating beauty, sustainability, and inclusiveness into tangible criteria for accessible buildings.

In doing so, it not only furthers NEB's ambitions but also helps create a **new standard for accessibility**—one where buildings do not merely accommodate, but actively **welcome and empower all**.

3.2.4 A Shared Language of Accessibility: NEB and EN 17210

While the NEB introduces a more values-oriented lens on accessibility, the AccesS methodology also integrates **technical standards**—particularly EN 17210:2021—alongside NEB. What is noteworthy, however, is that the NEB framework provides the **qualitative ambition and policy alignment**, while EN 17210 offers **functional design guidance**.

NEB's contribution is the articulation of **accessibility as a human right and a societal objective**, helping reframe building evaluation beyond minimum compliance. The AccesS project thus positions NEB as **the conceptual foundation**, while using standards like EN 17210 to build out the details in physical and operational terms.

This NEB-led approach reinforces the role of accessibility not only in **universal usability**, but also in **urban transformation**, tying together affordability, stakeholder inclusion, and sustainable community-building. NEB views **accessibility as part of cultural equity**—a notion echoed in the evaluation of the **impacts on neighbourhoods**, the **needs of vulnerable and marginalized groups**, and the **inclusion of cultural heritage buildings** in accessibility upgrades. This is especially relevant to the AccesS demonstrators, some of which are **cultural heritage sites**. Here, NEB's approach is essential: rather than viewing heritage preservation and accessibility as conflicting goals, NEB encourages a **creative synthesis**—where design enhances access without erasing cultural identity. By embedding NEB criteria into its methodology, the AccesS project supports a **redefinition of design priorities**, recognizing that equitable access is just as critical as preserving historical character.

3.3 EN 17210:2021 and the Foundations of Accessibility in the Built Environment

3.3.1 A Methodological Review Based on the AccesS Project Workshop

The European Standard **EN 17210:2021**, titled *"Accessibility and usability of the built environment – Functional requirements"*, represents a critical foundation in shaping inclusive and equitable spaces across Europe. Framed within the AccesS WP3 Methodology Workshop, the standard is not only referenced as a regulatory touchstone but also as a methodological backbone for building a quantifiable, inclusive, and adaptive accessibility assessment system. This analysis explores how EN 17210 is presented and interpreted in the AccesS framework, focusing on its structural principles, scope, limitations, and its application across the scales of the built environment.

EN 17210 is grounded in **Universal Design**—also referred to as *Design for All*—and aims to ensure that the built environment is **usable, safe, and accessible to the broadest range of users**, including individuals with disabilities and older adults. As discussed in the AccesS workshop, the essence of EN 17210 is to **go beyond specialized design** and instead incorporate inclusive solutions **from the outset** of planning, construction, and maintenance.

The standard emphasizes:

- **Equitable use** for people with varying abilities.
- **Elimination of the need for adaptation** or specialized solutions.
- **User safety and autonomy**.
- **Inclusive participation** in public, social, cultural, and economic life.

It applies to **new construction, refurbishment, adaptation, and maintenance**—positioning accessibility not as a retrofit measure, but a **core design objective** from day one.

3.3.2 Scope and Applicability in Built Environments

The EN 17210 standard is far-reaching in its applicability, covering both **indoor and outdoor environments**, including:

- Buildings for **residential, administrative, cultural, service, and employment** purposes.
- **Outdoor pedestrian areas**, such as streets, squares, and public spaces.
- **Transport facilities** and connectivity areas (e.g., parking and drop-off zones).

The AccesS workshop material emphasizes that this scope makes the standard particularly **suitable for city-wide applications**, public infrastructure planning, and comprehensive building certification schemes—such as the one AccesS is developing.

3.3.3 Key Accessibility Domains in EN 17210

The structure of EN 17210 is built around **specific domains** or key functional areas. These include:

1. **Wayfinding and Orientation**

   Guidance on signage, lighting, tactile surfaces, and visual contrast to support users in navigation—especially critical for people with visual or cognitive disabilities.
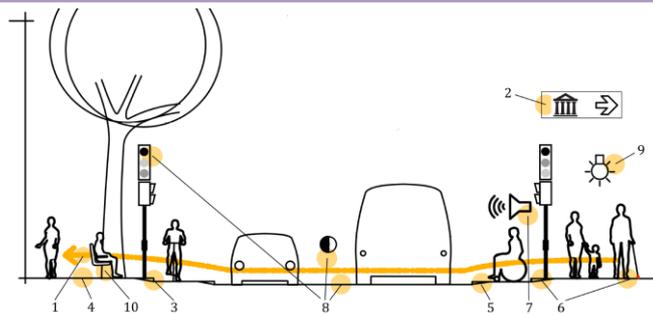
Figure 2 - Examples of main design considerations for accessible and usable pedestrian areas [source standard EN 17210]

1) Accessible route in pedestrian area and road crossing
2) Good wayfinding signage, e.g., Signs with clearly legible text and numbers, directional wayfinding signage
3) Separate pedestrian, cycling and vehicular areas, e.g., kerbs, guarding or tactile surfaces
4) Even, firm and slip – resistant surfaces
5) Step- free accessible routes and pedestrian crossings, e.g., kerb ramps
6) Tactile guidance, e.g., guidance and warning surfaces, tactile signals at crossings
7) Audible guidance, e.g., audible signals at pedestrian crossings
8) Good visual contrast, e.g., white markings on dark road surface, high lighting levels in traffic lights
9) Good lighting, e.g., lighting on footways and crossings
10) Resting places at regular intervals along pedestrian areas

2. **Outdoor Environment Access**

   Accessibility in public outdoor spaces, including curb cuts, ramps, tactile paths, and accessible seating zones.

3. **Arrival and Departure Zones**

   Design of parking areas, drop-off points, and building entrances to support inclusive access for all, particularly users with mobility aids or assistive devices.

4. **Horizontal and Vertical Circulation**

   Routes within buildings (corridors, doorways, hallways) and between floors (elevators, ramps, stairs) are emphasized for their crucial role in ensuring continuous, independent movement.

Figure 3 Examples of main design considerations for accessible and usable routes in vertical circulation [source standard EN 17210]

1) Accessible route, e.g., lifts for vertical circulation
2) Good wayfinding signage
3) Adequate width of the stair
4) Safe stairs, e.g., rise and going of appropriate size, handrails located correctly
5) easy to operate, e.g., controls at a height suitable for seated and standing people audible feedback, tactile buttons, hearing enhancement systems
6) spacious lifts, e.g., room for wheeled mobility devices, ambulance stretchers
7) easy to locate, e.g., obvious placement of stairs and lifts in circulations routes
8) good lighting, e.g., higher lighting levels on stairs, ramps and entrance to lifts
9) good visual contrast, e.g., step nosing's, handrails and lift controls clearly distinguishable from background
10) good acoustics, e.g., adequate speech transmission

5. **Specific Interior and Exterior Areas**

   Examples include lobbies, service counters, terraces, or gardens, where multiple user needs must be accommodated.

6. **Sanitary Accommodation**

   Guidance on accessible toilets, showers, and changing facilities.

7. **User Interfaces and Controls**

   Placement, visibility, and usability of switches, intercoms, and other control devices.
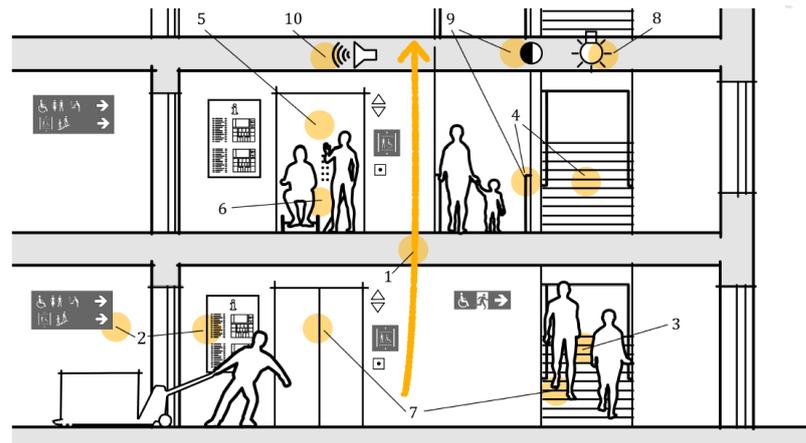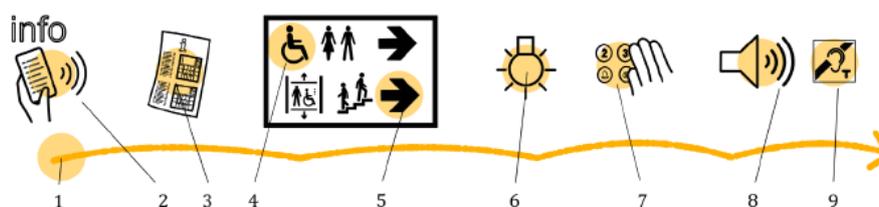

Figure 4 Examples of main design considerations for accessible and usable information via multiple senses [source standard EN 17210]

1) Accessible route
2) Accessible formats, e.g., accessible web pages, apps
3) Large print, e.g., information available in large print upon request
4) Good signage, e.g., clearly legible fonts and symbols with good visual contrast
5) Use of standardized symbols, e.g., ISO pictograms
6) Good lighting, e.g., Adequately lit signage
7) Tactile formats, e.g., raised letters Braille, tactile warning systems
8) Audible formats, e.g., Text-to-speech, audible warning signals
9) Audible information through induction loop

8. **Fire Safety and Emergency Evacuation**

   Inclusive emergency strategies, such as visual/auditory alarms, accessible exits, and safe refuge areas.

9. **Environmental Conditions**

   Thermal comfort, acoustics, and lighting that respect diverse sensory needs.

10. **Information Accessibility**

    Ensuring that all communication is **multi-sensory**—visual, tactile, auditory—to accommodate a full range of abilities.

These domains are all **interdependent**, reinforcing the principle that **true accessibility is holistic**—not reducible to a single feature or solution.

3.3.4 Multiscale Design: A Strength of EN 17210

A significant strength of EN 17210, as highlighted in the AccesS workshop, is its **multiscale approach** to accessibility. Rather than limiting the scope to building interiors, the standard expands accessibility analysis to:

- **Pedestrian areas**: design criteria for sidewalks, crossings, public squares.

- **Approaches to buildings**: e.g., pathway gradients, surface texture, signage.

- **Entrances and lobbies**: tactile indicators, threshold designs, automatic doors.

- **Circulation**: corridors, door widths, turning radii for wheelchair users.

- **Vertical movement**: placement and dimensioning of lifts and staircases.

- **Rooms and functional areas**: accessible layouts in all user-relevant rooms.

- **Equipment and services**: inclusive kitchens, ATMs, vending machines, etc.

- **Exits and safety provisions**: alarm systems and emergency signage.

This **granularity of analysis** allows EN 17210 to be used flexibly—from small-scale renovations to large-scale master planning—providing consistent guidance throughout.

While EN 17210 is **rich in descriptive detail**, its main limitation, is its **lack of a formal evaluation or scoring mechanism**. The standard offers exhaustive "good practice" descriptions and performance expectations but does **not assign quantitative metrics or thresholds** that would enable comparative assessments or certification.

This limits its use in:

- **Performance benchmarking** between buildings.

- **Accessibility certification schemes** (e.g., for regulatory compliance or public procurement).

- **Actionable feedback systems** for designers and developers.

To address this, the AccesS project proposes a **scoring system that builds upon EN 17210**—quantifying how well each domain is met across user groups and use cases.

3.3.5 EN 17210 as a Foundation for the AccesS Certification Framework

The AccesS framework adopts EN 17210 as a **technical and conceptual foundation**, translating its guidance into **specific, measurable evaluation criteria**. This includes:

- **Weighting different accessibility domains** based on the building type or user demographic.

- **Defining thresholds** (e.g., minimum turning radius, optimal signage height) that can be used for compliance assessment.

- **Operationalizing qualitative recommendations** (e.g., "easy to use" switches) into checklist items or simulations using digital tools.

The AccesS team draws from the standard to map user needs (as outlined in WP2 and *D2.1 User-Centered Design Approach and Inclusive Active Mobility Solutions*), inform the development activities of WP5 for Virtual User Models (VUMs) that represent diverse human characteristics, and design scenario-based simulations—such as vertical circulation, tactile interface use, and emergency evacuation—in alignment with the general approach for Business scenarios and technical use cases described in *D1.2 AccesS Framework architecture, use cases and master planning for demonstrators*. Task 7.1 will deliver the large-scale accessibility assessment tool to enable the assessment of accessibility features according to accessibility guidelines as well as enable the implementation of the AccesS assessment framework developed in WP8, based on this preliminary work of WP3.

3.3.6 Linking Accessibility with Smartness and Energy Efficiency

While EN 17210 does not explicitly address **smart buildings or energy use**, the AccesS methodology incorporates these aspects in a way that remains **compatible with the EN standard**. For example:

- Automated doors or lighting can be assessed both for **usability (EN 17210)** and **energy performance (Smart Readiness Indicator)**.

- Sensors for environmental conditions are evaluated both for **comfort (EN 17210)** and **smart control functionality**.

This dual compatibility makes EN 17210 a **stable, standards-based platform** upon which smart, sustainable, and inclusive design tools can be built.

3.3.7 Towards Evaluation: Bridging Standards with Assessment

A central takeaway from the AccesS workshop is that **EN 17210 provides best practices, but not performance benchmarks**. The AccesS methodology fills this gap by introducing:

- A **scoring scale (0–5)** for each evaluation criterion.

- Weighted criteria tailored to disability types and building functions.

- Integration with digital tools and AI-based assessments.

In doing so, AccesS transforms EN 17210 from a descriptive guideline into the backbone of a **quantitative certification system**—capable of supporting regulatory, commercial, and design use cases.

EN 17210:2021 stands as the **most comprehensive accessibility standard** currently available in Europe. As articulated in the AccesS WP3 workshop, it offers the **depth, granularity, and versatility** needed to inform inclusive design across contexts. Yet, its primary limitation is the absence of **quantitative evaluation tools**, which are essential for certification, benchmarking, and public accountability.

The AccesS project leverages the EN 17210 standard not merely as a reference document but as the **technical foundation for innovation**—enabling the development of digital tools, scoring systems, and adaptive frameworks that truly operationalize inclusivity in the built environment.

By transforming descriptive guidance into evaluative power, the AccesS framework ensures that the accessibility principles of EN 17210 are **not just ideals on paper—but real features in every building, for every user.**

4 **Modelling Accessibility**Principles of the AccesS Assessment Scheme

The challenge of making buildings truly inclusive goes beyond meeting the minimum requirements of national building codes. In the context of a digital, sustainable, and human-centered built environment, accessibility must be treated not merely as a technical requirement but as a performance indicator—evaluated, benchmarked, and improved continuously. Within this context, the Accessibility and Inclusiveness Certification Model developed by the AccesS project offers a structured, flexible, and scalable methodology for assessing the usability of buildings by people with diverse disabilities.

The model is designed as a quantitative framework that can be customized to different building typologies, user demographics, and policy objectives. It supports evidence-based design, structured evaluation, and transparency in performance reporting. At its core, the model builds on three analytical pillars: **Disability Types (DT)**, **Assessment Dimensions (AD)**, and **Evaluation Criteria (EC)**. These layers are linked through a hierarchical structure of **weights and scores**, enabling the generation of robust, composite indicators of building inclusiveness.

4.1.1 Disability Types (DT): Personalizing the Assessment Scope

The first layer of the model introduces the concept of **Disability Types (DT)**, which serve to define the user profiles being considered in the assessment. This classification recognizes that accessibility is experienced differently depending on the user's physical, sensory, or cognitive abilities.

Disability type layer is divided into two categories—**DT1: Individuals with limited mobility** and **DT2: "blind or low vision people** —but these are **only indicative**. The model allows for the inclusion of a broad set of disability types such as:

- Cognitive disabilities (e.g., autism, dementia)
- Deaf and hard-of-hearing people (e.g., partial or full hearing loss)
- Neurodiverse conditions (e.g., ADHD, learning disorders)
- Temporary or situational disabilities (e.g., injury, fatigue)
- Age-related limitations (e.g., low vision, reduced mobility)

Each disability type is assigned a **DT_Weight**, a numeric value that reflects its relative importance in a given evaluation context. The use of DT_Weights makes the model adaptable: the weighting can reflect national priorities, building functions (e.g., hospitals vs. cultural centers), or demographics (e.g., aging populations).

4.1.2 Assessment Dimensions (AD): Organizing Accessibility Domains

The second layer comprises **Assessment Dimensions (AD)**—broad, functional categories that structure the way accessibility is understood and assessed within the building. Again, the presentation illustrates two examples—**AD1: Physical Accessibility** and **AD2: Safety**—but the full model is capable of accommodating a far more extensive set of dimensions, including but not limited to:

- Wayfinding and Navigation
- Smart System Usability
- Information and Communication Accessibility
- Environmental Comfort (light, noise, temperature)

- Sanitary Facility Design

- Entrance and Circulation Systems

- Digital Service Interfaces

- Interaction with Emergency and Alert Systems

Each dimension is weighted per disability type through a set of **AD_Weights**, allowing the framework to capture the fact that certain domains may matter more to some users than others. For instance, tactile signage and emergency lighting might be critical for users with visual disabilities , while step-free circulation and door-opening mechanisms may carry greater weight for wheelchair users.

The use of AD_Weights ensures that the framework supports **multi-dimensional assessments** that can be dynamically prioritized. It also allows evaluation outputs to be tailored and filtered by user group, enabling both holistic scoring and disaggregated analysis.

4.1.3 Evaluation Criteria (EC): Translating Design into Measurable Performance

The third and most granular layer of the model involves the definition of **Evaluation Criteria (EC)**. These are specific, observable, and measurable features or conditions within a building, such as:

- Ramp gradients and landing widths.

- Availability and placement of tactile surfaces

- Voice-feedback systems on elevators or kiosks

- Acoustic insulation levels in circulation zones

- Interface accessibility of smart HVAC or lighting controls

- Placement and clarity of emergency evacuation signage

Each EC is scored on a **discrete scale from 0 to 5**, with each level clearly defined:

- 0 = Not Applicable

- 1 = Non-compliant

- 2 = Needs Improvement

- 3 = Meets Basic Requirements

- 4 = Exceeds Requirements

- 5 = Best Practice / Exemplary

The model enables both qualitative and quantitative data collection—via audits, simulations (e.g., BIM-based user journeys), digital twin integrations, or stakeholder interviews. Each EC is also assigned an **EC_Weight**, representing its relevance within its respective dimension and user type.

4.1.4 Scoring Logic: From Disaggregated Ratings to Composite Accessibility Indices

The key to the model's strength lies in how these layers—DT, AD, EC—are linked mathematically to produce coherent, weighted outputs that reflect the performance of a building in inclusive design.

The building's total accessibility score is calculated using a **nested aggregation formula**, expressed as:

$$\text{Accessibility Score} = \sum_{i=1}^{n_{DT}} \left(DT\_Weight_i \cdot \sum_{j=1}^{n_{AD}} \left(AD\_Weight_{i,j} \cdot \sum_{k=1}^{n_{EC}} \left(Score_{i,j,k} \cdot EC\_Weight_{i,j,k} \right) \right) \right)$$

Where:

- i indexes Disability Types
- j indexes Assessment Dimensions
- k indexes Evaluation Criteria

This formula serves as a **composite scoring engine**, dynamically adjusting the final outcome based on the selected user groups, context, and assessment focus. Importantly, it allows for:

- **Tailored application** (e.g., evaluating only DT1 in an orthopedic clinic)
- **Comparative benchmarking** across buildings or cities
- **Score deconstruction**, showing per-user-group and per-dimension performance

Additionally, partial assessments are possible. If a building is not relevant to certain user groups (e.g., no overnight occupancy, limiting the need for visual alarm cues), those elements can be removed or zero-weighted.

4.1.5 Model Adaptability and Scope

This layered and weighted logic makes the model:

- **Scalable**: Suitable for small community centers, complex hospital campuses, or city-wide certification programs.
- **Flexible**: Applicable across new builds, renovations, cultural heritage contexts, or smart infrastructure pilots.
- **Future-ready**: Compatible with integration into BIM environments, IoT data feeds, and digital twins.
- **Policy-aligned**: Mappable to national and European accessibility strategies, and capable of incorporating evolving standards (e.g., EN 17210, NEB indicators).

Beyond scoring, the model enables **scenario-based simulations**, such as evaluating accessibility changes under different renovation options or testing how well a building accommodates additional user groups after retrofitting.

4.2 Comparison of the AccesS Certification Model and the NEB Self-Assessment Scheme

Despite their different orientations—**AccesS as a quantitative, technical assessment model** and **NEB as a qualitative, values-based reflection framework**—these two approaches are highly complementary and mutually reinforcing. AccesS provides the **evidence-based foundation** necessary to evaluate accessibility in precise, measurable terms, covering physical, sensory, cognitive, and digital domains. In contrast, the NEB framework offers a **holistic vision** of how inclusion, aesthetics, and sustainability come together to shape transformative spaces. Integrating the two would enhance the **depth, credibility, and strategic alignment** of building assessments, linking **performance metrics** with **design values**. This synergy enables both rigorous technical validation and participatory design reflection, strengthening how inclusiveness is conceptualized, implemented, and communicated in EU-funded projects and sustainable urban transformation initiatives.

Table 2 Comparative Overview of the AccesS Accessibility Model and the New European Bauhaus (NEB) Self-Assessment Scheme

Feature	AccesS Model	NEB Self-Assessment Scheme
Purpose	To quantitatively assess the inclusiveness and accessibility of buildings for diverse disability types.	To qualitatively reflect on how a project aligns with the NEB values: **sustainability**, **aesthetics**, and **inclusion**.
Core Focus	Evidence-based evaluation of **physical and smart accessibility**.	Value-based reflection on **design culture**, **environmental performance**, and **societal impact**.
Structure	Mathematical model with weighted scores	Thematic scorecard based on **16 guiding questions** across three NEB pillars. Each scored qualitatively (0–5).
Scoring System	Fully **quantitative**, based on granular evaluation criteria across Disability Types (DT), Assessment Dimensions (AD), and Evaluation Criteria (EC).	**Qualitative and narrative**, encouraging self-reflection on how a project supports NEB values. Scores guide improvement but are not directly tied to compliance.
Accessibility Approach	Accessibility is **explicit, central**, and measurable across physical, sensory, cognitive, and smart system domains.	Accessibility is part of the "**Inclusion**" pillar, addressed more broadly (e.g., "Who is left out?" "Can all people access this space?"), but without technical depth or metrics.
Output Format	Composite numerical score (0–5), detailed sub-scores per DT and AD, and suitable for certification or benchmarking.	Traffic light visualizations and narrative reflections; more suited to strategic positioning than technical auditing.
Technology Integration	Includes evaluation of **smart systems**, IoT, UI accessibility, and digital interfaces.	Technology is **not directly assessed** but may be implied under sustainability or aesthetic innovation.
Use Case	Can inform **building certifications**, procurement criteria, or digital twin evaluation.	Useful for **early-stage project ideation**, value alignment, and NEB Lab funding applications.

Mutual Reinforcement of the "Inclusion" Dimension

- **AccesS → NEB**: The AccesS model can be used to **quantify and evidence** the NEB "Inclusiveness" pillar. Where the NEB asks "Is the project inclusive?", AccesS provides the actual performance metrics across user groups and accessibility domains.

- **NEB → AccesS**: The NEB guiding questions on inclusion—such as "Who participates in the design process?"—can enrich the AccesS methodology by incorporating **co-creation processes** or **stakeholder engagement** into its assessment dimensions.

> **Suggested Link**: Create a NEB-Inclusive Access Scorecard that adds AccesS-derived scores to the NEB self-assessment under the inclusion domain.

Shared Score Weighting Logic

While NEB uses qualitative 0–5 ratings across 16 criteria, the AccesS model aggregates scores using a **nested, weighted structure**. NEB could benefit from adopting a **weighting mechanism** that gives more importance to critical dimensions (e.g., safety for elderly populations), following the AccesS model logic.

> **Suggested Link**: Offer a "quantitative NEB plugin" where AccesS weights are mapped to selected NEB inclusion questions to produce a composite **numerical inclusion performance score**.

Each of the 16 guiding questions from the NEB Compass can be aligned with **selected Assessment Dimensions (ADs)** and **Disability Types (DTs)** from the AccesS model.

Table 3: Mapping NEB Inclusion Questions to Corresponding Assessment Dimensions and Evaluation Criteria in the AccesS Mode

NEB Question	Mapped AD from AccesS Model	Example EC
"Can everyone use and access the place?"	AD1: Physical Accessibility	Ramp width, door automation, tactile paths
"Can people with different needs feel safe?"	AD2: Safety	Multi-sensory alarms, accessible exits
"Is the place co-created with its users?"	ADX: Participation (to be added)	Documentation of inclusive design processes

> **Suggested Link**: Create a mapping table in the AccesS methodology annex that cross-references NEB questions with relevant ECs and ADs

Integrating NEB into AccesS Reporting

The output report from the AccesS evaluation could include a **NEB Reflection Section** summarizing how the building scores across the NEB Values, based on accessibility results:

- **Inclusion**: Derived directly from the composite scores of DTs and ADs.
- **Sustainability**: Linked to ECs in environmental comfort, energy control systems.
- **Aesthetics**: Descriptive, qualitative input from users or designers on inclusive visual design.

> **Suggested Link**: Include a "NEB Summary Box" in the final AccesS certificate or dashboard.

Policy and Funding Synergies

Since NEB is closely tied to **EU mission-driven innovation** and funding programs (e.g., NEB Lab, Horizon Europe NEB calls), integrating AccesS metrics into NEB assessments would:

- Provide a **technical foundation** for value-based project evaluation.
- Support **impact measurement** in NEB-supported demonstration projects.
- Offer a **common language** for architects, engineers, funders, and user groups.

> **Suggested Link**: Position AccesS as the "technical accessibility module" within future NEB evaluation guides or proposal templates.

Table 4: Opportunities for Integration of AccesS into the NEB scheme

Integration Area	What NEB Offers	What AccesS Adds	Benefit
Inclusion Assessment	Reflective questions	Quantitative scores by user group	Evidence-based evaluation
Weighting Logic	Equal scores across questions	Weighted aggregation by relevance	Targeted scoring

Technical Coverage	General reference to accessibility	Detailed ECs and smart tech evaluation	Broader and deeper assessment
Reporting Format	Narrative & qualitative	Scorecard and sub-indices	Combined storytelling and metrics
Funding/Policy Fit	Alignment with NEB policy	Usable in proposals, evaluations	Strategic compatibility

It is important to clarify that the proposed links to the New European Bauhaus (NEB) framework are presented in a **recommendatory and exploratory** capacity. These links are **provisional** and aim to **align the project conceptually with the NEB values** of sustainability, aesthetics, and inclusiveness. However, they **do not represent a commitment** to the development or implementation of such links at this stage. Further discussion and evaluation of their relevance and feasibility are expected to take place within **Work Package 8 (WP8)**, where strategic alignment and potential integration pathways may be more thoroughly assessed.

5 Voices from the field: Stakeholders insights

5.1 Introduction

Task T3.2 focuses on the critical process of stakeholder consultation and engagement in support of developing inclusive and practical EU accessibility standards. Implemented during the first ten months of the project (M1–M10), the task is coordinated by FRC, with key contributions from IsZEB, DMO, ASRO, AEM, and BHA. Its primary objective is to ensure that a broad and diverse range of stakeholder perspectives is not only acknowledged but also meaningfully integrated into the accessibility standards, particularly those to be operationalized through assessment and certification frameworks.

The stakeholder groups targeted through this task include disability advocacy organizations, representatives of older populations, architects, urban planners, designers, builders, industry professionals, regulators, and policymakers. By involving these groups, the task aims to promote a co-creative and inclusive process where accessibility is shaped not in isolation, but through the lived experiences, technical expertise, and policy perspectives of those directly impacted by its implementation.

A structured program of engagement activities—including targeted consultations, thematic workshops, and interactive meetings—has been designed to facilitate meaningful dialogue and the exchange of knowledge. This program follows the structure outlined and the Workshop Engagement Calendar (see table below), which provides a clear roadmap for when and how each engagement activity took place. These events offered a way for stakeholders to discuss existing barriers, identify user needs, and provide constructive feedback on proposed approaches to accessibility.

Table 5: Stakeholders Engagement Activities Planning

Partner	Country	Type	Date
FRC	Cyprus	Virtual Workshop	Friday, 19 December 2025
BHA	Netherlands	Physical Workshop	Monday, 17 February 2025
ASRO	Romania	Virtual Workshop	Wednesday, 19 February 2025
Miwenergia	Spain	Consultation Activity (physical)	Tuesday, 11 February 2025
CETEM	Spain		
IsZEB	Greece	**Phase 1:** One - one Meetings **Phase 2:** online Workshop	Thursday, 27 February 2025
CERTH	Greece		
AEM	Switzerland	Online questionnaire	27/1 - 10/2/2025
DMO	Netherlands	Physical Workshop	Thursday, 6 February 2025

In the next section, we present the set of guidelines that were shared with partners to support the organization and execution of the workshops. These guidelines helped ensure consistency and quality across all engagement activities. Following this, the deliverable outlines the key findings, insights, and recommendations gathered from the stakeholder workshops, offering a comprehensive overview of the contributions that shaped the development process.

5.2 Workshop Guidelines Introduction

To ensure successful and consistent execution of stakeholder engagement activities across different countries, partners were requested to follow these guidelines:

Define Objectives and Outcomes

- Clearly outline the objectives of the event, ensuring alignment with the AccesS project's goals and the development of the accessibility assessment methodology.
- Identify specific outcomes, such as stakeholder insights to refine the methodology and action-able recommendations for Deliverable 3.1.

Stakeholder Identification

Ensure representation from all identified stakeholder categories:

- Social and Community Support organizations
- Professional and Technical Experts
- Academic and Research Institutions
- Business, Media, and Sustainability Partners
- Maintain diversity to capture a broad spectrum of perspectives.

Preparation for Event Content

- Integrate key elements from the December 19 methodology workshop to provide consistency and relevance.
- Include questions aligned with the tailored questionnaire developed for Task 3.1 to gather consistent data across all events.
- Customize the format and content to fit the local context while adhering to project guidelines.

Event Logistics

For Physical Events

- Confirm venue details, accessibility, and logistical arrangements.

For Virtual Events

- Use interactive tools (e.g., Miro, Jamboard) for brainstorming.
- Plan for live polling, breakout groups, and real-time Q&A to encourage participation.
- Ensure technical support is available for smooth execution.

Engagement Activities

- Plan for diverse formats such as workshops, brainstorming sessions, and webinars to suit the local audience.
- Utilize structured breakout discussions and real-time feedback mechanisms.

Feedback Integration Framework

- Establish a systematic approach to collect, analyze, and integrate feedback into the project deliverables.
- Ensure that stakeholder input directly informs the development and refinement of the accessibility assessment scheme.

Documentation and Reporting

- Record meeting minutes, including stakeholder participation, discussions, and key insights.

- Submit reports summarizing the event outcomes to the WP3 lead within two weeks of the event.

Timeline for Engagement Activities

- Plan and execute stakeholder events during M7–M9 (December–February 2025).
- Align with the timeline for drafting Deliverable 3.1 by M10 (March 2025).

Flexibility and Localization

- Adapt activities to reflect the specific conditions and needs of your country while meeting the overarching goals of the AccesS project.
- Ensure inclusivity and accessibility in both content and format.

Next Steps

- Share detailed plans, including the finalized event agenda, with the WP3 coordination team for review and feedback before execution.
- Coordinate with other partners for consistency and mutual learning.

5.3 Key findings

The workshops carried out in Cyprus, Greece, Romania, the Netherlands, Spain, and Italy served as a critical mechanism for co-developing an, inclusive, and contextually grounded Accessibility Certification Framework. By actively involving a diverse group of stakeholders—including policymakers, municipal planners, architects, disability advocacy organizations, building owners, construction professionals, and smart technology providers—these consultations aimed to collect qualitative and practical insights that reflect real-world challenges and solutions in advancing accessibility in the built environment.

The workshops facilitated knowledge exchange and cross-sectoral dialogue around key dimensions of accessibility, particularly in relation to existing policy gaps, technological integration, socioeconomic constraints, and user-centric design. Below is a synthesis of the key findings from each country, highlighting the thematic convergence and local specificities observed during the engagement process.

Cyprus

In Cyprus, the consultation revealed a strong consent on the urgent need to establish a structured and standardized accessibility assessment methodology. Stakeholders emphasized that accessibility must extend beyond physical access to also include digital navigation, sensory communication, and cognitive usability. Current urban infrastructure was seen as inadequately prepared to serve people with disabilities, primarily due to inconsistent design standards, poor public transport interfaces, and the absence of legally enforced guidelines. The discussions also called for the incorporation of accessibility into municipal planning policies and urban renewal strategies, ensuring that accessibility is mainstreamed into both new developments and retrofit projects.

Spain

Spanish stakeholders advocated for a redefinition of accessibility that encompasses all forms of disability—physical, sensory, and cognitive—and is treated as a fundamental element of public safety and welfare. Accessibility should be institutionalized in legislation with the same weight as fire safety regulations. A particularly critical issue raised was the lack of inclusive emergency evacuation protocols, which continue to overlook persons with mobility or sensory disabilities . Furthermore, the need for enhanced acoustic design in public buildings was noted, particularly for users with hearing disabilities or neurodivergent conditions. On the technological front, several innovative smart building tools were

suggested, including real-time navigation applications, tactile orientation maps, induction loop systems for the hearing-impaired, and mobile accessibility alerts.

Netherlands

The workshop in the Netherlands presented a rich and layered analysis of the barriers faced by people with disabilities and older adults. Stakeholders identified a wide array of physical and digital challenges, including heavy manual doors, misaligned or inaccessible entry points, lack of coordination between contractors and design teams, insufficient tactile cues, and inconsistent signage. While the role of technology was widely acknowledged—such as the use of automatic doors, smartphone-based indoor navigation, and real-time mobility assistance—participants cautioned that these solutions must not become the sole mode of access. To mitigate digital exclusion, they stressed the importance of offering alternative formats and ensuring human support remains available. A particularly noteworthy contribution was the discussion around Virtual User Models (VUMs) and their potential to simulate diverse user interactions with buildings during the design phase. In terms of social accessibility, emphasis was placed on inclusive communication strategies that reflect linguistic, cultural, and cognitive diversity, including for those with limited digital skills.

Figure 5: Physical Stakeholder's Engagement Workshop in Netherlands

Romania

In Romania, participants focused extensively on the systemic challenges that inhibit accessibility, particularly in smaller municipalities and rural areas. High retrofitting costs limited public awareness, and a fragmented regulatory landscape were cited as major obstacles. Physical barriers such as narrow corridors, steep or uneven ramps, and inaccessible toilets persist across both public and private buildings. Although the application of smart technologies—such as voice-controlled elevators or sensor-based lighting—was acknowledged as promising, stakeholders warned against over-reliance on digital solutions without physical redundancies. There was a strong recommendation to integrate accessibility checks into BIM (Building Information Modeling) workflows, allowing for early identification and resolution of design-related issues. Stakeholders further advocated for harmonized signage standards, state-supported financial incentives for accessibility improvements, and the introduction of legal enforcement mechanisms, including penalties for non-compliance.

5.4 Outcomes

Throughout the series of stakeholder workshops held across the participating countries, several persistent themes and priority areas were identified, reflecting a convergence of concerns, expectations, and recommendations from diverse stakeholder groups. These shared insights offer critical strategic guidance and form the foundational pillars for the development of a multidimensional Accessibility Certification Framework that is both adaptable to local contexts and aligned with broader European policy goals.

Multidimensional Accessibility

Accessibility must be defined in comprehensive terms, incorporating physical, sensory, digital, and cognitive dimensions. The traditional focus on mobility disabilities is insufficient and must expand to reflect the diverse needs of all user groups.

Smart and Assistive Technologies

While digital tools and smart systems can significantly enhance accessibility, they must be designed with inclusivity, simplicity, and redundancy in mind. Solutions must be user-tested and accompanied by non-digital alternatives to ensure equitable access.

Emergency Planning and Safety

All national consultations raised concerns regarding the exclusion of persons with disabilities from current emergency evacuation procedures. Future accessibility standards must incorporate inclusive risk planning and simulation-based training for both users and staff.

Policy Integration

There is a broad recognition that accessibility must be more deeply integrated into local, regional, and national policy frameworks. This includes legislative mandates, funding programs, urban design guidelines, and public procurement processes.

Cultural and Social Dimensions

Accessibility is not merely a technical challenge but also a social and cultural issue. Public education, inclusive communication strategies, and design processes that embrace cultural and linguistic diversity are essential to foster acceptance and awareness.

6 Conclusions

This deliverable has consolidated the results of an extensive program of research, modelling, and stakeholder engagement conducted within Work Package 3 (WP3) of the AccesS project. The findings collectively provide a strong, multi-dimensional foundation for the development of a unified and adaptable Accessibility Certification Framework for the built environment. Several key conclusions emerge from the synthesis of actions undertaken:

Comprehensive Review of Accessibility Standards and Regulations

The comparative analysis of national legislations, international standards, and existing certification systems revealed significant inconsistencies in how accessibility is defined, regulated, and assessed across Europe. While frameworks like EN 17210:2021 provide robust technical guidance, gaps remain—particularly regarding quantifiable evaluation, smart technology integration, and enforcement mechanisms. Sustainability certifications such as LEED, BREEAM, and WELL were found to incorporate accessibility only tangentially, often limiting it to compliance with minimum legal standards without addressing digital accessibility or inclusive smart technologies.

Development of a Quantitative Accessibility Assessment Model

A flexible, scalable, and modular numerical assessment model was developed to translate qualitative accessibility principles into measurable performance indicators. By structuring the model around Disability Types (DT), Assessment Dimensions (AD), and Evaluation Criteria (EC), and applying a weighted scoring system, the framework offers dynamic adaptability to different building types, user groups, and national contexts. The model bridges a critical gap by providing a method to objectively benchmark, compare, and monitor accessibility performance over time, supporting evidence-based design, policy evaluation, and certification efforts.

Integration of New European Bauhaus (NEB) Values

The alignment of the AccesS framework with the values of the New European Bauhaus (NEB)—sustainability, inclusion, and aesthetics—ensures that accessibility is understood not only as a technical requirement but as a societal value. By combining the philosophical lens of the NEB with the technical depth of EN 17210 and the quantitative rigour of the AccesS model, the project proposes a methodology that is both transformative and operational. This hybrid approach positions accessibility at the intersection of social equity, environmental responsibility, and cultural sustainability.

Critical Insights from Stakeholder Engagement

Stakeholder consultations across six countries consistently emphasized the need for an expanded definition of accessibility that encompasses physical, sensory, cognitive, and digital dimensions. Participants highlighted the importance of inclusive emergency planning, user-centered design of smart technologies, and the integration of accessibility requirements into broader urban and policy frameworks. Stakeholders also stressed the cultural and social dimensions of accessibility, calling for public education, inclusive communication strategies, and participatory design processes to foster a truly accessible society.

Strategic Priorities for Future Work

The outcomes of this deliverable highlight several strategic imperatives for the next phases of the AccesS project:

- **Operationalization and Validation:** Pilot testing of the assessment model in real-world contexts is essential to validate its structure, usability, and adaptability.

- **Digital Integration:** Future work should focus on embedding the scoring system into digital platforms, including Building Information Modelling (BIM), Digital Twins, and Smart Readiness Indicators (SRI).

- **Policy and Certification Synergies:** Further alignment with European policy initiatives, including Horizon Europe, NEB Lab projects, and public procurement standards, will enhance the uptake and impact of the certification framework.

- **Co-Creation and User Testing:** Continuous involvement of end-users, particularly persons with disabilities and older adults, is critical to refining and legitimizing the framework.

In conclusion, the work completed under WP3 lays the groundwork for a new generation of accessibility standards that are not only technically sound and verifiable but also socially meaningful, future-ready, and deeply aligned with Europe's commitment to building inclusive, sustainable, and resilient urban environments.

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ANNEX

A1. Cyprus Stakeholder's Workshop

Participants List

	Organization
1	Frederick Research Center (FRC) (2 personnel)
2	CYPRUS PARAPLEGICS ASSOCIATION (OPAK) (2 representatives
3	Cyprus Architects Association (SAK)
4	The Cyprus Organization for Standardization (CYS)
5	Pancyprian Organization of the Blind (POT)

Minutes

Summary of the Meeting
Dr Paris Fokaides (PF) from FRC welcomed the participants to the workshop and then briefly outlined the purpose of the meeting. The meeting was about gathering information from the stakeholders that are involved, regarding the development of a methodology concerning accessibility in buildings. This initiative is part of a European research program ''AccesS'', which studies the creation of better accessibility conditions for individuals with disabilities in buildings. Details regarding the program will be provided in the presentation.

AccesS Project:

The AccesS research program aims to develop a comprehensive accessibility assessment framework for buildings. Dr PF added that this program is being implemented considering the current advancements in the field of buildings, such as smart buildings and various methodologies for gathering information from buildings or the building equipment, and the goal is to utilize the knowledge, and the information obtained to improve accessibility for all building users.

Main Elements of the Program:

Accessibility Assessment: Developing a methodology to assess physical, social and digital accessibility in buildings.

Aspects related to smart buildings will be considered as well as the implementation of digital tools that will be used to evaluate the accessibility of buildings. Dr PF then reported general information about the project, such as the grant agreement of 5 million euros that was awarded by the European Commission, that it began in June 2024 and will be completed in May 2027. 22 partners from all over Europe are involved and Frederick University participates from Cyprus through its research center, while the program is coordinated by the National Center for Research and Technological Development of Greece, providing a wide geographical coverage.

The standardization organizations, ASRO from Romania participates, as the program includes standardization procedures with the aim of creating a Workshop Report. In addition, there are many partners from all over Europe who cover the needs of the program.

The purpose of the meeting is to discuss the aspects that must be considered for the involvement of the Stakeholders in the context of the development of an integrated framework for the assessment of accessibility and cooperation, in relation to the data that will be examined.

A study of existing standards, such as the EN17210 standard, has been carried out, for which a detailed analysis was made regarding its content and the description of the aspects to be considered in the design of buildings.

However, there is no rating system that ranks buildings based on their accessibility friendliness. Dr PF referred to a new European model, which was developed in the framework of the New European Bauhaus assessment. This new framework assesses various aspects of building sustainability, one of which is accessibility. Although there is an evaluation system, the criteria are quite limited and do not fully cover all interest groups.

Based on the above, the purpose of the program is to gather and combine all this information and knowledge in an integrated evaluation system. This system will be put under the support of the European Commission and will create the background for future implementation at a more formal level, that is, at the level of the member states.

First Question: What are the difficulties you face in implementing accessible solutions in buildings?

Pancyprian Organization of the Blind (POT) was the first to answer the question, stressing that we never talk about difficulties, but about accessible or inaccessible buildings. It was emphasized that accessibility cannot be delayed and must be implemented immediately so that all people can move safely and independently everywhere. It was stated that the criteria for accessibility are derived from the United Nations Convention on Persons with Disabilities, as well as the relevant standards. There are specialized standards, such as that for road guides, which are specifically aimed at people with impaired vision.

In addition, there is a standard for tactile depiction of the environment, both on pavements and in buildings. POT also noted that Cyprus has had such a standard since 1999. These criteria must be incorporated into every evaluation plan and expanded as possible to cover the 22 countries participating in the program.

Dr PF then addressed the same question to the Paraplegic Group of Cyprus (OPAK).

OPAK referred to the difficulties faced by people using wheelchairs, which mainly relate to access through openings or ramps. He also highlighted the need for adequate access to sanitation facilities, an issue of particular importance. In addition, he highlighted the issue of thermal comfort for people with different needs, noting that buildings often do not provide the required thermal comfort.

OPAK also expressed concerns, as the dimension of legislation and existing specifications seems to be ignored. It was emphasized that a building must first be assessed for compliance with the relevant legislation and to what extent it has been implemented, as well as whether the building had an obligation to comply

OPAK also noted that as long as a general question is being asked about difficulties in a building constructed after 1999 and having the relevant legislation applied, in theory there should be no difficulties. In this case, details regarding the accessibility upgrade should be considered, as the building is already accessible.

Therefore it was suggested clarifying whether the project's approach would focus on legislation and whether it had been implemented, or whether a general assessment of building accessibility would be made, regardless of legislation. The existence of international standards was also pointed out, such as ISO on accessibility and British Standards, which go a long way in ensuring an accessible environment for all. It was emphasized that if there is a basis for evaluating whether legislation has been implemented, this will allow the evaluation to start from a specific reference point. On the other hand, a general and vague assessment of accessibility will not be as effective. OPAK concluded by underlining the importance of having a clear baseline so that we know whether a building already

meets the basic specifications or whether the assessment needs to start from scratch, which is critical to the success of the project.

Dr PF replied that the purpose of today's meeting is to record opinions and experiences, underlining that there is already significant preparatory work regarding the recording of existing standards. Specifically, he stated that the application of standards has been recorded in 14 EU member states. and that the EN 17210 standard has been extensively studied. He also pointed to the existence of the Bauhaus assessment, which includes evaluation criteria, and explained that his team has already looked at various evaluation practices, such as those applied to the energy and intelligence of buildings.PF pointed out a gap in accessibility assessment, stressing that although there are mandatory standards for other sectors, there is no equivalent for the assessment of accessibility solutions. In particular, he said that while accessibility can be taken for granted due to legislation, there are different levels of accessibility, and the AccesS program aims to create an evaluation system that will examine accessibility solutions in terms of their functionality and efficiency. He explained that the focus is not only on whether legislation is followed, but also on how different methods can meet the same needs in different ways, which one is more functional for users, and how a building is evaluated based on the solutions it provides At the same time, he underlined the need to take into account the design of the buildings and the possibilities of integrating digital solutions.

Referring to OPAK's comments on thermal comfort, PF emphasized the importance of design that takes into account the differentiated needs of individuals, such as those related to different metabolism due to movement pattern. He clarified that the question concerned such aspects and not the assessment of compliance with the law. He also mentioned that the questions may have been simplified in the context of the workshop to facilitate the discussion with the stakeholders, while he stated that he fully understands the observations of OPAK.

Second Question: What characteristics of a building do you consider most important for assessing accessibility?

The representative from Cyprus Architects Association (SAK) mentioned in response that the key issues to be considered are access and transition to the building, which includes the route from the arrival point to the building entrance, ensuring safe identification and guidance to the entrance. He also highlighted the importance of thermal comfort and protection from weather conditions, with the path to the entrance being shielded from the elements using architectural solutions like shading. Additionally, differences in elevation should be addressed, with the consideration of ramps and the possibility for safe access without significant elevation changes. The design should also account for the challenges posed by older buildings, ensuring safe navigation despite potential elevation differences. Lastly, accessibility mechanisms, such as the presence of elevators and other devices to facilitate access, must be incorporated into the design.

OPAK emphasized the importance of applying the specifications of the relevant legislation as the fundamental starting point for ensuring a building's accessibility. However, it was pointed out that the details implemented by engineers on top of this foundation are crucial for making accessibility safer and more functional. Examples were given such as slippery materials on ramps with the correct slope, which can become dangerous when it rains, or the installation of metal sheets for traction, which complicates the use of wheelchairs. The variations in design were also pointed out, such as the presence of buttons for door opening in some buildings. Similar issues such as elevations, where the choice of materials and design is not always equally functional. Inside the building the need for clear and accessible signage was highlighted to guide users to restrooms, elevators, and accessible routes. He mentioned that having a map could be sufficient. In conclusion, it was emphasized that although buildings may be considered accessible, attention to detail and proper application of standards are critical for improving the daily experience of users.

POT mentioned that the first part of the question concerns the need for easy identification of buildings. It was emphasized that buildings should be **recognizable**, easy to spot and accessible, and for this reason, there are devices and mobile applications that can help in identification. These applications can guide a person by informing them of the exact location of the building, such as indicating that the building they are looking for is 100 meters away and slightly to the right. While such applications exist in other countries, they have not been funded in Cyprus, and despite efforts, the government has not invested in them. POT stated that such an application would improve the autonomy of people with disabilities, enabling them to know the exact location of the building and how to find it. The situation in Cyprus is not ideal, as the guides for blind people do not lead to the entrances of buildings as they should. Instead, they run parallel to the buildings and do not guide users to the entrance or other accessible areas, such as the elevator or service areas. It was also noted that the Department of Public Works claimed there are guides everywhere, which was refuted, stressing that studies should be conducted with the involvement of people with disabilities, as they are the ones who know their needs best. The existence of applications in other countries that provide strategic navigation inside buildings was also mentioned, for example, giving directions on how to reach a specific floor or office. These applications can store routes and share them with all users, facilitating access to their destination. However, POT stated that such solutions do not exist in Cyprus, and therefore, evaluating accessibility with these applications is not possible, highlighting the significant gaps in the country regarding accessibility and the lack of standards for such solutions.

Dr PF asked if accessibility for guide dogs is considered, and if there are buildings that are friendly to them.

The representative from POT responded that the guide dog is directed by the person accompanying it, and the building must be accessible without obstacles in the pathways. If there are obstacles, the dog will be confused and fail to perform the command properly. In other countries, movement with a guide dog is much easier and faster, providing greater independence for users.

It was asked if the attempt to evaluate each building for its accessibility is similar to energy assessments.

Dr PF responded that the purpose is to develop a system for evaluating buildings based on their accessibility, as long as they meet the minimum requirements. The program will apply various digital tools, such as those used for evaluating smart buildings, and the goal is to integrate and establish them for accessibility.

OPAK added that each building should be assessed separately for each type of disability, leading to an overall score. The need for assessing urban accessibility at the neighborhood and city level was emphasized, noting that Cyprus lags in this area.

Dr PF replied that the analysis of the AccesS program focuses on building-level and indoor accessibility.

The representative from Cyprus Organization for Standardization (CYS) added that engineers should design for all, meaning that the design of buildings should ensure that the built environment assists all individuals. CYS noted that the existing condition of a building should be evaluated, with the assumption that all buildings, regardless of type, must be accessible to everyone. The goal is for all people to be able to move autonomously within these buildings without limitations. The evaluation should be conducted, followed by upgrades, giving recognition to buildings that not only meet the minimum requirements but offer something extra. CYS also mentioned that technological upgrade solutions should be inclusive.

Dr PF responded that existing evaluation systems are insufficient, and for this specific project, digital solutions will be used for better results. These digital solutions will help improve accessibility assessments by providing more accurate and efficient tools for recording and evaluating buildings.

Eighth Question: What parameters should we consider ensuring that accessibility meets all social and cultural needs in different areas of Cyprus?

SAK mentioned the importance of diversity in the area, highlighting that for regions in the mountains, there are greater elevation differences and more uphill paths. SAK emphasized that accessibility in these areas is more challenging, and finding the path to the entrance of a building becomes more crucial. To ensure accessibility, the routes must take these topographical challenges into account.

CYS mentioned that designing for all is the key principle for using any standard, with reference to the national level in Cyprus, where a standard for nature trails is being developed. CYS emphasized that the design should ensure autonomous use by the user while also supporting the experience of the individual and their companions, so that the inclusion process becomes more accessible with the help of those who accompany the individual.

OPAK mentioned that elevation plays a significant role in design and accessibility. In areas near the sea, the terrain is easier to shape, while in mountainous areas, access becomes more complicated due to larger elevation differences. In such areas, mechanical solutions, such as elevators or other mechanisms, may be needed to facilitate access and ensure accessibility. Therefore, OPAK emphasizes that it is crucial to consider both the area and the morphology of the region being studied. The design and accessibility solutions should be adapted to the characteristics of the land and landscape to ensure the best possible access, considering local peculiarities and elevation differences.

SAK added that the building's use must also be considered, as it affects the design. Every building has different needs depending on its function, and the design of accessibility must be adapted to these needs. For example, a building that hosts public services or healthcare units will require different accessibility mechanisms compared to a residential or commercial building.

POT mentions that standards do not differentiate between town squares and streets, and different requirements may be needed for a town square. The needs are different for areas near the sea, in the city, or in mountainous regions, and these differences must be considered. POT also points out that the building alone cannot provide all the solutions for proper use and that applications play a significant role. Systems, such as sensors and other technological tools, are needed to meet the users' needs and should be integrated with the physical infrastructure.

CYS added that the Accessible Tourists Committee is focused on the specific needs of the tourism sector, particularly ISO 21902, which pertains to products and services related to accessible tourists. The tourism aspect could involve areas near the sea or in the mountains. PF stated that ISO 21902 would be considered during the evaluation and design process, incorporating the standard's requirements to ensure accessibility in the tourism sector.

OPAK mentioned that when someone visits a city as a tourist, they use maps without knowing the area. If the city has hills or inclines, even small ones, it can be difficult and dangerous for many people to navigate. Unfortunately, maps do not provide information about elevation, making it hard to know whether an area is flat or not.

Dr PF agreed and supported the idea that information about slopes is an important factor, and this observation was recorded.

Third Question: How can technology help improve accessibility without violating equality for all users?

SAK mentioned that, at a technological level, the design might include automation for doors or signage that can be perceived by people with visual disabilities . SAK also emphasized the importance of color contrast and questioned whether this could be integrated through technological solutions. Additionally, SAK pointed out the use of sounds to mark specific points or stops at certain locations within buildings. SAK then referred to modern systems, such as GIS-based recording for creating

Twin Models, which are primarily used for evacuation issues. These models can help identify safe routes in emergency situations. Furthermore, such solutions can be connected to mobile phone applications, although they are still in the experimental phase.

CYS mentioned that there are standards for the accessibility requirements of ICT (Information and Communication Technology) products and services, which guide the design and implementation of solutions that promote accessibility. Specifically, CYS emphasized the importance of designing smart buildings, which, through cutting-edge technologies, can facilitate access and support the needs of people with disabilities, enhancing their independent mobility and overall experience within the space.

Dr. PF mentioned the legislation concerning the evaluation of building intelligence, which is based on a European directive and relates to the Smart Readiness Indicator (SRI). He noted the collaboration with the Energy Office of Cyprus for drafting the Cypriot legislation on the matter. However, he pointed out that accessibility issues are not considered within this indicator, as the intelligence of buildings is mainly assessed based on automation and control systems related to energy efficiency and other aspects. Dr. PF emphasized that this is a significant gap, which is being discussed at the European level. He proposed incorporating accessibility as an additional service within the smart readiness indicator, so that a building's smartness rating would also include automation and control systems that promote accessibility, beyond merely meeting the minimum requirements of the building envelope.

OPAK emphasized the importance of digital modeling of buildings as a tool that can assist individuals with mobility or sensory disabilities. Digital modeling provides these users with the ability to navigate a building more quickly and safely. Additionally, OPAK pointed out that digital modeling should be considered a standard feature for all "smart" buildings, as it offers users information both before and after they reach the location. OPAK also highlighted the significance of lighting automation, such as automatic lighting on and off without the need for switches, especially in areas like corridors or restrooms. These automation systems, along with automatic door mechanisms, greatly enhance a building's intelligence. He noted that even in spaces like hospitals, where large fire-resistant doors exist, the lack of such automation can hinder access, particularly for individuals with limited mobility.

POT added the following important points regarding accessibility in buildings:

Easy access to doors: Doors should be designed to open easily, without requiring significant effort from the user.

Braille: The use of Braille should be promoted at the national level, as there are currently no appropriate devices for writing on various surfaces.

Tactile maps: Large buildings should have tactile maps at entrances that include:

The size of the building.

The pathways.

The stairs.

The location of important areas.

Guidance systems: Guidance systems should be present at both building entrances and elevator entrances.

Issues at airports:

OPAK noted that airports face problems with guidance systems, which peel off due to temperature changes.

OPAK emphasized that airports should apply different standards to serve users, considering their special conditions.

POT's contribution underscores the need for specific and targeted interventions in infrastructure and technologies that facilitate accessibility and inclusion.

OPAK raised important issues regarding accessibility at airports. The representative pointed out that the arrivals ramp at some airports presents problems due to its varying slope, making it difficult for individuals with reduced mobility to pass through. Additionally, the jet bridge, which connects the airplane to the terminal, is often steep, making it difficult for individuals with mobility disabilities or other special needs to use it, which is attributed to poor design. OPAK emphasized the need for airports to be an immediate and high priority, as they are critical points for the movement and experience of travelers. Furthermore, a significant question was raised about whether an accessibility measure could potentially create inequalities. This concerns the possibility of accommodating different needs in the design without creating new inequalities or sidelining other user groups. His position underscores the importance of a holistic and balanced approach to infrastructure design.

POT mentioned that universal design and design for all do not exclude the implementation of specific standards to cater to users with special needs. It was emphasized that architects must design shared spaces in a way that ensures equal usage by everyone. POT referred to the ISO 17210 standard, which provides guidelines for the design and management of shared spaces to ensure they are accessible and functional for all users, regardless of their needs or abilities.

CYS mentioned that the standardization organization supports workshops that promote innovation and expressed its intention to support them. CYS emphasized the importance of collaboration for the development of standards, adding that the organization is available for synergies in European committees. It was highlighted that a research effort that results in a standard is extremely important. Additionally, the need to provide incentives for upgrading infrastructure was mentioned, stressing the importance of strengthening organizations that seek improvements in accessibility issues.

Dr. PF thanked all the participants in the workshop and assured them that their opinions would be recorded and considered. He explained that the ongoing research focuses on digital tools and categorization, with an emphasis on research and development. He mentioned that assessment systems are important for design, as well as for linking accessibility to mathematical models that define the ranking of buildings, which helps meet minimum requirements and enhances competition among buildings. Finally, he promised to keep the participants informed about developments regarding the progress of the research.

A2. The Netherlands Stakeholder's Workshop

The Stakeholders' engagement workshop in The Netherlands was organised by DMO and BHA on the 17th of February 2025. The event took place at DMO's office in Delft from 15:00 to 17:00.

Before the workshop

First the list of stakeholders was prepared, making sure that four clusters are covered:

- Social and Community Support
- Professional and Technical Experts
- Academic and Research
- Business, Media, and Sustainability

An invitation letter was sent to 12 people on the 22nd and 23rd of January.

Then the agenda was drafted, including the questions for the participants to discuss during the workshop. The questions were divided into two groups:
1. Technical-Focused Questions

   a. What are the most common challenges you face in implementing accessible solutions in buildings?
   b. How do "smart" or tech-enabled features (e.g., sensors, automated doors) intersect with accessibility?
   c. In what ways could technologies like Virtual User Models (VUMs) help assess and improve building accessibility?
   d. How can technology help improve accessibility, without violating equality for all users and neglect physical accessibility?

2. User-Experience-Focused Questions

   e. 5.   From your perspective, what are the biggest barriers people with disabilities or older adults encounter when using buildings day-to-day?
   f. 6.   How can technology (e.g., mobile apps, digital signage) enhance user experience and accessibility without excluding certain groups?
   g. 7.   Which solutions do you find most helpful for people with disabilities or the elderly in terms of comfort, safety, and ease of navigation?
   h. 8.   What parameters should we consider to ensure that accessibility also covers social and cultural needs?

The agenda was as follows:

   a. Ice breaker
   b. Introduction of companies
   c. Introduction of the project
   d. Keynote speech
   e. Questions
   f. Discussion
   g. Closing remarks

The keynote speaker was from the Droom Je Thuis foundation, the demonstration case of the project.

Preparing the material for the workshop included creating and printing the brochures for the participants and printing the questions on large papers for the breakout sessions. The printing was done by Ipse de Bruggen, which is a disabled care organisation.
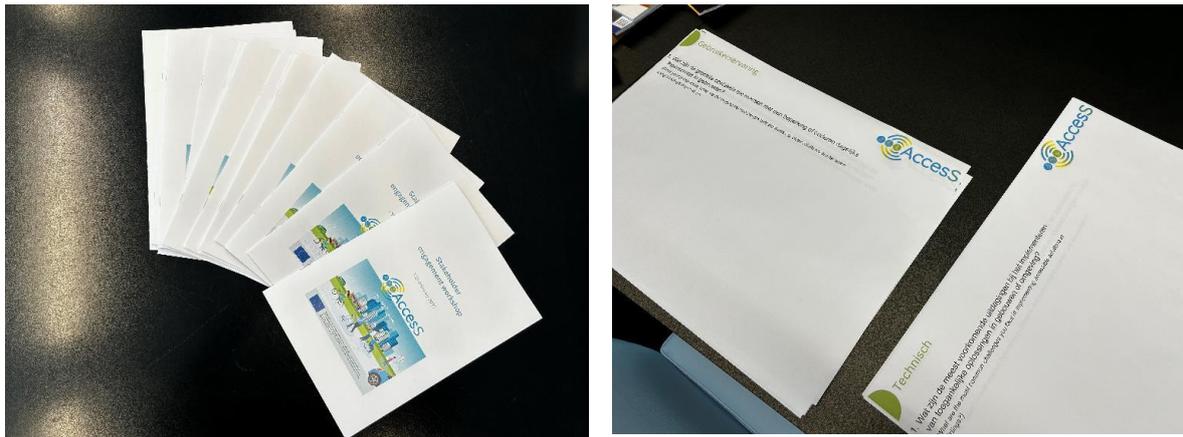
Figure 6. Printed material used during the workshop

During the workshop

There were 9 participants at the workshop and 5 personnel from DMO and BHA.

No	Organization
1	DEMO Consultants B.V. (DMO) (4 personnel)
2	KOW Aechitecten (KOW)
3	Techniek Nederland (TN)
4	Gemeente Utrecht (GU)
5	Gemeente Delft (GD) (3 representatives)
6	Droom Je Thuis Foundation (DJT)
7	CROW
8	TU Delft (TU)
9	Bruco Huisvesting adviseurs B.V. (BHA)

The workshop started with an icebreaking session where everyone introduced themselves. Then we continued with the introduction of both hosting companies, DEMO Consultants and Bruco Huisvesting adviseurs and a short presentation of the project.

The keynote speaker presented the Droom Je Thuis and its history. The kids with disabilities that live there were presented and the team behind it which makes sure everything is taken care of.

Next, two groups were formed for the breakout session and each group answered both sets of questions, using 20 min for each set. The participants used post-it papers and markers to wrote down their answers.

Once the questions were answered, we had a fruitful discussion about it.

Discussion outcomes

During the workshop, experts and experienced professionals responded to questions about building accessibility and the user experience of people with disabilities or older adults. Below is a summary of the key insights, linked to the discussed questions.

What are the most common challenges you face in implementing accessible solutions in buildings?
- People with disabilities or older adults frequently encounter obstacles in buildings, such as doors that cannot be opened independently or unclear entrances (also referred to as 'brick walls').
- A door that can be opened independently is far more accessible than one requiring assistance.
- Access points must be clearly marked, especially for people with visual disabilities .
- Facilities: buttons placed too high, elevators that are often too narrow, reception desks that are too high, fire alarm systems that do not always meet the needs of people with auditory or visual disabilities .
- Digital tools are not always understood or usable by everyone, leading to exclusion.
- Multiple parties are often involved in development and implementation, leading to inconsistencies and lack of coordination. A single clear design vision is essential. For example, an accessible toilet sometimes has a toilet paper holder in an inconvenient location.
- Parking information is often incomplete or difficult to find, creating a barrier for people who want to plan their journey in advance.
- Signage or queue numbers that are only visually presented and not announced via audio.
- Inconsistencies in public transport systems and recognizable designs, such as differences in gates, check-in methods, and signage across stations, cause confusion.
- Privacy regulations in healthcare sometimes limit technological solutions, such as automatic doors.
- Users experience uncertainty about the reliability of digital information, especially in public transport.

How do "smart" or tech-enabled features (e.g., sensors, automated doors) intersect with accessibility?
- Automatic doors improve accessibility, provided they are reliable and well-placed.
- Digital tools such as navigation apps can be useful, but they must be simple, accessible to all, and functional. Young people are often overestimated in their digital skills, so less is more.
- A single, integrated, and reliable app with travel information for public transport. Currently, a longer journey involving buses and trains may require up to five different apps to organize the trip.
- Privacy regulations in healthcare restrict some technological solutions, such as automatic doors.
- Various systems often do not work together, reducing accessibility.
- Warning signs should be placed so that everyone can see them.
- Technology should be supportive and not create barriers. People should not be dependent on a single digital solution.
- Human assistance remains essential as a complement to technology.

In what ways could technologies like Virtual User Models (VUMs) help assess and improve building accessibility?
- VUMs can provide early insight into design issues, allowing them to be addressed in the early stages.
- They can simulate how different users navigate space, contributing to better planning.
- Designers can use VUMs to test whether a space is practical and accessible before it is built.

How can technology help improve accessibility, without violating equality for all users and neglect physical accessibility?

- Multiple options must always be provided to prevent exclusion (e.g., in addition to a digital solution, also a physical or human alternative).
- An app can be useful, but it should not be the only way to access information.
- Signage should be available in both visual and auditory formats.
- Digital solutions must be intuitive and should not create additional barriers for users with lower digital literacy.
- Alternatives to digital tools are essential so that not everyone is reliant on technology.

From your perspective, what are the biggest barriers people with disabilities or older adults encounter when using buildings day-to-day?
- Doors that are difficult to open or unclear entrances.
- Lack of information on accessibility, such as parking spaces or elevator locations.
- Poor placement of facilities such as buttons, counters, or warning signals.
- Public transport information is fragmented across multiple apps, leading to confusion and uncertainty.
- Lack of recognizable structures in public transport, such as differences in gates and check-in methods at stations.

How can technology (e.g., mobile apps, digital signage) enhance user experience and accessibility without excluding certain groups?
- Apps must be easy to use and cater to different user needs.
- Information should be reliable and up-to-date, especially in public transport.
- Signage should be available in multiple formats, such as audio signals and braille.
- Human assistance remains important as a supplement to digital systems.

Which solutions do you find most helpful for people with disabilities or the elderly in terms of comfort, safety, and ease of navigation?
- Clear and simple access to buildings without extra steps.
- Reliable public transport information that is not solely digital.
- Consistent layouts of, for example, public transport gates, so users are not caught off guard.
- Human support remains important, such as hosts or stewards at stations.
- Alternatives to digital tools, so that not everyone is dependent on technology.

What parameters should we consider to ensure that accessibility also covers social and cultural needs?
- Raising awareness through education and training to make accessibility a natural aspect of design.
- Encouraging interaction between different groups to break down barriers.
- A broad, inclusive approach in design and policy, involving people with firsthand experience.
- Accessibility should not only be physical but should also take language, culture, and digital skills into account.

Conclusion

The workshop highlighted many valuable insights regarding the challenges and opportunities in accessibility. The importance of clear and consistent facilities, reliable information, and an integrated approach was emphasized. Additionally, it was stressed that technology should be supportive but not the only solution. People with first-hand experience play a crucial role in developing effective and practical solutions.

Through collaboration, policy adjustments, and innovative technology, accessibility can be significantly improved, allowing more people to navigate buildings and public transport independently and with confidence.

A3. Greece Stakeholder's Workshop

List of Participants

No	Organization
1	Intelligent Solutions for Zero and Positive Energy Buildings (IsZEB) –(3 personnel)
2	Aristotle University of Thessaloniki – Department of Mechanical Engineering (AUTH)
3	Technical Chamber of Greece (TEE)
4	Association of Persons with Disabilities – Thessaloniki
5	Open Care Centres for the Elderly (KAPI) – Municipality of Kalamaria
6	Building Permit Issuance Department, Urban Planning Directorate, Municipality of Preveza (MP)

Minutes

Summary of the Meeting
Today's workshop is held in the framework of the AccesS research project. Afroditi Zamanidou (AZ) from IsZEB which is partner in the AccesS project, opened the session by welcoming the participants and giving a brief presentation of the project.   **The AccesS research project** aims to develop an integrated accessibility assessment framework for buildings. The project is implemented with consideration of recent developments in the building sector, such as smart buildings and various methodologies for collecting information from buildings and their equipment. The goal is to utilize the acquired knowledge and data to improve accessibility for all building users.   **Key Elements of the Project:**   • **Accessibility Assessment:** Development of a methodology to assess physical, social, and digital accessibility in buildings. The project will consider aspects related to smart buildings and will develop digital tools that will support the accessibility assessment process.   The project is funded with **€5 million** by the **European Commission**, started in **June 2024**, and will run until **May 2027**. It involves **22 partners** from across Europe and is coordinated by the **Centre for Research and Technology Hellas (CERTH)** in Greece, ensuring broad geographical coverage.   From the standardization sector, **ASRO** from Romania participates, as the project includes standardization processes aiming to produce a CEN Workshop Agreement (CWA).   The purpose of this stakeholder workshop is to discuss key aspects that should be considered for engaging relevant stakeholders in the development of the accessibility assessment framework and to explore cooperation in relation to the data to be examined.   A study of existing standards has already been conducted, including an in-depth analysis of **standard EN 17210**, which outlines relevant design considerations for accessible and usable built environments.   However, there is currently **no established system** for **rating buildings** based on their level of accessibility or user-friendliness. The **New European Bauhaus** initiative (https://new-european-bauhaus.europa.eu/index_en) includes accessibility as one of the dimensions of sustainability

assessments, but the criteria are still quite limited and do not fully cover the needs of all stakeholder groups.

Based on the above, the goal of the project is to consolidate this knowledge and information into a **comprehensive assessment system**. This system will be developed under the auspices of the **European Commission** and aims to provide a foundation for future implementation at a more official level, such as **EU Member States**.

The objective of the workshop is to collect answers from representatives of different stakeholder groups to the following guiding questions:

1. What are the main difficulties you face in implementing accessible solutions in buildings?

The representative from AUTH pointed out that a major difficulty lies in the lack of funding, the heterogeneity of the existing building stock, and the excessive bureaucracy, especially when dealing with public buildings. It was noted that even when there is political will or relevant provisions, delays and administrative obstacles discourage the effective implementation of interventions. The lack of practical guidance for implementing accessibility solutions by both designers and implementing bodies was emphasized.

The representative from the Building Permit Issuance Department, Urban Planning Directorate, Municipality of Preveza (MP) highlighted that the legislation requires the integration of accessibility features in new building permits; however, significant barriers arise during implementation. These are mainly related to the lack of resources and the complexity of retrofitting older buildings to meet modern standards. MP also mentioned that urban planning services lack sufficient technical support and training to effectively guide private individuals or engineers seeking related information.

The Elected Member of the Central Committee of Technical Chamber of Greece (TEE) acknowledged that there are major technical challenges in adopting accessibility solutions, especially in listed or older buildings, where interventions require special approvals — resulting in high costs and time-consuming procedures. TEE also noted the absence of an available catalogue of standardized solutions, and that property owners or even professionals in the field often lack the necessary information or motivation to implement accessibility measures.

Christina Mykoniou (CM) from IsZEB noted that the high cost of necessary interventions and the complexity of existing infrastructures make it particularly difficult to incorporate accessibility solutions. She also referred to the lack of specialization among technicians and professionals involved, which often leads to ineffective or unsafe implementation of innovative technological measures. Additionally, she highlighted the need for guidance tools and practical examples that could support professionals in designing and implementing appropriate solutions.

2. How are "smart" or technologically supported features (e.g. sensors, automatic doors) related to accessibility?

AUTH emphasized that smart technologies can significantly enhance the experience of users with disabilities, as they enable autonomous navigation and reduce physical barriers. However, the lack of universal design principles and standardization limits the functionality of these solutions was noted.

MP highlighted that the integration of technological features, such as sensors and automatic doors, greatly facilitates accessibility. However, MP pointed out that technical training is needed for designers and supervising engineers to ensure these solutions are properly incorporated into both design and construction.

The representative from TEE stated that technological solutions are especially useful when applied in public buildings with high visitor numbers. However the need for regulatory frameworks to ensure their reliability and maintenance was stressed.

CM explained that these technologies not only facilitate movement and access but also enhance users' sense of safety. She emphasized the importance of compatibility with existing infrastructure and interoperability between different systems.

3. In what ways could technologies such as Virtual User Models (VUMs) support the assessment and improvement of building accessibility?

AZ noted that VUMs offer a valuable simulation-based approach to replicating user experiences. Through these models, exclusion points can be identified, allowing solutions to be integrated as early as the design phase—before construction begins.

CM explained that the use of VUMs enables the evaluation of different accessibility scenarios based on the specific characteristics of users. This enhances the effectiveness of interventions and improves the precision of accessibility planning.

The representative from TEE highlighted that VUMs can serve as tools that support transparency and documentation in urban planning and infrastructure projects, offering objective data to guide decisions based on user needs.

The representative from MP mentioned that VUMs could act as supportive tools for engineers developing studies, helping them better understand users' actual needs and enabling more appropriate design of accessibility interventions.

AUTH pointed out that VUMs make it possible to run scientifically informed simulations and evaluate accessibility with greater reliability before any physical implementation of solutions.

4. How can technology improve accessibility without compromising equality for all users or neglecting physical accessibility?

AZ emphasized that technology should function as a supportive tool and not as a replacement for physical accessibility measures. Its implementation must not require digital skills from the user, in order to preserve equality.

CM pointed out that it is crucial to ensure that technology is integrated as a complement to infrastructure and not as the sole means of access. The design must consider the needs of all users, regardless of age or technological familiarity.

The representative from the Association of Persons with Disabilities – Thessaloniki stressed that while technology can enhance autonomy, it should never substitute physical accessibility. For instance, a touch button or an app should not be the only way to enter a building.

The representative from the Open Care Centres for the Elderly (KAPI) – Municipality of Kalamaria noted that technological solutions should be easy to use and must not require prior knowledge or special training, in order to be truly accessible to everyone.

MP mentioned that in public buildings, technology must be combined with physical accessibility standards, as not all users can utilize advanced solutions—due either to age or other limitations.

AUTH explained that technology can offer flexibility and personalization, but only if it aligns with the core principles of universal design. It must serve as a complement, not a substitute, for physical access.

5. From your perspective, what are the main barriers faced by people with disabilities or elderly individuals in using buildings in their daily lives?

The representative from the Association of Persons with Disabilities – Thessaloniki emphasized that the biggest obstacle remains society's mindset, which does not prioritize accessibility. A lack of awareness leads to indifference, both from citizens and the responsible authorities.

The representative from KAPI pointed out that a significant barrier is the insufficient understanding of the needs of elderly individuals. Infrastructure is often designed without considering real mobility, vision, or hearing challenges.

Zoi Boutopoulou (ZB) from IsZEB added that the lack of collaboration between involved stakeholders is a major hindrance to the holistic implementation of solutions. The absence of networking and sharing best practices limits the sector's capacity for improvement.

AZ stressed the need for systematic training of professionals so that they develop the necessary skills and sensitivity to incorporate accessibility solutions from the early design stages.

6. How can technology (e.g., mobile apps, digital signage) improve user experience and accessibility without excluding specific groups?

AZ stated that technology can offer enhanced information and guidance to users, as long as multi-channel access to information is ensured (e.g., audio, visual, tactile), so that individuals with different needs are not excluded.

CM pointed out that digital signage can be customized to meet individual user needs through parameter settings. However, successful integration requires participatory design to avoid excluding users who do not use smart devices.

The representative from the Association of Persons with Disabilities – Thessaloniki noted that applications must be easy to use and available in multiple languages or formats (e.g., visual and auditory information) to support a wide range of users.

The representative from KAPI emphasized that technology can greatly contribute to user guidance and information, provided it is combined with physical information points for individuals without access to mobile applications.

MP stressed that in public buildings, digital solutions should complement traditional signage methods and not be the sole source of information, in order to ensure equality.

AUTH highlighted that technological solutions must be designed according to universal design principles and include testing with real users to ensure accessibility without exclusion.

7. Which solutions do you consider most useful for persons with disabilities or the elderly in terms of comfort, safety, and ease of movement?

The representative from the Association of Persons with Disabilities – Thessaloniki stated that automatic doors, ramps, elevators with voice guidance, and buttons with tactile indicators are essential for the independence of people with disabilities and their safe navigation through spaces.

The representative from KAPI emphasized the importance of ergonomic waiting seats, non-slip flooring, and well-lit corridors, especially for elderly individuals with mobility or vision issues.

CM highlighted the value of sensors that automatically activate lighting or doors, as they reduce the need for manual interaction, which is particularly helpful for users with mobility limitations.

MP pointed out that public spaces should be equipped with stable solutions such as elevators, handrails, clear signage, and soft lighting to address diverse needs in a holistic and sustainable way.

AUTH underlined that every solution should be based on universal design principles, so it serves all users without requiring adjustments or personalization, while enhancing everyday functionality and safety.

8. What parameters should be taken into account so that accessibility covers both social and cultural needs?

The representative from the Association of Persons with Disabilities – Thessaloniki emphasized that cultural diversity is critical, as different communities have different needs and ways of interacting with space. Solutions should be understandable, non-stigmatizing, and promote social inclusion.

The representative from KAPI pointed out that elderly people, especially women from rural areas, are often unfamiliar with technology. The importance of social experiences and cultural background must be recognized for the acceptance of technological solutions.

Christina Mykoniou argued that cultural sensitivity must be incorporated into design through the use of universal symbols, multilingual signage, and participation of local communities.

MP stated that public buildings should take into account the different cultural expressions of citizens and promote practices that enhance social cohesion and non-discrimination.

AUTH highlighted the importance of a holistic approach to accessibility, which is not limited only to physical needs but also includes cultural and social parameters.

MB: Maria Basdekopoulou stressed that cultural diversity must be taken into account, as individuals from different backgrounds may have varied needs and ways of interacting with the built environment. Additionally, social inclusion should be strengthened through solutions that are understandable and non-stigmatizing.

The representative from the Association of Persons with Disabilities – Thessaloniki emphasized that many elderly women, especially from rural areas, struggle to understand and adapt to technological systems. Social experience must be considered, and solutions should be developed that respect cultural contexts and literacy levels.

Christina Mykoniou suggested that elements of cultural sensitivity should be incorporated into design, such as multilingual signage, the use of universal symbols, and the involvement of communities themselves in shaping accessible solutions.

MP pointed out that public buildings should respond to different cultural expressions and incorporate practices that enhance social cohesion, without discrimination or exclusion.

AUTH stated that universal design must take into account not only physical but also cultural and social parameters of users, in order to ensure real and holistic accessibility.

Concluding the discussion, the need for a holistic and inclusive approach to accessibility design was clearly highlighted—one that combines technology with respect for users' social and cultural differences. Participants emphasized that, although technology can serve as a driver for improving accessibility—through tools such as Virtual User Models (VUMs), sensors, or mobile applications—it must be developed in a way that does not create new forms of exclusion. A critical factor is the involvement of end-users in the design of solutions, the preservation of physical accessibility, and sensitivity to the needs of older adults and persons with disabilities. The workshop confirmed that accessibility is not only a technical issue, but also a social and cultural right.

A4. Spain Stakeholder's Workshop

List of Participants

No	Organization
1	FAMDIF, federación de asociaciones murcianas de personas con discapacidad
2	CERMI, Comité Español de Representantes de Personas con Discapacidad
3	ASTRADE, Asociación de familias de personas con trastorno del espectro autista,
4	FASEN, Federación de Asociaciones de familias con Discapacidad Auditiva
5	FUNDOWN, Fundación Sindrome de Down de la Región de Murcia.
6	Ayuntamiento de Murcia
7	Ayuntamiento de Yecla
8	CETEM, Centro tecnológico del Mueble y la Madera
9	COAMU, Colegio de Arquitectos de la Región de Murcia
10	MIWenergia

Minutes

Summary of the Meeting
The councillor in charge of the European projects area from the Municipality f Murcia , Mercedes Bernabé, thanks all attendees for their presence and presents the AccesS project. She highlights the importance of this project for the Municipality of Murcia, accessibility, and the Verónicas Market, the demonstration site in Murcia. It gives way to the participating associations and groups, who present themselves through their representatives, and express their interests and objectives by participating in this accessibility table that will support the AccesS project.
The person responsible for the project from the City Council, Cristina Marchante, presents the session, its structure, contents and objectives. Start with questions
First Topic: What are the main aspects that define an accessible building, and how can we realistically evaluate its accessibility?
(Architects Professional Association - COAMU): The focus is primarily on physical accessibility, with less emphasis on sensory and cognitive accessibility. They define a building as accessible when it can be used autonomously by any person, regardless of their conditions. Accessibility is also self-sufficiency and autonomy, not just access. There are various types of accessibility, such as ostomy accessibility, which is often not considered in building design. In 2021, the Spanish Senate unanimously approved a motion urging the creation of public bathrooms adapted for ostomates to facilitate their right to mobility.
(Yecla City Council): Key aspects defining accessibility include automated access (automatic doors, accessible navigation systems, digital assistance), virtual tours before visiting the building, and assessments to adapt the building for a diverse range of users and conditions. Collaboration between public administration and associations of individuals with disabilities is essential.
(FAMDIF - Federation of Associations for People with Disabilities): Accessibility should cater to the entire society, not just physical disabilities but also cognitive ones. Universal accessibility focuses

mainly on physical, cognitive or visual disabilities, but there are often other pathologies that go hand in hand. Many disabilities are interconnected, affecting the same individuals, so it is not sufficient to address only some aspects of disability. Accessibility must be considered for the general population, including pregnant women, the elderly, etc. Specific measures for buildings include adapted public transport stops, adapted and accessible pedestrian route, parking for physically disabled individuals, adapted pathways, accessible restrooms, appropriate furniture arrangement, and universal design principles for furniture.

(Plena Inclusión - Association for People with Cognitive Disabilities): Digital solutions can greatly contribute to accessibility, but some individuals need more support as they struggle to access the digital world, leading to a digital divide. Accessible signage and information should consider factors such as color, size, and location.

Second Topic: What are the main barriers (regulatory, financial, user acceptance, awareness, technical or execution limitations, etc.) to making a building accessible?

(Murcia City Council - Technical Architecture Office): Accessibility means that the building can be accessed and used safely, independently and without discrimination. There is a clear distinction between the barriers in new buildings versus existing ones. The biggest challenges are in existing buildings due to physical and technical difficulties in implementing accessibility measures and the failure to include accessibility in the budget. For buildings with historical or artistic protection, technical difficulties and costs are higher. In private buildings such as residential properties, a major barrier is the lack of awareness among property owners regarding the accessibility of common areas.

(Plena Inclusión - Association for People with Cognitive Disabilities): The first barrier is the lack of awareness of existing barriers, especially for cognitive disabilities. It is easier for non-disabled individuals to identify physical barriers than intellectual ones. For example, surveys sent to user association representatives are often difficult to understand. Another significant barrier is the absence of clear regulations and technical standards addressing cognitive accessibility in the built environment.

(FAMDIF - Federation of Associations for People with Disabilities): There is no valid justification for a building not being accessible. Budget constraints should not be an excuse, as most accessibility measures represent a small percentage of a building's total cost if planned from the beginning. Accessibility should be treated as a fundamental requirement, just like fire protection.. Within regulations, we must ensure that accessibility is considered in fire safety regulations.

(COAMU): Accessibility depends on the sensitivity of those in charge, which is a barrier in itself. Advocacy groups are always ahead of society, regulations and decision-makers. The demands of these groups and society should receive faster responses from public administrations. Moving forward is also a matter of awareness and sensitivity

(ASTRADE - Association of Families of People with Autism Spectrum Disorders): When organizing events in buildings, accessibility for individuals such as autistic people is often overlooked. Considerations like non-aggressive acoustics and quiet rooms should be part of the building's design. Accessible signage can sometimes be difficult to understand for autistic individuals, so flexibility is essential.

(FASEN - Federation of Deaf People): The lack of training, awareness, and knowledge among staff working in public buildings is a significant barrier. Employees need to be prepared to interact with customers and users with disabilities, including deaf individuals. For people with hearing aids or cochlear implants, it is important to plan for the use and installation of induction loop systems in buildings.

Third Topic: How can technology improve accessibility and comfort for users of public buildings?

(FUNDOWN - Federation for People with Down Syndrome): Technology can help if the digital divide is first eliminated or reduced. Any design should start with common sense. The participation of people with disabilities in the design process is essential.

(CERMI): New technologies are crucial, with Navilens as an example. CERMI has worked on projects enabling people with disabilities to shop without barriers in local stores, not just large supermarkets or online platforms. Technologies should facilitate locating and understanding product features, finding and monitoring parking spaces in city centers, and improving accessibility in public spaces like beaches, not just retail stores.

Other Important Aspects for Improving Accessibility in Public Buildings.

(FASEN) Acoustics from design: Acoustics are critical, not only for individuals with hearing disabilities but also for autistic individuals and those with other cognitive disabilities. Issues like reverberation cause significant difficulties.

(CERMI) Accesibility in emergencies. Emergency evacuation procedures must consider individuals with various disabilities, such as in cases of fires in public buildings.

(FASEN) Online Accesibility. Website accessibility is an essential part of a building's overall accessibility.

(CERMI) Micromobility. Micromobility is currently not taking accessibility into account. Bicycle and scooter lanes are not only not an advantage in terms of accessibility for people with reduced mobility or other disabilities, but also pose a danger due to the high speed of vehicles that do not adequately signal their presence. Another challenge identified is kerb management. Occupation by loading and unloading vehicles is not adequate, making it very difficult for people with reduced mobility to use the pavement in some cases.

(CERMI) Active Mobility: The narrowness of the pavements, together with the existence of height differences, are the main obstacle. A difference in height of just 4 centimetres in the form of a step is an insurmountable barrier for many people.

(COAMU) Air Quality: Odours and air cleanliness. In the area around the market, waste management is very inadequate, the containers generate a number of odours that deter or sometimes prevent the use of the pavement on one side of the building, where the containers are located.

(FASEN) Magnetic Induction Consideration of magnetic induction loops and their installation in noisy places, such as the market place, makes them easier to use for people using assistive listening technologies such as hearing aids.

(CERMI) Furniture Arrangement. Ensuring that a wheelchair can approach a counter, for example, is an issue of furniture barriers that should be avoided from the design stage.

(Plena Inclusión) Accesible Signage for all disabilities. As good practices, accessible directories, accessible floor plans, and reinforcing signage with light and color are recommended. As an example of best practices to replicate in the Verónicas building, it is mentioned that shopping malls have rest areas such as sofas and children's zones. It is also noted that noise in a market is very high, which creates barriers for people with intellectual disabilities, deaf and hard-of-hearing people , low vision, or blindness, as they rely more on auditory information. Acoustics should be taken into account.

(CERMI) Good Practices: The renovation of the Saavedra Fajardo Market is mentioned as a model of good practice.

(FAMDIF) Safe spaces in emergencies: The expansion of safe spaces to buildings that are not as large as those currently included in regulations should be considered. It is important to create safe rescue spaces for people with disabilities in other types of buildings beyond those covered by current regulations.

(COAMU) Work conditions: It highlights the need to consider that public buildings, in addition to being spaces for visitors, are also workplaces. In some cases, the same accessibility barriers that affect users also create problems for workers, whether they have a recognized disability or not.

(FASEN) Private initiatives benchmarking. Large commercial spaces are ahead of public spaces in terms of accessibility. El Corte Inglés, a major department store chain present throughout Spain, recently implemented a system that exists in many other customer service locations for people with hearing disabilities. This system is software that recognizes Spanish sign language and transcribes it into text, and vice versa, capturing the meaning of written information and translating it into Spanish sign language through an avatar. The selection of materials is also highlighted as highly relevant in creating an acoustically friendly or accessible space. For example, in hospitality, metal trays should be replaced with plastic ones, and in general, materials that produce loud noises upon impact should be avoided.

A5. Romanian Stakeholder's Workshop

List of Participants

No	Organization
1	ASCHF-R Filiala Prahova- Association for the Support of Physically Handicapped Children - Romania - Prahova Branch
2	Asociatia INFOCons
3	Asociatia ROHA
4	asociatia DogAssist
5	Architect Order in Romania
6	Formare ANICP
7	Asociatia de Sprijin a Copiilor si Tinerilor cu Dizabilități FIzice Tulcea
8	Asociația Calea spre Acces
9	Help Autism
10	Președinta CNDR
11	ELMAS SRL
12	STRABAG SRL
13	BRIKSTON CONSTRUCTION SOLUTIONS SA
14	ALLBIM NET SRL
15	A.C.D.I.T.C. BIMTECH
16	NOVART ENGINEERING SRL
17	ALLBIM NET SRL
18	CELCO S.A.
19	ALLBIM NET SRL
20	BIMTech
21	A.C.D.I.T.C. BIMTECH
22	IP Oficiul Amenajarea Teritoriului, Urbanism, Construcții și Locuințe, Chișinău,
23	Centrul Zonal ASRO Iasi
24	Departamentul pentru Dezvoltare Durabilă
25	Directia Asistență Socială Zalău
26	Institutul Naţional de Cercetare-Dezvoltare în Construcţii, Urbanism şi Dezvoltare Teritorială Durabilă - URBAN INCERC
27	Direcția Generală de Asistență Socială a Municipiului București
28	Compania Națională pentru Controlul Cazanelor, Instalaţiilor de Ridicat și Recipientelor sub Presiune S.A.
29	Direcția de Asistență Socială Slatina

30	Muzeul Antipa
31	Vulcan City Hall
32	Direcția Siguranța Cetățenilor, Locuire și Dezvoltarea Comunității, Primăria Sector 1
33	Bucharest sector 1 City Hall
34	Serviciul Informatizare, Primaria Municipiului Iași
35	Braila City Hall
36	Roman City Hall
37	Bucharest sector 5 City Hall
38	Suceava Area Counsel
39	European Accessibility Resource Centre AccessibleEU
40	Standardization National Institute from Moldova (ISM) (8 representatives)
41	University of Architecture and Urbanism "Ion Mincu" Bucharest
42	Technical University in Buildings Bucharest (2 representatives)
43	Technical University from Cluj-Napoca, Building Construction Faculty
44	ASRO (4 personnel)
45	Physical person (14 people)

Minutes

Summary of the Meeting

Speranta Stomff welcomed the participants to the workshop and then briefly outlined the purpose of the meeting. The meeting was about a brief presentation of the project, of ASRO`s involvement in R&I projects, gathering information from the stakeholders that are or should be involved, regarding the development of a methodology concerning accessibility in buildings. This initiative is part of a European research program ''AccesS'', which studies the creation of better accessibility conditions for individuals with disabilities in buildings.

ASRO involvement in R&I project

Mihaela Stancu presented the ASRO`s activity in general and focused on ASRO`s involvement in R&I projects and in other programs financed by European Commission.

AccesS Project

The AccesS research program aims to develop a comprehensive accessibility assessment framework for buildings. Speranta Stomff underlined that this program is being implemented considering the current advancements in the field of buildings, such as smart buildings and smart cities.

Main Elements of the AccesS Project were presented:

Accessibility Assessment: Developing a methodology to assess physical, social and digital accessibility in buildings.

Aspects related to smart buildings will be considered as well as the implementation of digital tools that will be used to evaluate the accessibility of buildings. General information about the project

were presented: a 5 million euro grant agreement that was awarded by the European Commission, that it began in June 2024 and will be completed in May 2027. 22 partners from all over Europe are involved including ASRO, Romania.

The purpose of the workshop is firstly to present to the present stakeholders the impact of national, European and international standardization in smart building and smart cities, including in accessibility area. Another purpose is to discuss the aspects that must be considered for the involvement of the stakeholders in the context of the development of an integrated framework for the assessment of accessibility and cooperation, in relation to the data that will be examined, and in this purpose a questionnaire will be sent by email to all the interested stakeholders (people, company who sent their emails).

Accessibility and social inclusion in European and international standards

Madalina Simion, standardization expert within the Standardization Department of ASRO, had two main topics: legislation and standardization at the European level and also standardization at the international level.

In the first part, the participants received information regarding the European Accessibility Act and Mandate M/587: Accessibility requirements of products and services in support of Directive (EU) 2019/882 and the European Technical Committees dealing with accessibility were briefly presented.

After a brief presentation of the content of the European Accessibility Act, the benefits for businesses and persons with disabilities and elderly people were detailed. The products and services identified as being most important for persons with disabilities while being most likely to have diverging accessibility requirements across EU countries were mentioned.

Regarding mandate M/587: Accessibility requirements of products and services in support of Directive (EU) 2019/882, were presented:

— List of new harmonised standards to be drafted and deadlines for their adoption;
— List of existing European standards to be revised and deadlines for their adoption as harmonised standards;
— List of existing European Standardisation deliverables to be revised and deadlines for their adoption.

The requirements that need to be introduced following the revision of the EN 301 549, *Accessibility requirements for ICT products and services*, have been highlighted.

The most important European Technical Committees dealing with accessibility were briefly presented:

— CEN/CLC JTC 12 - *Design for all*,
— CEN/CLC/ETSI/JWG eAcc – *eAccessibility*,
— CEN/CLC/JTC 11 - *Accesibility in the Built Environment*,
— CEN/BT/WG 213 - *Strategic Advisory Group on Accessibility' (SAGA)*,
— CEN/TC 315 - *Spectator facilities*,
— CEN/TC10 - *Lifts, escalators and moving walks*,
— CEN/TC 293 - *Assistive products and accessibility*,
— CEN/TC 320 - *Transport - Logistics and services*,
— CEN/TC 122 – *Ergonomics,*

with emphasis on the scope and the most important European standards in each technical committee mentioned above.

Next, international standardization was presented. The most important international Technical Committees dealing with accessibility were briefly presented:

— ISO/TC 59/SC 16, *Accessibility and usability of the built environment*,
— ISO/IEC JTC 1/SC 35, *User interfaces*,
— ISO/TC 173/SC 7, *Assistive products for persons with impaired sensory functions*,
— ISO/TC 178, *Lifts, escalators and moving walks*,
— ISO/TC 204, *Intelligent transport systems*,

with emphasis on the scope and the most important European standards in each technical committee mentioned above.

Social accessibility and inclusion in national standards and regulations

Daniela Lulea, standardization expert within the Standardization Department of ASRO, presented national regulations on accessibility and social inclusion of people with disabilities, aligned with various international and European legal acts:

— Law no. 221 of November 11, 2010, for the ratification of the Convention on the Rights of Persons with Disabilities,
— Law no. 448 of December 6, 2006 (republished), on the protection and promotion of the rights of persons with disabilities, together with the Methodological Norms of 14 March 2007 for the application of the provisions of Law no. 448/2006,
— Law no. 232 of July 19, 2022, on the accessibility requirements for products and services – represents the transposition of Directive (EU) 2019/882 of the European Parliament and of the Council of 17 April 2019 on the accessibility requirements for products and services,
— Emergency Ordinance no. 112 of December 21, 2018, on the accessibility of the websites and mobile applications of public sector bodies – represents the transposition of Directive (EU) 2016/2.102/EU of the European Parliament and of the Council of 26 October 2016 on the accessibility of the websites and mobile applications of public sector bodies,
— Emergency Ordinance no. 195 of December 12, 2002 (republished), regarding traffic on public roads – Highway Code,
— Regulation NP 051-2012, Order of the Minister of Regional Development and Public Administration No. 189 of February 12, 2013 for the approval of the technical regulation "Regulation on the adaptation of civil buildings and urban space to the individual needs of people with disabilities"

Then, two original Romanian standards were presented that take into account accessibility for people with disabilities.

The standards in the SR 1848 series, *Road signs*, consist of 4 parts, namely:

— SR 1848-1:2024 *Road signs – Road signs and means of signalling – Part 1: Classification, symbols and location*
— SR 1848-2:2011 *Road signs. Road signs and means of signalling. Part 2: Technical requirements*
— SR 1848-3:2011 *Road signs. Indicators and means of road signaling. Part 3: Writing, way of signaling*
— SR 1848-7:2015 *Road signs. Road marking*.

These are standards that are subordinate to the Highway Code and normative NP 051 on the adaptation of civil buildings and urban space to the individual needs of people with disabilities. Part 1 provides road signs for accessibility for people with disabilities. Part 7 of the SR 1848 series includes markings for parking spaces intended for people with disabilities.

The SR 10144 series of standards comprises two parts, namely:

— SR 10144-1:2024, *Streets and bicycle facilities - Cross-sections - Design requirements*

— SR 10144-2:2024, *Streets, sidewalks, pedestrian paths and bicycle facilities - Design requirements*

The standards are subject to the Highway Code and normative NP051 on the adaptation of civil buildings and urban spaces to the individual needs of people with disabilities. The standards apply to new constructions or those undergoing modernization/rehabilitation work.

All provisions of the standards have been taken into account the normative NP051 so that access for people with disabilities is easy to be made.

Next, Speranța Stomff presented the "New European Bauhaus (NEB)" Initiative and AccesS Project Methodology. The main topics of discussion were:

— What ACCESS wants,
— Stakeholder consultation and involvement,
— Targets,
— Research basis – standards,
— Research basis – regulations,
— Research basis – NEB.

It was mentioned that the purpose is to create a methodology to ensure that the built environment is accessible, easy to use and supports diverse needs, encompassing both the physical and social dimensions of accessibility and expected outcome is the collaboration to develop a unified approach to accessibility that will guide the implementation of accessible environments in future projects. This will be achieved through consultation and involvement of the stakeholders, encouraging collaboration and inclusion through a series of consultations, workshops and meetings, collecting a wide range of perspectives, insights and feedback, followed by integrating the collected stakeholders' input into the standards to ensure that the standards are inclusive, practical and relevant, responding to the diverse needs of stakeholders, while promoting social inclusion in the European Union.

By building bridges between different environments, across disciplines and based on participation at all levels, NEB inspires a movement to facilitate and lead the transformation of our societies along three inseparable values:

— sustainability, from climate goals to circularity, zero pollution and biodiversity,
— aesthetics, quality of experience and style beyond functionality,
— inclusion, from valuing diversity to ensuring accessibility.

The new European Bauhaus brings together citizens, experts, businesses and institutions to reimagine sustainable living in Europe and beyond. In addition to creating a platform for experimentation and connection, the initiative supports positive change.

At the end of the event, during the questions-and-answers session, the floor was given to the representative from the European Accessibility Resource Centre to make a brief presentation of the Centre, which represents one of the key initiatives proposed in the European Commission's Disability Rights Strategy 2021-2030, being a resource center in the field of accessibility in the main areas: built environment, transport, information and communication technology and policies, with the aim of ensuring the participation of people with disabilities on an equal basis with others, in all aspects of life.

The project objectives, the consortium, the senior experts and national experts from all European countries involved, as well as the main activities were presented. The free resources made available were mentioned, as well as the lists of national and European events in which interested persons can participate.

Participants who have accepted to be part of the national working group for the project (and who have communicated their email address) received the dedicated set of questions in the following days after the workshop. The answers were sent in writing to ASRO, which analyzed them and shared with the WP3 coordinator.

Enhancing Accessibility and Sustainability in Smart Cities and Smart Buildings: The Universal Accessibility Suite Initiative

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