SUSTAINABLE PLACES 2022

BIM SPEED

BIM-SPEED

BIM-Speed BSI use cases for building renovation

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Why do we need standardized Use Cases?

Standardized use cases enable capture, specification of exchange and actors involved in a unified manner, to ensure implementation of best practices, which are accessible to all members within the built industry.

BIM-SPEED Use Cases have been developed and documented, based on IDM standards, to aid standardization practices and open accessibility within the industry.

BIM-SPEED Use Cases

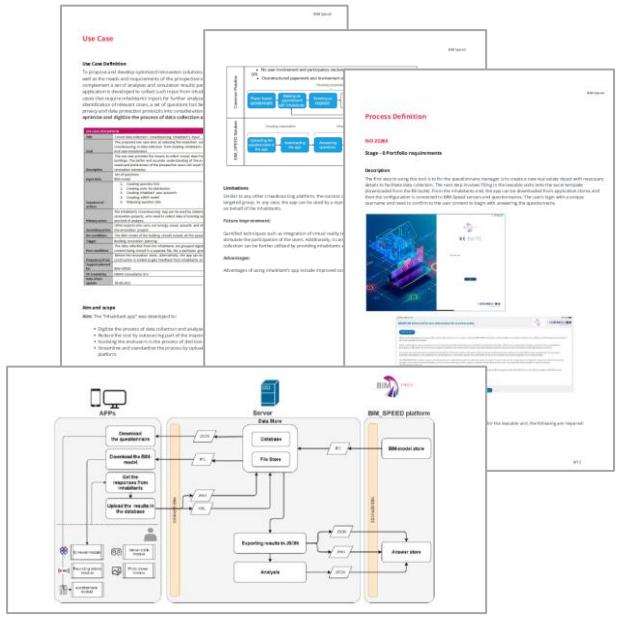
BIMSPEED Use cases

BuildingSMART UC definition tailored to BIMSPEED Goals

- Use case definition
- Process definition
- Exchange requirements

- Objectives validation
- Demonstration of UC on project sites

BIM-SPEED Use cases



BIM-SPEED Use Cases

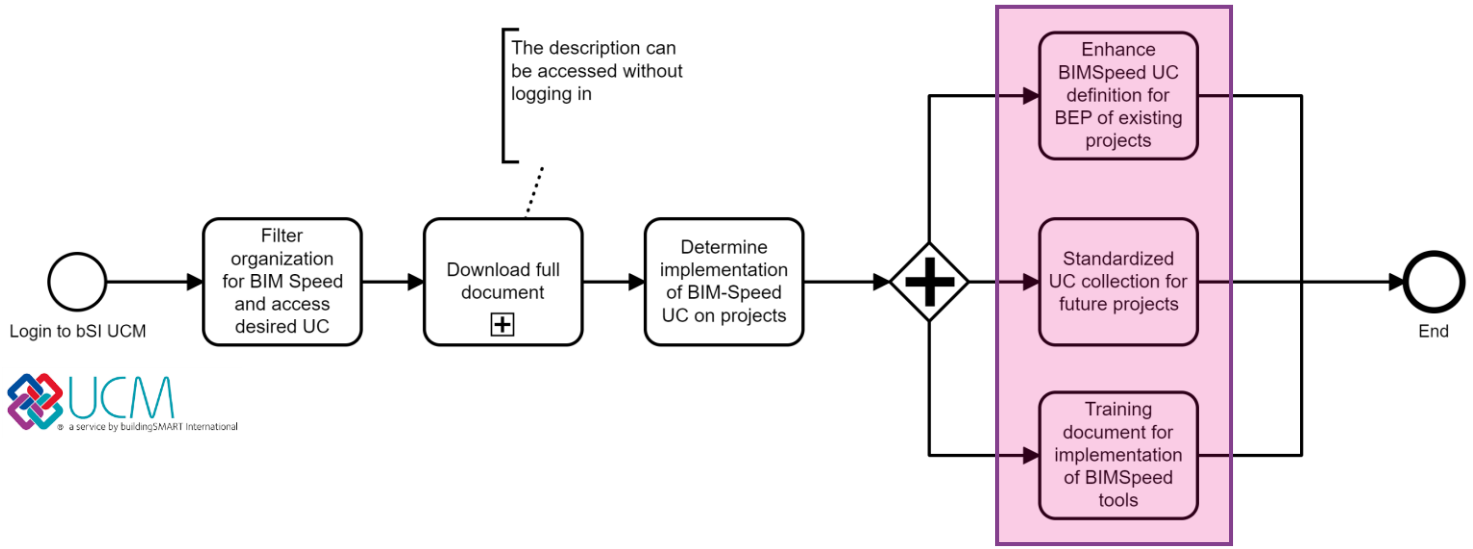
Content of the standardized Use Case description

Use Case Definition	Overall Process across life cycle stages	Demonstrate implementation of Use Cases	Exchange Requirements
Objectives	BPM based Process map description	Demonstrated demonstration of Use Case including BIM actors, Exchange Requirements, Project Life Cycle Stages	File and Data exchange requirements across every stage of execution of Use Case
Scope	Life Cycle Stage		
Disciplines	Segregated Process definition		
Description of Use Case			

BIM-SPEED Use Cases

Intended Use and aimed Benefits

- Standardized Use Case **collection for renovation** projects to speed up initial project phase
- Easily adjust standardized BIM-SPEED Use Cases to the requirements of projects
- Available and ready-to-use **training materials** for BIM-SPEED tools



Intended uses of BIM-SPEED UCs

*This list is not exhaustive

Deliverable to use case description

BIM-SPEED Use Case Development

BIM-SPEED Use Cases

Intended Use and aimed Benefits

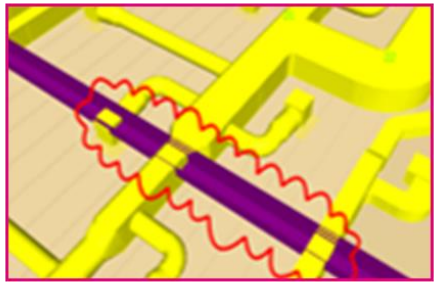
BIM-SPEED Use Case No. 10:
“Model Checks for compliance testing and design coordination”

Geometrical Checks

Clash Detection

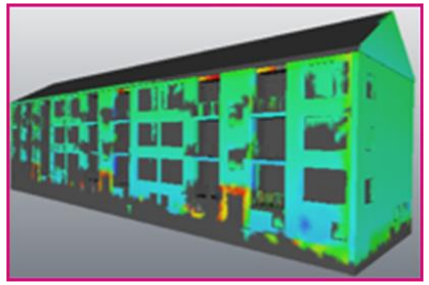
Granularity of 3D objects

Design Coordination



Deviation Analysis

Comparison of pointcloud and 3D Model



Compliance testing & Design Coordination

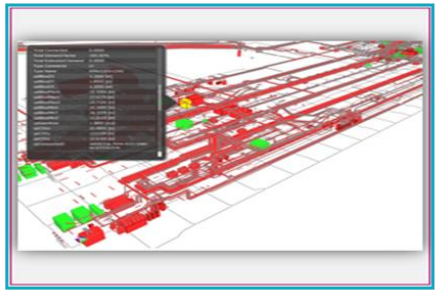
Compliance Checks

Consistence of 3D objects

Naming Conventions

Attribute Checks

Evaluation of Numerical Information provided within property sets



Use Case Description

Model Checks for compliance testing & design coordination

OBJECTIVES

Required information can be accessed; Values of attributes fulfill all defined regulations; Calculated results are correct.

SCOPE

To check and verify that all required information is available and values of specified attributes are within accepted constraints.

DISCIPLINES

No limits regarding the disciplines to be checked.

DESCRIPTION

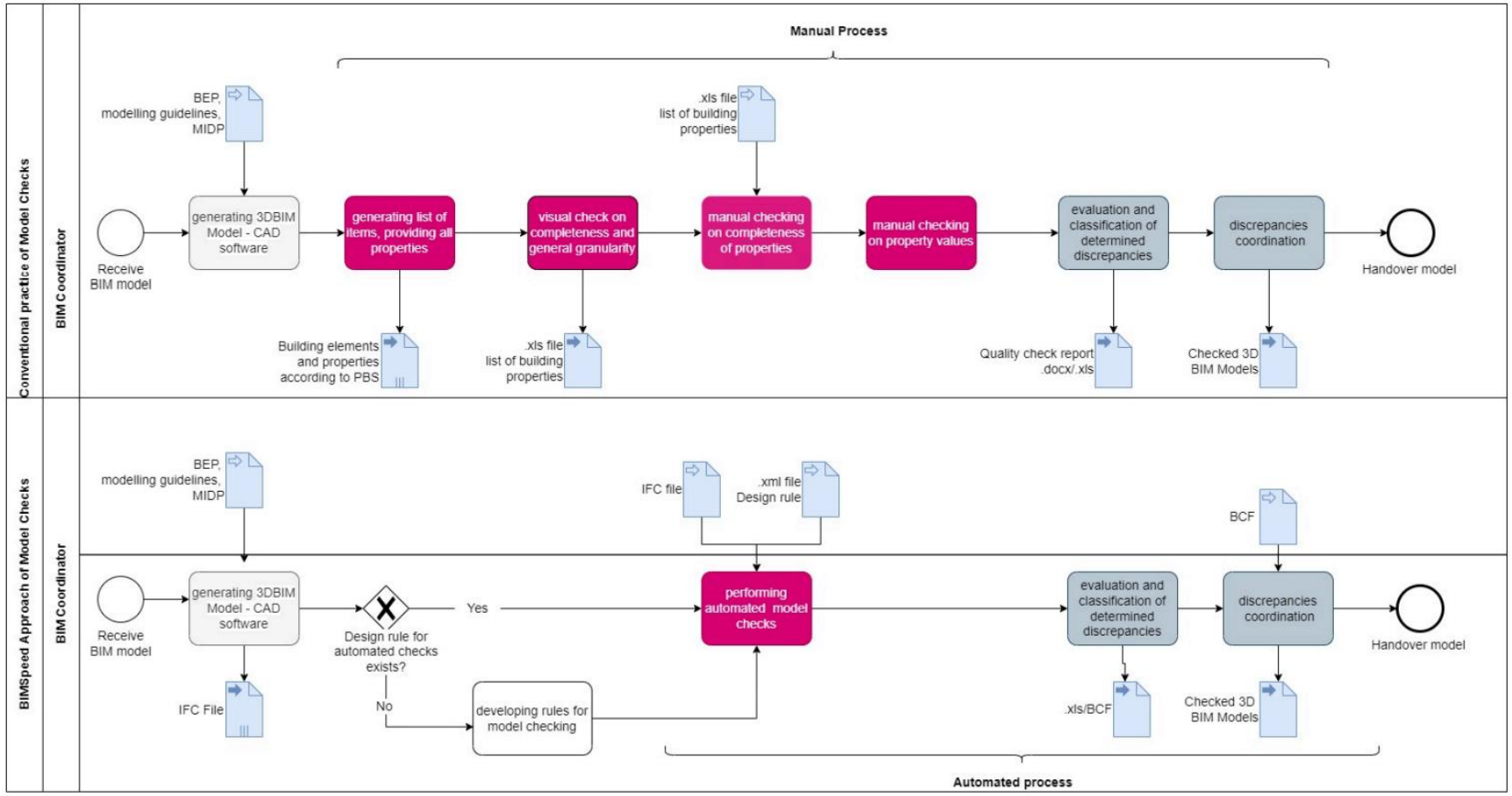
Use Case description will summarize all required information for the use case “Model Checks for compliance testing and design coordination”

USE CASE DESCRIPTION	
Title	Model Checks for compliance testing and design coordination
Goal	The use case aims to ensure the semantic and numerical definition of elements of a 3D model for compliance testing and design coordination.
Description	The use case explains the process to perform a model check. This process ensures that the model is valid and checked to guarantee the use of the model to perform the needed use cases to reach the aimed project goals.
Input data	• EIR (Exchange Information Requirement)/BEP (BIM Execution Plan) • 3D BIM Model • Naming conventions • National/regional standards, Design rules • Model Element Matrix
Sequence of actions	• Collect the design rules to be considered and interprete them to a format for using in suitable model checking software • Evaluating the results of semantical and numerical checks
Output Date	Evaluate the results of semantical and numerical checks and providing a verified 3D BIM Model, so that a decision can be made on whether further BIM use cases based on this model can be performed.
Primary actors	BIM Author, BIM Coordinator
Secondary actors	Designer of the renovation workflow
Trigger	Building Renovation Design
Post-conditions	The checked and verified 3D BIM models are to be handed over for geometrical checks
Frequency of use	Every time within a building renovation project, a data drop to deliver a status of the 3D BIM Model is required.
Support planned for	BIM-SPEED
UC Created by	Hochtief ViCon

Process

BIMSPEED Objectives Validation

Use Case Definition | **Overall Process across life cycle stages** | Demonstrate implementation of Use Cases | Exchange Requirements

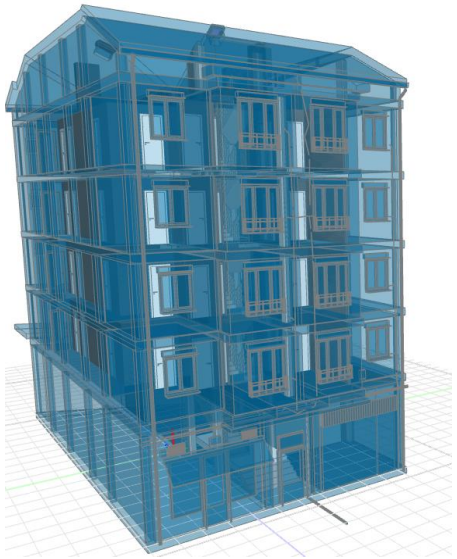


Demonstration

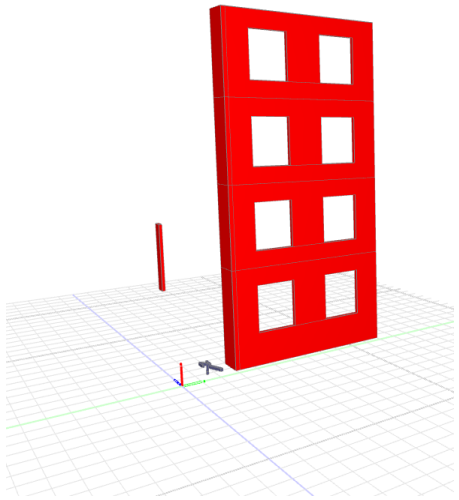
Use Case Objectives Validation

Use Case Definition | Overall Process across life cycle stages | **Demonstrate implementation of Use Cases** | Exchange Requirements

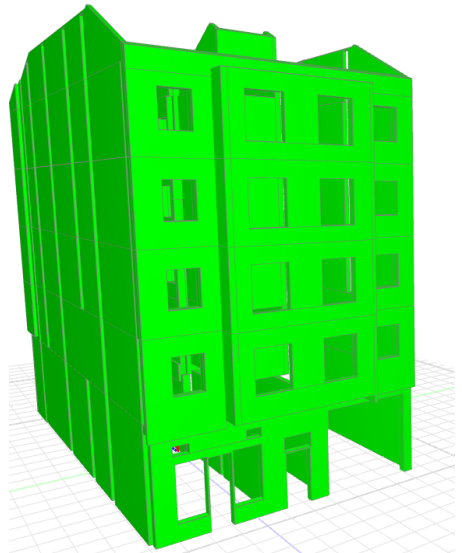
Spanish Demo Model



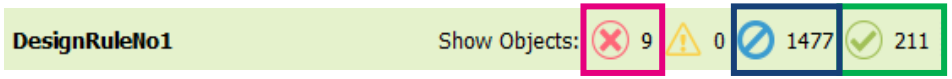
Ignored Elements



Failed Model Check



Complying Elements



Exchange Requirements

Model Checks for compliance testing and design coordination

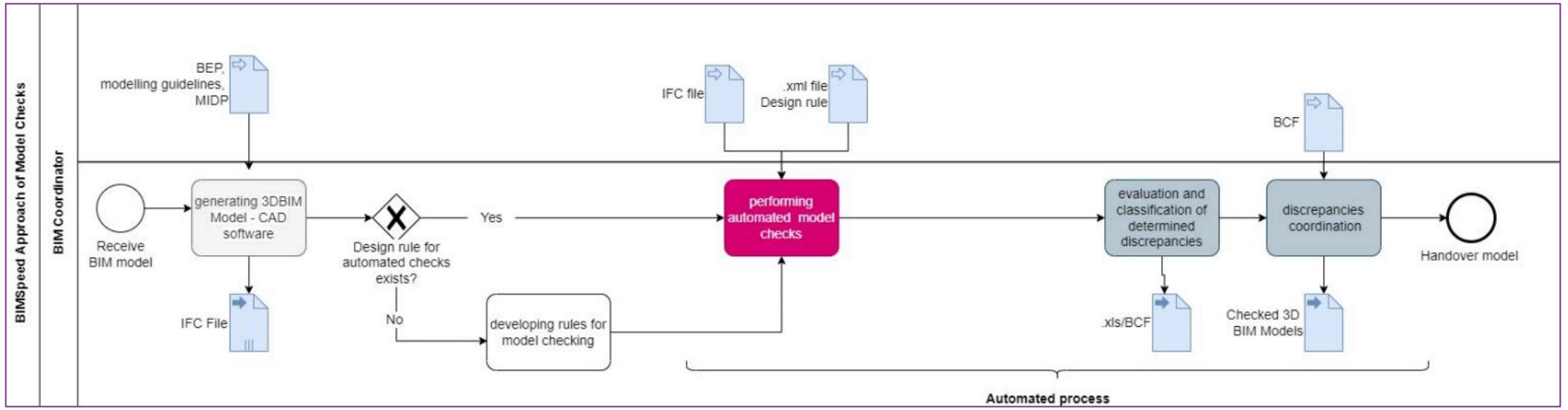
Use Case Definition | Overall Process across life cycle stages | Demonstrate implementation of Use Cases | **Exchange Requirements**

INPUT

- BEP, MIDP
- Modeling Guidelines
- IFC File

OUTPUT

- BCF-File
- Report
- Checked 3D BIM Models

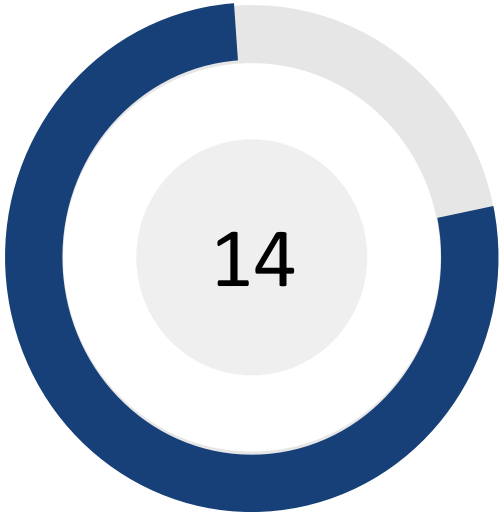


Overview of BIM-SPEED Use Cases for Deep Renovation Projects

Published & to be published

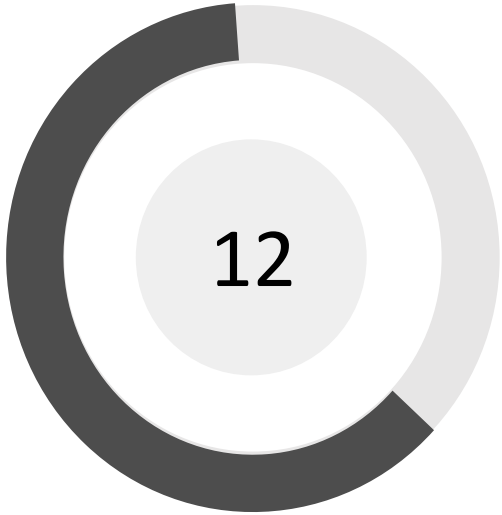
Use Case Status Overview

BIM-SPEED Use Cases on BuildingSMART UCM



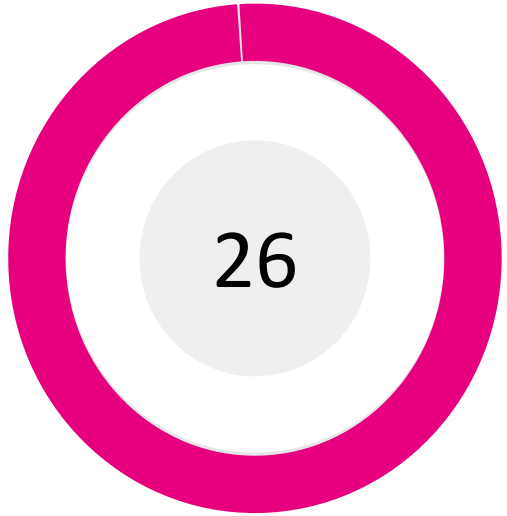
UCM published UCs

14 BIMSPEED UCs can now be accessed on BuildingSMART UCM



UC drafts

12 BIMSPEED UCs are in the process of being drafted



Total BIMSPEED UCs

26 UCs are to be available on BuildingSMART UCM until the end of the project

Uce Case Overview

BIM-SPEED Use Cases across life cycle stages of a project

Execution of renovation works

Scheduling and Planning of construction works

Health and Safety training at construction sites

Renovation Design

Thermal Comfort and Indoor Air Quality Analysis

Lighting and Visual Comfort Analysis

Decision-making in residential building renovation

Semantic Design rules and tool for deep renovation design

Scheduling and planning of construction

Cost estimation and budget analysis

Model Checks for compliance testing

BIM to BEM approach

BIM-SPEED library

Creation of 3D thermal model

Holistic Evaluation

Remote simulations of Building Renovation Scenarios via Holographic Twinning

LCC Analysis

Operation and Maintenance

Building Data collection and download based on IFC model definition

BEM sensitivity analysis and calibration

Thermal Comfort and Indoor Air Quality analysis

Life cycle cost estimation

Existing building data acquisition

3D modeling of existing asset based Point Clouds

Existing building data collection and download based on IFC model definition

Historical Weather Data Collection for Building Energy Modeling

Site analysis and planning

Retrieving BIM data for acoustic comfort calculation

Crowd data collection

Deviation Analysis

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BIM SPEED

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Sustainable Places 2022

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