



Federal Ministry  
for Digital  
and Transport

# Federal Trunk Roads BIM Masterplan

Explanatory notes on the framework documents – version 1.0



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# 1. Introduction

Building Information Modelling or BIM is an essential part of the future vision for planning, building, maintaining and operating the federal trunk road infrastructure. The Federal Trunk Roads BIM Masterplan describes this goal and defines the phased implementation within the framework of a corresponding strategy.

In this way, it ties in with the Stufenplan Digitales Planen und Bauen (Road Map for Digital Design and Construction) and specifies the implementation strategy for Autobahn GmbH and for the federal state authorities with delegated powers. Phase I (Launch and harmonization) provides for the transition of BIM implementation to a uniform and standardized basic level throughout Germany. Subsequently, in Phase II and Phase III, BIM implementation in design and construction will be expanded step by step and introduced as a norm and a standard process across the board. After that, the strategy for digital transformation is to be continued within the framework of the ‘Digital Twins’ vision for the future with a focus on operations.

In order to accompany the BIM implementation in the aforementioned phases in a target-oriented manner, two different control instruments are provided for the strategic action areas and for the operational measures: the model guideline and the recommended action.

- The model guideline for BIM (MG BIM) contains framework documents for specific project work, for example regarding award process preparation, software use or data management topics. It provides practical and state of the art recommendations for project work and is structured based on the use cases.
- The recommended actions for BIM (RA BIM) provide supporting advice and procedures for the implementation of BIM at Autobahn GmbH and in the federal state authorities with delegated powers. They are divided by action areas: guidelines, processes, technologies and people.

The framework documents of the MG BIM are provided at the beginning of each phase of the Federal Trunk Roads BIM Masterplan.

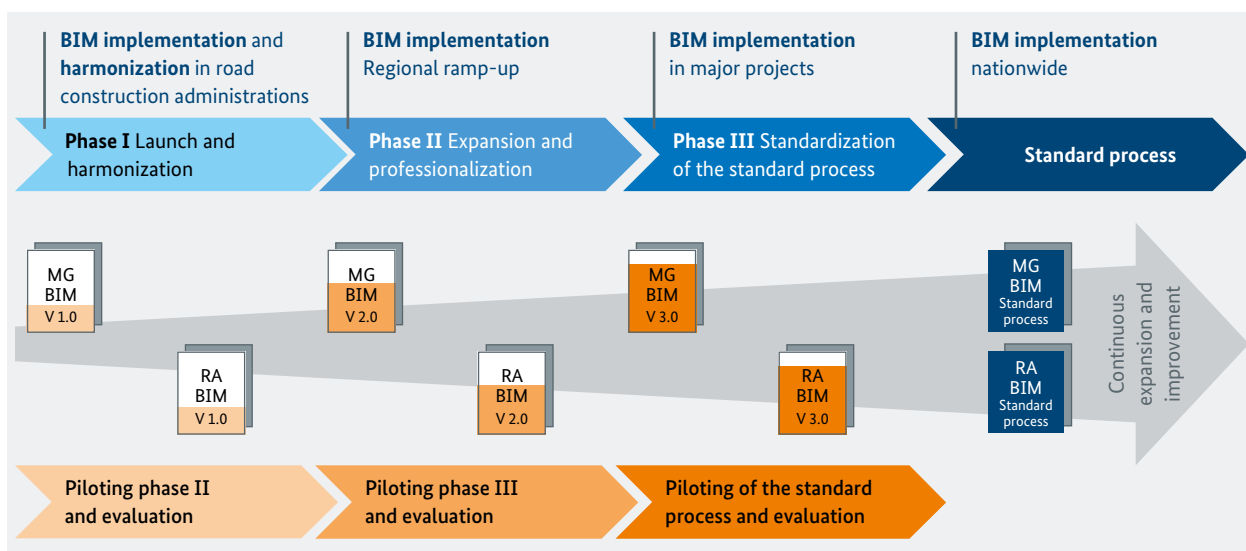


Figure 1: Version 1.0 of the model guideline for BIM (Source: Federal Trunk Roads BIM Masterplan)

## 2. Framework documents of the model guideline for BIM for phase I

Framework documents define the uniform application of the BIM method in Phase I (Launch and harmonization) and provide practical answers to the BIM-specific topics and issues required for a uniform understanding of BIM throughout Germany in the federal trunk roads segment.

The version 1.0 framework documents were designed to facilitate updating to a new version of the model guideline for BIM at the beginning of phase II of the BIM implementation strategy; the same will apply again later for phase III. In the end, the MG BIM for the standard process will be derived from this. In this way, the BMVI is supporting the uniform and harmonized implementation of the Federal Trunk Roads BIM Masterplan.

The framework documents presented here have been developed by the expert groups initiated by the BMVI and established in the official BIM meetings of the Federal Government and federal state governments. In these groups, technical experts from the Federal Trunk Roads Administration consisting of employees from the BMVI, the federal state authorities with delegated powers and Autobahn GmbH work together with BIM Germany on the further realization of the BIM implementation strategy for the federal trunk roads. Both the experience gained from completed

and ongoing projects, as well as input from the ongoing participation of the federal states and executive agencies were taken into account. At the same time, the general developments in the BIM method were considered for national and international standardization.

Version 1.0 of the MG BIM includes the following framework documents:

- Employer Information Requirements (EIR)
- BIM Use Cases and Legal Frameworks
- BIM Execution Plan (BEP)
- Data Management
- Definition of Specialist Models
- Model-based Plan Derivation for Bridge Design
- Use Case Profiles

Each framework document is assigned to a thematic category based on the project process and is thematically self-contained. Cross-references to other framework documents are explicitly highlighted.

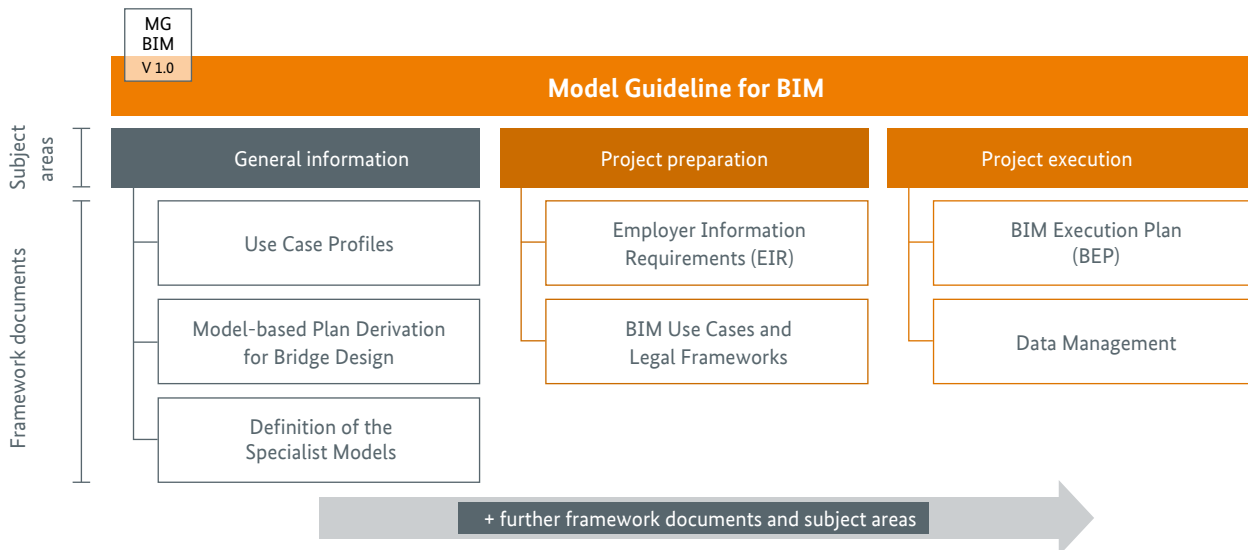


Figure 2: Overview of the subject areas and the included framework conditions

The minimum requirement for BIM implementation in the first phase is derived from the already tested BIM use cases described as part of the framework documents. In addition to the central definition of the use cases, the framework documents also contain information and answers on relevant legal, organizational, methodological and technological framework conditions and provide assistance for the further implementation of BIM. Moreover, practical advice is provided for operational project management.

The framework documents developed for the first phase are divided into three initial subject areas and are intended to support the BIM implementation of the first phase as well as the initiation of BIM pilot projects for the second phase, thereby ensuring the achievement of the implementation goals specified in the Masterplan.

## 2.1 Subject area 1: Fundamentals

The definition, common understanding and coordinated implementation of the main BIM use cases are a central part of BIM rollout and use in Germany.

With this in mind, the Use Cases framework document explains the eight use cases envisioned for implementation in the first phase. The use case profiles and additional documents developed for this purpose are based on a uniform model template and are aimed at Autobahn GmbH and the federal state authorities with delegated powers that use the BIM method as contracting entities and thus define the BIM requirements in projects.

Table 1: Eight use cases of the first phase

No.	Use case
010	Existing conditions modelling
030	Planning variants and/or preparation of documents substantiating the budget*
040	Visualization
050	Coordination of the professional trades
080	Derivation of planning documents
100	Quantity take-off and costing
110	Bill of quantities, tender, contract award
190	Project and structure documentation

\* Depending on the specialist area, either 'Planning variants' or 'preparation of documents substantiating the budget' can be selected

In addition, the 'Definition of specialist models' framework document answers important questions about the BIM models generated and used in the use cases. Both structural and content-related specifications for specialist models are formulated and important specifications for the model-based implementation of federal trunk road infrastructure projects are made. In order to bring the work with specialist models in line with the valid guidelines and regulations, recommendations are made, for example, for the plan derivation of bridge structures and reference is made to alternative forms of presentation. These recommendations can be found in the framework document 'Model-based plan derivation for bridge design'.

## 2.2 Subject area 2: Project preparation

The contents of this subject area primarily support federal trunk road administration employees in initiating the BIM pilot and evaluation programme described in the Masterplan. For this purpose, model employer information requirements have been provided in the form of the framework document 'Employer Information Requirements (EIR)', which contains comprehensive descriptions including a practical example.

There are various options for tendering and awarding BIM services based on the EIR. In particular, the description of the contractual deliverables, the compensation, but also questions of copyright protection and aspects of liability are addressed in it. The 'BIM Use Cases and Legal Frameworks' framework document points out special features of the BIM methodology and also provides assistance for drafting contracts.

## 2.3 Subject area 3: Project management

A large number of action areas are addressed in the project management subject area. Standardization gaps that exist due to non-existent or not yet published standards are to be closed. In the current version, the topics of the BIM Execution Plan (BEP) and those of data management/software were each dealt with in a separate framework document. Like the EIR, the contents of the BEP are shown and comprehensively described here. The Data Management framework document describes the handling and management of digital data. This takes into account all processes from gathering, storage, processing and use to archiving.

### 3. Provision and updating of the framework documents

In future, the framework documents will be available online on the BMVI website in an up-to-date version. They will be updated in parallel with the implementation of the measures from the Masterplan on the basis of knowledge gained and advancing standardization.

Findings and experience from the BIM pilot and evaluation programmes are gathered and prepared to update existing framework documents and develop new ones. This preparation of BIM-specific topics facilitates the step-by-step

updating of the model guideline for BIM for road construction administrations (cf. Figs. 1 and 2).

In the long term, the framework documents are to serve as a starting point for the application of harmonized BIM use cases throughout Germany and for the uniform implementation of the BIM methodology in the federal trunk roads segment. By the end of Phase III, uniform national specifications are to be derived from this and are to result in a normative model guideline for BIM for the standard process.





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