

EMERALD / ICE PUBLISHING (Wiley)

BIM for Transportation Infrastructure Handbook

Building the Foundation, Sustaining the Learning

A Comprehensive Guide for Transportation Project Professionals

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THE BIG PICTURE: FILLING A CRITICAL GAP

The Challenge for Agencies

Transportation infrastructure is critical to economic growth, connectivity, and resilience. Yet agencies still face:

- Data gaps between design, construction, and O&M
- Few transportation-specific practices and standards
- Uneven adoption across agencies and projects
- Staff turnover with no common training reference

Why This Book Is Unique



Built for Transportation

Tailored to roads and bridges, with connections to rail, transit, and airports; not adapted from building BIM.



Full Lifecycle, Connected

15 chapters from planning to asset management, each ending with the handoff to the next phase.



Aligned with National Standards

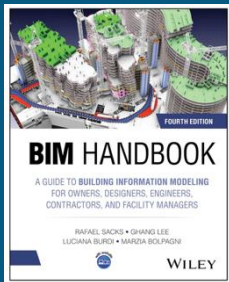
Grounded in ISO 19650, IFC, IDS, and bSDD, and aligned with FHWA and AASHTO frameworks.



Written by Practitioners

45+ contributors from DOTs, FHWA, and industry, with real-world case studies and workflows.

FROM A PROVEN MODEL TO AGENCY NEEDS



THE PROVEN MODEL

4 editions · 17 years

Eastman's *BIM Handbook* anchored building BIM and evolved with the industry, from early adoption to ISO 19650 and digital twins.

Transportation Has No Equivalent

Linear, distributed assets with decades-long lifecycles need their own reference, and agencies are adopting digital delivery at very different speeds.

NIBS CBTL review: *BIM adoption varies widely across state DOTs, from leading agencies to those still exploring.*

This handbook continues Chuck Eastman's legacy.

STATE DOT DIGITAL DELIVERY MATURITY

Agencies Are at Different Points on the Journey

STAGE	WHAT IT LOOKS LIKE	WHERE THE HANDBOOK HELPS
01 Exploring	Building the business case, awareness, and executive sponsorship	Ch 1 Introduction Ch 3 Leadership & Transformation
02 Piloting	Project-level model-based delivery, e-construction, 3D models in bid packages	Ch 4 Model-Based Design Ch 7 Digital Project Delivery Ch 9 Field Technologies
03 Standardizing	Agency standards, information requirements, CDEs, model as legal deliverable	Ch 2 Standards & Governance Ch 6 Coordination & Interop.
04 Enterprise Lifecycle	Data flows from design into asset management and digital twins	Ch 5 GIS Integration Ch 10 Digital Twins Ch 11 Asset Management

Takeaway: Every agency has an entry point, and each stage has its own learning needs.

THE VISION

One Foundational Reference

Full lifecycle coverage, from planning and design through long-term asset management, written by practitioners for practitioners. Appendices add a standard glossary, execution frameworks, and case studies.

15

Chapters

100K+

Words

45+

Contributors

PART
I

Foundations of BIM & Digital Delivery

Introduction, Standards & Governance, Leadership (Ch. 1–3)

PART
II

Planning, Design & Coordination

Model-Based Design, GIS Integration, Interoperability (Ch. 4–6)

PART
III

Construction & Digital Project Delivery

Digital Delivery, Construction Mgmt, Field Tech (Ch. 7–9)

PART
IV

Operations, Maintenance, & Asset Management

Digital Twins, Asset Management, Resilience (Ch. 10–12)

PART
V

Advanced Technologies & Future Directions

Emerging Tech, Digital Equity, Future of BIM (Ch. 13–15)

DEVELOPED BY PRACTITIONERS, FOR PRACTITIONERS

More than 45 contributors from state DOTs, FHWA, consultants, contractors, and technology providers, guided by a cross-industry steering team.

*Synthesizing existing national efforts and reformulating the findings
into an implementable guidebook*



Agency Voices

State DOT contributors and reviewers.



Industry Expertise

Consultants, contractors, and technology providers: HNTB, Kimley-Horn, WSP, HDR, Olsson, Esri, and more.



Steering Team

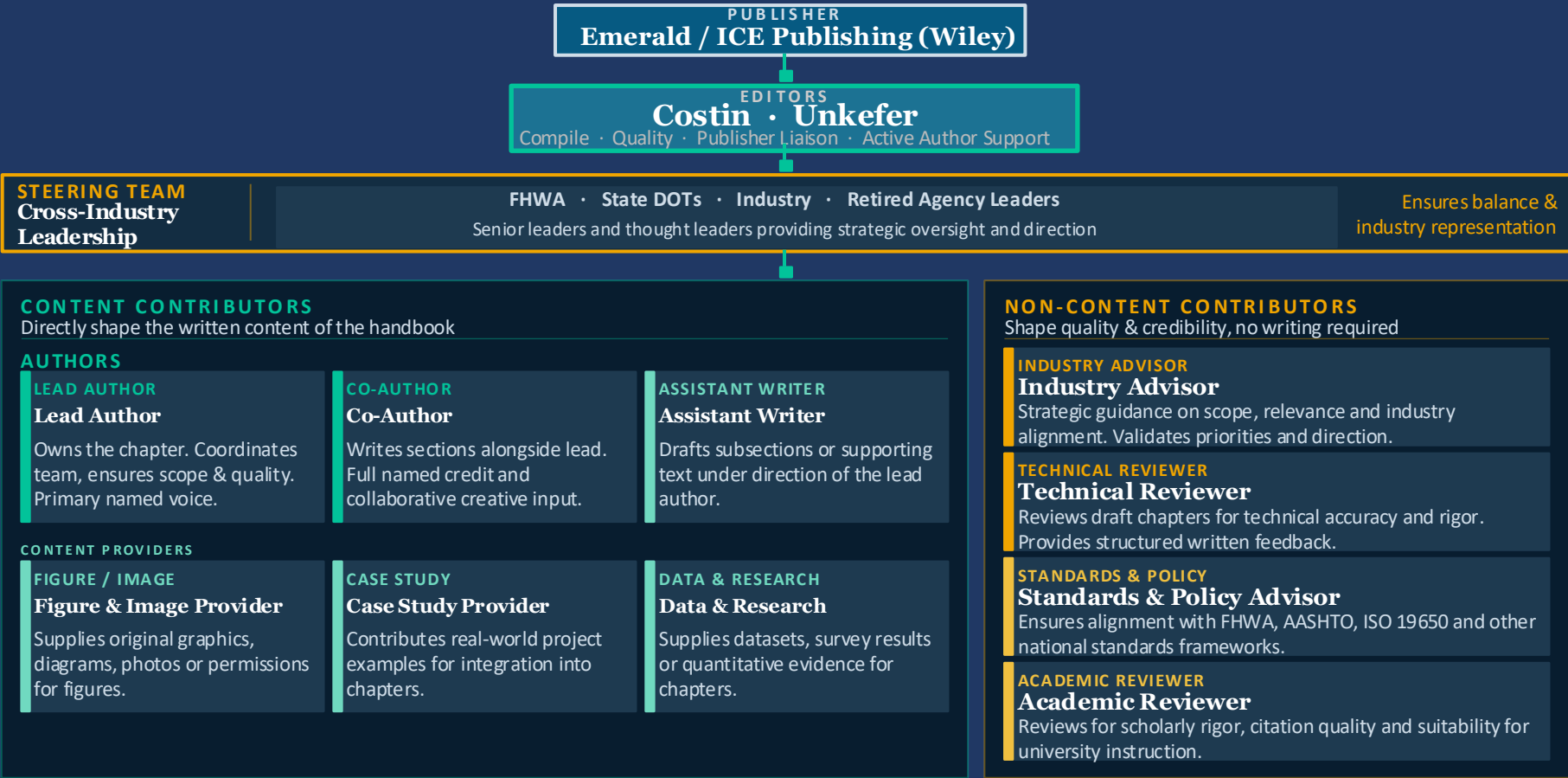
Leaders from FHWA, state DOTs, and industry ensure balance and national relevance.



Global + National Context

International best practices (ISO 19650, openBIM) aligned with FHWA and AASHTO frameworks.

Collaboration and Teamwork: Structure, Roles & Oversight



All contributions are voluntary. Contributors may hold more than one role across different chapters. Every role, from lead author to case study provider, has a voice in shaping this seminal reference.

ALIGNED WITH NATIONAL EFFORTS

Lifecycle Framework

- ✓ Structured around the FHWA BIM Roadmap lifecycle wheel
- ✓ Each chapter ends with the handoff to the next phase
- ✓ Connects project delivery to asset management
- ✓ Covers design-bid-build and alternative delivery

Open Standards

- ✓ ISO 19650 information management
- ✓ IFC 4.3 and openBIM for infrastructure
- ✓ IDS and bSDD for requirements and data dictionaries
- ✓ Common and connected data environments

National Programs

- ✓ BIM transportation pooled fund studies
- ✓ Central BIM Transportation Library (CBTL)
- ✓ FHWA and AASHTO frameworks
- ✓ Shared glossary for consistent national terminology

CONTINUAL EDUCATION: WHY A BOOK ISN'T ENOUGH

Learning Never Stops

Eastman's handbook stayed relevant through 4 editions over 17 years. Transportation practice is moving even faster:

- Standards are maturing: IFC 4.3, IDS, bSDD
- Agency practices evolve with every project
- New technologies arrive every year
- Experienced staff retire as new staff arrive

Three Layers, Three Speeds



Principles: Stable

Information management, lifecycle thinking, and open standards.



Practices: Evolve Over Years

Contracting, execution plans, and model-based deliverables.



Technologies: Change Monthly

Digital twins, IoT, reality capture, and AI.



The Handbook's Role

Anchors the principles so people can keep learning the practices and technologies.

A LEARNING PATHWAY FOR THE WORKFORCE

University

Prepare future owners, designers, and contractors with a **comprehensive teaching text**, so graduates contribute from day one.

Onboarding

Give new DOT and industry staff a **common starting point** and a shared vocabulary for digital delivery.

Upskilling

Help mid-career engineers, inspectors, and contractors **climb the learning curve** as practices and tools evolve.

Leadership

Build the **fluency to set policy, procurement, and data requirements** across the agency.

Data handoffs between project phases mirror knowledge handoffs between generations of staff.

BEYOND THE BOOK: A LIVING FOUNDATION

1

The handbook: a shared foundation for the industry

Foundation

2

Training modules and workshop materials

· Built with DDSG member groups to keep pace with standards and technology

Co-develop

3

A case study library that grows with practice

Co-develop

4

Curriculum resources for universities and DOT programs

· Chapter teams are already developing material with future curriculum in mind

Partner

5

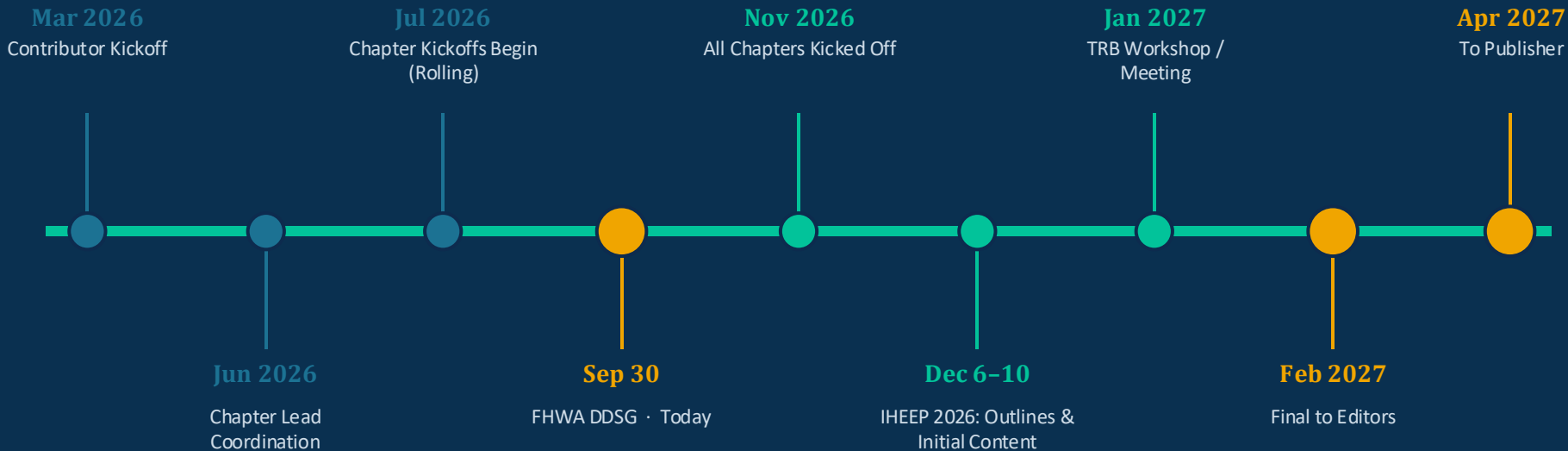
Future editions shaped by DDSG feedback

· Updated as IFC 4.3, ISO 19650, and agency practices mature

Evolve

STATUS & TIMELINE

Mar 2026 – Apr 2027



Status:

Chapter kickoffs are rolling. Teams with confirmed leads are underway; remaining chapters kick off by November, with outlines and initial content targeted for IHEEP.

HOW YOU CAN ENGAGE

Join Us in Shaping the Future of BIM

The handbook is the foundation. Together with DDSG, we can keep the learning going for this generation and the next.

01

Write: lead or co-author an open chapter, such as asset management or digital twins

02

Contribute: share case studies, figures, or data from your agency

03

Review: serve as a technical, standards, or policy reviewer

04

Build what's next: shape and pilot follow-on training materials

05

Adopt: use the handbook in training programs and university partnerships

WHY THIS MATTERS



Shared Foundation

One practitioner-built reference that gives every agency a common starting point.



Continual Learning

Training that keeps pace with evolving standards, practices, and technology.



National Alignment

Reinforces FHWA, AASHTO, and DDSG efforts rather than competing with them.

COMMON QUESTIONS

Q1

Why a textbook if the technology changes so fast?

We're capturing the foundations: principles, lessons learned, and how best to proceed. Tools change, foundations don't, and future editions and training keep pace.

Q2

We're busy. How can we contribute?

Chapter teams work like structured committees. Lead, write, review, or share a case study; starter materials and key questions make any level of input easy.

Q3

How is this different from FHWA, AASHTO, and CBTL resources?

It doesn't replace them. It connects them into one lifecycle reference that points readers back to the source guidance.

Q4

Can my agency share a case study?

Yes, it's one of our biggest needs. Your agency controls what's shared, with a formal permissions process for figures and data.

Q5

How do you stay vendor-neutral?

Content is built on open standards and agency workflows, and cross-industry teams with owner-side reviewers keep it balanced.

Q6

Which chapters still need help?

Construction management, digital equity, and Part IV: digital twins, asset management, and sustainability. Digital as-builts is a proposed addition.