

# **BIM for Bridges and Structures Pooled Fund Initiative**

**AASHTO Committee on Bridges and Structures  
Annual Meeting, T-19 Committee Meeting**

**July 13, 2021**



# Introductions



## **Julie Rivera, PE, SE** *Project Manager*

- HDR Bridge Program Lead for IL/IN
- 17 years industry experience
- Bridge design, analysis, 3D modeling
- [Julie.Rivera@hdrinc.com](mailto:Julie.Rivera@hdrinc.com)



# Introductions



**Alexa Mitchell, PE**  
*Project Technical Lead*

- HDR Transportation BIM Program Manager
- 22 years industry experience
- [Alexa.Mitchell@hdrinc.com](mailto:Alexa.Mitchell@hdrinc.com)



# AGENDA

1. AASHTO Vision & Project Objective
2. Overall Project Status
3. Project Task Updates
4. Questions



# AASHTO VISION & PROJECT OBJECTIVE

# AASHTO Bridge Vision

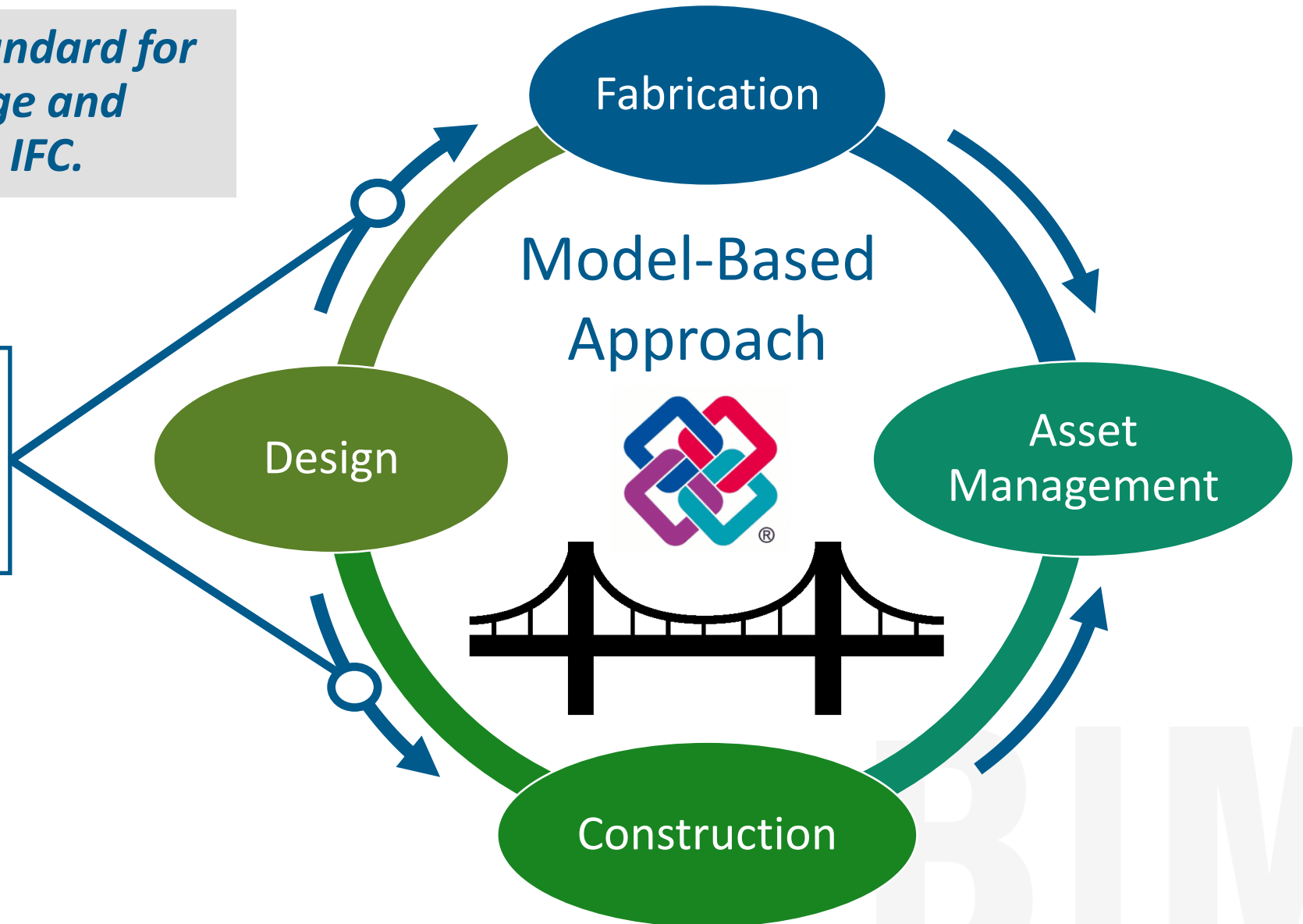
*Develop a National Standard for open exchange of bridge and structure data utilizing IFC.*

Focus of pooled  
fund project

**BIM**

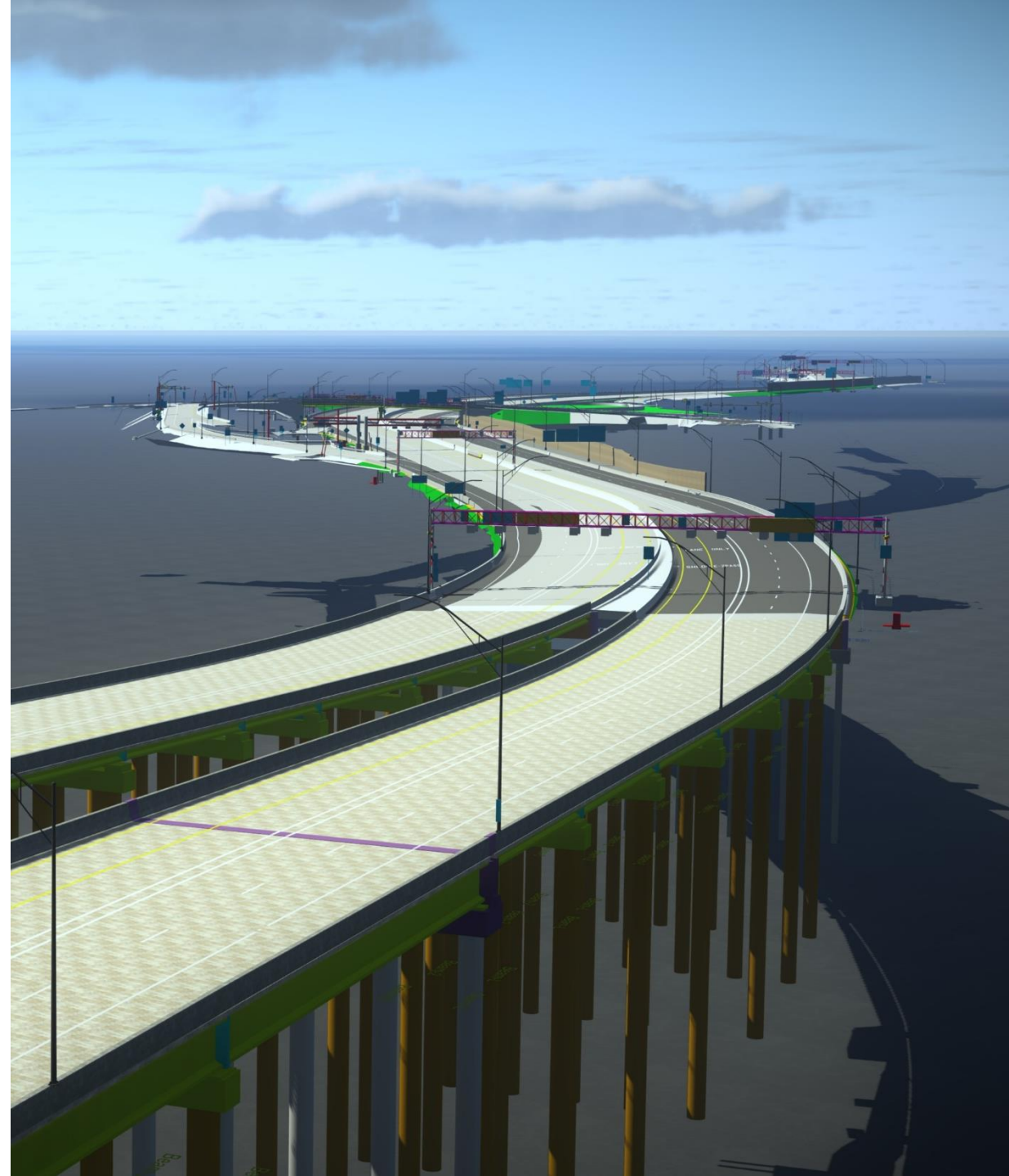
FOR  
BRIDGES  
AND STRUCTURES  
TPF-5(372)

**BIM** FOR  
BRIDGES  
AND STRUCTURES  
TPF-5(372)



# Overall AASHTO Vision

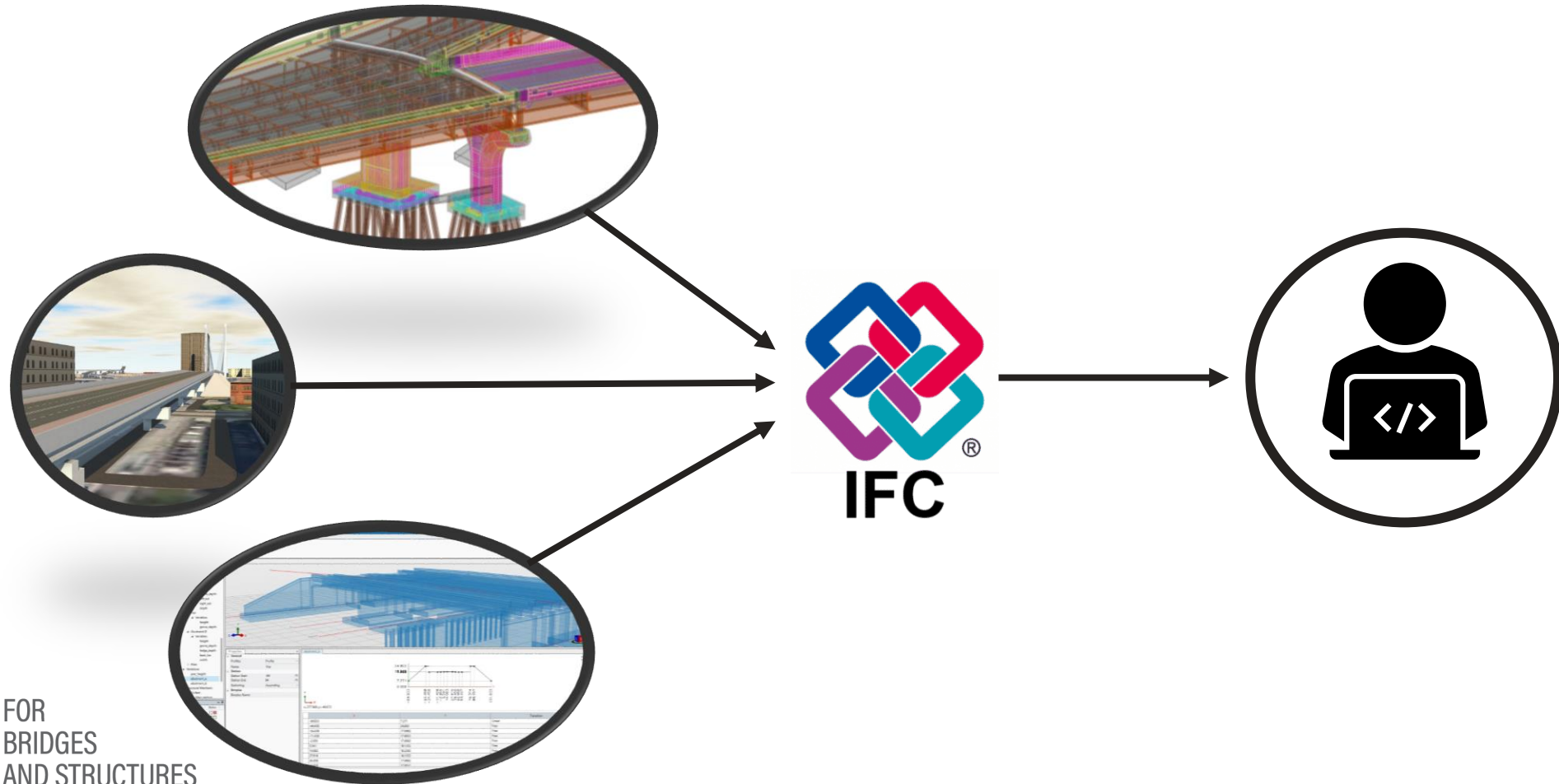
- Industry shift to:
  - Digital delivery
  - Model as the legal document
  - Digital as-builts
- Key Milestones
  - Creation of BIM for Bridges and Structures Pooled Fund in 2017
  - AASHTO Adoption of IFC in 2019
  - Creation of BIM for Infrastructure Pooled Fund in 2021





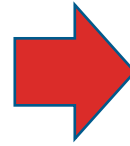
# Project Objective

*Adoption of Industry Foundation Classes (IFC) for the US Bridge Industry*

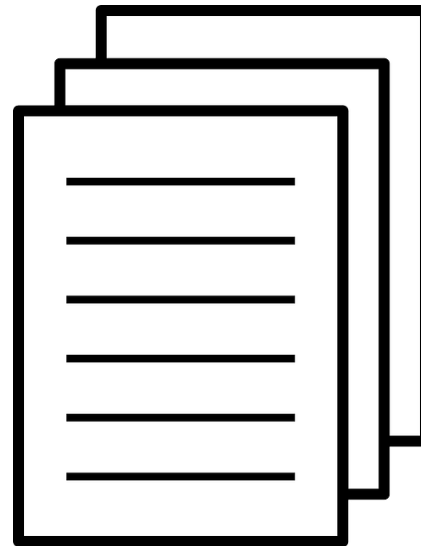




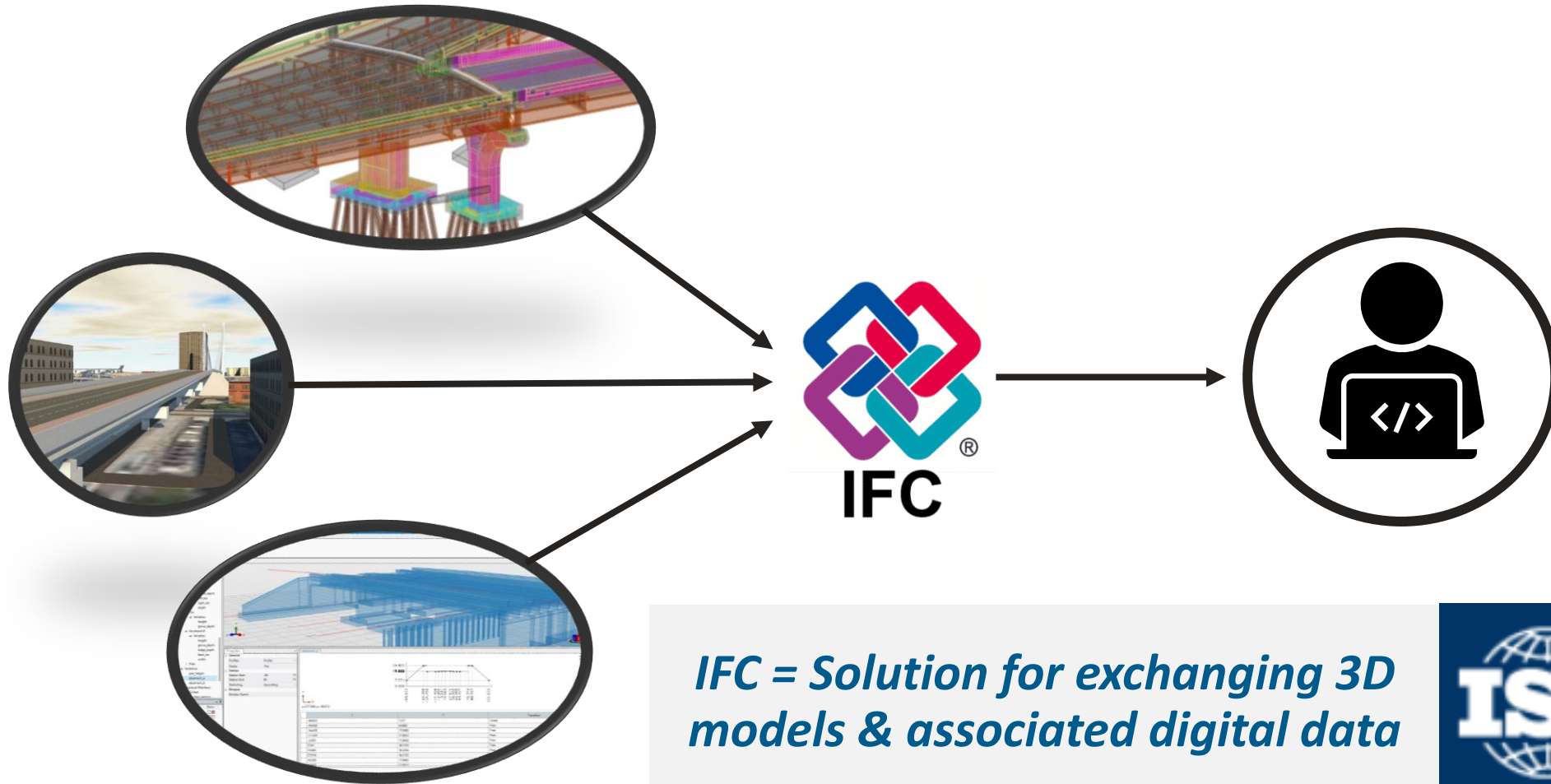
# Project Objective



ISO 32000



# Project Objective



*IFC = Solution for exchanging 3D models & associated digital data*



ISO 16739

# Project Outcomes

OUTCOME 1: 

Development of Information  
Delivery Manual (IDM)

OUTCOME 2: 

Creation of Model View  
Definition (MVD)

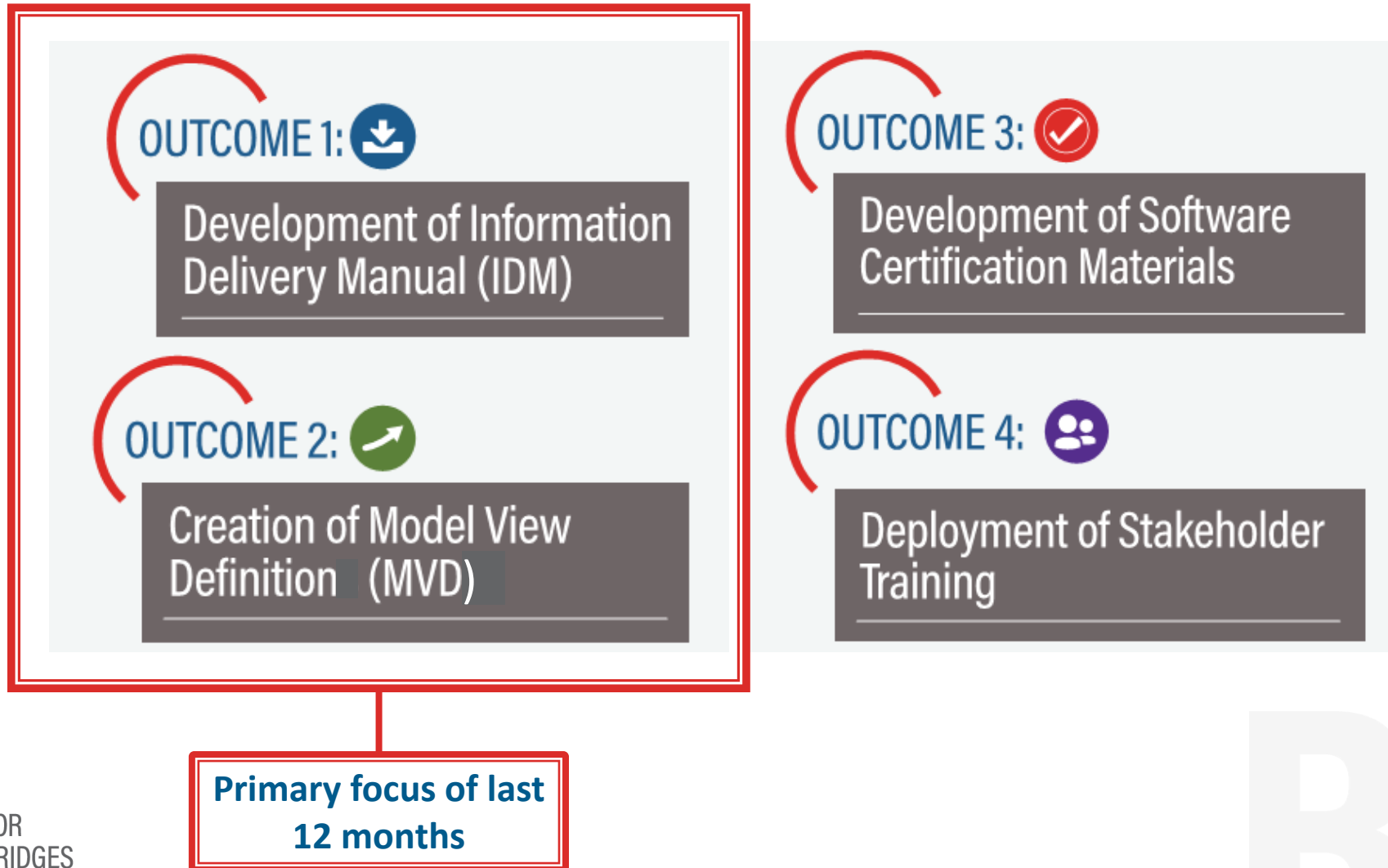
OUTCOME 3: 

Development of Software  
Certification Materials

OUTCOME 4: 

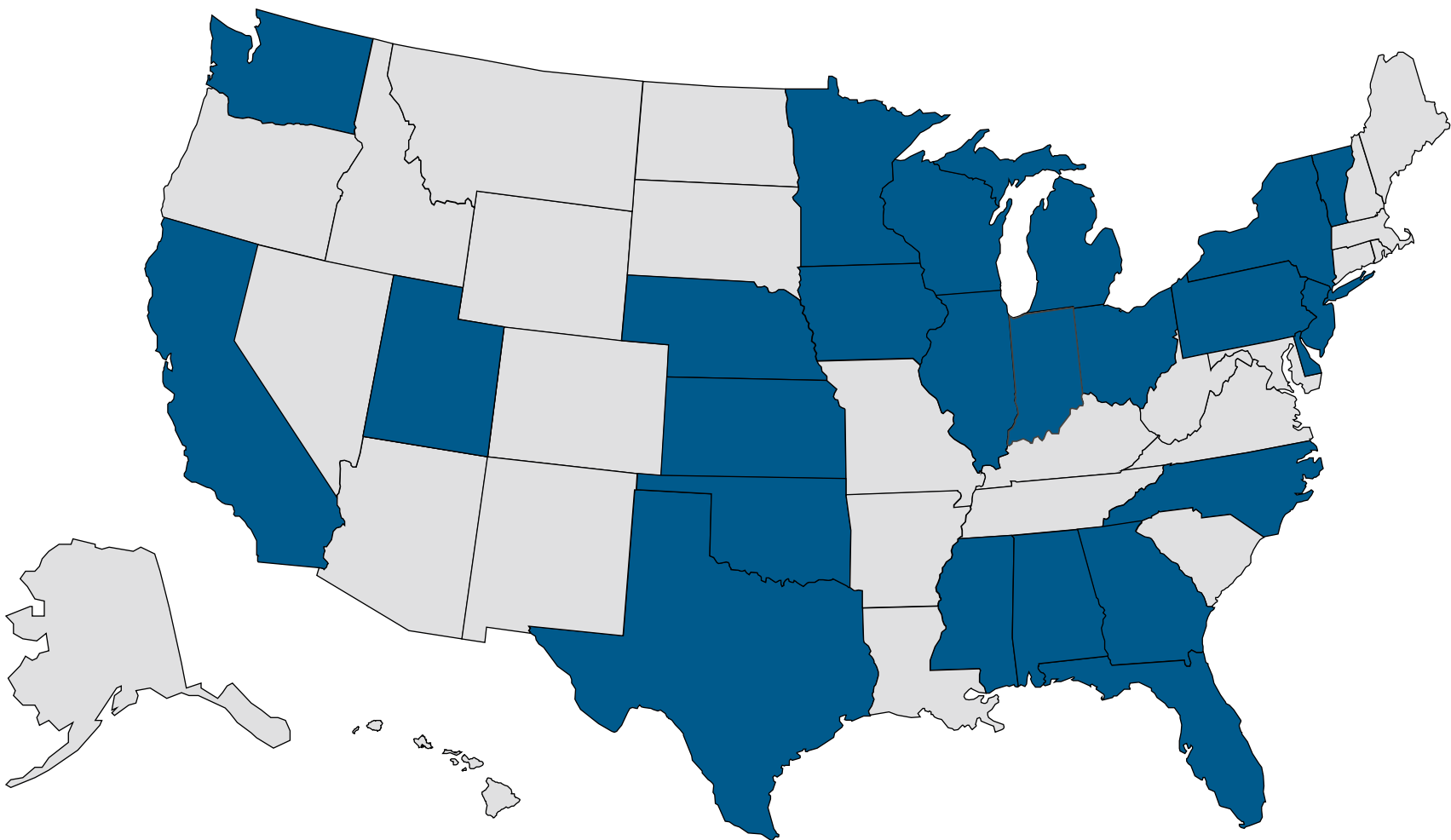
Deployment of Stakeholder  
Training

# Project Outcomes



# OVERALL PROJECT STATUS

# Transportation Pooled Fund – TPF-5(372)



## 24 STATES PARTICIPATING

- |                |                   |
|----------------|-------------------|
| 01 Alabama     | 14 New Jersey     |
| 02 California  | 15 New York State |
| 03 Delaware    | 16 North Carolina |
| 04 Florida     | 17 Ohio           |
| 05 Georgia     | 18 Oklahoma       |
| 06 Illinois    | 19 Pennsylvania   |
| 07 Indiana     | 20 Texas          |
| 08 Iowa        | 21 Utah           |
| 09 Kansas      | 22 Vermont        |
| 10 Michigan    | 23 Washington     |
| 11 Minnesota   | 24 Wisconsin      |
| 12 Mississippi | FHWA              |
| 13 Nebraska    |                   |

# Consultant Team & Industry Partners



## PROJECT MANAGEMENT

Alexa Mitchell, PE  
Will Sharp, PE, PTOE  
Julie Rivera, PE, SE

## INVESTIGATION & EXPLORATION

Aaron Costin, PhD

## IFC DEVELOPMENT

Thomas Liebich, PhD

## ECONOMIC ANALYSIS (ROI)

Stéphane Gros, PhD

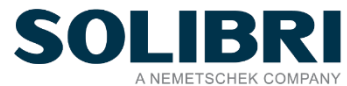
## EDUCATION & ENGAGEMENT

Francesca Maier, PE  
Katie Hatfield Edstrom, PhD

## SOFTWARE VENDOR ENGAGEMENT

Jeffrey W. Ouellette

## INDUSTRY INVOLVEMENT





# Software Vendor Engagement

## Software Vendor Workshop

- Virtual 3-hour sessions
- July 20, 21, and 22
- Vendors will demonstrate early progress and/or intent to support BIM for Bridges & Structures
- Pooled fund TAC, especially Working Group 3 (WG3), encouraged to attend

## Demonstrations by:

ALLPLAN  
A NEMETSCHEK COMPANY

LARSA

AUTODESK®

Bentley®

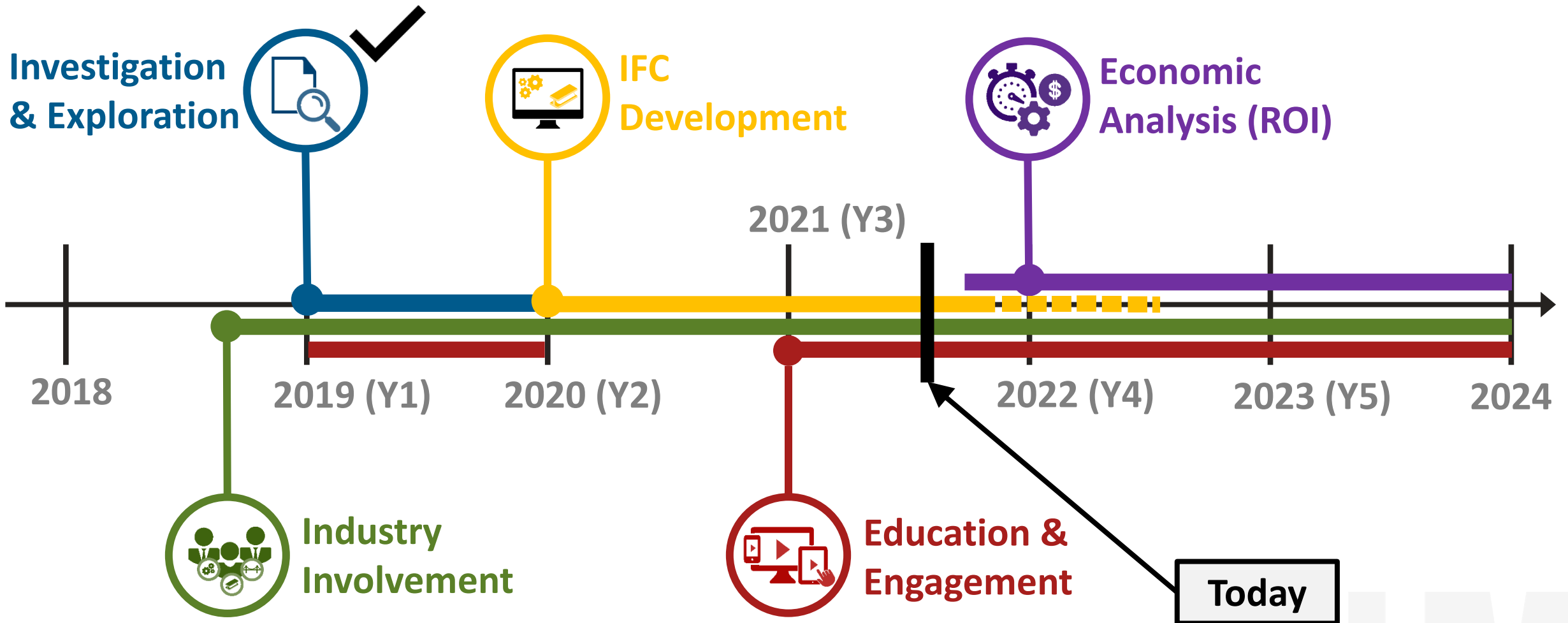
open  
BrIM

BridgeSight  
Software™

PGSuper

Trimble Quadri & Tekla Structures

# Project Timeline





# PROJECT TASK UPDATES

# Project Tasks



**Investigation and Exploration**



**IFC Development**



**Industry Involvement**



**Education and Engagement**



**Economic Analysis (ROI)**

# Project Tasks



Investigation and Exploration



IFC Development



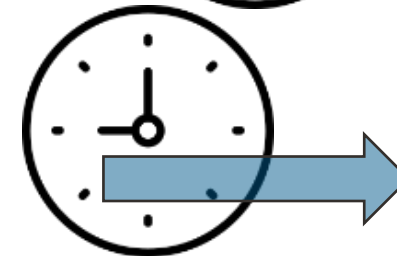
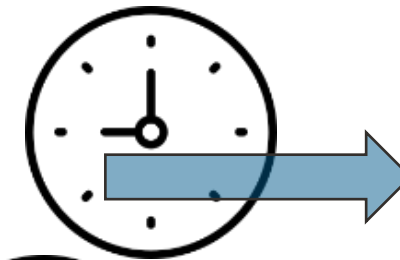
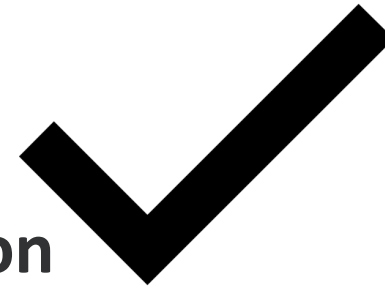
Industry Involvement



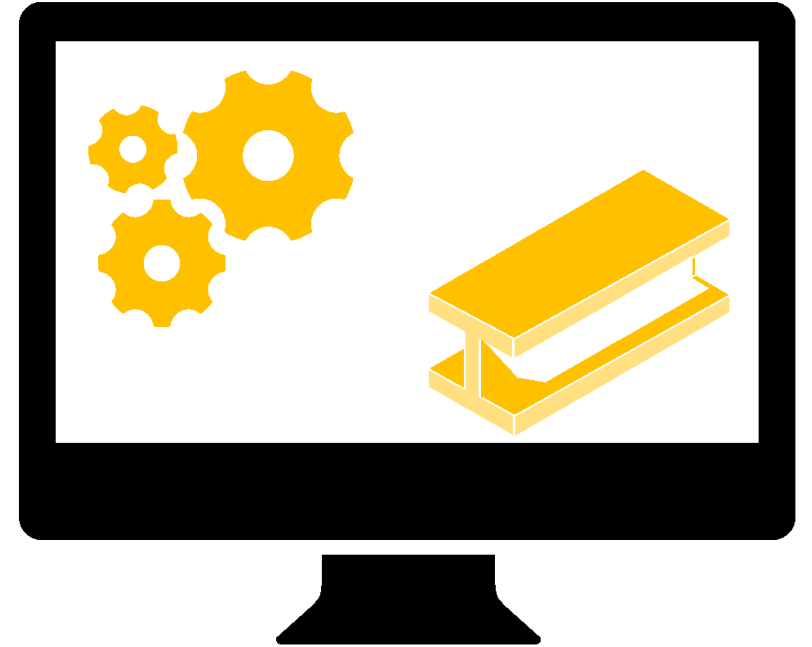
Education and Engagement



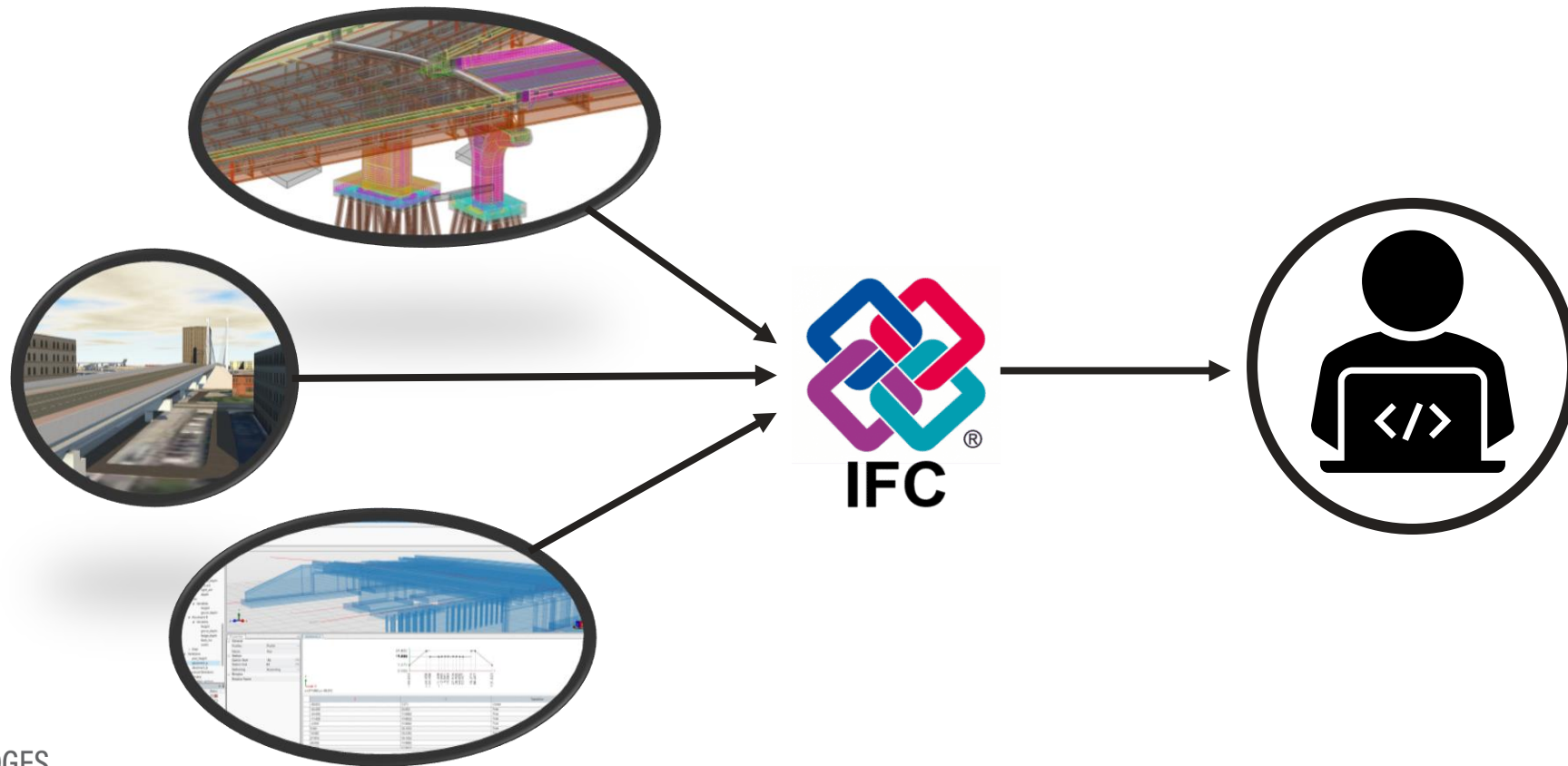
Economic Analysis (ROI)



# IFC DEVELOPMENT



# IFC Development





# Project Outcomes

OUTCOME 1: 

Development of Information  
Delivery Manual (IDM)

OUTCOME 2: 

Creation of Model View  
Definition (MVD)

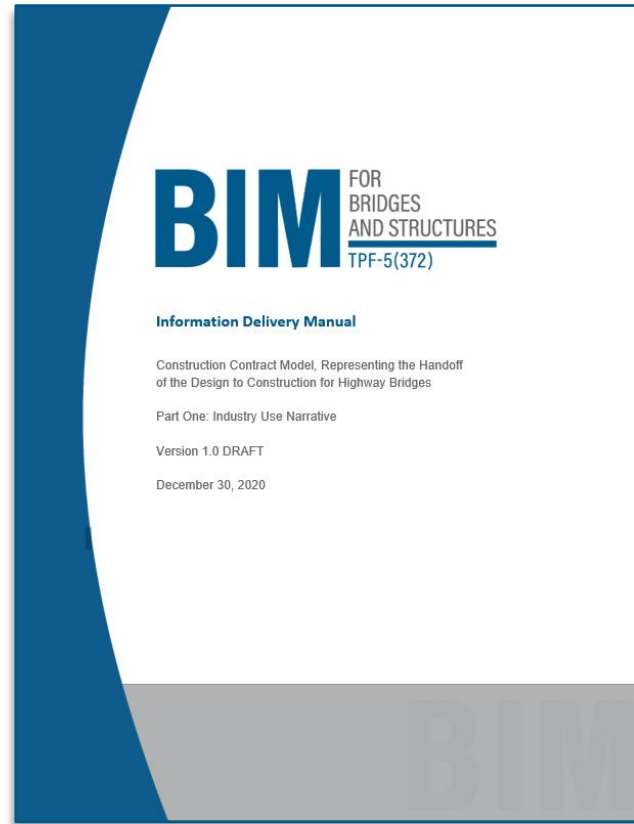
OUTCOME 3: 

Development of Software  
Certification Materials

OUTCOME 4: 

Deployment of Stakeholder  
Training

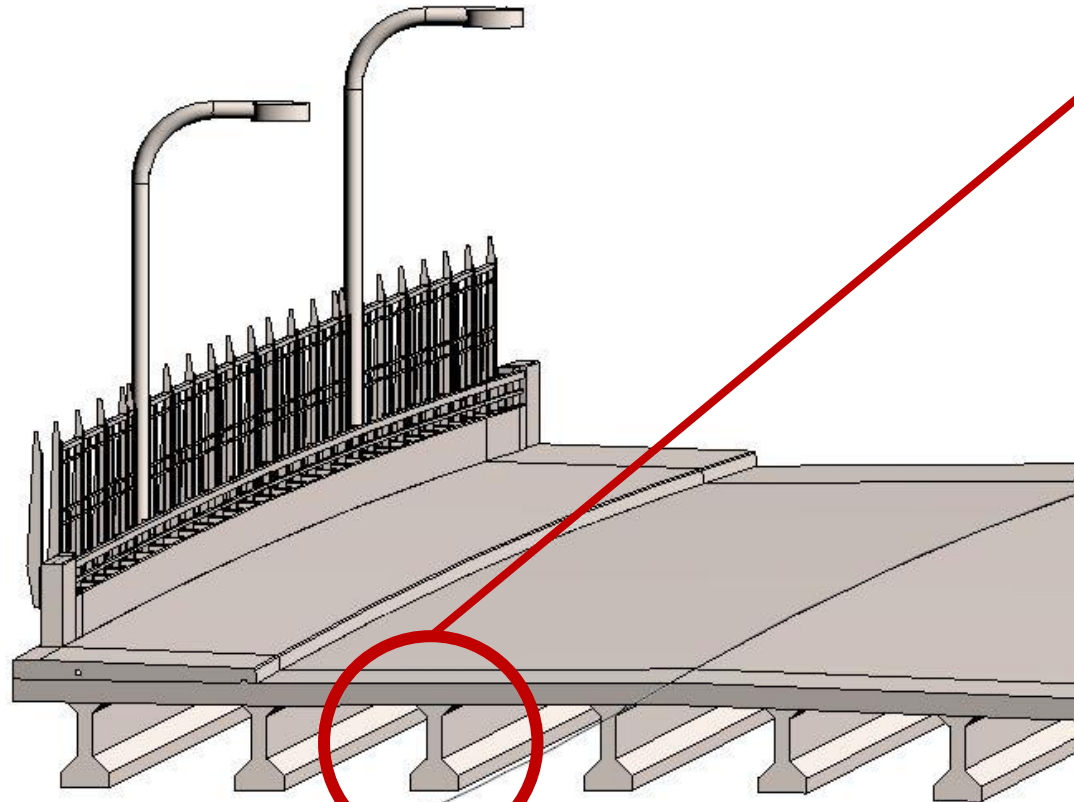
# Information Delivery Manual (IDM)



## Information Delivery Manual

- What element/object am I?
- What kind of properties do I have?
- What are the names of my individual properties?

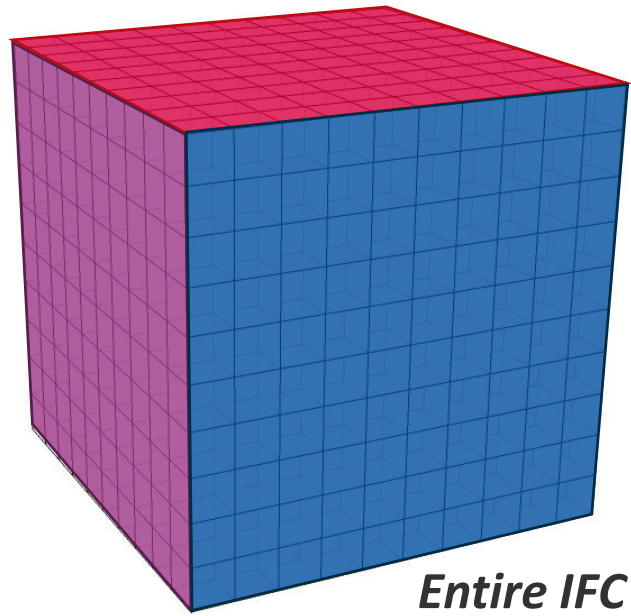
# Information Delivery Manual (IDM)



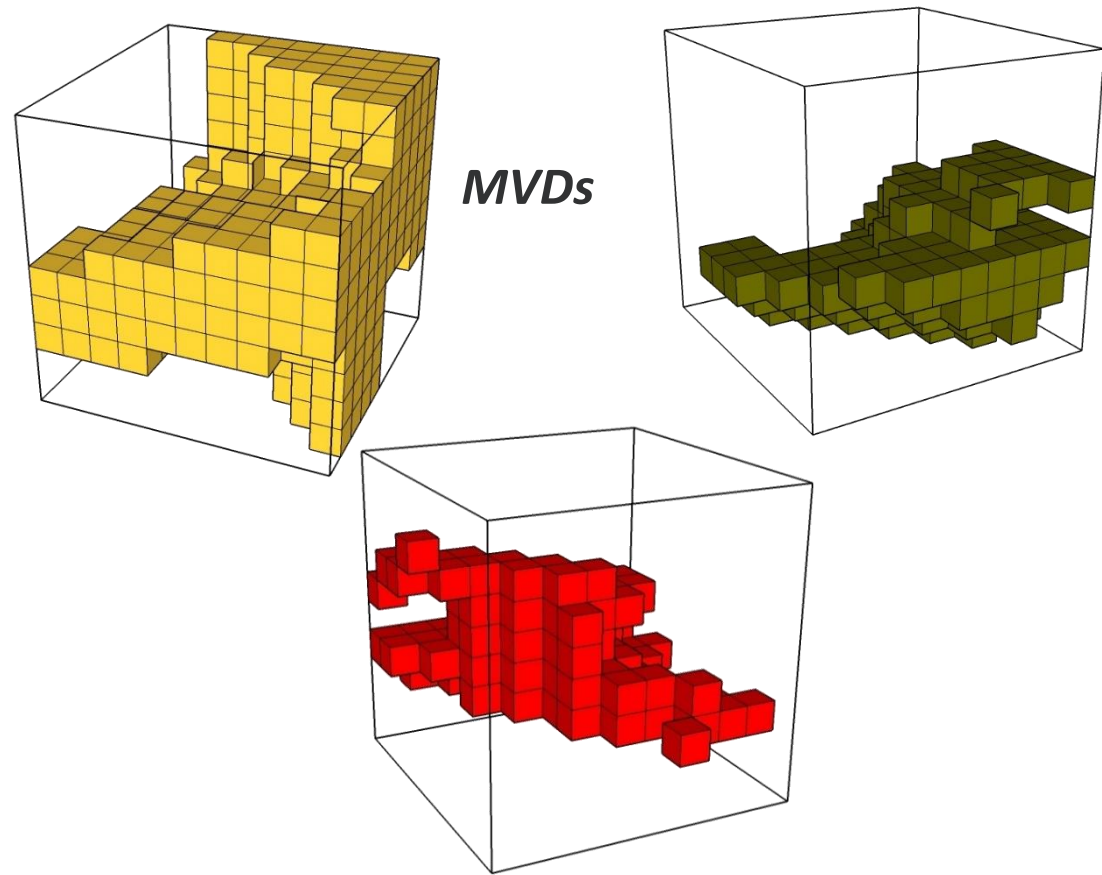
10111000000  
10110001100  
10001100101

Girder depth = 42"  
Web thickness = 6"  
Top flange width = 16"  
Bot. flange width = 22"  
Etc...

# Model View Definition (MVD)



*Entire IFC  
Schema*



*MVDs*

*Source: Mark Baldwin (Mensch & Maschine)*

# Model View Definition (MVD)

**Structural Engineer**

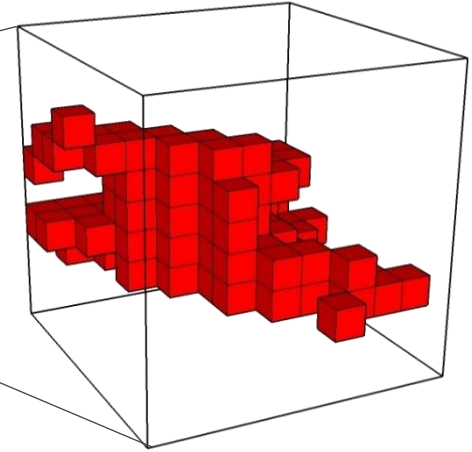
*design is complete*



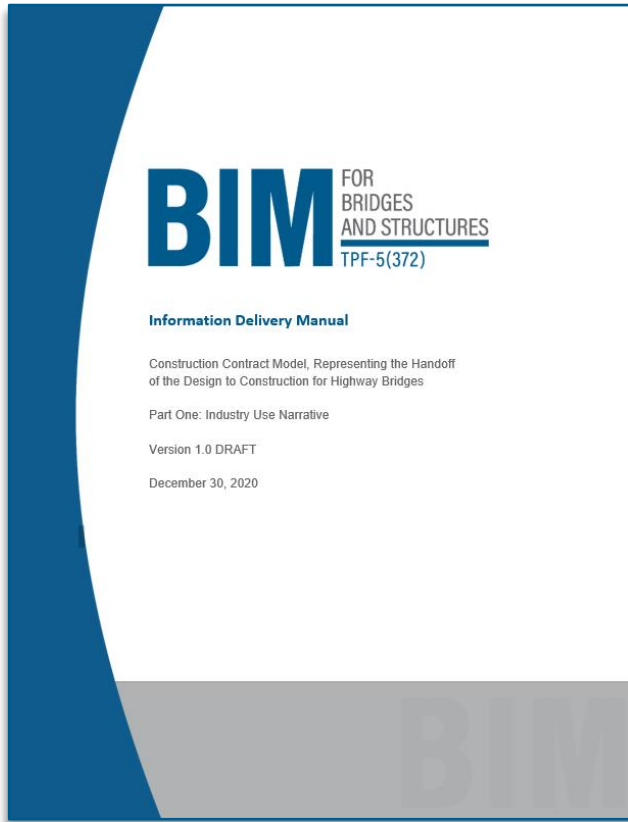
**Contractor**

*bid preparation*

*MVD*



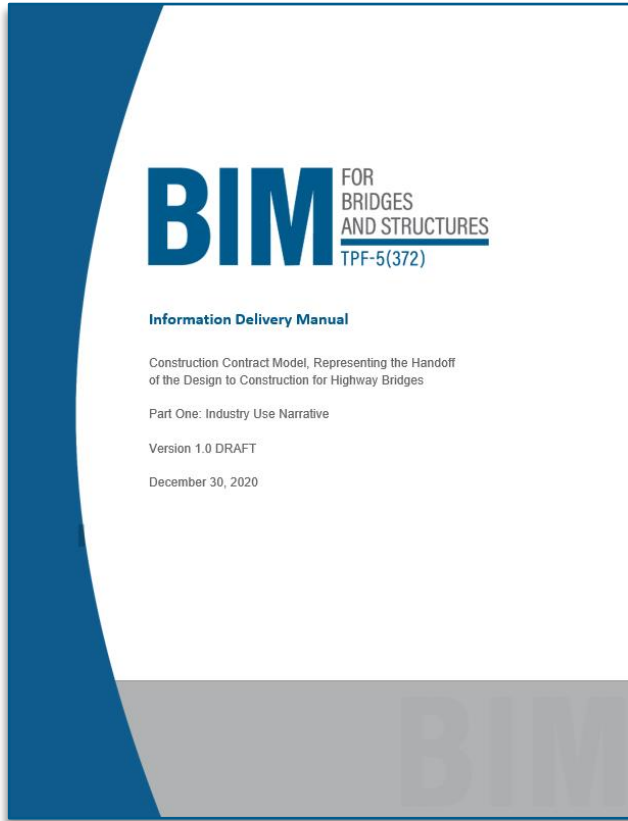
# IDM Status Update



## Table of Contents

- List of Acronyms
- Executive Summary
- Chapter 1 – Introduction
- Chapter 2 – Basis
- Chapter 3 – Scope
- Chapter 4 – Exchange Requirements
- References
- Appendix 1 - Definitions

# IDM Status Update

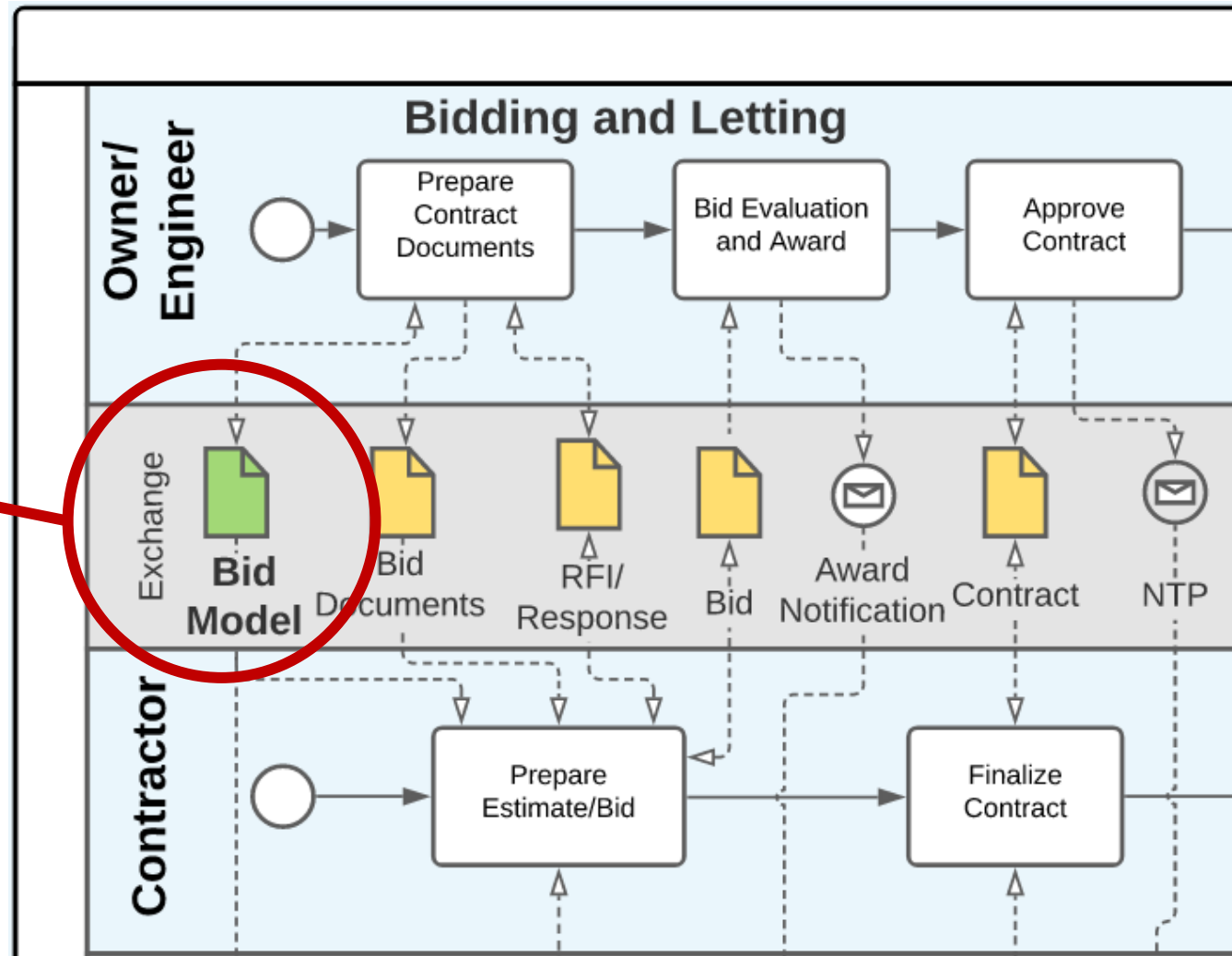
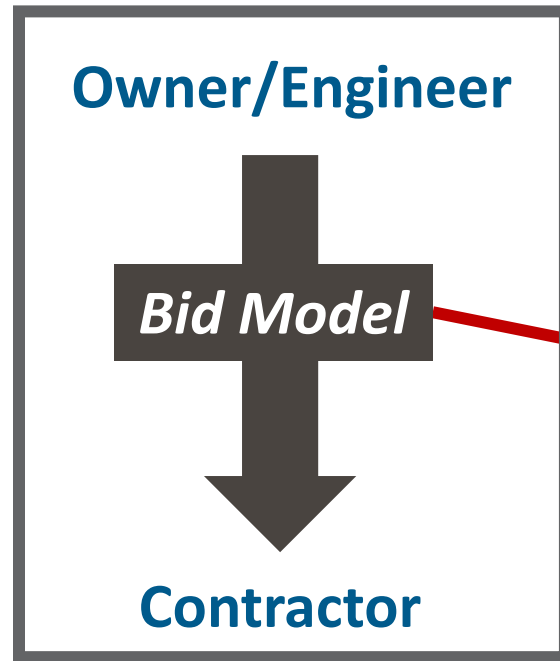


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- Appendix 1 - Definitions



# IDM: Covers One Specific Exchange



# IDM: Scope of the Exchange (Chapter 3)

- Structure Types
  - Slab bridges
  - Girder (i.e. I-girder, I-beam, box girder, deck beam) bridges
  - Common buried structures (box culverts, three-sided structures, arch-type)
  - Retaining walls associated with or adjacent to a bridge
- Material Types
  - Reinforced Concrete
  - Precast/Prestressed Concrete
  - Post-Tensioned Concrete
  - Steel

# IDM: Exchange Requirements (Chapter 4)

Category: Bridge Substructure													
Consolidated results								TPF-5(372) WG2 Evaluation					
Column	Entity	Property Set	Property	Combined Recommendation	HDR Recommendation	TPF Recommendation	TPF Comment Disposition	Reviewer 1 Evaluation	Reviewer 1 Comments	Reviewer 2 Evaluation	Reviewer 2 Comments	Reviewer 3 Evaluation	Reviewer 3 Comments
	Pedestal	General Properties	General Properties	Optional	Optional	Optional	Open	Optional	Material properties?	Optional		Optional	What does General Properties include? I am think material strength.
	Pedestal	Connections	Connections	Optional	Optional	Optional		Optional		Optional		Optional	
	Pedestal	Location	Station at pedestal location	Optional	Optional	Optional		Optional		Optional		Optional	
Category: Project													
Consolidated results								TPF-5(372) WG2 Evaluation					
Column1	Entity	Property Set	Property	Combined Recommendation	HDR Recommendation	TPF Recommendation	TPF Comment Disposition	Reviewer 1 Evaluation	Reviewer 1 Comments	Reviewer 2 Evaluation	Reviewer 2 Comments	Reviewer 3 Evaluation	Reviewer 3 Comments
	Identification	Identification numbers	Project Identification Number (PIN)	Mandatory	Mandatory	Mandatory		Mandatory				Mandatory	
	Identification	Identification numbers	Structure Number	Optional	Optional		Open	Mandatory	need to identify structure			Optional	
	Identification	Identification numbers	Construction Contract number	Mandatory	Mandatory	Mandatory		Mandatory				Mandatory	
	Identification	Names	Project name	Optional	Mandatory	Optional		Optional				Optional	
	Identification	Names	Structure name	Optional	Mandatory	Optional		Optional				Optional	
	Identification	Names	Structure alternative name (current)									Optional	
	Identification	Names	Structure alternative name (existing)									Optional	
	Identification	Over roadway identities (flyovers)	State highway name and number									Optional	
	Identification	Over roadway identities (flyovers)	Route number									Optional	
	Identification	Over roadway identities (flyovers)	Local road number/name									Optional	
	Identification	Over roadway identities (flyovers)	Functional classification									Not Required	
	Identification	Over roadway identities (flyovers)	Design classification									Not Required	
	Identification	Primary Road	State highway name and number									Optional	
	Identification	Primary Road	Route number									Optional	
	Identification	Primary Road	Local road number/name									Optional	
	Identification	Primary Road	Functional classification									Not Required	
	Identification	Primary Road	Design classification									Not Required	
	Identification	Under feature identities	Feature name (e.g. Highway, river, creek, railroad, etc.)									Optional	
	Identification	Under feature identities	Route number									Optional	
	Identification	Under feature identities	Local road number/name									Optional	
	Identification	Under feature identities	Functional classification									Optional	
	Location	Places	State									Optional	
	Location	Places	Region									Optional	
	Location	Places	County									Optional	
	Location	Places	District									Optional	

- Detailed review of bridge elements and properties
- Lists came from ongoing Data Dictionary development
- Combined recommendation from WG2 and HDR Team

# Data Dictionary (DD)

Category: Bridge Substructure				Consolidated results				TPF-5(372) WG2 Evaluation					
Column	Entity	Property Set	Property	Combined Recommendation	HDR Recommendation	TPF Recommendation	TPF Comment Disposition	Reviewer 1 Evaluation	Reviewer 1 Comments	Reviewer 2 Evaluation	Reviewer 2 Comments	Reviewer 3 Evaluation	Reviewer 3 Comments
	Pedestal	General Properties	General Properties	Optional									
	Pedestal	Connections	Connections	Optional									
	Pedestal	Location	Station at pedestal location	Optional									
	Pedestal	Location	Skew angle at pedestal location	Optional									
	Pedestal	Location	Elevation at the upper surface	Optional									
	Pedestal	Location	Elevation at the bottom surface	Not Required									
	Integral Pier/Bent Cap	General Properties	General Properties	Optional									
	Integral Pier/Bent Cap	Connections	Connections	Optional									
	Pier cap	General Properties	General Properties	Optional									
	Pier cap	Connections	Connections	Optional									
	Pier cap	Type	hammer head	Optional									
	Pier cap	Type	Multi column	Optional									
	Pier cap	Type	tapered	Optional									
	Pier cap	Type	stepped	Optional									
	Pier cap	Type	inverted	Optional									
	Pier cap	Location	Station at cap beam location	Optional									
	Pier cap	Location	Skew angle at cap beam location	Optional									
	Pier cap	Location	Elevation array (such as for stepped caps)	Optional									
	Pier cap	Location	Elevation at the left end	Optional	Optional	Optional		Optional		Optional		Optional	
	Pier cap	Location	Elevation at the right end	Optional	Optional	Optional		Optional		Optional		Optional	
	Pier cap	Dimensions	Cap beam length	Optional	Optional	Optional		Optional		Optional		Optional	
	Pier cap	Dimensions	Cap beam width	Optional	Optional	Optional		Optional		Optional		Optional	
	Pier cap	Dimensions	Cap beam thickness	Optional		Optional		Optional		Optional		Optional	
	Pier cap	Dimensions	Cap beam depth	Optional	Optional	Optional		Optional		Optional		Optional	
	Pier cap	Dimensions	Top offset	Optional		0 Optional	Open	Optional		Optional		Optional	
	Pier cap	Dimensions	Fillet radius	Optional		0 Optional	Open	Optional		Optional		Optional	
	Pier cap	Dimensions	Horizontal chamfer	Optional		0 Optional		Optional		Optional		Optional	
	Pier cap	Dimensions	Vertical chamfer	Optional		0 Optional		Optional		Optional		Optional	
	Column Pier	General Properties	General Properties	Optional				Optional		Optional		Optional	
	Column Pier	Connections	Connections	Optional				Optional		Optional		Optional	

Data Dictionary was reviewed indirectly as part of the development of the Exchange Requirements

required

offset of what?

Fillet Radius of what?

Data Dictionary was reviewed indirectly as part of the development of the Exchange Requirements

Taxonomy defines term relationships and structure

Data Dictionary assigns GUID, metadata, and user-defined information

## Dictionary

- Definitions
- Uses

## Glossary

- Domain-specific terms

## Classification System

- Formal classification

# MVD Status Update

ifc4.3\_infra\_RC1.ifcdocxml - IFC Documentation Generator

File Edit View Insert Diagram Tools Help

Find

Scope

- Bridge Alignment Reference View
  - Bridge Alignment Reference Exchange
    - IfcAlignment
      - Referent Nesting [Element Nesting]
      - Alignment Attributes
    - IfcProduct
    - IfcReferent
  - Bridge Design Transfer View
  - Bridge Reference View
  - Coordination View
  - Design Transfer View
  - General Usage
  - Reference View
- Normative references
- Terms, definitions, and abbreviated terms
- Fundamental concepts and assumptions
- Core data schemas
- Shared element data schemas
- Domain specific data schemas
- Resource definition data schemas
- { } Constants
- { } Property Constants
- { } Property Enumerations
- { } Properties
- { } Quantities
- Computer interpretable listings
- Alphabetical listings
- Inheritance listings
- Diagrams
- Examples
- Change logs
- { } Bibliography
- { } Publications

IfcElement

GlobalId	[1:1]
OwnerHistory	[0:1]
Name	[0:1]
Description	[0:1]
HasAssignments	S[0:2]
Nests	S[0:1]
IsNestedBy	S[0:2]
HasContext	S[0:1]
IsDecomposedBy	S[0:2]
Decomposes	S[0:1]
HasAssociations	S[0:2]
ObjectType	[0:1]
IsDeclaredBy	S[0:1]
Declares	S[0:2]
IsTypedBy	S[0:1]
IsDefinedBy	S[0:2]
ObjectPlacement	[0:1]
Representation	[0:1]
ReferencedBy	S[0:2]
PositionedRelativeTo	S[0:1]
ReferencedInStructures	S[0:2]

IfcRelNests

GlobalId	[1:1]
OwnerHistory	[0:1]
Name	[0:1]
Description	[0:1]
RelatingObject	[1:1]
RelatedObjects	L[1:2]

IfcElement

GlobalId	[1:1]
OwnerHistory	[0:1]
Name	[0:1]
Description	[0:1]
HasAssignments	S[0:2]
Nests	S[0:1]
IsNestedBy	S[0:2]
HasContext	S[0:1]
IsDecomposedBy	S[0:2]
Decomposes	S[0:1]
HasAssociations	S[0:2]
ObjectType	[0:1]
IsDeclaredBy	S[0:1]
Declares	S[0:2]
IsTypedBy	S[0:1]
IsDefinedBy	S[0:2]
ObjectPlacement	[0:1]
Representation	[0:1]
ReferencedBy	S[0:2]
PositionedRelativeTo	S[0:1]
ReferencedInStructures	S[0:2]

IfcLocalPlacement

PlacesObject	
PlacementRelTo	
RelativePlacement	

Documentation Identity Query Constraints Parameters Requirements

Locale Name Description URL

Referent Nesting

# IFC Schema

IFC4.3 RC2 - Release Candidate 2 [Draft]

Cover

Contents

Foreword

Introduction

1. Scope

2. Normative references

3. Terms, definitions, and abbreviated terms

4. Fundamental concepts and assumptions

5. Core data schemas

6. Shared element data schemas

7. Domain specific data schemas

8. Resource definition data schemas

A. Computer interpretable listings

B. Alphabetical listings

C. Inheritance listings

D. Diagrams

7.11.2.9 IfcTendonTypeEnum

7.11.2.10 IfcVoidingFeatureTypeEnum

7.11.2.11 IfcBendingParameterSelect

7.11.3 Entities

7.11.3.1 IfcFooting

7.11.3.2 IfcFootingType

7.11.3.3 IfcPile

7.11.3.4 IfcPileType

7.11.3.5 IfcReinforcementDefinitionPro

7.11.3.6 IfcReinforcingBar

7.11.3.7 IfcReinforcingBarType

7.11.3.8 IfcReinforcingElement

7.11.3.9 IfcReinforcingElementType

7.11.3.10 IfcReinforcingMesh

7.11.3.11 IfcReinforcingMeshType

7.11.3.12 IfcSurfaceFeature

7.11.3.13 IfcTendon

7.11.3.14 IfcTendonAnchor

7.11.3.15 IfcTendonAnchorType

7.11.3.16 IfcTendonConduit

7.11.3.17 IfcTendonConduitType

7.11.3.18 IfcTendonType

7.11.3.19 IfcVoidingFeature

7.11.4 Property Sets

7.11.4.1 Pset\_ConcreteElementGeneri

7.11.4.2 Pset\_FootingCommon

7.11.4.3 Pset\_PileCommon

7.11.4.4 Pset\_PrecastConcreteElemen

7.11.4.5 Pset\_PrecastConcreteElemen

7.11.4.6 Pset\_PrecastSlab

7.11.4.7 Pset\_ReinforcementBarCount

7.11.4.8 Pset\_ReinforcementBarPitchC

7.11.4.9 Pset\_ReinforcementBarPitchC

7.11.4.10 Pset\_ReinforcementBarPitchC

7.11.4.11 Pset\_ReinforcementBarPitchC

7.11.4.12 Pset\_ReinforcementBarPitchC

7.11.3.1 IfcFooting

DE

Fundament / Flachgründung

EN

Footing

FR

Fondation

Natural language names

Change log

Item	SPF	XML	Change	Description
IFC2x3 to IFC4 4.0.0.0				
IfcFooting				
OwnerHistory			MODIFIED	Instantiation changed to <i>OPTIONAL</i> .
PredefinedType			MODIFIED	Instantiation changed to <i>OPTIONAL</i> .
IFC4.2 Candidate 4.2.0.0				
IfcFooting				
PositionedRelativeTo			ADDED	

7.11.3.1.1 Semantic definitions at the entity

Entity definition

A footing is a part of the foundation of a structure that spreads and transmits the load to the soil. A footing is also characterized as shallow foundation, where the loads are transferred to the soil by friction and end bearing.

NOTE Definition according to ISO 6707-1: stepped construction that spreads the load at the foot of a wall or column.

HISTORY New entity in IFC2x2.

NOTE Slab foundations, also called slab-on-grade, are not instantiated as IfcFooting but as IfcSlab or as its subtype IfcSlabStandardCase, IfcSlabElementedCase with a thickness, which transfer the loads to subsurface layers, are represented by IfcDeepFoundation and its subtypes IfcCaissonFoundation and IfcPile.

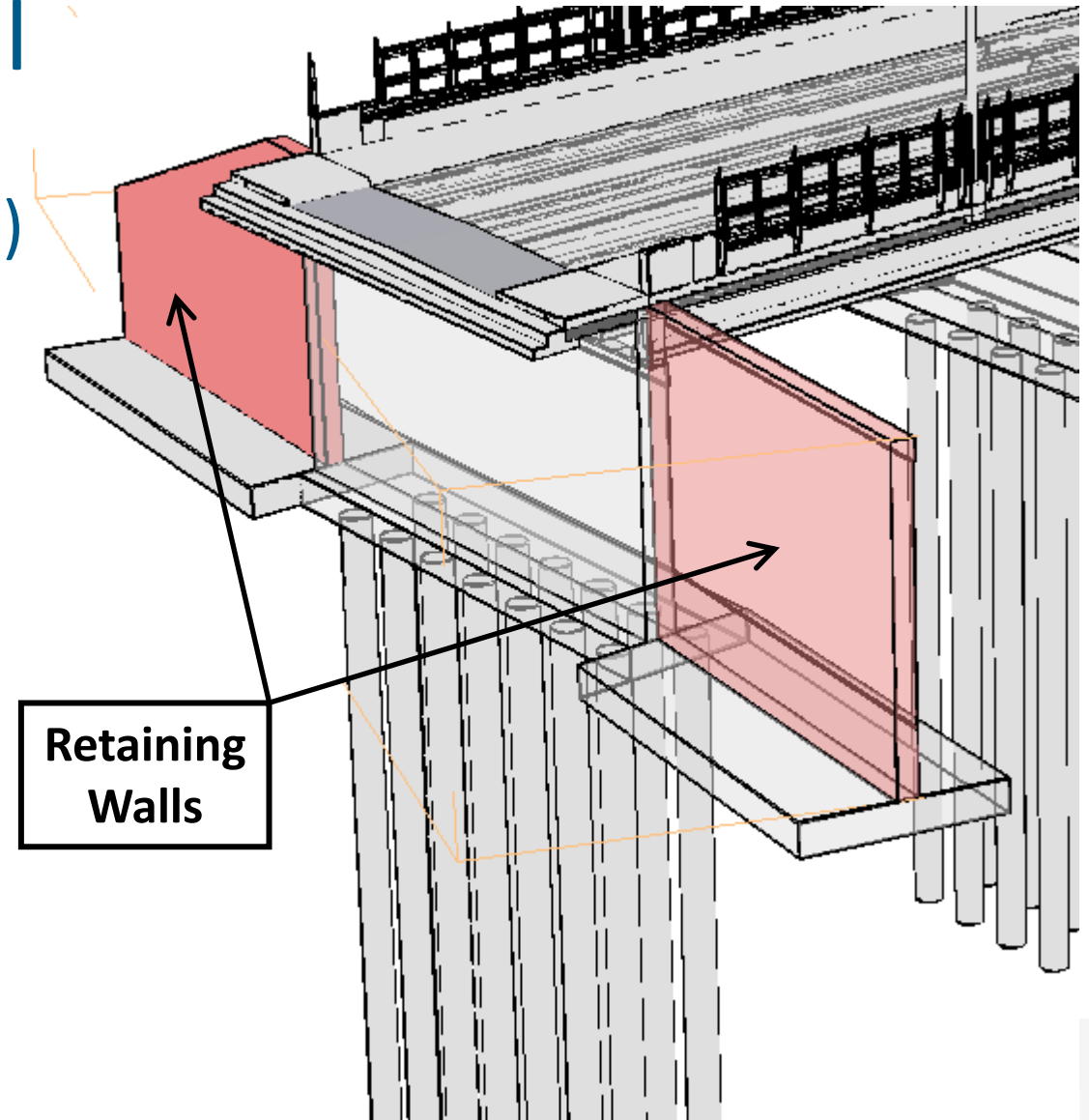
Attribute definitions

#	Attribute	Type	Cardinality	Description
1	Base	IfcSurface	1	Base of the footing
2	TopSurface	IfcSurface	1	Top surface of the footing
3	LongitudinalReinforcement	IfcReinforcingBar	1	Longitudinal reinforcement
4	TransverseReinforcement	IfcReinforcingBar	1	Transverse reinforcement
5	PredefinedType	IfcText	1	Predefined type
6	OwnerHistory	IfcText	1	Owner history
7	PositionedRelativeTo	IfcText	1	Positioned relative to

# IFC Example: Retaining Wall

[https://standards.buildingsmart.org/IFC/DEV/IFC4\\_3/RC2/HTML/link/ifcwall.htm](https://standards.buildingsmart.org/IFC/DEV/IFC4_3/RC2/HTML/link/ifcwall.htm)

- Defined in IFC schema as a wall (IfcWall)
- Predefined Type: RETAININGWALL
- Concept Templates (IfcWall):
  - Property Sets for Objects
  - Quantity Sets
  - Material Layer Set
  - Path Connectivity
  - Spatial Containment
  - Axis 2D Geometry
  - Surface Geometry
  - Body SweptSolid Geometry
  - Body Clipping Geometry
  - Voiding
  - Product Assignment





# IFC Development Accomplishments

- Pooled Fund IFC Working Group (WG2) – very active this year
- Key Accomplishments
  - WG2 review of Draft IDM in early 2021
  - Compilation of Exchange Requirements
  - Detailed review of Exchange Requirements by WG2
  - Combined recommendation on Exchange Requirements
  - MVD development underway
  - Finalized IDM coming soon

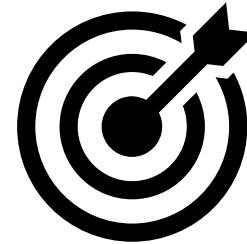
# Project Tasks



Investigation and Exploration



IFC Development



Industry Involvement



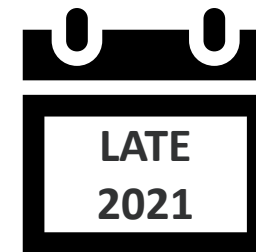
Education and Engagement



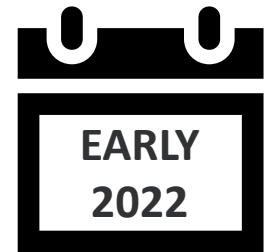
Economic Analysis (ROI)

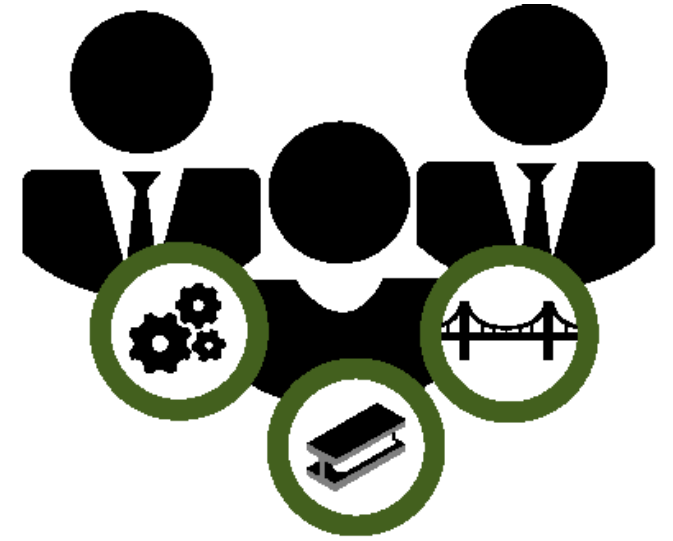


IDM



MVD





# INDUSTRY INVOLVEMENT

# BIM FOR BRIDGES AND STRUCTURES

TPF-5(372)

## ROADMAP

### BACKGROUND

The desired outcome of the work under the TPF-5(372) Project is to establish a standard for bridge semantic and geometric information that is common in the United States, which is a continuation of a previous effort known as the IFC Bridge project to create international standards. The resulting products from the TPF-5(372) may be used by States as a baseline for future projects to further refine standards at the local level. The work under this project will be conducted in a series of activities in a five-year timeline to accomplish four major goals:

#### OUTCOME 1:

Development of Information Delivery Manual (IDM)

#### OUTCOME 2:

Creation of Model View Definitions (MVD)

#### OUTCOME 3:

Development of Software Certification Materials

#### OUTCOME 4:

Deployment of Stakeholder Training

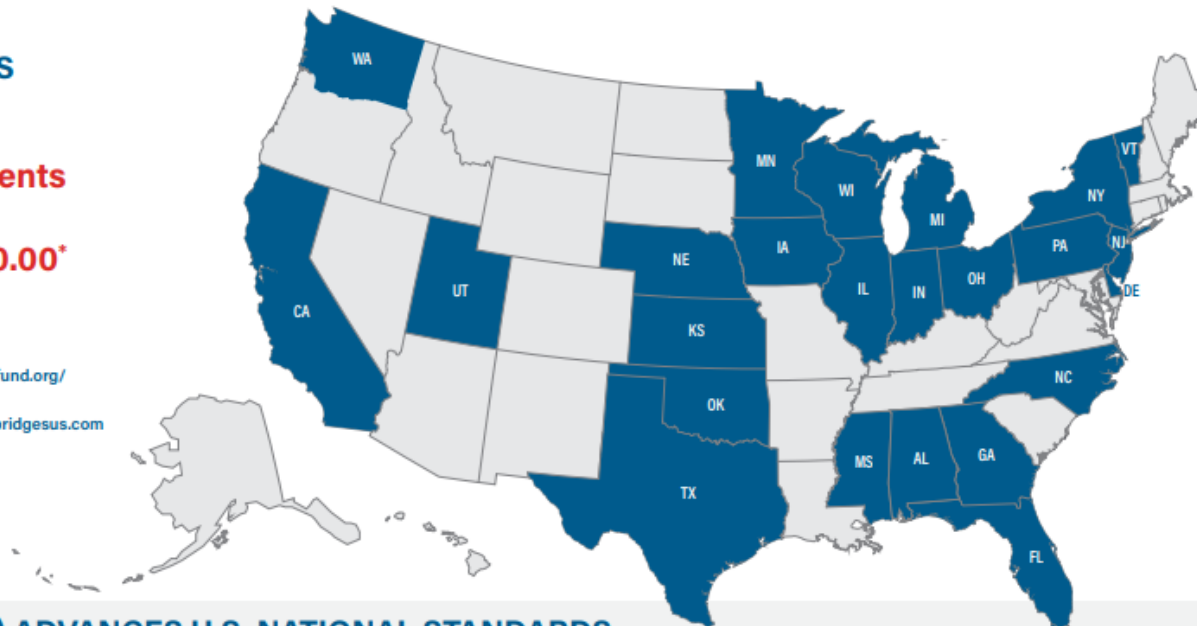
### PROJECT SPONSORS

**Total Commitments Received:**  
**\$2,100,000.00\***

\*As of March 2021

<https://www.pooledfund.org/Details/Study/624>

<https://www.bimforbridgesus.com>



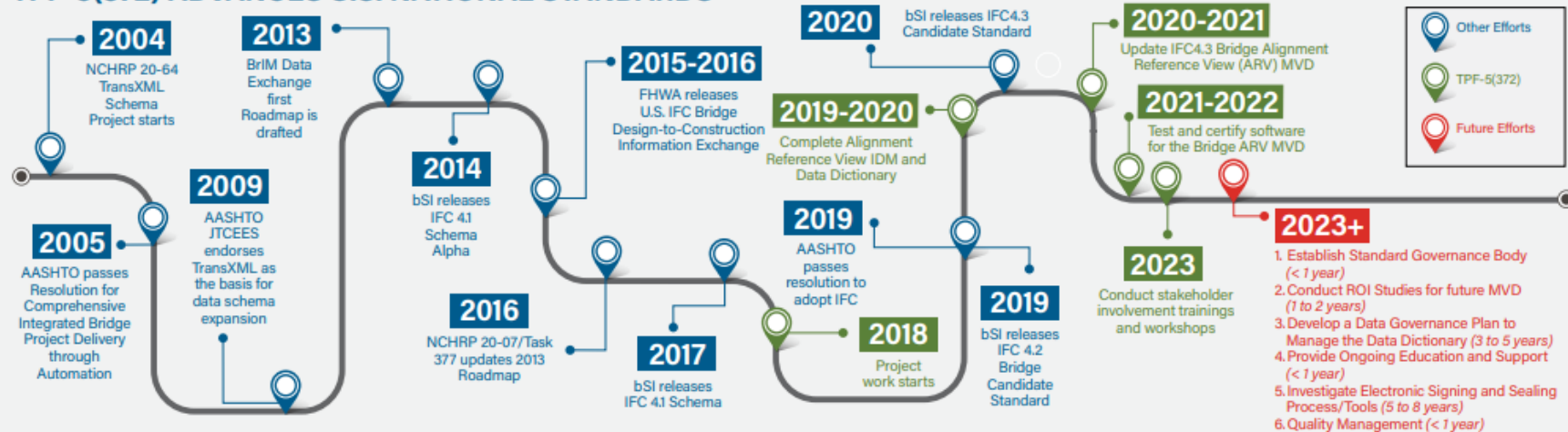
**24 PARTICIPATING STATES PLUS FHWA\***

**Potential AASHTO Publications**

- BIM for Bridges IDM
- BIM for Bridges MVD
- BIM Guide for MVD certification



### TPF-5(372) ADVANCES U.S. NATIONAL STANDARDS



#### Key Activities to Create IDM

- Validate FHWA Bridge Lifecycle Process Map
- Develop IDM
- Evaluate current data dictionary
- Develop engagement plan



#### Key Activities to Create MVD

- Research common terms for bridge taxonomy for naming elements
- Evaluate proposed data structure and LOD requirements
- Generate exchange requirements



#### Key Activities to Test Software

- Create a software vendor engagement plan
- Create manuals and guidance documents to support software vendors in the initial certification process



#### Key Activities for Stakeholder Involvement

- Create product-specific BIM Guides on how to use the standards
- Conduct an ROI study
- Host seminars, conferences, and workshops to educate on the standards
- Develop a collaboration forum to gather feedback on standards

Year 1

Year 2

Year 3

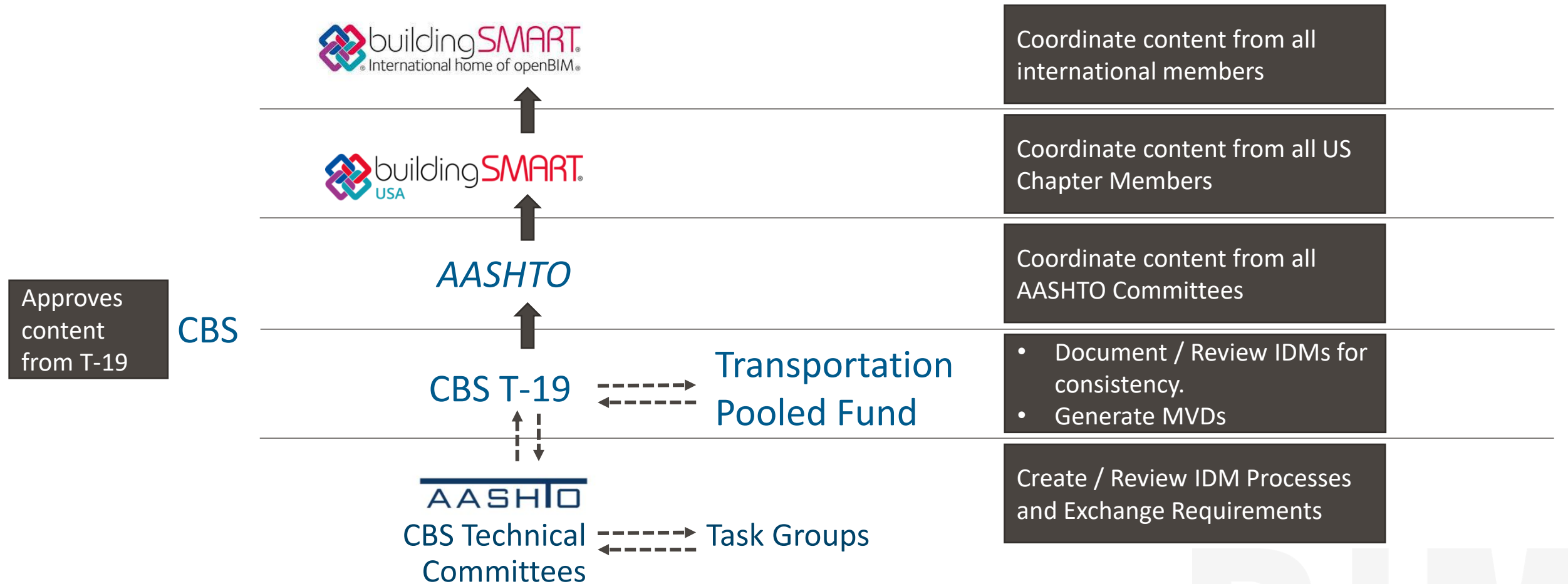
Year 4

Year 5

# Engagement with buildingSMART

- IFC 4.3 Program Board (buildingSMART International)
  - Attend regular Program Board meetings
  - Keep track of work to finalize IFC 4.3 standard
  - Collaborate with IFC Infra/Bridge project
- buildingSMART USA
  - Ongoing engagement efforts

# Potential Governance Structure



# Software Vendor Engagement

- Software Advisory Group
- Letter of Intent
- Unit Test Suite
- Outreach to in-house steel detailing software developers (such as Tensor and others)
- Software Vendor Workshop next week

## Workshop Daily Schedule:

Tuesday, 20 July 2021

Time	Session	Objectives
9:00am-10:20am	Updates on TPF-5(372)	Overall Schedule / Scope review IDM / MVD <ul style="list-style-type: none"> <li>▪ Final IDM scope and format delivery</li> <li>▪ MVD creation and mvdXML delivery</li> </ul> Data Dictionary <ul style="list-style-type: none"> <li>▪ Data Dictionary content</li> <li>▪ Proposed Data Dictionary governance and delivery <ul style="list-style-type: none"> <li>○ bS-USA USDD Working Group</li> <li>○ USDD and bSDD</li> </ul> </li> </ul> General Q&A
10:20am-10:40am	Scheduled Break	
10:40am-11:20am	Demo w/ Q&A: Allplan & LARSA	Demonstrate early development progress and/or intent to support "BIM for Bridges and Structures"
11:20am-12:00pm	Demo w/ Q&A: Autodesk	

Wednesday, 21 July 2021

Time	Session	Objectives
9:00am-10:20am	Review of Software Vendor Engagement Plan	Letter of Intent Unit Test Suite Certification General Q&A
10:20am-10:40am	Scheduled Break	
10:40am-11:20am	Demo w/ Q&A: Bentley Systems	Demonstrate early development progress and/or intent to support "BIM for Bridges and Structures"
11:20am-12:00pm	Demo w/ Q&A: OpenBrim	

Thursday, 22 July 2021

Time	Session	Objectives
9:00am-10:20am	bSI IFC4.3 Progress	Candidate Standard status Feedback from participating Vendors on results General Q&A
10:20am-10:40am	Scheduled Break	
10:40am-11:20am	Demo w/ Q&A: PGSuper	Demonstrate early development progress and/or intent to support "BIM for Bridges and Structures"
11:20am-12:00pm	Demo w/ Q&A: Trimble – Quadri & Tekla Structures	

# Project Tasks



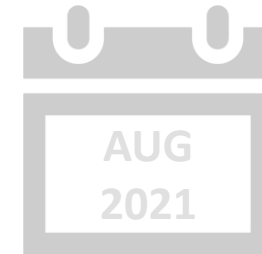
Investigation and Exploration



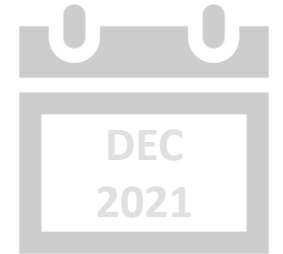
IFC Development



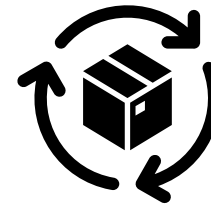
IDM



MVD



Industry Involvement



Education and Engagement



Economic Analysis (ROI)





# EDUCATION & ENGAGEMENT



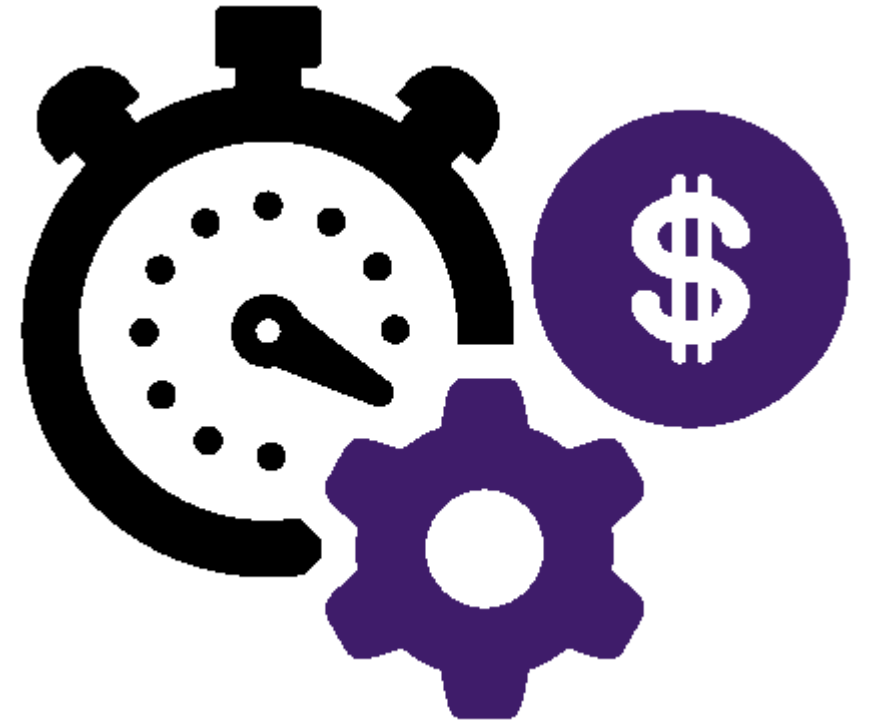
# Collaboration Site Status Update

- Collaboration Site expansion
- Develop high-level concept/mock-up
  - Up to 4 new sub-pages
    - Resource Library
    - AASHTO BIM Governance Standards/Process
    - Accomplishments
    - Data Dictionary
- Support the development of content
  - Publish on website
  - Limited content
- Ongoing web support



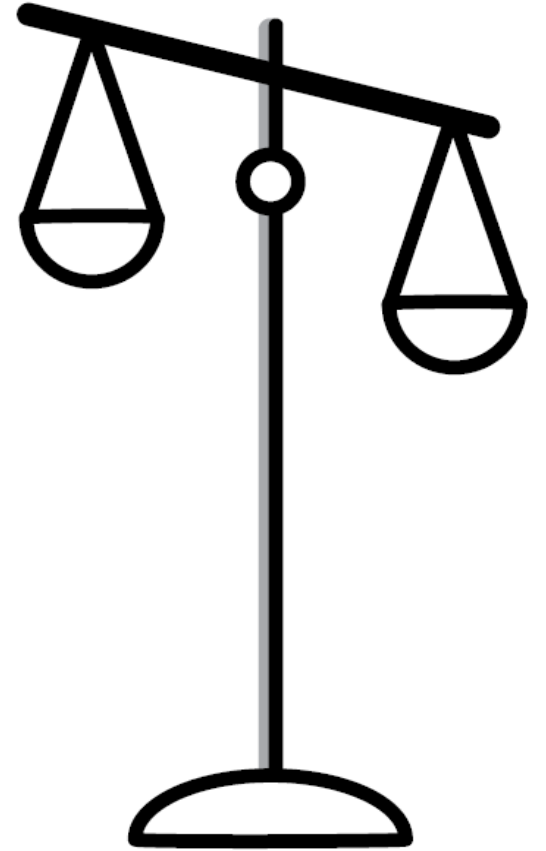
**BIMforBridgesUS.com**

# ECONOMIC ANALYSIS (ROI)



# Economic Analysis (ROI)

- Literature Review for Return-on-Investment study
  - Literature Review Report
  - New Working Group to be formed
- Formal ROI study → 2022



# QUESTIONS

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TPF-5(372)