第6回国際土木委員会
資料3-1

buildingSMART International
北京サミット報告

buildingSMART Japan
古屋 弘
有賀 貴志

国際土木委員会

一般社団法人 buildingSMART Japan

報告内容

- サミット概要
- Infrastructure Roomの動向
- プロジェクトの動向

プログラム（1/2）

Monday 28th October 2019

Opening Plenary
Hall B, Level 4, CNCC

09:00 | **Welcome/ Introduction**
Richard Petrie (CEO, buildingSMART International)
Sun, Ying (Vice President, China Construction Technology Consulting Co. Ltd)
Welcome from the Local Host
Xiu, Long (President, China Construction Technology Consulting Co. Ltd.)
Welcome from China Government Official
Welcome From the Co-Host
Sun, Ziyu (Vice President, China Communications Construction Company Ltd.)
Welcome From the Co-Host
Wang, Tongjun (Vice President, China State Railway Group Co., Ltd.)

09:25 | **Welcome from buildingSMART International: The True Value of Open Standards**
Richard Petrie (CEO, buildingSMART International)

Part 1: Digital Construction: How digital technology is changing the face of construction?

09:55 | **Delivering Digital Projects:**
Sean McGinn (Buildings Digital Leader, Arup)
Tristan McDonell (Chartered Civil Engineer and Director, Arup)

10:25 | **Japan's Construction BIM Leading the World to the Next Stage:**
Kazumi Yajima (BIM Director, Kajima Corporation)

10:55 Morning Tea Break and Group Photo

11:15 | **Digital Supply Chains in the Built Environment**
Enzo Blonk (Director Industry Engagement for Technical Industries, GS1)
Paul Surin (Associate Partner, IBM)

11:45 | **Panel Discussion: How can we speed up the digitization of the construction industry?**
Yu, Jie (President, China Design Digital Technology Co.,Ltd)
Liu, Boying (General Manager of Science and Technology Department, China Communications Construction Company Ltd.)
Suo Ning (Vice Director of CRBIM Expert Committee, China Railway BIM Alliance)
Kazumi Yajima (BIM Director, Kajima Corporation)
Mike Ramsay (Technical Director for Maritime and Aviation, Royal Haskoning)

12:30 Lunch (Hall A, Level 4, CNCC)

Part 2: Digital Asset Management: Why open standards help asset owners?

13:30 | **Liberating Data - Climbing the BIM Stairs Step by Step**
Karin Anderson (bSI/ Board Member, Trafikverket)

14:00 | **Optimizing Data Management at Schiphol Airport Using Open Standards**
Maya Tryfona (Data Engineer, Schiphol Airport)

14:30 Afternoon Tea Break

Part 3: "Towards a Digital Future"-Smart Cities: The compelling case for a digital city

15:00 | **Smart Cities - Integrating Digital Twin with Digital Workflow**
Boon Khai (Singapore Land Authority, CEO)

15:30 | **Digital Twins of a City**
Jarmo Suomisto (Project Manager, The City of Helsinki)

16:00 | **Panel Discussion: Smart Cities - Fact or Fiction?**
Boon Khai (CEO, Singapore Land Authority)
Jarmo Suomisto (Project Manager, The City of Helsinki)
Wolfgang Hass (Principle Consultant, Siemens)
Frank Weiss (Senior Director, Oracle)

16:40 | **buildingSMART and the Open Design Alliance**
Neil Peterson (President, Open Design Alliance)

16:55 | **Future Technology Vision**
Léon van Berlo (Technical Director, buildingSMART International)

17:10 | **The Solutions & Standards Program**
Richard Kelly (Operations Director, buildingSMART International)

19:00 buildingSMART Awards Dinner (Hall B, Level 4, CNCC)

China National Convention Center (CNCC)
No.8-1 Beichen West Road,
Chaoyang District,
Beijing,
100105
China

Thursday 31st October 2019

Closing Plenary
Level 1, Ballroom A

08:30 | **buildingSMART's International Standards Summit conclusions**
| **Program Lead:** Richard Kelly
Rooms and groups' actions arising, resolutions and future work plans

| **ISG:** Jeffrey Ouellette
| **Technical Room:** Greg Schleusner
| **Infra Room:** Tiina Perttula
| **Product Room:** (tbc)
| **Regulatory Room:** Nicholas Nisbet
| **Construction Room:** Ken Endo
| **Airport Room:** Alex Worp
| **Building Room:** David Ivey

10:00 | **IFC Rail**
Winfried Stix (ÖBB-Infrastruktur AG, Lead Coordinator)

10:20 | **Universal Types - Making Construction Products More Accessible**
Dirk Schaper (ProMaterial, CEO)

10:40 Morning Tea Break

11:00 | **Professional Certification Progress Report**
Mark Baldwin (Managing Director, Digital Insights)
Sarah Merz (Head of Academy, EDUBIM)

11:20 | **IFC Bridge**
Christophe Castaing (Egis, Director of Digital Engineering)

11:40 | **Closing Address:**
Richard Petrie (buildingSMART International, CEO)

Friday 1st November 2019

BIM Project Visit

Project
National Speed Skating Oval (NSSO), Beijing

Date
Friday 1st November 2019

Agenda

09:00 a.m.	Departure (about 20mins drive from NCCC Grand Hotel/ Intercontinental Hotel to NSSO)
09:30a.m.-10:30a.m.	Project introduction and free discussion in the NSSO meeting room
10:30a.m.-11:30a.m.	Site visiting
11:30a.m.-12:30p.m.	Lunch
12:30p.m.-13:00p.m.	Back to hotel

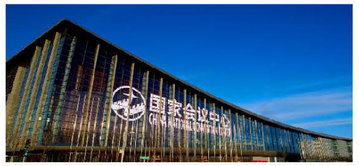
Please Note

1. buildingSMART China will provide free bus between the hotel and the NSSO
2. More detailed information such as the bus license plate number will be sent to delegates via email
3. Any question about the project visiting, please contact Shuang Huang (huangs@cbs.com.cn, +86 18701322305)

プログラム（2/2）

Wednesday 30th October 2019

China National Convention Center (CNCC)
No.8-1 Beichen West Road,
Chaoyang District,
Beijing,
100105
China



	Technical Focus Rooms				User Focus Rooms				bSI
	Technical Room	Building Room	Infrastructure Room	Product Room	Regulatory Room	Construction Room	Airport Room	Railway Room	bSI General
Room	202	402	302	303	403	203	205	301	405
	Registration – Morning welcome								
09:00 Session 5 10:30	TR5 Linked Data	BR5 Presentations of openBIM projects in China	IR5 IFC Ports & Waterways	PR5 Content / Quality Management Procedures Working Group	RR5	CR5 Common Data Environment for "long term data repository", "Multi use of data"	AR5 Update GIS and IFC Developments and IFC-GIS use cases at Schiphol	RWR5 IFC Rail Phase 2 - Project Proposal: Tasks, Methods, Discussion	bG5
	Break								
11:00 Session 6 12:30	TR6 Digital Twin Concepts and Technology Joint Session CR6 / AR6 Room 202	BR6 Opportunities for Automated Compliance Joint Session RR6 Room 402	IR6 IFC Road	PR6 Product Data Templates Working Group	RR6 Opportunities for Automated Compliance Joint Session BR6 Room 402	CR6 Digital Twin at Construction Site Joint Session TR6 / AR6 Room 202	AR6 Digital Twin/ CDE; bSI standards for a Digital Twin Joint Session TR6 / CR6 Room 202	RWR6 IFC Rail Phase 2 - Workshop SW-Manufacturer: Use Cases/MVDs Data Samples Expectations	bG6
	Lunch								
13:30 Session 7 15:00	TR7 Project Review and Planning	BR7 New Projects 2020 (Including Quantity Take Off / IFC Energy & Landscape / IFC Spatial Zone)	IR7 Infra & Rail Joint Session Delivery Plan & Harmonisation Joint Session RWR2 Room 302	PR7	RR7 2020 Projects Launch	CR7 Technical Session (Technical and Business Trend of Industries)	AR7 Update from Civil Aviation University of China Project Proposal missing IFC entities	RWR7 Common Schema: Project Proposal, Harmonisation , Funding Joint Session IR7 Room 302	bG7 bSDD Agents Launch
	Break								
15:30 Session 8 17:00	TR8 Project Review and Planning	BR8 Closing Session	IR8 Closing Session	PR8 Closing Session	RR8 Requirements and regulations in Infra projects Joint Session IR8 Room 302	CR8 Closing Session	AR8 Mirroring the AR-roadmap to the summit topics and making summit conclusions	RWR8 Closing Plenary – Summarize & Proposal for RWR Resolution	bG8

Tuesday 29th October 2019

China National Convention Center (CNCC)
No.8-1 Beichen West Road,
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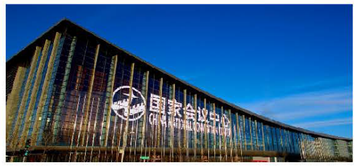
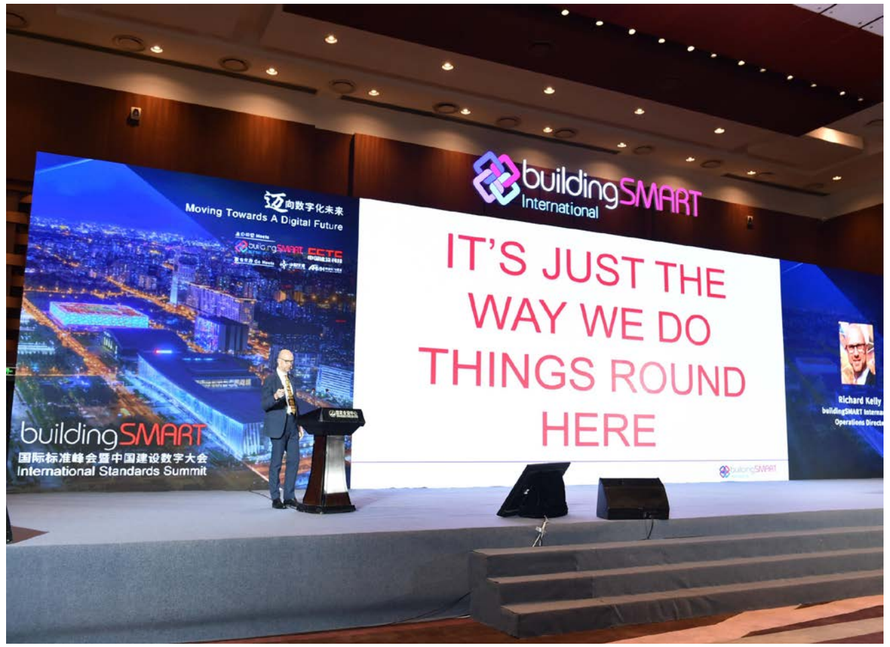
Beijing,
100105
China



	Technical Focus Rooms				User Focus Rooms				bSI
	Technical Room	Building Room	Infrastructure Room	Product Room	Regulatory Room	Construction Room	Airport Room	Railway Room	bSI General
Room	202	402	302	303	403	203	205	301	405
	Registration – Morning welcome								
09:00 Session 1 10:30	TR1 Technical Room Opening Plenary	BR1 Introduction to buildingSMART Standards	IR1 Introduction to next phase of IFC for Infrastructure development	PR1 Opening Session	RR1 Business Case for Automated Regulatory Compliance Report - Discussion & Expert Panel	CR1 Opening Session	AR1 Introduction Update on ARSC Roles Roadmap	RWR1 Opening Plenary: Deliverables of the IFC-Rail Project - Overview and Domains	bG1 Professional Certification – Chapter Implementation
	Break								
11:00 Session 2 12:30	TR2 Current Working Group and Project Update	BR2 Roadmap Presentations Introduction to Open Standards	IR2 Common Schema (Infra Room Projects) IFC for Landscape	PR2 bSDD Needs and Requirements Workshop	RR2	CR2 Use Case of Construction BIM	AR2 Developments : Schiphol's OTL and CDE Future of 'Library exchange specification'	RWR2 IFC Rail Phase 1: Requirements Conceptual Model IFC Candidate Standard	bG2
	Lunch								
13:30 Session 3 15:00	TR3 Serving the Technical needs of the Rail Room Projects Joint Session RWR Room 202	BR3 Building Room Active Projects Updates	IR3 Infra Room Roadmap IDBE Update	PR3 bSI Standards and the Supply Chain (with GS1) Joint Session CR3 Room 303	RR3 Overview of Regulatory Room, Charter, Roadmap, Projects	CR3 BIM and Logistics Joint Session PR3 Room 303	AR3 Usage of rules for IFC models and the Digital TWIN at Airports Presentation by NACO-RHDHV	RWR3 Progress of BIM work of various National Railway Companies Parallel Joint Session TR3 Room 202	bG3 bSI Process
	Break								
15:30 Session 4 17:00	TR4	BR4	IR4 IFC Tunnel	PR4	RR4 Application Updates and Developments	CR4 Quantity Take Off	AR4	RWR4	bG4 Linking Ontologies Room 303



サミット概要

Standards Summit, Beijing 2019

CHAPTERS（支部）


Benelux


Spain


Nordics


UK&I


Australasia


Singapore


China


Canada


Germany


Austria


Japan

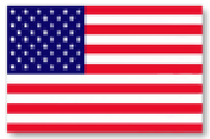

Norway


South Korea


France


Russia


Switzerland


USA


Italy

Newest Chapter


Poland

Formal Chapter Requests


Finland


Hong Kong


Sweden


Turkey

Potential Future Chapters


Brazil


Chile


Croatia


Estonia


Latvia


Lithuania


Mexico


Peru


Portugal


Slovenia


UAE

MEMBERS（会員）

Strategic Advisory Council

ARUP

CCCC CHINA COMMUNICATIONS CONSTRUCTION COMPANY

RBIM 中国铁路BIM联盟

NEMETSCHEK GROUP

SIEMENS Ingenuity for life

ORACLE

News!

Multinational Members

Bentley Advancing Infrastructure

BLUEBEAM A NEMETSCHEK COMPANY

BRICSCAD

Catenda

coBuilder

DASSAULT SYSTEMES

GRAPHISOFT A NEMETSCHEK COMPANY

鹿島 KAJIMA CORPORATION

Royal HaskoningDHV Enhancing Society Together

VECTORWORKS

SBB CFF FFS

STRABAG

Trimble

Standard Members

ACCA SOFTWARE

Basler & Hofmann

BIM INFRA.DK

BEXEL CONSULTING

CEMEX

crb

DB NETZE

DBA GROUP

ferrovial agroman

FM Global

HOCHTIEF PPP SOLUTIONS

HOCHTIEF ViCon

iLF CONSULTING ENGINEERS

h+k

Leica Geosystems

M metro

mensch maschine CAD as CAD can

ÖBB INFRA

OYO oyo corporation

POLITECNICO MILANO 1863

ProMaterial The digital construction network

RFI RETE FERROVIARIA ITALIANA

Rijkswaterstaat Ministry of Infrastructure and the Environment

SAMOOCM.

Schiphol Amsterdam Airport

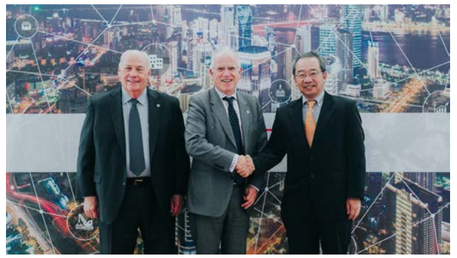
SNCF RÉSEAU

storaenso

TNO innovation for life

TRAFIKVERKET SWEDISH TRANSPORT ADMINISTRATION

New Members

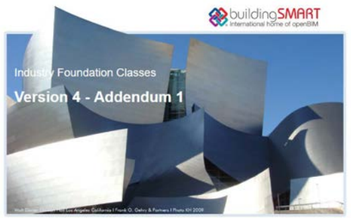


- Oracle
- Catenda AS
- BEXEL Consulting
- Data Design System
- Vectorworks
- China Design Digital Technology Co. Ltd
- Graebert GmbH
- Takenaka
- Tongji Architectural Design (Group) Co., Ltd.

ROOMS（分科会）

Technical Focus Rooms

Technical Room



Steering committee:
Greg Schleusner, Dennis Shelden
Remainder to be confirmed

Building Room

Steering committee:
David Ivey, Geraldine Rayner, John Mitchell, Benjamin Gonzales, Mark Baldwin, Kjell Ivar Bakkmoen, Rob Roef, Marie Claire Coin, Jan-Anders Jönsson, Inés Azpeitia

Infrastructure Room

Steering committee:
Tiina Perttula, Jim Plume, Nobuyoshi Yabuki, Tristan McDonnell, Christophe Castaing, Phil Jackson, Ronald Bergs, Benno Koehorst

Product Room

Steering committee:
Roger Grant, Espen Schulze, Robert Heize, Lai Wei, Hans Christoph Gruler, Hansueli Schmid, Michel Bohren, Radboud Bayen, Alesi Umbero, Frederic Grand

New Rooms

Manufacturers Room

Utilities Room

User Focus Rooms

Railway Room

Steering committee:
Winfried Stix, Liming Sheng, Peter Axelsson, Lukas Spengeler, Guy Pagnier, Peer Franz Josef, Tarmo Savolainen, Xenia Fiorentini, Billal Mahoubi, Christophe Castaing

Airport Room

Steering committee:
Alex Worp, Birgitta Foster, Birgitta Schock, Adam Rendek, Maya Tryfona, Richard Kelly

Regulatory Room

Steering committee:
Nick Nisbet, Masaki Muto, Øivind Rooth, Inhan Kim

Construction Room

Steering committee:
Kazumi Yajima, Ken Endo, Remainder to be confirmed

Infrastructure Roomの動向

Standards Summit, Beijing 2019

Infrastructure Room Steering Committee（運営委員会）

Chair

Tiina Perttula
buildingSMART
Nordic
2016-2020

Deputy Chair

Jim Plume
buildingSMART
Australasia
2018-2022

Technical Leader

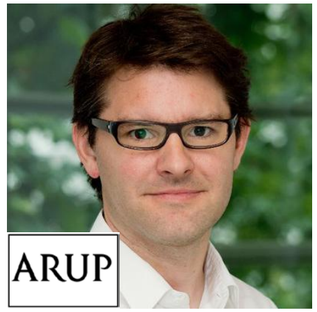
Christophe Castaing
buildingSMART
France
2018-2022

Nobuyoshi Yabuki
buildingSMART
Japan
2018-2022

Benno Koehorst
Rijkswaterstaat
(Standard Member)
2016-2020

Phil Jackson
buildingSMART
UK & Ireland
2016-2020

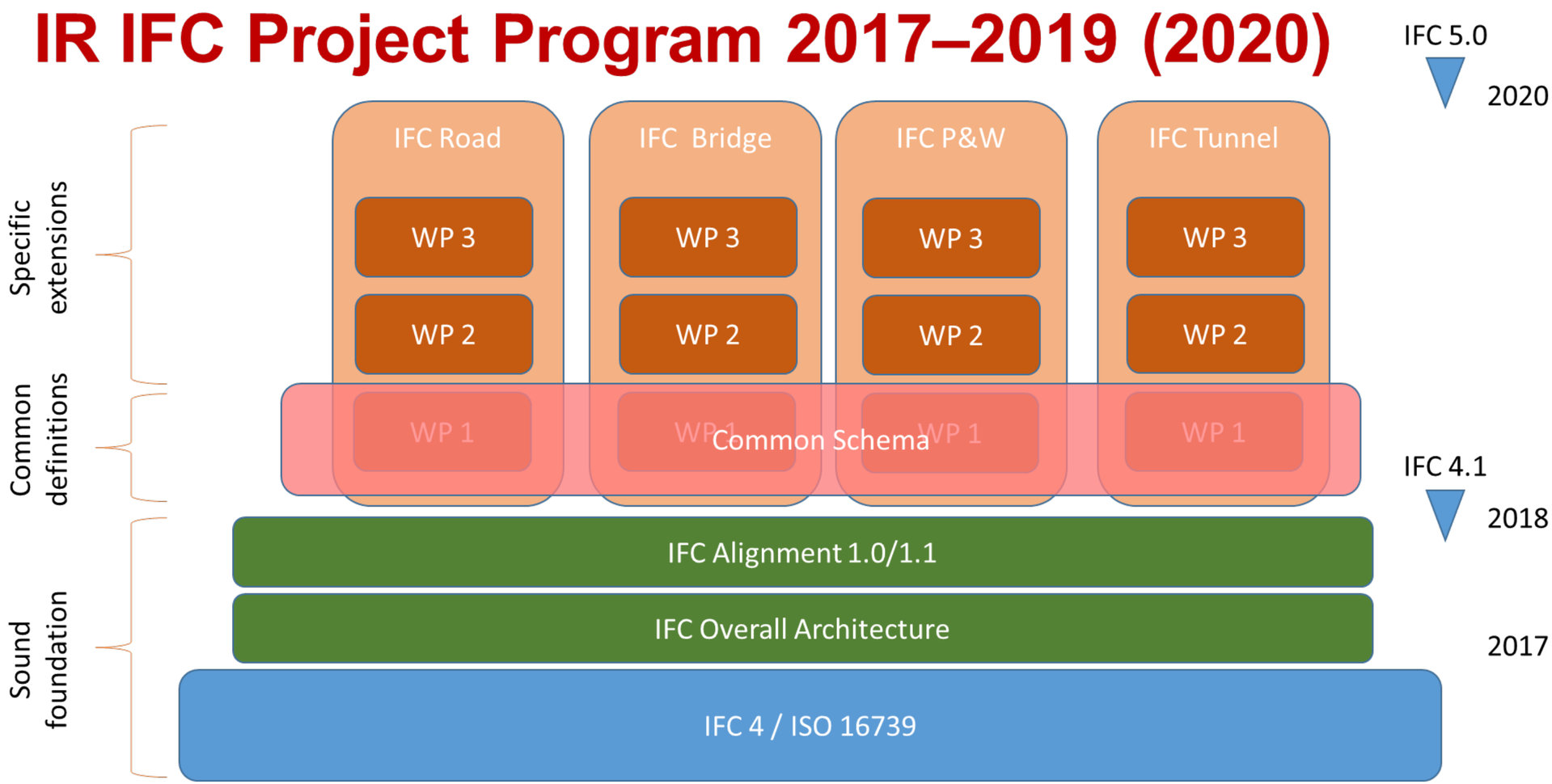
Ronald Bergs
buildingSMART
Benelux
2016-2020



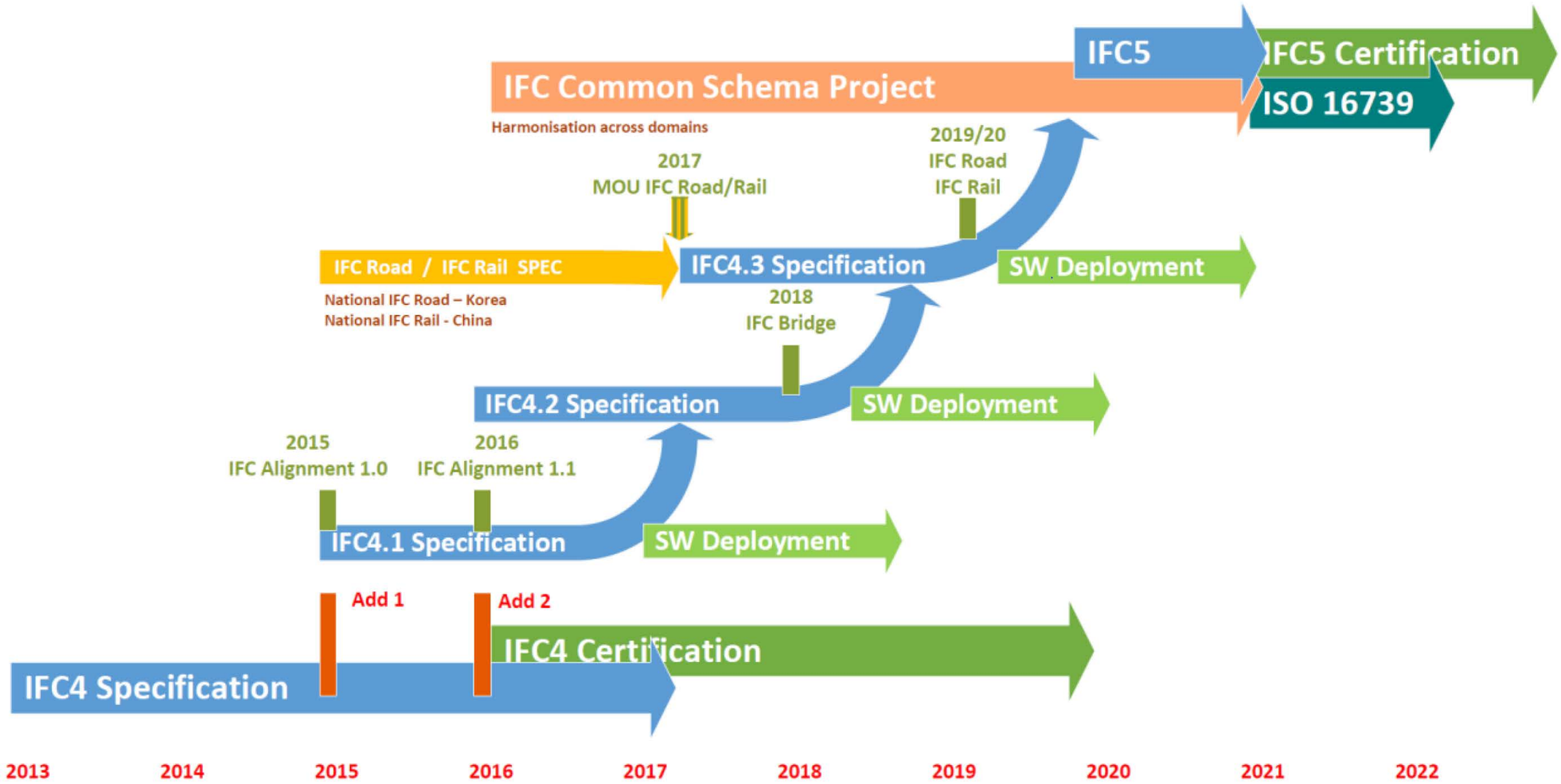
Tristan McDonnell
Arup
(Strategic Advisory Council)
2018-2022

Jorge Torrico
buildingSMART
Spain
2018-2022

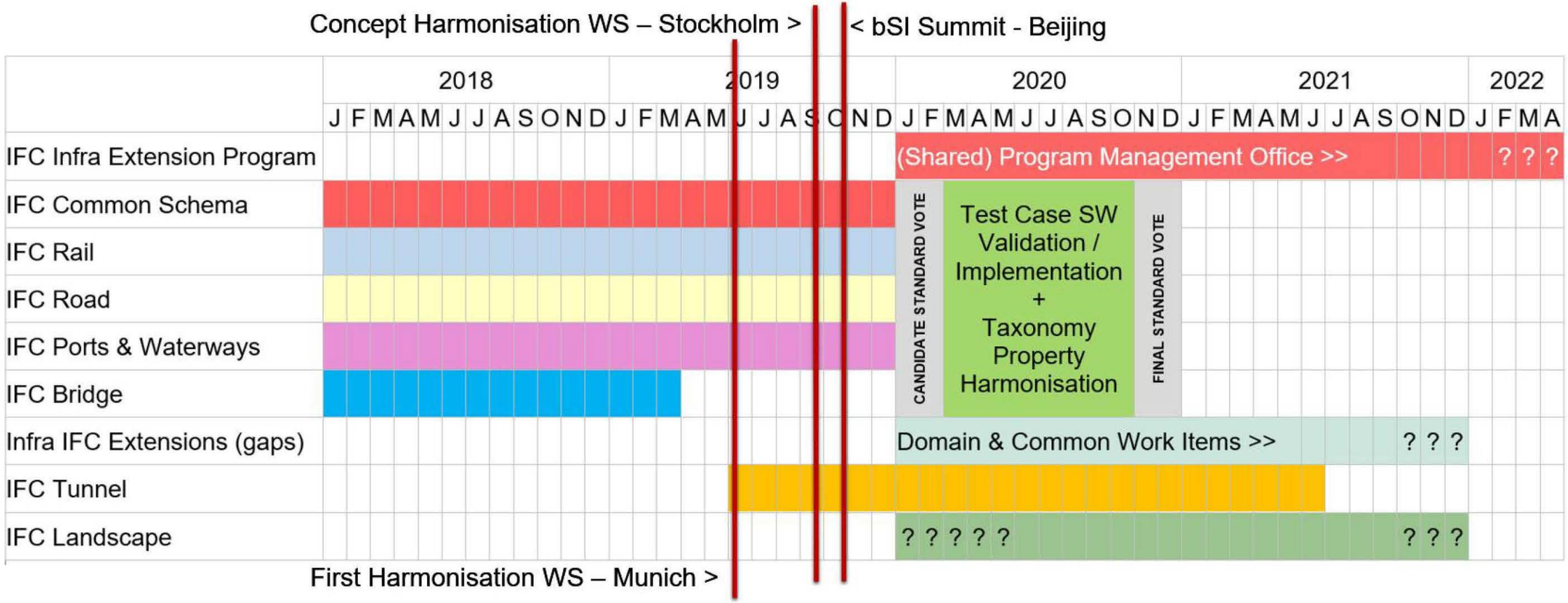
IFC プロジェクト計画



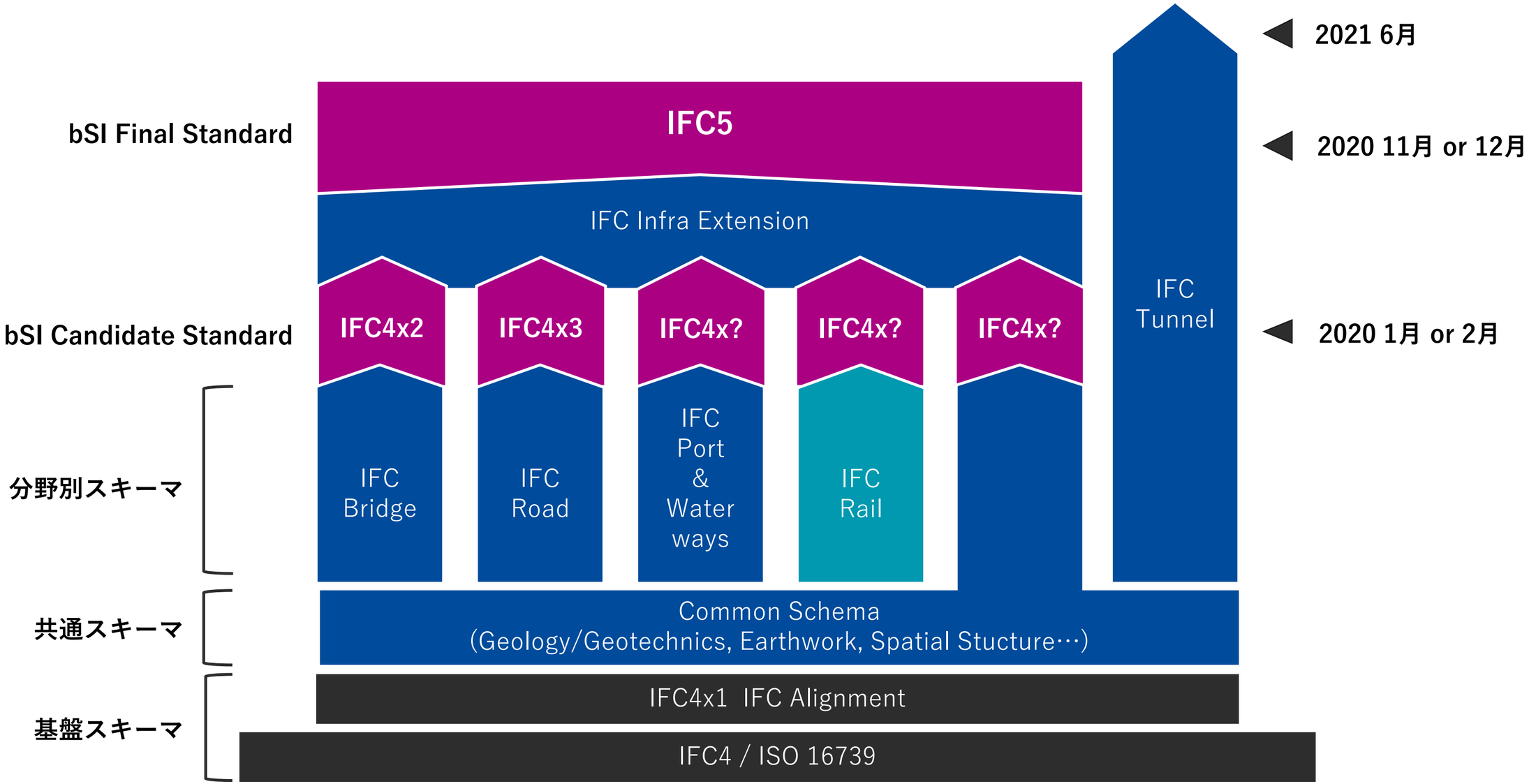
IFC拡張計画


IFC5
IFC5 Certification
IFC Common Schema Project
ISO 16739
Harmonisation across domains
2019/20
IFC Road
IFC Rail
2017
MOU IFC Road/Rail
IFC Road / IFC Rail SPEC
IFC4.3 Specification
SW Deployment
National IFC Road – Korea
National IFC Rail - China
2018
IFC Bridge
IFC4.2 Specification
SW Deployment
2015
IFC Alignment 1.0
2016
IFC Alignment 1.1
IFC4.1 Specification
SW Deployment
Add 1
Add 2
IFC4 Certification
IFC4 Specification
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022

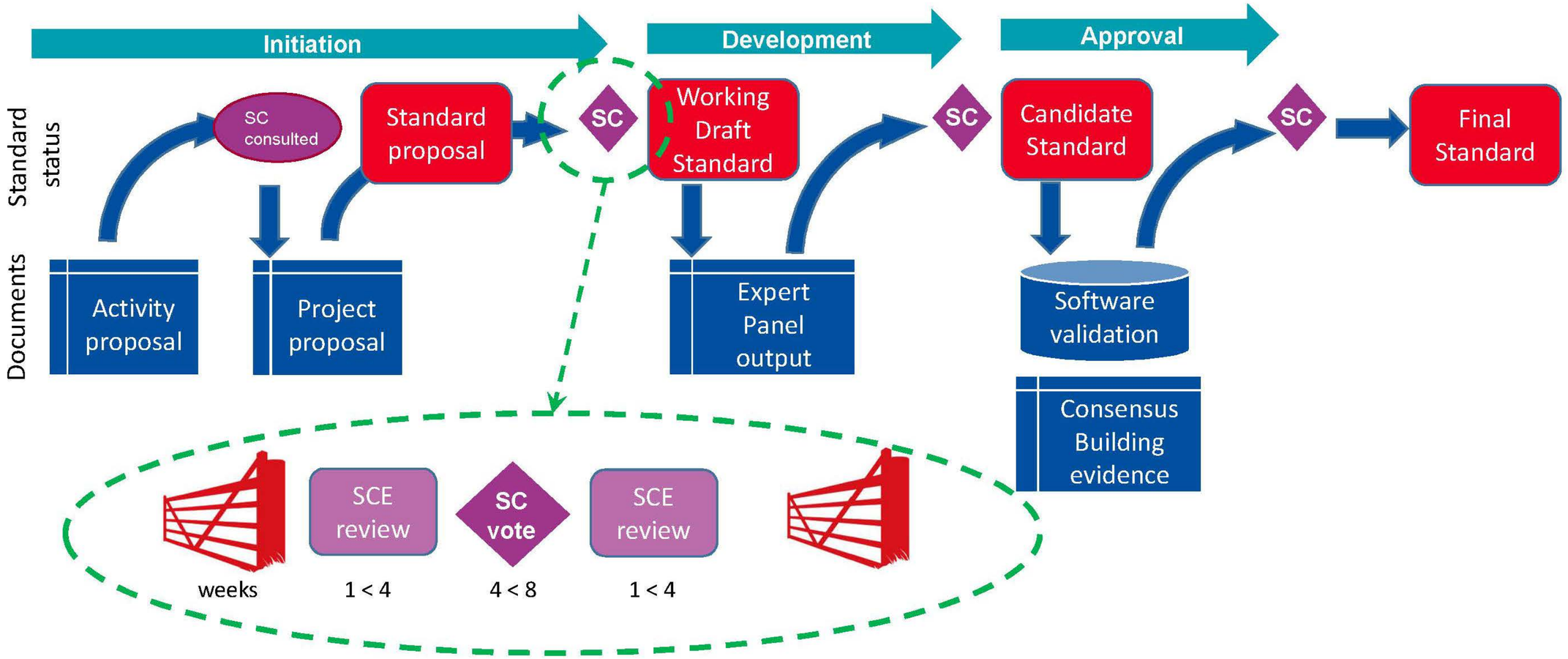
プロジェクト毎の検討スケジュール



IFC5へのロードマップ



bSI 標準化プロセス


Initiation
Development
Approval
Standard status
SC consulted
Standard proposal
SC
Working Draft Standard
SC
Candidate Standard
SC
Final Standard
Documents
Activity proposal
Project proposal
Expert Panel output
Software validation
Consensus Building evidence
SCE review
SC vote
SCE review
weeks
1 < 4
4 < 8
1 < 4

Infrastructure Roomの動向

Standards Summit, Beijing 2019

InfraRoomのプロジェクト

	対象範囲	中心人物	参加団体
IFC-Common Schema **コモンスキーマ**	• 階層構成 • 地盤 • 土工 • 排水	 **Jim Plume** buildingSMART Australasia	• Swedish Transport Agency, Trafikverket, • Finnish Transport Agency • Austroads, Australia • CRBIM China Railway BIM Alliance
IFC-Bridge **橋梁**	• 橋梁	 **Christrophe Castaing** EGIS	• French MiNnD project • German Federal Ministry of Transport (BMVI) • Swedish Transport Agency Trafikverket, • U.S. American Association of State Highway and Transportation Officials (AASHTO) • Finnish Transport Agency • **buildingSMART Japan.**
IFC-Road **道路**	• 道路	 **Moon Hyounseok** KICT	• KICT, Korea • Swedish Transport Agency, Trafikverket • Finnish Transport Agency, Liikennevirasto • German Federal Ministry of Transport (BMVI) • APLITOP, Spain • APOGEA Consultores SL, Spain • China Railway BIM Alliance CRBIM • Autodesk • French MiNnD project
IFC-Ports & Waterways **港湾および水路**	• 港湾 • 水路	 **Haijian Li** Cardiff University	• CCCC , China • Cardiff University, UK • DUT , China • Royal Haskoning, Netherlands • Waldeck Consulting
IFC-Tunnel **トンネル**	• トンネル	 **Andre Borrmann** Technische Universität München	• French MiNnD project • CCC, Consolidated Contractors Company, Greece(HQ) • SBB, Switzerland • OYO Corporation, Japan • Swedish Transport Agency, Trafikverket

インフラストラクチャ・ルームで実施しているプロジェクト

	Common Schema との連携	Step1 利用場面の特定	Step2 分類の選定	Step3 IFCの拡張	Step4 MVDの作成	Step5 モデル検証 ソフト機能開発
IFC-Common Schema コモンスキーマ		• 対象範囲の特定 • 地盤、土工、排水	▶ **IFC Infra Extension Program**			
IFC-Bridge 橋梁	• 階層構成の提案	• 要件分析レポート（最終版）の公開	• 概念モデルレポート（最終版）の公開	• IFC Bridge拡張スキーマ（案）の作成	• MVDの作成	• ソフト機能開発の開始
IFC-Road 道路	• 排水の提案 • 土工の提案	• 要件分析レポート（案）の作成	• 概念モデルの検討	• IFC Bridge拡張スキーマ（案）の作成		
IFC-Ports & Waterways 港湾および水路	• 地盤の提案 • 動的要素の提案	• 要件分析レポート（案）の作成	• 概念モデルの検討			
IFC-Tunnel トンネル		• 要件分析レポート（案）の作成				

IFC-Common Schemaの検討範囲

Rail Project Scope – Track Domain

In-scope
- Panels (Track, Turnout, Dilatation)
- Objects of Track (Rail, Sleeper, Fastening)
- Ballast
- Slab track
- Rack Railway
- Elements of turnouts
- Track covering (for level crossing, light rails, tramways)
- Track alignment stops like buffers
- Track bench
- Lubrication
- Special equipment for shunting yards
- Track spatial structures
- Survey element
- Alignment

Out of scope
- Subsoil (should be treated by ifcRoad)
- Underground (should be treated by ifc Earthworks)
- Drainage of track
- Temporary objects
- Functional views and conditions
- Special equipment for depots (turntable etc.)

Rail Project Scope – Energy Domain

In-scope
- Substations
- Earthing and current return
- Overhead constructions and supporting structures
- Overhead lines
- Switching post
- Suffix post
- Foundation and Fundaments
- AC and DC Installations
- Protection devices (Birds, touch protection)
- Lineside signs and signals

Out of scope
- High voltage lines (Distribution network)
- Power plants
- Rigid catenary
- Catenary for Tramways and light rails
- Trolley bus overhead lines
- Induction lines (non-contact system)
- Third rail (mounted trackside / on track panel)
- Equipment for diesel powered trains
- Equipment for steam powered trains
- Equipment for gas powered trains
- Installations for consumption measurements

Rail Project Scope – Signalling Domain

In-scope
- Lineside installations
- Main signals (as standalone objects, simplified modelled)
- Shunting signals
- Relays
- All types of trackside signals and signs as information for train driver (no specific function)
- ETCS/CTCS lineside equipment (Balises, signs etc)
- Barriers for level crossing
- Warning signals at level crossings for road and pedestrian traffic (lights and bell)
- Level cross protection signs for rail traffic
- Operation and Surveillance equipment (Computer, Cabinets, Video cameras)
- Turnout machines and mounting installation, incl. manual switch lever
- Turnout heating (only electrical)
- Signalling cables (incl. trench, cable canal)
- Trackside sensors (Hotbox, etc.)
- Axle counter

Out of scope
- Signal components (like aspect lampes etc.)
- Logical and functional detailed aspects
- Small electronical components (fuses, etc.)
- ETCS/CTCS on board equipment
- Mechanical signalling equipment (bares, steel cables)
- Rods / turnout lock
- Gas turnout heating
- Signals for tramways and light rails
- Natural hazards sensors/surveillance
- Dynamic axle weight device

Rail Project Scope – Telecom Domain

In-scope
- Mainly trackside equipment
- Terminals
- Cabinets and shelters
- Cabling (cables and connectors)
- Cable Routing (Laying installations)
- Sensors (snow, wind etc.)
- Antennas
- Towers and Poles
- Active Networks
- Base Transceiver Stations (BTS)
- E-Utran Node B for LTE (4G)
- Lineside telephones
- Vending and ticket machines
- Tetra Networks (limited mobile network)

Out of scope
- Centrals (inside equipment)
- Servers, terminals, computers, consoles (inside equipment)
- Radio inside devices
- Operation and surveillance installations
- CCTV
- Security systems (Access controls, batch readers etc.)
- Customer information systems (screens, loudspeakers)
- Functional modelling

IFC-Common Schemaの検討範囲

Road Project Scope

In-scope

- Linear road types:
  - Controlled access highway;
  - Dual carriageway;
  - Single carriageway;
  - Street;
  - Bicycle path;
  - Footpath.
- Junction types:
  - Interchange (grade separated):
    - overpass;
    - underpass;
    - ramp.
  - Intersection (at grade):
    - Intersecting roads (3, 4, ..., 7 way);
    - roundabout or traffic circle;
    - pedestrian crossing;
    - bicycle crossing.
- Road components, elements and equipment: Some of these concepts may be identified as being common and handed over to the common schema project and some may be developed by the IFC Road project team for the Common Schema project.
  - Road structure (road prism (road body)
  - Road guard elements
  - Road sign elements
  - Road paving components
  - Utilities
  - Lighting, telecommunications and power
  - Storm-, surface- water and drainage systems
  - Other underground facilities located in the road body.

Expected to be covered (but not subject to validation tests):

- paved surfaces of:
  - parking lots;
  - service areas;
  - toll plazas;
  - parking buildings;
  - ferry ports;
  - airports

Out of scope:

- Equipment and buildings of the above listed paved surfaces;
- railway crossings;
- tramways;
- city scape / urban planning.

The following developments are out of scope for IFC Road because they are delivered through the Common Schema project:

- Earthworks cut and fill design;
- Geotechnical investigations;
- Geotechnical constructions

Ports & Waterways Project Scope

In-scope

- Complex types
  - Cargo ports (Container, dry bulk, liquid bulk, roll-on roll-off)
  - Passenger terminals (cruise, ferry & foot traffic)
  - Marinas & leisure terminals
  - Ship & boat building yards
  - Marine & water maintenance
  - Offshore support/construction base
  - Canal complexes/networks
  - Channel regulation & water control
  - Ship lock complexes
- Facility types
  - Breakwaters
  - Revetments
  - Sluices, spillways &control gates
  - Ship-lifts
  - Hydraulic lift docks
  - Slipways
  - Dry docks
  - Floating docks
  - Wharf/Quays & Piers/Jetties
  - Ship locks
  - Anchorages
  - Navigational channels/areas
  - Storage/working areas
  - Intermodal yards/areas
- Marine Products & Components
  - Cargo & Vehicles
  - Cranes
  - Marine dock/lock gates
  - Aids to navigation (buoys, lights, markers etc.)
  - Fenders & bollards
  - Mooring systems & devices
  - Rock armour systems

Expected but not validated

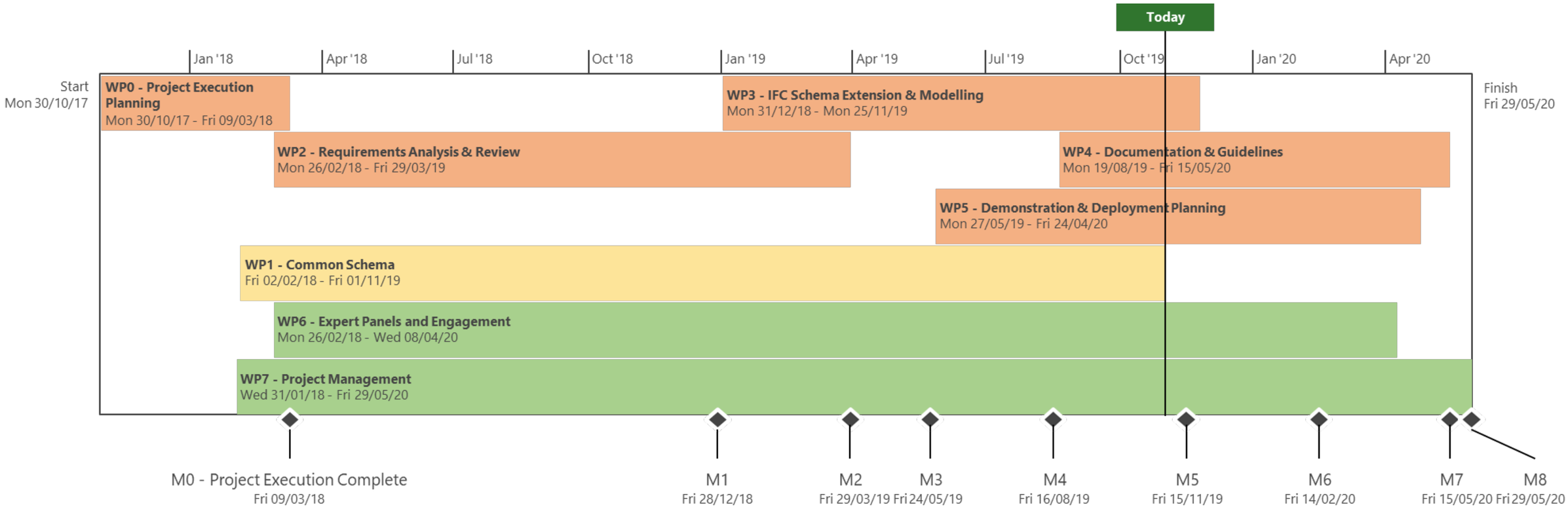
- Complex types
  - Lifeboat & coast guard stations
  - Military complexes
- Facility Types
  - Retaining walls
  - Port/Complex Roads
  - Railways (for cranes & vessel transfer systems)
  - Tunnels
  - Buildings
- Geology, hydrology & geotechnics
  - Geo strengthening
  - Hydrology/water elements
  - Earthworks

Out of scope:

- Complex types
  - Coastal protection
  - Erosion protection
  - Flood protection
  - Power generation (Hydroelectric, tidal, wave, offshore wind)
- Facility types
  - Seawalls
  - Groynes
  - Dams/levees
  - Weirs

IFC-Ports & Waterways

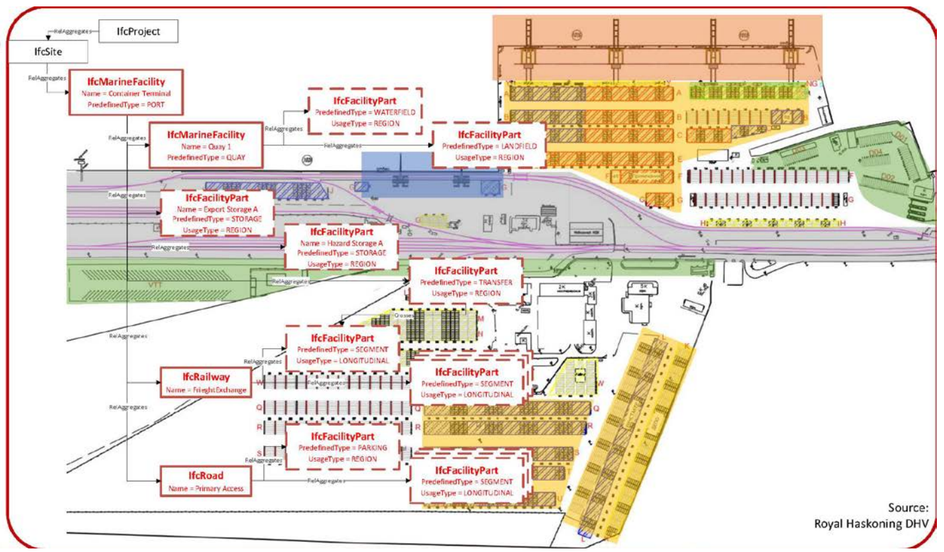
プロジェクトの進捗



IFC-Ports & Waterways

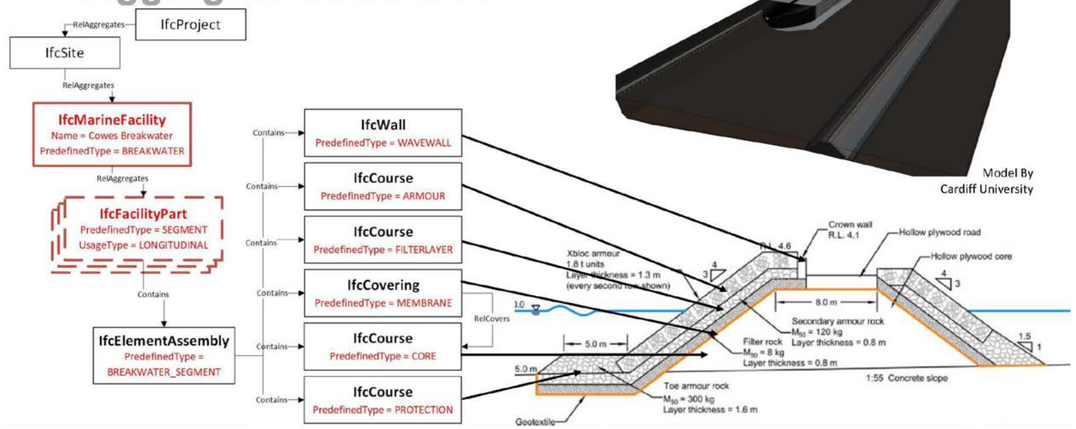
コンセプトモデル

Examples
Intermodal Facility

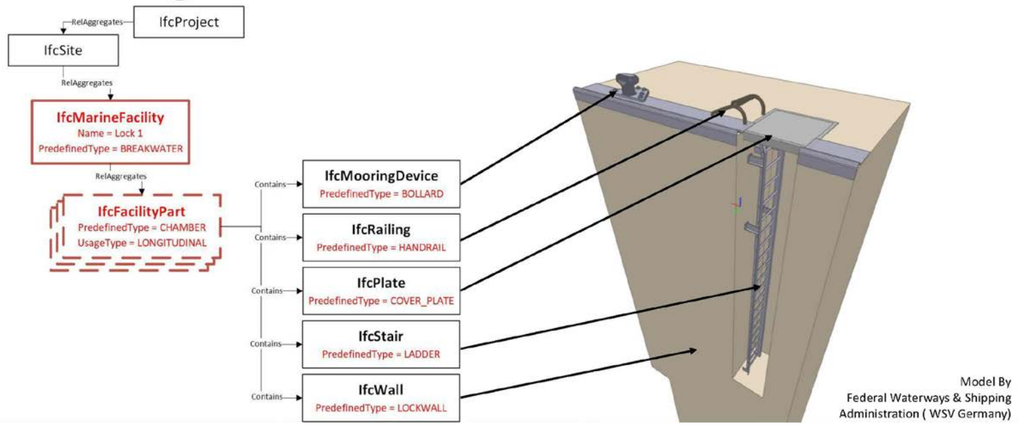


WP3 – Conceptual Model

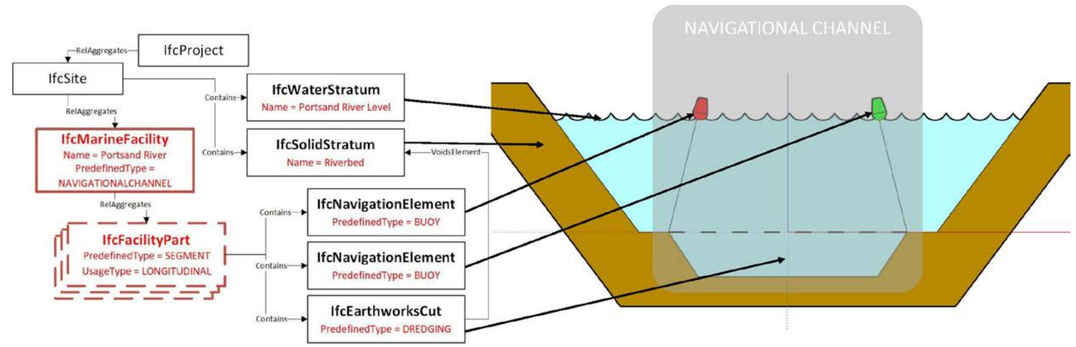
Aggregate Structures



Mooring Elements



Earthworks Example



IFC-Ports & Waterways

サンプルデータ

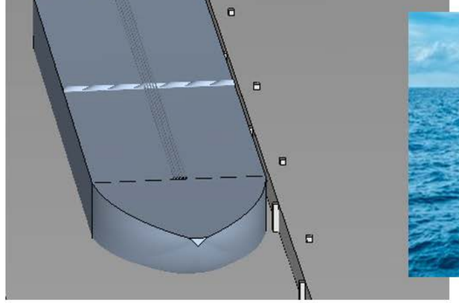
Water

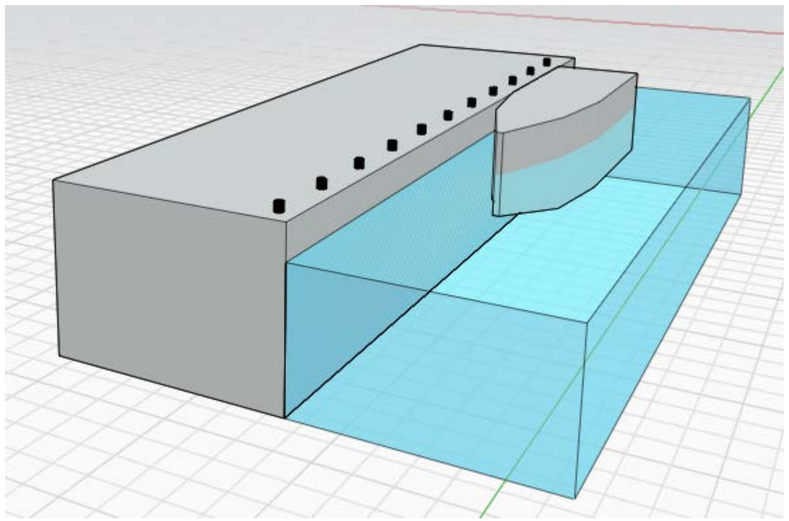
Water (IfcWaterStratum)

Name	Value
GlobalId	0cmp0000000000ID0EPMAC
Name	Water
Description	Mean Sea Level
ObjectType	component
CompositionType	ELEMENT

Pset_WaterStratumCOmmon - Properties expressing the composition and any variablility in the height of the body of water. Ranges are non-negative describing a spread. (IfcPropertySet)

Name	Value	Description
WaveRange	3.2	WaveRange
SeicheRange	1.4	SeicheRange
TidalRange	4.75	TidalRange
AnnualRange	2	AnnualRange
AnnualTrend	0	AnnualTrend
IsFreshwater	False	IsFreshwater





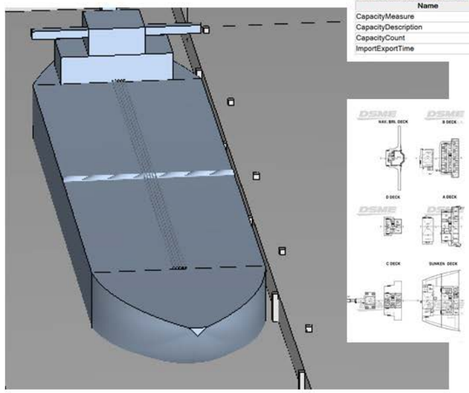
Vessel

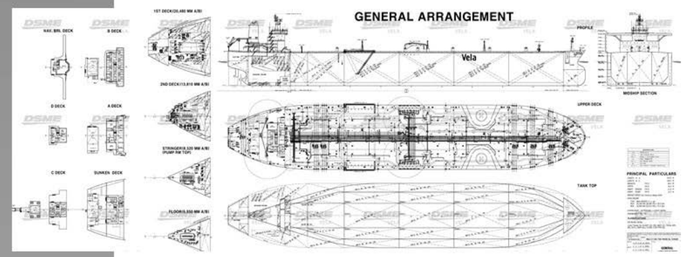
VLCC (IfcTransportElement)

Name	Value
GlobalId	0cmp0000000000ID0ELFAC
Name	VLCC
Description	Very Large Crude Carrier
ObjectType	component
OperationType	
CapacityByWeight	Kg
CapacityByNumber	0

Pset_ProcessCommon - Properties defining capacity and performance characteristics (IfcPropertySet)

Name	Value	Description
CapacityMeasure	Barrel	CapacityMeasure
CapacityDescription	US Oil barrel	CapacityDescription
CapacityCount	2E+006	CapacityCount
ImportExportTime	25000	ImportExportTime





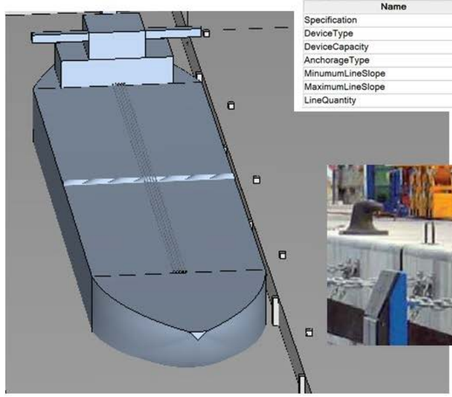
Bollards

B1 (IfcBuildingElementProxy)

Name	Value
GlobalId	0cmp0000000000ID0E2BAE
Name	B1
Description	Bollard 1
ObjectType	component
CompositionType	ELEMENT

Pset_BollardCommon - Bollard characteristic properties and performance (IfcPropertySet)

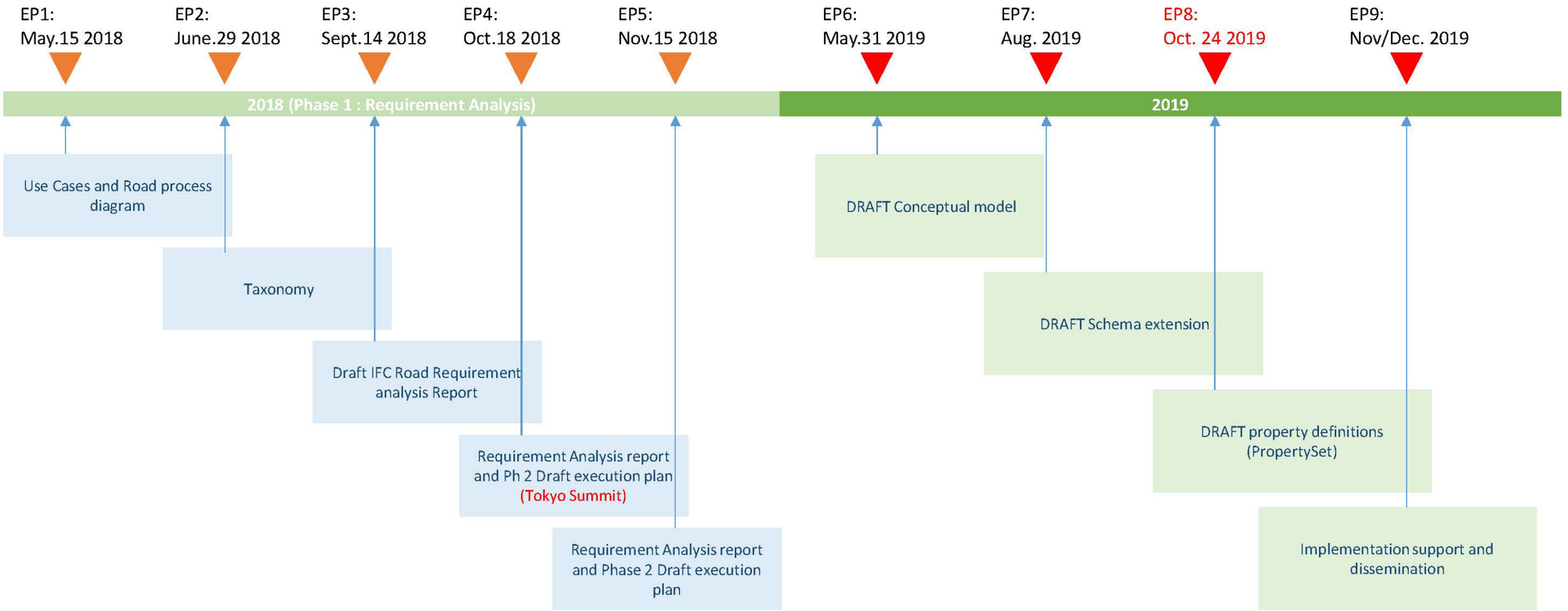
Name	Value	Description
Specification	BL1	Specification
DeviceType	T-Head	DeviceType
DeviceCapacity	20000	DeviceCapacity
AnchorageType	Cast-In	AnchorageType
MinumumLineSlope	-10	MinumumLineSlope
MaximumLineSlope	10	MaximumLineSlope
LineQuantity	2	LineQuantity



IFC-Road

プロジェクトの進行

- Phase 2: 3 live meeting, 19 online project team meeting, 11 technical meeting etc.

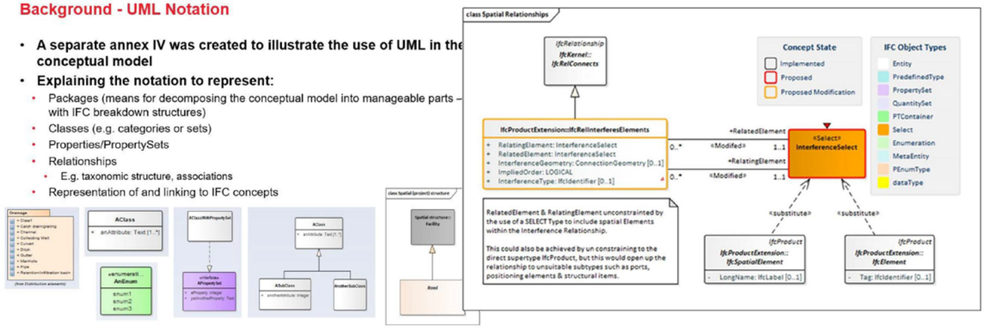


IFC-Road

検討事項

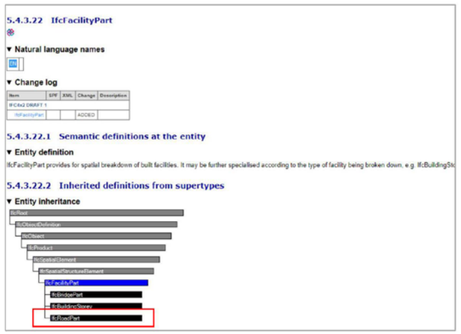
Updated Conceptual Model

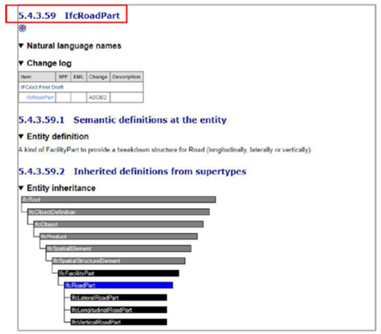
- Updated according to the Common Schema Harmonisation and EP feedbacks etc.
- Led by Lars Wikstrom
- Approaches : UML Conceptual Model → BIM-Q → IfcDocTool → Schema / Document / MVD



Updated Draft IFC Schema Extension

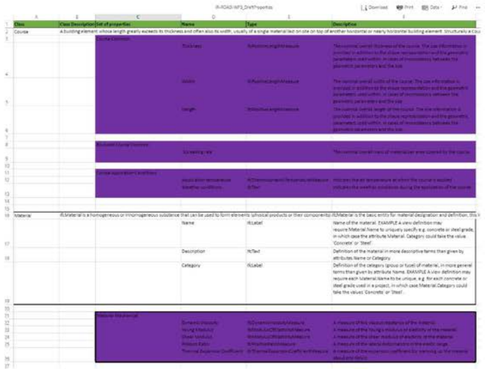
- Updated according to the Common Schema Harmonisation and EP feedbacks etc.
- Led by Sergej Muhic
- Approaches : UML Conceptual Model → BIM-Q → IfcDocTool → Schema / Document / MVD

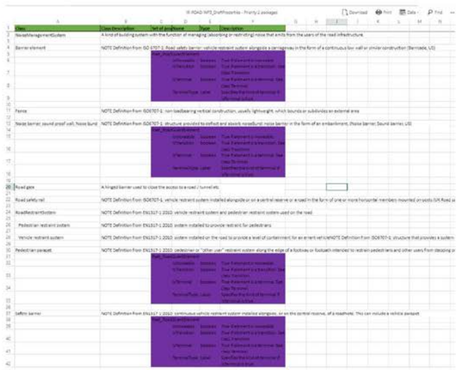




Draft Property Definitions

- Led by Johnny Jensen (Trimble/OGC)
- Created based on Properties collected from other countries (Korea, Finland, France, Norway and others)



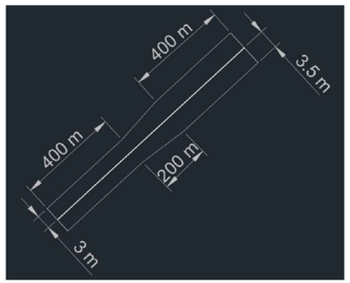


Prototypical Implementation

- New schema Test, Demo File, Scenario, Technical meeting with software vendors
- Led by Štefan Jaud / Participants : 12D, AKG, Aplitop, Autodesk, TUM, Bentley, KICT, MIDAS, ProVI, Tool.ES, Trimble. Etc.
- Topic: Georeferencing, Profile geometry, Linear placement, Terrain and soil model, Drainage etc.

Aplitop Sample for WidthEvent_1

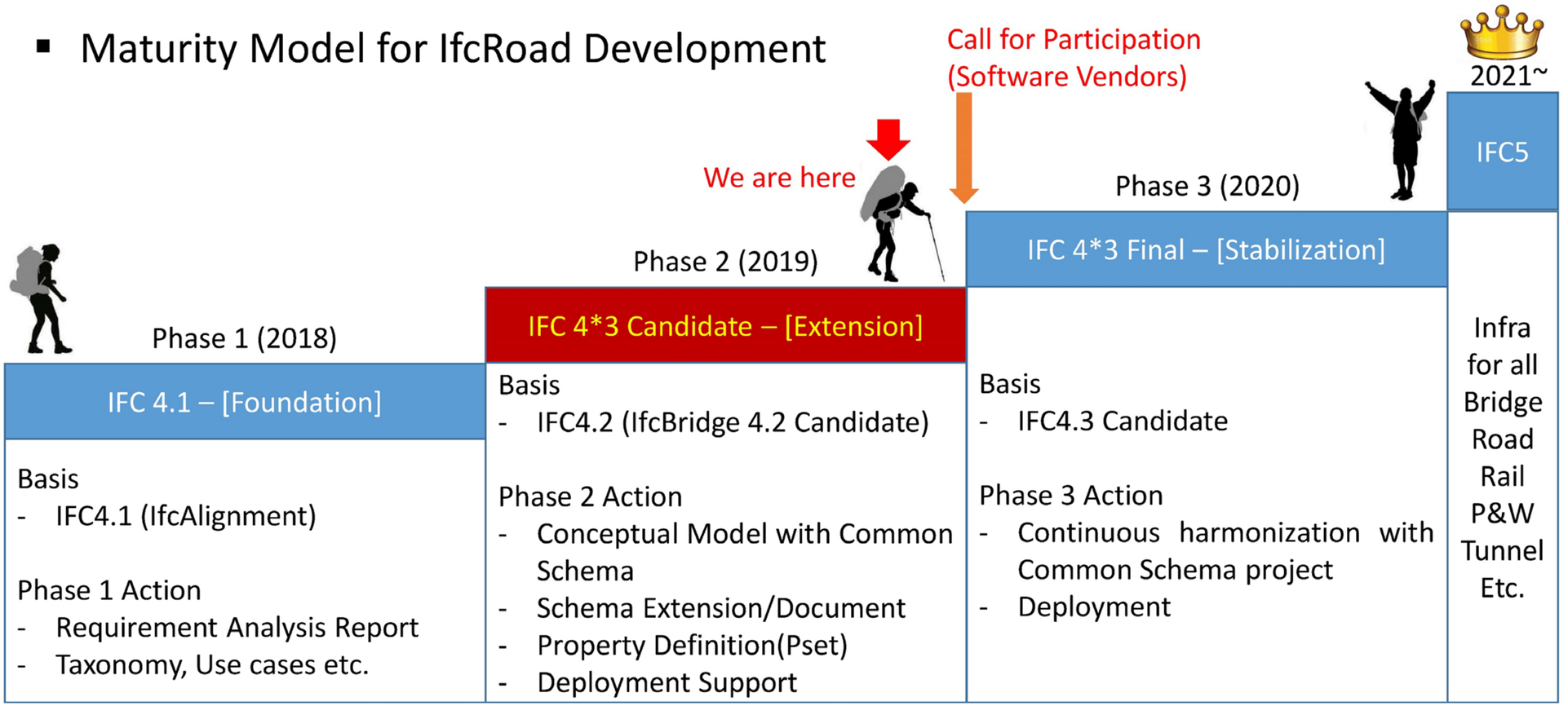
```
/* Three Properties*/
#46=IFCPROPERTYSINGLEVALUE('Width',$,IFCNONNEGATTVELENGTHMEASURE(3.),$);
#48=IFCPROPERTYSINGLEVALUE('Side',$,IFCLABEL('LEFT'),$);
#50=IFCPROPERTYSINGLEVALUE('Transition',$,IFCLABEL('CONST'),$);

/* Linear placement */
#51=IFCDISTANCEEXPRESSION(0.,$,$,$,$);
#52=IFCORIENTATIONEXPRESSION(#42,#43);
#53=IFCAXIS2PLACEMENT3D(#44,#43,#42);
#54=IFCLINEARPLACEMENT($,#31,#51,#52,#53);

/* IfcWidthEvent */
#55=IFCEVENTELEMENT('0fWVkMjV9EdxGn6twE4JjK',$,$,$,$,#54,$,.WIDTH.);

/* Property set of IfcWidthEvent */
#56=IFCPROPERTYSET('086$zR_rP3x9Ltw3zWlpzk',$,'Pset_Width',$,(#46,#48,#50));
#57=IFCRELDEFINESBYPROPERTIES('08hs0LiWHFDCR$AV902hUNw',$,'Pset_Width',$,(#55),#56);
```



IFC-Road

ロードマップ

- Maturity Model for IfcRoad Development



- **WP3 – Schema extension (To be Continued)**
  - Task 3.1 Conceptual Model Report – Finalised V2
  - Task 3.2 Schema Extension – Draft 2 reviewed
  - Task 3.3 Property Definition – Draft 1 reviewed (Oct.)
- WP4 – International consensus (To be Continued)

- **WP5 – IFC Road Software Deployment (To be Continued)**
  - Task 5.1 Communication with Software vendors - Started
  - Task 5.2 MVD development -Started
  - Task 5.3 Technical support for software implementers
  - Task 5.4 Example data for IfcRoad - Started
  - Task 5.5 Dissemination

IFC-Tunnel

ロードマップ

June 2019 — Beijing — Oslo — June 2020 — June 2021

Phase 1 Requirement analysis

Phase 1 tasks:
- Use Cases
- Process Map
- Taxonomy
- Update Scope statement
- Project Execution Plan Phase 2
- Phase 2 Budget

Phase 2 Extension & Deployment

Phase 2 tasks (to be defined, based on Phase 1 output)
- *Conceptual Model*
- *Ifc Extension & documentation*
- *Candidate Standard*
- *Deployment*

- Contribution to Common Schema
- International consensus

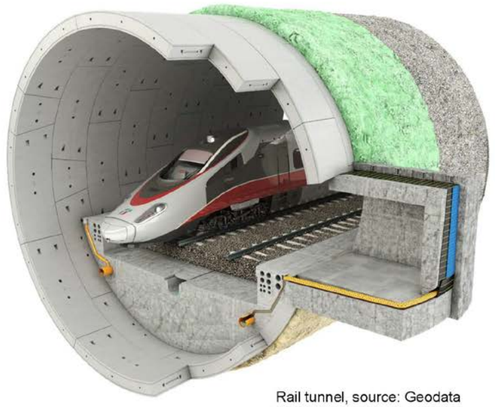
IFC-Tunnel

適用範囲（構想）

Tunnel types in scope based on their construction method:

- Mechanized
- Cut & Cover
- Conventional

Mechanized tunneling, source: ILF



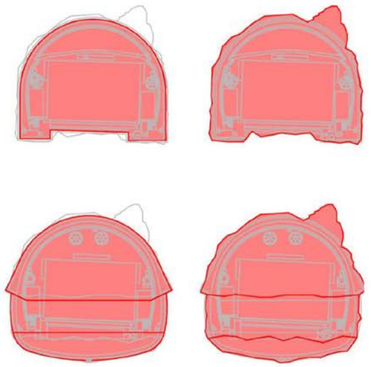
Rail tunnel, source: Geodata

Tunnel types in scope, based on their function:

- Rail
- Road
- Water
- Services

Other topics currently addressed by project team:

- Geology
- Excavation
- Tunnel Equipment



Conventional excavation, source: ILF

2019 in collaboration with Common Schema:

- Geotechnics
- Spatial Structure

2020 on-going collaboration with Common Schema, require interaction with other other projects:

- Geothermal
- Drainage
- Earthworks

IFC-Tunnel

プロジェクト参加者

- AMBERG (Austria)
- CCC (Middle East)
- CRBIM (China)
- Geodata (Italy)
- IC Group (Slovenia)
- ILF (Switzerland)
- MINnD (France)
- Norwegian Tunneling Association
- ÖBB (Austria)
- OYO (Japan)
- RHDHV (the Netherlands)
- Ruhr University Bochum (Germany)
- SBB (Switzerland)
- SWS (Italy)
- TRV (Sweden)
- & many more interested parties

次のテーマ

IFC Infrastructure Future Requirements
Potential (Selected) Delivery Projects

- ユーティリティ
  - 電力
  - ガス
  - 飲料水
  - 下水道
  - 通信
- 道路用地外および環境中の排水
- メンテナンスコンパウンド
- ランドスケープ
- 土工のマシンコントロール

次回以降の開催予定


Save the Date
buildingSMART International Standards Summit
Thon Hotel, Oslo
23-26 March 2020


Save the Date
buildingSMART International Standards Summit
Hotel Bonaventure, Montreal
28 Sept - 1 October 2020


地図
航空写真
Rotnes
Lindeberg
Frogner
Aulifeltet
Lørenfallet
Sørkedalen
Skedsmokorset
Blaker
Sørumsand
Sollihøgda
Sandum
Bærums Verk
Finstadbru
Aursmoen
Lierfoss
Fetsund
Skårer
Fjerdingby
Fornebu
Sandvika
Nordre Øyeren naturreservat
Gan
Bjørkelangen
Østmarka
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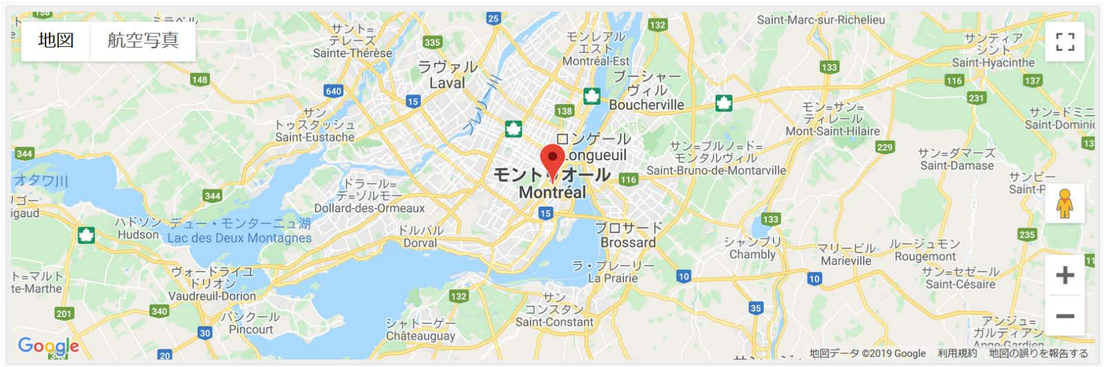
利用規約
地図の誤りを報告する


地図
航空写真
Saint-Marc-sur-Richelieu
Laval
Boucherville
Longueuil
Montréal
Saint-Bruno-de-Montarville
Mont-Saint-Hilaire
Saint-Hyacinthe
Saint-Damase
Dollard-des-Ormeaux
Hudson
Lac des Deux Montagnes
Dorval
Brossard
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利用規約
地図の誤りを報告する

ご清聴ありがとうございました

お問い合わせ

t.aruga@building-smart.jp