

# openBIM Foundational Standards: Global, National and Regional Impact

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# Challenges

1. Scope of work increasing
2. Roles and responsibilities are changing
3. Growing request for Digital deliverables
4. Lack of knowledge
5. Limited expertise
6. Contracts vs disclaimers

# BIM: Building Information Modeling



International  
Organization for  
Standardization

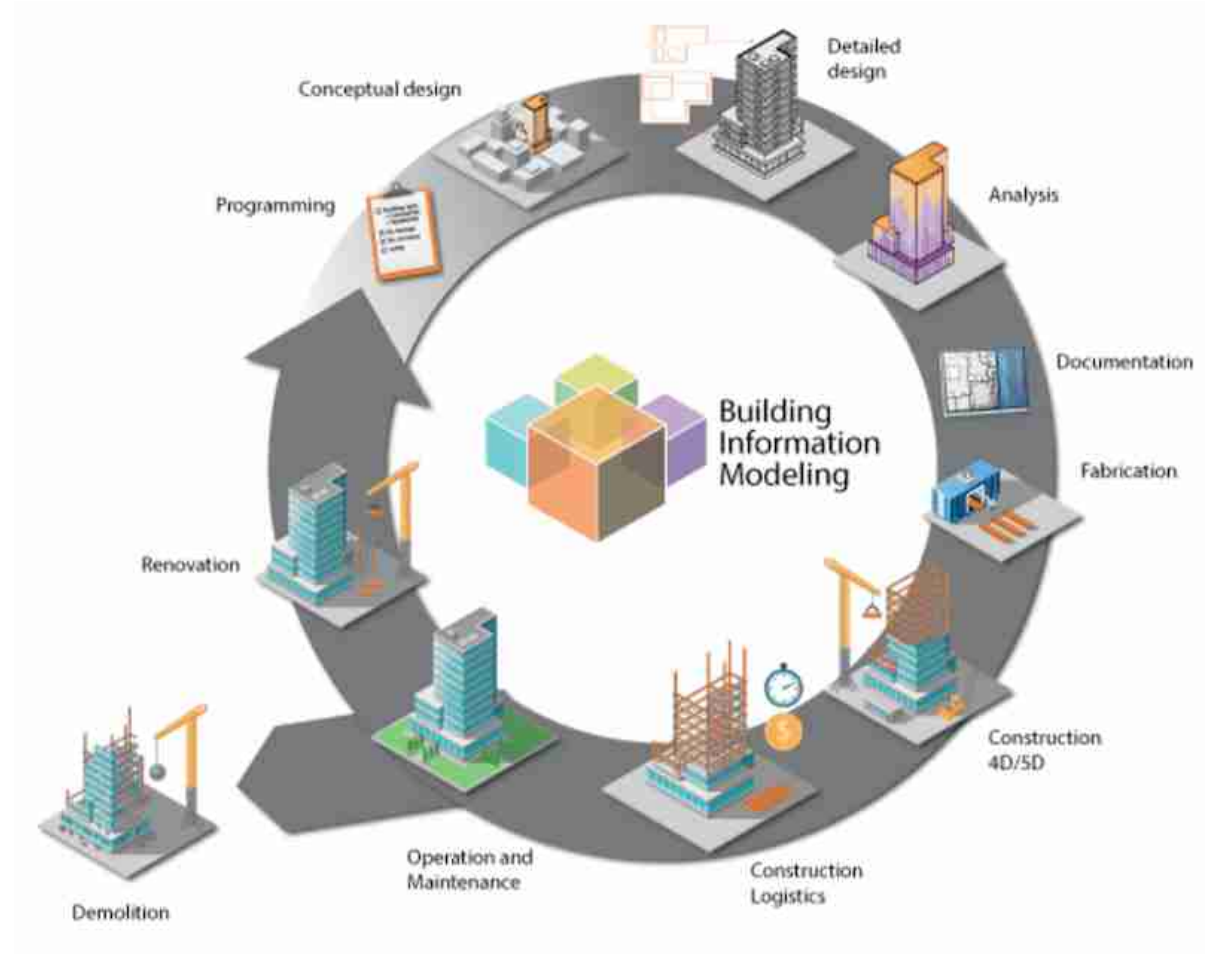
## Process



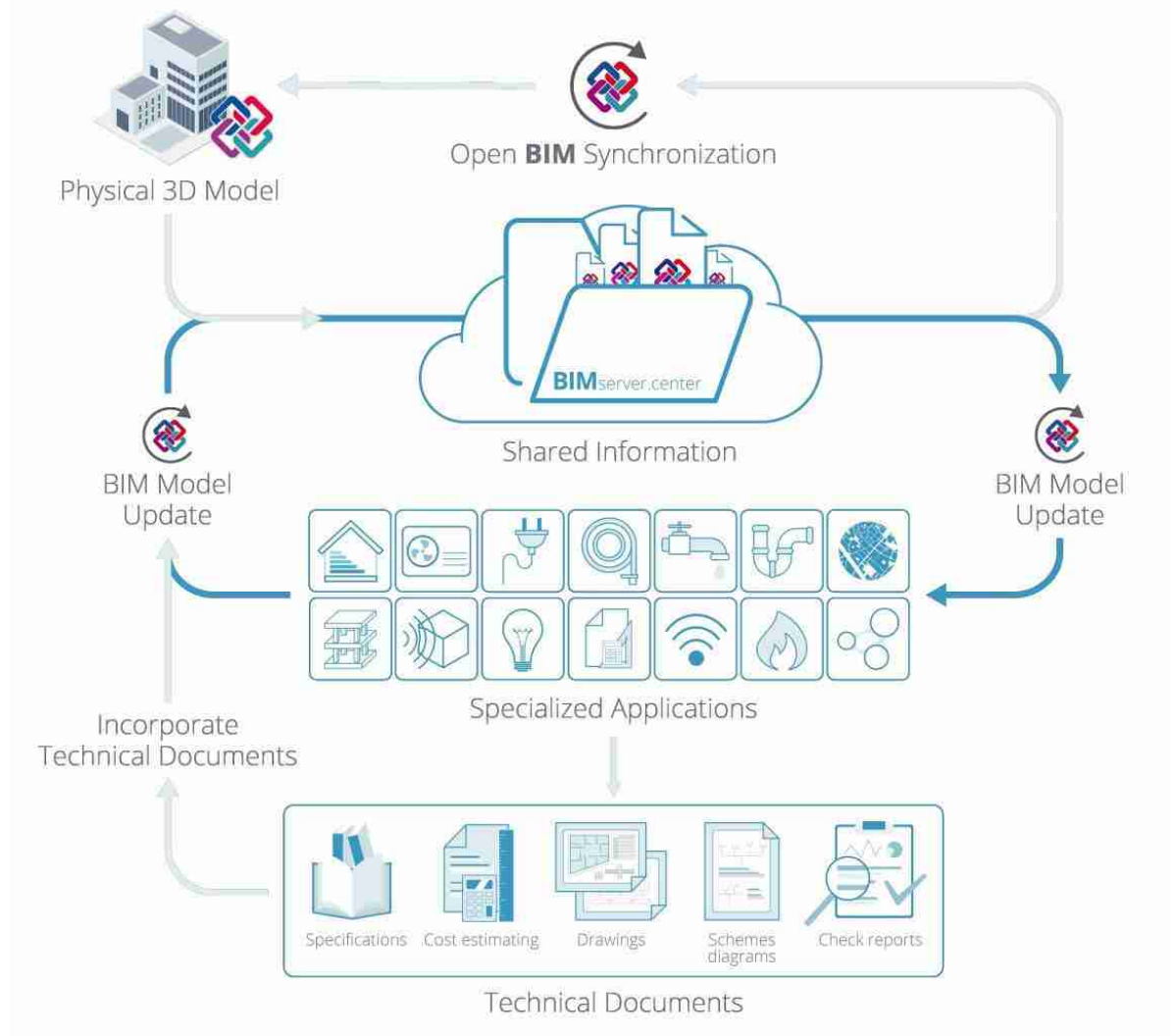
**CAN ISO 19650: Published January 2025**

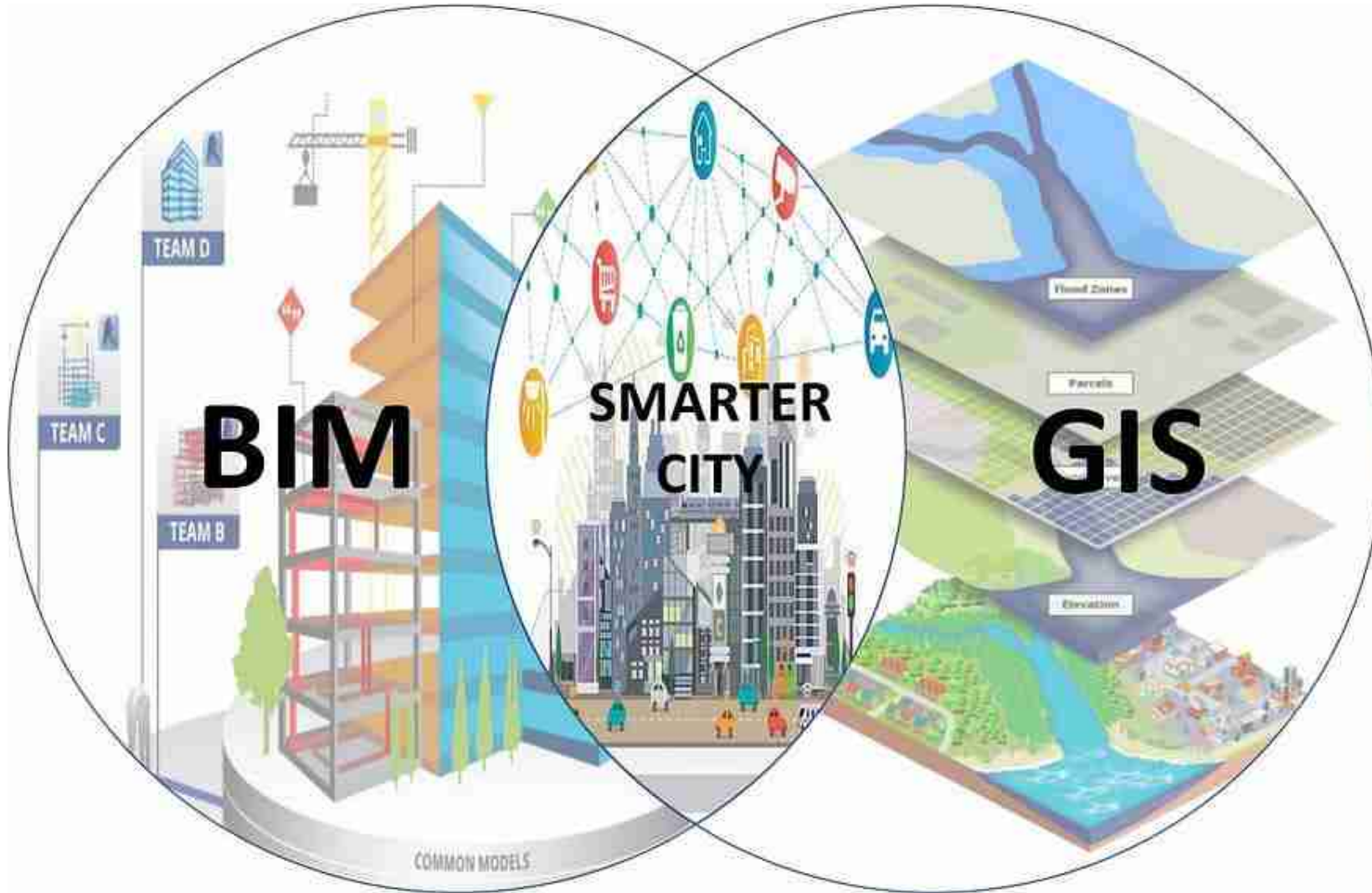
# BIM: Building Information Management

openBIM<sup>®</sup>  
Information



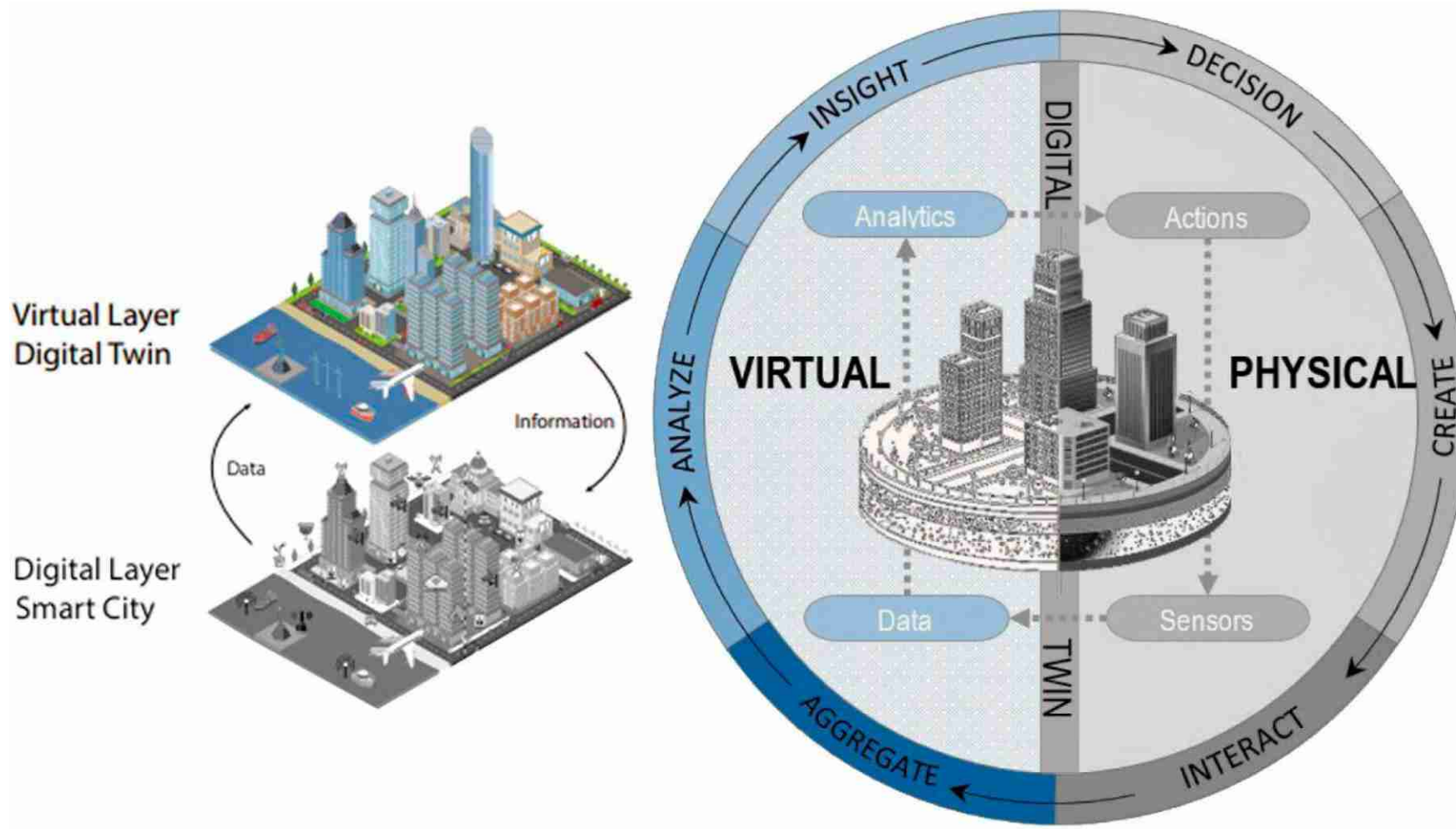
*openBIM  
enables global universal  
data-sharing for BIM data  
regardless of proprietary  
BIM platform or BIM tool*







# To enable digital twins



Caprari, G.; Castelli, G.; Montuori, M.; Camardelli, M.; Malvezzi, R.  
Digital Twin for Urban Planning in the Green Deal Era: A State of the  
Art and Future Perspectives. *Sustainability* 2022

*believes in  
collaborative approaches  
based on openBIM tools, technologies and processes*



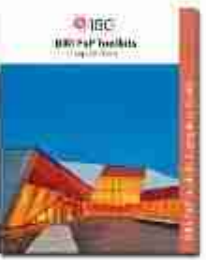


# buildingSMART International





**BIM Contract Appendix**  
Released



**PXP Toolkits**  
Released



**Canadian Practice Manual for BIM**  
Released



**ISO 19650-2 Canadian Annex**  
Released



**BIM for Municipalities**  
Released



**Certification Launched**

2010

2005

2010

2015

2020

2025

**buildingSMART Canada**  
Founded 2011



**bSC Affiliate Program**  
Founded



**Roadmap to Lifecycle BIM in Canadian AECOO**  
Released

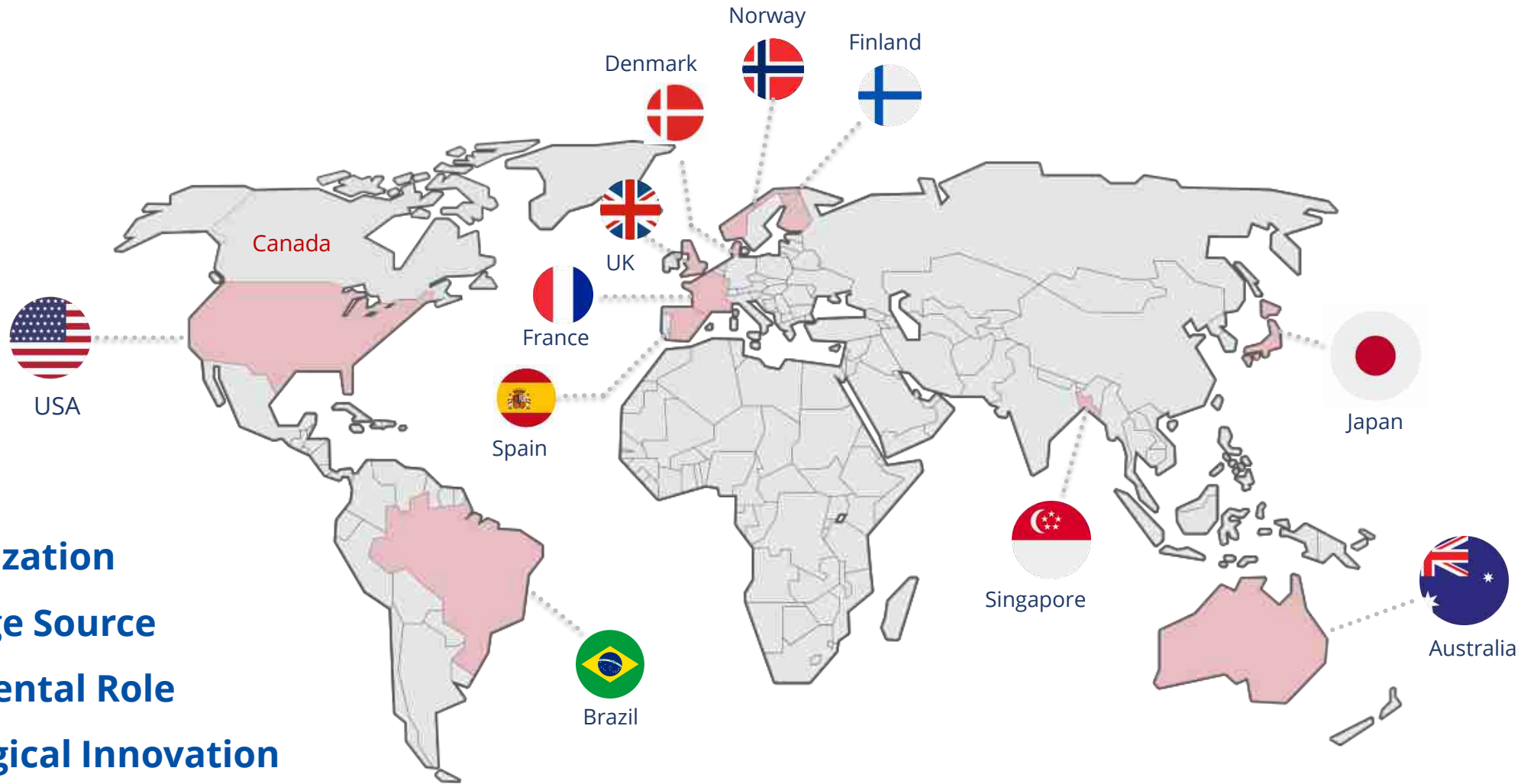


**openBIM Implementations for Canadian Roadmap**  
Released

# Recent Publication



1. **Standardization**
2. **Knowledge Source**
3. **Governmental Role**
4. **Technological Innovation**
5. **Environmental Integration**
6. **Implementations at National Level**



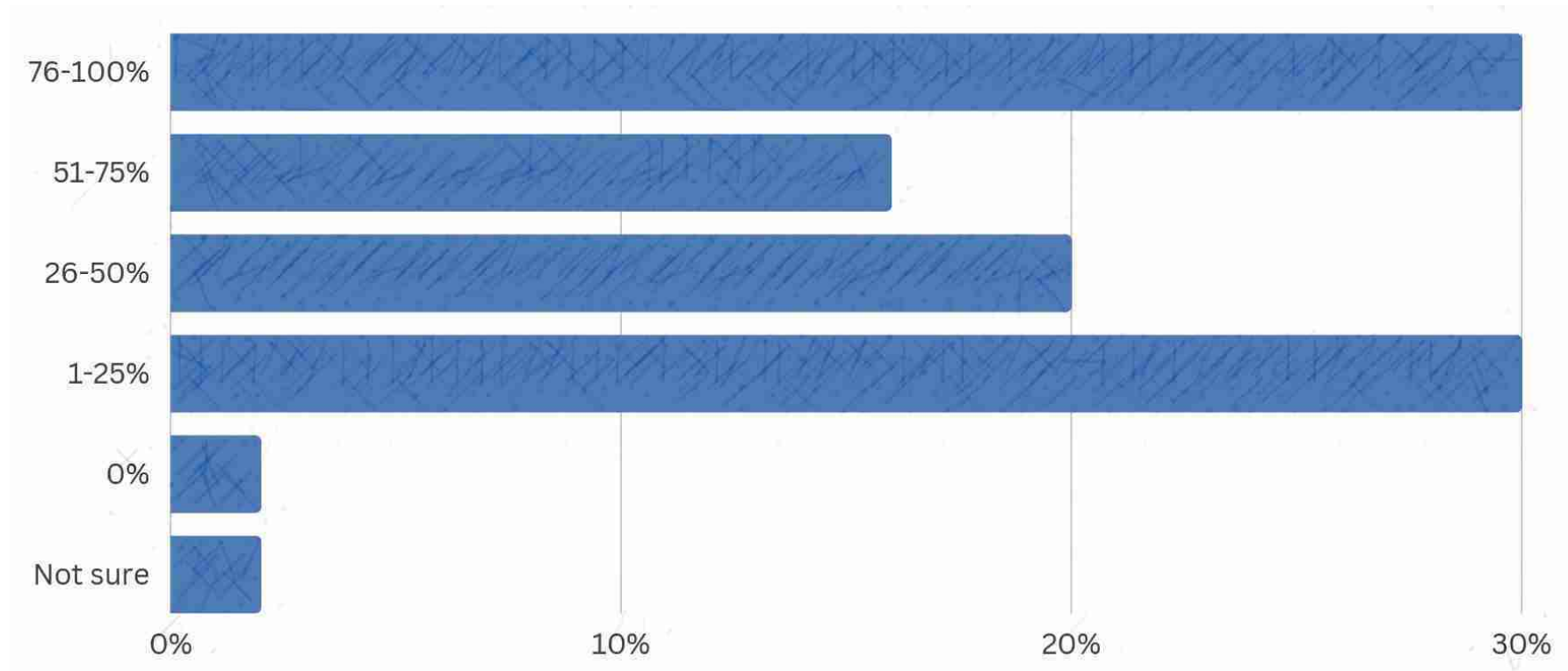


# **BIM Adoption and Implementation in Canada's Built Asset Industry**





# Digital Deliverables



Percentage of projects with digital deliverables besides PDFs

# ISO 19650 Project Implementation

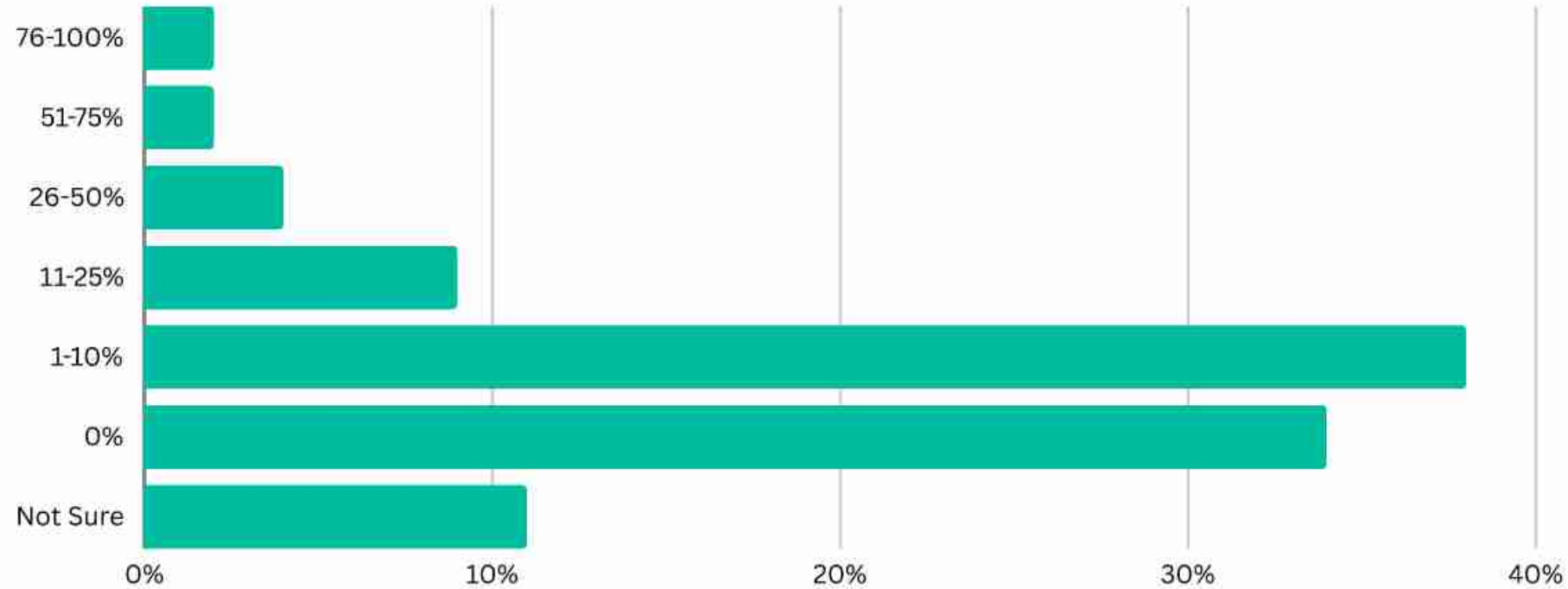
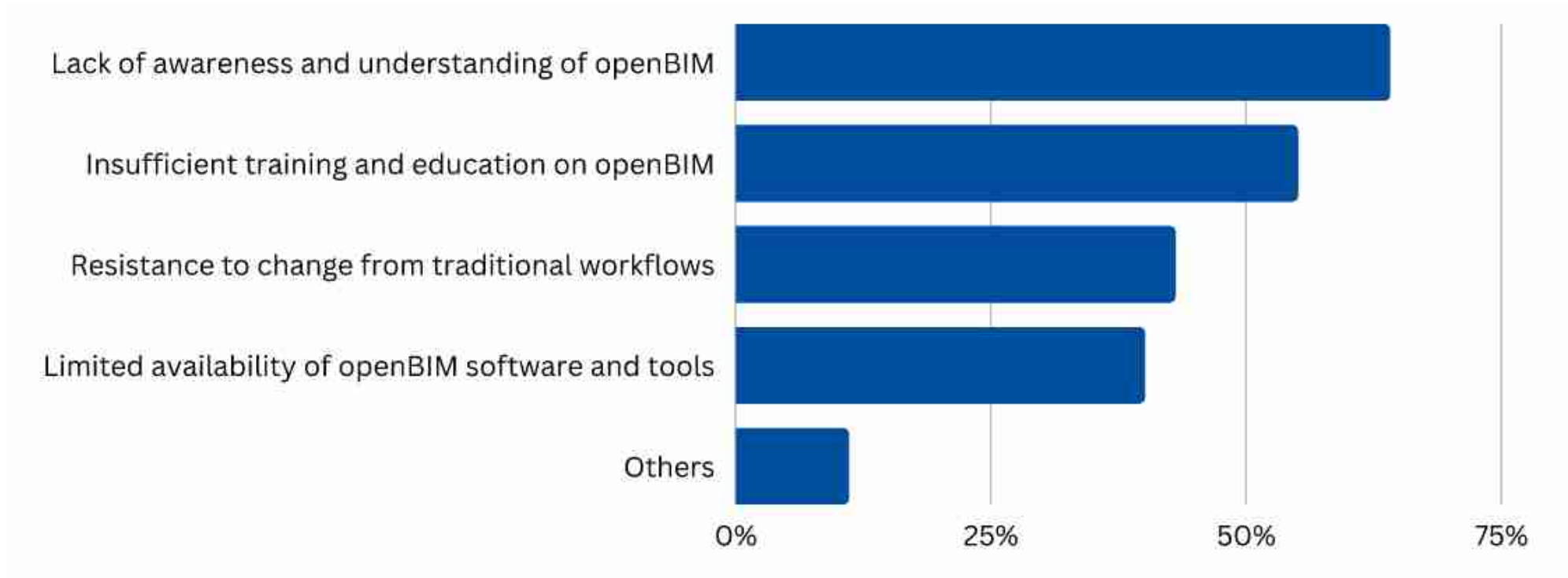
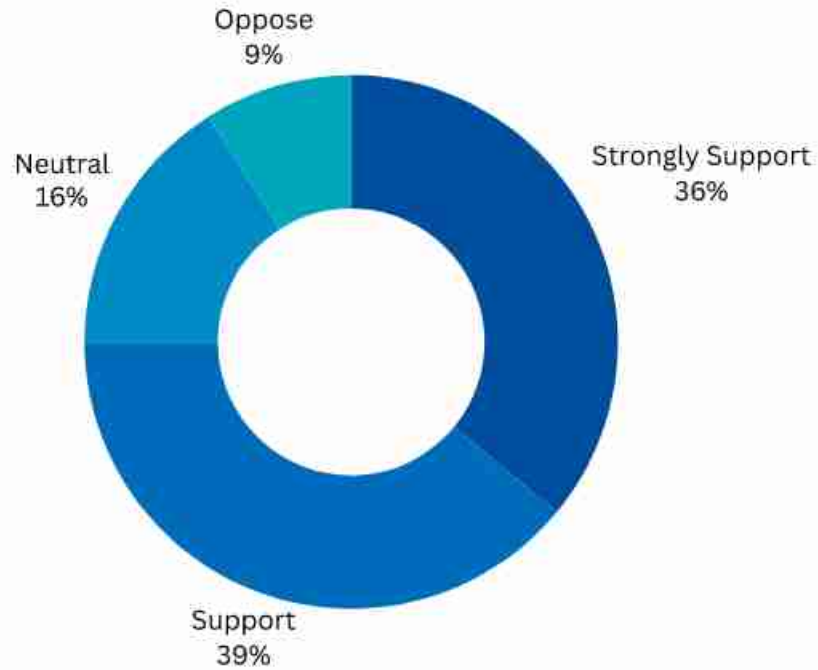


Figure 46: Percentage of projects using ISO 19650 standards

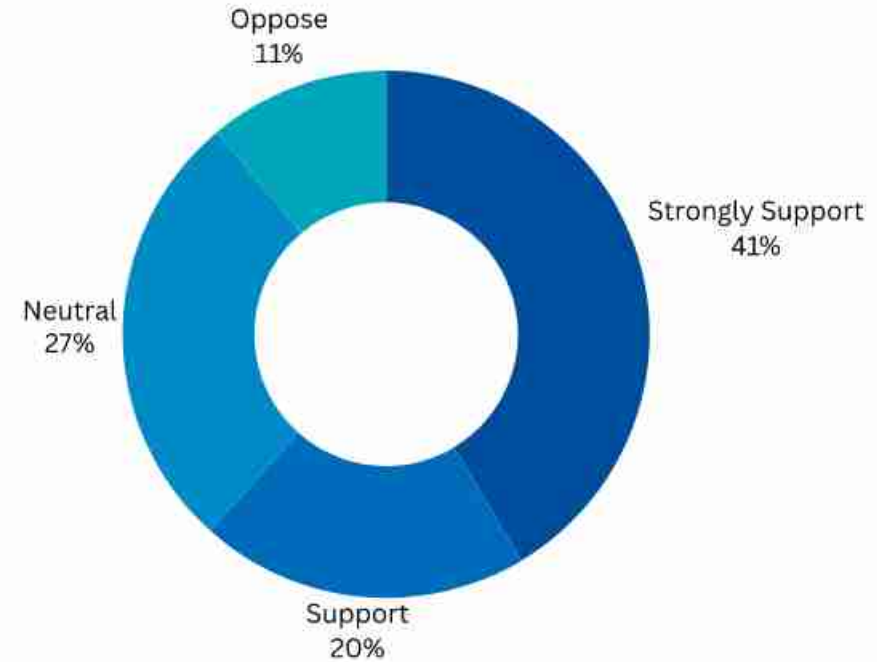
# Challenges of openBIM in Canada



# Support for BIM Mandates

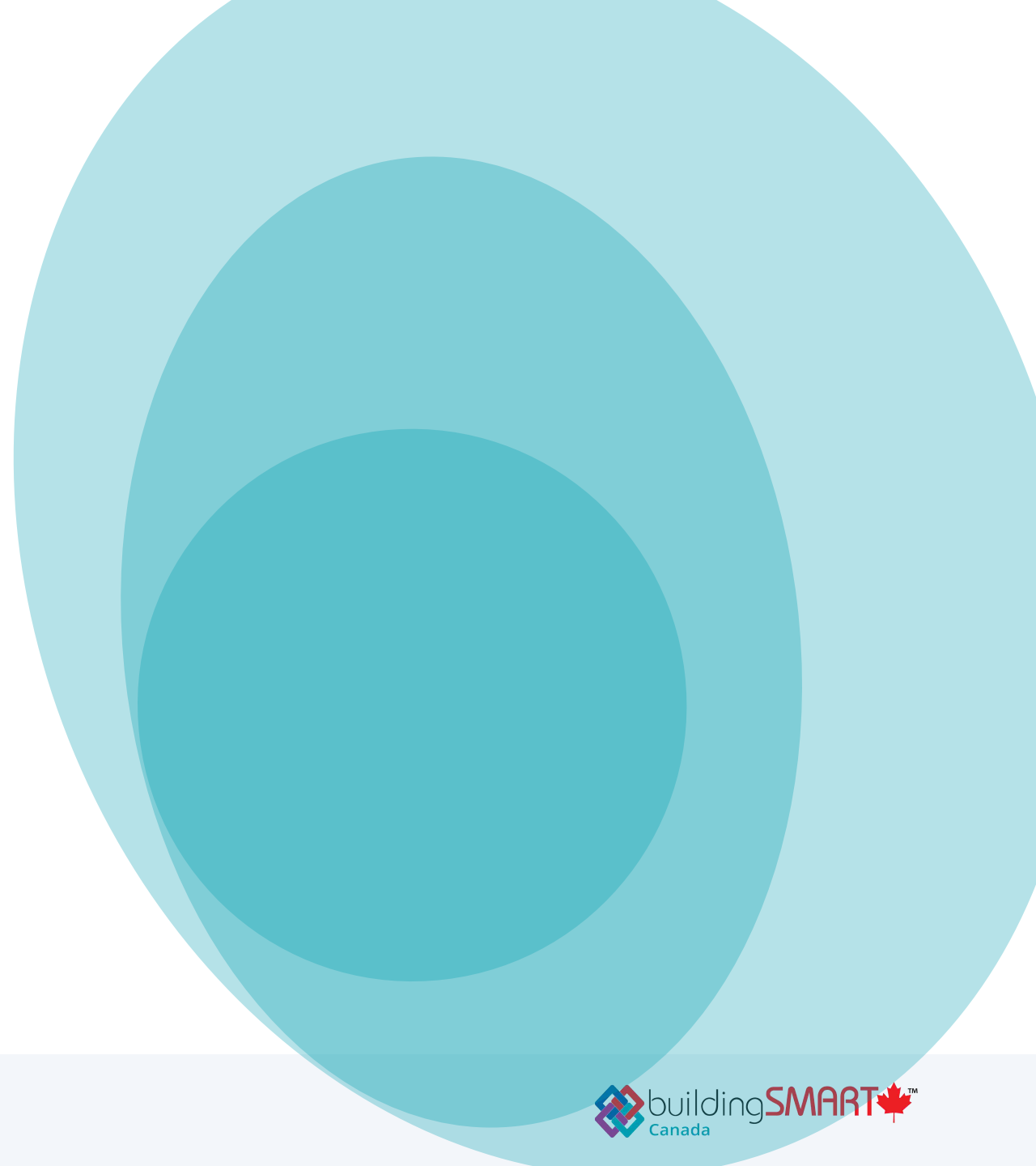


**Figure 60: Level of support for openBIM mandate for planning approvals and building permits**



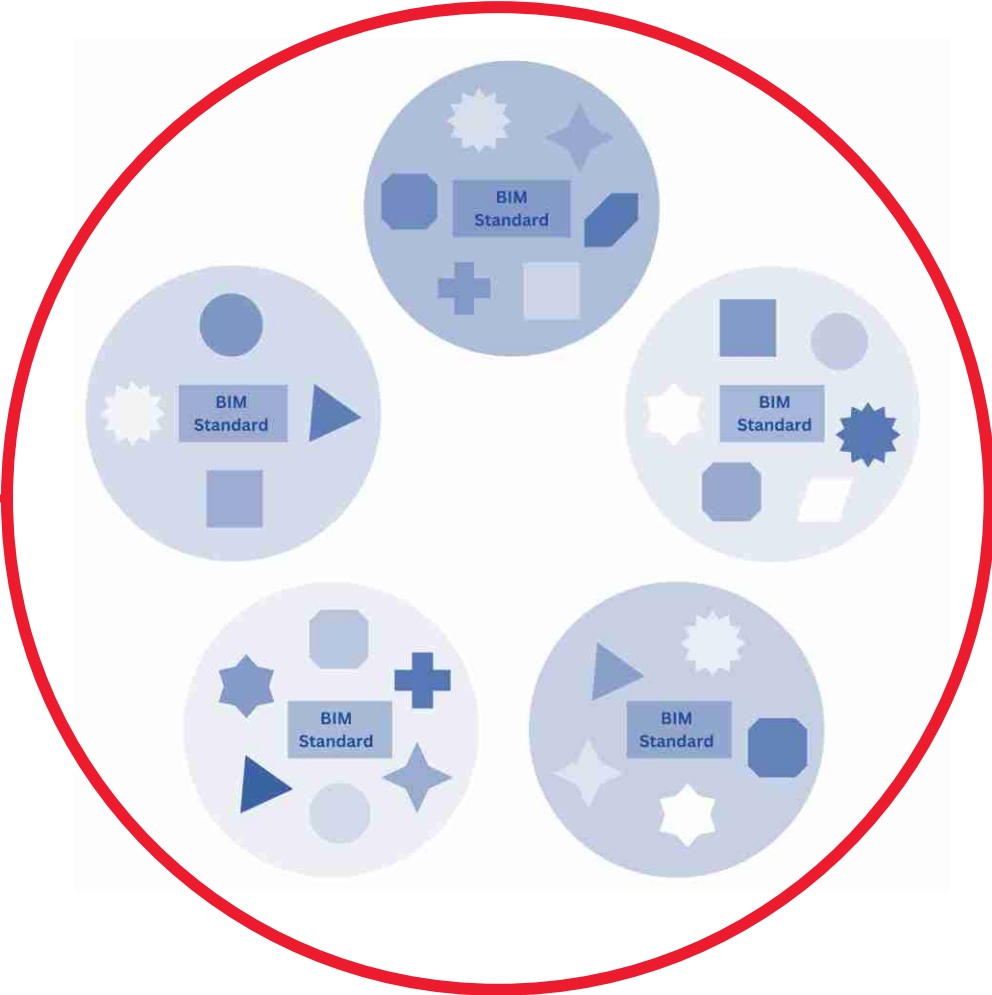
**Figure 61: Level of support for openBIM mandate for submission to owners**

# How





# Mission



# **ACCELERATING THE DIGITIZATION OF THE BUILT ENVIRONMENT IN CANADA**

# DIGITIZATION OF THE BUILT ENVIRONMENT OVERVIEW



- Digitalization of the built environment is at an inflection point
- Geospatial and BIM, two cornerstones of digitalization are advancing worldwide including how GIS/BIM data and respective standards can be interoperable in projects
- Canada's advancement in the built environment is progressing but is also at an inflection point
- Key components in Canada are taking shape:
  - Creation of the National Council on Digitization of Canada's Built Environment
  - Maturation of buildingSMART Canada
  - Opportunities for Canada to partner with the Open Geospatial Consortium

# THE DIGITIZATION OF THE BUILT ENVIRONMENT – CANADA’S NEXT STEPS

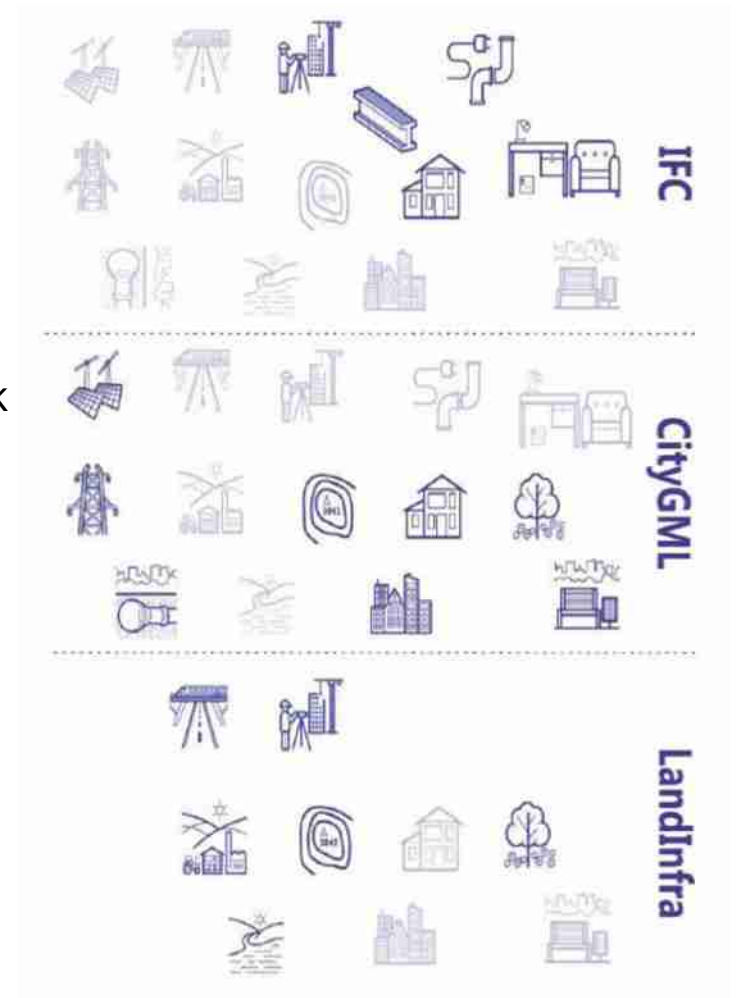


- The global stakes regarding built environment digitization are significant
- The pace of GIS and BIM continue to increase globally
- Opportunities present themselves on a domestic level through economic savings, stronger and needed security benefits, impressive environmental gains, among other areas
- Threats set in if your domestic apparatus, starting with the application of GIS and BIM international standards, are not incorporated
- Canada is not behind nor are we decidedly ahead in built environment digitization
- We are at a crossroads where continuing to advance will require strategic investment by the federal government

# PLANNING FOR THE DIGITALIZATION OF CANADA'S BUILT ENVIRONMENT

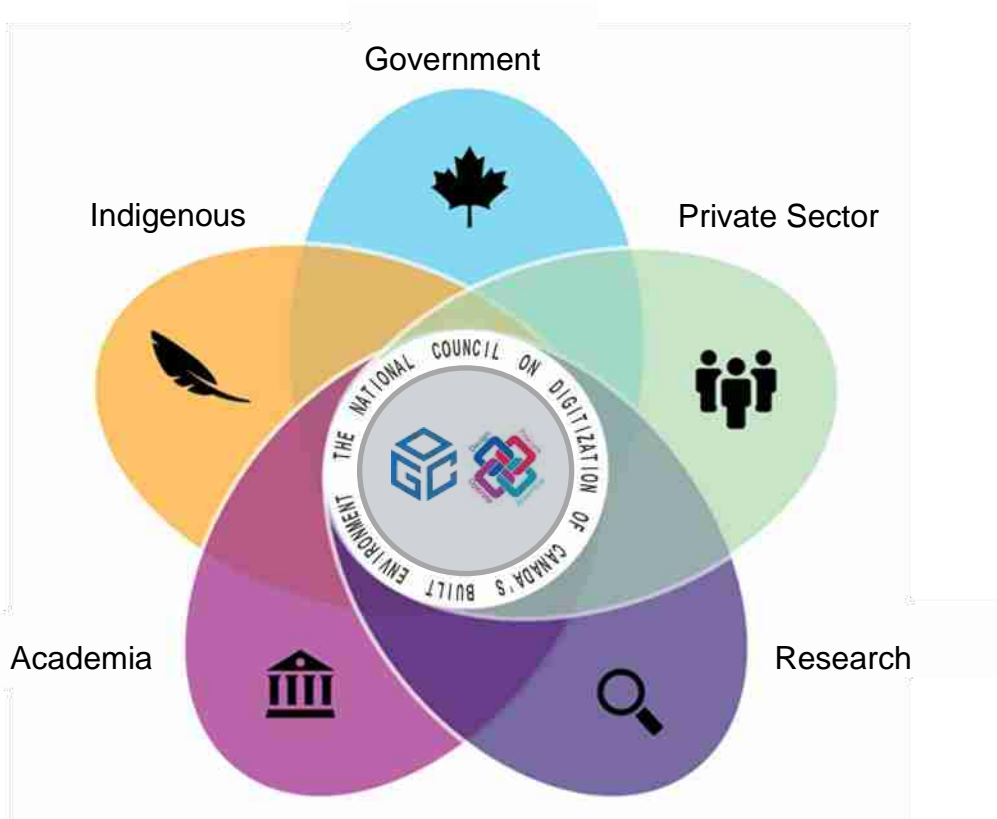
## Key Activities:

1. Engage with Government, Industry and Academia
  1. To partner in the development of the Canadian Digital Twin Roadmap
  2. To develop and implement open standards for Canadian use
  3. To establish the **Integrated Digital Built Environment (IDBE)** framework
  4. To foster technology development through pilot projects/test beds
2. Implement ISO 19650 tools and processes
3. Establish the foundation for the Digitalization of Canada's Built Environment





# FORMALIZING THE NATIONAL COUNCIL ON DIGITIZATION OF CANADA'S BUILT ENVIRONMENT



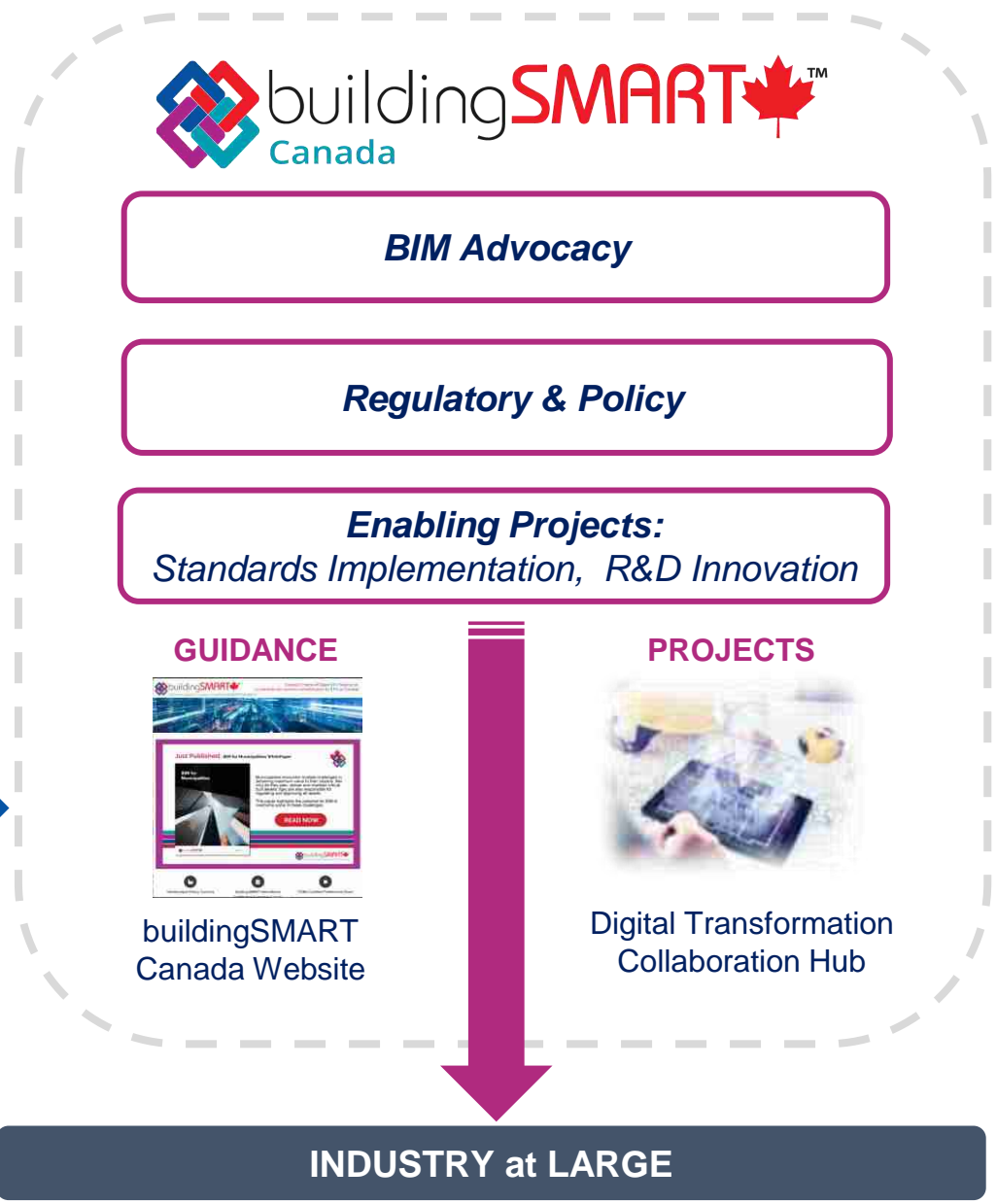
## CURRENT INFORMAL COMPOSITION

- PSPC (CGSB)
- National Defence
- buildingSMART Canada
- CSA Group
- Government of Quebec
- National Research Council
- Natural Resources Canada
- Open Geospatial Consortium

- The National Council on Digitization of Canada's Built Environment (NCD-CBE) was created to provide strategic direction, filling an important void
- As is typical in a fast-moving environment, the NCD-CBE has been operating informally since its conception
- To properly establish ongoing strategic direction to Canada's built environment, NCD-CBE requires **investment in formalizing its membership, structure, and governance**
- Implementing these changes is imperative to properly guide the Canadian built environment community the growing pace of change the sector is experiencing



Provides structure, stability and expertise in **oversight** of enabling projects and case studies



**buildingSMART Canada Members Community**



Plays unique role of investing in and **implementing enabling projects** given leverage and payback to Canadian built environment



Provides **proving ground** and case studies through project implementation that utilize and test the enabling projects in various Domains

# NATIONAL COUNCIL ON DIGITIZATION OF CANADA'S BUILT ENVIRONMENT

## Enabling projects that will guide future development



### Canadian ISO 19650

- Active project started January 2024 to be published within 12 months.

### Canadian BIM Practice Manual Update

- Updating Practice Manual including inclusion of application of ISO standards
- Provides consistent guidance to all

**CAN ISO 19650:  
Published  
January 2025**

### Digital Twin Road Map

- Longer term milestones and timelines for BIM advancement in Canada
- Strategic guide for all sectors on BIM that allows them to plan effectively



### IDBE Framework

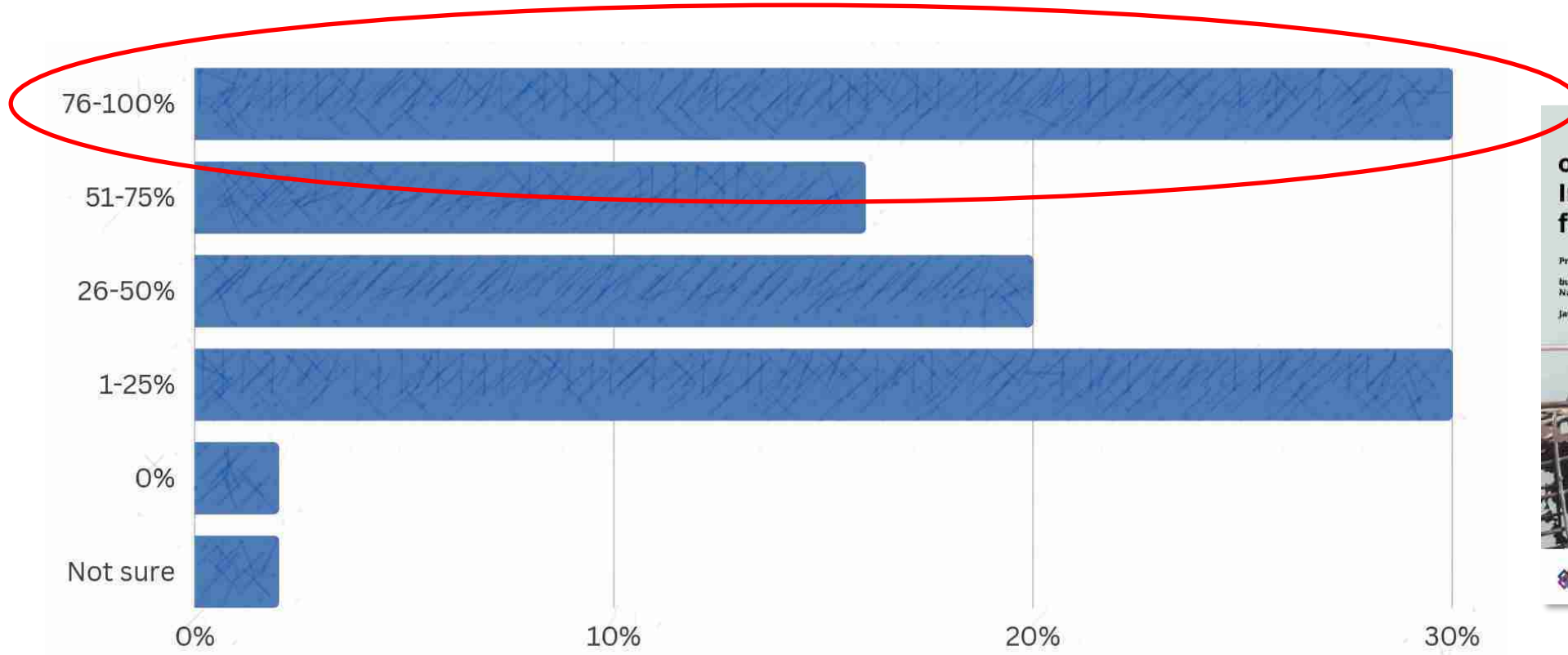
- Methods to allow BIM and GIS data to be interoperable
- Provides the structure necessary to test projects and prove out BIM/GIS project interoperability

### Update CGDI

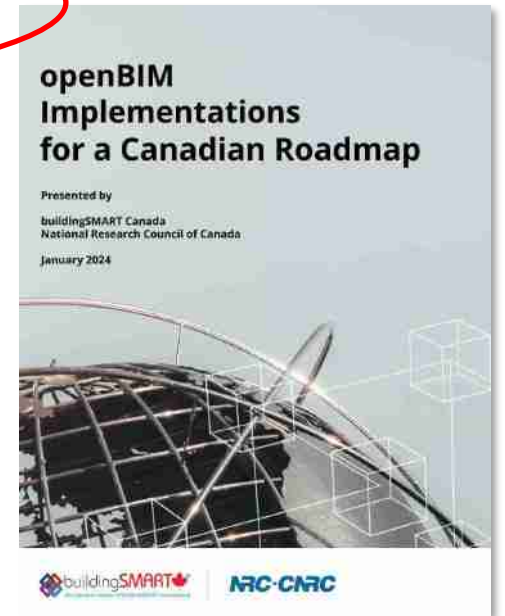
- The Canadian Geospatial Data Infrastructure (CGDI) is managed by the Department of Natural Resources Canada and establishes the foundational geospatial data framework for Canada. Real Property or the Built Environment are not currently represented.

# Challenges

## Growing request for Digital deliverables



Percentage of projects with digital deliverables besides PDFs



# Challenges

## Without a BIM Contract we have disclaimers

*This model looks great so you can look at it but you can't use it for anything or rely on it for anything which includes, but is not limited to, everything.*

*If you use it for anything anyway then you have to pay my lawyers anything they want if I get sued for anything related to your use of the model for anything.*

*Have a nice day.*

Some of the information is not reliable so *don't rely on any of it.*

# BIM Contract Appendix

The Institute for BIM in Canada (IBC) mission: To lead and facilitate the coordinated use of BIM in the design, construction and management of the Canadian built environment.

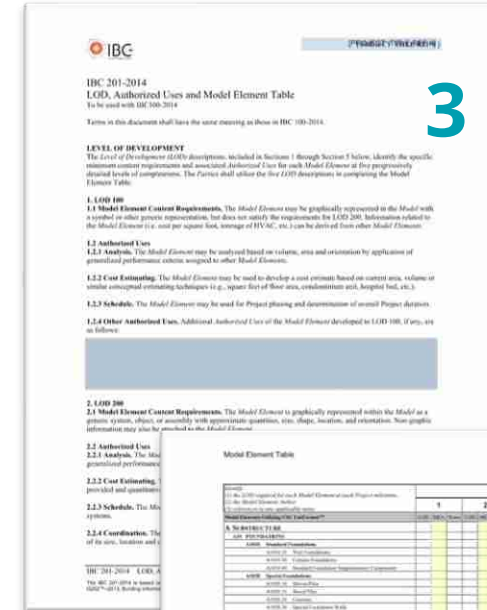
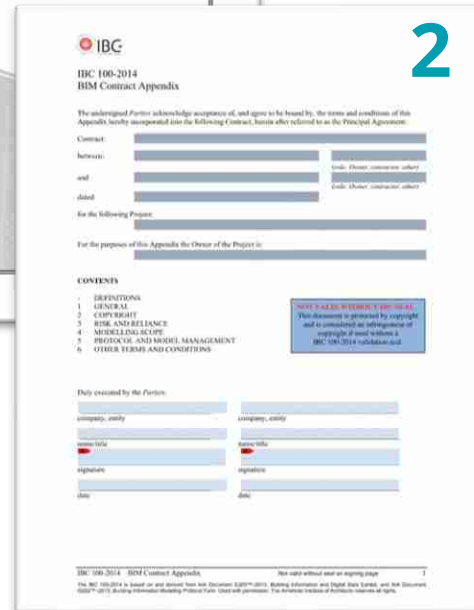
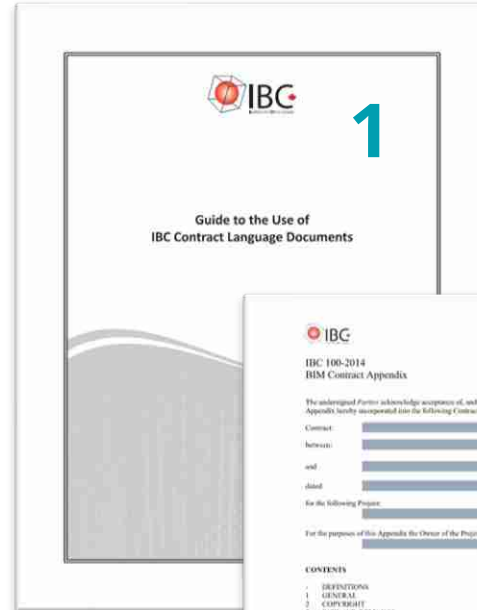
## Working group & founding partners of The IBC-2014 BIM Contract Appendix

1. Royal Architectural Institute of Canada (RAIC)
2. Association of Consulting Engineering Companies (ACEC)
3. Canadian Construction Association (CCA)
4. Construction Specifications Canada (CSC)
5. Private Sector Lawyers, construction law section

**buildingSMART Canada inherited the BIM Appendix in 2019**



# BIM Contract Documents Package



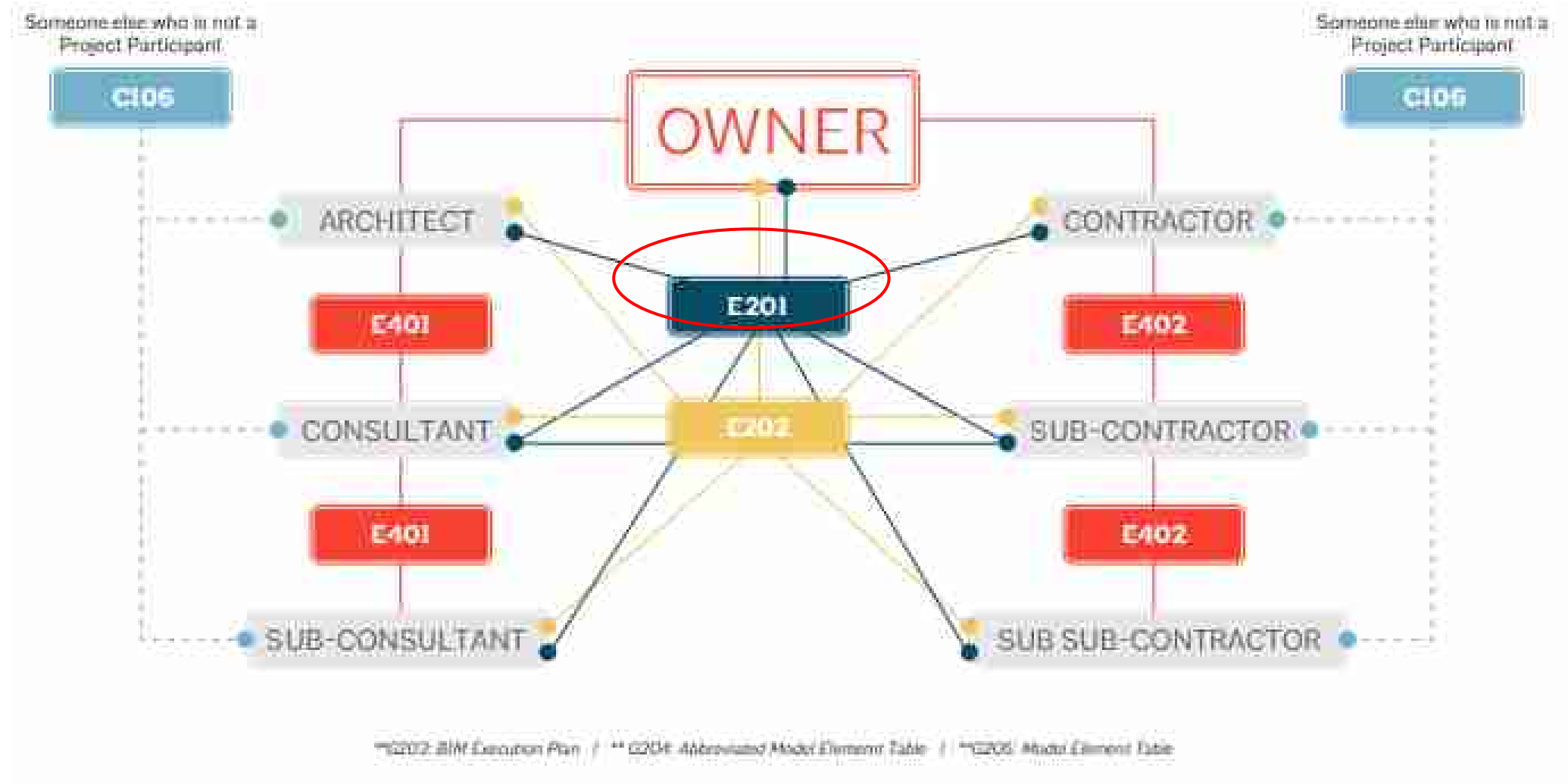
Model Element	Project Milestones						Notes
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1.010 - Project Information							
1.020 - Project Information							
1.030 - Project Information							
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1.990 - Project Information							
2.000 - Project Information							

## 4 Documents

1. Guidance Document
2. IBC 100-2014 (BIM Contract Appendix)
3. IBC 201-2014 (Level of Development and Authorized Uses)
4. Model Element Table

# AIA BIM Contract

\$140 USD each



# PROJECT PLAN

Item	Item Description
Phases	<ol style="list-style-type: none"><li>1. Update BIM contract appendix draft</li><li>2. Reach out to professional associations and industry for feedback</li><li>3. Release BIM contract appendix update</li><li>4. Promote updated document</li><li>5. Continue to endorse use and implementation</li></ol>
Deliverables	<ol style="list-style-type: none"><li>1. BIM contract appendix</li><li>2. Guidance document</li><li>3. Template</li></ol>
Supporting bSC Activities	<ol style="list-style-type: none"><li>1. Work with professional associations and industry</li><li>2. Endorsement</li><li>3. Promote the update through bSC membership, affiliate network, professional associations</li></ol>

# Discussion Questions