National Defence / Défense nationale

OPEN BIM and the future: BIM and GIS integration

Building the DND Real Property Spatial Data Framework

ASSISTANT DEPUTY MINISTER (INFRASTRUCTURE AND ENVIRONMENT)
SOUS-MINISTRE ADJOINT (INFRASTRUCTURE ET L'ENVIRONNEMENT)

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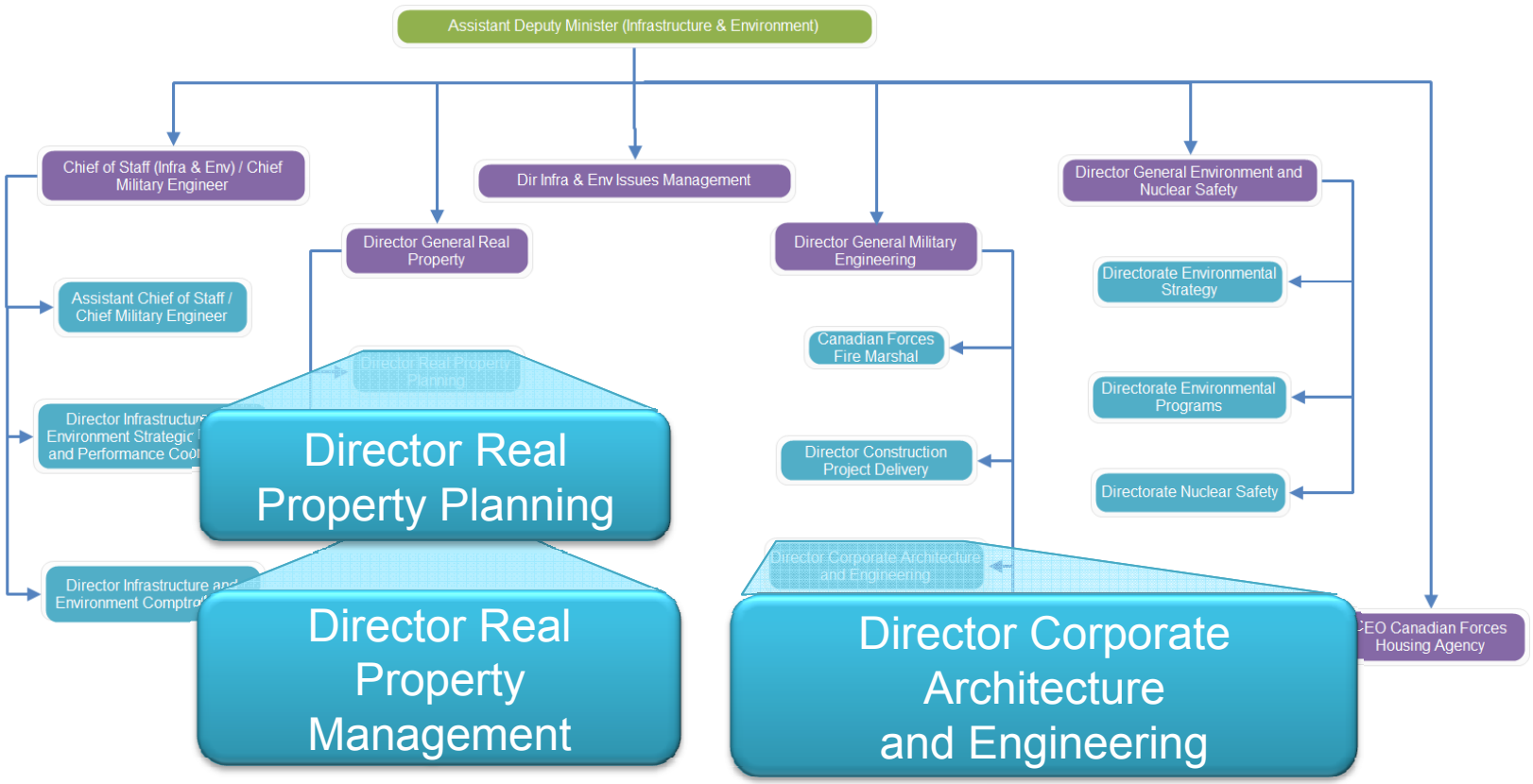
Assistant Deputy Minister (Infrastructure & Environment)



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Major Influences of Change at the DND

- Canada First Defence Strategy
- Building Information Management Implementation
- Infrastructure and Environment Business Modernization

Real Property and Military Engineering groups are working together to develop a central Spatial Data Warehouse in support of lifecycle asset management.

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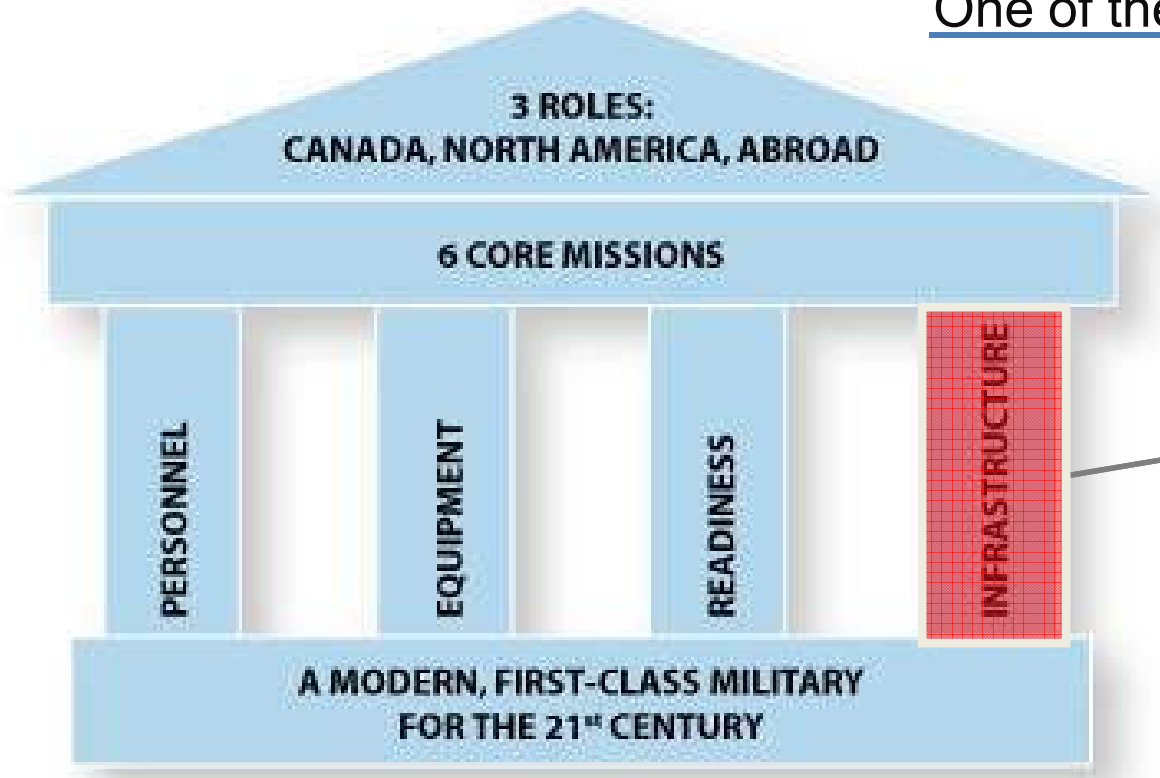
Canada First Defence Strategy

Infrastructure:
One of the Four Pillars



http://www.forces.gc.ca/site/pri/first-premier/index-eng.asp

Sound infrastructure is required

This is where BIM comes into the picture/portfolio

Usage of BIM represents increased efficiency in project delivery and portfolio management

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Building Information Modelling

BIM

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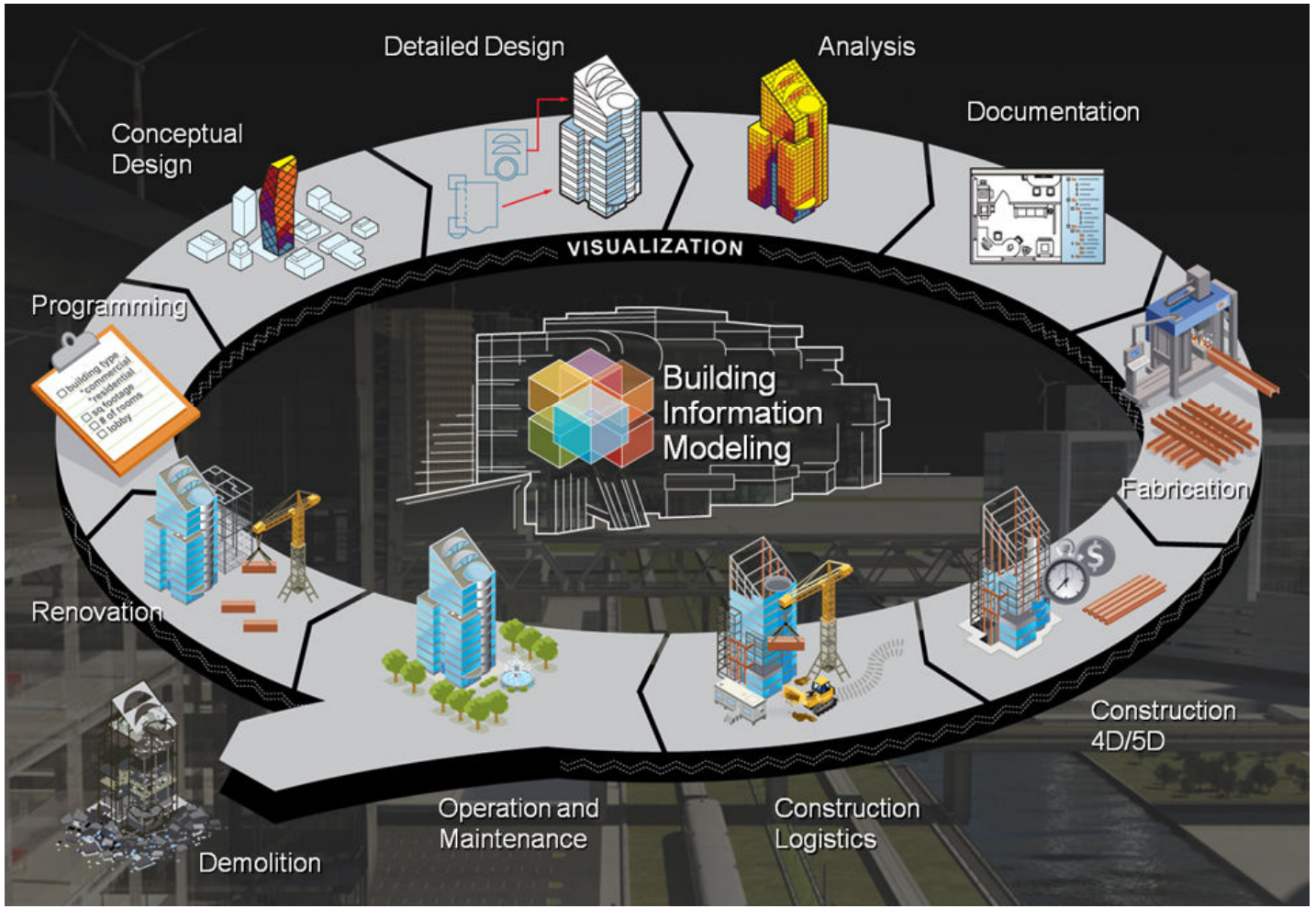
What is BIM?



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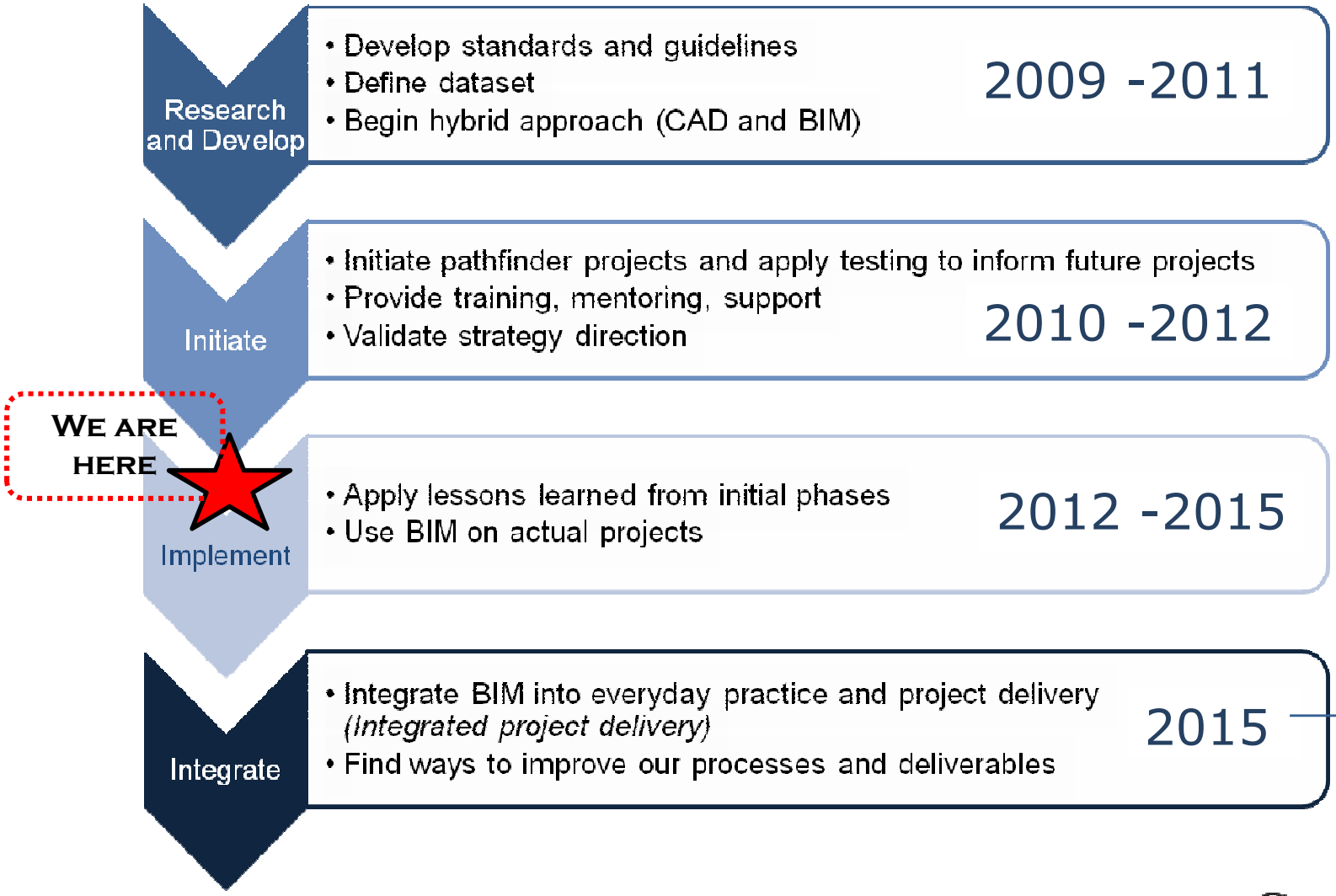
Background

- As an owner and manager of assets, DND stands to gain the most from a BIM environment.
- BIM implementation is driven from the Director General level.
- We are about half-way into the process which involves:
  - Develop/adopt new DND CAD/BIM standards, policy and guidelines;
  - Phased CAD/BIM hybrid approach;
  - Education and Training;
  - Outreach to Industry and other government departments;
  - Realize the ultimate goal of OPEN BIM™
- Apply Open Standards in the integration of this information with GIS and legal data to create a complete spatial data repository.

DND's Multi -Year Transition to BIM



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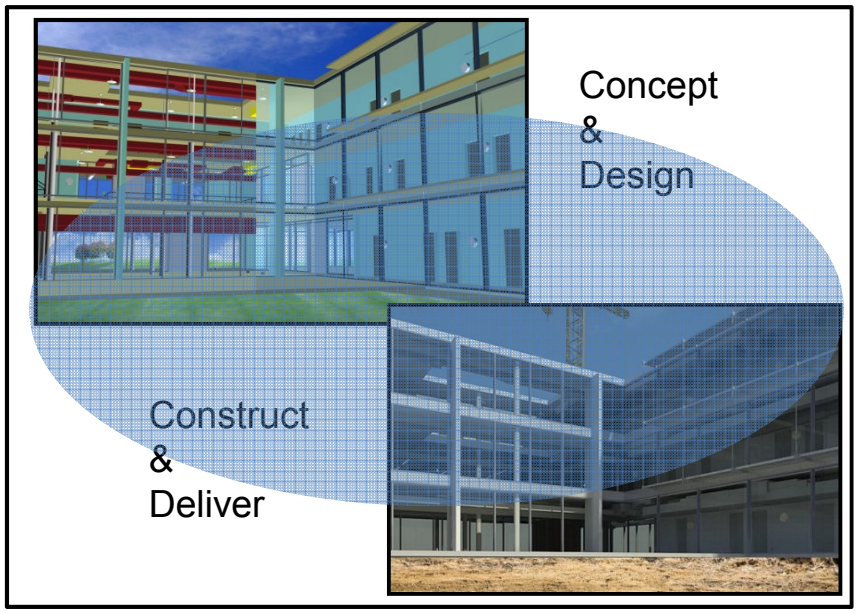
Little BIM to BIG BIM

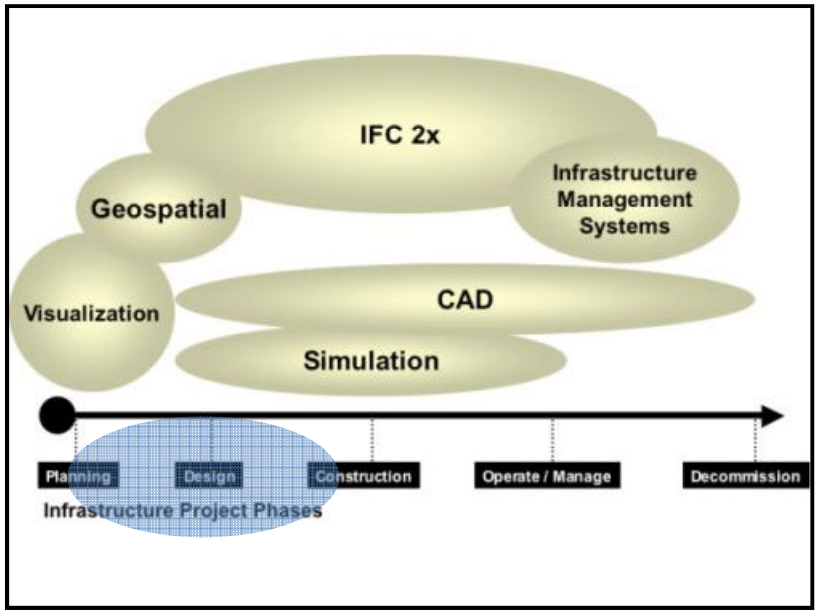
Little BIM

In simple terms…
Used to Deliver a Project



BIG BIM

In simple terms…
Concept to Demolition



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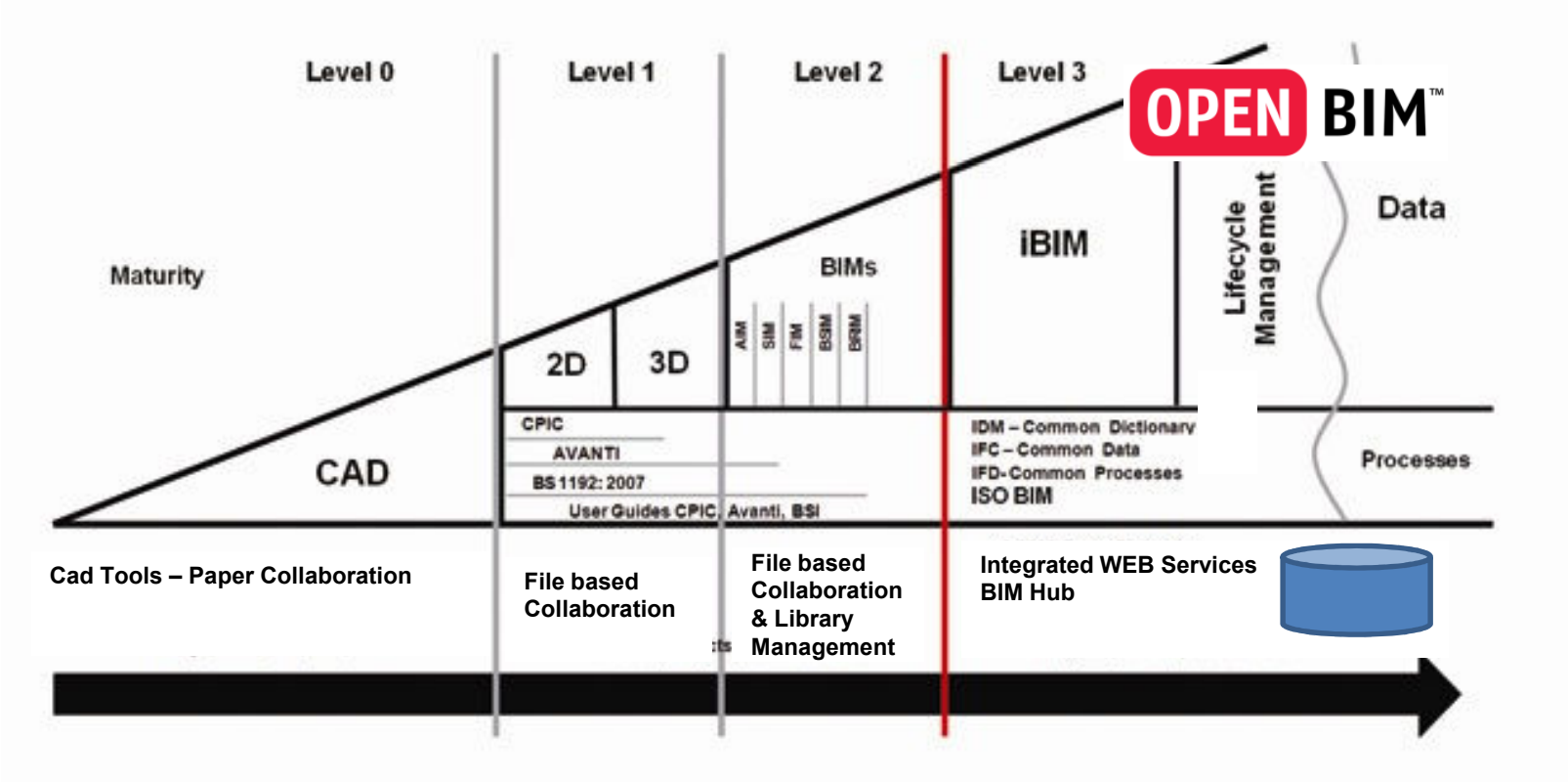
BIM and Standards

- The global BIM standards will incorporate “model views" of information exchanged between AEC and DND the owner / operator. The standards will build upon standards in use today, in particular:
  - The buildingSMART (formally International Alliance for Interoperability) IFCs;
  - Standards of the National Institute for Building Sciences (NIBS)
  - ISO standards;
  - Open Standards Consortium for Real Estate (OSCRE) standards;
  - Open Geospatial Consortium (OGC) standards;
  - The FIATECH capital investment roadmap;
  - Efforts like CSI OmniClass taxonomies, COBIE (Construction to Operations Building Information Exchange), etc.
- All of these will have an impact on our ability to exchange Real Property information on a corporate wide basis.

BIM Strategy Direction

- Bringing change to lifecycle management processes of an asset.
- The industry is entering Level 2 with many still working in 2D CAD.
- The ultimate position is shown as OPEN BIM, where all data and systems are integrated and interoperable using the same data.



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Outreach

Through its membership in the Institute for BIM in Canada (IBC), DND plays an active role in the promotion and application of OPEN BIM in Canada.

IBC Mission:

"Act as the authoritative voice for BIM in Canada."

Formed in late 2010, Constituent Organizations:

- Association of Consulting Engineering Companies (ACEC)
- Canadian Construction Association (CSA)
- Construction Specifications Canada (CSC)
- Royal Architectural Institute of Canada (RAIC)

Institute for BIM in Canada

- Develop contract language
  - Supplementary conditions to existing contract forms
  - Standalone contract forms
- Established the Canadian Chapter of buildingSMART International in mid 2011.
- Canadian practitioners were participating in the work of the North American chapter, the buildingSMART Alliance
- Need to establish Canadian chapter due to differences between US and Canadian industries.
  - Legal
  - Language
  - Metric System

www.ibc-bim.ca

Spatial Data Management

INTEGRATION

It's All About the…

DATA

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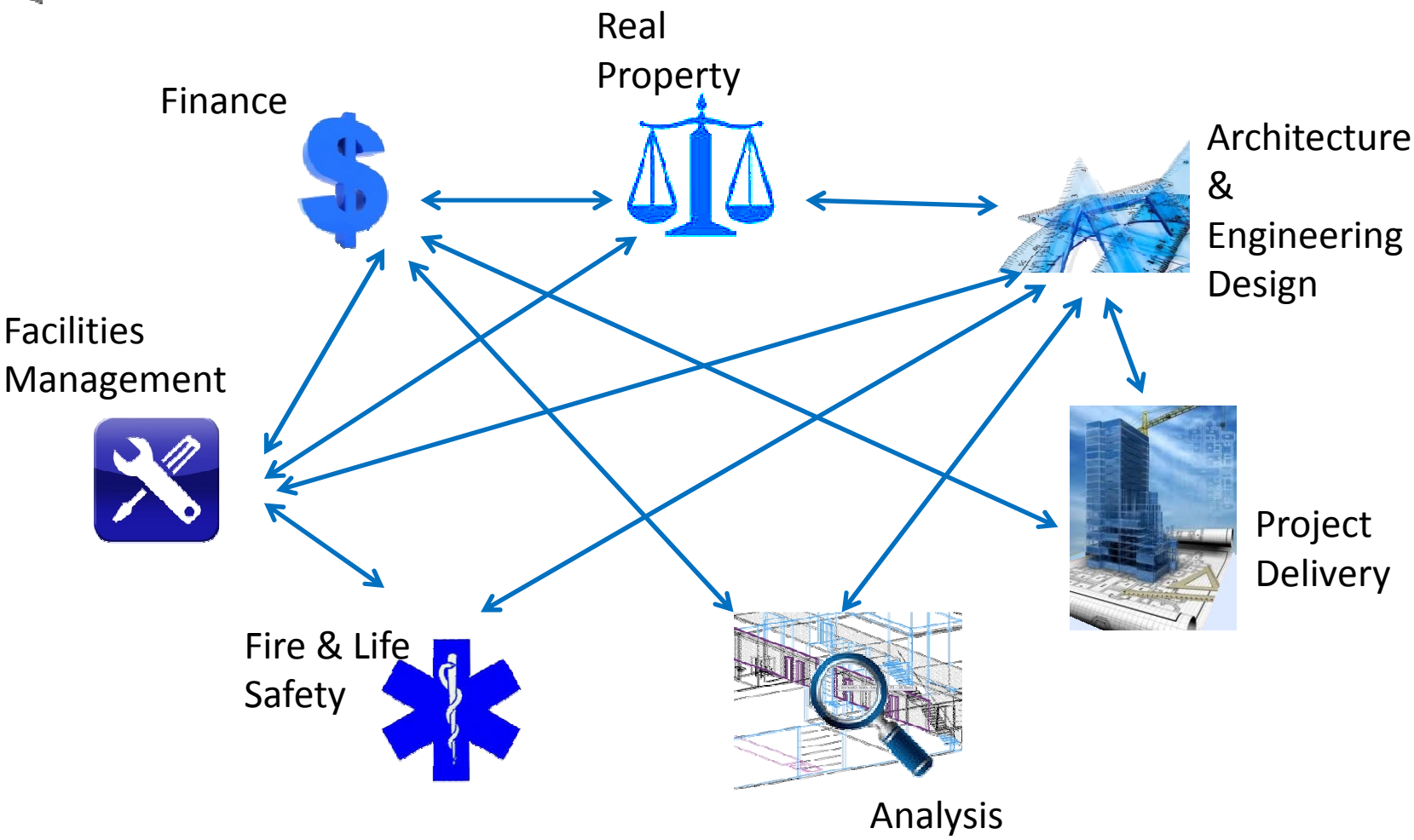
Data Sharing – Today



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Modernize Spatial Data Environments

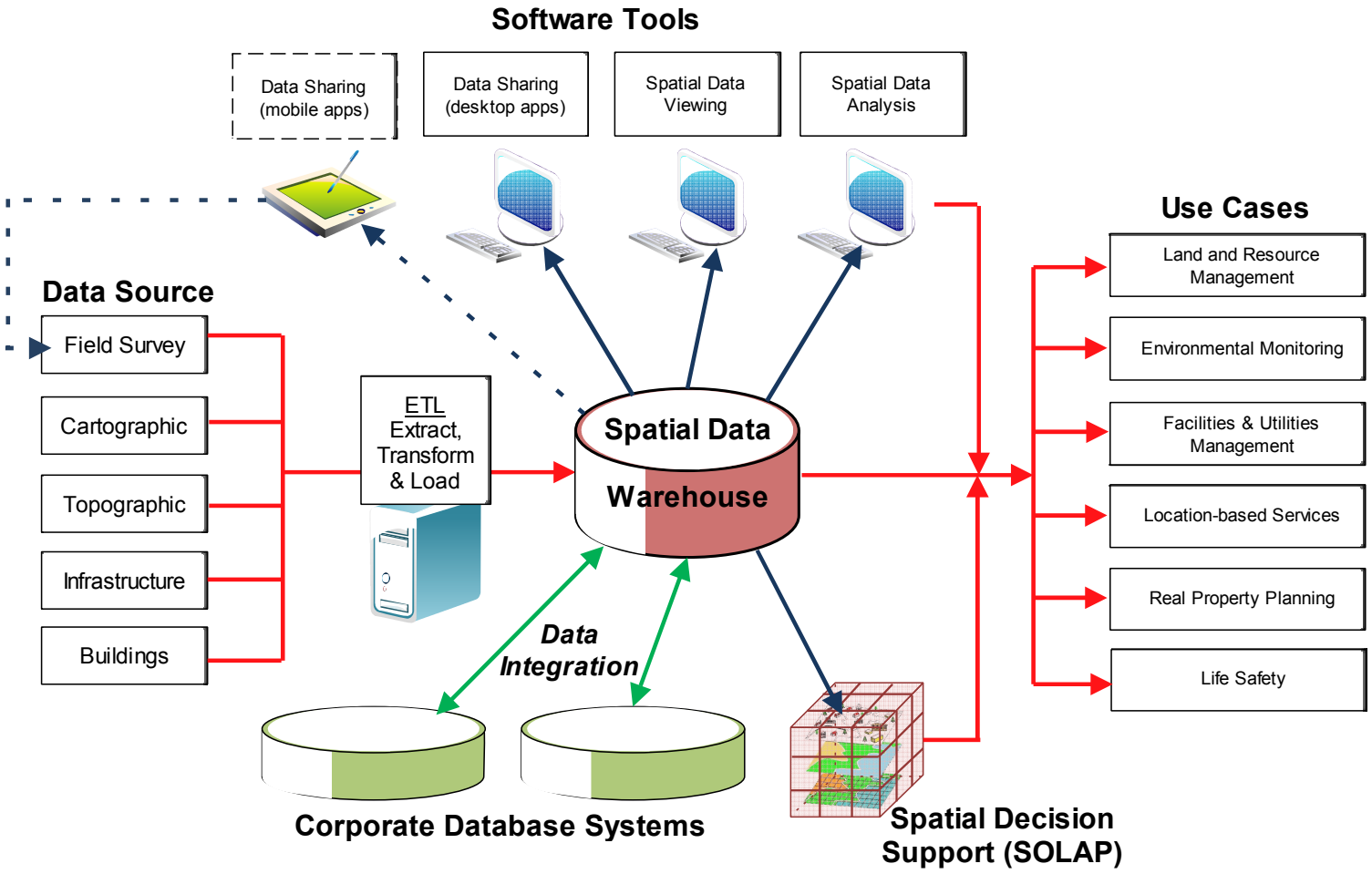
Corporate Spatial Data Migration Strategy		
	Existing	Future
Database and Application Environment	▪ File repositories ▪ Local data servers ▪ AD-HOC spatial applications ▪ Manual data exchange	▪ Interoperable database access ▪ Distributed spatial data processing ▪ Integration with non-spatial application in decision support
Computing and Interface Environment	▪ Desktop (DWAN) computers ▪ Engineering Workstations ▪ GIS Client and Web Portals ▪ Geo-relational databases ▪ Off-line data acquisition and exchange	▪ Regional, National & Global spatial data infrastructure ▪ Application service provider ▪ Web mapping ▪ High-bandwidth scalable network

Spatial Data Management and Sharing

Goal: Establish departmental spatial capability that is fully integrated with the enterprise system.

- Creation of a Real Property Spatial Data Office (OPI) that will:
  - Develop, implement and monitor policies, standards and guidelines for spatial data management;
  - Provide governance and stewardship of spatial data;
  - Develop framework and functional specification for a centralized Spatial Data Warehouse;
  - Integrate AEC, GIS and Legal data into a single authoritative source;
  - Allow for the collaboration between spatial applications that require vast amounts of data.
- The main benefits of centralized integrated spatial data are:
  - To realize the value that accurate spatial data represents to ERP and BI.
  - To reduce the risk of stranded technologies by enabling the users to adopt new platforms without effecting the warehouse;
  - To standardize infrastructure information management for all phases of lifecycle.

Spatial Data Relationships



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Spatial Data Integration Mandates

- Surpass government requirements (Treasury Board);
- Allow class structures for GIS and BIM data to co-exist;
- Establish rich metadata through ISO 19115:2003;
- Ensure support for a multitude of software applications;
- Include terrain, buildings, legal and site infrastructure;
- Ensure the platform provides speed, scalability and interoperability;
- Provide validated information through an automated workflow;
- Track progress and apply Total Quality Management principles in the refinement of the system.
- Share the model with other government real property departments.

Data Sharing – Collaboratively

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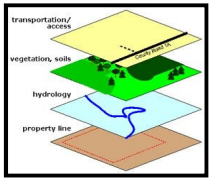
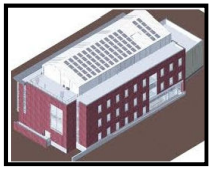
The Complete Campus Model: an example

Data Sources

GIS



BIM/CAD



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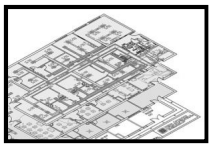
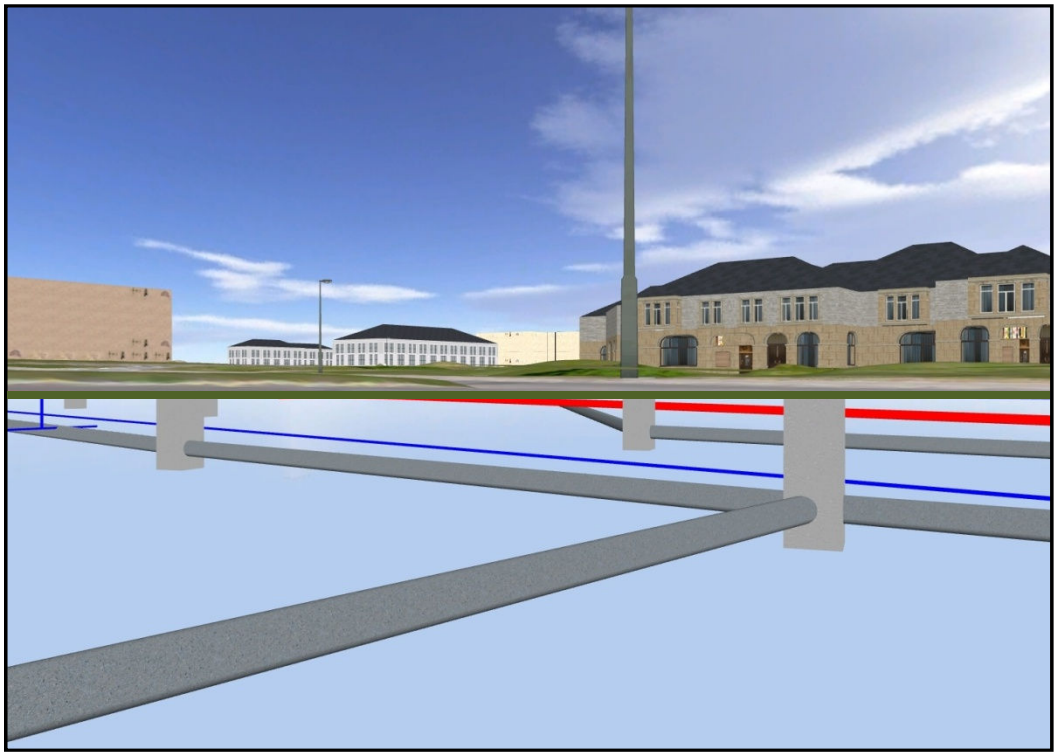


RASTER

Compiled for Visualization



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Questions Welcome