



Digitizing Rules and Regulations

A GUIDE FOR LOCAL GOVERNMENTS

Converting Bylaws and Other Rules Into Machine-Readable Formats

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Why Digitize Rules and Regulations?

Throughout the housing construction process, builders and developers must navigate rules issued by multiple regulators and spread across a range of legislative, regulatory, and policy documents. Many have identified the challenge determining which rules apply to their projects in each jurisdiction as a key barrier to efficiently delivering housing. Confusion, delays in finding applicable requirements, and difficulty resolving conflicting rules slows projects, increases costs, and ultimately hinders the delivery of homes for British Columbians.

Today, these rules exist in Word files, PDFs, or even printed volumes, often accompanied by PDF or paper-based permitting processes. Citizens and the construction sector expect better access to tools and services, like modern online platforms and AI compliance tools, that streamline approvals and reduce uncertainty. Technologies that make it easier to submit, review, and approve permits rely on structured information to interpret complex requirements. The way governments and regulators publish rules for building more housing isn't helping people understand what's required, and, instead, creates friction for those trying to build.

Converting rules to machine-readable formats is essential for using current and future technology to streamline the development of new housing. Tools and services powered by digital rules in a consistent format help builders and developers submit more complete and compliant permit applications, freeing local government staff to focus on higher-value oversight and decision-making.

The Limitations of Traditional Formats

Word documents and PDFs present significant challenges for use:

1

Limited Searchability

Users must manually navigate through hierarchical content to find relevant provisions. A simple search might return dozens of results without context.

2

No Integration Pathway

There's no standardized way to connect bylaws with digital design tools, permit systems, GIS platforms, or compliance software.

3

Manual Version Control

Tracking amendments, corrections, and updates across multiple documents is labour-intensive and error-prone.

4

Barriers to Automation

AI-powered tools, chatbots, and automated compliance checking cannot meaningfully process unstructured documents.

What Digitization Enables

By converting regulatory documents to structured, machine-readable formats like JSON or XML, you unlock new possibilities:

1

Intelligent search
that understands
document hierarchy and
cross-references

2

Direct integration
with permit processing
systems and development
applications

3

Automated compliance
checking against
submitted plans

4

AI-assisted
interpretation and
guidance for applicants

5

Point-in-time queries
("What were the setback
requirements on January
1, 2023?")

6

**Consistent, error-free
publishing** across web,
mobile, and print

Key Benefits of Digitization

For Your Organization

- **Reduced Manual Work:**
Automated cross-reference checking, validation, and structured rule formats catch inconsistencies early, reducing errors and cutting staff time spent on manual reviews
- **Frees Staff for Higher-Value Services:**
Repeatable, auditable amendment workflows make updates faster and more reliable, allowing staff to shift effort from routine rule maintenance to higher-value services
- **Supports Innovation:**
Machine-readable rules enable a wide range of reliable digital tools that help builders work more efficiently, reduce uncertainty, and innovate with greater confidence
- **Single Source of Truth:**
One central dataset that ensures all channels (web, print, APIs) draw from the same accurate, up-to-date information
- **Seamless Multichannel Delivery:**
Capability to publish content across websites, apps, PDFs, and permitting systems in ways that deliver a better user experience

For Your Organization

Continued

Ministry of Housing and Municipal Affairs BC Building Code Publishing

e.g.

The production of a machine-readable version of the BC Building Code is valuable not just for the innovation it enables in the technology and construction sectors, but for the modern publishing process it can enable within the Ministry.

Combined with an XML/JSON editing tool, this approach is primed to give the Ministry's code publishing team effective tools to manage content, supporting critical functions such as inserting and analyzing BC-specific variations in full context, updating revisions more quickly, and converting to user-friendly formats with greater fidelity. Together, these capabilities create a more reliable, efficient, and consistent foundation for publishing the BC Building Code.

Smart Inspections Digital Assistant (InspectorAI)

e.g.

Cloudpermit, in collaboration with Tedford AI and Amii, is developing InspectorAI which will use advanced AI to learn from past inspection data and provide site-customized predictions of building code issues. The tool will use Natural Language Processing to convert speech to text for recording notes but **then will link those notes to specific Building Code requirements** so that they can be accurately documented and shared with the builder. For builders, it will use the predictive machine learning model to direct builders towards any areas where deficiencies are likely to occur, allowing them to address these issues before an inspector arrives.

By overseeing and automating many tasks involved in preparing, conducting, and reporting on inspections, it will help reduce stoppages caused by non-compliant construction.

For Your Community



- **Rules as a Service:**

Everyone can find relevant rules faster and user-friendly interfaces let everyone explore rules more easily

- **Trusted Source of Truth:**

Everyone relies on the same up-to-date, authoritative version of the rules

- **Better Outcomes:**

Everyone has access to technologies that help identify what's possible to build and get an early indication on project compliance

e.g.

Interactive BC Building Code

Since 2018, the Ministry of Housing and Municipal Affairs has published the BC Building Code and its revisions in PDF format. However, Code users have asked for features beyond what this format is able to support.

To address this, the Ministry is developing a new interactive version of the BC Building Code, powered by its underlying JSON data. This modernized format will include key features designed to make the code easier to use, including full-text search, downloadable content options, in-line glossary definitions, filtering by effective dates, and pins to the most common areas of the Code.

A screenshot of the BC Building Code interactive website. The page has a blue header with the BC Building Code logo and navigation links for Search, Glossary, and Download. Below the header is a breadcrumb trail: Home / ... / 1.1.1. Application of th... / 1.1.1.1. Application of ... The main content area is titled 'BC Building Code' and includes a download button for 'Division A - 1.1.1.1 Application of this Code PDF'. There are three numbered items: 3) This Code applies to both site-built and factory-constructed buildings. (See Note 1.1.1.1.(2).) 4) Farm buildings shall conform to the requirements in the National Farm Building Code of Canada 1995. 5) For heritage buildings, the Alternate Compliance Methods for Heritage Buildings in Table 1.1.1.1. may be substituted for requirements contained elsewhere in this Code. (See Note 1.2.1.1.(1)(a).) Below these items is 'Table 1.1.1.1. Alternate Compliance Methods for Heritage Buildings Forming Part of Sentence 1.1.1.1.(5)'. The table has three columns: No., Code Requirement in Division B, and Alternate Compliance Method. Row 1: No. 1, Code Requirement: Fire Separations Sentence 3.1.3.1.(1), Table 3.1.3.1., Subsection 9.10.9, 2 h fire separation required between some major occupancies. Alternate Compliance Method: Building means any structure used or intended for supporting or sheltering any use or occupancy. Except for occupancies, 1 h fire separation is acceptable, provided the building is sprinklered. Row 2: No. 2, Code Requirement: Fire Separations Sentence 3.1.3.1.(1), Table 3.1.3.1., Subsection 9.10.9, 1 h. Alternate Compliance Method: 30 min fire separation is acceptable if the...

No.	Code Requirement in Division B	Alternate Compliance Method
1	Fire Separations Sentence 3.1.3.1.(1), Table 3.1.3.1., Subsection 9.10.9, 2 h fire separation required between some major occupancies.	Building means any structure used or intended for supporting or sheltering any use or occupancy. Except for occupancies, 1 h fire separation is acceptable, provided the building is sprinklered.
2	Fire Separations Sentence 3.1.3.1.(1), Table 3.1.3.1., Subsection 9.10.9, 1 h	30 min fire separation is acceptable if the

For Your Community

Continued

e.g.

Revolutionizing Housing Design & Approval: 3D Generative Design for Master Planning

Malahat Nation, in collaboration with Archistar and Zaha Hadid Architects, is integrating 3D generative design into the master planning process. This project uses Archistar's 3D Generative AI Building Design technology, leveraging advanced algorithms and AI to generate 3D optimized building and urban designs **based on specific criteria and constraints, such as zoning laws**, environmental factors, and community needs across multiple masterplan scenarios.

This allows architects and planners to explore increased design alternatives while reducing planning time, optimizing resources for enhanced sustainability and customizing for community centric designs.

For Regional Collaboration

When multiple jurisdictions adopt compatible data structures, possibilities expand further:



- Shared tools and validation frameworks across local governments
- Regional analysis and planning based on consistent data
- Reduced duplication of effort in building digital services
- Easier mobility for developers working across local governments

Critical Considerations for Any Jurisdiction

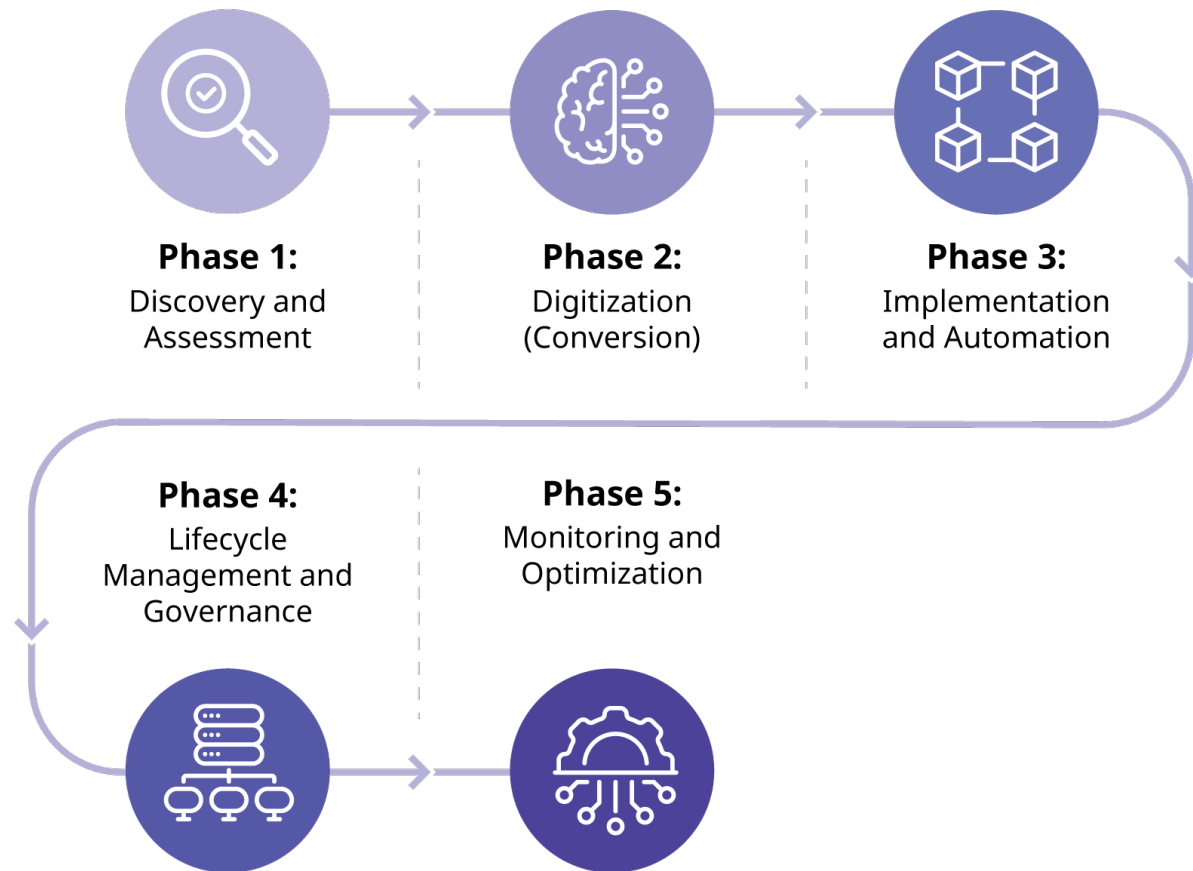
Before beginning a digitization project, you'll need to make decisions about how to handle various types of content. The choices you make here will affect both the complexity of your project and the capabilities of your final product.

These considerations apply whether you're digitizing a zoning bylaw, building bylaw, development permit guidelines, or any other regulatory document.

Digitization is only the beginning

This guide focuses on one phase of the broader digital rule lifecycle: the digitization (conversion) of Word and PDF files, as the source of truth for our rules and regulations, to machine-readable formats.

Once your regulations and policies are machine-readable, your organization will need to evolve its processes, workflows, and governance practices to manage these assets over time. The full lifecycle of digital rules includes several phases:



Images and Graphics

3.1

Many regulatory documents contain essential visual content: zoning maps, setback diagrams, cross-section illustrations, or example site plans.

You'll need to decide:

- **Reference vs. Embed:**
Will images be stored separately and referenced by the JSON/XML or embedded directly? Referenced images are easier to update but require additional file management.
- **Alt Text and Descriptions:**
For accessibility and searchability, each image should have descriptive metadata.
- **Format Standards:**
Choose consistent formats (SVG for diagrams, PNG/JPEG for photos) and resolution standards.
- **Versioning:**
When a diagram is updated, how will you track which version applies to which time period?

HOW BC BUILDING CODE HANDLES IMAGES

- Images are stored as separate files in a graphics directory (EPS format for print, with web versions generated automatically)
- Each image is referenced by a stable ID in the JSON structure
- Alt text and figure captions are stored as metadata alongside the reference
- When the National Research Council updates a figure, BC can either adopt it or substitute a BC-specific version

Tables and Calculations

3.2

Regulatory documents often contain tables that are essential for compliance—setback requirements by zone, floor area ratio calculations, parking minimums, etc.

Consider:

- **Table Structure:**
How will you represent complex tables with merged cells, headers, and footnotes?
- **Calculations:**
Some tables contain formulas or calculation methodologies. Will these be represented as static values or executable formulas?
- **Cross-References:**
Tables often reference other sections. How will these links be encoded?
- **Updates:**
When a single value in a table changes, your system should allow surgical updates without recreating the entire table.

HOW BC BUILDING CODE HANDLES TABLES

In the BC Building Code system, tables are stored as structured data rather than embedded images. Each table includes:

- Explicit rows, columns, headers, and footnotes
- Stable IDs for each table element
- Cross-references to the sections that govern how the table is used

This allows individual numbers (e.g., a required setback or load value) to be amended without recreating the entire table and enables software to validate calculations automatically.

Effective Dates and Point-in-Time Queries

3.3

Regulatory documents often contain tables that are essential for compliance—setback requirements by zone, floor area ratio calculations, parking minimums, etc.

Consider:

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How will you represent complex tables with merged cells, headers, and footnotes?
- **Calculations:**
Some tables contain formulas or calculation methodologies. Will these be represented as static values or executable formulas?
- **Cross-References:**
Tables often reference other sections. How will these links be encoded?
- **Updates:**
When a single value in a table changes, your system should allow surgical updates without recreating the entire table.

BC BUILDING CODE APPROACH

The BC Building Code tracks effective dates at the clause level. This enables precise historical queries such as “what rule applied on March 15, 2021?” even when only a single sentence changed.

Recommendation

At minimum, track effective dates at the section level. This balances query capability with maintenance burden.

Formatting with Legal Meaning

3.4

In regulatory documents, formatting often carries legal significance:

- **Italics:**
Frequently indicate defined terms that link to a glossary.
- **Bold:**
May indicate mandatory requirements vs. recommendations.
- **Strikethrough/Underline:**
Often used in amendment documents to show deletions and additions.
- **Indentation:**
Indicates hierarchy (clauses, subclauses, etc.).

Your system should distinguish these types, track their effective dates, and maintain an audit trail. Users should be able to see both the current state and the history of changes.

BC BUILDING CODE APPROACH

Legal formatting (bold, italics, strike-throughs, and indentation) is preserved as structured attributes rather than visual styling.

This allows digital systems to distinguish defined terms, requirements, and amendment markings while still rendering them correctly for users.

Revisions, Errata, and Amendments

3.5

Regulations change over time through various mechanisms:

- **Amendments:**
Formal changes through council action or ministerial order.
- **Errata:**
Corrections to errors in the published text.
- **Policy Updates:**
Interpretive guidance that doesn't change the regulation itself.

Your system should distinguish these types of changes, track their effective dates, and maintain an audit trail. Users should be able to see both the current state and the history of changes.

BC BUILDING CODE APPROACH

Amendments, errata, and policy updates are stored as separate revision layers applied over a stable base document.

This allows the system to show both the current law and the complete history of how it changed.

A General Framework for Digitization

Regardless of your source format (Word, PDF, or existing XML), the digitization process follows a general pattern. This section describes a framework you can adapt to your jurisdiction's needs.

The Digitization Pipeline

4.1

Most digitization projects follow these stages:

STAGE 1: SOURCE ANALYSIS

Understand your current documents, identify structure, catalog content types

STAGE 2: STRUCTURE DEFINITION

Design your hierarchy, ID scheme, and schema for the target format

STAGE 3: CONTENT CONVERSION

Transform content from source to target format (manual, automated, or hybrid)

STAGE 4: VALIDATION

Verify accuracy, completeness, and schema compliance

STAGE 5: MAINTENANCE

Establish workflows for ongoing amendments, corrections, and updates

HOW THIS WAS APPLIED TO THE BC BUILDING CODE

For the BC Building Code, the National Building Code (NBC) XML was used as the authoritative source. A BC-specific target JSON schema was first defined, after which the NBC content was transformed into the BC Building Code by applying a structured set of amendments.

These amendments inject BC-specific content and structural changes onto the NBC baseline, while tracing and preserving the provenance of every modification.

The resulting BC Building Code dataset was then validated through automated test procedures and integrated into the deployment pipeline. This approach enables precise, auditable updates and provides a reliable foundation for long-term maintenance and publication.

Amendment Operations

4.2

Once your base content is digitized, you'll need to apply changes over time.

Most amendment scenarios fall into four categories:

OPERATION	USE CASE
REPLACE	Swap an existing element (section, clause, table) with new content
INSERT	Add new content at a specific position in the hierarchy
MODIFY	Make targeted changes within an existing element (e.g., change a number)
REMOVE	Delete an element (while preserving it in revision history)

Building your system around these four operations provides a consistent framework for handling any type of regulatory change.

BC BUILDING CODE APPROACH

To distinguish BC-specific content from the National Building Code baseline, the BC Building Code uses a systematic XML identifier convention. Elements that originate from the National Building Code use the NBC prefix, while BC-specific provisions use the BC prefix. This allows software tools, validation rules, and user interfaces to reliably identify whether a provision comes from the national building code or from a BC amendment.

For example, a BC-specific sentence would be encoded as:

```
\<sentence xml:id="bc.divB.  
part1.sect1.subsect2.art1.sent1"  
number="1">
```

This convention supports precise amendment targeting, visual highlighting of provincial changes, and long-term traceability across versions.

Structuring Your Digital Content

Designing a Hierarchy

5.1

Every regulatory document has an implicit hierarchy. Your digital format should make this explicit. For example, a zoning bylaw might have:



The number of levels depends on your document's complexity. More levels provide finer granularity for cross-references and amendments but increase complexity.

Creating Stable Identifiers

5.2

Each element in your hierarchy needs a unique, stable identifier.

Good IDs are:

- **Predictable:**
Based on the document structure, not arbitrary numbers
- **Hierarchical:**
Child IDs extend parent IDs (e.g., part1.div2.sect3)
- **Stable:**
Won't change when content is reordered or renumbered
- **Human-readable:**
Staff can understand what they reference

EXAMPLE ID SCHEMES

Zoning Bylaw:

zoning.part3.div2.sect5.
subsect1

Development Permit:

devpermit.area1.
guideline3.clause2

Building Regulation:

building.part9.sect23.art4.
sent1

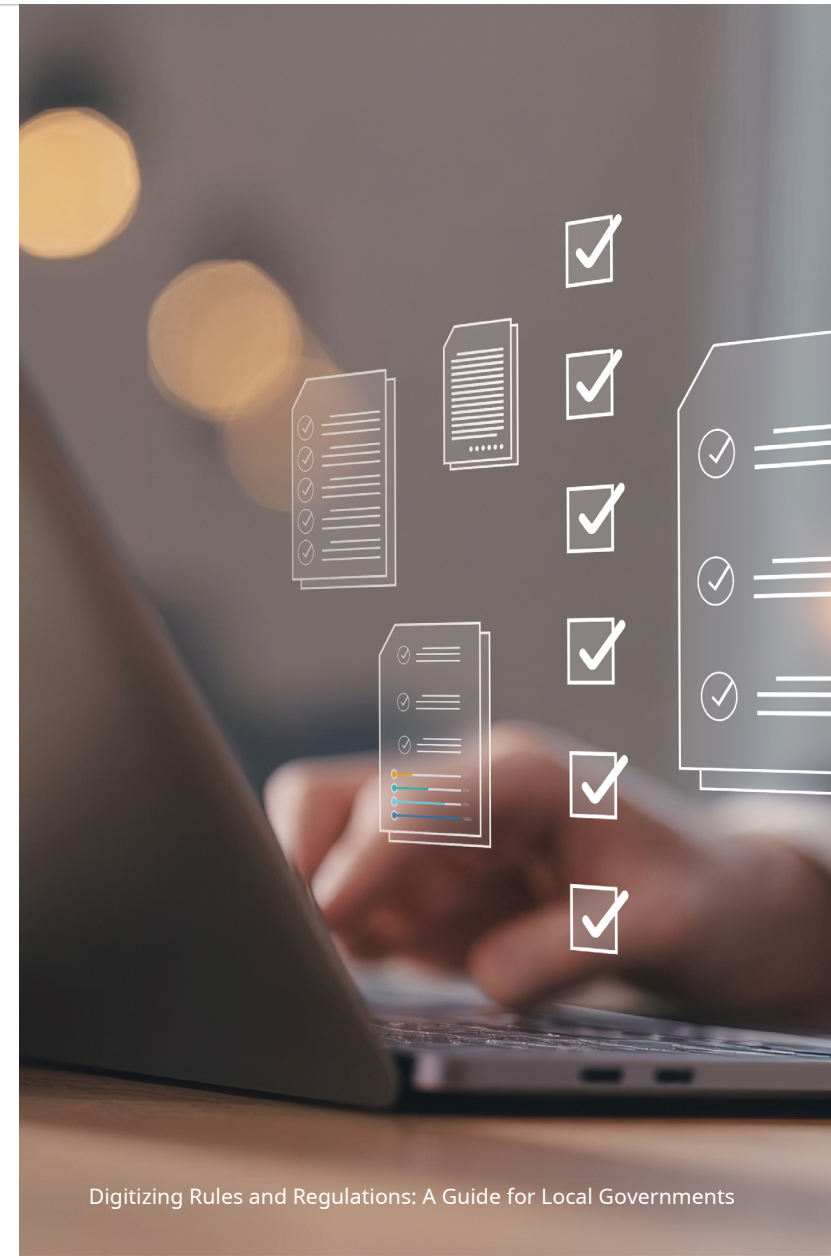
Encoding Cross-References

Regulatory documents are full of cross-references (“as per Section 4.2.1” or “see definition of Setback”). Your digital format should encode these as machine-readable links.

- **Internal references:**
Links to other sections within the same document
- **Term references:**
Links to glossary definitions
- **External references:**
Links to other documents, standards, or legislation



When a referenced section is amended or renumbered, your system can automatically identify affected cross-references.



CONTENT TYPE	RECOMMENDED APPROACH
TABLES	Structure as rows/columns with separate header and data sections; include footnotes as linked annotations
IMAGES	Store externally with references; include alt text, captions, and source metadata
FORMULAS	Store both the display format and (if applicable) executable calculation logic
DEFINED TERMS	Maintain a glossary with each term having an ID, definition, and list of sections where it's used
NOTES ANNOTATIONS	Distinguish between legally binding content and explanatory notes; encode the difference

BC BUILDING CODE APPROACH

In the BC Building Code implementation, images, tables, notes, and terms are encoded as different content types. This allows digital tools to present guidance to users.

Validation and Quality Assurance

Digitized regulations must be accurate as these are legal documents where errors have significant consequences. A robust validation framework catches issues before they reach users.

Layer 1:

SCHEMA VALIDATION

Your schema defines the rules for valid documents: required fields, data types, allowed values, and structural relationships.

Schema validation catches:

- Missing required fields (e.g., a section without an effective date)
- Incorrect data types (e.g., text where a number is expected)
- Invalid references (e.g., a cross-reference to a non-existent section)
- Structural errors (e.g., a clause without a parent section)

Layer 2:

CONTENT VALIDATION

Beyond schema compliance, you need to verify that content accurately represents the source:

- All sections from the source document are present
- Text matches the authoritative source
- Cross-references resolve correctly
- Tables and figures are complete and properly positioned

Layer 3:

BUSINESS RULE VALIDATION

Some validations are specific to your domain:

- Effective dates are logical (start before end, no gaps in coverage)
- Amendment references cite valid authority (bylaw numbers, resolutions)
- Defined terms are used consistently throughout

VALIDATION CHECKLIST	STATUS	
JSON/XML structure matches schema	<input type="checkbox"/> Pass	<input type="checkbox"/> Fail
All required fields are present	<input type="checkbox"/> Pass	<input type="checkbox"/> Fail
All sections from source are represented	<input type="checkbox"/> Pass	<input type="checkbox"/> Fail
Cross-references resolve correctly	<input type="checkbox"/> Pass	<input type="checkbox"/> Fail
Tables are complete and accurate	<input type="checkbox"/> Pass	<input type="checkbox"/> Fail
Images are referenced and accessible	<input type="checkbox"/> Pass	<input type="checkbox"/> Fail
Effective dates are valid and logical	<input type="checkbox"/> Pass	<input type="checkbox"/> Fail
Glossary terms link correctly	<input type="checkbox"/> Pass	<input type="checkbox"/> Fail

Case Study: BC Building Code

In support of the Province's Homes for People Plan commitment to become a North American leader in digital permitting and construction, the Ministry of Housing and Municipal Affairs started the process of creating a machine-readable version of the BC Building Code. This project focused on converting the BC Building Code from the source Word/PDF versions to structured JSON and was completed in early 2025.

However, this approach proved to be highly constrained. The PDF-to-JSON conversion relied on text extraction and document recognition technologies that could not reliably preserve the full structure, hierarchy, tables, and cross-references required for a regulatory document of this complexity. This resulted in loss of structural fidelity and introduced significant data quality risks.

These challenges made it clear that a document as complex as the BC Building Code requires a structured, authoritative source format. The project therefore pivoted to using the National Building Code XML as the foundation, allowing BC-specific changes to be applied in a controlled and traceable way before generating JSON for digital services.

Note: The BC Building Code had a unique advantage—access to the National Building Code in XML format. Most local governments will be starting from Word or PDF documents, requiring a different conversion approach. The principles below still apply.

Project Context

The BC Building Code is based on the National Building Code of Canada, with approximately 100 pages of BC-specific amendments. The Ministry of Housing and Municipal Affairs only publishes a PDF version for use by Code users, the public, and the technology sector.

The digitization project needed to:

- Preserve 100% fidelity with the source documents
- Maintain 25,000+ cross-references
- Support date-based queries for any point in time
- Support the publication of a more user-friendly web-based version of the regulation
- Enable the development of new solutions that help people build by the technology and construction sectors (e.g., AI-powered compliance tools)



Technical Approach

The BC Building Code digitization used a four-stage pipeline:

1

Source Normalization

Convert vendor XML to a canonical format with stable, hierarchical IDs

2

Overlay Amendments

Apply structural changes that make BC's Code different from the National Code

3

Revision Amendments

Apply date-based changes from Ministerial Orders, errata, and policy updates

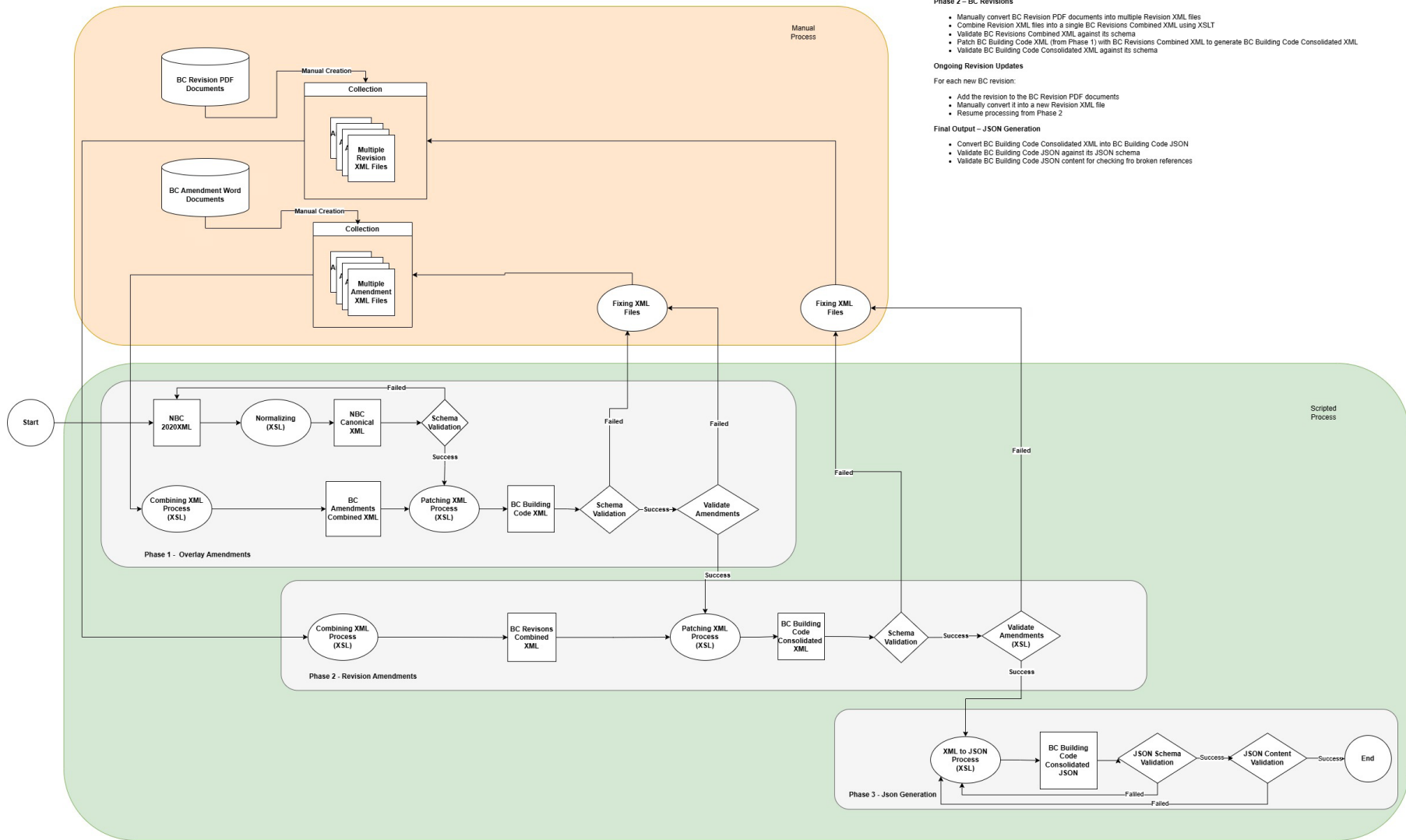
4

JSON Generation

Transform the final XML into AI-optimized JSON format

Architecture Overview

The following diagram shows the BC Building Code transformation pipeline:



BC Building Code JSON Generation Process

Phase 1 – Base Code + BC Amendments

- Normalize NBC 2020 XML into NBC Canonical XML format
- Manually convert BC Amendment Word documents into multiple Amendment XML files
- Combine Amendment XML files into a single BC Amendments Combined XML using XSLT
- Validate NBC Canonical XML against its schema
- Validate BC Amendments Combined XML against its schema
- Patch NBC Canonical XML with BC Amendments Combined XML to generate BC Building Code XML
- Validate BC Building Code XML against its schema

Phase 2 – BC Revisions

- Manually convert BC Revision PDF documents into multiple Revision XML files
- Combine Revision XML files into a single BC Revisions Combined XML using XSLT
- Validate BC Revisions Combined XML against its schema
- Patch BC Building Code XML, from Phase 1) with BC Revisions Combined XML to generate BC Building Code Consolidated XML
- Validate BC Building Code Consolidated XML against its schema

Ongoing Revision Updates

For each new BC revision:

- Add the revision to the BC Revision PDF documents
- Manually convert it into a new Revision XML file
- Resume processing from Phase 2

Final Output – JSON Generation

- Convert BC Building Code Consolidated XML into BC Building Code JSON
- Validate BC Building Code JSON against its JSON schema
- Validate BC Building Code JSON content for checking for broken references

1

Limited Searchability

Users must manually navigate through hierarchical content to find relevant provisions. A simple search might return dozens of results without context

2

No Integration Pathway

There's no standardized way to connect your bylaws with digital design tools, permit systems, GIS platforms, or compliance software

3

Manual Version Control

Tracking amendments, corrections, and updates across multiple documents is labour-intensive and error-prone

4

Barriers to Automation

AI-powered tools, chatbots, and automated compliance checking cannot meaningfully process unstructured documents

Next Steps – Advanced Digitization

7.5



Establishing machine-readable codes has provided a solid foundation for more advanced capabilities such as automated compliance checking and compatibility with Building Information Models (BIM).

Machine-readable formats such as JSON and XML can also be semantically enriched with metadata, included in a knowledge model (e.g. ontology for compliance checking), or converted into machine-executable logical expressions, such that software tools cannot only read the digitized codes, but also interpret them.

These machine-executable expressions can also be mapped to specific objects in a BIM model through a data dictionary.

The Province is currently collaborating with the National Research Council of Canada and other industry and academic experts to further advance digitization, in anticipation of BIM and automated compliance checking in Canada in the coming years, in a similar direction to several jurisdictions in Europe, Australia, and Asia.

Further details can be shared with local governments, including potential applicability and benefits for local bylaws, as the initiative progresses.

Getting Started: A Practical Checklist

If you're considering a digitization project for your jurisdiction, here's a practical checklist to guide your planning.

PHASE 1: ASSESSMENT

- Inventory your regulatory and policy documents (bylaws, policies, guidelines)
- Identify the most valuable candidates for digitization (high-use, frequently amended)
- Catalog content types: text, tables, images, formulas, cross-references
- Document your current amendment and publishing workflows
- Identify stakeholders and their needs (staff, builders/developers, citizens)

PHASE 2: DESIGN

- Define your document hierarchy and ID scheme
- Decide how to handle images, tables, and special content
- Determine effective date granularity
- Design your cross-reference encoding scheme
- Create or adopt a schema (JSON Schema, RELAX NG, etc.)
- Plan your validation framework

PHASE 3: PILOT

- Start with a single, manageable document or section
- Convert content and validate thoroughly
- Test amendment workflows with a sample change
- Gather feedback from staff who will maintain the system
- Refine your approach based on lessons learned

PHASE 4: SCALE

- Extend to additional documents based on pilot learnings
- Develop training materials for staff
- Establish ongoing maintenance procedures
- Consider integration with other systems (permit systems, GIS, web publishing)

The Ministry of Housing and Municipal Affairs is available to share additional resources and discuss approaches with local governments undertaking projects to convert bylaws to a machine-readable format.

*Please email: **BGI-DigitalDelivery@gov.bc.ca***

Appendix A: Glossary of Terms

Amendment: A formal change to a regulatory document (e.g., council bylaw) through an authorized process

Canonical ID: A stable, hierarchical identifier for a document element that won't change when content is reordered

Cross-Reference: A link from one part of a document to another (internal) or to an external document

Effective Date: The date when a provision comes into force or ceases to apply

Errata: Corrections to errors in published content (distinct from substantive amendments)

JSON (JavaScript Object Notation): A lightweight, text-based data format widely used for data interchange

Machine-Readable: Data structured so that software can process it without human interpretation

Schema: A formal definition of the structure, fields, and rules for valid data

Validation: The process of checking that data conforms to its schema and business rules

XML (Extensible Markup Language): A markup language for encoding documents in a format that is both human-readable and machine-readable

Appendix B: Sample JSON Structure

The following is a simplified example of how a zoning bylaw section might be represented in JSON:

Sample JSON Structure

```
{  
  "document_type": "bc_building_code",  
  "version": "2020",  
  "canonical_version": "1.0",  
  "generated_timestamp": "2025-12-31T13:13:05.8015478-08:00",  
  "metadata": {  
    "title": "National Building Code of Canada 2020",  
    "subtitle": "Volume 1",  
    "authority": "Issued by the Canadian Commission on Building and Fire Codes National Research Council of Canada",  
    "publication_date": "2022",  
    "nrc_number": "56435E",  
    "isbn": "978-0-660-37913-5",  
    "volumes": [  
      {  
        "volume": "1",  
        "title": "National Building Code of Canada 2020",
```

```
    "subtitle": "Volume 1"
  },
  {
    "volume": "2",
    "title": "National Building Code of Canada 2020",
    "subtitle": "Volume 2"
  }
]
},
"divisions": [
  {
    "id": "nbc.divA",
    "type": "division",
    "letter": "A",
    "title": "Compliance, Objectives and Functional Statements",
    "number": "",
    "parts": [
      {
        "id": "nbc.divA.part1",
        "type": "part",
```

```
“number”:1,  
“title”:“Compliance”,  
“sections”:[  
  {  
    “id”:“nbc.divA.part1.sect1”,  
    “type”:“section”,  
    “number”:1,  
    “title”:“General”,  
    “subsections”:[  
      {  
        “id”:“nbc.divA.part1.sect1.subsect1”,  
        “type”:“subsection”,  
        “number”:1,  
        “title”:“Application of this Code”,  
        “articles”:[  
          {  
            “id”:“nbc.divA.part1.sect1.subsect1.art1”,  
            “type”:“article”,  
            “number”:1,  
            “title”:“Application of this Code”,
```

```
"content":[
  {
    "id":"nbc.divA.part1.sect1.subsect1.art1.sent1",
    "type":"sentence",
    "number":1,
    "text":"This Code applies to any one or more of the following:",
    "clauses":[
      {
        "id":"nbc.divA.part1.sect1.subsect1.art1.sent1.clause1",
        "type":"clause",
        "letter":"a",
        "text":"the design and construction of a new [REF:term:bldng]building,"
      },
      {
        "id":"nbc.divA.part1.sect1.subsect1.art1.sent1.clause2",
        "type":"clause",
        "letter":"b",
        "text":"the [REF:term:ccpnc]occupancy of any [REF:term:bldng]building,"
      },
      {
```

```
    "id": "nbc.divA.part1.sect1.subsect1.art1.sent1.clause3",
    "type": "clause",
    "letter": "c",
    "text": "a change in [REF:term:ccpnc]occupancy of any [REF:term:bldng]building,"
  },
  {
    "id": "nbc.divA.part1.sect1.subsect1.art1.sent1.clause4",
    "type": "clause",
    "letter": "d",
    "text": "an [REF:term:ltrtn]alteration of any [REF:term:bldng]building,"
  },
  {
    "id": "nbc.divA.part1.sect1.subsect1.art1.sent1.clause5",
    "type": "clause",
    "letter": "e",
    "text": "an addition to any [REF:term:bldng]building,"
  },
  {
    "id": "nbc.divA.part1.sect1.subsect1.art1.sent1.clause6",
    "type": "clause",
```

```
"letter": "f",  
"text": "the demolition of any [REF:term:bldng]building,"
```

```
},
```

```
{
```

```
"id": "nbc.divA.part1.sect1.subsect1.art1.sent1.clause7",
```

```
"type": "clause",
```

```
"letter": "g",
```

```
"text": "the reconstruction of any [REF:term:bldng]building that has been damaged by fire,  
earthquake or other cause,"
```

```
},
```

```
{
```

```
"id": "nbc.divA.part1.sect1.subsect1.art1.sent1.clause8",
```

```
"type": "clause",
```

```
"letter": "h",
```

```
"text": "the correction of an [REF:term:nsf-cndtn]unsafe condition in or about any  
[REF:term:bldng]building,"
```

```
},
```

```
{
```

```
"id": "nbc.divA.part1.sect1.subsect1.art1.sent1.clause9",
```

```
"type": "clause",
```

```
"letter": "i",
```

“text”:“all parts of any [REF:term:bldng]building that are affected by a change in [REF:term:ccpnc]occupancy,”

},

{

“id”:“nbc.divA.part1.sect1.subsect1.art1.sent1.clause10”,

“type”:“clause”,

“letter”:“j”,

“text”:“the work necessary to ensure safety in parts of a [REF:term:bldng]building”,

“subclauses”:[

{

“id”:“nbc.divA.part1.sect1.subsect1.art1.sent1.clause10.subclause1”,

“type”:“subclause”,

“number”:1,

“text”:“that remain after a demolition,”

},

{

“id”:“nbc.divA.part1.sect1.subsect1.art1.sent1.clause10.subclause2”,

“type”:“subclause”,

“number”:2,

“text”:“that are affected by but that are not directly involved in [REF:term:ltrtn]alterations,

or”

```
},  
{  
  "id": "bc.divA.part1.sect1.subsect1.art1.sent1.clause10.subclause3",  
  "type": "subclause",  
  "number": 3,  
  "text": "that are affected by but not directly involved in additions,"  
}
```

```
]
```

```
},
```

```
{
```

```
  "id": "nbc.divA.part1.sect1.subsect1.art1.sent1.clause11",  
  "type": "clause",  
  "letter": "k",
```

```
  "text": "except as permitted by the British Columbia Fire Code, the installation, replacement,  
or [REF:term:ltrtn]alteration of materials or equipment regulated by this Code,"
```

```
},
```

```
{
```

```
  "id": "nbc.divA.part1.sect1.subsect1.art1.sent1.clause12",  
  "type": "clause",  
  "letter": "l",
```

and after relocation,"

},

{

"id": "nbc.divA.part1.sect1.subsect1.art1.sent1.clause13",

"type": "clause",

"letter": "m",

public,"

},

{

"id": "nbc.divA.part1.sect1.subsect1.art1.sent1.clause14",

"type": "clause",

"letter": "n",

[REF:term:plmbng-sstm]plumbing systems, and"

},

{

"id": "nbc.divA.part1.sect1.subsect1.art1.sent1.clause15",

"type": "clause",

"letter": "o",

"text": "the [REF:term:ltrtn]alteration, rehabilitation and change of occupancy of [REF:term:hrtg-bldng]heritage buildings."

}

]

}

]

}

]

}

]

}

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}

]

}

]

}