ParcelMap BC Transition Planning:

A Case Study on the Large Municipality Focus Group

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1. Introduction

The Large Municipality Focus Group (LMFG) consisted of six (6) of the larger local governments in BC who agreed to participate in a working group. The LMFG participants included:

- City of Burnaby
- City of Surrey
- City of Vancouver
- District of North Vancouver
- Township of Langley
- City of Kamloops

The scope of the LMFG exercise was comprised of the following

1. **Focus Group Meetings** to set expectations, gather inputs and discuss findings,

2. **Situation Assessments** for each participating municipality to gather key facts and issues, and

3. Development of **High-level ParcelMap BC Transition Plans** for each participating organization.

The facilitation team which led this work was comprised of staff from the LTSA (Brian Greening, Irshad Jamal) and Spatial Vision Group (Bill Johnstone, John Samulski). Technical advice and mentoring were provided by Adam Chadwick, GIS Manager, City of Kamloops, who provided invaluable insight and guidance of behalf of a large local government who had already adopted ParcelMap BC.

2. Discovery Methodology: Documenting Parcel Fabric Maintenance

This section describes the methodology that was followed by the facilitation team to document how parcel fabrics are maintained by the LMFG participants, and how dependent GIS datasets and business system integrations are maintained.

A Situation Assessment Template (Excel Worksheet) was sent to all participants prior to the kick-off meeting in May 2020. The Situation Assessment Template (Excel Worksheet) contained several Thematic Areas that required input from the participants to facilitate the final development of the transition plan for each municipality. The Thematic Areas (See Figure 1) of the situation assessment worksheet comprised of:

- *Parcel Fundamentals:* The fundamental approach the municipality uses to manage their parcel fabric
- *Primary Cadastre Data Comparison:* How the content of their in-house parcel fabric compares with the ParcelMap BC data content,

- *Data Dependencies:* The various data, workflow and business system integration dependencies that need to be supported,
- *Program Dependencies:* Internal and external program dependencies which could influence the approach to, or timing of, adoption of ParcelMap BC.

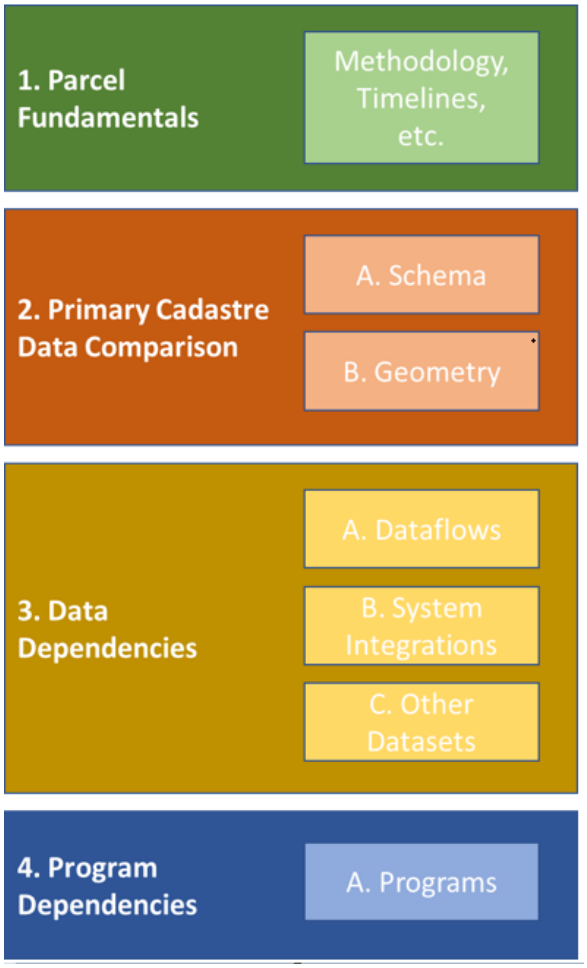

Figure 1 – Situation Assessment Thematic Areas

The key activities of the LMFG during the Summer and early Fall of 2020 were as follows:

- Development and distribution of situation assessment worksheets to LMFG participants.
- Preliminary findings meetings to review completed situation assessment worksheets.
- One-on-one online interviews with each municipality.
- Development of individual Transition Plans for each municipality.
- Follow-on meetings with each municipality to confirm findings and to elicit feedback on the proposed transition plan approach.

- Finalised individual Transition Plans for each municipality were completed before a final group meeting was held on October 20, 2020 to close out this work.

3. Parcel Fabric Fundamentals: Systems, Datasets and Workflows

This section discusses the high-level systems, datasets and workflows used by each participant for land record and parcel record intake and update. The findings have been distilled here into two logical diagrams: one showing the current state before adoption, and a second showing the state after.

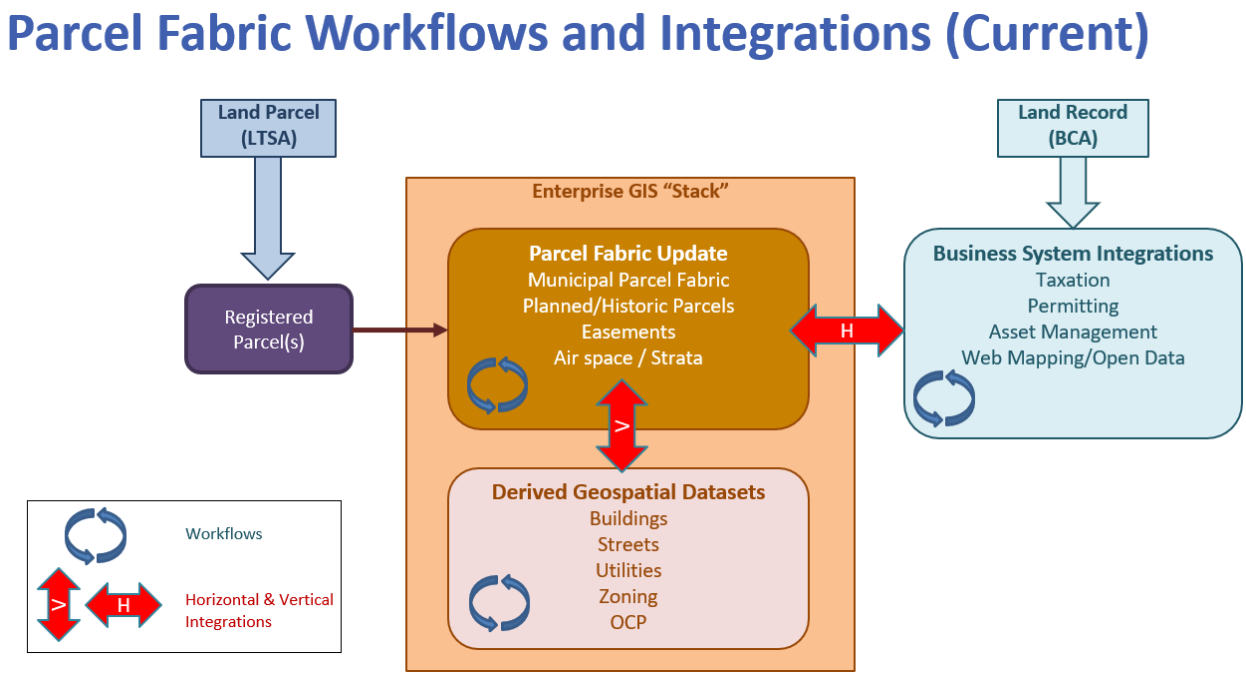

Figure 2 - Parcel Fabric Workflows and Integrations Before ParcelMap BC Adoption (Refer to Appendix A for a detailed overview of this workflow.)

- **Key Systems:** The figure introduces the various systems maintained by the LMFG municipalities. It shows the Enterprise GIS "Stack" in the center column, and business systems to the right. The Enterprise GIS stack manages all of the municipality's geospatial datasets and provides users and systems with secure access.

- **Enterprise GIS Systems Stack**: The GIS stack shows two main groupings of GIS layers. The Parcel Fabric Update box shows the GIS feature layers that contain the municipal parcel fabric and related content such as air space and strata parcels, planned and historic parcels, easements and rights of way, and annotation. The Geospatial Datasets Derivations box shows all GIS feature layers that either depend on or need to be updated once the land and parcel records have been updated.

- **Business Systems**: The integrations box at right identifies the various business systems that work with data in the Enterprise GIS stack. These systems include: taxation, permitting, asset /work management, and web mapping / Open Data.

- **Horizontal (H) and Vertical Integrations (V)** (red arrows): In order to support a wide range of business needs in each municipality, a number of horizontal and vertical integrations need to be maintained.

  o Vertical integrations ensure that all spatial layers correctly relate to each other in terms of positional quality and content. For example, if an area of land has been subdivided, it may be necessary to also update other parcel fabric and derived layers.

  o Horizontal integrations connect content in the geospatial layers to content in the business systems, usually via foreign keys. For example, the taxation system manages information about the owner, tax rates and recent payments, and the manages the municipal parcel layer, and all of the related parcel, zoning, OCP, utility, building, streets and parks datasets.

- **Land and Parcel Record Workflows** (blue arrow circles): The goal of these figures is to show how land record data and land parcel data are updated. Three workflows are shown. Workflow 1 indicates the process followed to reflect changes to the parcel fabric. This includes additions, deletions and changes to attributes. Workflow 2 encompasses all of the work required to update geospatial dataset derivations and vertical integrations. Workflow 3 covers the work required to update business system integrations.

Parcel Fabric Workflows and Integrations (Future)

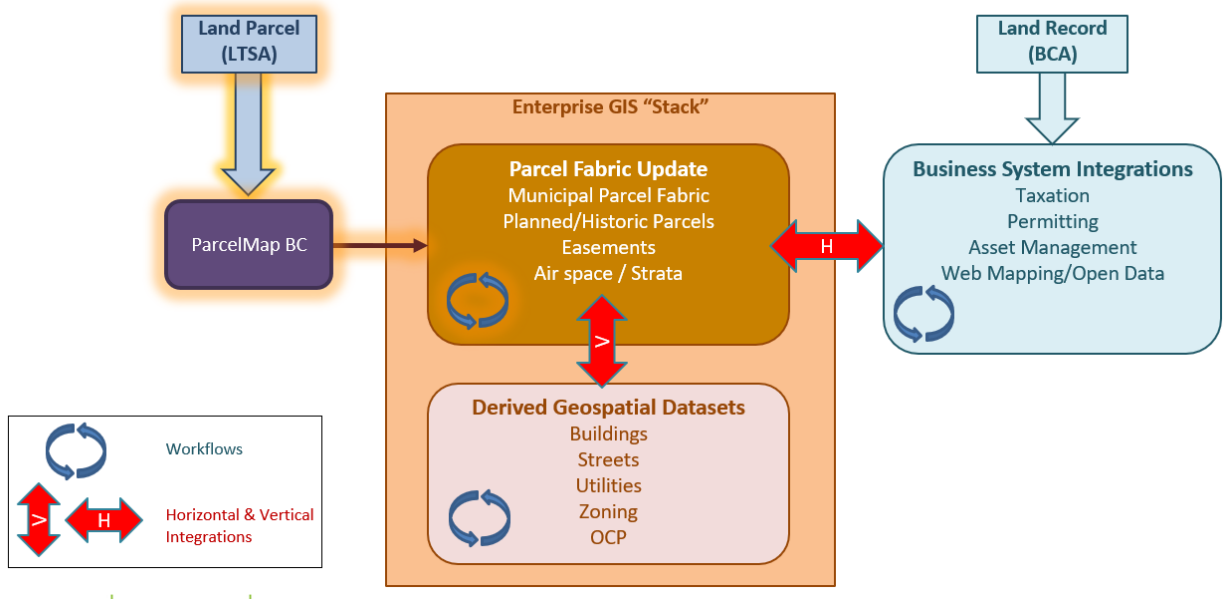

Figure 3 - Parcel Fabric Workflows and Integrations After ParcelMap BC Adoption (Refer to Appendix B for a detailed overview of this workflow.)

After ParcelMap BC Adoption: Figure 3 presents the expected situation after adoption. The primary change is that ParcelMap BC becomes the authoritative source for changes to the parcel geometries (indicated by the burgundy boxes). While opportunities for improvements and further automation have been identified (discussed above), a key finding of this assessment is that the primary impact area would be Workflow 1, and a subset of the horizontal and vertical integrations related to Workflows 2 and 3.

4. List of Benefits/Opportunities

During the LMFG participant interviews, a number of potential opportunities and benefits associated with adoption of ParcelMap BC were identified. While some additional specific adoption benefits may be applicable to individual Large Municipalities, the general set of benefits identified by the situation assessment are presented below and are organized using the following five themes: 1) Data Quality and Completeness, 2) Efficiency, 3) HR Savings, 4) Improved Integrations and Collaborations, and 5) Improved Decision-Making and Risk Mitigation

4.1 Data Quality and Completeness

• ParcelMap BC minimizes data discrepancies and confusion by employing a closest-to-source maintenance of the parcel fabric representation to a common province-wide standard.

• Improvement to the overall accuracy and completeness of the municipality's parcel fabric dataset, leading to better and quicker support for analysis and decision making by many groups, typically including Planning, Engineering, Parks and Survey.

• Reduced "turn around time" for updates to the parcel fabric being available to participants.

• Access to additional ParcelMap BC related mapping data, products and services offered by LTSA.

• Ongoing post-adoption liaison with the LTSA parcel fabric operations team to efficiently resolve parcel fabric related data issues that may arise.

4.2 Timeliness and Efficiency

• ParcelMap BC updates are published daily with service target of 2-day turnaround, exceeding that target since March 2018 with a year-to-date metric hovering around 1 day at the time of this report.

• Elimination/minimisation of duplication of effort with LTSA related to parcel data management.

• Opportunities to review and rationalise existing current legacy parcel data management practices or systems that can be eliminated or reduced in complexity.

• Additional opportunities around automation and streamlining of parcel fabric data and related land records system data maintenance (e.g., digital plan intake vs. manual data entry from PDF), resulting in more efficient workflows and decreased probability of human error (see Risk Mitigation theme below).

• Efficient and seamless online access to the Province's authoritative parcel fabric mapping via transactional and cloud-based services.

4.3 HR Savings

• Potentially some savings (portions of FTEs among multiple departments for some large municipalities) related to reassignment of internal resources currently responsible for parcel data fabric maintenance and coordination.

4.4 Improved Integrations and Collaborations

• Improved consistency, alignment and integration between each participant's parcel fabric with neighbouring jurisdictions and other external agencies' data (e.g., BC Assessment, utilities, Metro Vancouver, Port Metro Vancouver, emergency response agencies), leading to more efficient collaboration and improved potential to participate in regional level analysis and initiatives.

4.5 Improved Decision-Making and Risk Mitigation

• Improvements to the overall accuracy and completeness of a municipality's parcel fabric dataset, will improve overall confidence in analysis and decision making by many groups including the surveying, permitting, planning, engineering, finance and parks departments.

• Decreased probability of human error during the parcel data mapping maintenance processes and resulting decisions/actions based on incorrect information.

• Adoption of ParcelMap BC as the authoritative source for parcel fabric mapping will mitigate risk associated with use of incorrect or inconsistent parcel fabric data relative to LTSA/LTO records.

• Reduction of risks associated with third-party damage to buried infrastructure. Improved quality and completeness of utility "locate" maps provided to BC One Call. Reduction of risks associated with damage to third-party buried infrastructure

4.6 Lessons Learned from the LMFG

1. Technical Literacy: The detailed product specification and related operational maintenance procedures in place to deliver ParcelMap BC are currently not well understood by many LMFG participants. Perceived "gaps" associated with adoption can be addressed through reviewing available adopter resources and attending technical workshops related to the use and maintenance of ParcelMap BC.
2. Management of multiple parcel identifiers: The use of multiple unique business or system level identifiers to link parcel data to various information systems (ex. land records) beyond the parcel identifiers (PID, PIN, JUROL) provided in ParcelMap BC may add to the complexity in transitioning to ParcelMap BC.
3. Competing priorities: Organisational priorities that compete with IT/GIS resources can prolong priortization of the transition to ParcelMap BC. A consideration is to incorporate ParcelMap BC adoption as related scope to a proposed project to help align shared resources and facilitate adoption.
4. Changes in HR/Key resources: Knowledge sharing (parcel fabric workflows, standards and specifications) and documenting existing processes in an organization are critical, especially where employee retirement or attrition is helping support the transition to ParcelMap BC. It is recommended that employee(s) assigned the role for ParcelMap BC in their organization receive the necessary background and training prior to the departure of the outgoing staff member to ensure the transition to ParcelMap BC addresses necessary workflows.

5. Adoption Pathways

This section presents a proposed approach for ParcelMap BC adoption by each LMFG participant. It describes proposed ParcelMap BC adoption pathways, a minimum set of parcel geometries and attributes for adoption, recommended additions to the adoption issue logs, and proposed post-adoption responsibilities for LTSA and the adopting organization.

The work to perform the Situation Assessment with the LMFG participants provided an opportunity to clarify the possible pathways for ParcelMap BC adoption. This was an iterative process in which alternative approaches were developed and reviewed with the participants.

Table 1 presents the final set of adoption pathways that were identified. The starting point is determined by whether the jurisdiction's parcel fabric is fundamentally based on a PID-centric (legal property based) or folio-centric (tax entity based) approach. Each of these can then be divided into two

primary approaches: a replace or realign strategy. The first is a full replacement of the parcel fabric with the current ParcelMap BC fabric, and the second requires an assessment and adjustment workflow and, where necessary, cooperative work between the participant and the LTSA to assess and address specific differences in the municipal and ParcelMap BC parcel data, to confirm the basis for alignment for other datasets.

The last column of Table 1 indicates the assumed adoption pathways that each of the five LMFG participants might follow.

Note that additional adoption pathways may be developed to address the needs of other adopter groups including utilities and Provincial Government agencies.

Table 1- ParcelMap BC Adoption Pathways and Possible LMFG Choices

Parcel Fabric Fundamentals	**Primary Approach**	**Typical Adopter**	**Possible LMFG Adoption Choices**
1. "PID-Centric" Or Legal Property based	a) Replace	• Organizations who are reworking their fabric • Municipalities and Regional Districts with minimal system integrations. • Utilities using new fabric	
	b) Realign	• The bulk of the large adopters	• City of Surrey • District of North Vancouver • City of Burnaby
2. "Folio-Centric" Or Tax Entity based	a) Replace	• Small number of all adopters	• None from LMFG
	b) Realign	• Small number of all adopters	• Township of Langley

There are four (4) possible approaches to ParcelMap BC adoption based on alignment of Geometry and Attributes as described below.

Table 2 - ParcelMap BC Adoption Pathways: Geometries and Attributes

<table>
<tr><th>Adoption Pathway</th><th>Geometric Alignment</th><th>Attribute Alignment</th></tr>
<tr><td rowspan="2">“PID-centric” Or Legal Property base</td><td>Option 1 (“ParcelMap BC Replace”): Completely replace the current internally maintained parcel fabric dataset with ParcelMap BC. The required minimum set of attributes would be included in this data set by default.</td><td>Implicitly achieved by replacement approach.</td></tr>
<tr><td>Option 2 (“ParcelMap BC Realign”): Employ assessment and adjustment workflows to align existing cadastral data and other aligned datasets with ParcelMap BC. Collaborate with LTSA to reconcile specific differences in the geometry of the internally maintained parcel data with the ParcelMap BC dataset.</td><td>The following attributes should should align with ParcelMap BC: • PID
• PIN
• Legal Description
• Plan Number
• Owner Type
• Parcel Status
• Regional District
• Parcel Class
• Municipality
• Designation 1
• Designation 2
• Designation3</td></tr>
<tr><td rowspan="2">“Folio-centric” Or Tax Entity based</td><td>Option 1 (“BCA Replace”): Completely replace the current internally maintained parcel fabric dataset with BCA’s Assessment Fabric, which is based on geometry sourced from ParcelMap BC.</td><td>Attributes utilized will be based on organizational need and will be sourced from BCA data advice</td></tr>
<tr><td>Option 2 (“BCA Realign”): Employ assessment and adjustment workflows to align existing cadastral data and other aligned datasets with the Assessment Fabric. Collaborate with BCA to reconcile specific differences in the geometry of the internally maintained parcel data with BCA’s Assessment Fabric, which is based on geometry sourced from ParcelMap BC. Post adoption, any concern with the accuracy or correctness of BCA’s representation is first compared for consistency with ParcelMap BC for shape and attribution before raising an issue with the LTSA.</td><td>Attributes utilized will be based on organizational need and will be sourced from BCA data advice.</td></tr>
</table>

Additional adoption requirements include the following:

- **Regular Updates**: The municipal fabric must be reconciled regularly with updates from the ParcelMap BC fabric or BCA Assessment Fabric (both spatially and attribution content). Report any discrepancies or concerns to the LTSA for investigation and correction, as necessary, for the benefit of all users.

- **ParcelMapBC is the Authoritative Representation**: If any temporal discrepancies are encountered, ParcelMap BC will be considered the "correct" version for decision making. Confirm with the LTSA if there are pending reported accuracy or correctness concerns that are being addressed by LTSA in cooperation with other stakeholders.

5.1 Substantial Adoption

The concept of "Substantial Adoption" is achieved when ParcelMap BC data supersedes the incumbent self-maintained parcel fabric data as the primary source of truth for the geometric and related attribute representation of parcel features.

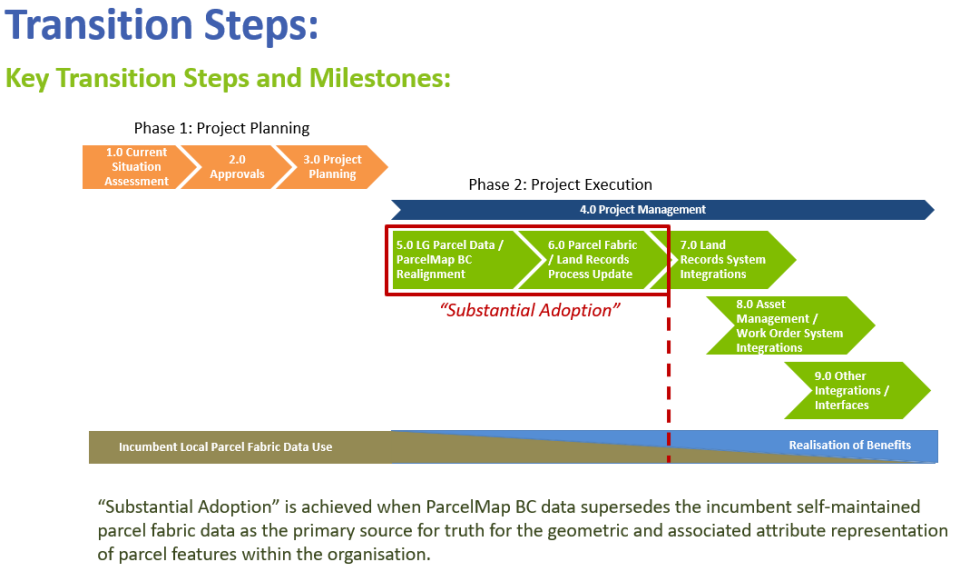

Figure 4 – Key Task Areas in each Phase of the High-Level Transition Plan.

Appendix A

Parcel Fabric Workflows and Integrations (Current)

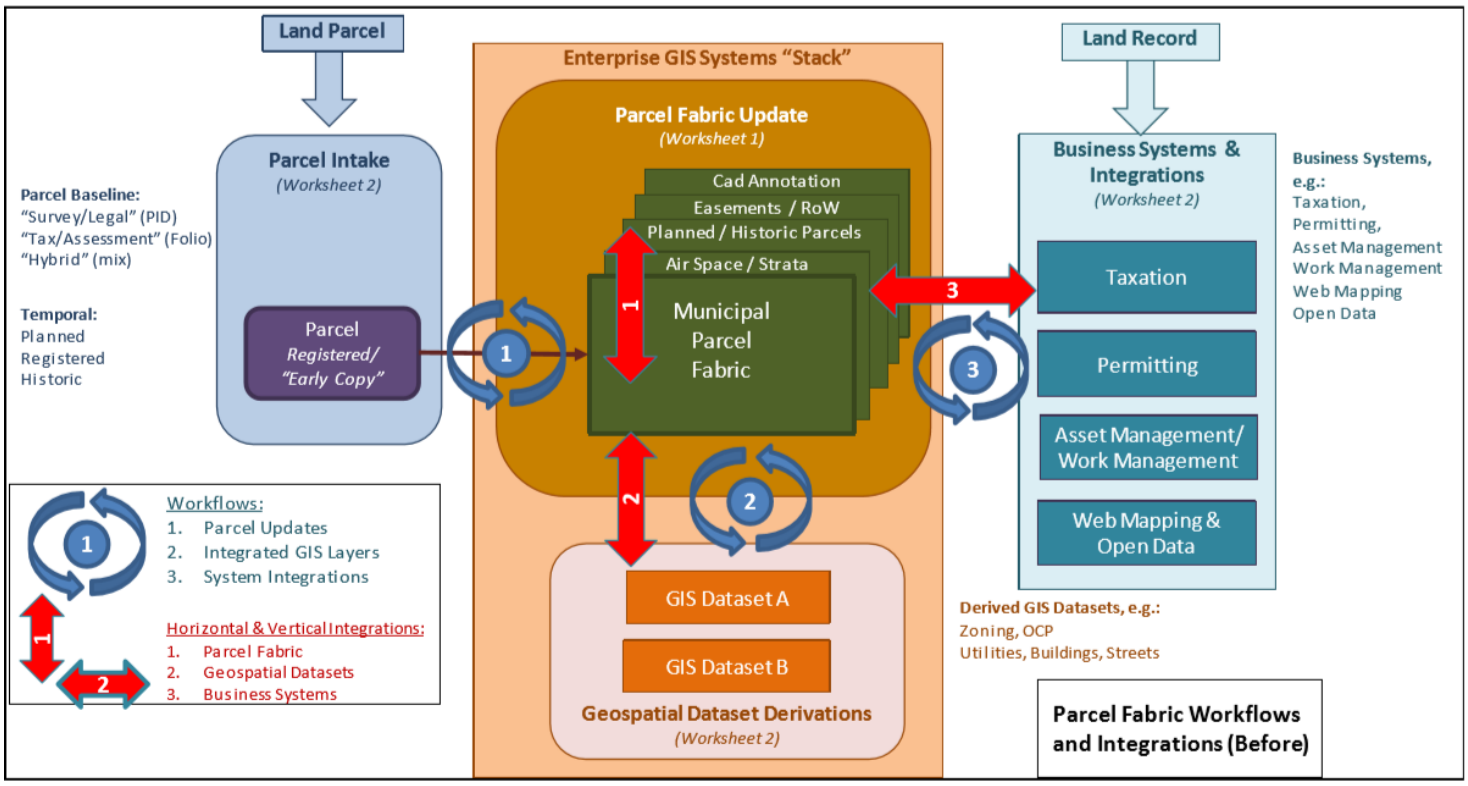

Figure A1– - Parcel Fabric Workflows and Integrations Before ParcelMap BC Adoption

Appendix B

Parcel Fabric Workflows and Integrations (Future)

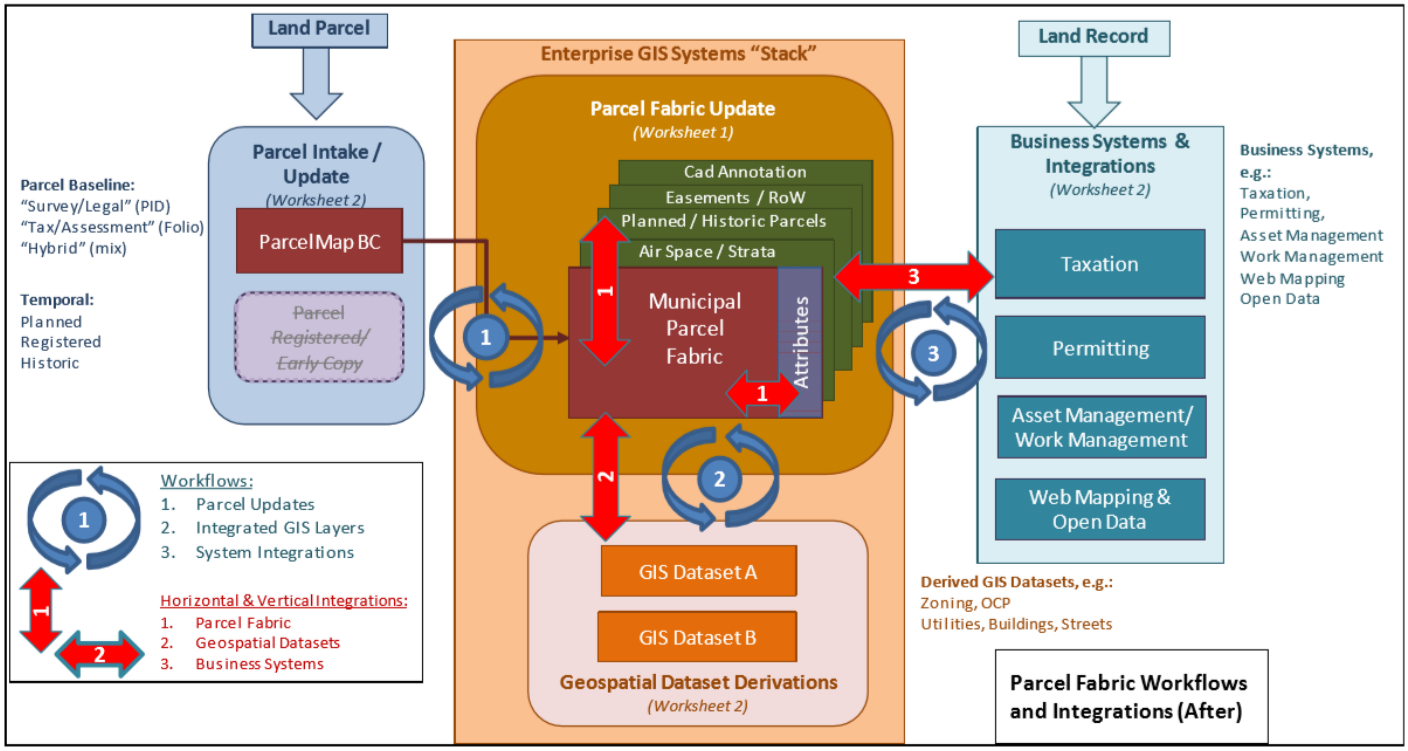

Figure B1– - Parcel Fabric Workflows and Integrations After ParcelMap BC Adoption