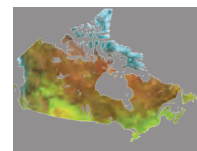




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Surveyor General Branch

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Towards a community based, cost-effective and



Preface

The enthusiasm generated from the Parcel Fabric Renewal (PFR) initiative is testament to the collective recognition that if community aspirations are to be realized and the true potential for First Nations lands are to be unlocked, the land development frameworks on many First Nations Reserves need to be re-designed. It is also clear that the underlying problems are as much social as they are technical and as much institutional as they are cultural. The diversity across the 600 First Nations in Canada creates a level of complexity that precludes the development of a “silver bullet” that will solve all land management problems. PFR has however brought key stakeholders together to jointly discuss a broad array of underlying issues and develop a clear way forward.

Pilot projects provided the opportunity to closely examine all aspects of existing land development constructs in First Nations communities. They provided a lens into a Pan Canadian cross-section of representative models from Mount Currie, British Columbia, to Uashat, Quebec. The following report, illustrates key results and lessons learned. Detailed project reports are also available for each pilot. However, given that work is continuing on Uashat and that projects flowing from the recommendations are being designed and to a certain extent implemented, this report should be considered as a summary of activity completed to date. Work is continuing!

The projects have produced a great deal of useful data that is being used to provide more accurate costs and timelines associated with parcel fabric renewal and help identify the communities that are best positioned to engage in a renewal process. We also have confidence that post renewal, the rebuilt survey frameworks will help reduce survey costs. Further, having surveys done at the right time in a well-defined, simplified and predictable development process will ensure that the resources invested in surveys are optimized. A coordinated approach to the management of surveys will also ensure that projects can be bundled geographically and as part of an integrated long term plan.

It is clear that the following components are essential to the success of the initiative going forward:

- 1) A community approved land use planning framework;
- 2) Formal integration through policy or legislation of the requirements for land registration and land surveys within the land use planning framework;
- 3) Tools that provide a holistic view of land use activity and occupation in a community;
- 4) Integration of local capacity into all aspects of the development framework.

Thus the following series of recommendations, gleaned from this report and the individual Pilot Project reports, are designed to inform action plans that will translate into immediate improvements and lay the foundation for a modernized approach to land development. The next step must be a collective and thorough analysis of the recommendations by all participants. This dialogue is necessary to validate the proposed approach and build the common understanding and enthusiasm that will facilitate momentum going forward.

It is important to recognize the significant contribution made by participating First Nations and the staff at AANDC and NRCan that have dedicated so much energy to this initiative. There is still a

great deal to do, however we now have the essential blueprint that will provide an effective path forward.

A handwritten signature in black ink, consisting of a large, stylized 'P' followed by a horizontal line and a small flourish.

Peter Sullivan
Surveyor General for Canada Lands

Acknowledgements and many thanks to:

Lil'wat First Nation, British Columbia
Brokenhead First Nation, Manitoba
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Uashat First Nation, Quebec
Eel Ground First Nation, New Brunswick

The many project participants at Aboriginal Affairs and Northern Development Canada and the Surveyor General Branch of Natural Resources Canada

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Executive Summary

There are various reasons for renewing parcel fabric on Reserves. Policy imperatives include the *Federal Framework for Aboriginal Economic Development*, which sets out that economic opportunity for Aboriginal resources must be “systematically assessed, targeted and expanded.” That is, investment should no longer be distributed on equitable principles; rather, distribution must anticipate, encourage and react to business opportunities. Thus, applying rigour to Reserve parcel fabric responds to the Framework’s goals of modernizing land management regimes to enhance the value of assets, taking a more systematic approach to identifying economic opportunities, strengthening capacity for community economic development planning, and ensuring that economic development programs are opportunity-driven and market-oriented.

The Surveyor General Branch (SGB) of NRCan has the legislative mandate (through the *Canada Lands Surveys Act*), the expertise (in boundaries, parcels and surveys) and the experience of a close working relationship with AANDC, Aboriginal groups (such as NALMA¹, AFN² and FNTC³) and individual First Nations to survey the parcels that are a necessary condition for economic development on Reserves. In 2008, the quality of the parcel fabric was assessed across a representative sample of Reserves and was found – on average – to be less than that in off-Reserve communities. Parcel fabric renewal began in earnest in 2010, in order to improve the fabric and capacity in some communities, to strengthen the links between parcels and economic development and to test innovative survey techniques and practices.

Five Reserves were chosen for a myriad of reasons, including willingness on the part of the Chief and Council, proximity to NRCan and AANDC regional offices, language- and regional-distribution, type of tenure issue (such as multiple ownership), and application of environmental regulations. Six general findings from renewal are significant as regards the next analytical steps, and as informing the recommendations:

1. Many First Nations have created coherent informal parcels to allow for customary rights. Some are surveyed (albeit without *Indian Act* sanction) and mapped (using in-house GIS), many are fenced, and many if not most are bounded by physical features.
2. Renewal (reconciling formal parcels with occupation and in some cases registered interests) follows a bi-partite process. If a customary right encroaches over a formal parcel boundary, then the parcel fabric is shifted to accommodate the improvement. If a customary right exists without a formal parcel, then a new parcel is created to accommodate the improvement (the latter scenario is much more prevalent).
3. Formal parcels that accommodate a legal interest are to be left untouched, owing to the constraints and difficulties in varying such parcels and amending such parcel description. Renewed parcels, therefore, are adjusted around the existing legal interests. In any case, encroachments by such improvements are rare and there is thus little need to vary the fabric.
4. Given scarce resources, renewal must target those Reserves which can most benefit. SGB has developed a methodology for determining optimum Reserves for renewal, based on

¹ National Aboriginal Lands Managers Association,

² Assembly of First Nations,

³ First Nations Tax Commission.

proximity to urban centres, the quality of the parcel fabric, community well-being, and population.

5. SGB will adapt (through renewal) and adapt to (through enhancements to its regulatory framework) the parcel fabric reality on Reserves, to ensure that parcels continue to enable economic development.
6. First Nations will continue to drive renewal, through political will, lands management capacity, development pressures, land use planning mechanisms, AANDC funding and SGB expertise.

Recommendations

Communication and Outreach

1. Develop a communication strategy with key participants⁴ in the land development process to raise awareness of the need for a Fully Integrated Land Tenure and Sustainable Economic Development (FILT-SED) framework. To describe and raise awareness of how land use planning, land survey and land registration systems must integrate to produce an effective community-based development framework. Each participant's role in the renewed process must be clearly defined. The strategy must communicate the importance of an effective and synchronized process for community development.

Why? There is clearly a need to build a stronger understanding of how land development regimes must be integrated through legislation or as a minimum, policies developed by a community. How can you plan without knowing the location of zone boundaries, parcel boundaries or appropriate road design? How can you manage effectively without a comprehensive view of all rights, restrictions and boundaries?

Development of a model framework

2. Provide First Nations access to a FILT-SED policy or legislative framework⁵ that allows First Nations to allocate land interests on parcels; or to existing legislative tools such as s.81(1)(g) and (i) of the *Indian Act* (that allow First Nations to integrate the zoning of prohibited uses, and the surveying and allotment of Reserve lands, respectively, into by-laws). Such a FILT-SED framework would allow First Nations to seize the initiative in maintaining parcel fabric; fabric that provides surface and sub-surface (service) access to all parcels, creates parcels for buildings without parcels and eliminates encroachments of buildings across boundaries.

Why? There is a need for a model, designed by and for First Nations communities, which can be adapted to each community's needs. The framework should build on existing FN capacity and related lessons learned from the pilot projects.

3. Formalize the FILT-SED framework and ensure that it is supported by capacity development in communities, First Nations organizations or institutions.

Why? A formal process cannot function without the appropriate support. Capacity must be developed in the community or a supporting organization such as a tribal council or a First Nation institution. In general, a community must be able to access a menu of potential administrative tools and technical solutions successfully for their day to day planning activities such as approval of applications and updating their community development plan. As examples, such capacity building could take the form of training for First Nation community members in land surveying and marketing land surveying in First Nation communities as a viable career path.

⁴ Such as: AANDC, SGB, the National Aboriginal Lands Managers Association (NALMA), the Lands Advisory Board/Resource Centre (LAB/RC), the Association of Canada Lands Surveyors (ACLS), and regional lands contacts such as the First Nations Alliance for Land Management (FN4LM) in BC

⁵ Similar to work being done through the joint AANDC, AFN, NRCan and DoJ working group on Additions to Reserves and the First Nations Property Ownership initiative.

Development of guidelines and processes for renewal

4. Compile lessons learned from the five parcel fabric renewal pilot projects by SGB and AANDC into a formal set of guidelines, processes and products to support First Nation communities in the development of a FILT-SED framework. The guidelines are to include the development of a phased approach that would allow renewal to take place on parts of the community over time and in support of community adhesion. The guidelines and processes would form part of the communication strategy.

Why? A well defined and rigorous process will avoid re-inventing the renewal process for each First Nation. Further, by phasing the process, First Nations need not wait until the whole community has completed a renewal before implementing a community planning regime. The renewal process can be adapted and improved over time as First Nations develop their administrative regimes.

5. Develop model guidelines, standards and processes for maintenance of a Geographic Information System (GIS) supported land development framework, such as the *Community Parcel Plan* (Appendix 2). Such a framework will provide a community with the ability to have an integrated visualization of a rights-based parcel fabric (Indian Lands Registry or other formal land registration system) along with the future development that is planned for the community. The framework would support the local land development process and be fully integrated with the land registration system used by a community. Such a process will ensure that surveys are completed at the optimum time in the land development process and are fully integrated with local land development policies and/or legislation.

Why? To satisfy the need for a comprehensive and integrated view of all rights and restrictions on a Reserve, to facilitate comprehensive planning and to ensure that the formal planning process informs when and what type of survey is required to support the development process and land tenure regime.

6. Develop an integrated land development program. Predicate the Parcel Fabric Renewal component on fully integrated participation from each respective First Nation, such that community consultation is facilitated, timelines and deliverables are agreed to and met, and infrastructure – both parcel demarcation and lands management capacity - is efficiently improved. Participation should be demonstrated through First Nation policies or by-laws that allow parcel bounds to be varied and prohibit clashes between formal and informal parcels.

Why? The process must be driven by the community. Full community engagement will be required for success, particularly when resolving conflicting boundary locations and to ensure that the whole community understands and supports the long term development plan.

Coordinate and bundle survey programs

7. Develop a mechanism to ensure that all components of the land development process (land use planning, surveys, land registration and development) be fully integrated with the AANDC capital works program, so as to ensure that parcel demarcation and interest registration are integral parts of community infrastructure and that boundary monuments are not disturbed in the land development process.

Why? To ensure coordination of the investments in surveys and to ensure demarcation of surveys occurs at the optimum time in the development process.

8. Develop a five year plan for surveys to ensure effective planning and resource utilization.

Why? Although difficult to coordinate, a long term view is essential to ensure coordination of surveys and to ensure that surveys are performed at the most appropriate time of the year.

9. To contribute to cost reduction for surveys, develop a geospatial referencing framework to support efficient demarcation of boundaries and lay out of facilities and infrastructure on the ground. It would be mandatory for all new surveys to be integrated into the reference framework. Such a framework would include an appropriate combination of space based positioning (GPS) and local High Precision Network (HPN) stations; along with monumented road infrastructure and property block corners. This reference framework would also be fully integrated with the existing parcel fabric in order to provide a common geospatial foundation for all engineering and land development in a community.

Why? Geospatial reference frameworks are essential to provide reference marks for surveyors and engineers such that boundaries and infrastructure can be marked on the ground with confidence. They are essential to provide the necessary linkages from plans/coordinates and theoretical virtual lines and the ground. Poor frameworks require that surveyors spend additional time and resources reconstructing the fabric prior to survey.

10. Develop a program to ensure that each community has current ortho-imagery to support land use planning, renewal and to ensure that surveys are made in the most effective manner possible.

Why? High resolution imagery can be integrated with parcel and other geospatial information to provide a full visualization of land based activity and occupation in a community. Imagery is an essential component of all modern land management regimes. There are many opportunities to partner with others such as the provinces and municipalities to acquire the necessary imagery.

Modernize the survey system

11. Continue to promote a culture of innovation within SGB by leveraging the e-environment to integrate and streamline the survey and land registration functions within an integrated FILT-SED process. Build on successful initiatives such as e-RIP, the ILR-CLSR Reconciliation Project and My-CLSS. Simplify survey plan standards where possible as part of a review of the requirements for surveys in the 2009 NRCan/AANDC Interdepartmental Agreement.

Why? Moving the survey process “tooth to tail” into a digital environment will expedite the land transaction process by eliminating shipping of hard copy survey plans and documents between administering departments and First Nations. Approvals would also be provided electronically. Also, an integrated on-line process will support the land development framework and GIS application suggested in recommendation 5.

12. Expand the joint ACLS⁶ - SGB application MY-CLSS as a digital plan approval tool for First Nations lands administrators and to fully describe “Why” and “When” a survey is required along with a “How to” guide for the survey process for lands administrators.

Why? MY-CLSS exists to support surveyors through the land survey process. It can be expanded to allow the recording of electronic survey plans and to guide land administrators through the survey process. The application could be expanded to support electronic approvals of survey documents by land administrators.

Optimize investments in renewal

13. Use the determinants of optimality methodology along with compatibility for economic development in selecting appropriate First Nations for Renewal, to ensure that resources are efficiently allocated.
14. Monitor the five First Nations that were wholly or partially renewed to 2017 to assess the extent to which sustainable economic development (boundary conflicts; socio-cultural indicators; transaction costs) has been improved. The monitoring should be controlled by integrating a random trial approach; using similar (i.e. location, population and economic development activity) Reserves as control.

⁶ Association of Canada Lands Surveyors

Recommendations that will require new investment

Many of the above recommendations can be implemented with minimal investment. However the following will require multi-year investments and associated cost estimates:

Recommendation 6. “Develop an integrated land development program”;

Recommendation 9. “Develop a geospatial referencing framework to support efficient demarcation of boundaries and lay out of facilities and infrastructure on the ground;”

Recommendation 10. “Develop a program to ensure that each community has current ortho-imagery to support land management;”

Recommendation 12. “Expand the joint ACLS - SGB application *MY- CLSS*”.

Next steps - Estimating investment costs

Costs will be scalable depending on how many communities are engaged each year. The following next steps are recommended:

- 1) Identify priority First Nation communities in Canada that require Parcel Fabric Renewal considering determinants of optimality, community aspirations and participation in related self-government initiatives such as First Nations Land Management.
- 2) Based on existing geomatics capacity and infrastructure, estimate the cost to establish GIS capacity either in the community or with a First Nation Institution or service provider that will support an integrated land development process.
- 3) Estimate the cost to acquire high resolution imagery for each Reserve.
- 4) Based on available geomatics capacity and infrastructure, analyze and estimate the cost to provide a geospatial referencing framework for the communities and lands identified in step 1.
- 5) Develop a cost estimate to expand My-CLSS to accommodate digital survey plans and on-line approvals.

Proposed Approach to Implementation

| Activity | Links to Recommendations |
|---|----------------------------------|
| <p>Develop a Communication Strategy</p> <p>Establish an AANDC/NRCAN/NALMA/ACLS working group to oversee the development of a communication strategy to promote FILT-SED. This working group should involve First Nation community participation. Director level representation is recommended.</p> | Recommendation 1 |
| <p>Develop a model land development policy/legislative framework.</p> <p>Link this activity to the work carried out through the AANDC Land Use Planning pilot projects and the current dialogue with the First Nations Tax Commission and the joint AFN/AANDC working group investigating improvements to the Additions to Reserve process.</p> | Recommendation 2 |
| <p>Establish a domain-functional estimating team (AANDC/SGB).</p> <p>Estimate the resources required to implement recommendations 6,9,10 and 12.</p> <p>This team will be required to develop a process to evaluate the geomatics capacity available in target communities to accommodate recommendation 3.</p> | Recommendations 3,6,9,10, and 12 |
| <p>Develop a set of guidelines and procedures for Parcel Fabric Renewal based on the five pilot projects.</p> <p>Short term action: Establish a <i>tiger team</i> with representation from NRCAN, AANDC, ACLS and participating First Nations to oversee development of the guidelines. Build on work developed for the conceptual Community Parcel Plan illustrated in Appendix 2.</p> | Recommendations 4, 5 and 6 |
| <p>Develop a process to ensure the coordination of legal survey activity on First Nations Reserves.</p> <p>It is suggested that this activity will require an AANDC champion to coordinate across AANDC supported by SGB.</p> | Recommendations 7 and 8 |
| <p>Revitalize the Manual of Instructions for the Survey of Canada Lands and expand My-CLSS to accommodate digital survey plans and on-line approvals.</p> <p>Underway as a modernization project in SGB.</p> <p>Recommendations 11 and 12</p> | |

Impetus 1 – The Surveyor General's role

There are some 3,100 First Nation Reserves in Canada which are held in trust for some 630 First Nations. Reserves have a total area of 35,524 sq km, and differ significantly in location, size, capacity and complexity. They range from vacant tracts of wilderness to communities with the infrastructure and development activity of major urban centres. Governance, natural resource endowments, land tenure, levels of education, geographic remoteness and economic conditions in nearby municipalities all influence economic development. That being said, formal land parcels are certainly part of the socio-economic puzzle, so the tricky part is diagnosing when the gains of defining, demarcating and maintaining parcels become larger than the cost of doing so.

The Surveyor General Branch of Canada's Department of Natural Resources (NRCan) has legislative responsibility pursuant to the *Canada Lands Surveys Act* for surveys on First Nations Reserves. Specifically, SGB issues instructions for surveys, reviews plans of survey and registers such surveys to allow parcels to be created on Canada Lands, of which Reserves are the single largest component. To give a sense of scale, in 2011-12 alone, SGB issued 1,000 survey instructions, registered 1,800 plans of survey in the Canada Lands Survey Records (the CLSR, which holds some 100,000 records in toto) and created 6,300 new parcels in its cadastral dataset. Perhaps the most important role for the Surveyor General Branch however, is to provide communities regional access to the cadastral system.

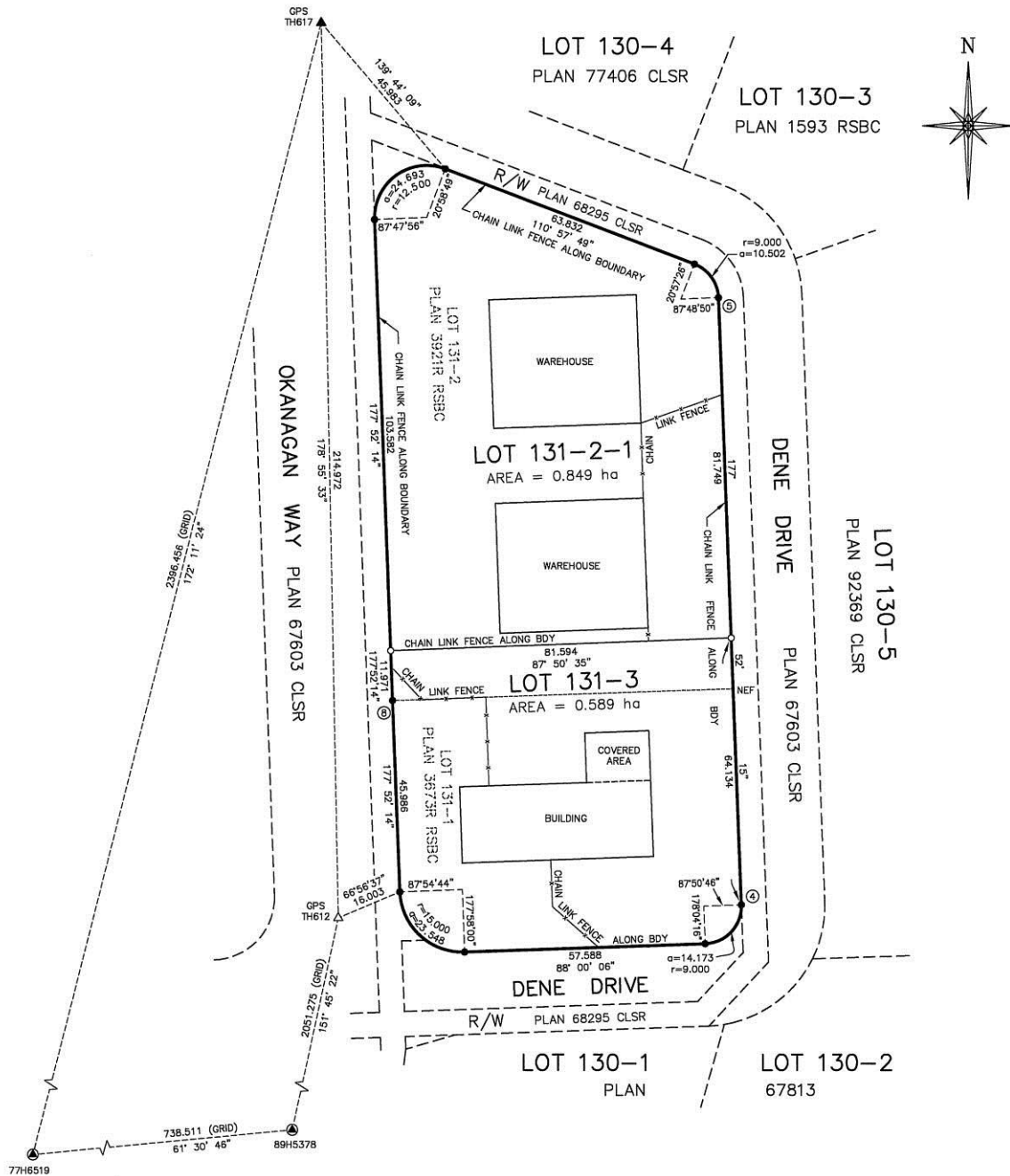
Surveying and mapping are indispensable for defining locations for formal and informal interests, and for using this location data for other analytical purposes. These purposes include routing emergency vehicles, planning land uses, avoiding natural hazards and responding to utility breakdowns and contaminant spills. Surveys create parcels – both on the ground (physical monumentation) and within administrative systems (digital format). On Reserves, a formal parcel is an area of land, generally defined by survey, registered in the CLSR. Any legal interest must now be accompanied by a formal parcel; parcel fabric is the mosaic of the many formal parcels (contained on various survey plans) across any given Reserve.

Informal/customary rights can be accommodated by either a formal or an informal parcel. An informal parcel is an area of land to which a customary right attaches that is defined through occupation (fences, walls, hedges, mowed grass, tree lines) or through an engineering or other non-sanctioned plan, and that has not been defined on a plan of survey registered in the CLSR. Owing to its non-presence in the CLSR, the knowledge of informal parcels is scanty outside the Reserve community.

Surveying is based on the premises that efficient property rights are a good thing; parcels locate and bound the spatial extents of rights and uses; parcels respond to development pressures but do not create pressures; parcels are ubiquitous across cultures and times. However, surveying takes place within legal and financial constraints, meaning exploring more cost effective ways to create parcels on Reserves was a key driver for parcel fabric renewal.

Impetus 2 – Evaluating parcel fabric

The extent to which formal parcels are utilized was measured on a sample of 118 First Nations, representing 20% of First Nations. The sample was also representative by having good diversity in geographical distribution (all Provinces were encompassed); in proximity to urban areas (many rural First Nation Reserves were included); in population; and in level of development. A formal parcel was defined as an area of land shown on a survey plan in the CLSR:



A *Parcel Fabric Index* (PFI) equation was developed that represents the relationship between improvements on the ground and formal parcels. Values approaching 0 indicate a very low parcel-to-improvement ratio, whereas values approaching 1 indicate a very good ratio.

$$PFI = \frac{TNI + VP + \frac{1}{2}OGI - (IOB + INP + IUM + \frac{1}{2}OGE)}{TNI + VP + \frac{1}{2}OGI}$$

Parcel Fabric Index (PFI) Equation

PFI = Parcel Fabric Index (between 0 and 1)

TNI = Count of total number of improvements on Reserve

VP = Count of vacant parcels (formal parcels with no improvements thereon)

OGI = Count of oil and gas improvements

OGE = Count of oil and gas errors (oil and gas improvements encroaching over formal parcel boundaries or without formal parcels)

IOB = Count of improvements on boundaries (improvements encroaching over formal parcel boundaries)

INP = Count of improvements without formal parcels (ad-hoc development)

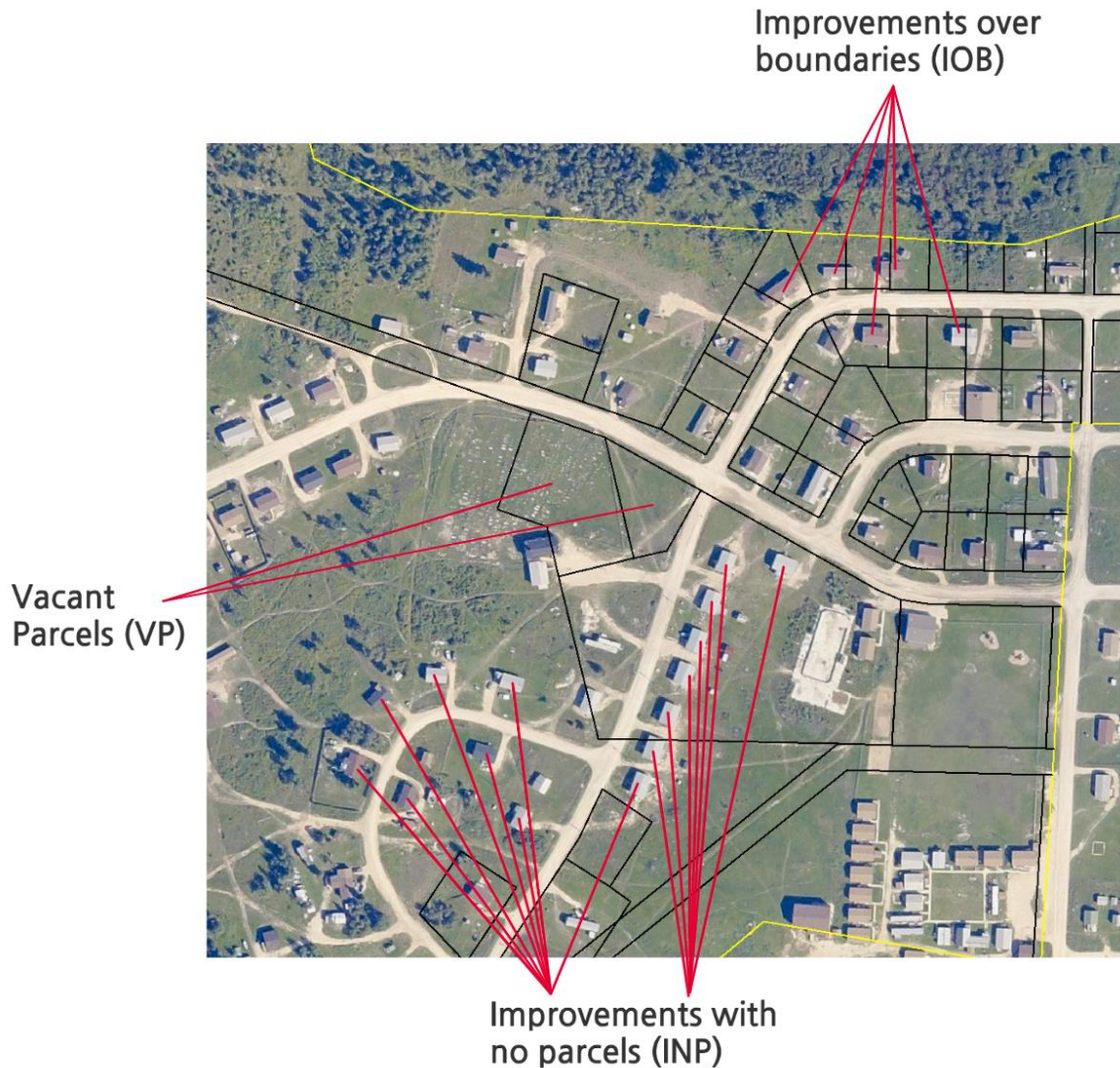
IUM = Count of improvements on un-maintained parcels

The formal parcels were overlaid on high resolution geo-referenced imagery. Improvements were considered to be any house or large structure, land clearing, or agricultural development visible on the imagery (garages, sheds and other small structures were excluded). Vacant parcels (VP), improvements on boundaries (IOB), improvements with no parcels (INP), improvements on un-maintained parcels (IUM), and oil and gas improvements (OGI) were counted.

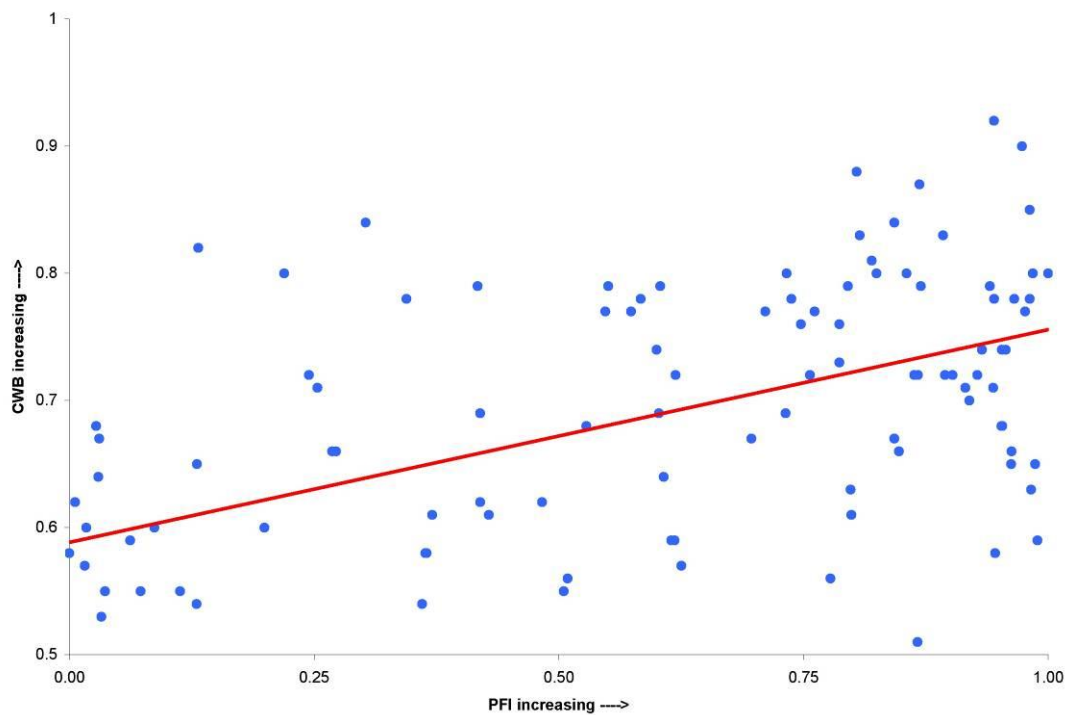
As a median, 72% of all improvements on Reserves fall within formal parcels. There was great diversity across the 118 Reserves, leading to a PFI range of 1.0. These results on-Reserve stand juxtaposed to the rest of Canada. The subdivisions in Abbotsford, Langley, Saskatoon and Winnipeg had a mean PFI of 0.97, and a range of only 0.04.

| | |
|--------------------|------|
| Mean PFI | 0.61 |
| Median | 0.72 |
| Standard Deviation | 0.33 |
| Minimum PFI | 0 |
| Maximum PFI | 1 |
| Count | 118 |

Summary statistics from the PFI evaluation

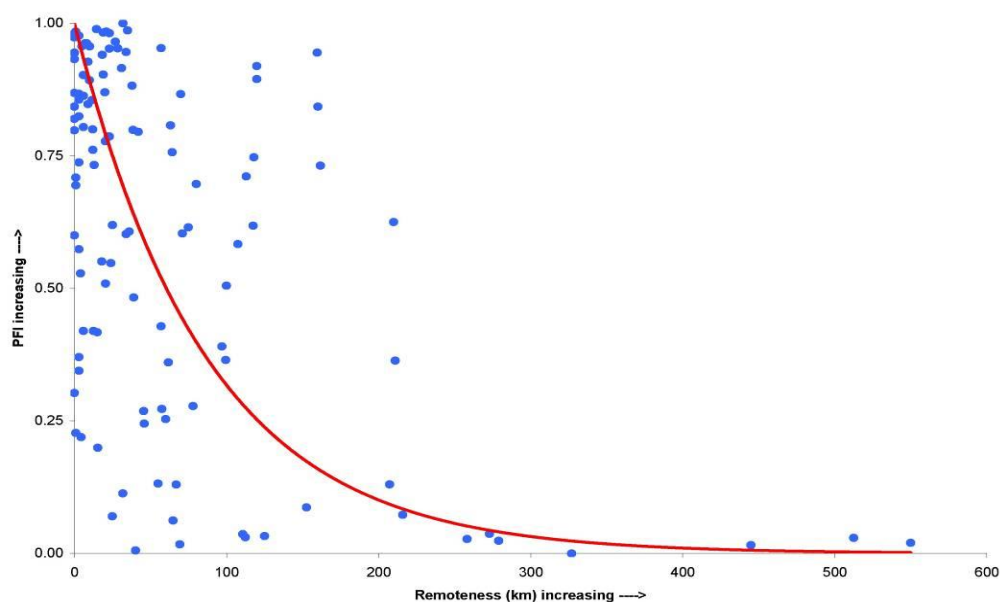


The PFI for 108 Reserves were then correlated with the Community Well Being (CWB) index for each Reserve (the remaining 10 Reserves had no CWB values, and were omitted). There is a strong positive correlation between parcel fabric and socioeconomic well-being on Reserve. As parcel fabric increases, socio-economic well-being tends to increase. However, such correlation does not necessarily mean causation: An outside investor shows interest in locating a business on a Reserve, after which a parcel is created; or housing demand predates the parcel.



PFI and CWB correlation

To test for what causes demand for parcels, the PFI values were correlated with remoteness (distance from urban centres). In the context of this study, 'remoteness' is defined as the driving distance from every Reserve to its corresponding nearest service centre. The results indicate a significant relationship between remoteness and parcel fabric (and between remoteness and CWB). As distance from a service centre increases, formal parcels tend to decrease.



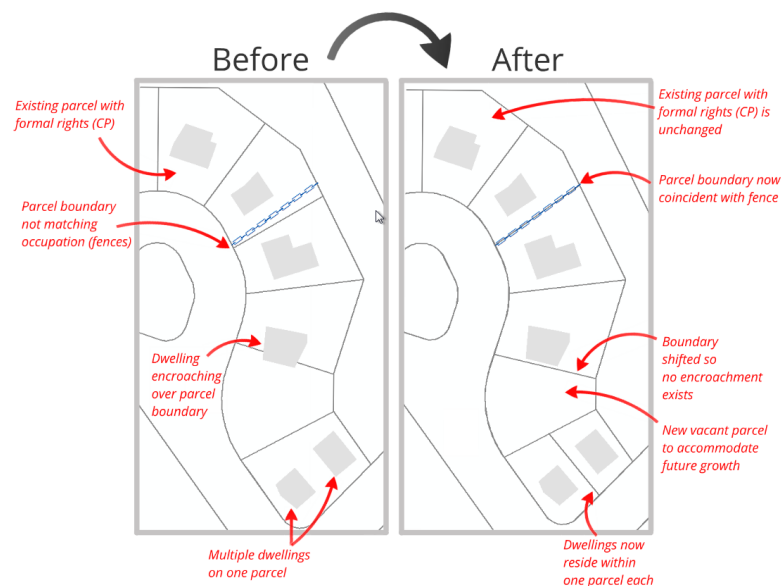
PFI correlation with remoteness

Parcel Fabric Renewal

There are various reasons for renewing parcel fabric on Reserves. Policy imperatives include the *Federal Framework for Aboriginal Economic Development*, which sets out that economic opportunity for Aboriginal resources must be “systematically assessed, targeted and expanded.” That is, investment should no longer be distributed on equitable principles; rather, distribution must anticipate, encourage and react to business opportunities. Thus, applying rigour to Reserve parcel fabric responds to the Framework’s goals of modernizing land management regimes to enhance the value of assets, taking a more systematic approach to identifying economic opportunities, strengthening capacity for community economic development planning, and ensuring that economic development programs are opportunity-driven and market-oriented.

Parcel fabric renewal is both process and product – it is the process of surveying lots to enclose existing improvements (buildings and other occupied spaces) within communities, and the product of the enhanced infrastructure (plans, maps, monuments, capacity). Renewal began in June 2010 at five First Nation Reserves – Mount Currie, Brokenhead, Akwesasne, Uashat and Eel Ground, and evolved to encompass:

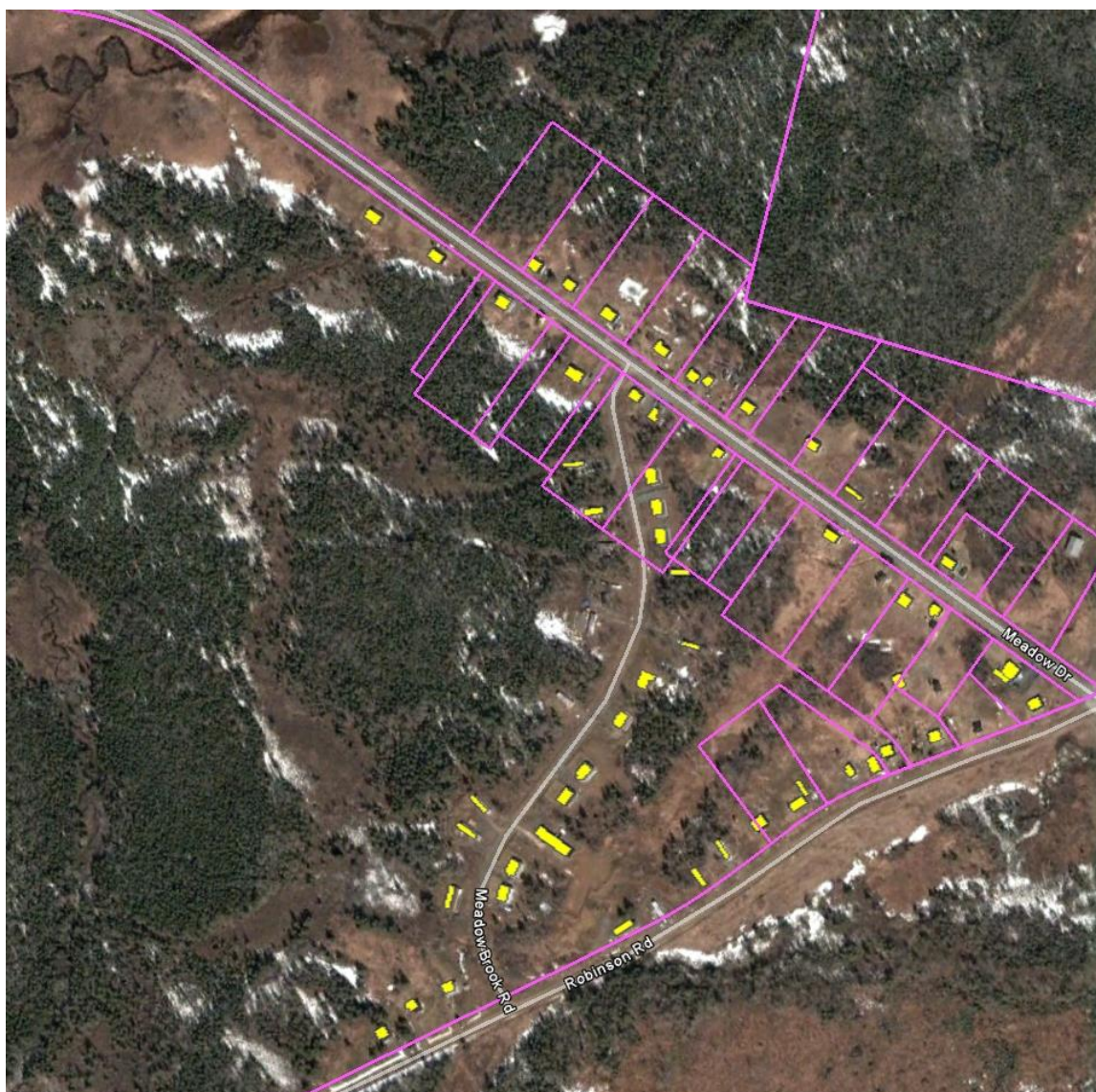
- Defining new parcels to accommodate buildings existing without parcels;
- Defining new parcels to resolve buildings encroaching over parcel boundaries;
- Defining new vacant parcels to accommodate future development (a land use planning principle followed at Eel Ground);
- Shifting existing parcels to align boundaries with occupation, such as fences (at the request of the First Nation at Uashat);
- Demarcating boundaries of parcels that had been defined but not surveyed (four parcels at Mount Currie that were defined in the 1950s).



One of the goals of renewal was to develop survey techniques to allow fabric to be efficiently⁷ renewed en-masse, such that informal parcels are formalized within the Canada Lands Surveys

⁷ Efficiency as measured in both time and cost; how long did it take and how much money did it cost?

Records (CLSR). The process began with a desk-top exercise in which current parcel fabric was combined with informal (occupied) parcels, and then the amalgam was formalized using principles of planning and geometry:



Step 1 – Overlay CLSR parcel fabric on imagery



Step 2 – Accommodate evidence of occupation (fences, cultivated areas)



Step 3 – Renew the parcel fabric according to land use planning principles

Five First Nations:

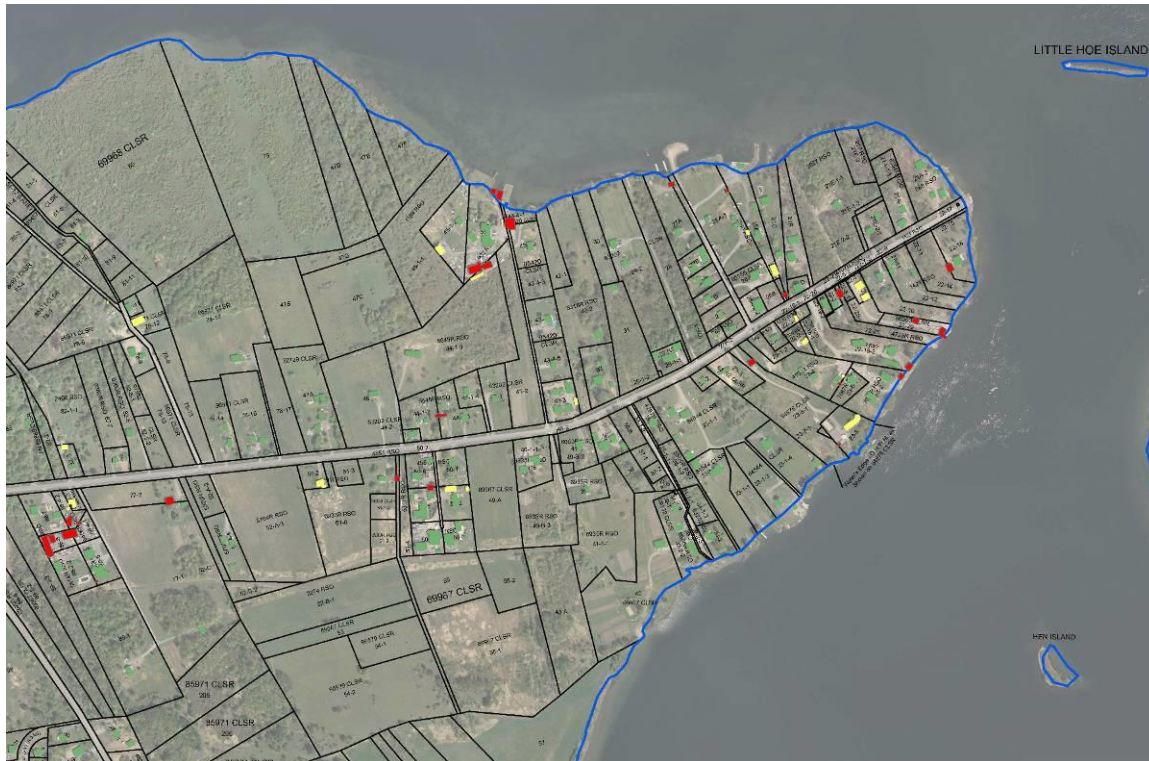
Mount Currie (below) - Seven new parcels (black):



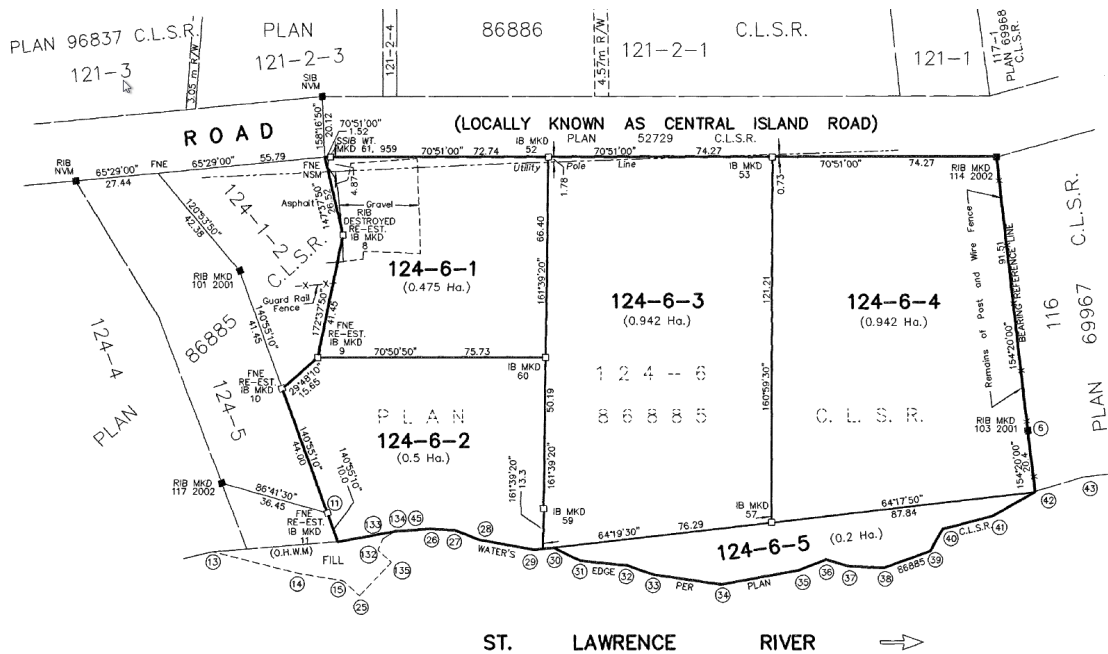
Brokenhead (below) - Disconnect between buildings (pink) and parcels (white and yellow):



Akwesasne (below) - Disconnect between buildings (red & yellow) and parcels (black & blue):



Akwesasne (below) - Five new parcels created:



Uashat(below) - New parcels were created to accommodate existing buildings, roads and fences:



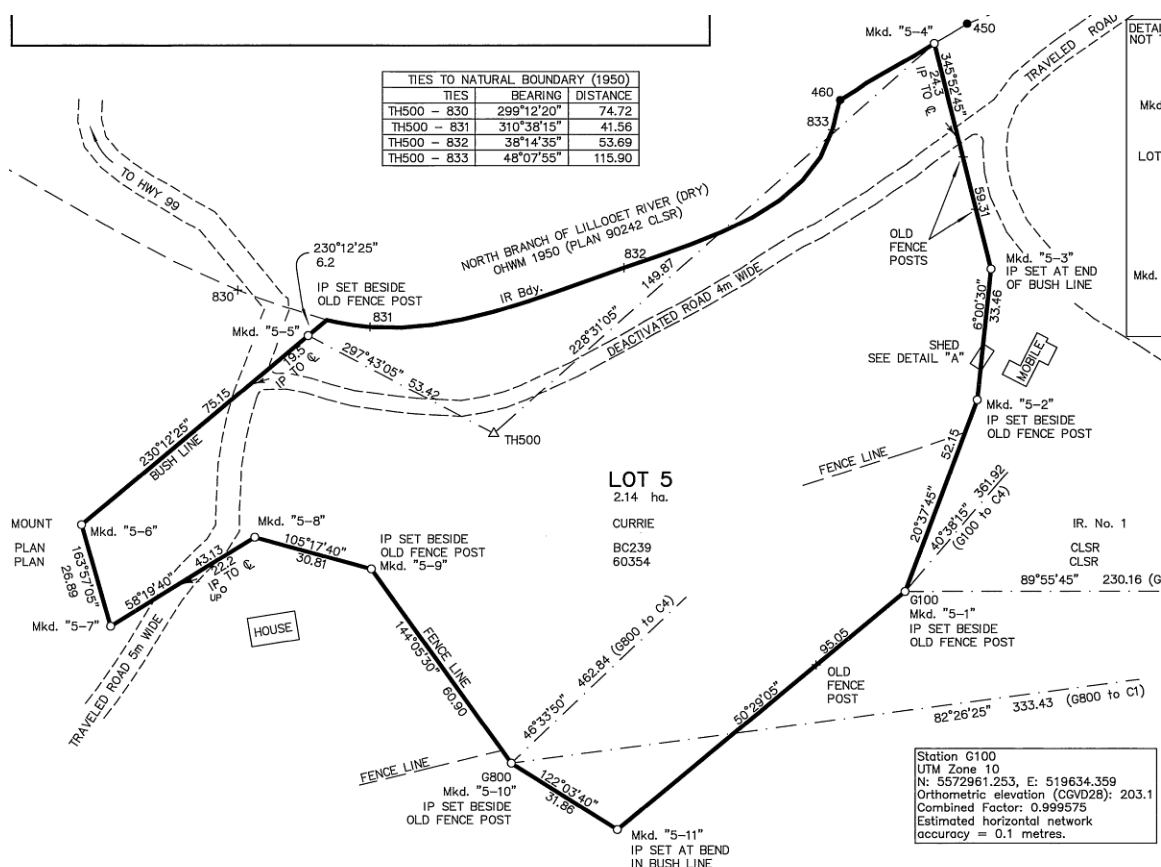
Eel Ground – Disconnect between buildings (red) and surveyed parcels (white and yellow)



What was learned?

1. Renewal was accommodated by section 31 of the *Canada Lands Surveys Act*, which provides much flexibility in how parcels are surveyed and demarcated. All renewed parcels are fully monumented (Mount Currie, Akwesasne, Uashat). Techniques focused on imagery and ground-truthing:

- There was enhanced use of desk-top products such as imagery to identify areas requiring renewal and to draft proposed plans of new fabric using limits of occupation (Brokenhead and Eel Ground). At Akwesasne, a building inventory classification for identifying encroachments compared ortho-rectified mosaics to CLSR fabric, with a linked attribute table to allow for queries. The attribute table identified buildings that did not encroach, that encroached, whose relationship with boundaries was uncertain, and that shared a parcel with other buildings.
- The apparent sympathy between buildings and CLSR parcels in calculating parcel fabric indices (PFI) might be artificial, if the community entirely disregards such parcels in favour of informal parcels (Brokenhead). Thus, consultation with the community is integral to ensuring that PFIs are accurate.



A s.31 plan of a fully monumented Mount Currie parcel

2. Renewal is a social process. Formalizing de facto occupation (reconciling occupation with CLSR parcel fabric) is primarily a community calculus, which requires much discussion between four parties – Chief and Council who grant informal rights, members who enjoy informal rights, the surveyor and of course Aboriginal and Northern Affairs Canada, the department with the responsibility for the land management regime. Renewal is an exercise in defining new boundaries; it is not merely a technical exercise of demarcating and delineating said boundaries. This calculus of community consultation is unique to each First Nation:

- New boundaries are defined by those who have rights in land. In renewal, the rights are informal – granted/respected by Chief and Council. The ease with which informal parcels can be formalized is a function of the strength with which the rights are held by members. Strongly held rights at Brokenhead mean that the First Nation is reluctant to reduce sizes of informal parcels, slowing the process.
- At Brokenhead, the First Nation does not anticipate new parcels preceding land use planning. Only after the community has approved a new subdivision design can new parcels be surveyed. Thus, the tripartite process of surveying but not formalizing existing holdings; then planning but not surveying a new subdivision; and then surveying and formalizing the new parcels has only just begun.
- At Mount Currie, the First Nation was reluctant to file any sort of community parcel plan, because the granting of informal interests against informal parcels was on-going, because it was seen as fettering the ability to adjust the parcel fabric, because the existing GIS system was deemed adequate, and in general because of general unease of the relation between surveyed parcels and official *Indian Act* interests (the latter of which there was a moratorium on).
- Less formally held rights at Uashat mean that the First Nation community consultation process is less rigorous than under the Indian Act, thus accelerating the process.
- At Eel Ground, the First Nation is keen to take the path of most benefit⁸ by focusing on creating vacant parcels in greenfields areas to attract immediate development, rather than on mediating the adjustment of all informal parcel bounds.

3. For the most part, formal parcels against which *Indian Act* interests are registered (certificates of possession, leases and licences) were left untouched, because there is little need for renewing such parcels and because the process of amending the legal description is arduous (Uashat, Eel Ground). The sacrosanct nature of existing formal parcels meant that their demarcation conflicted with occupation limits of abutting informal parcels (Mount Currie), causing friction between members living on informal parcels and members with an estate interest in the formal parcels.

4. Renewal requires significantly more time than for typical on-Reserve subdivisions. Much of the elapsed time was accounted for by consultation; SGB staff awaiting First Nation feedback, partnerships, agreements and approvals. Timelines are a function of the number of informal parcels to be renewed, the sophistication of informal parcels and the complexity of the community:

- Renewing few parcels requires less consultation (Mount Currie)⁹

⁸ Informal parcel adjustments are seen by the First Nation somewhat as a solution in search of a problem.

⁹ Since the completion of the Parcel Fabric Renewal pilot project, the Lil'wat First Nation has been accepted into the First Nation Land Management (FNLM) regime. Because of this, the Lil'wat First Nation has indicated

- At Uashat, non-CLS survey work by a Quebec land surveyor (block corners) and by the First Nation (informal parcel corners), in conjunction with a community fencing program that physically defined the side boundaries of many parcels, made for efficient renewal.
- Community enthusiasm is uneven in a community the size of Akwesasne (11,000 members), meaning that only 14 parcels were renewed. The First Nation did not immediately approve the project; there are many parcels with estate interests; some members do not welcome surveys; the approval process is cumbersome.

5. Renewal costs per parcel are a function of the party doing the work, the number of parcels to be formalized, the sophistication of informal parcels and the frequency of monumentation:

- The bulk of the renewal work was done in-house by SGB staff, with the exception of Akwesasne. Renewing other First Nation communities will be contracted to private sector surveyors, whose costs will likely be higher.¹⁰
- Renewing much parcel fabric (Brokenhead and Uashat) incurs much lower costs/parcel than renewing few parcels. There appear to be economies of scale (owing to lower logistical costs/parcel).
- The cost to survey First Nation GIS-based parcels was one-third of the cost to survey parcels described by metes and bounds (Mount Currie). In order to manage informal parcels and interests, the GIS uses traditional occupation (historical aerial photos, survey plans and field notes), members' (primarily elders') testimony, and compares such historical information to high resolution ortho-photography. Conversely, parcels described using metes and bounds at Mount Currie were more difficult to survey, thus increasing inefficiency.

6. Low costs per parcel (associated with renewing many parcels) and short time-frames (less consultation associated with fewer parcels) are mutually exclusive:

a growing need for surveys to transition customary holdings into legal interests under a First Nation land code. The Lil'wat First Nation indicated that had they understood the need for parcels to support FNLM interests during the pilot project, they would have worked towards a more comprehensive parcel renewal. See comments from Graham Haywood, Reserve Land Manager, November 1, 2013.

¹⁰ Parcel fabric renewal for the First Nations in the FNPO initiative is budgeted at \$1,300 per parcel.

Determinants of optimality

Given resource constraints (money, time and people), parcel fabric renewal cannot accommodate all Reserves in Canada. The optimum candidates for renewal will have an appropriate mélange of four factors: location, parcel fabric quality (PFI), community well-being (CWB) and population.

The ideal remoteness value for a Reserve is 0 km. This indicates that the Reserve is either directly adjacent to, or entirely within the 'service centre'. Among the 118 Reserves in the sample, the remoteness mean (\bar{x}_{rem}) was 65 km, with a standard deviation (μ_{rem}) of 98 km (given the lack of constraint on large distances). The criteria limits for ideal remoteness were set between 0 km and 163 km ($\bar{x}_{rem} + \mu_{rem}$). Any Reserve exceeding 163 km was excluded, owing to its distance from the economic drivers. In other words, there is less reason to renew parcel fabric on remote Reserves, given the more nebulous effects of renewal for such Reserves:

$$0 \text{ km} < \text{rem} > \bar{x}_{rem} + \mu_{rem}$$

Of the 118 Reserves in the sample, the mean PFI (\bar{x}_{PFI}) was .61, with a standard deviation (μ_{PFI}) of .33. Ideal PFI limits were set to three-quarters of one standard deviation to each side ($\bar{x}_{PFI} \pm 0.75\mu_{PFI}$). The upper limit of the PFI was set in such a fashion because PFI values exceeding .85 are approaching off-Reserve norms and those Reserves benefit little from a slight renewal in parcel fabric. Conversely, the lower PFI limit was set at .36 because Reserves beneath that limit require much parcel creation and not mere parcel renewal (while there is merit in creating parcels anew, it is outside the scope of renewal):

$$\bar{x}_{PFI} + 0.75\mu_{PFI} < \text{PFI} > \bar{x}_{PFI} - 0.75\mu_{PFI}$$

Of the 500 First Nation Reserves in the CWB sample, the mean (\bar{x}_{CWB}) was .57 with a standard deviation (μ_{CWB}) of .10. In contrast, the mean off-Reserve CWB value was .77. Ideal CWB limits were set at the mean value minus one half of one standard deviation ($\bar{x}_{CWB} - 0.5\mu_{CWB}$) and at 1. The lower CWB limit was set in such a way because values less than .52 are indicative of systemic problems on Reserve; parcel renewal is not a panacea. The upper CWB limit of 1 is an ideal (no community in Canada received this score):

$$\bar{x}_{CWB} - 0.5\mu_{CWB} < \text{CWB} > 1$$

Only a minority of Reserves are populated. In the 2006 census, 1,092 Reserves were enumerated (22 of the remaining 2,000 Reserves refused to complete the census; the others had no population). Of the 1,092 Reserves:

- 277 Reserves have a population of zero;
- 206 Reserves have a population of 50 or less;
- 199 Reserves have a population of 500 or more (Statistics Canada, 2006, 2007, 2008).

Off-Reserve, municipal governments are formed when an area reaches a critical mass of people. Although the definition of what constitutes a 'municipality' varies by Province, it is clear that minimum population numbers exist that reflect this critical mass. With the exception of Alberta, the

smallest municipal government authority has over 100 people, so this was set as the minimum population limit for optimum parcel renewal candidates:

$$\text{pop} > 100$$

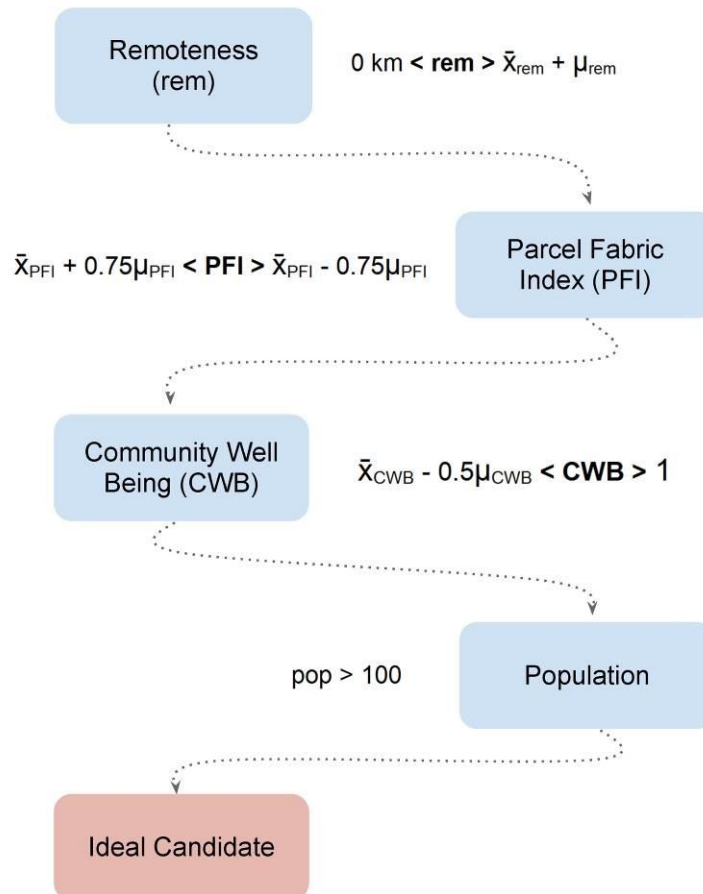


Figure – Algorithm of determinants of optimality (DO)

When this four-part determinant algorithm is tested against the 118 Reserves: 97 met the remoteness criteria. Of these 97, 43 met the PFI criteria. Of these 43, 42 met the CWB criteria. Of these 42, 41 met the population criteria (35% of the sample):

----- Iteration 1 (original) -----

| Criteria | Restriction | Change from 118 |
|-------------------|---|-----------------|
| <i>Remoteness</i> | 0kms --> $\bar{x}_{rem} + \mu_{rem}$ | 97 |
| <i>PFI</i> | $\bar{x}PFI \pm 0.75\mu PFI$ | 43 |
| <i>CWB</i> | $\bar{x}CWB - 0.5\mu CWB \rightarrow 1$ | 42 |
| <i>Population</i> | >100 | 41 |

Slight changes to the criteria result in large changes to the number of optimum Reserves. To illustrate, six more iterations of the algorithm were run against the PFI sample of 118:

----- Iteration 2 -----

| Criteria | Restriction | Change from 118 |
|-------------------|--|-----------------|
| <i>Remoteness</i> | 0kms --> $\bar{x}_{rem} + 0.75\mu_{rem}$ | 93 |
| <i>PFI</i> | $\bar{x}PFI \pm 0.75\mu PFI$ | 42 |
| <i>CWB</i> | $\bar{x}CWB \rightarrow 1$ | 37 |
| <i>Population</i> | >100 | 36 |

----- Iteration 3 -----

| Criteria | Restriction | Change from 118 |
|-------------------|---|-----------------|
| <i>Remoteness</i> | 0kms --> $\bar{x}_{rem} + 0.5\mu_{rem}$ | 88 |
| <i>PFI</i> | $\bar{x}PFI \pm 0.75\mu PFI$ | 40 |
| <i>CWB</i> | $\bar{x}CWB \rightarrow 1$ | 35 |
| <i>Population</i> | >100 | 34 |

----- Iteration 4 -----

| Criteria | Restriction | Change from 118 |
|-------------------|--|-----------------|
| <i>Remoteness</i> | 0kms --> $\bar{x}_{rem} + 0.25\mu_{rem}$ | 81 |
| <i>PFI</i> | $\bar{x}PFI \pm 0.75\mu PFI$ | 35 |
| <i>CWB</i> | $\bar{x}CWB \rightarrow 1$ | 32 |
| <i>Population</i> | >150 | 29 |

----- Iteration 5 -----

| Criteria | Restriction | Change from 118 |
|-------------------|--|-----------------|
| <i>Remoteness</i> | 0kms --> $\bar{x}_{rem} + 0.75\mu_{rem}$ | 93 |
| <i>PFI</i> | $\bar{x}PFI \pm 0.5\mu PFI$ | 23 |
| <i>CWB</i> | $\bar{x}CWB \rightarrow 1$ | 20 |
| <i>Population</i> | >100 | 19 |

After the substantial initial filtering that occurs against remoteness and PFI, the sample is reduced very little by CWB and population. The reason for this is three-fold:

- There is a strong correlation between remoteness, PFI and CWB, so any potential filtering through CWB is already largely accommodated by remoteness and PFI;
- The more remote a Reserve, the less likely it is to have a significant population, meaning that the remoteness value eliminates most of the lower-populated Reserves; and
- The sample was selected to have the more-developed (i.e. populated) Reserves. Given a different sample with less-developed Reserves, the population filter might have more impact.

Link with land use planning

In 2010, SGB canvassed 43 First Nation communities as to their surveying and mapping capacity and found that one-third employ such staff, that half had adopted or were preparing land use plans, and that those with such in-house capacity are three times more remote than those who contract such expertise. Land use planning informs decisions about existing and future land allocation, use, management and protection. It generally designates zones of land (zoning) within which only certain uses are permitted. All other uses within that zone are prohibited, so as to reduce negative externalities.¹¹ These refer simply to unwanted stuff (such as noise, odours and other pollutants) that might escape from Parcel A and bother Parcel B. Heavy industry is often separated from residential uses, and recreational green space is often separated from contaminated waste sites.

The link between parcels and land use planning is a function of the following issues:

- 1. Vision/context (1):** How is the need for planning best explained for the First Nation community? Is there a general need to provide basic infrastructure (owing to population growth), economic opportunity and diversity (allowing for both jobs and taxation) or environmental sustainability, or a combination of the three?
- 2. Vision/context (2):** What is the specific impetus to plan now? Is it responding to pressure from specific land development (such a designation for a large store) or is it to encourage such development? Is it population pressure; is it ecosystem concerns?
- 3. Seven generations:** How progressive should planning be in the community? How many years or generations should it consider: five years, ten years, twenty years, fifty years?
- 4. Spatial extent:** What area should the plan cover; what is to be its geographic focus or scale? Should it focus simply on the hub of the main Reserve, the entire main Reserve, all the Reserves of your First Nation, or the entire traditional territory of the First Nation?
- 5. Standing on the shoulders of giants:** What does the community now have? Is the planning process starting from scratch – which will require much consultation with members – or does nascent planning now exist? For instance, there are some 50 land use plans across First Nations in BC alone, either completed or in progress, and most have a system of land use zones.
- 6. The wheel might exist:** Are there exemplars (or, conversely, cautionary tales) from other Aboriginal communities about what should be included or excluded from the plan. Or, are there lessons from similar (in terms of location, scale or issues) municipalities?
- 7. Going it alone:** Depending on scale and purpose, should partnerships be entered into with nearby municipalities (owing to servicing agreements or merely being good neighbours), tribal councils (sovereign indigenous nations), provincial agencies (e.g. if the use of forests on traditional territories is to be regulated), other First Nations groups (such as NALMA, the First Nations Tax Commission, or the First Nations Lands Management, Lands Advisory Board), or resource extractors and developers?

¹¹ Any discussion of land use planning must incorporate the phrase “negative externalities.”

8. Constraints (1): What political and legal forces are at work? Under what auspices is land managed within the community:

- Under the Indian Act, meaning that, pursuant to s.81(1)(g), Council can make a by-law for “the dividing of the reserve or a portion thereof into zones and the prohibition of the construction or maintenance of any class of buildings or the carrying on of any class of business, trade or calling in any such zone.”
- Or has the community been delegated the management of lands pursuant to sections 53 and 60 of the *Indian Act*? Section 53 allows the management of leases on surrendered or designated lands to be delegated to Council; section 60 allows full control of lands to be delegated to the First Nation.
- Or has the community assumed land management responsibilities pursuant to a Land Code under the *First Nations Land Management Act*?
- Or is the community self-governing (albeit still a Reserve), such as under the *Westbank Self-Government Act*?
- Or is the community fully autonomous and no longer a Reserve, with municipal-like powers and control over land management, such as Tssawassen and Nisga’a?

9. Constraints (2): What other planks in the Canadian or provincial legal and policy framework are relevant? What of the Fisheries Act, the Species at Risk Act, the Oceans Act, the CEAA¹², the CEPA¹³? What of provincial Accords, Agreements and legislation

10. Constraints (3): What other forces play a part? Is the community embroiled in litigation or a specific claim to expand its land base, is it contemplating moving from one land management regime to another (e.g. from *Indian Act* to FNLMA, or from FNLMA to FNPO), is land being added to Reserve (through the Additions to Reserve - ATR process), is land being designated for economic development?

11. Constraints (4): What of environmental constraints, such as slopes, drainage, riparian buffers, rights-of-way, green space, access, accretion, erosion?

12. Precautionary principle: Are the symptoms (albeit, merely predicted) of climate change to be considered, such as higher temperatures, higher winter precipitation, lower summer precipitation, higher sea levels, more drought and more flooding? What of beetle infestations or fire conflagrations?

13. Traditions: To what extent should traditional ecological knowledge be incorporated in the plan? Are there cultural norms to be respected? Is there information about land within the community that should not be shared with all members (i.e. perhaps it resides only with Elders or with specific families) or must not be shared with non-members?

14. Coarseness/granularity (1): How is land within the community to be designated? Should the categories of zones be broad (economic development vs. cultural use) or narrow (distinctions between single family and apartment-style housing, or between commercial and industrial uses)?

15. Coarseness/granularity (2): Within specific zones, should the plan accommodate site planning, such as building envelopes, side-yard and front-yard set-backs, height maxima? What of building permits? What of the subdivision process?

¹² Canadian Environmental Assessment Act - CEAA

¹³ Canadian Environmental Protection Act - CEPA

- 16. Options:** Should the draft plan incorporate various options that reflect diverse priorities (green space could go either here or there) for debate by the community, or is the vision sufficiently specific to allow one comprehensive plan to be debated?
- 17. Process:** How will the plan be adopted? Does the community have a member consultation protocol that includes existing land management offices and committees, must such a process be established concurrent with developing the plan, or does Council have full discretion? Does the community embody a duty to consult and accommodate?
- 18. Highest and best use:** To what extent should economic development accommodate (or be constrained by) cultural and ecosystem considerations? Are the forests (trees) seen as a source of timber (jobs and money) or as a method of controlling river floods (as a sponge in the floodplain)?
- 19. Existing rights:** What is the level and type of outside investment in land (such as long-term leases) in the community? To what extent has land been granted to individuals and families through Certificates of Possession, or at the pleasure of Council? Are Band lands occupied or unoccupied?
- 20. Tension:** Is the community comfortable with the distinction between the right to possess land and the right to regulate the use of land?
- 21. Timing is everything:** Over what period (a few weeks, months, years) should the plan gestate? Is there urgency? Should there be a moratorium on land dispositions until the plan is debated and adopted?
- 22. Money:** Who funds the development of the plan? Is it funded through the community's own source revenue, through AANDC monies (such as the Infrastructure Fund, the BC Capacity Initiative, or the Professional and Institutional Development Programme), or by tapping into other monies (e.g. Western Economic Diversification, Community Futures, Real Estate Foundation, Community to Community forums, New Relationship Trust)?
- 23. Indicators of success:** How are will the effects of planning to be measured? Is there baseline data (Community Well-Being metrics) now available? How often should the plan be reviewed?
- 24. Capacity:** Who will administer the plan, through its adoption, its application (e.g. rezoning from residential to commercial, varying from a side-yard of 1.0m to 0.8m, subdividing existing parcels, and permitting building construction) and its contravention? On the latter point, is there political will and a legal mechanism to police the plan and to punish transgressors?
- 25. Technology:** Is the community well-equipped with mapping and GIS imagery, or must that be acquired as part of the planning process?

The argument for integration

In most Canadian jurisdictions the three primary components of a land development regime (planning, surveying and registration) are integrated through legislation. For example, typically subdivisions of and development of land require formal planning approval. A land surveyor cannot begin a survey without this approval. A registrar cannot register the subdivision plan and raise new titles without the statutory approvals. Integrated planning, surveying and land titles (registration) legislation ensures that parcels are well-defined and the fabric reflects the occupation and interests in land. On First Nations Reserves this is not always the case and will need to be rectified if there is to be an effective system going forward.

Parcels must be defined such that their boundaries can be efficiently and unambiguously marked on the ground. This is required to support infrastructure and building layout. To ensure that roads have the proper widths and turning radii, buildings have the appropriate setbacks from property lines to accommodate emergency access and so on. Most importantly, boundaries need to be marked to ensure development occurs without conflict. The land development process in Canada relies on and is founded on the principles of integrated policy and legislation frameworks.

The Surveyor General Branch and Aboriginal and Northern Affairs are continuing to advance the Uashat pilot project as an example of integrated land use planning, land registration and parcel fabric renewal on a First Nation Reserve. The project is showcased in Appendix 1. Lessons learned from Uashat and the best practices from the other Pilot Projects have been compiled into a conceptual **Community Parcel Plan** (Appendix 2) framework for renewing and maintaining parcel data. The Community Parcel Plan has been designed to provide the structure necessary to move towards a **community-based, cost-effective and timely land development framework**.

Appendix 1 – Uashat parcel renewal project

Uashat Example of a Fully Integrated Land Management Project (Eric Groulx, CLS)

Introduction: This project is one of the 5 pilot projects for parcel fabric renewal on First Nation Reserves. The goal of the project was therefore to reconcile legal surveys, titles (land rights or interests) and land occupation.

Selection of First Nation Reserve: The First Nation Reserve was selected based on three key points. First, the reserve had to have an average Parcel Fabric Index. The Uashat reserve had an index of 0.37. Second, the reserve had to have economic development potential. That is the case in Uashat, where there are several small businesses and even some major ones, such as Walmart. Third, we needed to have a good relationship with the First Nation and have their cooperation before going ahead with the project.

Uashat: The Uashat Reserve is located on the north shore of Quebec, approximately 700 km from Quebec City and adjacent to Sept-Îles. It has a population of 1,800 people on reserve and approximately 500 people off reserve. The Reserve covers approximately 117 hectares.

Current land management by the First Nation

Management system: Land management is done under the communal regime where all of the land is available to the population. Even though very few CPs have been granted, there is a willingness to issue individual rights. The band has implemented a housing policy and associated regulations. There are three types of programs for accessing housing: the individual component, the Innu Manikatisshu component and the social component. For each component, a right (land interest) that is not a CP is conferred on the owner. To support the housing policy and ensure orderly development, there are also land use regulations that date back to 1997. The regulations are currently under review and will be updated as part of this project.

Survey system: The survey system is based on a global community plan that shows all the parcels (unofficial). Survey monuments have been placed on street corners by a Land Surveyor from Quebec and corner monumentation on each parcel is done by a band technician (ITUM monument). For official rights such as permits, a legal survey is carried out by a CLS.

Registry system: Official land rights are registered in the ILRS (CP, leases, permits, etc.). With regard to customary rights, the documents are kept in filing cabinets at the Band Council office. The First Nation is open to improving this aspect.

Methodology

Inventory: The first stage of the project was to draw up an inventory of all information available from the SGB, AANDC and the First Nation.

SGB-CLSR: At the SGB, we had at our disposal survey plans and field notes, as well as mapping data (cartography and orthophotography) dating back to 2006. This data was updated during the project with new aerial photographs taken in 2011.

AANDC-ILRS: In the ILRS, we found all registered land interests, including two (2) CPs and a number of permits and leases.

UASHAT: Global plan completed by the Land Surveyor.

Field campaign: The goal of the field campaign was to conduct a survey of official monuments, a survey of other unofficial monuments (SG and ITUM), and a comprehensive survey of marks of occupation. It should be noted that there are fences on most of the properties in Uashat.

Land analysis and adjustment: The land survey brought to light several problems between occupation and the parcels shown on a plan prepared by a land surveyor from Quebec. To illustrate them, we prepared some factsheets showing the problems and proposed solutions. After some discussion, a decision was made and the changes were approved by a representative of the Band Council.

Public consultation: During the entire project, the public was informed about it mainly via local radio. Before the monumentation of parcels, preliminary plans showing the changes were posted at the Band Council for consultation purposes. A public consultation session followed supervised by a representative of the Band Council and in the presence of two SGB surveyors.

Monumentation of parcels with customary rights: To enable registration of rights and interests granted by the band, we placed official survey monuments for parcels subject to a right to be registered. For Uashat, approximately 150 parcels were affected by this surveying for a total of 340 new CLS survey monuments.

Production of legal survey plans: We are currently at the stage of producing “parcel renewal plans” that will serve as an official document for renewing the community’s parcel fabric. A global plan will be submitted removing the existing layer of parcels that are no longer valid. Next, 20 sector plans will be created and recorded in the CLSR to cover all of the new parcels in the community. These plans will be based on survey standards that will allow the placement of deferred monuments because specific coordinates were established for each point.

Parcel registry and community parcel plan: Once the plans have been submitted, a new computerized parcel registry will be created. It will serve as a basis for the community parcel plan.

Registration of interests: Once the survey plans have been made official, AANDC will create a registry page enabling the registration of customary rights granted by the band council.

Land use plan: The new parcel fabric will serve as a basis for the land use plan which is currently under review.

The Project in Numbers

| | Uashat | Maliotenam |
|--|------------|------------|
| <i>Demographic information</i> | | |
| People living on the reserve | 3100 | |
| People living off the reserve | 700 | |
| <i>Survey data</i> | | |
| Area (ha) | 117 | 527 |
| Official parcels (before the project) | 155 | 170 |
| Parcels (after the project) | 577 | ±600 |
| Points located | ±2500 | ±2000 |
| Official monuments located | 126 | 227 |
| Official monuments placed | 338 | 370 |
| <i>Major differentiations</i> | | |
| Problem sheet | 67 | 57 |
| Solution sheet | 65 | 55 |
| New land sheet... | | 15 |
| <i>Registry system</i> | | |
| Certificate of Possession (ILRS) | 2 | 2 |
| Permits (ILRS) | 3 | 0 |
| Leases (ILRS) | 1 | 0 |
| Certificate of Ownership (internal system) | ±150 | ±150 |
| <i>Production of plans</i> | | |
| Global plan | 1 | 1 |
| Area plan | ±20 | ±20 |
| Approximate project cost | ±\$150,000 | |

Appendix 2 - Proposed process and guidelines for the Community Parcel Plan (CPP)

The Community Parcel Plan

A Community Parcel Plan (CPP) is an essential tool required by a community to manage an integrated, **land use planning, land survey and land registration framework**. It is a dynamic geospatial, comprehensive land information and management system composed of the parcels and processes required to support an integrated framework. The CPP supports and guides the entire land development process from land use planning to rights registration.

The foundation for the CPP is a renewed parcel fabric, integrated with community-based information such as proposed parcels for planning community development and other thematic information related to First Nations cultural aspects of land development, local land use and community development plans.

A CPP is therefore a composition of official **Parcel Data, Registered and Community Allocated Interests**, the **Proposed Land Use and Development Plan**, all superimposed on an **Ortho-image Backdrop** of a community or part of a community.

A Community Parcel Plan is not an official product of the Surveyor General. It would not be approved nor recorded into the official records. However, official parcel data maintained by the Surveyor General would form a foundation layer for the CPP. Official **geospatial referencing frameworks** approved by the Surveyor General would provide a link from the CPP to the ground and support integration of other thematic layers of information such as infrastructure. The ground-based reference framework will be accessible for land surveyors, engineers and community-based geomatics professionals to support efficient field surveys for data capture and layout of infrastructure and parcel boundaries.

The CPP is to be maintained by the community, with support when required, from the Surveyor General, local geomatics professionals or by a First Nation institution such as a Tribal Council with the required capacity. The CPP can support numerous other Geographic Information System (GIS) applications to facilitate a broad array of community needs from emergency route location to school bus routing.

A community will decide on the content and use of a CPP based on local needs and aspirations.

Building a Community Parcel Plan

1. Start with a Renewed Parcel Fabric compiled into an SGB Cadastral Data Set,

1.1. Definition

The Cadastral Data datasets that provide the cadastral parcel framework for specified Canada Lands are called the *Canada Lands Digital Cadastral Data*. They are

This cadastral linework and parcel structured vector data is available in DWG and SHP format that are designed and suited for Geographic Information Systems (GIS). The existing cadastral data sets have not been adjusted for a parcel fabric renewal process and may not reflect the existing occupation, locally allocated interests or land use.

Renewed Parcel Fabric in the *Cadastral Data datasets* would be composed of surveyed parcels with legal interests registered under the Indian Act such as designated land, leases, permits, easement and certificates of possession (CP); and surveyed parcels without legal interests, and reconciled fabric based on local occupation and land use.

1.2

The links below will guide you to the FTP locations where you can freely download the existing cadastral datasets. The data contained in these files are lines showing parcels, lot numbers and the survey plan numbers.

<http://clss.nrcan.gc.ca/cadastraldata-donneescadastrales-eng.php>

2. Next add the Registered Interests

2.1 Definition

Information on the registered interests can be found using the e-RIP system available from AANDC.

<http://geoviewer.inac.gc.ca/geoviewer/Default.aspx?LANGUAGE=en>

2.2 How do I import the Registry Information?

You need to contact AANDC to be able to import information.

The contact person is: *Place a name here*

3. Now add Land Use Planning information (existing land use zones and proposed land division)

3.1

The proposed land division view represents parcels that illustrate proposed future subdivisions. Such parcels are non official, not surveyed and not registered in the Canada Lands Surveys Records. Land use zone boundaries can also be added.

The proposed parcels are shown on the CPP adjacent to the formalized Cadastral Data for land use planning and land management purposes. The community can decide on use and application of the information based on local needs.

Upon approval by a community, parcels of the proposed land division can be formalized with a Plan of Survey. When the Plan of Survey is recorded in the CLSR, the *Canada Lands Digital Cadastral Data* is updated and the formalized parcels then form part of the *Canada Lands Digital Cadastral Data* when the file is downloaded. If an Official Parcel Registry (refer to “Innovating for the Future” last section of the report) is implemented, the need to prepare a Plan of Survey would be replaced with an on-line update of the official parcel map.

3.2 How to create the Proposed land division

The proposed land division can be created and shown with the *Canada Lands Digital Cadastral Data* by adding parcels to the dataset. Lines and parcels of the proposed land division are added to the dataset on different layers with specific attributes (color, linetype, etc.) for each type of parcel (present and future subdivisions).

Each type of information is to have its own layer (with specific attributes) along with a report to identify and define each layer in detail.

This information can be added by local geomatics professionals in the community if available or by a local service provider. The Surveyor General Branch can provide some technical support regarding the utilization of cadastral data.

4. Add a visual reference of current life in the community – The Ortho-image Background

4.1 Definition

The Ortho-image Background is a colour, digital, planimetric¹⁴ correct map of a reserve that will be accurately geo-referenced and in the same reference system as the Cadastral Data. This digital map image, overlaid with the Cadastral Data, can be used to provide the framework for managing an integrated development process.

The Ortho-image Background is georeferenced using ground or space based (GPS)¹⁵ reference systems to an accuracy that will permit the user to view enough details to inform land development decisions. Accurate georeferencing is required to clearly illustrate the location of features such as buildings, driveways, hedges, fences, retaining walls, trails and their positions relative to the parcel fabric.

¹⁴ Distortions from sensors, terrain relief and curvature of the earth have been removed to a high degree of accuracy

¹⁵ The recommended approach is to use Geodetic Survey Division’s (NRCan), Precise Point Positioning System (PPP), augmented by high precision or Real Time Kinematic (RTK) GPS reference stations in the community. The appropriate solution will vary by community.

5. You will need metadata (data about data) so that you can add other thematic layers of information

5.1 Definition

Different types of information can be added to the CPP. Metadata information is required in order to qualify and accurately integrate the information represented on the CPP. Since the CPP is a snapshot in time, metadata describing the information being used is critical to allow temporal monitoring of changes in land use. Other types of information can be added based on the community's needs.

5.2 Paper maps are useful for presentation - Information that should be shown on a paper version of the CPP

- Title identifying the First Nation Reserve shown on the plan
- North arrow
- Scale of the plan
- Parcel Designators (Lot numbers) for all parcels
- Legend

5.3 Information to be shown in the legend of a paper map

- Last update date and source of Cadastral Data information
- Last update date and source of Proposed Land Division
- Aerial photo or satellite imagery acquisition dates
- Ortho-image creation Date
- Ortho-image accuracy
- Ortho-image resolution
- Color code and line type for the cadastral and planning information

5.4 Types of Information that can be shown on the Community Parcel Plan (not available from the Cadastral Data dataset)

- Precise distances and directions along parcel boundaries (info available in the CLSR)
- Existing survey markers (info available in the CLSR)
- Area of parcels (info available in the CLSR)
- Parcel ID (NRCAN PIN, AANDC PIN) (info available in the CLSR and at AANDC)
- Owner of parcels (info available at AANDC)
- Control reference monuments used for geo-referencing
- Topographic information
- Place name
- Civic number of existing buildings
- Land use planning
- Zoning by-law and regulations
- Basic infrastructure (sewer, gas and power utilities)
- Traditional land use
- Cultural thematic information

6. Some New Survey Standards will be required

The Manual of Instructions for the Survey of Canada Lands will be augmented with a specific chapter for products required to produce and maintain the Community Parcel Plan.

The following is a summary of proposed additions to the standards for surveys.

Chapter X –Community Parcel Plan Survey Plan Types

Effective Date:

This Chapter is effective XXX X, 201x.

Chapter Sections

General

Parcel Renewal Plan

Consolidation of parcels

Demarcation

Subdivision Plan

Approvals and Certifications

Returns

Field Notes

Returns of Field Notes

Ground-based reference framework¹⁶

Specimen Plans

General

1. In this Chapter, a boundary survey is a survey based upon a field survey and is in accordance with the technical survey requirements of sections 1 to 68 of Chapter D1, insofar as they are not inconsistent with this Chapter.
2. Three survey plan types may be used, depending on the purpose from which the survey plan is prepared:
 - a. "Parcel Renewal Plan" means that a survey was carried out for the purpose of renewing the parcel fabric of a First Nation Reserve and that parcels have been consolidated and/or created. Some of the boundaries may have been marked during the survey, some boundaries may have been marked during previous surveys and the demarcation of some boundaries may have been deferred to avoid loss due to construction or to ensure that a survey is synchronized with the planning approval process.
 - b. "Subdivision Plan" means that a survey was carried out for the purpose of creating parcels and that all of the boundaries were marked during this survey or during previous surveys.

¹⁶ The recommended approach is to use Geodetic Survey Division's (NRCan), Precise Point Positioning System, augmented by high precision or real time kinematic reference stations in the community. The appropriate solution will vary by community.

- c. "Field Notes" means that a survey was carried out for the purpose of marking parcel boundaries only or for establishing a ground-based reference framework.
- 3. The provisions regarding surveys in chapters C1 and C5 of the Manual of Instructions for the Survey of Canada Lands, apply to these survey plans.
- 4. A Survey Plan must clearly and unambiguously describe the parcels dealt with by a plan.

Parcel Renewal Plan

- 5. A *Parcel Renewal Plan* is a survey plan unique to a First Nations Reserve. This product is used to renew the parcel fabric of a First Nation Reserve by consolidating obsolete or unwanted parcels and by creating parcels for land with existing occupation.
- 6. The *Parcel Renewal Plan* is prepared under section 31 of the *Canada Lands Surveys Act*.
- 7. Specific survey instructions are required for the preparation of this plan.
- 8. The *Parcel Renewal Plan* shall be prepared in accordance with the technical requirements of Chapter D1, sections 5 to 12, sections 22 to 31, sections 41 to 68 and sections 82 to 109, insofar as they are not inconsistent with this Chapter.¹⁷

(Note: Discussion is needed for sections of Chapter D1 to include/exclude.)

Consolidation of parcels

- 9. Unoccupied adjacent parcels with no formal rights, and found not required by land administering authorities, can be replaced by one single parcel by consolidation. Survey information on field notes recorded in the CLSR of the parcels to be consolidated can be compiled in accordance with Chapter D1, sections 91 to 101¹⁸.

Monumentation

- 10. When field work is carried out to prepare the *Parcel Renewal Plan*, as a minimum, road deflections and block (street) outlines are to be demarcated. Demarcation is also required in cases where there is a high potential for conflict with or between adjoining interests.
- 11. Delayed or deferred demarcation for the *Parcel Renewal Plan* is allowed in accordance with Chapter D1 section xx.

(Note: New section to be inserted in Chapter D1)

"Delayed demarcation"

Demarcation of boundaries can be delayed for up to one year (or longer period specified in the survey instructions) from the survey plan's registration if:

- a. the survey was carried out to produce a 'Parcel Renewal Plan'; and
- b. there is an internal control network of monuments in the vicinity of the survey.

¹⁷ Manual of Instructions for the Survey of Canada Lands

¹⁸ Ibid

Demarcation shall be completed in the period of time specified by the instructions, by the surveyor who prepared the 'Parcel Renewal Plan of Survey'. However, when circumstances make this impossible, another surveyor acceptable to SGB could complete the demarcation.

Subdivision Plan

12. The *Subdivision Plan* is a survey plan unique to First Nation Reserves.
13. The *Subdivision Plan* is prepared under section 31 of the *Canada Lands Surveys Act*.
14. Specific survey instructions are required for the preparation of this plan.
15. The *Subdivision Plan* shall be prepared in accordance with the technical requirements of Chapter D1, sections 5 to 12, sections 22 to 31, sections 41 to 68 and sections 82 to 90, insofar as they are not inconsistent with this Chapter.

(Note: Discussion is needed for sections of chapter D1 to include/exclude.)

Approvals and Certifications

16. The surveyor shall provide on the plan a statement of responsibility in accordance with section 38 of the *Canada Lands Surveyors Regulations*.
17. The surveyor shall obtain an approval in writing from the First Nation Band Council or an appropriately designated representative (i.e. Band Lands Manager) that the plan is satisfactory.
18. The Surveyor General (or a person designated by the Surveyor General to approve such plans) will approve a registration plan when it conforms with the survey instructions.
19. The following statement shall be completed by the Surveyor General, or a person designated by the Surveyor General, to indicate that the plan was made under the authority of section 31 of the *Canada Lands Surveys Act*, under the provisions of the *Accord* and in accordance with these standards:

"Department of Natural Resources
Re: Section 31, Canada Lands Surveys Act
and Framework Accord (February 2009).

Approved

(signature of Surveyor General or designate)

.....

(name, title and date)".

Returns

- a. the plan;
- b. a copy of a signed formal letter, a Band Council resolution or a signed approval form indicating that the plan is satisfactory;
- c. a report in accordance with Chapter D15 to explain: the method of determining distances and directions, results of title searches, concerns regarding definition of parcels, provision for access, etc.;
- d. digital spatial file and the digital file report as specified in Appendix E5 and if necessary, the principal monument co-ordinate file;

Field Notes

21. This product is used to record the demarcation of boundaries when delayed demarcation was used for a 'Parcel Renewal Plan of Survey'.

22.

23.
sections 5 to 12, sections 22 to 31, sections 41 to 68 and

24. The provisions regarding surveys in chapters C1 and C5 apply.

Returns of Field Notes

25. The returns shall consist of:

- a. field notes in one of the prescribed forms;
- b. a report in accordance with Chapter D15 to explain: the method of determining distances and directions, results of title searches, concerns regarding definition of parcels, provision for access, etc.;
- c. digital spatial file and the digital file report as specified in Appendix E5 and the main monument coordinate file;

Specimen Plans

| PDF Format | DWG Format |
|--|--|
| Parcel Renewal Plan.pdf Subdivision Plan.pdf Field Notes.pdf | Parcel Renewal Plan.dwg Subdivision Plan.dwg Field Notes.dwg |

7. The Official Parcel Registry – Innovating for the Future

Currently the majority of land transactions on Canada Lands, including First Nations Reserves, are based on parcels shown on legal survey plans. The concept of an official parcel registry eliminates the need for the production of an official plan of survey. Instead, land transactions are based on a composite cadastral map¹⁹ that illustrates a complete parcel fabric for an entire community. Each parcel in the fabric is given a unique identifier that can serve as a legal description for a property. This approach simplifies the land survey and transaction process and the resulting virtual map of a community or reserve can serve as a basis for land information management.

An Official Parcel Registry (OPR) then can be described as a public, digital, web-based and official registry under the responsibility of an administering agency. The region or zone covered by an Official Parcel Registry would consist of parcels accepted, registered and approved in a rights registration system. The parcels would be systematically identified through a unique and distinct designation. Rights would be based on active parcels shown in the OPR and acknowledged in a rights registry. Parcels that are not acknowledged in a rights registry would not form part of the OPR.

By definition, a parcel represents the extent of an object (real property, easement, mineral claim, etc.) which can hold a unique and homogeneous right (for example: a piece of land with defined boundaries on which a public or private right is held by an individual, a group or a legal entity). Parcels would be illustrated with their respective official measurements and areas, and with the existing official markers²⁰ (including geographic coordinates). The quality of a right applied to a parcel would be ensured by the rights registry.

An official coordinate reference system would be approved by the Surveyor General for the Official Parcel Registry. Any subsequent geographic position established within the OPR that may be required to mark limits or create new limits, must be derived from the approved coordinate reference system.

Although all limits may not be marked on the ground when a new region or zone is integrated to the Official Parcel Registry, all the limits of the parcels that bound the region or zone are deemed to have been surveyed. The virtual limits would govern boundary location until marked on the ground.

The Official Parcel Registry could be modified by the extension of a region covered by the registry, modification of the parcel fabric through subdivision or consolidation, or the correction of existing parcels from survey information produced by a Canada Lands Surveyor and registered in the Surveyor General's official records. New surveys would be based on information shown in the Official Parcel Registry and from the information maintained in the Surveyor General's official records (Survey Records Information System) and boundary evidence on the ground.

Land transactions would be exclusively based on information shown in the Official Parcel Registry. The OPR would be fully digital and all changes and approvals would be made in an on-line web-based secure environment. Thus dramatically improving the efficiency of the property rights system and increasing the utility of the parcel data for community management purposes.

¹⁹ Similar to the "cadastre" system used in Quebec

²⁰ Legal survey monuments

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