Referrals Software

an analysis of options

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Contents

Context

Forward

The purpose of this report is to provide detailed, up-to-date information on the wide selection of software tools currently available to First Nation Governments, Bands, District Councils, Stewardship Groups, Hereditary First Nation Groups, or other parties (all hereby referred to as First Nation Groups) receiving referrals from government and industry. The referral process in the Province of British Columbia has developed as a result of court cases such as Haida Nation v. British Columbia which found that the Provincial and Federal Crown have a legal duty to consult and, where necessary, accommodate First Nation Groups when development activities are being carried out within their traditional territories. The referral process is triggered anytime the Crown is about to make a decision which may impact Aboriginal rights. This has resulted in an inundation of almost daily referrals upon sometimes small First Nation Groups with limited staff and resources. Organizing, prioritizing, analyzing and responding to referrals in a meaningful and effective way has proven to be a major logistical and administrative challenge for First Nation Groups today.

To assist First Nation Groups in meeting this challenge, several referrals management software tools and solutions have been developed, and over the last decade a competitive market for such products has emerged. Understanding and keeping up to date with all of the different software tools and solutions available to First Nation Groups is difficult, as is making decisions about how to best manage referrals. This report aims to bring key information about referrals management software tools and solutions into one accessible, easy to read document. The aim is to assist First Nation Groups in British Columbia particularly, but also in other parts of Canada, to make informed choices about software solutions appropriate to each of their unique situations. This supports Ecotrust Canada and the Aboriginal Mapping Network's (AMN) ongoing efforts to strengthen the capacity of First Nation communities to efficiently and effectively manage their traditional lands. Ideally, the report can be used as a complementary reference to the "Toolbox for Responding to Crown Land Referrals" available on the AMN website at: http://nativemaps.org/taxonomy/term/186

Introduction

In an effort to provide the most relevant and up to date information on referrals management software tools available to First Nation Groups today, we reached out to both software providers and users in British Columbia. Understanding the intricacies and details of each software system, including the full spectrum of options and services available from each software provider, was beyond the scope of this work. Referrals management software tools are highly customizable and include value added services which complement each system, as well as constant updates making any static documentation or review of the software quickly obsolete. Further, because each situation is unique, our own experiences using the systems may not reflect those of First Nation Groups. We encourage any First Nation Group looking for referrals management software solutions to use this report simply as an introduction and starting point for the options available, and to reach out to software providers directly to better understand how they can support them in their particular situation.

The software providers participating in this study include, in no particular order:

- Referral Tracking System (RTS)
- Cedarbox
- Stó:lōConnect
- Stewardship Planning Portal
- Lightship (Formerly Truvian Labs)
- Community KnowledgeKeeper (CKK)
- LOUIS Toolkit
- Trailmark

We selected an approach that takes into account the providers' own descriptions of the tools and services that they offer, along with users' experiences of such tools. We carried out semi-structured phone interviews with referrals management staff from twelve different First Nation Groups and received online survey responses from referrals staff from 42 different First Nation Groups within BC. These interviews and surveys provided user-based perspectives on the referrals management process, including user experiences of the different software tools and solutions. These user experiences come from both current users of software tools as well as from users who previously used the software tools – meaning such perspectives may no longer be valid. We additionally spoke to eight different referrals software tool providers, and had them complete online functionality surveys as well as questionnaires.

We identified the recurring themes that emerged throughout the interviews and organized them into three sections: Main Challenges, Benefits of Software Systems, and Other Important Themes.

Main Challenges

- Finding, training, and retaining referrals management staff, particularly those with GIS experience or other technical expertise, seemed to be a major challenge for First Nation Groups
- Data entry was one of the most difficult aspects of managing referrals, regardless of which or whether a software was being used
- Training staff on software almost always seemed to be a challenge, and there is always a long learning curve
- A lack of funding for managing referrals and paying for software

- Constant updates to software can require re-training on the same system, or the modification of a feature that was previously used
- As with any technology, there are always bugs that need to be fixed
- Troubleshooting software can become costly in terms of both time and resources

Benefits of Referrals Management Software Systems

- Proponents can enter their own data into the system, saving time for the First Nation Group
- Built in mapping means non-GIS staff can conduct simple spatial analyses
- Ability to carry out cumulative impact analyses in ways that were not possible before
- Streamline the referrals process and centralize all data into a web accessible system
- Integration of traditional use studies and other field data into referrals assessments
- Simplified tracking of referrals and comments
- Software updates can provide new helpful features

Other Important Themes

- Focusing on engagement with proponents rather than the referrals process itself can be a better way to achieve desirable results for the First Nation Group
- Having community liaisons or cultural monitors on staff is an important way of engaging communities in the consultation process and 'ground truthing' impacts
- Multiple First Nation Groups using the same system and/or process means collaborative troubleshooting and joint improvements to the software, and can result in lower costs
- Funding for referrals can be received from the government regulators through which the referral is sent (i.e. provincial ministry) or from industry

Funding which comes directly through engagement with proponents is often the most valuable

The Referrals Dilemma

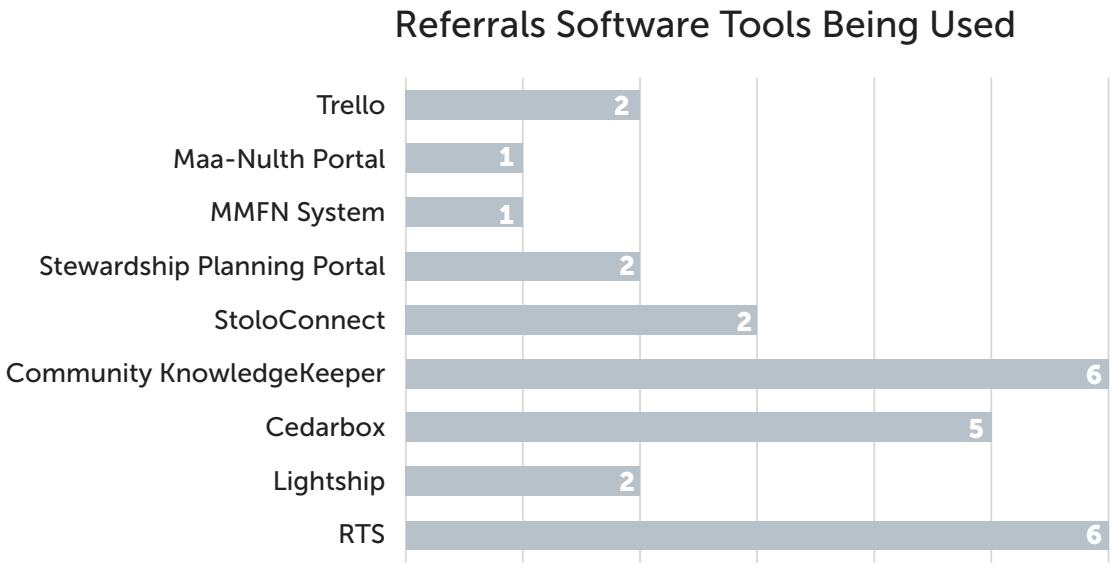
Our conversations with First Nation Group referrals staff across BC revealed that there are a wide variety of processes and systems being utilized to manage referrals. Many First Nation Groups are striving to catalogue, analyze and respond to every referral, while others are filtering through the often endless flow of referrals and prioritizing responses and engagement to those that seem to be the most impactful on their interests. We also found that there is a great difference not only in the approaches that First Nation Groups take to manage referrals, but also in the amount of time and resources given to the referral process. Some of the staff that we interviewed see the management of referrals, including detailed responses to each application, as an exercise of the First Nation Group's rights and as an important legal paper trail for potential future conflicts or ongoing negotiations. For many First Nation Groups, effective referrals management means greater assertion of guardianship over their territory, and as a way for the First Nation Group to have independent, critical and in-depth understandings of the cumulative impacts of activities within their territories. Others see the referrals process as reactive and ineffective in exercising the rights of the First Nation Group, and an overwhelming and burdensome process that takes time and resources away from more meaningful engagement with industry.

The underlying issues and varying opinions about the referrals process indicate the need for a significant improvement in the way in which industry and government interact with First Nation Groups. Having a practical and effective system in place for managing referrals, such as one of the software tools described herein, can and will continue to play an important role in supporting First Nations Groups in asserting increased sovereignty over their territories and resources.

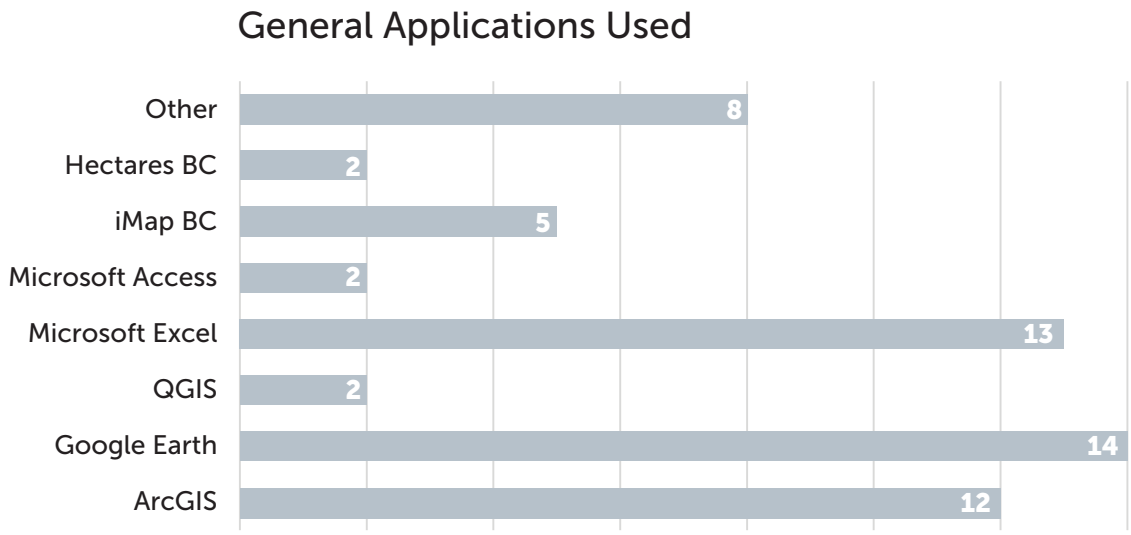
Survey Findings

The results of the surveys with First Nation Group referrals staff indicate the context-dependent nature of the referrals management process. Some of the First Nation Groups were overwhelmed by referrals and unable to manage them all, whereas some felt confident in the process. A total of 49 people from 44 different organizations (42 of which are BC-based) participated in the survey.

Of the survey respondents, 53% (28 people) were using a specific referrals software, while the rest were using general applications.



Of the respondents using general applications, 23% (5 of the 22) previously used specific referrals software tools before abandoning them. The reasons given for abandoning specific referrals software included costs and maintenance requirements, and a lack of capacity to make the software systems useful.



The reasons for not using a specific referrals software tool included:

- Costs associated with software use
- Lack of awareness about the options
- Lack of time to explore the options
- Lack of capacity
- Too few referrals to make it worthwhile
- Inappropriateness of software tools for the First Nation Group's business approach

The predominant reason for not using a specific referrals software tool was the cost associated with doing so.

There was no clear correlation between the use of a referrals management software and the ability to better manage referrals, and there were mixed levels of satisfaction with referrals software services. The surveys indicate that 54% (15 of the 28) First Nation Groups using a specific referrals software tool did feel that the software allowed the community to process and manage all referrals efficiently. This indicates that there is a usefulness in referrals specific software tools in improving the ability of First Nation Groups to efficiently manage referrals, but there is no guarantee. This again points toward the fact that no singular software tool is going to create success in managing referrals, and that a variety of other factors come into play. One of those factors includes the capacity and resources of a First Nation Group. Only 34% of survey respondents (18 people) felt that their community has sufficient resources and capacity to effectively manage referrals, whereas 50% (27 people) did not, with the rest uncertain.

Of the 50% of survey respondents who felt that their community did not have sufficient resources and capacity to effectively manage resources, some of the comments included:

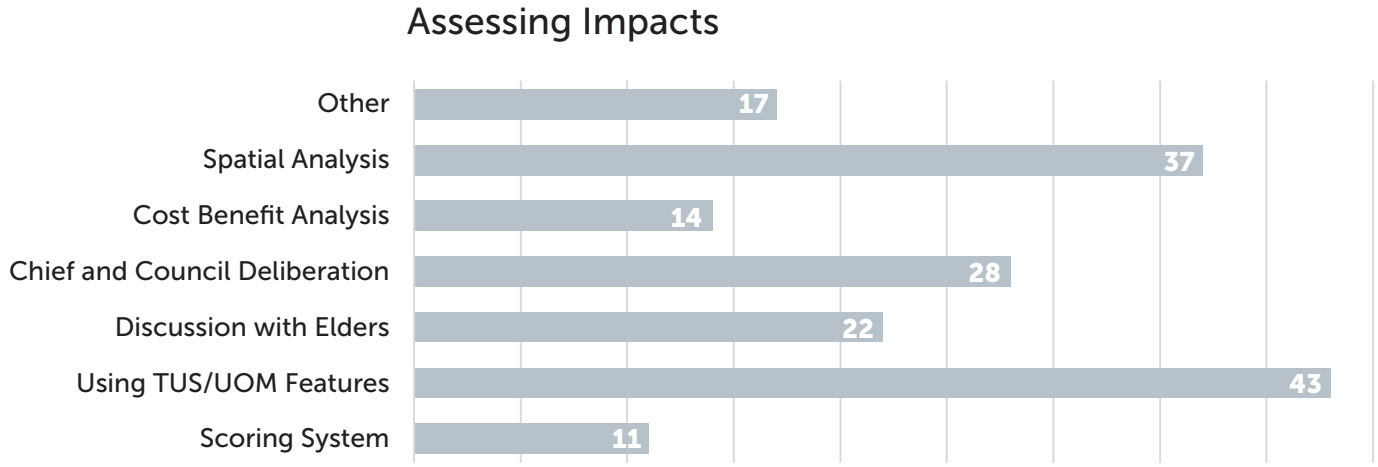
> "Absolutely not. Huge deficiency in resources, including human resources."

> "Yes and no. Without the capacity funding through various agreements (MOUs, FCRSA, BCOGC, etc) we couldn't pay for enough staff and equipment."

> "No, but at the same time we do not want to invest in tools for a process that needs revision."

> "We have the resources, but the process needs improvement."

In terms of analyzing referrals and making decisions, we found that First Nation Groups used a combination of approaches. Those receiving high numbers of referrals often permitted front line staff to assess, make decisions and formulate responses, while escalating only those referrals that appear more impactful to higher authorities. Most referrals staff primarily rely on Traditional Use Study/Use and Occupancy features on a map or other spatial analyses to assess the impact of referrals.



There is no one best way to manage referrals, and every First Nation Group has its unique circumstances requiring a customized solution. This may mean utilizing a referrals specific software tool or a general application that can be customized for referrals. What is clear is that some technological tools are needed to support First Nation Groups in exercising their sovereign rights over their territories and resources. The selection table that we provide later in this document might be a useful first step in deciding what system will work best in any particular context. The following section describes what three other First Nation Groups are doing to manage referrals.

Case Studies

Methods used by some BC indigenous groups to respond to referrals

Stó:lō Research and Resource Management Portal

In 2012, 14 Stó:lō bands and the BC government, in lieu of a treaty, signed a strategic engagement agreement (SEA) which consolidated and defined an engagement, consultation, and referral review process. At this time, Stó:lō Research and Resource Management Centre (SRRMC) had already developed a referrals management web portal, StoloConnect.com, which they used to facilitate the engagement and consultation prescribed in the Stó:lō Strategic Engagement Agreement (SSEA). Before the agreement, the thirty different bands comprising the Stó:lō Nation were all responding to referrals independently, even though their territories overlap. This system was disorganized and resulted in a duplication of efforts as multiple Band Offices all reviewed the same referral, or more often that referrals never received a response, as there was no dedicated referrals team at many Band Offices. This lack of a response led proponents to believe that they had permission from the First Nations to proceed, when no actual response or First Nations decision was given. Since then, two more bands have signed on to the SEA, making it 16 in total.

Stó:lō receives approximately 3 new referrals per day. Approximately 18% are forestry referrals, others include land (16%), water (22%), and those which fall under the Heritage Act (10%). When referrals are first received, they are automatically given engagement levels based on criteria within the SSEA, ranging from 0-4, with 4 requiring a high level of engagement on the referral. On occasion, these engagement levels need to be amended based on issues that were not known or considered when first assigned. In addition to the referrals officers, the Stó:lō portal utilizes community liaison officers who go back to each community with the referrals that could potentially affect them, ensuring a meaningful level of consultation is occurring. Stó:lō is one of the few referrals offices that keeps track of consensus among its member communities. Findings show that about 50% of referrals reach full consensus (i.e. decisions match and all conditions are met), 49% reach partial consensus (i.e. decisions match but not all conditions are met), and 1% no consensus (i.e. decisions do not match). Where there is some or no consensus, the referral

is escalated to Council and may become a political/legal issue.

The portal was designed by a firm called Culture Code, which provides troubleshooting support and updates when needed in exchange for a monthly retainer fee. It appears to be working very well for Stó:lō, and they are able to respond to 88% of referrals within the time frame designated under the SSEA, since January 2017. The fluidity of the system is a key advantage, and that it has been designed specifically for the needs of Stó:lō. The fact that the analysis, reporting, and contact information are all in one place means that just with an internet connection, staff can facilitate the entire referrals process. Instant analysis is unlike anything that Stó:lō has ever been able to do before – it allows for cumulative analysis that was not possible before. Like most referrals management systems, the drawbacks are that it is a technology that needs to be learned, and there is a significant learning curve, depending on one's responsibilities, before its potential can be fully realized.

Haida Referrals Management

Haida Nation has a unique and effective process in place for managing referrals without the use of any specific referrals management software. The Nation receives between 300 and 350 referrals per year, varying in type, and they currently have just one staff member analyzing and managing them using ArcGIS alongside the Haida database.

Natural resource development proponents are required to submit their referrals to Front Counter Haida Gwaii – a service of the provincial government designed to ease the authorization process for natural resource clients in British Columbia. At Front Counter Haida Gwaii, the referral is given a unique ID and is sorted based on the provincial or federal Act under which it falls. The referral is then sent to the Haida Mapping Office, where it is compared with various spatial layers of the area in question in order to determine potential conflicts or impacts. After the spatial comparison, the referral is given a 'Scenario' status. Scenario 1 referrals are often simple and streamlined, requiring least discussion and are responded to within 14 days. These scenarios are often renewals of projects or research referrals. Scenario 2 referrals are more complex in that they have potential impacts on the culture, land and resources, or other things of value to the Haida Nation. These Scenarios require longer discussions and are responded to within 1-60 days.

Once assigned a Scenario status, the referral moves up to the Solutions Table for a recorded forum for discussion. The Solutions Table is a joint body made up of two members of the Council of the Haida Nation and two members of the Province of BC. If no consensus is reached at this level, the referral is escalated to the Haida Gwaii Management Council for a higher level of discussion.

Overall, the feeling of the referrals staff member being interviewed was that the process in place works very well, but that of course there is always room for improvement.

Saulteau First Nations

Saulteau First Nations, comprised of approximately 400 people on reserve and 600 off reserve, typically has a busy referrals office. When the oil and gas sector is thriving, the Saulteau can receive several hundred referrals in one month, whereas a slowdown in the oil and gas sector, as at the time of the interview, results in only a couple of dozen referrals per month. Aside from oil and gas, Saulteau receives forestry, energy and related infrastructure referrals around such projects. To manage this all, Saulteau employs eight staff members, which include a department manager, one GIS technician,

one support clerk, one lands manager (for on-reserve lands management) and four technicians specializing in areas such as forestry, geology, oil and gas, and biology.

Saulteau does not use a specific referrals management software, rather they have a customized system which focuses more on engagement rather than processing. This means categorizing referrals based on their type, and then passing them on to the technicians for processing, prioritizing, making decisions, and formulating responses. Although they still receive some referrals in hard copy, more and more they are being sent digitally and include GIS information. The first step of the process is to take the referral shapefiles and overlay them on Saulteau's traditional and critical environmental data using QGIS, an open source GIS program. After this, the GIS technician uses Postgresql with PostGIS to assist in producing summaries of these GIS overlays, which are then passed on to the relevant technician. All referrals both incoming and outgoing are stored on a local, central server, administered by an IT team.

Based on the GIS data and any other relevant information, the technician then formulates a response to the proponent. This typically means engaging with the proponent and discussing concerns, and includes making sure that cultural concerns are included in the proponent's environmental, construction, or other management plans where needed. Saulteau often propose mitigation, and the government is good at meeting those concerns and addressing them, often by withholding permits until the mitigation is adequate. In rare circumstances, the Province has allowed projects to go ahead, such as in the case of certain LNG pipelines or the Site C dam, despite the objections, outstanding concerns or lack of capacity of the Nation. For major projects, Saulteau require independent technical reviews, carried out by consultants hired by Saulteau. This is an important precursor for many referrals such as a large-scale mining operation, wind development projects, LNG pipelines, or Site C. These reviews are typically funded by the proponent, after Saulteau and other affected First Nations collectively or independently submit a budget and proposal. Often they will establish agreements with large companies to ensure that there are cultural monitors funded and in place before and during operations. They also receive funds for participation from whichever regulator is reviewing the project, although the amount varies. They then make up the shortcoming of funds by engaging the proponent. There are also annual funding agreements in place from different Provincial Ministries for referrals, communications and other related interests.

Although there are times when they feel overwhelmed, in terms of the number of referrals they generally stay on top of them quite well. They have identified some shortcomings that include a lack of in-house technical capacity for technical reviews, a lack of capacity in place for community engagement to ground truth, and community involvement in mitigating or avoiding potentially harmful activities. Saulteau is looking at options for using a referrals management software system, which they see as necessary for moving forward and expanding, but they have many reservations around this. The big barrier is standardization, as using a system like this requires a lot of buy-in from proponents and government ministries, and right now, all of the different technical areas (forestry, oil and gas, etc…) have their own time lines and protocols. It is also a capacity issue, because currently it is quick and easy to download referrals information, whereas they worry that a new system could potentially create data entry and management delays. They want the focus to remain on the assessment rather than the management of the referral. Finally, they want to be able to house all information on their own servers, rather than a third-party server, as this poses a privacy and security issue.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Software Tools

Summary of Software Providers

The following section provides an overview of the referrals software systems that are available today for First Nation Group referrals staff. The summaries below were written by the providers themselves as a part of a larger questionnaire completed by each participating software provider (for the full questionnaire responses please see Annex 2 of this document). Following each of the summaries, users of the specific software provide comments on the best features and potential shortcomings of each software. These user comments come from the confidential survey results, and they represent a selection of viewpoints of both current and past users of the software applications. Therefore, Ecotrust Canada and the AMN cannot qualify or verify the claims or the comments made herein, and it may well be that shortcomings mentioned below have since been addressed by the provider. The software systems are listed in the order that we received them.

Software, Developer & URL	*Who's Using it?*
Cedarbox by GeoMemes cedarbox.ca	Metlakatla; Heiltsuk; Kitasoo/Xai'xais; Hartley Bay Village Council (Gitga'at); Nuxalk; Kitselas; Kitsumkalum; and Wuikinuxv
Trailmark trailmarksys.com	Unknown
RTS (Referral Tracking System) by DR Systems drsystemsinc.com	Halfway River First Nation ; Westbank First Nation; Cold Lake First Nations; Daylu Dena Council; Dease River First Nation; Dene Tha' First Nation; Ehatteshaht Chinehkint First Nation; Esk'etemc; Kapawe'no First Nations; Kwadacha Nation; Lake Babine Nation; Montana First Nation; Nak'azdli Whut'en; Nazko First Nation; Nisga'a Lisims Government; Nun wa dee Stewardship Society; Okanagan Indian Band; Okanagan Nation Alliance; Osoyoos Indian Band; Penticton Indian Band; Quatsino First Nation; Stellat'en First Nations; T'it'q'et First Nation
Stewardship Planning Portal by Geoborealis tsilhqotin.ca	Tsilhqot'in National Government (TNG); N.Shuswap; Musqueam; McLeod Lake; Tsleil-Waututh Nation; Takla Lake; Simpcw FN; Cheslatta Carrier
Community KnowledgeKeeper by Kwusen knowledgekeeper.ca	Adams Lake Indian Band; Gitxaala Environmental Monitoring; Lake Cowichan First Nation; Lil'wat Nation; Little Shuswap Lake Indian Band; Penelakut Tribe; Shuswap Indian Band; Tsay Keh Dene Nation; Tk'emlups te Sepwepemc; Upper Nicola Band
Lightship by Lightship (Previously Truvian) lightshipworks.com	St'at'imc; Kwikwetlem; Lower Nicola
Stó:lō Connect by Culture Code stoloconnect.com	Stó:lō Nation Bands; Sts'ailes Nation (Chehalis Indian Band)
LOUIS Referrals by Apropos Information Systems LOUISToolkit.ca	Unknown

Key Points	*Pricing*
• Easy integration of heritage and ecosystem data and mobile data collection tools • Live link Cedarbox data to desktop GIS and built-in community map • Mail harvesting capabilities	• Starting at $199/month; set-up fees for self-hosting subscriptions • Free updates
• Built in GIS • Integrates with their mobile data collection, survey tools, and document and multimedia library • Referrals app new in 2017	• Pay as you go service ranging between $0-$600/month • No set up or update fees • Free access to a basic account
• Useful cost tracking and automated letter writing capabilities • Necessitates a separate GIS application • Most established software application • Dated interface	• One-time license purchase that includes installation and training • Annual fee of $1350
• Cost effective • Mapping and GIS Functionality • Designed to complement rather than replace the human aspect of impact analysis	• Open source, no monthly or annual fees • Variable costs for installation based on needs
• Built-in GIS • Multiple users and access levels • Can act as a central repository for research and includes educational components	• Yearly Subscription Package costs vary from $625 - $1,500 per month and includes up to 150 hours of training/support, software maintenance, hosting, feature updates, bi-weekly security updates, and a yearly on-site training.
• Built-in GIS • Multiple user and access levels • Integrates with traditional use and ecological data and includes mobile data collection	• 3 year service agreement $450/month includes all set-up, training, support, multiple users and departments
• Cost-effective • Highly customizable open-source software • Requires GIS technicians	• Open-source so no monthly or annual fees • Set-up and support fees as based on needs
• Complementary tools available including a heritage tool for traditional use studies • Mobile data collection capability • Integrated asset management tool in development	• Pricing based on the number of new referrals each month starting at $1200/year • Other tools and support at an additional cost

Referral Tracking System (RTS)

Summary

RTS has been sold to over 65 communities throughout western Canada over the last 10 years. It is a proven solution that has a very large support base. RTS is an off the shelf product with the ability for each community to configure it to meet their needs and internal processes. All RTS users have input on the changes and enhancements that make it the successful tool it is. RTS is a very user friendly easy to use application that can adapt to existing work flows or assist in creating a standard work flow.

RTS will optimize your time and reduce costs by tracking work schedules, activity costs, automated responses, review current referral status and centralize information pertaining to each referral. Users can easily and quickly query the system to locate and sort referrals (e.g. by location, proponent, response date etc.). All documentation (e.g. Traditional Use Studies, emails, letters, etc.) can be embedded into the system so all information for each referral is stored together. RTS also provides direct links to all commercially available GIS packages. If the First Nation does not have any in-house GIS capabilities they can use Google Earth as an inexpensive alternative.

DR Systems (DRS) provides full-service technical support to RTS clients, with two full-time technical support staff dedicated to supporting RTS. DRS provides on-site training and installation support as part of our tech-support packages.

http://www.drsystemsinc.com/software_products.php?SID=15

User Comments

Best features:

- Easy to use
- Automated letter writing/generating response letters
- Able to send referral to affected community/family

Shortcomings:

- Unable to arrange referrals by location and no connection to TUS info is included in the system
- No built-in mapping
- Software has a tendency to crash
- No pop-up reminder for time lines of responses

Stó:lōConnect

Summary

Stó:lōConnect is bespoke. It has been crafted from the ground up to specific meet the needs of Stó:lō in regards to referral management. It generates our reports, it allows for file tracking, cumulative analytics across a number of parameters, an integrated mapping tool, contacts, and every files includes a forum which may act as a staff coordination hub. We here at the PRRO receive over 2.5 new referral submissions daily, and without Stó:lōConnect, I simply have no idea how we would manage so unrelenting a workload. Moreover, there a number of cultural sites throughout S'ólh Téméxw, Stó:lō territory, who have been spared impact or even destruction due to the efficient warning system Stó:lōConnect provides its communities. Only 5 years into its development, and already the impact of this system may be seen throughout S'ólh Téméxw.

http://www.srrmcentre.com/referrals

User Comments

Best features:

- Simple, intuitive web based overlay analysis allows non-GIS trained staff to conduct their spatial analysis work on StoloConnect.com anywhere with an internet connection

Shortcomings:

- Some aspects of Stó:lōConnect are functional but inelegantly designed due to the nature of a web portal being constantly updated, added to, and built upon rather than designed once and fully at the outset
- Implementers don't know the land
- Misses day to day rights issues.

Cedarbox

Summary

Cedarbox is a modern secure web application that grew out of the needs of coastal and northeastern BC Nations to track and respond to hundreds of complex referrals per year. Functionality has steadily expanded over 10 years to support three departments within a Stewardship/Lands department: development, heritage and ecosystems.

On the referrals side we focus on very low effort for initial referrals logging and slick tools for adding project details including communications, files and location (accepts dozens of spatial data types). We think MailHarvest (easy communications/files tracking) is important and few others do this. We have fields and methodologies to help people deal with Large Projects (with up to hundreds of communication streams around EIA and sub-permits). On the heritage side, Cedarbox has a very rich Heritage Library researcher tools. Central Coast Nations use Cedarbox to catalog and do indigenous laws research on 2000+ documents, running full-text searches on TUS interview transcripts and reports. For ecosystems, we have a rich species database that is cross-linked in the Development and Heritage Apps, and we connect to data collections tools (e.g. Coast Guardian Network RMS) via WFS (secure web feature service connections).

We love maps and have a clever LiveLink system that allows all the Cedarbox spatial layers to be securely accessed (in your office) in ArcMap or QGIS. Think: cumulative Impacts Analysis and rich wall maps.

Most of our clients host their data on mini-servers (which we configure and install) or virtual machines (VMs): this resonates with folks who don't want their data out of the office. We have some nice adds: 2-factor authentication and a cool way to push heritage data out as a Community Map. Company is 1/3 First Nations owned.

http://Cedarbox.ca

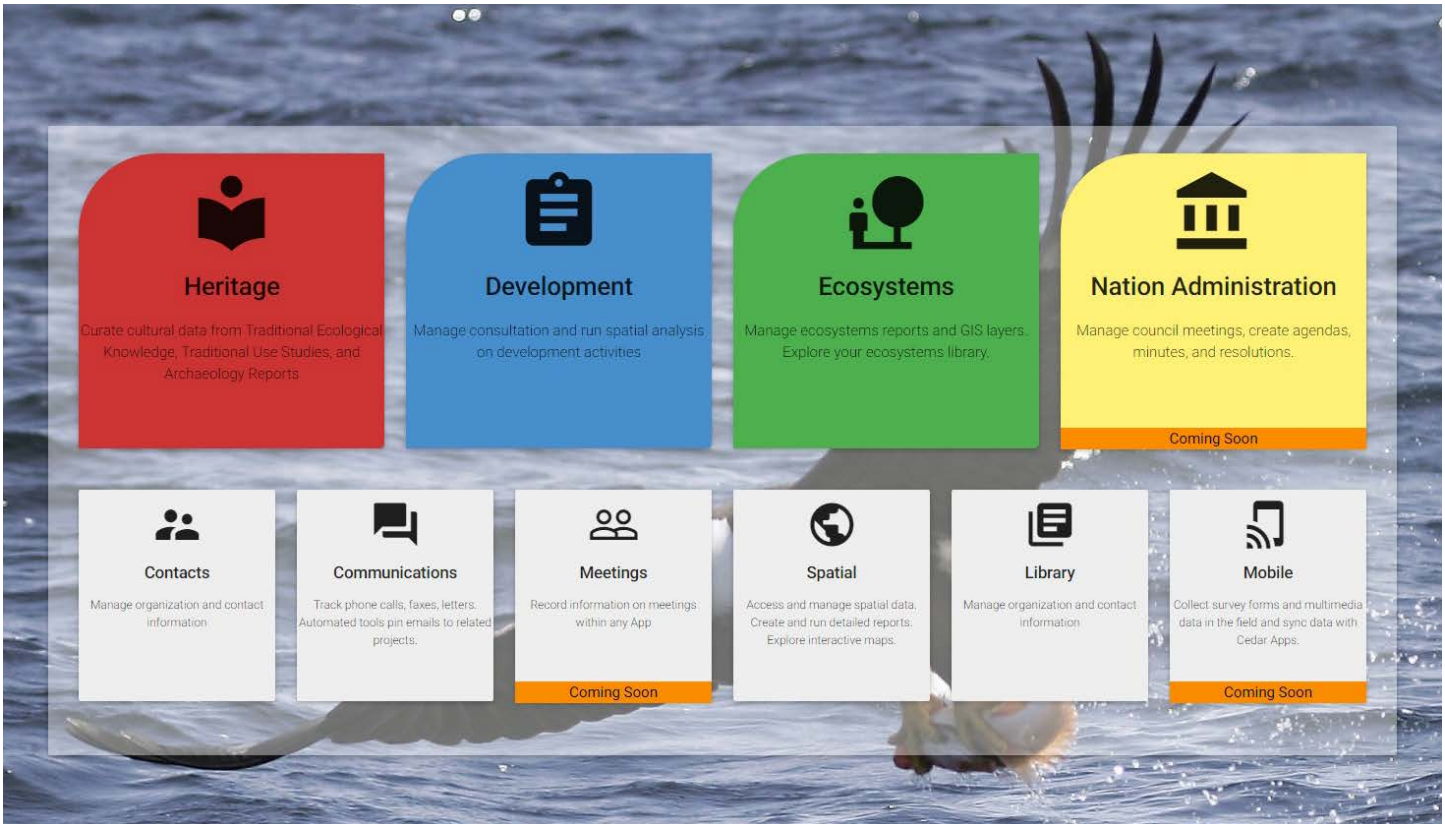
User Comments

Best features:

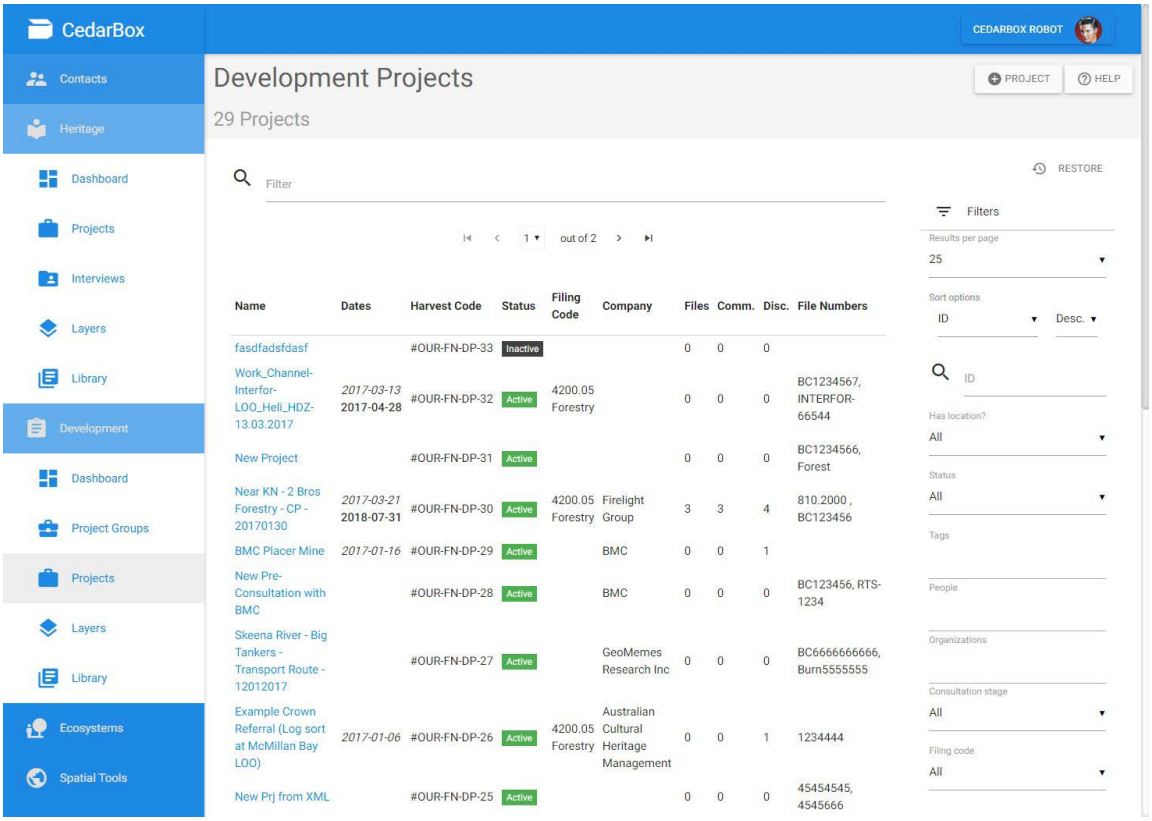
- Email mining and digital file storage
- Tracking response
- Email-based harvesting
- The map analysis
- Tracking, multiple search/sort criteria, spatial data, storage

Shortcomings:

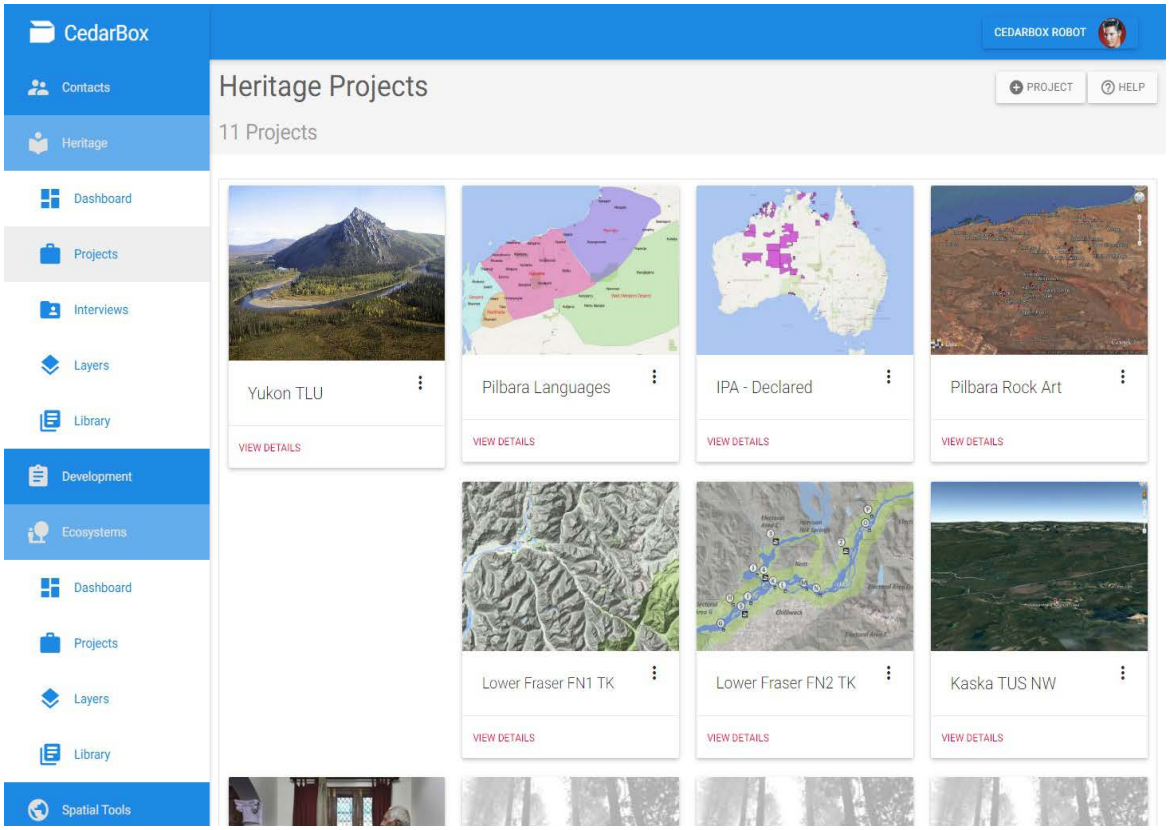
- Data entry heavy (until tracking numbers are used, then email mining is quick)
- Geospatial analysis is very limited, it is not very efficient to search, IT support is limited
- Still in its infancy
- Mapping is not quite what we need



Cedarbox: splash page screenshot



Cedarbox: development projects screenshot



Cedarbox: heritage projects screenshot

Stewardship Planning Portal

Summary

The Portal was developed by First Nations, for First Nations, but it has also been used by municipalities and university research groups, which highlights its flexibility/customizability. The data structure and framework is such that it has been able to grow with changing needs and capacities. For instance, in 2014, the Tsilhqot'in National Government (TNG) celebrated 10,000 milestone for submissions. TNG is currently receiving submission IDs in the 14000s, and the Portal has 48 user groups, and 240 active users registered.

As many First Nations are not comfortable with cloud-based data storage, the Portal is generally set up on local Infrastructure with daily and weekly backups. The portal is very easy to setup allowing cloud serving as an option. The permission model is robust, secure, and well thought out. The standards, and structure ensures that the information is not affected by staff turnover or corrupted computers & lost emails as we don't rely on individually-saved work product; everything related to a referral is stored in the Portal itself. The Portal provides the ability to create customized forms, user roles, upload all types of GIS data, spatial analysis and styling, custom searching, automatic emails, scheduling, fee for service collection and self-registration.

There is a network of Portal users (eight First Nations communities using the Stewardship Portal) providing methods for comparing policies and procedures as well as cost sharing for Portal upgrades.

For more information on the use of the Portal at TNG - http://www.tngportal.ca/

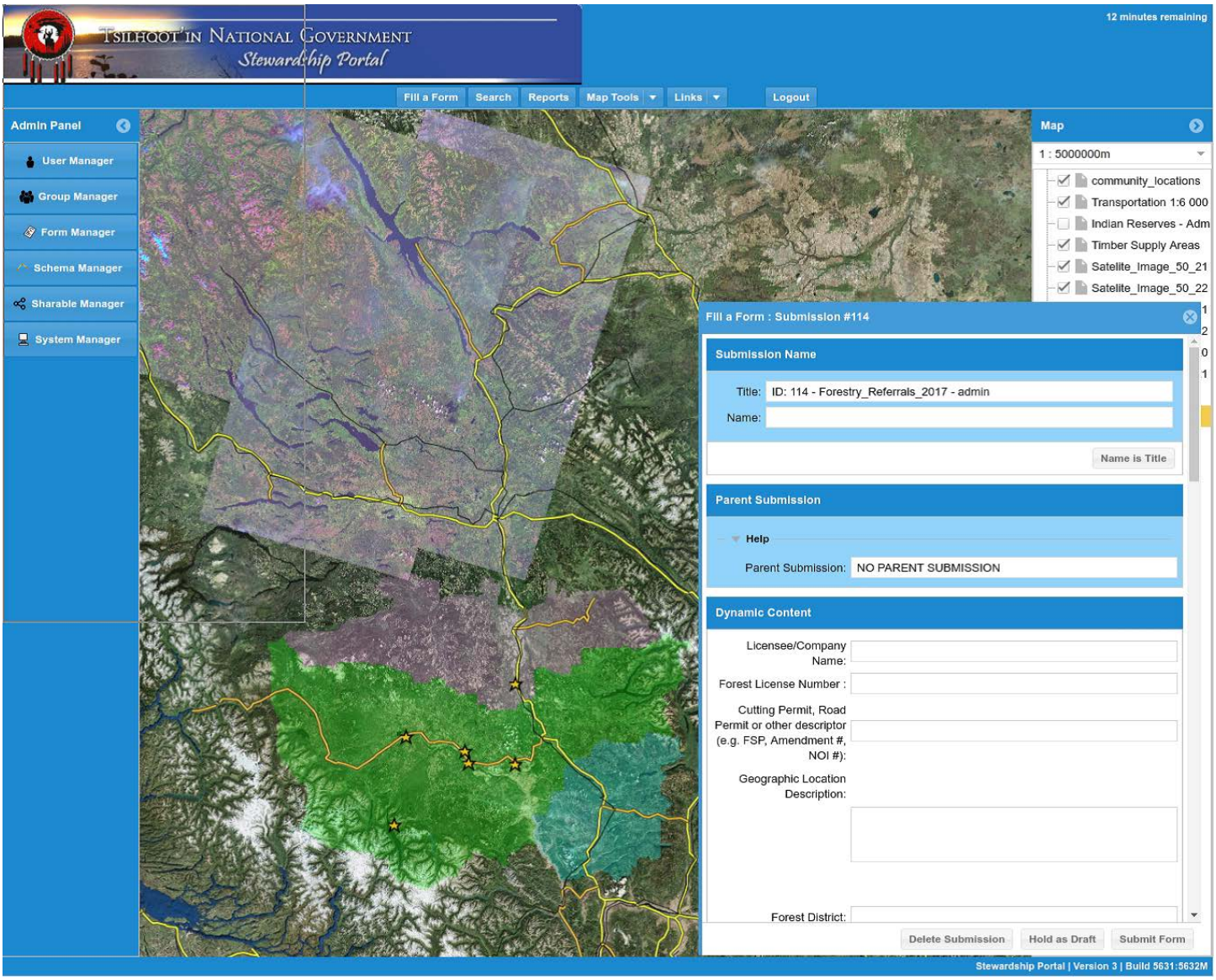
User Comments

Best features:

- Quick analysis, searching, spatial & tabular data storage for additional uses in the future
- Open Source
- Allows us to be prepared for broader discussions and not just deal with referrals

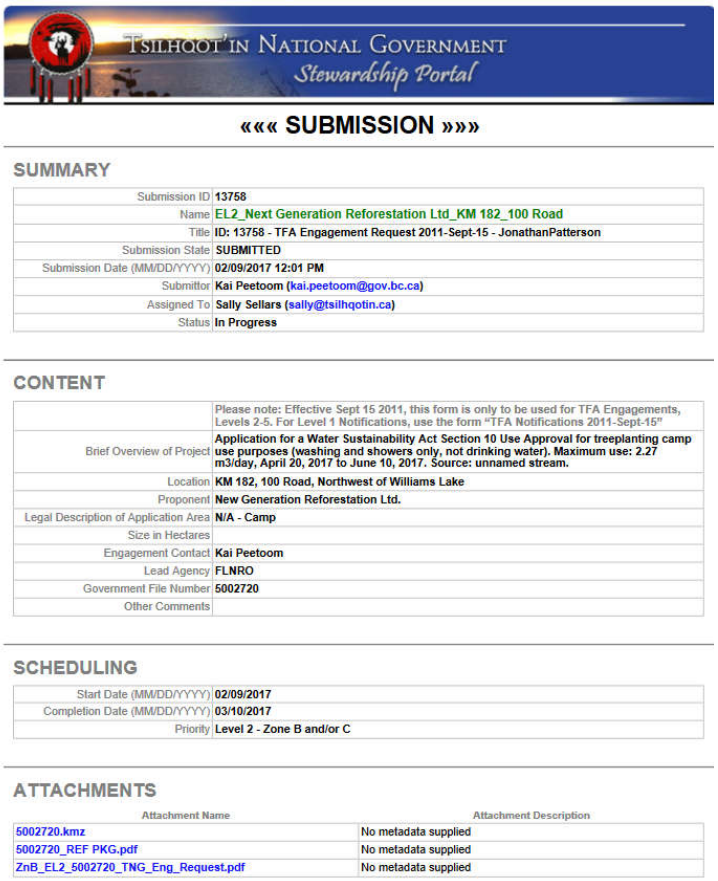
Shortcomings:

- Improvements are slow to be released, as there is not a large user base at this time



Stewardship Planning Portal: Map interface screenshot

Stewardship Planning Portal: screenshot of an example Forestry Referral form (below) and screenshot of an Engagement (right), with links to the attachments submitted (spatial data and two pdfs).



Tsilhqot'in National Government
Stewardship Portal

«««« SUBMISSION »»»»

SUMMARY

Submission ID	13758
Name	EL2_Next Generation Reforestation Ltd_KM 182_100 Road
Title	ID: 13758 - TFA Engagement Request 2011-Sept-15 - JonathanPatterson
Submission State	SUBMITTED
Submission Date (MM/DD/YYYY)	02/09/2017 12:01 PM
Submittor	Kai Peetoom (kai.peetoom@gov.bc.ca)
Assigned To	Sally Sellars (sally@tsilhqotin.ca)
Status	In Progress

CONTENT

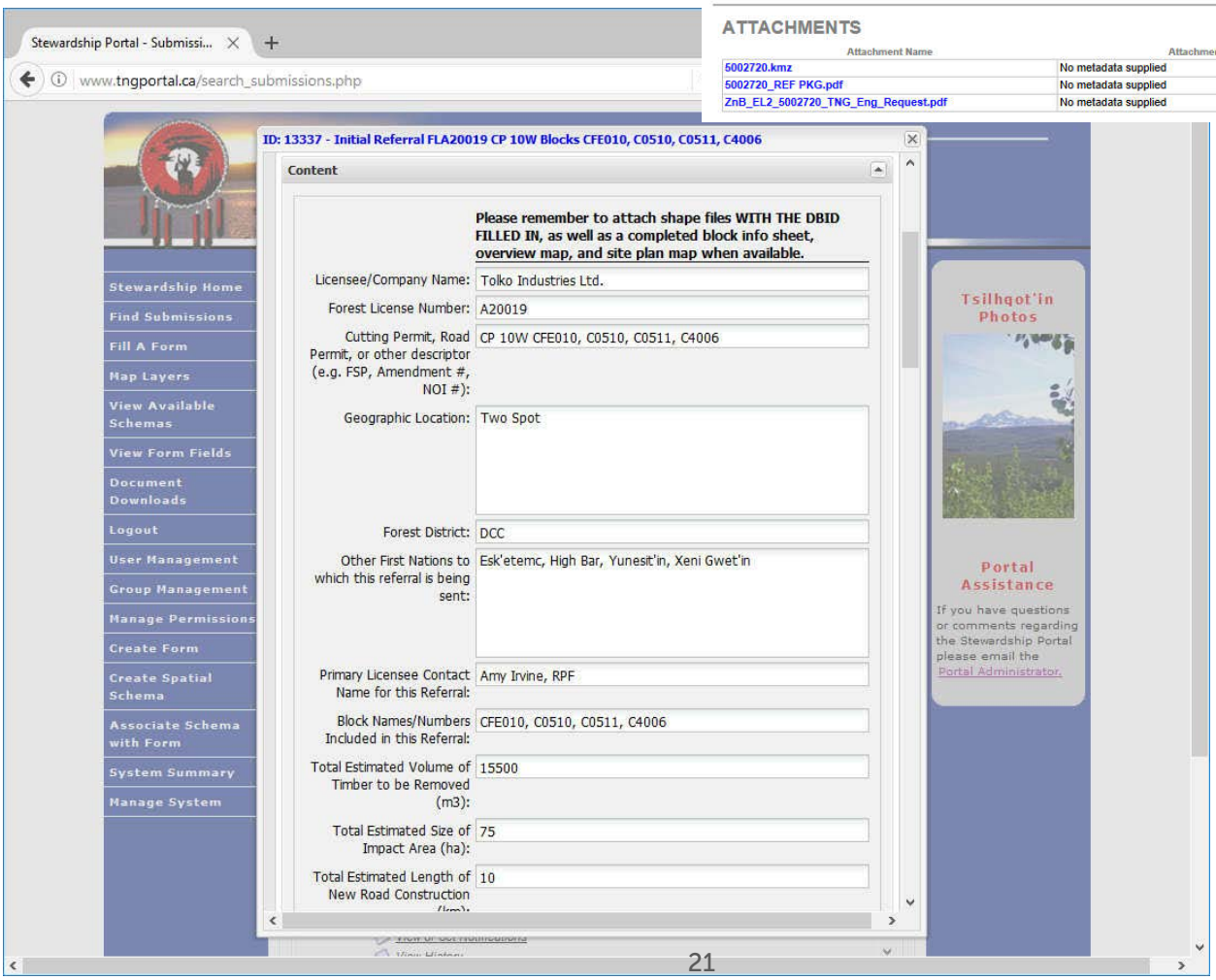
	Please note: Effective Sept 15 2011, this form is only to be used for TFA Engagements, Levels 2-5. For Level 1 Notifications, use the form "TFA Notifications 2011-Sept-15"
Brief Overview of Project	Application for a Water Sustainability Act Section 10 Use Approval for treeplanting camp use purposes (washing and showers only, not drinking water). Maximum use: 2.27 m3/day, April 20, 2017 to June 10, 2017. Source: unnamed stream.
Location	KM 182, 100 Road, Northwest of Williams Lake
Proponent	New Generation Reforestation Ltd.
Legal Description of Application Area	N/A - Camp
Size in Hectares	
Engagement Contact	Kai Peetoom
Lead Agency	FLNRO
Government File Number	5002720
Other Comments	

SCHEDULING

Start Date (MM/DD/YYYY)	02/09/2017
Completion Date (MM/DD/YYYY)	03/10/2017
Priority	Level 2 - Zone B and/or C

ATTACHMENTS

Attachment Name	Attachment Description
5002720.kmz	No metadata supplied
5002720_REF PKG.pdf	No metadata supplied
ZnB_EL2_5002720_TNG_Eng_Request.pdf	No metadata supplied



Lightship

Summary

Lightship was designed as a modern, fully integrated toolset that is capable of supporting multiple departments in a First Nations community as well as facilitating information and resource sharing between communities. Several of our First Nations clients have group licences; in this scenario, it's possible for a larger community or an external consultant to manage the bulk of the administration of the system, leaving the smaller communities that may have limited resources to simply consume the data and work with pre-built maps, reports, and data collection forms. The benefit is that one low license fee can benefit several departments in a community, but also that information exchange between departments can be done seamlessly. For example, if the community is currently working on a Land Use and Occupancy study, Lightship fully supports a direct to digital methodology that has proven successful in multiple communities. In Lightship, data recorded about use and values on the landscape are immediately available to inform referral decision processes, with no delay, and no extra expense. In many communities, there is a large amount of data and information that has been collected, but it is not available for land management decisions. Lightship eliminates these barriers, ensuring that the best data is available to people with the correct permissions.

In addition to bringing together data and considerations from multiple projects and departments, Lightship is also a powerful tool for completing work in the field related to environmental monitoring or other natural resource activities. This enables the community to compile comprehensive data regarding the location of archaeology, cultural heritage, trails, spills, and other relevant information. This data capture can be done with any mobile device, and will automatically synchronize to the main database when field work is complete, eliminating the need to manually enter data, or type in notes from a field notebook. Over time, this data provides a medium for knowledge transfer between staff and across generations. Lightship offers comprehensive reports that you can customize to your needs. Reports can summarize submissions from each proponent, and the total activity over the past quarter (or other time frame).

All information that is contained in Lightship can be shared in interactive maps. These maps can be shared with proponents, government agencies, membership, or anyone else you feel is relevant. This method of collaboration ensures that everyone has access to current data, and eliminates the trouble associated with emailing data to multiple people.

We have designed Lightship to enable communities to control their own processes. All administration activities can be completed by authorized staff including user management, permissions, creation of maps, reports, forms, and projects. Lightship also provides full support (included in the base subscription cost) to help users with any questions they might have.

https://lightshipworks.com

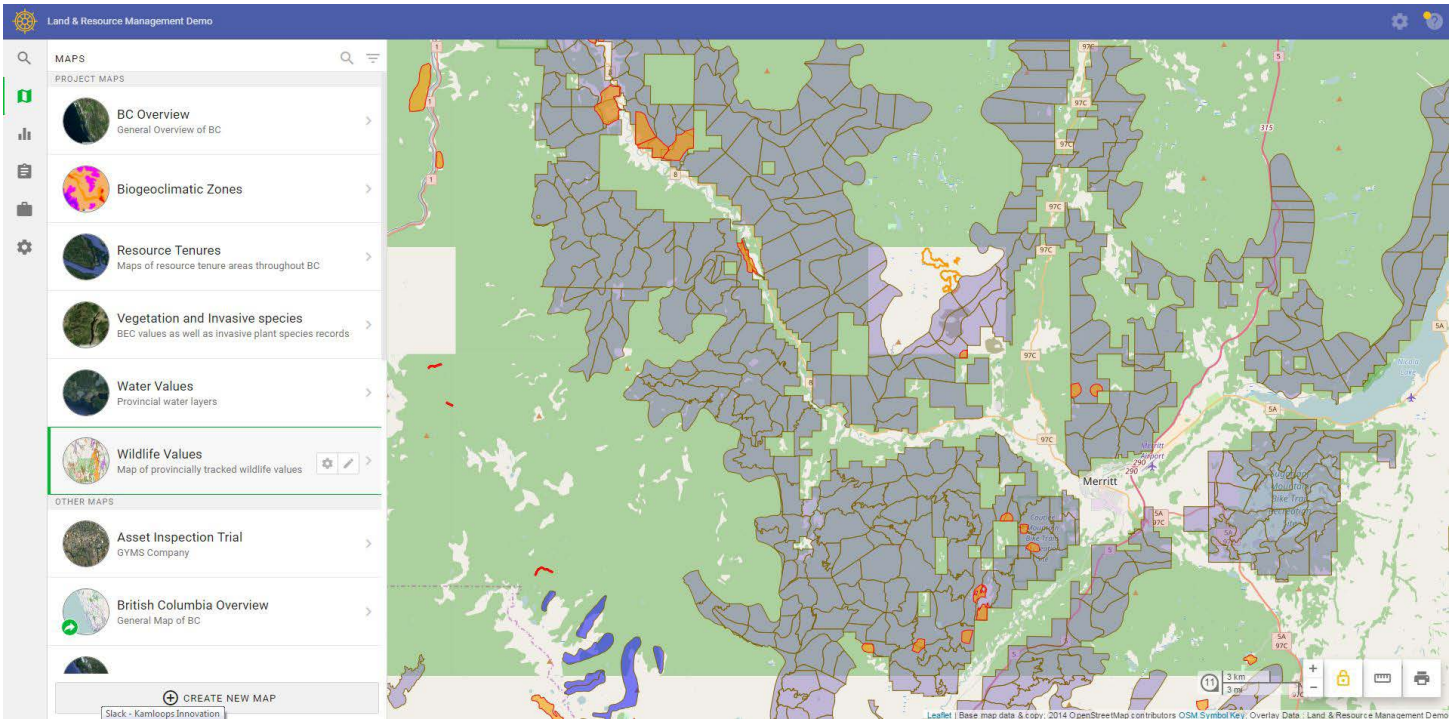
User Comments

Best features:

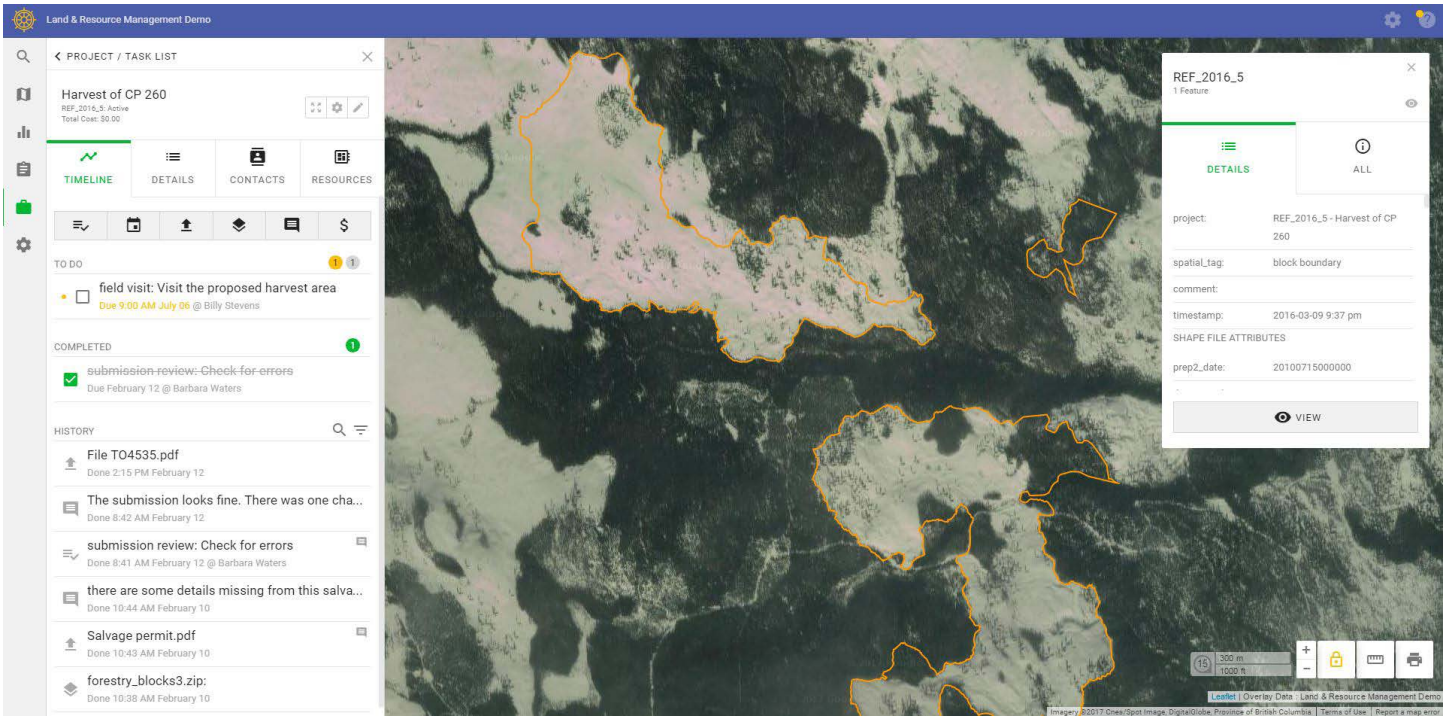
- Printing maps
- Database and spatial integration through browser, easy to use and flexible

Shortcomings:

- Uploading multiple files at once is problematic
- Finding correct location sometimes differs from Google Maps

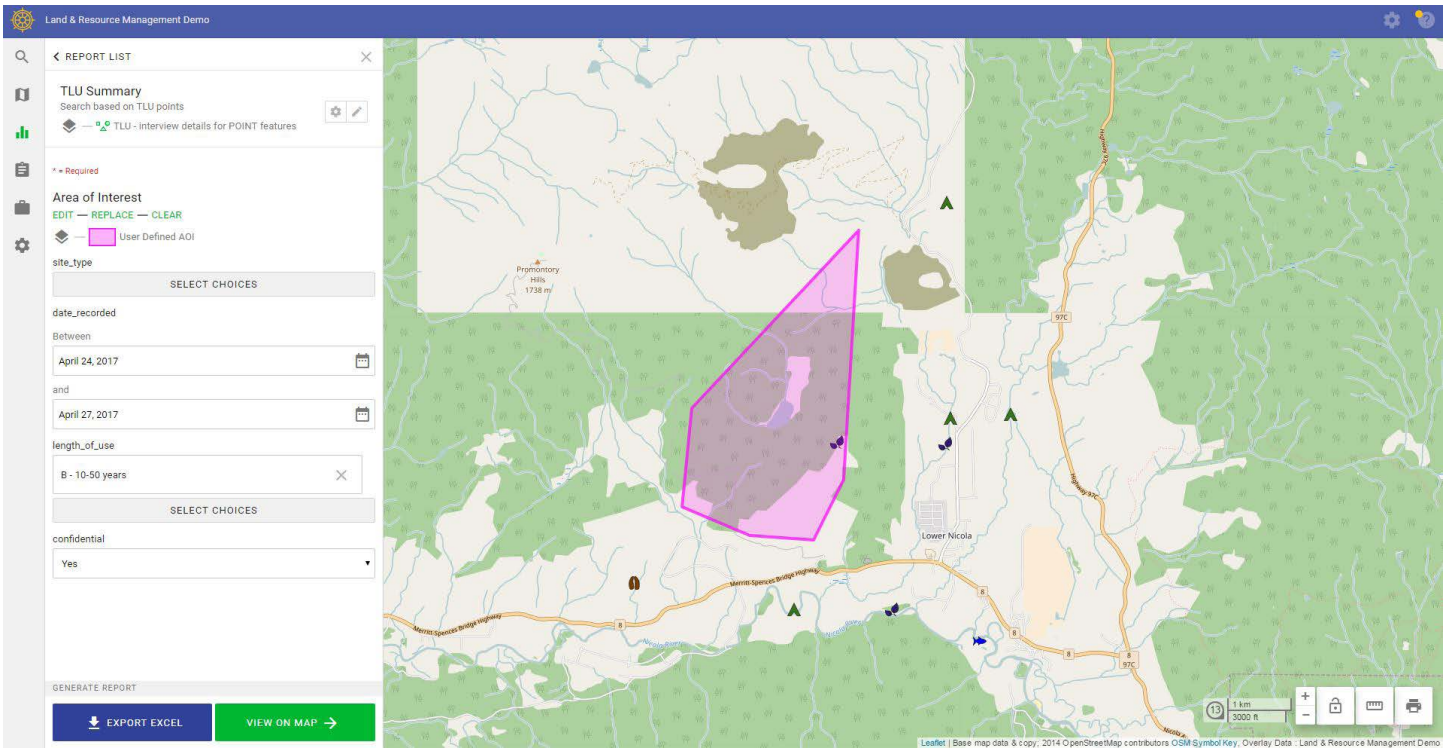


Lightship: map interface screenshot

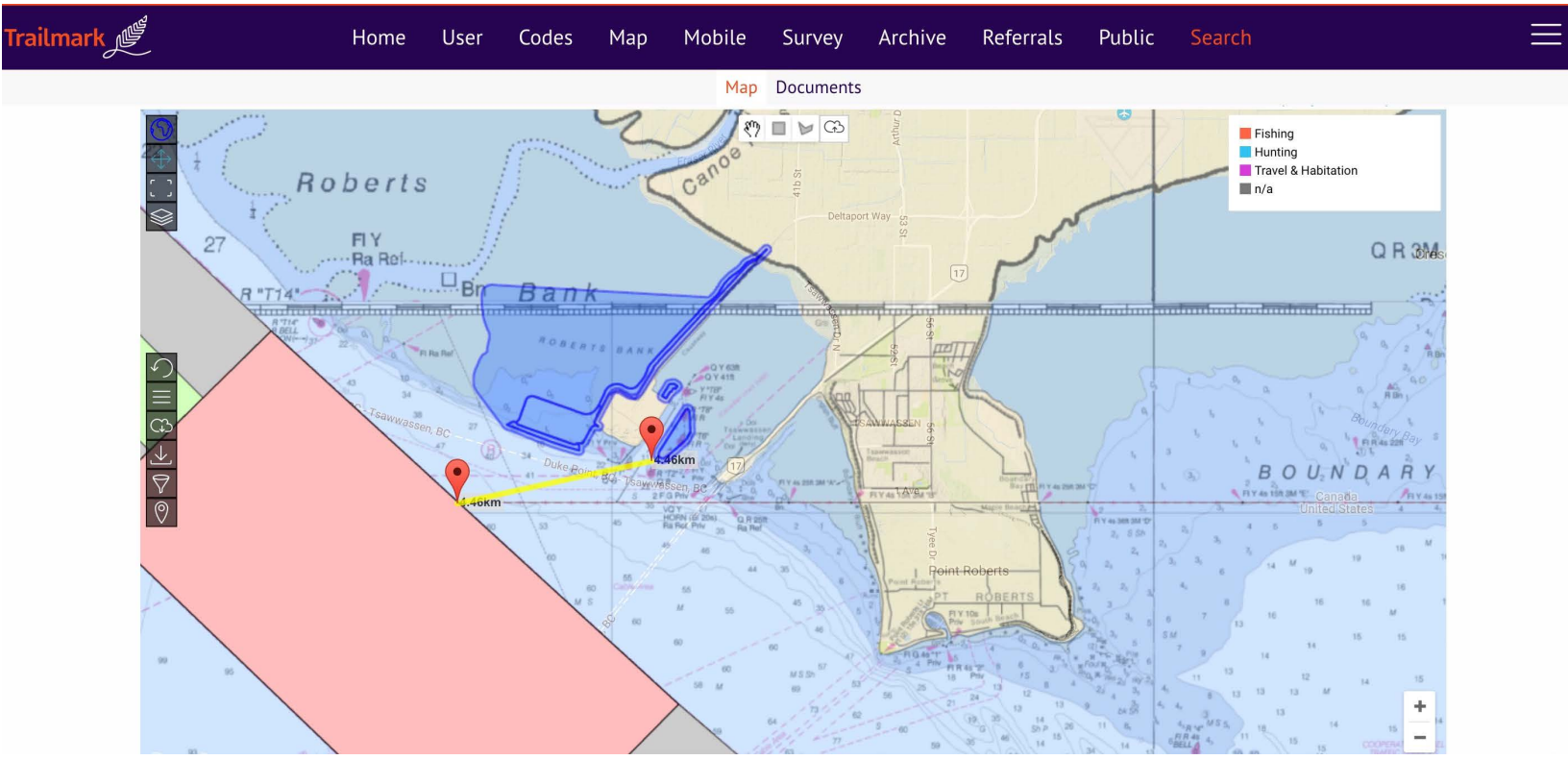


Lightship: project interface screenshot

Software Tools



Lightship: reports interface screenshot



Trailmark: spatial data management screenshot

Trailmark

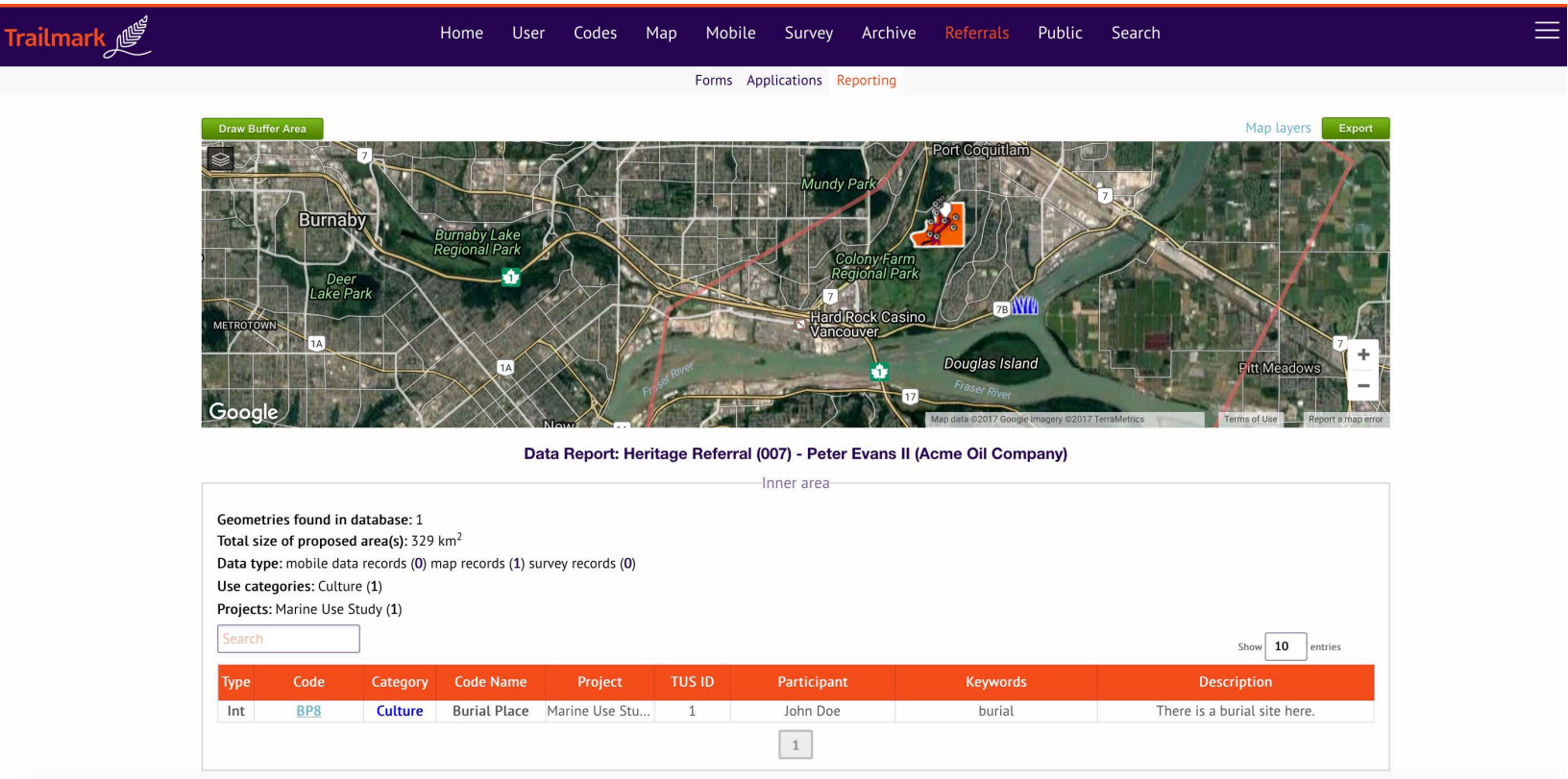
Summary

Trailmark is the only comprehensive Software-as-a-Service solution currently on the market (for Indigenous Lands, Resources, and Referrals, but also for heritage departments, linguists, wildlife managers, foresters, and housing and other asset management). Its ease-of-use, low costs (no installation or setup costs) including a freemium sign-up, and rapidly evolving analytical power are unique for this market. Trailmark is built upon a super-fast spatial search engine and complies with the highest web-based security standards. Users of any of the paid plans have a 24/7 email and phone support with a dedicated support specialist. Some competitors deliver a one-time installation and charge out customizations for each client individually. However, Trailmark is based upon a community-based principle: we've developed a software where the entire user community benefits from enhancements and new features, and we've backed that model up with our own investment. Trailmark releases software update for its strongly growing user community almost every month. Trailmark is used by Indigenous communities in all regions of Canada, from the east to west coasts, and across the Arctic, and in Australia.

https://www.trailmarksys.com

User Comments

We did not receive any survey or interview responses from users.



Trailmark: referral data report screenshot

Community KnowledgeKeeper (CKK)

Summary

The CKK is the only database that combines referrals tracking with a structured research database and community archive. Its user-friendly, visual nature allows for easily processing referrals and assessing potential impacts. There are no limits to the amount of user accounts a community can grant, and no concerns over data storage limits.

https://knowledgekeeper.ca

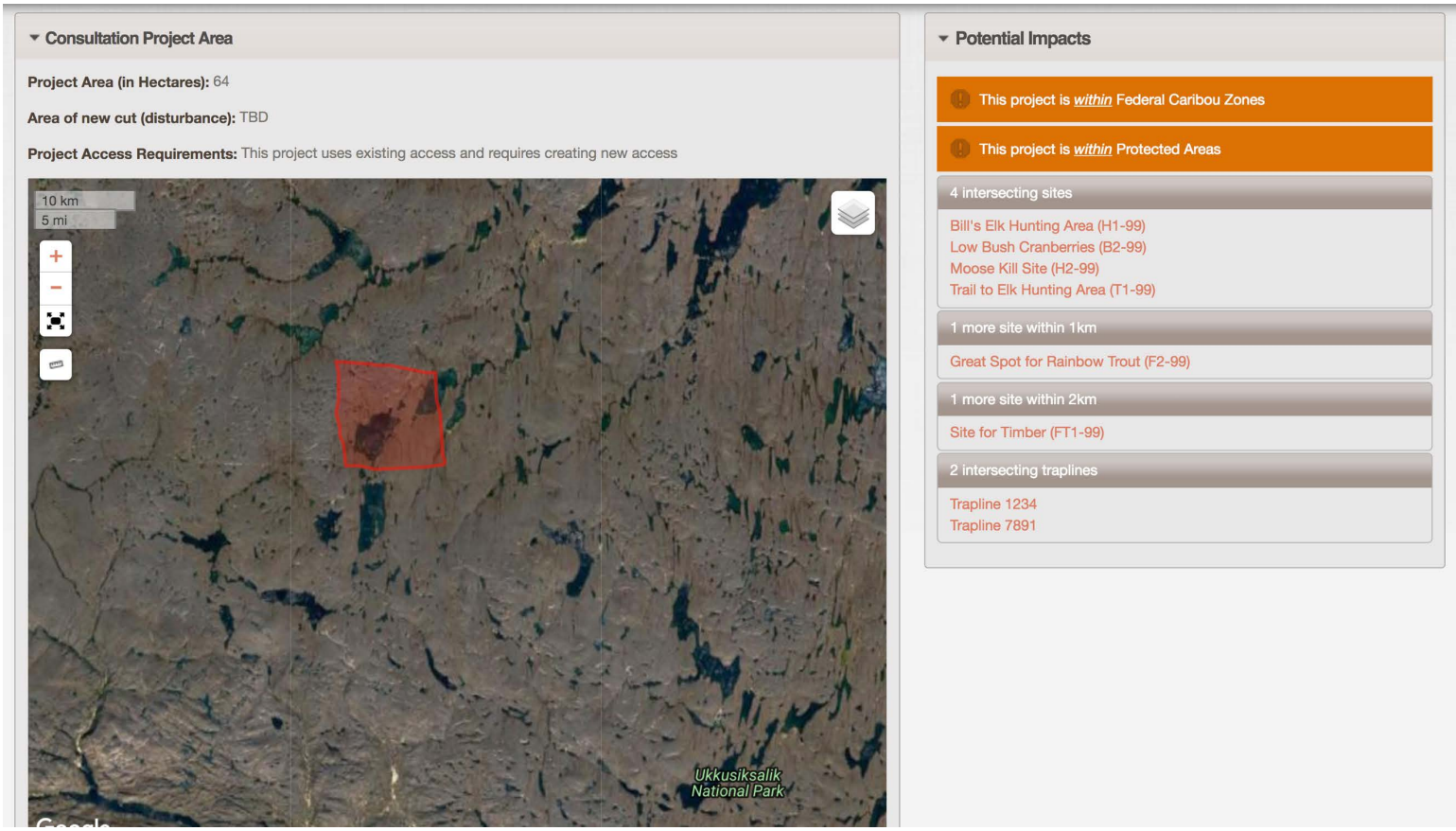
User Comments

Best features:

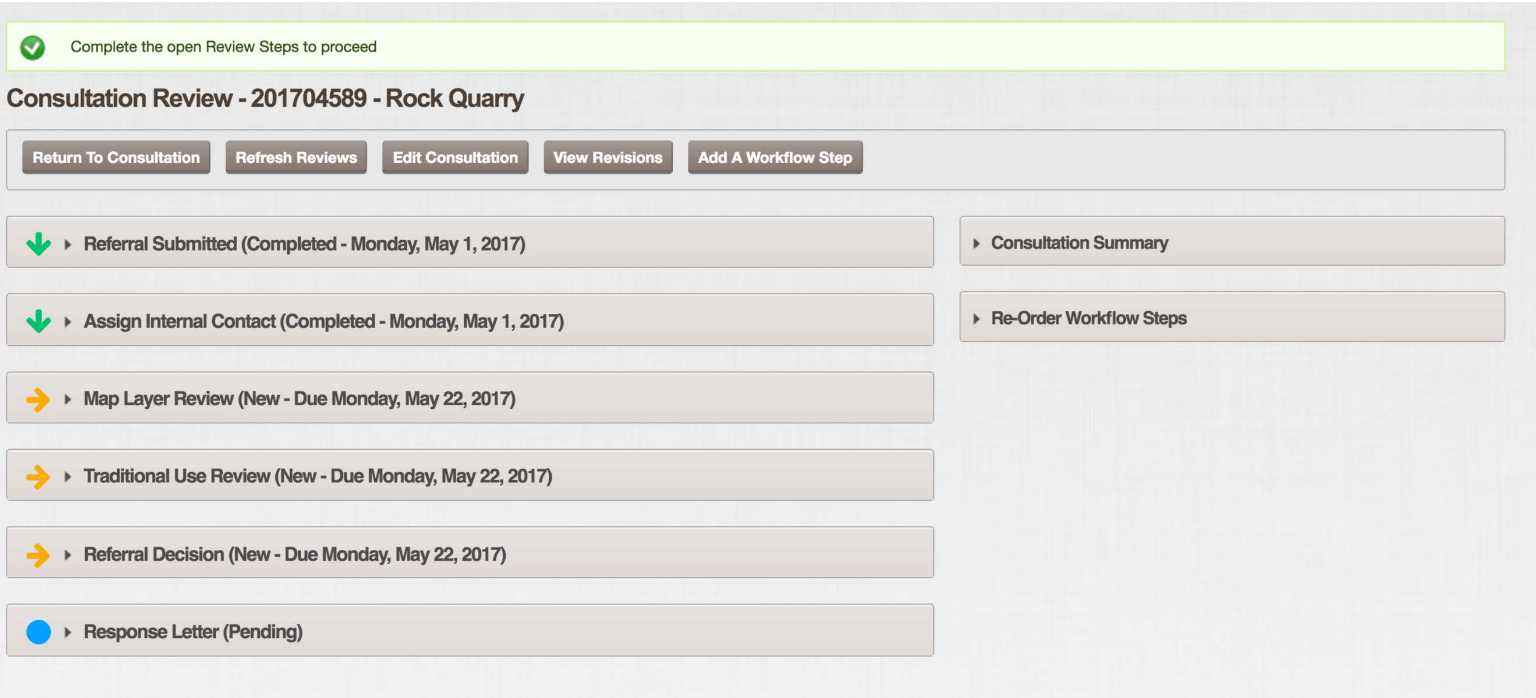
- Seeing the intersects on the map when it first pulls up
- Having digital maps to look at with the referrals.

Shortcomings:

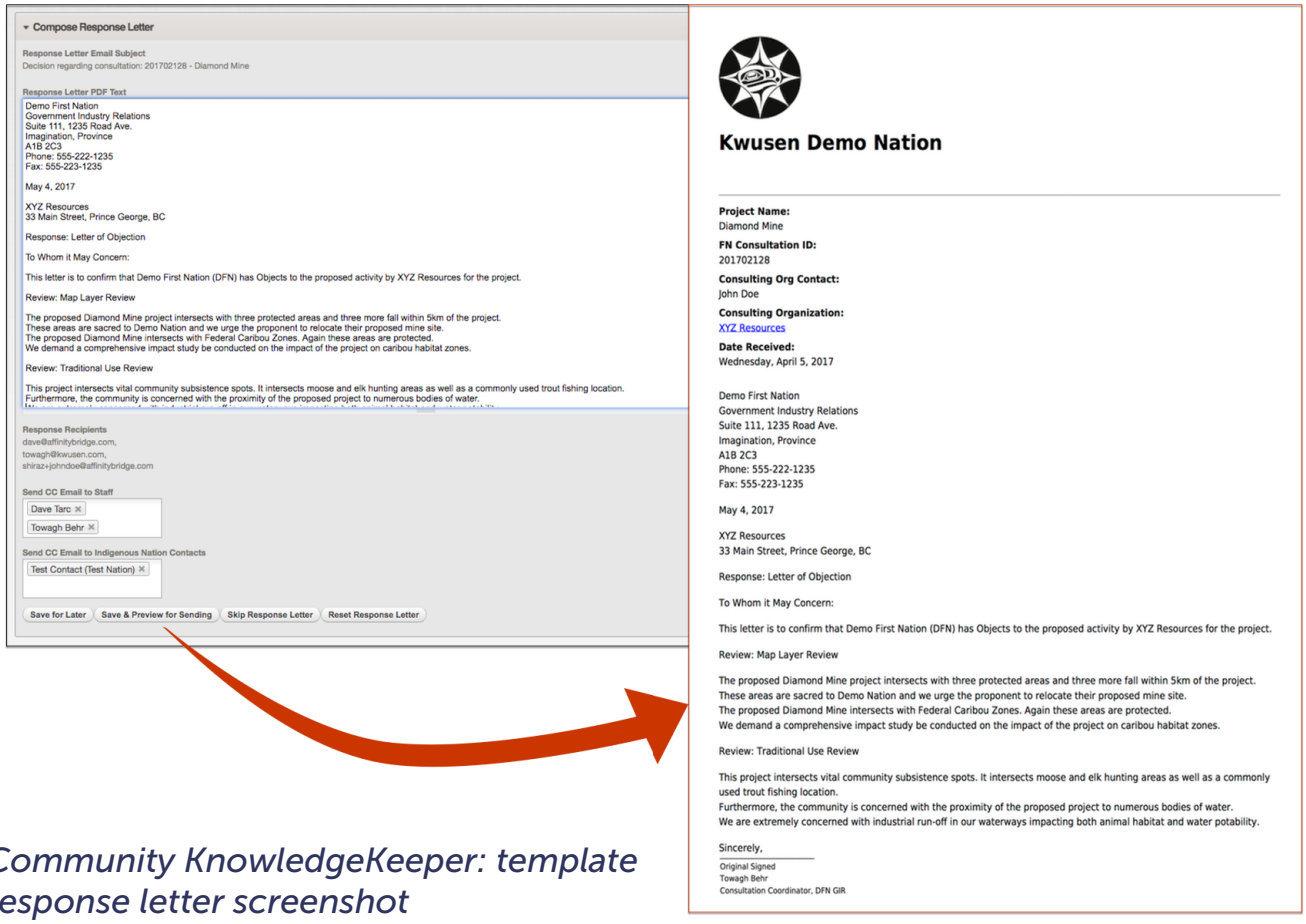
- Would like to be able to have PDF links to the mapping segment



Community KnowledgeKeeper: map interface screenshot



Community KnowledgeKeeper: consultation review interface screenshot



Community KnowledgeKeeper: template response letter screenshot

LOUIS Toolkit

Summary

The Land Occupancy and Use Information System (LOUIS) Toolkit offers a very complete set of tools and provides the means to use those data in an integrated fashion. Referrals itself is different from most systems by being process driven and giving communities tremendous flexibility to design consultation processes in LOUIS that match their real world processes. Heritage is unique in its content searching and classification capabilities as well as having a dedicated tool for in-person map based interviews built according to the best practices and standards outlined in Living Proof by Terry Tobias. Layers is unique in the way that good data management practices are integrated into the tool as well as in its ability to pull data from other sources and make them available to the rest of LOUIS. We are also in development of an asset management tool to allow for integration of asset and capital planning with spatial land use planning; this module will be available by the end of 2017. All of these modules are designed to work together and allow communities to use their information together for both day-to-day operations but also within the larger context of land use planning.

https://www.louistoolkit.ca

User Comments

We did not receive any survey or interview responses from users.

Other providers

The software industry is ever-evolving, and new referrals software applications are being developed, either by software companies or in-house by consultants with First Nations Groups. For example, Nlaka'pamux Nation Tribal Council is developing a referrals application called Connexio. Once created, the developer intends to make it available for other First Nation Groups to use.

We are aware of other software tools that could potentially be used for referrals management, but could not obtain information for inclusion in this report. These tools include:

- Cloverpoint
- Geolive
- Maa-nulth Portal
- GoPlan by PlanLab

Selecting a Tool

Which referrals management tool is right for you?

Factors to Consider

There are a variety of factors to consider when deciding on a software tool for referrals management. Such factors might include:

Size of referrals department

- How many full/part-time staff are dedicated to processing and managing referrals?
- How do you foresee the growth of the referrals department?
- How many users are going to need access to referrals information and what information will be available to them all (permission levels)?

Number of referrals being received

- Are you currently able to effectively respond to all referrals?
- Are there major developments that you foresee in your territory?

Type of referrals being received

- How many different types of referrals are received?
- Are there different protocols, deadlines, and/or operating procedures for the different types of referrals?

Current Agreements

- Existing reconciliation, consultation and engagement protocols and their fit with potential software tools?
- Do you already have benefit agreements in place with proponents/government?

Resources

- What funding do you currently have in place for purchasing, and maintaining, referrals tools?
- What funding do you have for referrals staff?
- Are you sharing costs with other First Nations/bands?

Capacity

- Does your staff have GIS training?
- Do you have technical experts on staff (i.e. biologists, archeologists, ecologists, mining, oil and gas, etc.)?

Goals of utilizing a software tool

- Simple data management and records of referrals responses?
- Simple spatial analysis?
- Comprehensive spatial/document analysis and cumulative assessment?
- Proponent driven (i.e. proponents enter data)?

Long-term goals of the First Nation

- Increased guardianship/stewardship over traditional territory?
- Community participation/engagement?
- Integrated governance system (natural resources, infrastructure, housing, etc…)?

Software reasons

- Stability of the platform – e.g., how long has it been around? Do you see the company continuing to produce the product in the future? [1]
- People close to you (e.g. your tribal council or band) are using it
- Architecture & functionality (see list below)

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1 This is an important consideration, as if your FNG decides to invest in a software, the sunk costs (including training and staff goodwill) can make it fiscally difficult to switch to another provider. However, software changes rapidly, and getting a sense of the commitment of the developers is important. Applications created within a community (e.g., the Ktunaxa RMS) and for a community (e.g., TerraTruth), have withered. We see future consolidation among the marketplace as something that may be important for users to consider when they are choosing a software.

Recommendations based on Functionality

The following recommendations are based on an analysis of all the data gathered as a part of this project, including survey and questionnaire responses from the software providers, and survey and interview responses from software users. The recommendations are based on our understanding of the strengths of each software, and are made in no particular order. Not recommending a software does not necessarily mean that it cannot perform the stated function.

	Cedarbox	Trailmark	Lightship	LOUIS Toolkit	CKK	RTS	Stó:lōConnect	Stewardship Planning Portal
You require built-in mapping	✓	✓	✓	✓	✓			
You have very little GIS capacity	✓	✓	✓	✓	✓			
You have GIS capacity and want a software which complements your GIS software					✓	✓	✓	✓
You want proponents to upload information		✓	✓	✓	✓	✓	✓	✓
You want software to automatically notify stakeholders if the activity is in an area of interest		✓		✓	✓	✓	✓	
You want the software to produce template response letters			✓	✓	✓	✓	✓	
You want the software to track the cost of processing a referral and to produce an invoice			✓	✓		✓		
You want the software to have mobile data collection capability	✓	✓	✓	✓	✓	✓		
You want the software to create cumulative analyses of referrals	✓	✓	✓	✓	✓	✓	✓	✓
You want your data stored on your own servers	✓				✓	✓		✓
You want an open source software							✓	✓

Other Options

Many First Nation Groups that we spoke with pointed out that there are many simple solutions for organizing and analysing referrals. These tools are often free or very low cost and can be highly useful depending on the needs of the First Nation Group. Such tools include:

- Microsoft Excel
- Microsoft Access
- Gmail
- Trello

These data organization tools can be utilized alongside separate mapping programs for spatial analysis including:

- QGIS (http://www.qgis.org/en/site/)
- ArcGIS (http://esri.ca/en/products/arcgis-platform)
- Google Earth Pro (https://www.google.com/earth/desktop/)
- IMAP BC (http://www2.gov.bc.ca/gov/content/data/geographic-data-services/web-based-mapping/imapbc)
- Hectares BC (http://www.hectaresbc.org/app/habc/HaBC.html)

Using these simple tools might be best for small referrals teams who already have in-house GIS capacity and who are receiving a limited number of referrals. For First Nations receiving high numbers of referrals requiring multiple levels of analysis and organizational 'memory', and with no or little GIS capacity, a specific referrals software tool would likely be useful.

Conclusion

This report is a part of a growing and evolving knowledge hub for First Nations and referrals management staff on the AMN website. It will be the first publication in a new section of the website aimed toward providing a forum for discussion on referrals, including on referrals software specifically. We encourage you to share your experiences with different software on our Referrals forum on the AMN: http://nativemaps.org/forum/671.

We anticipate updating this report as the applications are updated, and we will rely on the developers and users to tell us when features change, or when new software applications are launched. Please drop us a note at info@nativemaps.org if you have any comments – we would love to hear your feedback.

Annex A

Funding sources to assist with Referrals

Funding Sources

Securing funding to pay for referrals management staff and software tools is a great challenge for First Nation Groups today, and the diversion of other funds can mean other important issues such as health and housing are not adequately addressed. There are a variety of funding streams available to First Nation Groups for referrals management, depending on their circumstances. Current funding options which can be applied to referrals management staff and tools include:

British Columbia Capacity Initiative (BCCI)

A federal government initiative funded by Indigenous and Northern Affairs Canada (INAC). The BCCI focuses on enhancing First Nation Groups' abilities to prepare for comprehensive land claim negotiations by increasing First Nation Groups' capabilities to negotiate, implement or manage land and resource components of their future aboriginal title settlement agreements. All BC First Nation Groups with an unresolved land claim are eligible to apply for funding. This includes First Nation Groups both within and outside the BCTC process. Applications for funding may be made on behalf of a First Nation by its band office, tribal council, or representative First Nation organization. There is no maximum limit on the amount of BCCI funding that can be requested for a project. However, applicants must provide a detailed budget and project description that demonstrates strong evidence of expenditure planning and achievability of deliverables within the fiscal year.

http:/www.bccapacity.org

Forest Consultation and Revenue Sharing Agreements (FCRSA)

The FCRSA replaced the previous Forest Tenure Opportunity Agreements and Forest and Range Agreements. This funding mechanism, negotiated with the Province, allows First Nation Groups to receive direct

economic benefit returns from the harvesting activities taking place within their traditional territories. Although the FCRSA has the potential to provide long term funding, it also potentially limits the ability of First Nation Groups to exercise rights and jurisdiction over their territories. We have been told that by accepting the funding agreement many First Nation Groups are essentially accepting 'accommodation' for rights infringements, and therefore are unable to interfere, impede or challenge forestry activities within their territories. For this reason many First Nation Groups are no longer utilizing this funding agreement.

http://www2.gov.bc.ca/gov/content/environment/natural-resource-stewardship/consulting-with-first-nations/first-nations-negotiations/forest-consultation-and-revenue-sharing-agreements

'Accommodation Agreements' or 'Impact Benefit Agreements'

Our discussions with First Nation Groups referrals staff indicate that the greatest source of revenue for managing referrals and for improving consultation outcomes comes directly through engagement and negotiations with project proponents. Such a strategy can often provide funding for things like cultural monitors or community liaisons, and can encourage an early and consistent dialogue that can avoid referrals even being sent out in the first place if there is the potential of an impact. Although such agreements can be beneficial in terms of funding, there is never a guarantee that all actions on the part of the proponent will be carried out in good faith, and agreements can potentially disempower the First Nation from exercising its rights. For more information on negotiating an accommodation or impact benefit agreement, please see the AMN's toolbox for responding to Crown Land Referrals: http://nativemaps.org/taxonomy/term/186.

Charging for Accepting Referrals

Some Nations have chosen to charge proponents to submit referrals for review. This can help cover some direct costs associated with response.

Strategic Engagement Agreements

These are agreements established between the Province and First Nation Groups, on procedures for consultation and accommodation, including referrals protocol. Funding for referrals management can often accompany such agreements.

http://www2.gov.bc.ca/gov/content/environment/natural-resource-stewardship/consulting-with-first-nations/first-nations-negotiations/strategic-engagement-agreements

Annex B

Software Provider Questionnaire

The following series of questions were provided to all of the participating software providers. The responses below are verbatim from the providers, and Ecotrust Canada and the AMN cannot qualify or verify the statements.

Can you describe the basic workflow for processing a referral using this system?

Referral Tracking System (RTS)

RTS manages all activities from the initial receiving of the referral application until the final response is sent. DR Systems assists communities to develop a workflow that considers each communities' unique set of skills and land department personnel. RTS allows all documents, emails and correspondence to be stored indefinitely.

A general workflow includes (but is not limited to):

- Input of referral and all documents received.
- Determine what information is missing and send out an automated letter to the proponent requesting any missing information.
- Send out an automated letter acknowledging receipt of the proposal and, if desired, an invoice for First Nations costs related to initial processing and review of the proposal.
- Set up lists and timing of tasks related to the referral. This may include internal reviews, field review/ data collection, meetings and any on-going monitoring requirements.
- All correspondence received or sent are stored with the application.

- Use customized templates for creating/sending response letters.
- Mark file as closed – leaving it available for cumulative analysis.

LOUIS Toolkit

The workflow in LOUIS Referrals is largely user driven. Someone submits a proposal, the proposal is assigned to a user and process template and the template steps are followed. The submission of the proposal to LOUIS can be done by community staff or by a proponent. When proposals are assigned to a user and template the system walks staff through a process to validate contacts and identify possible duplicates (spatially and by reference code). After a proposal is assigned to a user and template the number of steps and the complexity of the analysis depends entirely on how the community has configured its templates. It is relevant to note that it is possible for users to go back and repeat steps or groups of steps as needed and LOUIS Referrals will automatically create versions each time a step is repeated to provide a complete historical record of the process. It is also worth noting that any number of templates can be created and that existing templates can be duplicated and modified if a community wishes to make changes to the processes.

Trailmark

The basic workflow inside Trailmark is flexible and simple. The community administrator has control over a flexible and easy to use form builder, with which he or she can create any number of referral forms. Where many developers have struggled with the workflow around this point – what fields should we have on our form, given that works under the Fisheries Act and Heritage Act, for example, have different parameters? – we came up with a simple solution: build as many forms as you like, and assign the right form to each proponent. The community administrator creates accounts for proponent logins and invites the proponent to log in via email that Trailmark tracks. The proponent logs in via a secure portal, and selects the form, uploads their referral, and either saves it as a draft for later work, or submits it. At the community side, the Admin receives notices of a referral upload and reviews the application. He or she can request revisions or generate correspondence to the proponent at any time. Once the referral is accepted for consideration, the Admin can run analytical reports on the material uploaded, can export those reports for others, or invite comment. After the referral has run its course through the internal review process, the Admin generates another email to the proponent.

Cedarbox

We largely support the workflows that our clients have set up (often with Government partners), but here are some typical steps:

1. Create project/application record in Cedar (Quick or XML upload)
2. Print out referral files -> put letter in a paper folder

3. Create folder in Shared Drive > Cedar > Projects > 2017 folder labelled: #### (just the number) -> save-all email attachments to this folder
4. Add details to the Project (cut/paste from government files)
5. Email government and proponent contacts with MailHarvest code and cc email: "use this code, use this cc email, this is missing"
6. Upload Location (Shapefile, Geomark) and run Spatial Reports (canned proximity reports against dozens of GIS layers)
7. Add notes to Discussion tab
8. Print our Project report and add to paper folder
9. Email manager, saying they can find the project in 3 places (paper, shared drive, Cedar)
10. You can see that Cedar is just one (important) part of the suite of tools we train folks to use, together as a Team, to smoothly deal with hundreds of requests for comment by Proponents and Government.

Custom workflows? Sure, if they have an engagement framework, for example, then they can use our project tags and custom checklists to track engagement level discussions. Later in 2017, we will launch our Portal service which will allow Government reps to submit referrals that will be transferred over to client Nation's Cedar, with notifications going out all around. This will greatly reduce steps 1 and 4, which can be quite time consuming.

Stó:lōConnect

Our workflow is rather complex due to the nature of our Strategic Engagement Agreement with British Columbia, but in a nutshell a file is submitted to our office either directly via Stó:lōConnect or by email, it is checked over and mapped by our staff, communities and staff are assigned to the file and it is then published out for review. Our review is a 3-stage process, and the report is generated within the system. Upon completion the report is sent out to the statutory decision maker at BC, who then makes their decision, and informs us at the PRRO of that decision which is then also entered into Stó:lōConnect, to allow of Consensus Decision Making tracking. This critical final element is unique to Stó:lōConnect, as I understand it.

Stewardship Planning Portal

1. Administrator establishes a username and password for employee of a land use proponent (or Government employee) – this isn't done until a funding arrangement is established whether flat monthly fee, fee for service, or annual contribution agreement. (We don't charge a flat fee per referral. We have found longer-term arrangements give the stability we need to train and keep staff instead.
2. The proponent logs into the system, and initiates a referral by completing the data entry on a form.

Forms are custom built to accommodate a proponent's specific Portal use (Forestry form for logging referrals, TSA form for referrals from BC, Mining form for mineral extraction / exploration companies). Proponent uploads, to that form, appropriate documents and shapefiles: a map(s) showing project area or access route (PDF), shapefiles of project itself (ArcGIS shapefile format *.shp, *.dbf, *.shx), Word Document(s) with context / mitigation strategies, spreadsheet of timber type details, photos, etc.

3. Proponent reviews and adds permissions, email notifications if necessary. Optional capability to [review] this submission in draft exists to accommodate review and addition of other information from multiple users. Proponent then submits.

4. The system generates an email to say the information was successfully submitted. This helps with record keeping both for the proponent (or BC Government staff) and for us at TNG.

5. Submissions are assigned in a weekly meeting every Monday. Prior to this meeting, a list of new Referrals is created (generated by a search of the Portal database by date submitted). These new referrals are distributed to Referral Workers based on geographic area, workload, industry familiarity etc. Timelines commence based on pre-arranged levels if this is a BC Government Referral. Stewardship Assistant then assigns the new referrals in the Portal generating an email notifying Referral Worker that they have been assigned a file.

6. Referral worker assigned to a referral reviews, in the Portal, the content and documents that the proponent has submitted. They may review TUS data spatially within the mapping agent of the Portal in conjunction with the shapefiles uploaded. They may assess adjacent land use referrals in the system or within our datasets on the mapping agent, they may query prior proposals done in the area, and search other submissions that may be similar and compare recommendations …. (these are the important human aspects)…. The Referral worker assesses and plans the work required based on what is learned in this initial review. The Referral worker likely schedules a field visit (may take community members along) and/or a community visit to discuss with elders/leadership and get a sense of their comfort level etc. They may request additional mapping analysis / presentation of data by GIS Analysts at TNG – this is done OUTSIDE the Portal using ArcGIS.

7. Note: Our TUS data is loaded into the Portal and viewable through map layers. TUS data is NOT DOWNLOADABLE by anyone, and is NOT VIEWABLE by proponents, government employees, etc. All six chiefs have to sign a document allowing each person to have TUS viewing permissions in the Portal prior to their username being set up to enable TUS viewing.

8. To prepare a response, The Referral Worker completes the data entry, and document submissions to support their recommendations, in a General Communications form. This submission will be tied to the original submission by linking to the Portal ID of the "Parent Submission." This would be called an "Amendment" or "Child" submission. There can be as many amendments to a Parent submission as is required allowing for the back and forth exchange of information. This submission may be only a request for a field visit, to report the outcome of a phone conversation, a recommendation, or a final report with documents, maps, letters and closing comments. These comments may include recommended boundary adjustments, photos, reports, and spreadsheets, or maps) Worker ensures that the Portal notification system will email the proponent directly so he/she knows to retrieve the workers' comments from the Portal.

Lightship

Lightship's proponent management module streamlines and consolidates the referral process by enabling the attachment of files, correspondence, geographic data, and tasks to a single view. Users can also create custom workflows (series of tasks) in Lightship, and have the system add that workflow to any new referral project.

While the following steps generally describe the process used by most of our current clients, it's important to note that Lightship does not require communities to process referrals in a specific way. The application was designed to give communities freedom to continue using their preferred method, and simply use Lightship as a tool to help organize their information. If a new process is adopted, Lightship will support their new workflow.

The general steps for processing a referral are:

1. Referral can be received by email, fax, mail etc., or submitted directly by the proponent using a secure form (unique login per proponent).

2. When received, a technician will review the submission package, look for file numbers or other key identifying information, and then search for these in the existing referral system. The technician will also compare any geographic locations or boundaries that are provided to determine if a submission already exists. If the file exists, this new information is added to the existing file.

3. If this is a new submission, the technician will create a new referral entry, recording the proponent, the category (oil and gas, water, etc. - this list is customizable), a brief description of the submission, then enter in file numbers and other keywords to optimize searchability.

4. If relevant, the technician will upload any geographic data provided (shapefile, kml, gpx, shps, etc.) and also attach any pdf or other documents that are included with the submission. Geographic data will automatically show up on a map in two ways: individually for the current submission, and also as part of a cumulative map, showing this submission in context of all existing submissions (cumulative effects).

5. Once the submitted information has been loaded, the technician can add and assign individual tasks or pre-defined workflows. For example, a workflow involving an office review, field recce, reporting, and invoicing can be chosen and applied to the submission. Each task can be assigned to the relevant staff. Workflows are defined by the end client, and are completely customizable to match the policy and processes already used in your department.

6. Staff complete their assigned tasks, adding notes and other information to the digital file. Staff can receive email reminders of pending tasks for the coming week.

7. The final report or response can be loaded to the system and sent to the proponent. Once complete, the referral remains permanently searchable on the map, or by keywords.

Community KnowledgeKeeper (CKK)

The CKK can be configured for multiple workflow processes depending on both a First Nation's requirements and the type of project under review. For example, a proposed access road may have a simple workflow with only a few steps whereas an environmental assessment will have numerous steps with multiple timelines and reminders.

Most referral reviews start with either Industry or Government logging into the CKK through limited-access accounts to submit a referral. (Alternatively, a First Nation's staff member can enter a referral into the CKK.) A referral submission is completed through a simple form with spatial information and documents attached.

Each referral submission sends an email to the designated person at the receiving community and emails a PDF copy of their referral submission to Industry or Government. The designated community staff member receives a link to the referral in their notification email. Simply by clicking on the link, they will be brought to the referral page in the CKK, which provides all the information on the referral as well as an interactive map featuring the referral project footprint, community land use data, and map layers (protected areas, animal habitats, reserves, etc.).

The CKK completes instant analysis of all potential community concerns based on the repository of community and government data available within the CKK.

Customized workflow steps for the review of the referral provide staff, community members, or consultants with notifications and a process for assessing effects and easily documenting them within the CKK.

Response letter templates are used within the CKK to assist with writing and responding to each referral. Upon completion of the review steps, reviewer comments populate a templated response letter, where further edits can be made. The final response letter is then emailed to the proponent and pertinent government agency as a PDF. The whole process of referral submission, reviews, and responses are tracked and recorded within the CKK to provide a detailed consultation record.

How does this system handle spatial information? Can you describe the mapping capability?

Referral Tracking System (RTS)

Using existing GIS layers, the user can view the location of the referral in relationship to community concerns. RTS queries provide a more in-depth knowledge of concerns, meetings, correspondence and discussions.

LOUIS Toolkit

LOUIS Referrals provides the means to upload spatial data and use data from other LOUIS modules (Heritage for traditional land use specific data and Layers for other GIS data). The analysis is vector based (buffers, intersections, etc.) and either simple or more complex analyses are possible depending on how the community has configured their templates. By default spatial analysis steps are run automatically once the process reaches that step in the template. Mapping within the Referrals module allows for adding other layers from different sources to create PDF maps up to 24 x 36 in size for printing. An additional general use mapping tool is also provided.

Trailmark

Trailmark is a very flexible GIS. Trailmark ingests kml, kmz, and shp files. It takes in spatial data from multiple platforms: mobile data, GPS tracks, geolocational desktop surveys, standard GIS layers, etc. It is used for direct-to-digital mapping of individual traditional knowledge interviews and for digitizing archival material as well. All spatial data can be queried and analyzed from multiple vantage points throughout the system.

Cedarbox

We can have any number of polygons, lines and points to define a Project/referral location: coming in as Shapefile, Geomark, KML/KMZ, Lat/Long and Draw-on-map. Spatial data to be used in Spatial Reports come from Heritage App (e.g. TUS Project 123 summary), Development App (e.g. all other projects, traditional territory, planning polygons), or Ecosystems App (sensitive streams, habitats, etc.)

Stó:lōConnect

Stó:lōConnect requires GIS Technicians. Every referral file must be mapped in ESRI Shapefile format. Moreover, Stó:lō cultural and heritage interests must also be mapped to allow for the GIS analysis that

results in our semi-automated report production. Here at the Stó:lō Research & Resource Management Centre we have two GIS Analysists and one GIS Technician.

Stewardship Planning Portal

As mentioned above, the Portal uses Map Layers to view spatial data. Map Layers can handle WMS data served up by the BC Government, and the TNG server. Shapefiles loaded into the Portal as submissions have to match certain schema (shapefile structure/attributes for consistency) to ensure data is standardized and relatable. All layers can be turned on or off, and sorted to be viewed usefully in conjunction with other datasets. Zooming in and out, and querying datasets (either individually or drill down), and measuring distance/area is also possible in MapLayers. Printing maps created in a MapLayers session is improving.

Lightship

Lightship is a comprehensive web mapping and proponent management application that supports all common GIS data formats, while also enabling users to create new data using custom-built data collection forms.

Lightship's user interface was designed with all levels of user in mind; staff without extensive GIS training can effectively administer and use the application with minimal training. Geographic data that is provided with a referral submission can be uploaded and immediately visualized on a base map or high-res satellite imagery. Lightship also allows management and visualization of other GIS data, including land use plans, value mapping, land use, and occupancy data so that all relevant information for decision making is located in one view.

Layers can be quickly customized to create the views and styles needed for each community. Multiple topic-based maps (e.g. wildlife, fisheries, land use and occupancy) can be created, allowing a fast and effective review of all values in relation to the new submission. Data can be live linked to the BC Government database, or use locally hosted data from the community.

Community KnowledgeKeeper (CKK)

The CKK is designed to be user friendly with numerus interactive maps that display community data, research data, map layers, and referrals. The CKK is used to store and visualize multiple types of spatial data, run queries against them, and import/export data. The CKK accepts Google Earth KMLs/KMZs and GIS Shapefiles.

How does this system analyze and present potential impacts of the referral?

Referral Tracking System (RTS)

While GIS views give a visual representation of all the applications in an area of interest, RTS queries provide more in-depth knowledge of concerns, meetings and discussions.

LOUIS Toolkit

Spatial analyses are defined in the user created templates. It is recommended that communities go beyond simple site-specific conflicts but export site-specific data and get a spatial analyst to create a feature density layer, which can then be uploaded to LOUIS Layers. This would enable all potential conflicts to be identified not only on the basis of site specific conflicts but also in terms of areas of high density of use. Similarly, identification of concerns based on positions within watersheds or endangered species habitats are also possible and recommended.

Trailmark

The referral information is assessed against whatever the community keeps in its database. The reporting function gives an immediate report of geographies and other data intersecting with the project area, and allows the Admin to draw additional buffers to generate further reports. The intersecting data could include all the rich data held inside the database – spatial data, TU/TK information, mobile and survey data (habitat assessments, harvest reports, etc…), or records associated with geometries. Impacts can be sifted through using feature type and by whatever other attributes have been used to organize the data.

Cedarbox

We help setup uploaded GIS layers into custom Spatial Reports. For example, a Wildlife Sensitivity Report might report against a dozen layers like sensitive streams, frog habitat, nesting sites, etc.

Users can run any referral (with a location) against any report. Report provides detailed proximity between referrals location(s) and Report layers. Report is a nice map and a list.

Stó:lōConnect

We have several mapping layers of various Stó:lō interests. Stó:lōConnect preformed background analysis to partially complete our reports, then our Stó:lō community member staff do similar but manual overlay

analysis to complete the report. These overlays are simplified GIS tasks presented in an extremely user-friendly form, meaning they may be performed without prior GIS training. GIS staff are required to set up and maintain the system, but not required for individual referral review. We call this a 'semi-automated' report. We very much believe there must be human, Stó:lō eyes on every file. We are not interested in a fully automated referral review system, however, partial automated if implemented wisely can reduce workloads and increase efficiencies.

Stewardship Planning Portal

By design, the Portal is a tool to assist personnel with impact assessment. It acts as a database management system for review, retrieval, and communication. It was considered more important that the system be able to permanently store and retrieve the human-generated assessment of potential impacts, thereby always building upon our knowledge base and enabling future review & evaluation for success. The Portal does instantly map the TUS with the referral, decreasing the reliance on our GIS staff to make a TUS map manually for each referral (as had been done prior to the creation of the Portal).

When the Portal was initially designed several factors were considered significant, which lead the designers to not replace the human aspect from the process. These factors were: The incompleteness of our TUS data (based on not all elders being interviewed; not all questions being asked; not all portions of the territory having been prioritized during the TUS project(s) etc.).All these variables and unknowns would contribute significant error to any computer-generated potential impacts assessment tool, and TNG did not want to simplify the process, but rather make the process more efficient. The Portal was never meant to 'replace' the careful consideration of TNG personnel, therefore, TNG never intended to have a computer-generated report. That being said, we do have some standard steps that referral workers take to consider spatial data & potential impacts. Referral workers view overlapping AND ADJACENT TUS spatial data in context with the referral shapes. They also look at Logging history, as well as other Notice of Intent / planned logging for the watershed / general area. They can add an orthophoto backdrop to MapLayers as well, and consider their own unmapped knowledge of the area.

Lightship

Lightship provides First Nations communities with a powerful tool to visualize cumulative effects of proponent activities across their traditional territory. When proponent submissions are loaded, they are instantly added to a cumulative map that shows the location and/or boundary of all other referrals in the system. Each individual submission or the cumulative total can then be easily overlaid on other values including wildlife habitat, sensitive ecosystems, water and riparian areas, archaeological sites, Land Use and Occupancy data, as well as any other important information that could potentially affect the decision-making process.

In addition to the spatial view, interactive reports can be easily created and customized to summarize considerations from any layer in relation to the proposed submission. For example, it is fast and easy to identify and export the information related to forest inventory for a proposed cut block. This can be

completed by a person with no GIS background or knowledge. All notes, trends, and other considerations can be recorded as notes with the submission, ensuring that these considerations will also help to inform future proposals in the area. In this way, the work you do today will help you inform and complete work you need to do in the future.

Community KnowledgeKeeper (CKK)

When a referral is submitted to the CKK, a spatial query is automatically run against traditional use sites and map layers (protected areas, reserves, archaeology sites, land use zones, species habitat areas, etc.) and the CKK instantly shows impacts on an interactive map and as a list with alerts (see CKK map interface screenshot). This list of impacts is prominently viewable on the referral page. Detailed analysis and commenting on impacts to individual sites is also available through the customized Workflow review steps that form part of the review and response process.

How would you describe the cost structures?

Referral Tracking System (RTS)

RTS is a one-time licence purchase that includes installation and on-site training. Clients purchase a small yearly support agreement that provides unlimited telephone support and all upgrades. The annual fee is $1350.

LOUIS Toolkit

The LOUIS Toolkit is a service based solution that includes secure backups and regular updates at no additional charge. Communities select and only pay for the parts of LOUIS that they use. There are no setup fees and training is recommended and offered either on site or in Calgary and charged on a per-day basis. Community staff can be trained to load community data or the LOUIS team can do it for communities on a fee for service basis. LOUIS Referrals fees are based on usage so that if a community is not receiving or processing any referrals, they don't pay anything for LOUIS Referrals. Costs for communities will range from $2000 to $10,000 / year depending on which parts of the LOUIS Toolkit they wish to use and what level of support they want to receive. For further details on pricing please see https://www.louistoolkit.ca/whylouis/pricing.

Trailmark

Trailmark is a pay-as-you go Software-as-a-Service, with prices ranging from $0 for a freemium account to $600 per month for the Enterprise-level service. There are no set-up fees, and no fees for updates. The average cost range over the course of a year ranges from $0 to $6,600.

Cedarbox

We have cloud-hosting and self-hosting subscriptions starting at $199/month. Happy to discuss with Nations. If the instance is self-hosted, there are set-up fees. Updates are included in the subscription.

Stó:lōConnect

Initial development costs were covered by grants. Stó:lōConnect is an open source project, and so a set-up fee is required to customize the tool to any particular nation's unique situation and interests, but there is not a cost for the software itself. Support is definitely recommended. We have a monthly service agreement with CultureCode that has proven its worth time and time again. It has allowed Stó:lōConnect to grow with the needs of the People of the River Referrals Office. The base ConnectEngine is extremely malleable, which I feel is one of its greatest strengths. The system is place today is remarkably more advanced then the initial launch system in 2012.

Stewardship Planning Portal

The Portal software is open-source and the developer, Geoborealis, does not have monthly fees, annual fees etc. The software has been up and running at TNG since 2007. Updates and support have varied over the years from $500 annually to $5000 when we made significant changes based on changing our workflow and including the provincial government as a user-group. As TNG was the original designer of the Portal, and since it is customizable for any organization's needs, installation fees/start-up costs are not set.

One excellent feature is how the economies of scale work in favour of all organizations that operate a Portal. So, as the number of organizations using the software increases, improvements requested by group 1 get rolled out to groups 2, 3, 4, etc. without cost to those organizations. In several instances, 2 or more groups have collaborated together to design a batch of upgrades and have split the cost. Conversations with other developers has lead me to believe that this is NOT the normal business model, and other companies would only roll out improvements to additional groups if those additional groups paid for them just like group 1 did. This is the benefit of a true open source developer.

Lightship

We've structured our pricing to reflect total cost of ownership; setup, training, un-metered support, updates, system maintenance, and bug fixes are included in the subscription cost. Our pricing involves a monthly or annual fee that is discounted based on the length of agreement (1 to 5 year terms). Our platform license for a 3 year agreement is $450/month ($5,400/year), which includes up to 15 concurrent users per day (unlimited user accounts) and includes all capability needed to track referrals and complete work in the field.

This cost also includes all functionality required to support use by the Lands department (land code or otherwise), Public Works and Infrastructure, and Emergency Response. In several communities, we support multiple departments with this single low-cost license, which allows them to have multiple staff that are proficient in the software. It is also important to note that typical training and onboarding periods tend to be quite short; on average, our clients are fully trained and confident using the application in 2-4 weeks.

Community KnowledgeKeeper (CKK)

The CKK is built with open source tools and has no licensing fee. CKK costs are for the hours spent setting up, configuring, training, supporting, and updating an individual installation of the software for each client. There is an initial fee for setup and training, and beyond that, the ongoing cost is the yearly service package, which includes support, software maintenance, hosting, security updates, site usage analytics, and in-person trainings.

Yearly Subscription Package costs vary from $625 - $1,500 per month and includes up to 150 hours of training/support, software maintenance, hosting, feature updates, bi-weekly security updates, and a yearly on-site training.

Annex C

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