

FIELDWORK

The Fieldwork component of a survey generally involves the following activities in performing a legal survey on First Nation Reserve lands:



- Finding and taking measurements to suitable survey monuments in the area, cutting and blazing property lines, where appropriate
- Placing survey monuments at new corners, and/or replacing disturbed or missing survey monuments from previous surveys
- Measuring any encroachments/conflicting interests
- Measuring all features close to the boundaries, such as fencing, buildings, etc.
- Meeting client and/or First Nation project contacts on site
- Addressing concerns/questions from adjoining interest holders.

Considering these activities, a surveyor will take into account a number of factors that may affect the progress of a survey and thus effect the overall cost. To address these factors, some survey projects may require more labour or logistical support to properly conduct the fieldwork portion of the survey. While keeping in mind that each survey project is unique in its own way, certain survey projects may require more labour-intensive activities and or logistical support than others.

The following cost drivers related to fieldwork, which will be further addressed include:

1. Logistical Requirements (travel to site, local accommodations & meals);
2. Terrain, conditions, specific requirements (ie. line cutting, creek crossings, swamps);
3. Existing Survey Fabric – condition/age of evidence (some external boundaries are old and evidence is harder to find, i.e. wooden posts);
4. Time of year;
5. Licencing Requirements of the surveyor (fewer surveyors are both Canada and Provincial Lands Surveyors);
6. Extent of Labour required for the type of boundary surveyed;
7. Clarity of the Scope of Work.

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1. LOGISTICAL REQUIREMENTS

Depending on the location of the survey, the following logistical requirements will need to be considered for the fieldwork to be performed effectively, efficiently and safely.



Photo Courtesy of Mark Shannon & McElhanney Consulting Services Ltd.

a. Travel to/from and while on the Project Site

Most projects will require some form of travel to transport a field crew to and from the project site. Depending on the location of the site, some travel will require different modes of transportation to mobilize and demobilize crews and equipment. Air travel may be involved and chartered flights can notably increase the cost of a survey. Terrain and season of the year, may also determine the different forms of local transportation required to complete the survey safely and efficiently (ATV, boat, snowmobile, helicopter, etc.)

Almost 1/3 of the projects analyzed in the Cost Study reported that equipment and travel expenses totalled over \$1000 per project.

b. Accommodations and Meals

If a project requires a substantial distance to travel to the site, then meals and accommodations for the field crew must be considered. Depending on the duration of the project, certain cost-effective options may be available depending on the local resources. Remoteness can play a big factor in the cost of a survey in terms of accommodating a field crew.

In remote communities, the cost of food/meals/accommodations can be expensive, which is something that can make this cost driver difficult to adjust or mitigate.

Recommendations

- Hiring local survey assistants could help in the reduction of the survey costs in many ways. Some additional training (i.e. safety related) may be required for the local assistants, which in turn may add to the overall project costs. Although the up-front costs for these services may be significant, the costs in the long term could be reduced, as safety certifications generally last for a couple of years and the use of previously trained assistants will allow the surveyor to use local help in future surveys (without charging out for the surveyor's own staff).

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- Hiring local survey assistants or cutters can reduce costs by not having to pay for travel, living allowance and accommodations for another crew member. This also supports the local economy in the area, as well as getting community members involved in some of the local projects.
- Grouping survey projects into one trip will reduce the amount of mobilizing & demobilizing costs of a field crew.
- First Nations' resources can be used to lessen costs by providing boats, ATV's, snowmobiles, chainsaws, etc.
- Setting up a local camp or arranging some form of lodging where meals are provided may be a cost-effective way to accommodate a field crew.
- For certain projects, helicopter support may be necessary, but the costs can be offset through careful planning by the client. For example, using a helicopter for multiple projects while it is on site could significantly reduce the costs in mobilizing and demobilizing a helicopter.



2. TERRAIN, CONDITIONS, SPECIFIC REQUIREMENTS (E.G. LINE CUTTING, WATER CROSSINGS)

Only a small percentage of projects require line cutting and blazing. The ones that do can be significantly more expensive due to the amount of labour required to perform the activities. The number of hours devoted to cutting and blazing accounted for as much as half of the total labour for the project when distances requiring cutting exceeded 500m. However, line cutting and blazing serve a purpose in terms of clearly demarcating the boundaries and protecting the survey monuments from destruction. Cutting and blazing a boundary, where it is practical to do so, could reduce costs of future surveys and/or the future number of surveys required. Varying terrain can influence the production of a survey. Steep terrain and densely treed areas will obviously have an effect on the time it takes to complete a survey, as compared to flat, open terrain. Experienced surveyors can usually approximate the amount of time a survey may take based on the terrain, determined from aerial imagery or based on their familiarity of the area.

Recommendations

- Land Managers should offer local knowledge of the project area to surveyors to help reduce the costs by directing field crews as to where the best access can be acquired. (i.e. ATV trails, seasonal conditions that may affect access)
- If line cutting isn't a requirement but a First Nation still desires to have it carried out, an agreement could be negotiated with the surveyor. The boundaries could be flagged/identified by the surveyor, and the First Nation could have their own line cutting crew clear the boundary line.

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3. EXISTING SURVEY FABRIC – CONDITION/AGE OF EVIDENCE

The survey fabric is comprised of the survey evidence that defines a parcel or boundary on the ground. Survey monuments and supporting marker posts (or other ancillary monuments) placed by surveyors are used to mark the boundaries of a surveyed parcel of land. The poor condition of, or missing, or disturbed evidence along a boundary line can have a significant impact on labour inputs.



A surveyor tries to determine the potential state and probability of finding survey evidence when costing a survey, based on several factors, such as:

- Date of the original survey (likelihood that the monumentation/boundary evidence could still be found),
- Type of monumentation and ancillary monumentation (wood posts, iron post, rock posts, bearing trees, etc.) placed at the time of survey,
- Development or maintenance (i.e. new roads, utilities, snow removal) in the area,
- Changes in the landscape (i.e. flooding, erosion, land slides, etc.).

Based on the state of these factors, a surveyor may be able to confidently determine the required work that will need to be completed to establish, restore or re-establish the boundaries. However, sometimes unforeseen circumstances can arise leading to additional work (costs) that were not originally anticipated.

Recommendations

- Informing members, developers, etc. of the importance of surveys and that the protection of survey monuments should be paramount for all projects.
- Determine if “delayed posting” would be a beneficial part of the survey process (survey monuments are not placed until development or earth work is complete).

4. TIME OF YEAR



The time of year field work is performed can have a substantial impact on the planning of a survey project. Certain tasks performed in the winter will be more labour intensive than those same tasks performed in the summer. However, according to the cost study report, the time of year does not play a significant factor in the amount of time that is required to perform the activities necessary to produce surveys. Generally, the work requires the same amount of time year-round. This is mostly attributed to the fact that surveyors will advise on and select the most appropriate time of year to accomplish the work efficiently.

Recommendations

- Select a surveyor with a substantial amount of experience in the region to allow for a more accurate idea on the time of year a project should be conducted.

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5. LICENCING REQUIREMENTS OF THE SURVEYOR

For surveys involving interior boundaries, a surveyor must be commissioned and licenced as a Canada Lands Surveyor (CLS). A survey of a common boundary with Provincial lands (jurisdictional boundary) will need to be conducted by a surveyor who has a license to practice surveying in that province and is also a CLS.

Recommendations

- The surveyor hired, could be licenced in both jurisdictions (Canada and Provincial) for any projects, as there may be unforeseen work along a jurisdictional boundary.

6. EXTENT OF LABOUR FOR THE TYPE OF BOUNDARY SURVEYED

Jurisdictional boundary surveys can cost more than internal parcel surveys or right-of-way surveys. According to the cost study, on average it took over three times the total number of hours of labour to produce jurisdictional boundary surveys than either parcel surveys or rights-of-way surveys. *“This might be explained by the requirements to tie into both Provincial and Federal monumentation, which essentially doubles the distance surveyed.”*

7. CLARITY OF THE SCOPE OF WORK

The clarity of scope of work can have an impact on the cost of surveys. The cost study report indicates that the average total labour was 31% higher when the scope was not clear for the project. Clarification of the type of survey required for the intended transaction, prior to the field work starting, is key to ensuring the project outcome is what was expected and needed.

Recommendations

- Good communication with the surveyor and other stakeholders in the project will be key in ensuring that the project is completed as efficiently as possible. Frequent communication between the surveyor and Lands Manager will enable clarity in the scope of work amongst all parties involved.
- Local knowledge provided by the Land Manager can often reduce the time and potential hazards for the surveyor. Land Managers should discuss the project and their knowledge of site and survey conditions thoroughly, prior to issuing a contract.
- Utilization of local resources (survey assistants, accommodation, meals and transportation rental) can reduce costs and increase First Nation capacity.



Photo Courtesy of Kim Stallknecht & McElhanney Consulting Services Ltd.