COST DRIVERS

FIELD WORK

The Field Work component of a survey generally involves the following activities in preparing a legal survey on First Nation Reserve lands:

- Finding and taking measurements to acceptable survey monuments in the area,
- Cutting and blazing property lines,
- 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,
- Meeting client and/or First Nations Authorities on site,
- Addressing concerns/questions from abutting homeowners.

Considering these activities, a surveyor will take into account a number of factors that may affect the performance of a survey and thus effect the overall cost of the survey. To address these factors, some survey projects may require more labour or logistical support to properly conduct the field work 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;
(2) Terrain, conditions, specific requirements (i.e. line cutting);
(3) Existing Survey Fabric – condition/age of evidence (some external boundaries are old and evidence harder to find, i.e. WO's);
(4) Time of year;
(5) Licencing Requirements of the surveyor;
(6) Extent of Labour for the type of boundary surveyed;
(7) Clarity of the Scope of Work.

FIELD WORK

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.

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 maybe involved and private air travel can markedly increase the cost of a survey. Terrain and season of the year, may also determine the different forms of 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 will need to be considered. Depending on the longevity 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 for certain transportation, that will be required to conduct the survey. To ensure that local assistants meet the current safety standards and that they have a basic understanding of surveying, training for the local staff may be required. However, this training will have costs associated with it. 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).
- Hiring local survey assistants or cutters can reduce the cost in terms of not having to pay for travel, living out allowance and accommodations for another crew member. This also supports the local economy in the area as well as gets community members involved in some of the local projects.
- Grouping survey projects into one trip will reduce the amount of mobilizing and 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 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 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.

FIELD WORK

2. Terrain, conditions, specific requirements (i.e.: line cutting)

Although only a small percentage of projects require line cutting and blazing, the ones that do can significantly increase the cost of the survey due to the amount of labour input 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 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 from aerial imagery or potentially a familiarity of the area.

Recommendations

- Offering local knowledge of the project area to surveyors could 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.

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:

- Timeframe 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. snow removal) in the area,
- Changes in the landscape (i.e. flooding, land slides, etc.).

Based on the state of these factors, a surveyor may be able to accurately 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 put in until development or earth work is complete).

FIELD WORK

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.

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 cost more than 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 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 risks of 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 and transportation rental) can reduce costs and increase capacity.