

Carcross Alternate Access Options

Prepared for

**Yukon Community Services
Community Development Branch**

**Final Report
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by Challenger Geomatics

Drawings:

Overall Zoning Plan

Overall Plan and Access Options

1.0 Introduction

Quest Engineering Group Inc. was retained by Community Services to review the potential for alternate access options for the community of Carcross.

This letter report outlines the scope of work that was completed to develop conceptual alternate access options from the Klondike Highway corridor to the community core.

Quest retained the services of Challenger Geomatics to review the land tenure and provide a record of land ownership in the adjacent area. (see Appendix).

2.0 Scope of Work

The following tasks were carried out to develop the conceptual alternate access options:

- a) review of existing land tenure in the adjacent area by Challenger
- b) compilation of existing base information including cadastral survey fabric, existing surface features mosaic, and the existing proposed development plan for the Four Valley Resort.
- c) identification of land tenure on the overall base plan.
- d) Review of existing land use and zoning. (Overall Zoning Plan in Appendix)
- e) preparation of draft conceptual access alignments using mosaic base plan.
- f) Site visit and walk-a-bout to confirm access proposed access geometry and suitability.
- g) preparation of a conceptual access alignment options plan (attached)
- h) review of environmental concerns which could impact access options
- i) preparation of this summary letter report.

3.0 Discussion of Options

Based on a review of the existing Klondike Highway geometry in the area adjacent to Carcross, suitable access points were identified which could provide the required 305 m horizontal sight distances, as recommended by the Transportation Association of Canada for a 90 km/hr travel speed.

Four potential access points were identified, and are shown on the attached Options Plan, identified as Option 1, 2, 3 and 4.

Working from the highway, four access alignment options were developed, to intersect with existing roadway right-of-ways in the community of Carcross.

Land tenure was reviewed for each option to limit the impact on the number of land owners to be dealt with, for each option.

Existing Land Use Zoning was reviewed for each proposed access option.

Following is a discussion of each option, as shown on the attached overall plan.

Option 1:

Option 1 commences at the Klondike Highway creating a new 4-way intersection at the existing Tagish Road intersection. The proposed alignment crosses Yukon British Railway property Lot 3 remainder. It intersects and crosses an existing YTG road allowance, intersects and crosses the British Yukon Railway right-of-way, and crosses the northern limit of British Yukon Railway property Block 50, then continues west across commissioners land to an intersection with the existing Tagish Avenue right-of-way. The road would be constructed in the existing right-of-way, which is the only through right-of-way, connecting to 4th Street next to the existing school. This alignment could provide access for additional residential development along Tagish Avenue.

The intersection point with the existing road allowance and the railway right-of-way is close to perpendicular, which provides good horizontal and vertical sight distance in both directions.

The area between the Klondike Highway and the existing YTG road allowance is a low area which would require fill and embankment construction. The area to the west end of Block 50 rises sharply to intersect the Taku Avenue right-of-way, and some surface rock was noted in the area.

The existing topography and surface features appear to be suitable for a roadway alignment, with some cut and fill, and possible blasting.

The existing Zoning in the vicinity of Option 1 is Hinterland.

The approximate length of Option 1 is 1.3 km.

Option 2:

Option 2 commences at the Klondike Highway creating a new tee intersection at north of the existing Tagish Road intersection. The proposed alignment crosses Yukon lands, and intersects an existing YTG road allowance. Option 2 follows the existing road allowance alignment to a point where it would meet the proposed Option 1 alignment, and cross the railway alignment and Block 50, following the same Option 1 alignment.

The intersection point with the Option 1 alignment and the railway right-of-way is close to perpendicular, but right turns would experience a restricted view of the railway alignment to the north. This could be mitigated by having a stop control crossing of the railway.

The new tee intersection with the Klondike Highway is on a crest vertical curve which may restrict vertical sight distance. A more detailed review of the existing highway profile is required to determine if suitable sight distance is available.

The existing topography and surface features appear to be suitable for a roadway alignment, with some cut and fill, and the majority of the new access road would follow the existing road right-of-way, which is already developed.

The existing Zoning in the vicinity of Option 2 is Hinterland.

The approximate length of Option 2 is 2.23 km.

Option 3:

Option 3 is shown with 2 sub-options for the intersection connection at the north end. One option commences at the Klondike Highway creating a new tee intersection with the highway. A second option intersects the proposed Four Valley Resort access road, if it is built first.

The proposed alignment crosses Yukon lands, and runs parallel to the existing railway right-of-way, continues across British Yukon Railway lands Lot 4 remainder, and intersects the existing Tagish Avenue right-of-way. The road would be built along Tagish Avenue to 4th Street as with Options 1 and 2.

The new tee intersection with the Klondike Highway would provide adequate horizontal and vertical sight distance for highway traffic, but horizontal sight distance to the south on the railway line may be restricted. This may be mitigated with additional clearing along the railway right-of-way.

The existing topography and surface features appear to be suitable for a roadway alignment, with some cut and fill, and the majority of the new access road would parallel the existing railway right-of-way, to reduce the impact on the open space area. Note that this option would have the greatest impact on the existing dunes area.

The existing Zoning in the vicinity of Option 3 is Hinterland.

The approximate length of Option 3 is 3.14 km.

Option 4:

Option 4 commences at the Klondike Highway approximately half way between the existing community access and the Tagish Road intersection, creating a new tee intersection.

The new tee intersection with the Klondike Highway would provide adequate horizontal and vertical sight distance for highway traffic.

The intersection point with the existing road allowance and the railway right-of-way is close to perpendicular, which provides good horizontal and vertical sight distance in both directions.

The proposed alignment crosses British Yukon Railway lands and connects to an existing crown owned Lot 25 at the end of the existing cul-de-sac. There is existing residential development on the adjacent lots. The existing lot is used as a trail to access the surrounding undeveloped area on the British Yukon Railway lands.

Option 4 may be more suited to a controlled emergency access, rather than a full time access, due to the nature of the surrounding residential development. A new full time access may create a lot of through traffic in the existing residential area.

The existing Zoning in the vicinity of Option 4 is Commercial and Institutional.

The approximate length of Option 4 is 0.23 km.

There is insufficient topographic mapping to create reliable profile information for reviewing vertical grades. More detailed mapping, or a GPS survey of the proposed centerline profiles is required, to prepare preliminary designs and more detailed cost estimates.

4.0 Review of Local Environmental Concerns

Discussions were held with YTG Department of Environment officials to review local environmental concerns and possible impacts of access development.

The local dunes area is an environmentally sensitive area, and a very important feature to the local residents, and the Yukon as a whole.

The impact on wildlife in the area would be minimal. Wildlife use of the area is fairly limited due to the surrounding residential development.

The dunes area provides a unique climate and is the site of a very rare sage species. Protection of the sage habitat would be an important consideration.

5.0 Order of Magnitude Cost Estimates (Class D)

Order of Magnitude cost estimates for the four options are as follows:

a)	Option 1,	1300 l.m. @ \$450/m	\$ 585,000
b)	Option 2,	2230 l.m. @ \$450/m	\$ 1,003,500
c)	Option 3,	3140 l.m. @ \$450/m	\$ 1,413,000
d)	Option 4,	230 l.m. @ \$450/m	\$ 103,500

Order of magnitude costs are based on the following assumptions:

- a) right-of-way width is 30 m.
- b) roadway width is 8 m top, c/w BST surface
- c) clearing, grubbing and stripping @ \$2.5 / sq.m. = \$75/l.m.
- d) common excavation @ 10 cu.m. / l.m. @ \$7.5/cu.m. = \$75/l.m.
- e) Gran E sub-base @ 0.3 m depth, 3 cu.m./l.m. @ \$12/cu.m. = \$36/l.m.
- f) Gran A surface @ 0.15 m depth, 1.5 cu.m./l.m. @ \$ 20 /cu.m. = \$35/l.m.
- g) BST surfacing @ 8 sq.m./l.m. @ \$7.5/sq.m. = \$60/l.m.
- h) Roadway construction costs = \$285 l.m.
- i) Culverts and signs @ 10% of road construction = \$30/l.m.
- j) Legal surveys @ 10% of construction costs = \$30/l.m.

- k) Engineering and Contingencies @ 30% = \$105/l.m.

Total Roadway Development costs @ \$450/l.m.

Note: Cost estimates are based on information gained from site observations, with no detailed survey or quantities. Estimates should be considered Class D (+/- 30 %).

6.0 Conclusions and Recommendations

All four options appear to be feasible for alternate access routes from the Klondike Highway to the community core.

Option 1 is the second shortest option, provides the best intersection locations, and horizontal and vertical sight distance requirements appear to be suitable. Option 1 has limited impact on the surrounding area. Option 1 would appear to be the second lowest cost option.

Option 2 is the third shortest option, and has the least impact on existing private land ownership. Option 2 utilizes the existing YTG road allowance to a great extent.

Option 3 is the longest option, and has the greatest impact on the existing surrounding area. Option 3 may result in an undesirable intersection location, being close to the existing Watson River access intersection.

Option 4 is the shortest option, with the assumed least cost. Option 4 may result in unwanted through traffic in the existing residential development.

Each of Options 1, 2, and 3 could provide access for additional residential development along Tagish Avenue, with excellent waterfront views.

A more detailed review of the existing topography is required to determine road centerline profiles and grades. The available surface mapping is insufficient to determine accurate profiles. A visual inspection of the alignments indicates that the vertical grades would be acceptable for rural access road development.

A GPS survey should be completed for the alignments, to confirm the vertical profiles, and horizontal sight distances, prior to making a final decision on the preferred roadway option.

Discussions should be engaged with the British Yukon Railway to determine their willingness to allow access and development across their land holdings.

7.0 Report Certification

Quest Engineering Group Inc.

Rick Savage, LL(Eng)

Appendix

Overall Zoning Plan

Land Tenure Documentation

Overall Plan and Access Options