

## **Fox Mountain Bike Trail Upgrade Project Plan**

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### **Introduction:**

This project aims to provide a route for mountain biking with a smooth and wide downhill trail and relatively direct uphill trail. The intent is to create a high-use trail, therefore the best existing parking areas on the trail network were chosen. The selected area is central to the City of Williams Lake with nearby food, drink, and accommodations.

These types of downhill trails have become exceptionally popular in other communities and Williams Lake has experienced an introduction to this success with the rebuild of the Foxfire trail on Fox Mountain. These wide and smooth downhill trails are known as flow trails and are typically built by machines (excavators and skid steers). This project plans to construct one new machine built trail and upgrade other existing trails (AK 89, Upper Section of Mitch's Brew, Zambonee, Lower Section of Aflo, and TDC) on the Fox Mountain trail network to provide one cohesive downhill flow trail from the existing parking lots on Ross Road and the Tourism Discovery Centre (Broadway Avenue). Ideally, existing trails would not need to be used for this project. However, the trail network surrounding Williams Lake has a long history and is extensive, covering most of the area available for trail construction. Efforts were made to find a suitable location for a new downhill flow trail, however this was not possible given the limited access and potential conflict with adjacent landowners at parking areas on Fox Mountain (Murre and Dixon Roads), First Nations interests on South Lakeside, and limited terrain on Westside (too steep). Another reason for choosing to refurbish existing trails is the fact that the Williams Lake trail network is already vast, and many trails do not receive much maintenance. Refurbishing existing trails allows existing trails to be made more enjoyable and sustainable to long-term use.

### **Detailed Work Plans:**

Detailed work plans for each section of trail are provided below and KML files are attached for geographical reference.

**AK-89 (850 metres total, woodwork = 33 m, machine build = 817m).** This is an existing trail beginning from the parking lot on Ross Road. This trail has many exposed roots and wet areas (puddles and mud) making it prone to maintenance and degradation. This trail is already quite wide and disturbance required to turn it into a flow trail is relatively minimal. Approximately 10 live trees are proposed to be removed where required to maintain speed and improve sightlines. Aside from the proposed wood features, the entire length of the trail will be excavated and rebuilt to produce a smooth, raised tread allowing for proper drainage to reduce further maintenance requirements. This approach will be similar to that used on the rebuild of Foxfire. Dirt work is proposed at the first skid road /ATV trail crossing approximately 250 metres down slope from the Ross Road parking lot. This is also where two other trails (Chicken Scratch and AK Connector) merge with AK89. This feature will address a long-standing wet area and also allow ATV/light truck crossing. It will be quite wide (3 metres) to allow merging of existing trails and quite high (50 cm) to allow proper drainage. Donated dirt can be trucked in using pick-up trucks if local dirt is not available. A simple 60 foot (18m) boardwalk and a complex 50 foot (15 m) stunt (rollers/jump) will be built over two perpetual wet areas. Existing berms will be rebuilt using excavation and local dirt.

**New Singletrack Upline (687 metres, all hand build).** AK89 is also a popular route for riders heading uphill towards the Ross Road parking lot. To alleviate conflict between up and downhill riders a new single-track trail is planned to be constructed. This trail will form an uphill route starting from the TDC, (start on the TDC trail, onto the Goat Trail/Sudz, Up Jimmies Fox, Kracker Jack, back onto Jimmies Fox, onto 3 Little Pigs, and finally onto the new single-track up line). This trail will be built using hand tools.

**Upper Section of Mitches Brew (387 metres, 54m woodwork, 333m machine build):** Planned work will occur on the top section of Mitches brew from the meadow to the intersection with Zambonee. Excavation will occur through the meadow section to the top of the first hill. A 85 foot (26 m) long feature (rollers, jump) is proposed to cover the perpetual wet area downslope of the first hill (extensive exposed roots and puddles when wet) and a 75 ft (23m)

boardwalk is proposed is proposed to cover the low lying wet area at the bottom of the hill. The 50 ft (15m) wooden run-in is planned to be rebuilt to be wider and have hand rails. Wood will be salvaged from the existing feature.

**Zambonee (301 metres, all machine build):** This entire trail is in a state of disrepair and the plan is to excavate and build many berms and jumps using local dirt using a mini-excavator.

**Section of Jimmies Fox (157 metres, machine build = 157 m, hand build = 157m)** This section of trail has extensive sightlines and will be excavated to build a series of jumps and berms will using local dirt. This section of trail is part of an existing long-standing trail which circumnavigates Fox Mountain. The section of trail proposed for refurbishment is a relatively popular uphill route. To remedy conflict with uphill riders, a narrow single track trail is proposed to be built approximately 20 meters upslope of the existing trail.

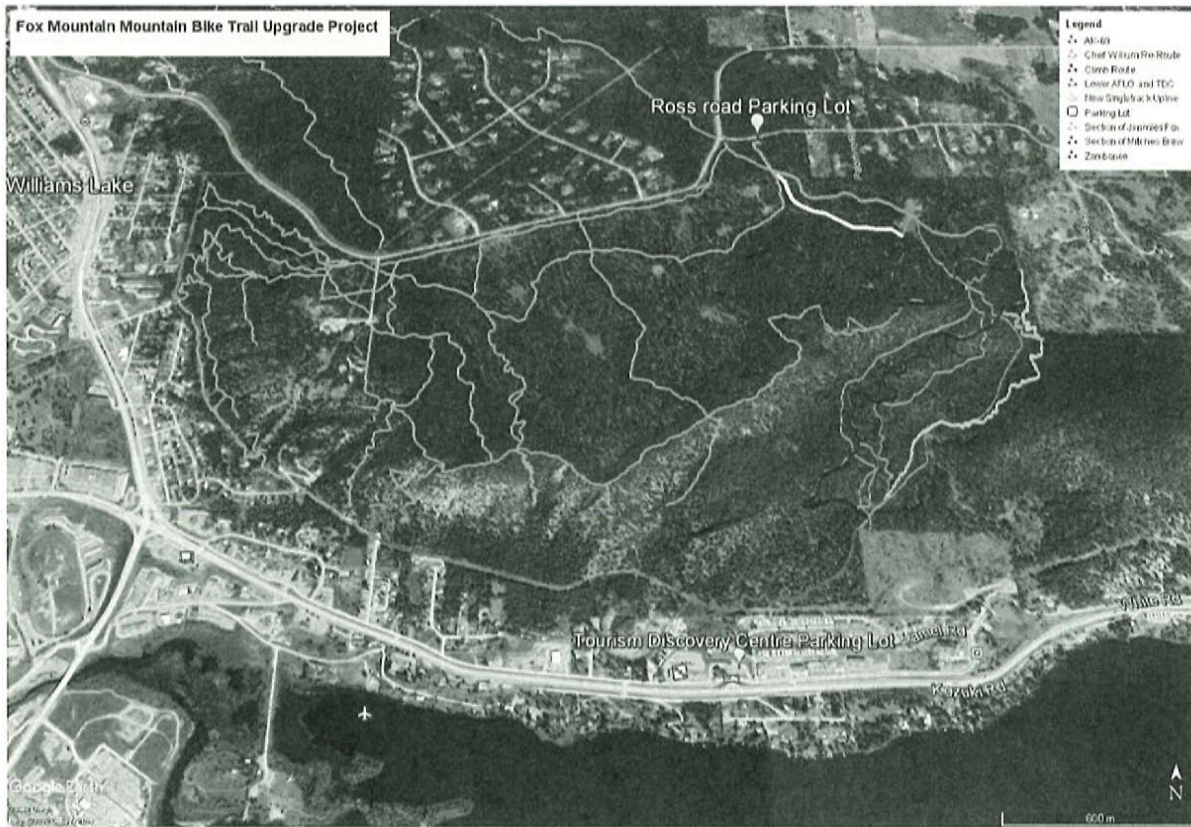
**New Machine Built Trail (1,582 metres).** A new section of trail is proposed to be built to connect Jimmies Fox to the bottom of Aflo. This trail is proposed to be built machine built with a 70 ft (21m) wooden structure to allow riders to go over an existing section of Chief Willium. The new machine built trail will merge for 151 metres beginning at an existing stopping point on AFLO and exiting in a section with wide sightlines. A picnic table is planned to be installed at the stopping/merging location. The trail will merge with GILF near its intersection with ALFO before carrying onto TDC.

**Lower Section of Alfo and all of TDC (1272 metres, machine build = 420m, buffing exiting trails using hand tools = 852m):** Much of this trail is wide, smooth and in a state of good repair. The trail will be widened to a maximum of 1 metre, but in most cases 30-50cm. Up to twenty-five trees (most less than 20cm DBH) are planned to be removed improving sightlines to avoid conflict between uphill and downhill riders. Some wooden jumps (up to 1 metre high) will be built in suitable locations. Excavation is planned at two existing problem areas where a skid road crosses the trail. Each are approximately 10 metres long, but will require substantial machine time. Excavation is also planned for the first ~400 metres of trail upslope from boardwalk near the Tourism Discovery Centre which are prone to erosion. The one tight corner will be widened. The objective of this trail is to be bi-directional, so emphasis will be made to improve sightlines and make the trail wide enough to allow riders to pass one another. Approximately 50 live trees are planned to be removed.

**Climb Route (3011 m, buffing existing trails using hand tools):** The existing climb route (TDC to Fox Connector, to Jimmies Fox, to Krackerjack, to Jimmies Fox, to 3Little Pigs) will be refurbished and signed to better provide a climbing route on the eastern section of Fox Mountain. New sections of single track will be built, as described above, in cases where the proposed downhill route conflicts with the climb route (Section of Jimmies Fox, AK-89)

**Reroute of Chief Willum (hand build = 450m):** The existing upper 450 metres of the Chief Willium trail will have to be rerouted due to conflict with the new machine built trail. This section of trail will be constructed with hand tools to connect at the bottom of the first gully (from Fox Mountain) to carry on the exiting trail to the Chief Willum campground.

Each of the sections of trail described above are shown in Figure 1.



**Figure 1:** Proposed location of new machine built trail and trails planned for upgrade.

Proposed excavation will use a mini-excavator to dig to a maximum depth of 1.5 metres deep and 3 metres wide. Dirt features will be built in line with the existing trail rating and any larger features will be signed as per Provincial policy. Construction techniques will prioritize long-term sustainability by being mindful of trail slope and camber to allow water to drain off the tread, and follow specifics outlined in Trail Solutions (Felton, 2004). To enhance sustainability and reduce future maintenance the trail will be packed using a plate packer, ditched on both sides with culverts installed in wet areas. These procedures were employed on a similar project (Foxfire) in 2019 with good results. Jeremy Stowards, (Jer-Can Contracting) is an experienced local trail builder and certified faller (with SAFE certification) is the preferred contractor for all hand tool and wood feature construction. James Doerfling (Jimco Services) is a local machine trail builder and is the preferred machine operator for this project, however an alternate sub-contractor may need to be used.


All woodwork will be framed with either locally sourced Fir logs with bark removed or pressure treated 4x4's. Decking will be rough sawn fir with spacing less than 2.54 cm. An emphasis will be on structural integrity to improve ability to maintain the structure in future years.

Trail building using hand tools will remove the duff layer and use local dirt and rocks to built a raised and cambered trail surface to promote drainage to minimize future maintenance. Removed vegetation will be a maximum of one metre in width and 0.5 metres in depth.

**References:**

Felton, V., 2004. Trail Solutions: IMBA's Guide to Building Sweet Single Track. International Mountain Bicycling Association, Boulder, Colorado, USA.

**Appendix 1: Project Quote**

<p>From: JER-CAN CONTRACTING          To: Russ Bobrowski  </p> <p>Stunt work built to Whistler Standards and defined as:          Complex TTF*: Includes cambered, curved and flat ladders. May have multiple height variations. May be high off the ground. May be longer than other stunts.          Simple TTF*: Includes flat ladders, consistent height, low to ground. May be relatively short.</p>			
<b>Machine building trail at AK-89, Miches Brew, Zambonee, Sections of Jimmies Fox, Lower TDC and new proposed line for 3,590 meters</b>	<b>Rate/meter</b>	<b>Amount (meters)</b>	<b>Cost</b>
Work includes: corridor clearing, excavation work, trail finishing work	\$ 30.00	3590	\$ 107,700.00
<b>Hand building new proposed line for 1,294 meters</b>	<b>Rate/meter</b>	<b>Amount (meters)</b>	<b>Cost</b>
Work includes: line locating, layout, clearing/brushing, digging and shaping trial	\$ 25.00	1294	\$ 32,350.00
<b>Hand building/buffing existing trial at Lower TDC, Aflo and Climb Route for 3,863 meters</b>	<b>Rate/meter</b>	<b>Amount (meters)</b>	<b>Cost</b>
Work includes: brushing, digging and shaping trial, re-establishing line of site	\$ 8.00	3863	\$ 30,904.00
<b>Stunt Work at AK-89, Mitches Brew, B.S and Various Locations</b>	<b>Rate/Board ft</b>	<b>Amount (feet)</b>	<b>Cost</b>
<b>AK-89 Complex TTF* Wood Stunt (50 feet)</b>			
Lumber: Rough cut 2x6's @ \$1.30/bdft (based off going rates + for 20% market inflation)	\$ 1.30	790	\$ 1,027.00
Fasteners and hardware @ \$150			\$ 150.00
Labour: pick up/delivery of materials, hiking in materials to site, construction of stunt, use of tools, fuel @ \$80/hr x 25hrs			\$ 2,000.00
<b>Total</b>			<b>\$ 3,177.00</b>
<b>AK-89 Simple TTF* Board Walk (100 feet)</b>			
Lumber: 10 foot treated 4x4's @ \$24.84 (based off Rona prices + 20% for market inflation)	\$ 24.84	25	\$ 621.00
Decking: Rough cut 2x6's @ \$1.30/bdft (based off going rates + 20% for market inflation)	\$ 1.30	720	\$ 936.00
Fasteners and hardware @ \$150			\$

			150.00
Labour: pick up/delivery of materials, hiking in materials to site, construction of stunt, use of tools, fuel @ \$80/hr x 24hrs			\$ 1,920.00
Total			\$ 3,627.00
<b>Mitches Brew Complex TTF* Wood Stunt #1 (85 feet)</b>			
Lumber: Rough cut 2x6's @ \$1.30/bdft (based off going rates + 20% for market inflation)	\$ 1.30	1322	\$ 1,718.60
Fasteners and hardware @ \$150			\$ 150.00
Labour: pick up/delivery of materials, hiking in materials to site, construction of stunt, use of tools, fuel @ \$80/hr x 43 hrs			\$ 3,440.00
Total			\$ 5,308.60
<b>Mitches Brew Simple TTF* Board Walk (75 feet)</b>			
Lumber: 10 foot treated 4x4's @ \$24.84 (based off Rona prices + 20% for market inflation)	\$ 24.84	20	\$ 496.80
Decking: Rough cut 2x6's @ \$1.30/bdft (based off going rates + 20% for market inflation)	\$ 1.30	480	\$ 624.00
Fasteners and hardware @ \$150.00			\$ 150.00
Labour: pick up/delivery of materials, hiking in materials to site, construction of stunt, use of tools, fuel @ \$80/hr x 30hrs			\$ 2,400.00
Total			\$ 3,670.80
<b>Mitches Brew Complex TTF* Wood Stunt #2 (50 feet)</b>			
Lumber: Rough cut 2x6's @ \$1.30/bdft (based off going rates + 20% for market inflation)	\$ 1.30	790	\$ 1,027.00
Fasteners and hardware @ \$150			\$ 150.00
Labour: pick up/delivery of materials, hiking in materials to site, construction of stunt, use of tools, fuel @ \$80/hr x 25 hrs			\$ 2,000.00
Total			\$ 3,177.00
<b>Chief Willyum TTF* Trail X-ing (80 feet)</b>			
Lumber: Rough cut 2x6's @ \$1.30/bdft (based off going rates + 20% for market inflation)	\$ 1.30	1750	\$ 2,275.00
Fasteners and hardware @ \$300.00			\$ 300.00
Labour: pick up/delivery of materials, hiking in materials to site, construction of stunt, use of tools, fuel @ \$80/hr x 40 hrs			\$ 3,200.00
Total			\$ 5,775.00

<b>6 Simple TTF* built throughout project</b>			
Lumber: Rough cut 2x6's @ \$1.30/bdft (based off going rates + 20% for market inflation)	\$ 1.30	1600	\$ 2,080.00
Fasteners and hardware @ \$300.00			\$ 300.00
Labour: pick up/delivery of materials, hiking in materials to site, construction of stunt, use of tools, fuel @ \$80/hr x 60hrs			\$ 4,800.00
Total			\$ 7,180.00
<b>Wood Overage (Waste Wood) 10% of total lumber</b>			
10 % of total lumber 7,497 bdft @ \$1.30/bdft	\$ 1.30	749.7	\$ 974.61
<b>Wood Work Overall Total</b>			\$ 32,890.01
<b>Infrastructure</b>			<b>Cost</b>
Drainage pipe: 4 x 100ft role (based of Rona prices + 20 % market inflation)	\$ 114.00		\$ 456.00
Trial signage: directional and technical trail features			\$ 3,000.00
Picknick table			\$ 755.00
Total			\$ 4,211.00
<b>Vehicle Mileage</b>	<b>Rate/Km</b>	<b>Amount (km)</b>	<b>Cost</b>
An average of kilometers travelled to sawmills in Cariboo region for every 1000 board feet (9 trips)	\$ 0.54	1170	\$ 631.80
<b>Administrative Costs</b>			<b>Cost</b>
Includes: Pre-works, field visit, project management, quality checks and invoicing @ 5% of total cost			\$ 10,434.34
Sub total			\$ 219,121.15
GST @ 5%			\$ 10,956.06
<b>Project Overall total</b>			<b>\$ 230,077.21</b>
<p>* Hours and rates determined off years of previous experience</p> <p>* Mileage determined off average from the distance to 4 saw mills in the Cariboo region @ \$0.54 which is lower then the Teasury Boards rate of \$0.55/km</p> <p>* Lumber costs were sourced from 4 different Cariboo sawmill</p>			