August 2020 Appendix A



# Highway 99 Capacity and Safety Review, Whistler (Alpha Lake Road / Cheakamus Lake Road to Lorimer Road)

# **Final Report**





# **McElhanney**

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**Preface: Highway 99 in Context** 

July 31, 2020

The BC Ministry of Transportation and Infrastructure (MoTI) has undertaken a study in cooperation with the Resort Municipality of Whistler (RMOW) to review traffic congestion and safety issues on Highway 99 within Whistler. The study area was defined as Alpha Lake Road/Cheakamus Lake Road at Function Junction at the south end of Whistler to Lorimer Road in Whistler Village. The detailed findings of the study are presented in the **Highway 99 Capacity and Safety Review, Whistler (Alpha Lake Road / Cheakamus Lake Road to Lorimer Road) Final Report** and are discussed below, in the context of other objectives and plans for the highway, the municipal transportation network and future developments in Whistler. The intent of this preface, prepared by the RMOW, is to help bring forward some of the local operational concerns discussed in Section 6 of this report. The RMOW and MoTI staff will work closely to determine which issues require further studies to confirm these concerns and develop possible mitigation strategies.

Traffic congestion is a recurring issue on Highway 99 during peak times, particularly in the section between Whistler Creekside (Lake Placid Road) and Function Junction (Alpha Lake Road/Cheakamus Lake Road). In general, there are potentially four ways in which traffic congestion, safety and operational issues on Highway 99 can be addressed:

#### 1. Improve Safety and Operations.

There are a number of small scale, localized projects identified in the report that would improve safety and operations at intersections along Highway 99, which can be undertaken in the short-term regardless of any long-term larger-scale capacity improvements. Analysis of these proposed improvements was not within the scope of the study, and therefore the next step should be to investigate each improvement to determine the benefits it offers and its associated costs. This investigation should also include locations north of the Village (which were not within the scope of the study), where safety and operations concerns have increased as traffic from north of Whistler has increased.

Priority locations for localized improvements on Highway 99 include (from south to north):

- Alpha Lake Road adjust intersection geometry and optimize signal timing and phasing, particularly for left turns, to reduce delays for vehicles turning to and from the highway and reduce traffic queues on Alpha Lake Road.
- Spring Creek Drive and Whistler Road construct protected left turn intersections to improve safety and reduce delays for transit buses and other vehicles turning left (southbound) onto the highway.
- Lorimer Road extend the southbound left turn lane, implement new bus stops, and add
  dual left turn lanes for the westbound-to-southbound left turn (when considering this last
  improvement, it will be important to assess the potential for increased congestion at the
  Village Gate Boulevard intersection as a result).
- Nesters Road/Spruce Grove Way reconfigure the southbound-to-westbound channelized right turn lane as a separated "off-ramp" to improve safety and operations of the Nesters Road intersection immediately west of the Highway 99 intersection.



 Meadow Lane, Autumn Drive and Emerald Drive – implement northbound left turn lanes on Highway 99 to improve safety and minimize the potential for rear-end collisions.

#### 2. Increase traffic capacity.

The key finding of the study is that the most effective way to reduce southbound traffic congestion on the highway is to increase traffic capacity by constructing an additional traffic lane from Whistler Creekside to Function Junction (the two southbound lanes could eventually be extended north to Whistler Village, but the analysis indicates that the major benefit would be south of Creekside). The estimated cost for the additional southbound lane is \$30 million.

It is important to note that the scope of the study was limited to the "worst case" traffic congestion which occurs southbound on Sunday afternoons in the winter. Prior to any major widening an analysis should be undertaken of northbound traffic congestion in winter and summer to determine what widening or other improvements would be needed to increase northbound traffic capacity, and these should be included in any widening project.

A risk in widening the highway to increase traffic capacity is that it can be expected to generate more peak period traffic due to latent demand (people who currently wait in the Village for a couple of hours before driving home) and induced demand (people who currently travel by bus or other modes and would choose to drive instead, or who don't drive to Whistler on peak days and would now choose to do so). As a result, congestion would likely not be alleviated to the extent anticipated in the study analysis.

#### 3. Increase people capacity.

Given the cost of increasing traffic capacity on the highway (northbound as well as southbound) and the likelihood that congestion would not be alleviated to the extent anticipated, it may be more cost-effective to invest in improving the *people* capacity of the highway rather than the *vehicle* capacity. This means carrying more people on transit on Highway 99, and shifting some automobile trips to transit. Options to make transit a more attractive travel option include the following infrastructure projects on the highway and parallel to the highway:

- Queue jumpers that allow buses to bypass traffic queued at an intersection, reducing delays to buses at traffic signals. Potential locations for queue jumpers include northbound and southbound at Blueberry Drive, and southbound at Lake Placid Road.
- Protected left turn intersections that improve safety and reduce delays for buses turning left onto the highway at unsignalized intersections, including at Whistler Road, Spring Creek Drive and the Meadow Park Sports Centre.
- Bus-on-shoulder (BOS) operation that allows buses to use the shoulder on the highway
  during times when there is significant traffic congestion, to bypass vehicles moving slowly
  in traffic lanes and minimize delays to buses. BOS is a cost-effective means of providing
  priority for buses as it generally does not require dedicated infrastructure or additional rightof-way, is low-cost and can be implemented relatively easily. BOS could be implemented
  northbound and southbound between Function Junction (Alpha Lake Road/ Cheakamus



Lake Road) and Whistler Creekside (Lake Placid Road), beginning with a peak summeronly demonstration project from Bayshore Drive to Lake Placid Road.

- New bus stops on Highway 99 at Lorimer Road northbound and southbound and at Nesters Road/Spruce Grove Way southbound, and improvements to existing bus stops to increase passenger comfort and security.
- A transit-only exit from southbound Highway 99 to Lynham Road in Function Junction.
- The planned Bayshores—Spring Creek Road connection that would enable buses to travel between these two neighbourhoods without using Highway 99, increasing route options and reducing bus travel times.

Other options to increase transit trips include increased frequencies, extended hours of service and expanded express services on Highway 99, particularly south of the Village, as well as reduced or integrated transit fares (such as a community transit pass for residents).

#### 4. Divert traffic.

Long term options to address traffic congestion on Highway 99 through Whistler include diverting regional traffic off the highway by redirecting it to a new gondola in Whistler South near Cheakamus Lake Road, and diverting local trips off the highway to new parallel routes on the municipal road network. Although development of a new ski base at Whistler South is likely decades away, it is useful to consider the effects of this proposal on traffic patterns when evaluating the potential benefits and costs of widening the highway.

In the short-term, the MoTI and RMOW should pursue the safety and operations improvements identified in item 1 above, and the transit improvements to increase people capacity identified in item 3 above. An analysis of potential benefits and costs would provide a basis for prioritizing improvements, developing a schedule for implementation, and allocating funds to complete these projects.

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Resort Municipality of Whistler

## 1. Introduction

At the request of the Resort Municipality of Whistler (RMOW), the BC Ministry of Transportation and Infrastructure (MoTI) is undertaking a study to review traffic congestion and safety issues on the Highway 99 corridor within Whistler. The intent of this assignment is to identify problem areas (either operationally or safety) and potential causes by conducting a traffic and safety analyses for the corridor, and to develop short-, medium-, and long-term options that will provide the best value.

This existing condition work presented herein will serve as a starting point to document the issues in the area and help MoTl understand the current traffic conditions of Highway 99 within the Whistler corridor. The next step, which is detailed in *Section 4*, is to develop and analyze short-term improvements (within the next five years) and medium improvements (five to ten years). Long-term options are provided for discussion purposes and may be required depending on growth along the corridor over the next 25 years. Local operational issues and high-level improvement opportunities are discussed and summarized in Section 6.0.

# 1.1. Highway Characteristics

Highway 99, also known as the Sea to Sky Highway north of Vancouver, is the major North-South highway running through the Greater Vancouver area of British Columbia from the U.S. border, up Howe Sound past the municipalities of Squamish, Whistler, and Pemberton to Lillooet; eventually connecting with Highway 97 just north of Cache Creek.

Highway 99 serves multiple road users including commuter traffic, local residents, and commercial vehicles. Most significantly, Highway 99 serves the high volume of tourist traffic traveling between Vancouver and Whistler during the summer and winter seasons.

Through the study area, Highway 99 is mostly a two-lane undivided roadway with a posted speed of 60 km/h - 80 km/h.

# 1.2. Highway Access

Access to/from the highway within the study area consists of a mix of signalized and unsignalized (side-street stop-controlled - SSSC and right-in right-out – RIRO) intersections. The signalized intersections typically serve major commercial areas while the unsignalized intersections mostly serve local residential developments. There is also a pedestrian signal, with SSSC, at Alta Lake Road.

At the major signalized intersections there are typically separate left- and right-turn lanes for the highway, as well as for the side-street. All of the unsignalized intersections are T-intersections with the majority of them having left- and right-turn lanes for the highway as well as for the minor roadway.



## 1.3. Land Use

Land use along Highway 99 ranges from industrial, commercial, and residential. There is a small industrial area (RMOW Treatment Plant) south of Highway 99 just south of the Highway 99 / Alpha Lake Road / Cheakamus Road intersection. There are large commercial developments west of Highway 99 at Alpha Lake Road (Function Junction Light Industrial) and east at Lake Placid Road. Whistler Creekside also provides a secondary connection to the Whistler Ski Area. Ski patrons can stay in Whistler Creekside and use the Creekside Gondola to access the Whistler and Blackcomb ski areas. Development at Alta Lake Road, Bayshore Drive, and Blueberry Drive is predominantly residential. The area east of Highway 99 between Village Gate Boulevard and Lorimer Road is Whistler Village with a large mix of both residential, commercial, and recreational land uses.

# 1.4. Topography

The general grade of the highway through the study corridor is mainly flat with a minor grade (approximately 4%) between Alpha Lake Road / Cheakamus Lake Road to half-way between Spring Creek Drive and Alta Lake Road. However, the highway grade does constantly change throughout the corridor to match the topography of the area, so is steeper in some locations.

The topography east of the highway is typically level with or higher than the highway through much of the corridor, while to the west it slopes down from the highway, sometimes guite significantly.



# 2. Study Area

The study area extends along Highway 99 from Alpha Lake Road / Cheakamus Lake Road in the south to Lorimer Road in the north. The study area is shown on *Figure 1*.

The following seven intersections will be analyzed as part of the operations analysis for the Highway 99 Corridor Study.

- Highway 99 / Alpha Lake Road / Cheakamus Lake Road (signalized)
- Highway 99 / Alta Lake Road (pedestrian signal, side-street stop-controlled SSSC)
- Highway 99 / Bayshore Drive (signalized)
- Highway 99 / Lake Placid Road (signalized)
- Highway 99 / Blueberry Drive (signalized)
- Highway 99 / Village Gate Boulevard (signalized)
- Highway 99 / Lorimer Road (signalized)

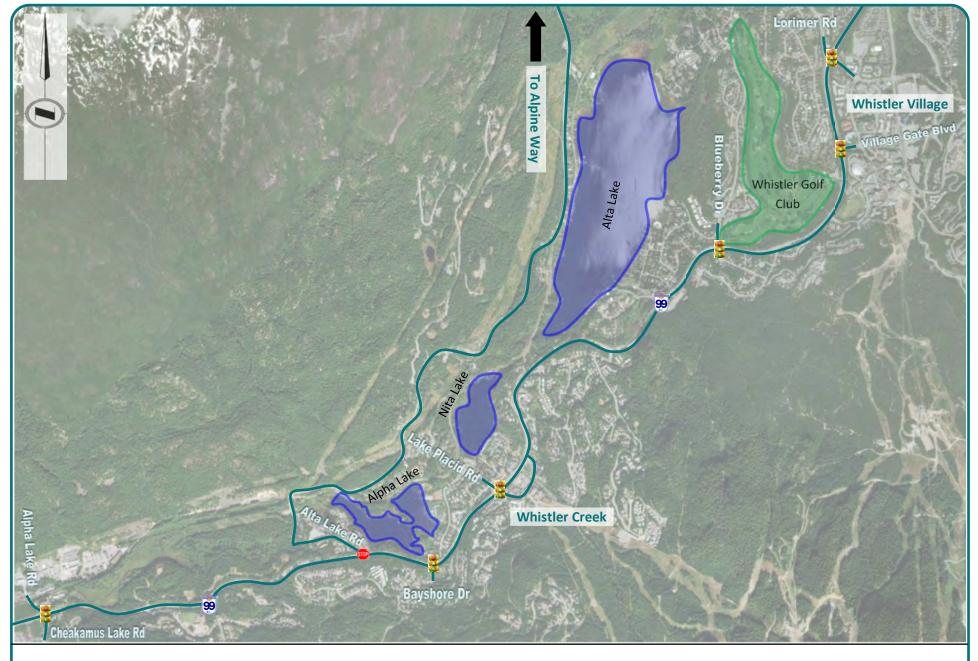
It is noted that the unsignalized intersections were not analyzed as part of the study.

## 2.1. Road Network

Within the study area, there are four types of road classification:

- Highway: Traffic movement is the primary consideration. Limited access generally used to connect major population centers.
- **Major**: Traffic movement is the primary consideration while land access is a secondary function. Provide connectivity to higher order roads (i.e. highways).
- **Minor**: Traffic movement and land access are of equal consideration. Provide connectivity between local roads and arterials.
- **Local**: Land access is the primary consideration. Provide direct access to adjacent land and generally do not carry through traffic.







HIGHWAY 99 CAPACITY AND SAFETY REVIEW (WHISTLER)

FIGURE 1: STUDY AREA

Not to Scale

## 2.1.1. Highway 99

Highway 99 through the study area is typically a two-lane regional highway with a posted speed of 60 km/h, except from Alpha Lake Road to Alta Lake Road (80 km/h). The designation of Highway 99 is a northbound-southbound highway that runs from the U.S. border up Howe Sound, eventually connecting with Highway 97 just north of Cache Creek. Most of the intersecting roadways with the highway have a posted speed of 50 km/h within the study area, except for Alpha Lake Road (40 km/h) and Lake Placid Road (30 km/h).

Shoulders are paved and vary from 1.5 m to 2.0 m with 0.5 m to 1.0 m additional gravel shoulder. Additionally, a significant portion of the highway has concrete roadside barrier, primarily on the west side of the highway, but also on the east.

There are marked bike lanes northbound and southbound for the length of the study corridor. For pedestrians, there are no sidewalks along Highway 99. However, portions of the Valley Trail network run parallel to the highway and provide separated facilities for pedestrian and cyclists away from the highway. There is an overhead pedestrian bridge just north of Nordic Drive.

Roadside lighting is generally only provided at side-street intersections, with some additional lighting provided upstream and downstream of signalized intersections. There are overhead advance warning flashers to warn motorists of traffic signals ahead northbound and southbound at Cheakamus Lake Road / Alpha Lake Road, southbound at Bayshore Drive, northbound at Blueberry Drive, and southbound at Lorimer Road. Additionally, there are northbound/southbound overhead emergency vehicle access flashers at Spring Creek Drive and an overhead electronic changeable message sign southbound on Highway 99 approximately 300 m south of Alta Lake Road.

## 2.1.2. Alpha Lake Road / Cheakamus Lake Road

Alpha Lake Road / Cheakamus Lake Road is a two-lane roadway that provides access to a large commercial /light industrial area west of Highway 99 along Alpha Lake Road (Function Junction) and Cheakamus Crossing to the east along Cheakamus Lake Road. The Highway 99 / Alpha Lake Road / Cheakamus Lake Road intersection is signalized with turning bays for all movements, and it should be noted as one of the busiest intersection in the study area.

#### 2.1.3. Alta Lake Road

Alta Lake Road is a two-lane roadway that forms the west leg of a T-intersection with Highway 99. It provides access to the residential area (Tamarisk) west of Highway 99 adjacent to Alpha Lake. Alta Lake Road continues along the north side of Alpha Lake, Nita Lake, and Alta Lake eventually connecting to the Alpine Meadows neighbourhood adjacent to Green Lake north of Whistler Village. Alta Lake Road is used by many local drivers to avoid the congestion southbound during peak times. If coming from the Village, drivers would head north to Alpine Way, then turn onto Rainbow Drive, which becomes Alta Lake Road after leaving the Alpine Meadows Neighbourhood. The Highway 99 / Alta Lake Road intersection is a pedestrian-controlled signal with side-street stop-controlled and left- and right-turn bays for the northbound left and southbound right.



## 2.1.4. Bayshore Drive

Bayshore Drive is a two-lane roadway that forms the east leg of a T-intersection with Highway 99 and provides access to the large residential area just south of Creekside. The Highway 99 / Bayshore Drive intersection is signalized with turning bays for all movements.

#### 2.1.5. Lake Placid Road

Lake Placid Road is a two-lane roadway with a posted speed of 30 km/h west of the highway. It provides access to the large residential areas on both the east and west sides of Highway 99 within Whistler Creekside. Additionally, east of the highway is the large Creekside commercial development, with shopping, restaurants, and lodging. Moreover, the Creekside Gondola, which is one of the major access points for Whistler Mountain, is located within Creekside. As such, Lake Placid Road experiences high traffic volumes during the winter season. The Highway 99 / Lake Placid Road intersection is signalized with turning bays for most movements (except the EBL and SBR), including dual westbound lefts (left and a shared thru-left).

## 2.1.6. Blueberry Drive

Blueberry Drive is a two-lane roadway that forms the west leg of a T-intersection with Highway 99. It provides access to the large residential areas surrounding the Whistler Golf Club, as well as, both Blueberry Beach Park North and South which are adjacent to the east shore of Alta Lake. Blueberry Drive transitions to Beaver Lane near the north end of the Whistler Golf Club. The Highway 99 / Blueberry Drive intersection is signalized with turning bays for all movements.

## 2.1.7. Village Gate Boulevard

Village Gate Boulevard is a four-lane roadway that forms the east leg of a T-intersection with Highway 99. It is the main access roadway to Whistler Village and services a large number of commercial, residential, and recreational areas within the municipality. Within the Whistler Village are major lifts to both Whistler Mountain and Blackcomb Mountain. As such, Village Gate Boulevard experiences extremely high traffic volumes during both the summer and winter seasons. The Highway 99 / Village Gate Boulevard intersection is signalized with turning bays for all movements, including dual westbound lefts.

#### 2.1.8. Lorimer Road

Lorimer Road is a four-lane roadway to the east of Highway 99 and a two-lane roadway to the west of Highway 99 located at the northern end of Whistler Village. Similar to Village Gate Boulevard, Lorimer Road provides access to a large number of commercial, residential, and recreational areas within the Village. Lorimer Road also experiences extremely high traffic volumes during both the summer and winter seasons due to the local mountain resort. Unlike Village Gate Boulevard, Lorimer Road also provides access to the residential areas west of Highway 99 adjacent to the Whistler Golf Club. The Highway 99 / Lorimer Road intersection is signalized with turning bays for all movements.



# 3. Existing Conditions

# 3.1. Traffic Operations

#### 3.1.1. Field Observations

#### Field Visit

A site visit was conducted on January 14, 2018 to observe conditions within the study area. The key observations are as follows:

- ~3:00 pm Free flow traffic southbound through the corridor
- ~3:15 pm Start of southbound queuing at Lake Placid Road. This generally clears up just south of the lane drop to Taylor Way.
- ~4:00 pm southbound queuing at Lake Placid Road back to Whistler Road (~600 m). Westbound
  queuing into Creekside along Lake Placid Road to Rob Boyd Way (~300 m). The southbound queue
  extends beyond the Lake Placid Road intersection, resulting in gridlock even though additional
  southbound green time is provided.
- ~4:00 pm Southbound queuing from Blueberry Drive to Lorimer Road (~ 2 km). Large westbound queues at Village Gate Boulevard and Lorimer Road.
- ~4:30 pm significant queue for the eastbound right movement from Alta Lake Road to Highway 99

Travel times were recorded at approximately 3:00 pm and 5:00 pm and are summarized in *Table 1*. As shown, travel times prior to 4:00 pm were generally one-third or less the travel time at 5:00 pm. Additionally, travel time along Alta Lake Road (alternate route) was also approximately one-third.

Table 1: Observed Travel Times

From	То	Travel Time min:sec				
FIOIII		SB @ 3 PM	SB @ 5 PM	NB @ 3 PM	Alta Lake Rd SB @ 4 PM	
Lorimer Rd	Village Gate Blvd	NA <sup>(1)</sup>	10:00	NA <sup>(1)</sup>	NA <sup>(1)</sup>	
Village Gate Blvd	Blueberry Dr	NA <sup>(1)</sup>	9:50	NA <sup>(1)</sup>	NA <sup>(1)</sup>	
Blueberry Dr	Lake Placid Rd	NA <sup>(1)</sup>	16:30	NA <sup>(1)</sup>	NA <sup>(1)</sup>	
Lake Placid Rd	Alta Lake Road	NA <sup>(1)</sup>	4:50	NA <sup>(1)</sup>	NA <sup>(1)</sup>	
Alta Lake Rd	Alpha Lake Rd	NA <sup>(1)</sup>	2:55	NA <sup>(1)</sup>	NA <sup>(1)</sup>	
	Total:	~14:00	44:05	~9:00	~16:00	

#### Notes:

1. No queuing observed at these locations or time periods. Only total travel time recorded.

## **Density Map**

A traffic density map was obtained from Google during the time of the observed travel times. These densities are summarized on *Figure 2*. As shown, northbound is mostly free-flow, while southbound the highest densities occur around Lake Placid Road and Village Gate Boulevard, which are in part due to the lane drops downstream of each intersection. The high density around Lake Placid Road begins around the lane drop and runs north along Highway 99 to approximately Nordic Drive, and then again starting at Blueberry Drive and extending to Lorimer Road. These densities are consistent with the observations made during the site visit.

#### 3.1.2. Traffic Volumes

Based on initial review, the winter Sunday PM peak hour typically experiences long delays and queues (extending through most of the corridor). Although northbound traffic does queue up in the summer, it is less intense than the southbound queuing in the winter. Therefore, this study chose to examine the worst case issues, which is the winter southbound conditions. Existing traffic volumes were provided by the MoTI in January of 2018 at the six signalized study intersections. Turning movement volumes were provided in 15-minute intervals. Counts from Sunday January 14, 2018 were used for this study and are representative of the desired study scenario. Since queues develop around 4:00 pm, the peak period was assumed to be from 3:00 pm to 6:00 pm. Section 6 of this report provides a discussion of summer and internal traffic volumes.

It should be noted, that the volume data from MoTI is from loop detectors at each of the signalized intersections, and while is a good indication of the total demand during non-peak times, only represents the demand served during the peaks, where queues develop on the highway (sometimes extending from Alta Lake Road to north of Lorimer Road) as well as the side-streets.

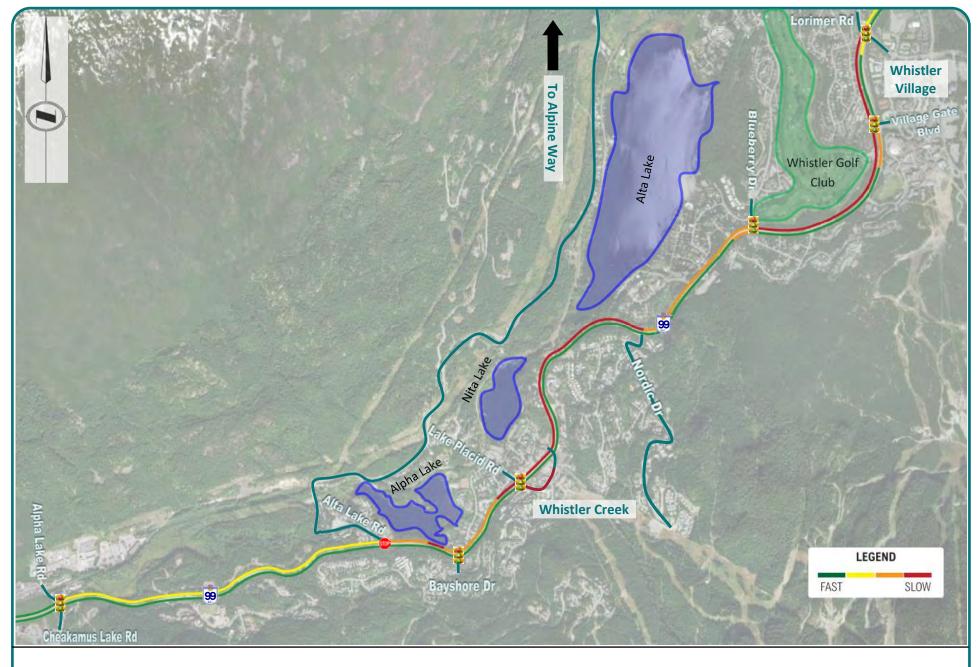
Since traffic volumes were not available at any of the unsignalized intersections, and volumes at these intersections are likely minor during the peak periods, they were only used to balanced between the signalized intersections.

Pedestrian volumes were modelled only at Alta Lake Road (pedestrian signal) and Lake Placid Road, as the other locations had minimal pedestrian volumes, which would not impact vehicle operation. The existing 2018 Sunday PM Peak Hour volumes are presented on *Figure 3*, while the intersection count data can be found in *Appendix A*.

# 3.1.3. Traffic Volume Balancing

VISSIM requires volumes between all intersections to be balanced, as the software does not generate or lose vehicles similar to how SimTraffic accounts for volume imbalance. Additionally, as stated above, the counts reflect only the demand served during periods of congestion and does not reflect the true latent demand and the lengthy queuing that occurs throughout the corridor over the course of several hours. This results in significant volume imbalances between signalized intersections. The balancing of volumes was done in a multistep process:

1) Through observations made during the site visit, the Highway 99 / Cheakamus Lake Road / Alpha Lake Road and Highway 99 / Lorimer Road intersections generally service 100% of the demand throughout the study period. Therefore, these two intersections were used as controls to balance volumes between intersections.





# HIGHWAY 99 CAPACITY AND SAFETY REVIEW (WHISTLER)

FIGURE 2: SUNDAY PM HIGHWAY DENSITY MAP

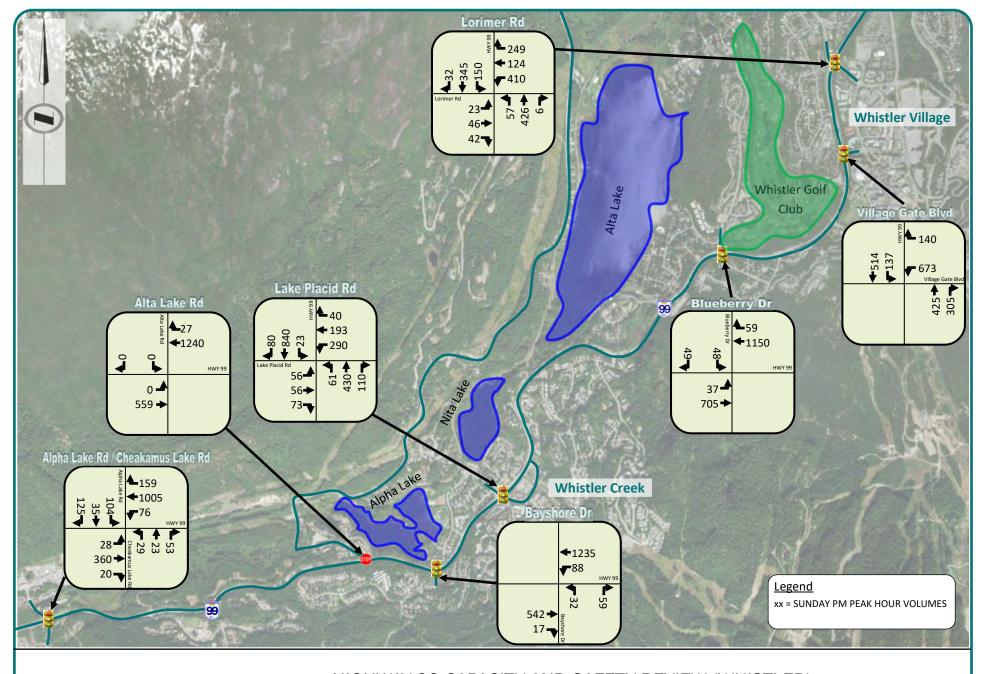




FIGURE 3: EXISTING 2018 SUNDAY PM PEAK HOUR VOLUMES

Not to Scale

- 2) Southbound through volume at each subsequent intersection was balanced up, as any imbalance between intersections would likely be because of the lengthy queues
- 3) Where balancing up resulted in more vehicles at Alpha Lake Road / Cheakamus Lake Road than the count, volume was distributed to minor intersections (Alta Lake Road and London Lane)
- 4) Where volume was still lost at Alpha Lake Road / Cheakamus Lake Road, the volumes at the intersection was increased for all southbound movements
- 5) Northbound volume gains/losses were distributed to minor streets (Spring Creek Drive, London Lane, Whistler Road, Nordic Drive, Hill crest Drive, Whistler Way, and Whistler Cay Drive)
- 6) Where volume was still lost at Lorimer Road, the volumes at the intersection was increased for all northbound movements

This process was done for each hour (2:15 pm - 3:15 pm, etc.) of the study period between 2:15 pm - 6:15 pm.

As stated above, the minor side-streets were observed to have a negligible effect on the overall operation of the corridor and given that traffic volumes were not obtained at these locations, they were assumed not to have any volume, except where volume balancing was necessary. The pedestrian-controlled intersection at Alta Lake Road was also included in the volume balancing due to the eastbound right-turn to southbound Highway 99 influencing the operation of the study corridor.

#### 3.1.4. Historical Traffic Growth

There are two BC MoTI permanent count stations within the vicinity of the study area. Station P-15-11NS is approximately 9 km north of the Hwy 99 / Lorimer Road intersection along Highway 99 near the north end of Green Lake. Station P-15-3NS is approximately 40 km south of the Highway 99 / Alpha Lake Road / Cheakamus Lake Road intersection along Highway 99 near Squamish. Data collected from the permanent count station 48 km south of Whistler was used to determine an annual growth rate. Count station P-15-11NS north of Whistler does not capture the high volume of seasonal traffic that travels between Vancouver and Whistler during the winter months and therefore is not a good representation of the traffic behaviour within the study corridor.

The average annual daily traffic (AADT) growth at the permanent count station from 2011 to 2016 is approximately 3% per year. To be consistent during winter weekend months, the monthly average weekend traffic (MAWET) for December, January, February was also calculated from 2011 to 2016. The growth in MAWET from 2011 to 2016 for the three winter months was also approximately 3%, consistent with the average AADT growth rate for the same period. Therefore, the 3% growth rate will be used to project existing traffic volumes for future analysis scenarios. It is noted that the internal traffic volume and growth within Whistler is discussed in *Section 6*.

It is worth noting that no data before 2011 is being used due to the 2010 Winter Olympics which were held in Vancouver and Whistler. This event resulted in significant traffic variation that is not consistent with typical traffic operation of the highway.



## 3.1.5. Level of Service Analysis

#### Calibration

An existing Highway 99 VISSIM model (traffic microsimulation model) was provided by the MoTI which modelled the highway from Horseshoe Bay to Pemberton. The original model was calibrated based on calibration criteria from the *Traffic Analysis Toolbox Volume III: Guidelines for Applying Traffic Microsimulation Modelling Software*, published by the U.S. Federal Highways Administration. These calibration criteria were based on the calibration criteria originally created by the Wisconsin Department of Transportation. The model was calibrated on traffic volumes, travel times, and a visual audit of vehicle behaviour.

For the scope of this study, the model was reduced to only include the study intersections Cheakamus Lake Road / Alpha Lake Road to Lorimer Road, and a modeled time of 2:15 pm to 6:15 pm (four-hour model). However, after several model runs, it was apparent that the model was not replicating the merge areas (south of Lake Placid Road and south of Village Gate Boulevard) appropriately. To replicate the merge behaviour, McElhanney modified the last 50 m of the merge to a different driver behaviour to better replicate merging under congested conditions. This included:

- Not allowing vehicles to change lanes over the last 25 m of the merge at the lane drop at Taylor Way south of Lake Placid Road and changing the driver behaviour for 25 m upstream of the lane drop
  - Average standstill distance = 5.5 m (from 2 m)
  - Additive part of safety distance = 3 (from 2)
  - Multiplicative part of safety distance = 6 (from 3)
- Not allowing vehicles to change lanes to the right over the last 25 m of the merge south of Village Gate Boulevard and changing the driver behaviour (the above-mentioned changes) over the last 50 m of the merge

Additionally, there was significant queuing WB at Village Gate Boulevard that would not be captured by the counts, as the controller data is only able to record demand that passes over the detector. Therefore, an additional 200 vehicles were added to the WBL for the last two hours of the model to keep it consistent with the previous two hours.

#### Validation of Traffic Model

Given the larger Highway 99 model was already calibrated, only validation of the reduced model within the study corridor was performed. Travel times were obtained using Google's travel time application program interface (API) and compared to the field observations from January 14, 2018. However, the results from Google API was significantly shorter southbound than what was observed from the field visit (even the high travel time). Therefore, the Google travel time information was not solely used to validate the VISSIM model. Instead, the model was validated using a combination of the travel times obtained during the site visit and Google API. The travel time results are summarized in *Table 2*.



Table 2: Travel Time Results

Direction	Time		VISSIM (m:s)			
Direction	Period	Average	Low	High	Observed	VISSIWI (III.S)
	3:15 – 4:15	9:08	8:03	9:56	NA <sup>(1)</sup>	9:31
Northbound	4:15 – 5:15	11:01	9:42	12:00	NA <sup>(1)</sup>	9:31
	5:15 – 6:15	9:26	8:23	10:15	NA <sup>(1)</sup>	9:08
	3:15 – 4:15	9:11	7:52	10:39	~14:00	26:01
Southbound	4:15 – 5:15	11:00	9:22	12:44	N/A	43:22
	5:15 – 6:15	9:22	8:08	10:23	~44:00	46:32

#### Notes:

1. No queuing observed at these time periods. Only total travel time recorded.

While the travel time results do not fall within the API data southbound, northbound generally falls within the travel time range. For southbound, the VISSIM results are much closer to the observed travel time. It should be noted that the purpose of the project will be to compare with and without improvements. Therefore, since the model is replicating observed conditions, it will be a good indication of the benefits of the improvements.

Additionally, the traffic volumes obtained from MoTI were validated based on the served (i.e. count), and not demand, as this would result in areas with significantly underserved volumes. *Table 3* summarizes the intersection volumes.

The model was also visually inspected at various time intervals to ensure that the behaviour replicated observations in the field.

Table 3: Intersection Volume Results

Intersection		Total Volume			VISSIM Volume		
	mersestion	3:15-4:15	4:15-5:15	5:15-6:15	3:15-4:15	4:15-5:15	5:15-6:15
1.	Hwy 99 / Alpha Lake Rd / Cheakamus Lake Rd	2,020	1,921	1,705	1,890	1,871	1,638
2.	Hwy 99 / Alta Lake Rd	NA <sup>(1)</sup>			NA <sup>(1)</sup>		
3.	Hwy 99 / Bayshore Dr	1,940	1,719	1,635	1,747	1,784	1,662
4.	Hwy 99 / Lake Placid Rd	1,940	1,768	1,692	1,998	2,010	1,938
5.	Hwy 99 / Blueberry Dr	1,789	1,462	1,540	1,907	1,691	1,606
6.	Hwy 99 / Village Gate Blvd	1,781	1,383	1,360	2,033	1,564	1,546
7.	Hwy 99 / Lorimer Rd	2,030	1,808	1,401	2,164	1,810	1,371

#### Notes:

1. Count is not available at this intersection



#### Level of Service Definition

Operations of roadway facilities are described in terms of Level of Service (LOS). LOS is a qualitative description of traffic flow based on factors such as speed, travel time, delay, and freedom to manoeuvre. Six service levels are defined ranging from LOS A, the best operating conditions, to LOS F, the worst operating conditions. LOS E corresponds to "at or near capacity" operations. When volumes exceed capacity, stop-and-go conditions result, and operations are designated LOS F. The delay thresholds and corresponding LOS are presented in *Table 4*. The MoTI criterion for acceptable operation is LOS D. Therefore, any movement or intersection operating at LOS E or worse is considered failing.

Table 4: Intersection Level of Service Definitions

Level of Service	Signalized Intersections <sup>(1)</sup>	Unsignalized Intersections	Description
Α	≤ 10	<u>≤</u> 10	Represents free flow. Individual users are virtually unaffected by others in the traffic stream. Usually no conflicting traffic
В	> 10 to 20	> 10 to 15	Stable flow, but the presence of other users in the traffic stream begins to be noticeable. Occasionally some delay due to conflicting traffic
С	> 20 to 35	> 15 to 25	Stable flow, but the operation of individual users becomes significantly affected by interactions with others in the traffic stream. Delay is noticeable, but not inconveniencing.
D	> 35 to 55	> 25 to 35	Represents high-density, but stable flow. Delay is noticeable and irritating; increased likelihood of risk taking.
E	> 55 to 80	> 35 to 50	Represents operating conditions at or near the capacity level. Delay approaching tolerance levels; risk taking behaviour is likely.
F	> 80	> 50	Represents forced or breakdown flow. Delay exceeds tolerance level; high likelihood of risk taking.

#### Notes:

Values shown are in seconds/vehicle. **BOLD** indicates unacceptable LOS.

- 1. HCM 2010, Chapter 18, Signalized Intersections
- 2. HCM 2010, Chapter 19 (Two-Way) and 20 (All-Way), Unsignalized Intersections

Signalized operations were analyzed using the methodology contained in Chapter 18 of the Highway Capacity Manual (HCM), Transportation Research Board, 2010. This methodology determines the level of service by comparing the average control delay for all vehicles approaching the intersection to the delay thresholds shown in *Table 4*.



For unsignalized (side-street stop-controlled) intersections, the level of service calculations were conducted using the methodology in Chapter 19-20 of the HCM. The LOS rating is based on the average control delay expressed in seconds per vehicle. For controlled approaches composed of a single lane, the control delay is computed as the average of all movements in that lane. *Table 4* also presents the thresholds for unsignalized intersections.

For the purpose of this analysis, based on the previous calibrated model, a vehicle is considered in queue if its speed drops below 5 km/h and has not yet exceeded 10 km/h (after dropping below 5 km/h). Also, a maximum headway of 20 m was assumed (the distance between two vehicles so that the queue is not disrupted) for a vehicle to still be considered in a queue.

#### **Existing Conditions**

A summary of intersection LOS results (worst movement LOS and maximum queue length) for the Sunday PM Peak Hour can be found in *Table 5* 

It should be noted that results are for the last hour (5:15 pm - 6:15 pm) of the model, and not presented for each modeled hour. As shown, poor intersection operation starts at the Lake Placid Road intersection and extends to Lorimer Road. A visual inspection of the corridor shows the bottleneck occurring at the merge just south of Lake Placid Road, consistent with field observations.

Table 5: Existing Sunday Intersection LOS

Location				Worst Movement		
		Control (1) Intersection (2)		Movement <sup>(3)</sup>	Delay <sup>(2)</sup> (LOS)	Max. Queue (m)
1.	Hwy 99 / Alpha Lake Rd / Cheakamus Lake Rd	Signal	15 (B)	EBL	33 ©	55
2.	Hwy 99 / Alta Lake Rd	Ped Signal SSSC	7 (A)	EBR	12 (B)	25
3.	Hwy 99 / Bayshore Dr	Signal	5 (A)	WBL	113 (F)	30
4.	Hwy 99 / Lake Placid Rd	Signal	203 (F)	WBL	470 (F)	Note 5
5.	Hwy 99 / Blueberry Dr	Signal	49 (D)	EBR	180 (F)	90
6.	Hwy 99 / Village Gate Blvd	Signal	203 (F)	SBT	383 (F)	330
7.	Hwy 99 / Lorimer Rd	Signal	138 (F)	SBT	290 (F)	465

#### Notes:

- 1. SSSC = side-street stop-controlled
- 2. 25 (C) = Average delay per vehicle in seconds (LOS). **Bold** indicates unacceptable operation.
- 3. Highway 99 is designated north-south (even though there are locations where it runs east-west)
- 4. Delay in seconds per vehicle
- 5. Exceeds modeled link, queue likely longer

It is worth noting that the intersection LOS is only reported for the main signalized intersections within the study area that have count data. The minor intersections within the study corridor were primarily used for balancing the volumes between study intersections, and thus are not included in the reported LOS.

# 3.2. Safety

## 3.2.1. Collision History

Collision data for Highway 99 was obtained from MoTI for a ten-year period (2007-2017) and is provided in *Appendix B*. It should be noted that the collision analysis is typically completed for the previous five years. However, to determine any trends along the corridor, the last ten years were analyzed for severity, occurrence, type, contributing factors, and conditions (road/weather/lighting).

#### **Collision Severity**

Figure 4 presents the collision severity, while Figure 5 shows the spatial distribution of the collisions, including the severity, along the corridor. There were 149 property damage, 98 injuries, and four fatalities within the study corridor, for a total of 251 incidents over the past ten years.

As shown on *Figure 5*, the majority of collisions occur at the signalized intersections due to increase in number of conflict points, with 20 or more each at Alpha Lake Road / Cheakamus Lake Road, Lake Placid Road, Blueberry Drive, Village Gate Boulevard, and Lorimer Road, and with the most of those being property damage only. However, at Alpha Lake Road / Cheakamus Lake Road, injuries were higher, which is indicative that speeds are higher at this location (generally, the higher the speeds, the higher the chance of injury). It should be noted that the speed changes from 60 km/h to 80 km/h just south of Alta Lake Road, approximately 2 km north of this intersection.

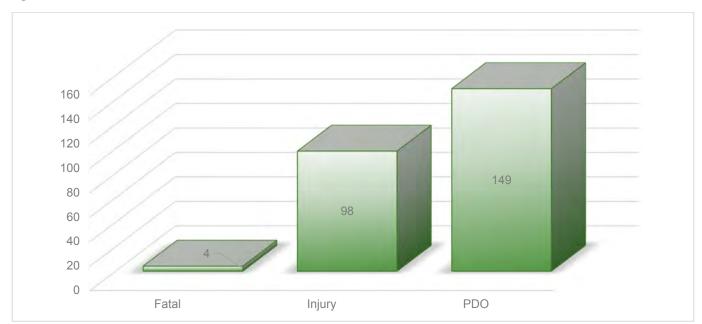
There were four fatalities within the study corridor:

- South end of the study area south of Alpha Lake Road / Cheakamus Lake Road (head-on involving a
  pickup truck and a commercially licenced limousine)
- At Nordic Drive (off-road left involving a motorcycle and logging truck and pole trailer)
- At Blueberry Drive (Van with trailer and pedestrian)
- North of Lorimer Road near the north end of the project (Van and pedestrian)

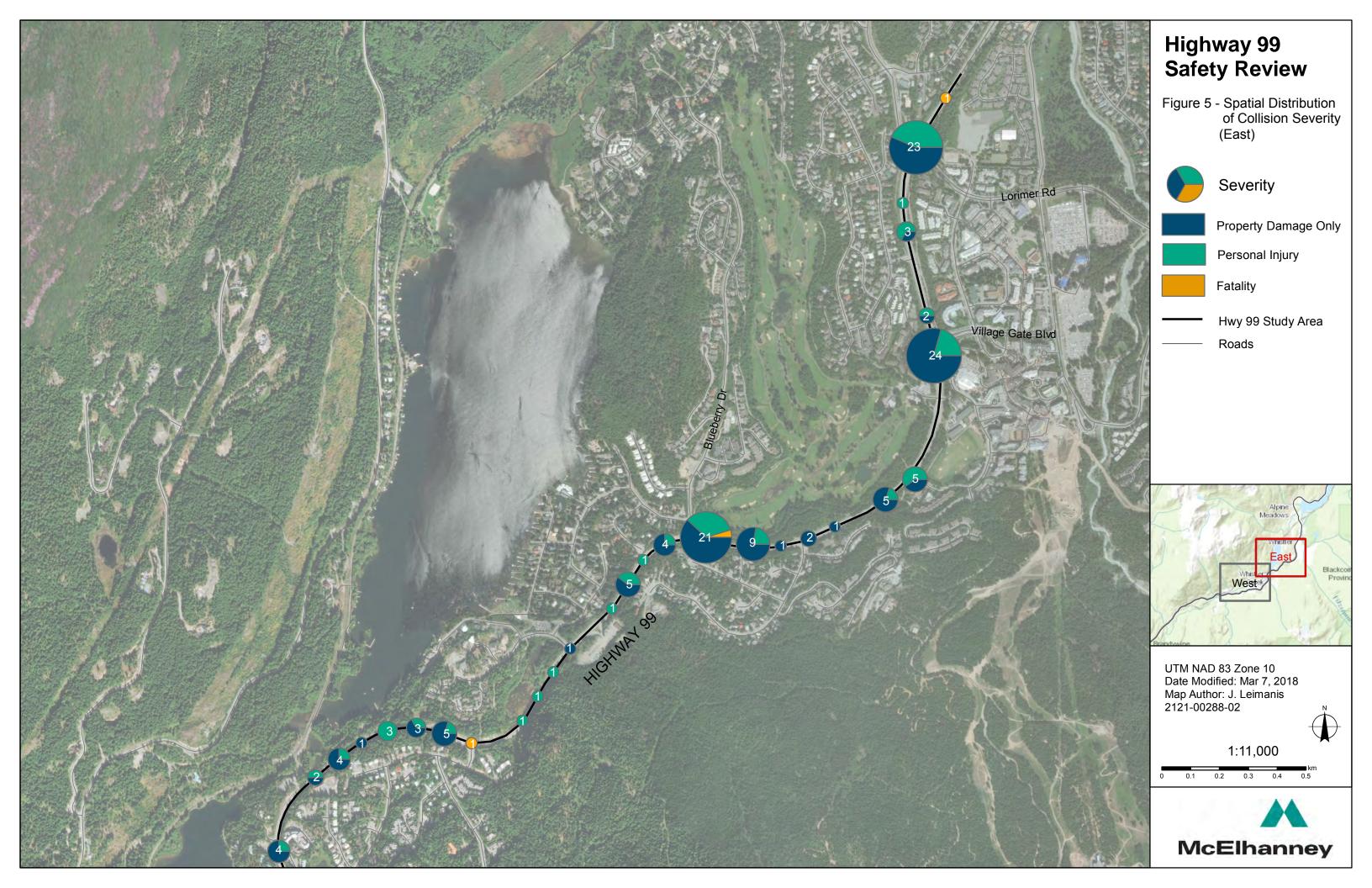
Three of the four fatalities occurred in locations where it was dark/had no illumination (nearly 40% of all collisions occurred outside of the daylight hours – see discussion below), and two were pedestrian-related. There does not appear to be any specific location pattern to the fatalities within the corridor as they are all spaced out throughout the study area.



Figure 4: Collision Severity





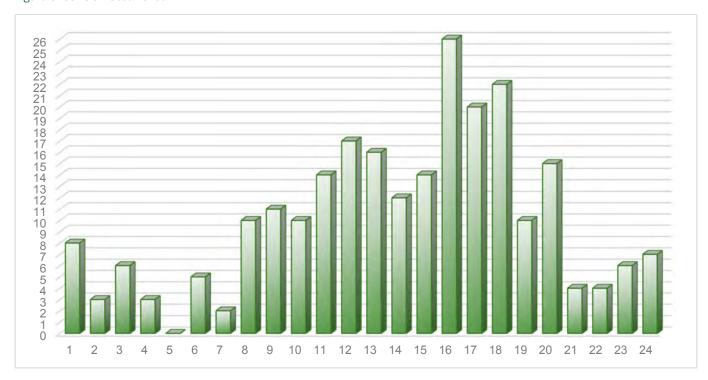


#### **Collision Occurrence**

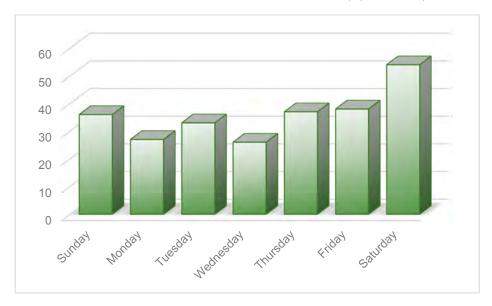
*Figure 6* presents the hour ending, day of week, month, and year of collision occurrence. The trends that can be seen from the figures are:

- The highest rate of collisions occurs between the hours of 3:00 pm and 6:00 pm, with the lowest occurring early in the morning around 5:00 am
- Collisions throughout the week are relatively constant with a spike in collisions on Saturdays. This is likely due to the increased recreational traffic experienced by the corridor on weekends.
- Increase in collisions over the winter months (December, January, February) and the end of summer (August). This could be due to the change in weather during the winter (i.e. ice, rain, snow, etc.), the higher traffic volumes during the tourist seasons, and vehicles without dedicated snow tires.
- A general trend of decreasing yearly collisions, with a significant drop from 2016 to 2017. It should be
  noted that 2017 seems to be an anomaly, as the yearly collisions are consistent between 2007-2016. It's
  also of note that there did not seem to be a significant increase in collisions in 2010, the year Vancouver
  held the Winter Olympics.

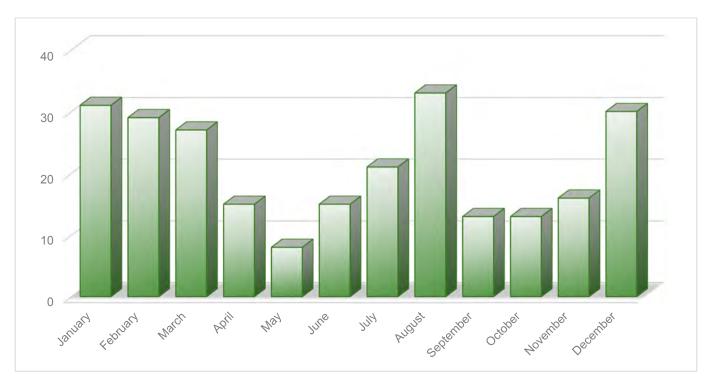
Figure 6: Collision Occurrence



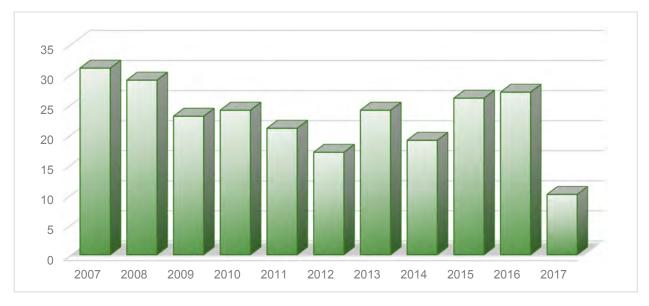
**Hour Ending** 



Day of Week



Month

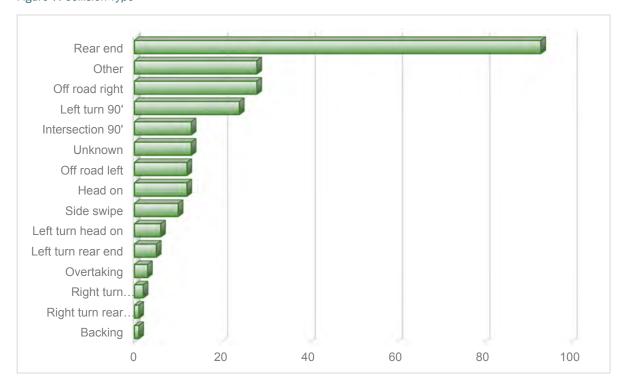


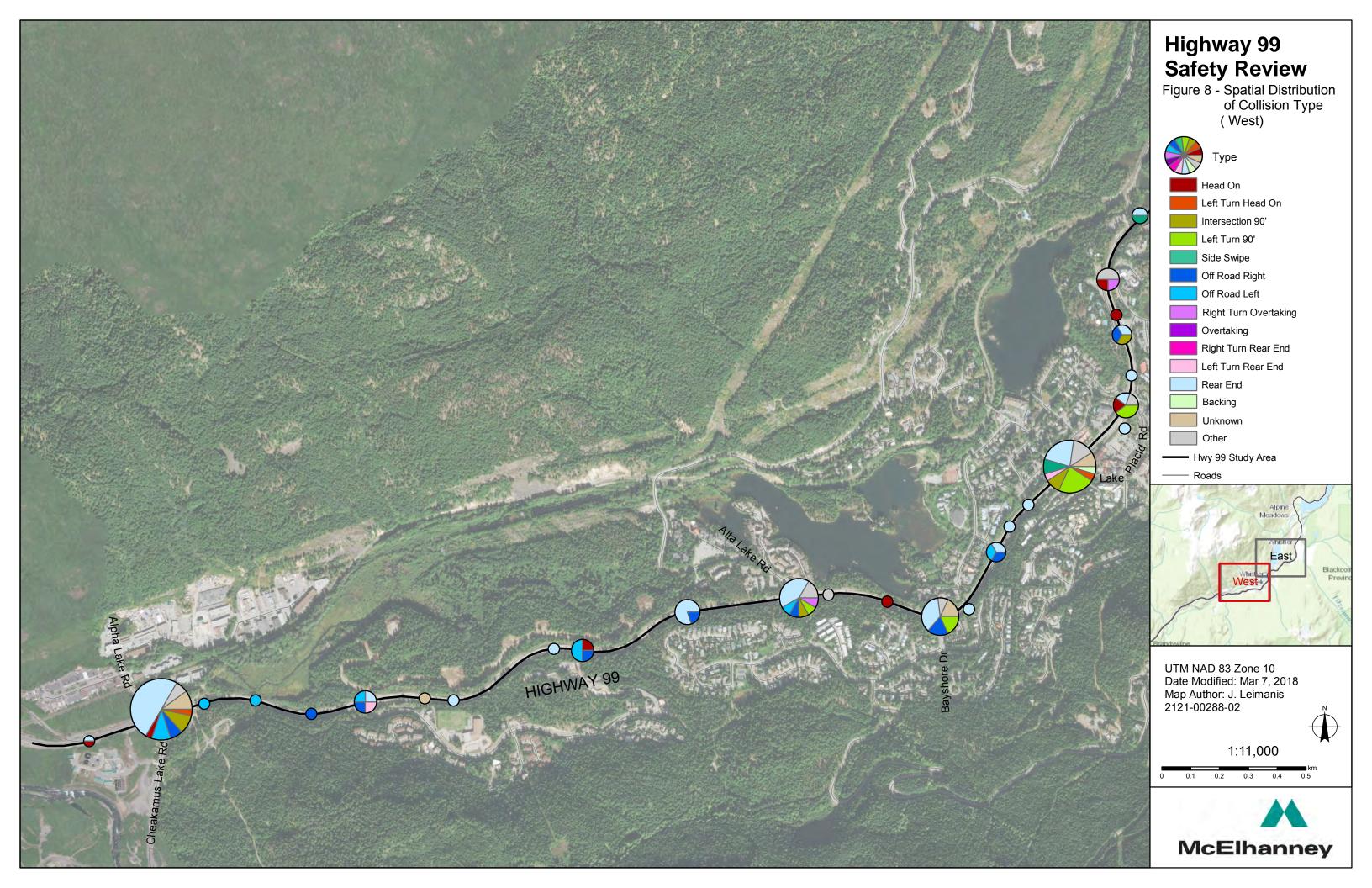
#### Year

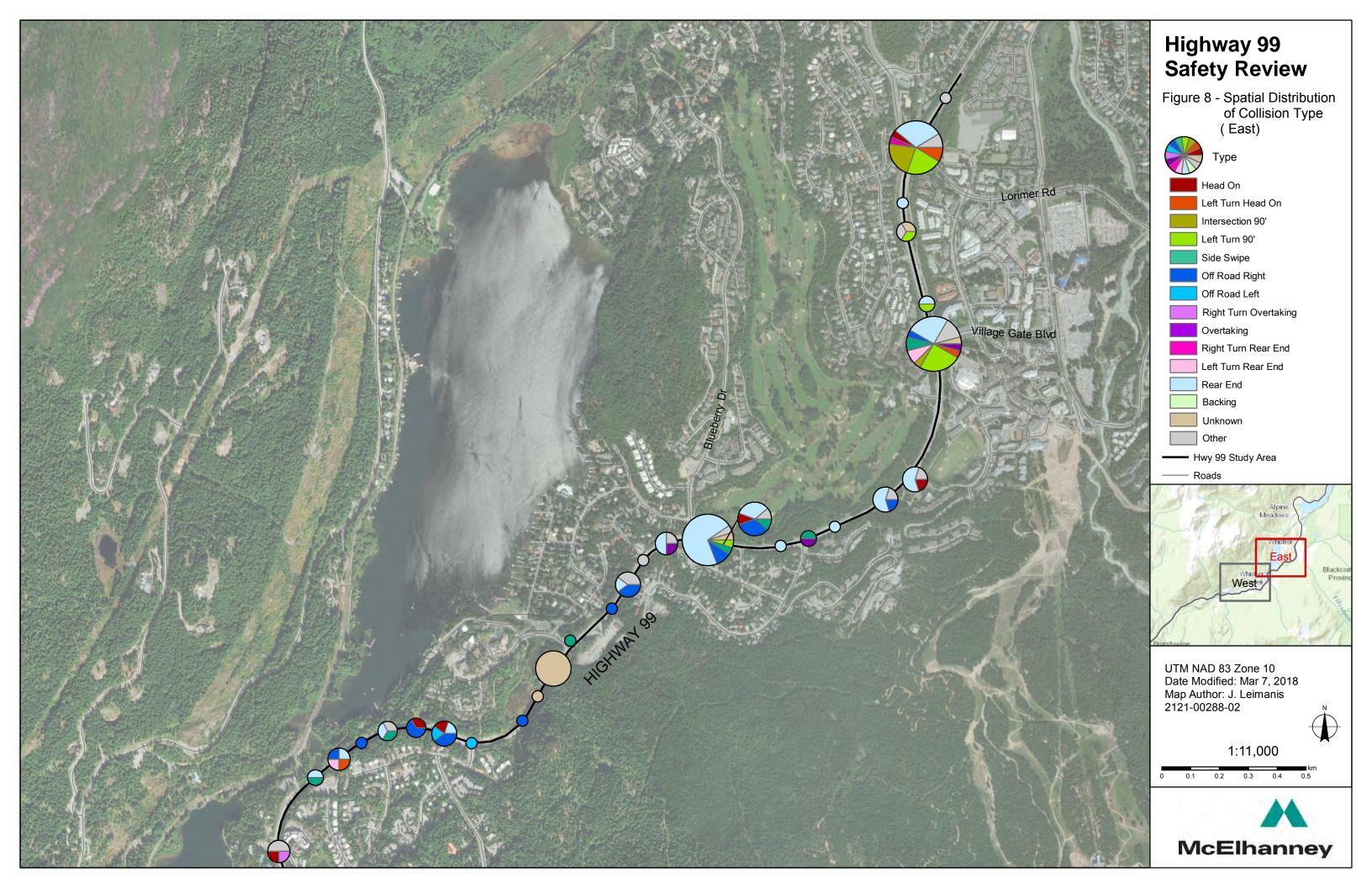
## **Collision Type**

The types of collisions throughout the study corridor are presented on *Figure 7*, while the location of each of these collisions is presented on *Figure 8*. As shown, rear end occurs over three times as often as the next closest collision type (other) and accounts for approximately 37% of collisions within the study corridor. This is indicative that there is significant queuing in the corridor, as drivers are either too close within the queue or are not expecting a queue.

Figure 7: Collision Type



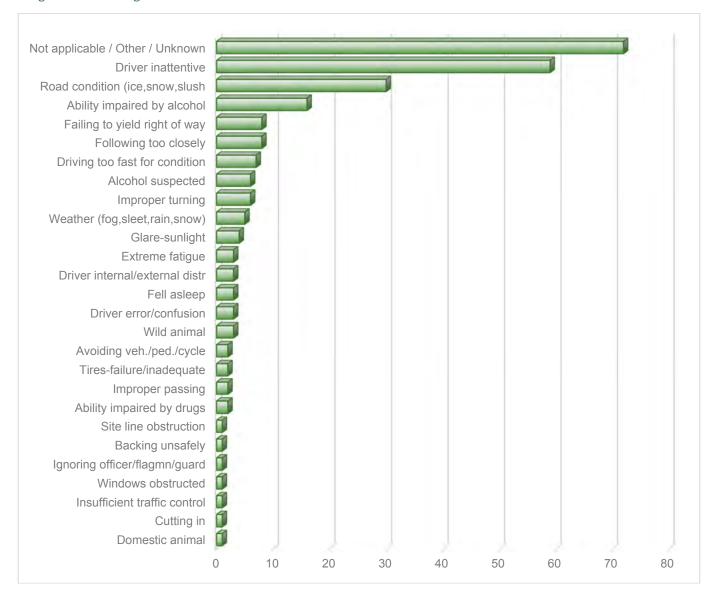




## **Contributing Factor**

Figure 9 shows the total collisions along the study corridor based on the main contributing factors. Other than not applicable/other/unknown, as shown, driver inattentiveness is the highest contributing factor to collisions along the corridor, accounting for approximately 24% of collisions. Road condition (ice, snow, slush) is the second highest contributing factor accounting for 12% of collisions.

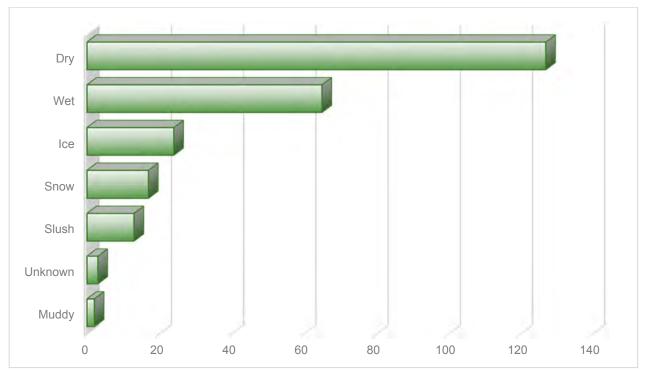
Figure 9: Contributing Factor



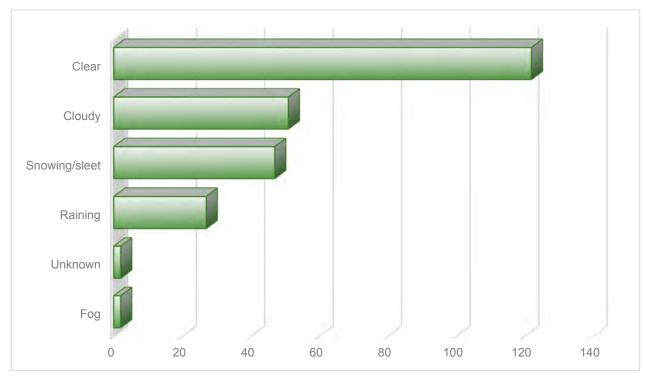
#### **Conditions**

*Figure 10* shows the roadway, weather, and lighting conditions for collisions along the study corridor. As shown, most collisions occurred during daylight, with clear skies, and a dry road. Therefore, collisions along the corridor are generally not a result of the prevailing adverse conditions.

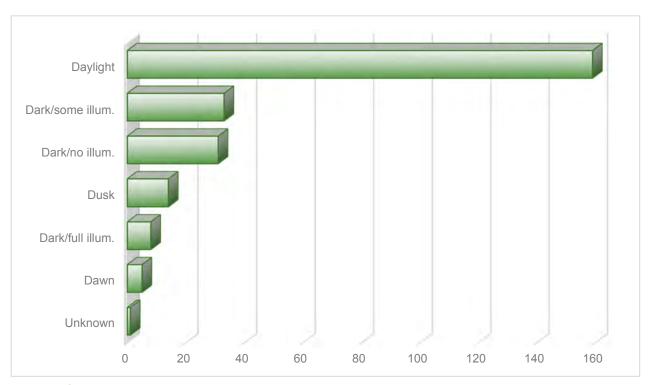
Figure 10: Road Conditions



**Roadway Condition** 



**Weather Conditions** 



**Lighting Conditions** 

## 3.2.2. Intersection & Provincial Collision Rate and Severity Index Comparison

The safety performance measures for the study intersections were compared to British Columbia Provincial benchmarks to determine if the study intersections are within the Provincial average of similar intersections. The latest five-year traffic volume range (January 1, 2009, to December 31, 2013) and average Provincial collision rates by highway service class (*Appendix C*) were used to compare the observed rates at the study intersections. It should be noted that while the collision history above is from the last ten years, the intersection and severity index are only from the last full five years (2013-2017). This results in a decrease in collisions from 251 for the ten-year period to 106 for the last five years (a reduction of approximately 58%). The following safety performance benchmarks, based on Provincial rates, are the most commonly used to determine the performance of a highway and have been used as part of this study. The highway classification used for Highway 99 is urban undivided, two-lane arterial with at-grade intersections (UAU2).

- Provincial Average Collision Rate: An average collision rate is simply an average of the calculated collision
  rates for a large group of similar locations that can be used as the basis for comparison. The average
  collision rates are often generated by road classification and traffic volume levels.
- Critical Collision Rate: The critical collision rate, which is based on statistical quality control procedures,
  has been the most widely used statistical technique among highway agencies to identify collision prone
  locations. The technique defines a location as collision prone if the observed collision rate exceeds a
  critical collision rate, which is based on the average collision rate. The critical collision rate is calculated as
  follows:

$$CR = CR$$
 ave  $+ k \sqrt{\frac{CRave}{m}} + \frac{1}{2m}$ 

where.

CRave = Average Provincial collision rate k is a constant (1.64 for 95% confidence) m = Million Vehicle Kilometres (MVK)

• Provincial Average Collision Severity Index (CSI): An average collision severity index is simply an average of the calculated collision severity indices for a large group of similar locations that can be used as the basis for comparison. Similar to average collision rates, the average CSI are often generated by road classification.

*Table 6* presents a comparison of observed safety performance measures at the seven study intersections as compared to Provincial benchmarks for similar intersections.

Table 6: Comparison of Provincial Averages & Intersection Collision Rates

Location	Provincial Average Collision Rate <sup>(1)</sup>	Provincial Critical Collision Rate <sup>(2)</sup>	Intersection Average Collision Rate	Collision Prone (Yes/No)
Hwy 99 / Alpha Lake Rd / Cheakamus Lake Rd	0.25	0.40	0.41	Yes
Hwy 99 / Alta Lake Rd	0.09	0.19	0.23	Yes
Hwy 99 / Bayshore Dr	0.25	0.41	0.06	No
Hwy 99 / Lake Placid Rd	0.34	0.51	0.16	No
Hwy 99 / Blueberry Dr	0.25	0.40	0.29	No
Hwy 99 / Village Gate Blvd	0.34	0.51	0.32	No
Hwy 99 / Lorimer Rd	0.25	0.41	0.37	No

#### Notes:

- 1. Based on Road Classification (UAU2); Provincial Average Collision Rate = number of collisions/million entering vehicles
- 2. See notes above for calculation of Provincial Critical Collision Rate

As can be seen, the Alpha Lake Rd / Cheakamus Lake Road intersection and Alta Lake Road intersection are considered collision prone when compared to the Provincial Critical Collision Rate. Over the last five years there have been 14 and seven collisions at the two intersections, respectively.

*Table 7* presents a comparison of observed intersection collision severity to the Provincial severity index for the UAU2 roadway classification. The severity index is calculated as:

Severity Index = (100\*fatal collisions + 10\*injury collisions + property damage collisions) / total number of collisions during 5-year period

Table 7: Comparison of Provincial Averages & Intersection Severity Indices

Location	Provincial Severity Index	Intersection Severity Index	Higher than Average Severity
Hwy 99 / Alpha Lake Rd / Cheakamus Lake Rd	7.82	6.79	No
Hwy 99 / Alta Lake Rd	7.73	4.86	No
Hwy 99 / Bayshore Dr	7.82	1.00	No
Hwy 99 / Lake Placid Rd	5.40	4.00	No
Hwy 99 / Blueberry Dr	7.82	4.60	No
Hwy 99 / Village Gate Blvd	5.40	3.25	No
Hwy 99 / Lorimer Rd	7.82	6.25	No

As shown, the severity index for the study intersections does not exceed the Provincial average. The results indicate that while the collisions occurring at the Alpha Lake Road / Cheakamus Lake Road and Alta Lake Road intersections are greater than the Provincial Critical Collision Rate, they are not as severe as collisions

occurring at similar intersections. There have been no fatalities at either of these intersections within the past five years.

### 3.2.3. Provincial Collision Prone Locations and Segments

Collision Prone Locations (CPLs) refer to intersections and Collision Prone Sections (CPSs) are highway segments at least a kilometre in length (excluding intersections), which have been identified as locations for safety improvements based on an analysis of collision data. Based on the Ministry's Collision Information System (CIS), CPLs and CPSs are identified using a preliminary safety performance analysis. The sites are then ranked to provide a priority for more detailed analysis. These are just the first steps in the Roadway Safety Management Process. Subsequent steps at the project level include problem confirmation (a more detailed review of collision data, traffic volumes, site conditions, etc.), problem definition (defining the issue; whether it's reduced site lines, unsafe vehicle speeds, lack of capacity, etc.), option development (how to address the issue), and option evaluation (benefits, costs, and other impacts). The *Corridor Management Plan and Project Level In-Service Road Safety Review Guidelines*, MoTI, rev. November 2010, provides further guidance on safety problem identification, problem definition, option development, and option evaluation (http://www.th.gov.bc.ca/publications/planning/index.htm).

Within the scope of this project, a review of the CIS data to determine if any locations within the study area are collision prone is sufficient.

The CPL and CPS locations are analyzed based on the composite index of the site. Each site is tested against two criteria and if both components of either criteria are satisfied the site is added to the collision prone list.

- Criteria 1: Collision Rate > Critical Collision Rate AND Number of Collisions > 15; or
- Criteria 2: Collision Severity Ratio > 6.0 AND Number of Collisions > 15

The composite index is calculated as follows:

 Composite Index = ADT x Severity-Weighted Accident Rate (SWAR) / Critical Severity-Weighted Accident Rate (CRSWAR).

The latest data available for the study area is from January 1, 2009, to December 31, 2013 (five years). The data shows none of the roadway segments (CPS) in the study area having a composite index that is ranked as collision prone for level one or two criteria. Additionally, none of the intersections are on the composite index rank for collision prone locations (CPL) for level one or two criteria.

## 3.2.4. Collision History Summary

The majority of collisions within the study corridor occur between 3:00 pm and 6:00 pm, and on Saturdays (not necessarily during the same time). The winter months of January, February, and December have the highest rate of collisions, as well as, the end of summer in August. Rear end is the most common type of collision (37%) with driver inattentiveness being the leading cause (24%). Most collisions occurred during daylight, with clear skies, and a dry road. Therefore, collisions along the corridor are generally not a result of the prevailing adverse driving conditions. Overall there has been a general decreasing trend in collisions over the past ten years with a significant drop in collisions from 2016 to 2017. It should be noted that 2017 seems to be an anomaly, however, as the yearly collisions are consistent between 2007-2016. It's also of note that there did not seem to be a significant increase in collisions in 2010, the year Vancouver held the Winter Olympics.



The Highway 99 / Alpha Lake Road / Cheakamus Lake Road and Highway 99 / Alta Lake Road intersections are considered collision prone when compared to the Provincial Critical Collision Rate. However, the severity index for these two intersections does not exceed the Provincial average. This indicates that while the number of collisions occurring at the two study intersections are greater than the Provincial Critical Collision Rate, they are not as severe as collisions occurring at similar intersections. There have not been any fatalities at any of the seven study intersections over the past five years.

The latest CPS and CPL data for the study area from January 1, 2009 to December 31, 2013 shows that none of the roadway segments or study intersections are collision prone for level one or two criteria.

## 3.3. Reliability

MoTI maintains a record on road closure events such as road closures related construction, incidents, and special events. MoTI provided closure events that were recorded along Highway 99 between January 2006 and December 2017. During this period there were 222 closures recorded within the Whistler area. There were ten closures for collisions, 201 for construction, five for special events, and six closures for miscellaneous events such as downed hydro lines and winter highway maintenance. All construction closures occurred before 2010, indicating that the majority, if not all, were related to the Sea-to-Sky upgrades for the 2010 Olympics in Vancouver. There have only been nine road closures since 2010, with five of those being planned closures for special events. The remaining four consist of a collision in 2013 that closed the highway in both directions for under 17 hours, a collision in 2017 that closed the highway in both directions for over an hour, and two police incidents in 2011.

Since Highway 99 is the primary route through the study corridor, any road closure, either partial (i.e. one-way) or full, would result in significant delay to users of the highway. The only viable detour route would be Alta Lake Road west of the Highway 99 corridor, between the Highway 99/Alta Lake Road and Highway 99/Alpine Way intersections. However, Alta Lake Road is a two-lane facility with limited shoulders and does not appear to be capable of accommodating a high number of vehicles (especially heavy vehicles).

## 3.4. Multi-Modal Considerations

#### 3.4.1. Pedestrians

Pedestrian facilities are limited within the corridor, with no sidewalks adjacent to the highway for the length of the corridor. There are separated MUP segments on the east side of Highway 99 between Bayshore Drive and Lake Placid Road, London Lane and Whistler Road, as well as, Village Gate Boulevard and Lorimer Road. There is also a multi-use bridge crossing above the highway at Nordic Drive. All the separated facilities adjacent to the highway are part of the Valley Trail network that runs throughout the Whistler area.

## 3.4.2. Cyclists

Many of the facilities mentioned above are also available for cyclist use. The valley trail network is a multi-use trail primarily for pedestrians. It provides separated facilities away from the highway traffic for its users. There



are marked bike lanes both northbound and southbound directions for the length of the study corridor. The cyclist lane pavement markings are wearing out and difficult to identify at certain points along the highway.

### 3.4.3. Transit

The study corridor is well serviced by public transit, with multiple bus routes running throughout the area. The bus numbers and a short description of their service routes are shown below.

- 20 Runs between Cheakamus Crossing and Function Junction following Highway 99 northbound to Whistler Village. Makes a detour off the highway to stop in Whistler Creek and to service the large residential area north of Whistler Creek.
- 21 Runs between Spring Creek following Highway 99 northbound to Whistler Village. Makes a detour off the highway to stop in Whistler Creek and to service the large residential area north of Whistler Creek.
- **25** Runs between Whistler Creek following Highway 99 northbound to Whistler Village. Makes a detour off the highway to service the large residential area north of Whistler Creek.
- 6 Originates and terminates at Whistler Village. Services the large residential area of Whistler Cay Heights around the Whistler Golf Club and adjacent to the east shore of Alta Lake.
- 30, 31 Runs from Whistler Village following the highway northbound past Lorimer Rd.
- 10 Runs between Emerald Estates and Alpha Lake Road/Cheakamus Lake Road.

A complete transit map of the Whistler area can be found in *Appendix D*.



## 3.5. Existing Conditions Summary

An initial review of the existing summer and winter conditions within the study corridor show that there is significant southbound queuing throughout the study corridor during the Sunday PM Peak in winter, with travel times in upwards of three to four times those of a typical trip. The primary issues appear to be due to reduced capacity at the lane drop south of Lake Placid Road and Village Gate Boulevard. Another reason is the sharp spike in traffic exiting the ski area which cannot be accommodated by the corridor with primarily one southbound lane. MoTI has implemented a max. green extension for southbound to try to resolve queuing in the corridor. However, as the issues seem to be related to the lane drops, rather than the available green time, the additional green time tends to be wasted as vehicles are unable to proceed through the intersection.

Over the past ten years there have been 251 incidents within the study area. The majority occur at/near signalized intersections, with rear-end being the most common type of incident. This is indicative that queues are developing along the corridor (either at the signalized intersections or lane drops), which is a result of more demand than there is capacity. Additionally, queuing seems to be mostly limited to southbound, especially during the winter months on a Sunday afternoon when most people are leaving Whistler to return south (either Squamish or Vancouver).

The highest rate of collisions occurs between the hours of 3:00 pm and 6:00 pm, which is during the weekday PM peak or a Sunday leaving Whistler.

While the queuing seems to be higher on Sundays in the winter, over the year, more incidents actually occur on Saturdays. There is also a noticeable increase in incidents over the winter months (December, January, February). However, there has been a general decreasing trend in incidents within the corridor over the past ten years, with a significant drop from 2016 to 2017. It should be noted that 2017 seems to be an anomaly, however, as the yearly collisions are consistent between 2007-2016. It's also of note that there did not seem to be a significant increase in collisions in 2010, the year Vancouver held the Winter Olympics.

Most collisions occur during daylight, with clear skies, and a dry road. This indicates that collisions along the corridor are generally not a result of the prevailing adverse conditions (i.e. when conditions are bad, people are generally more cautious). However, there were four fatalities within the study corridor; three of the four occurred in locations where it was dark/had no illumination, and two were pedestrian-related. There does not appear to be any specific location pattern to the fatalities within the corridor as they are all spaced out throughout the study area.

The Highway 99 / Alpha Lake Road / Cheakamus Lake Road intersection and the Highway 99 / Alta Lake Road intersection are considered collision prone when compared to the Provincial Critical Collision Rate. Over the past five years there have been 14 and seven collisions at the two intersections, respectively. However, the severity index for these two intersections does not exceed the Provincial Average. This indicates that while the collisions occurring at these intersections are greater than the average, they are not as severe as collisions occurring at similar intersections.

The latest CPS and CPL data for the study area shows that none of the roadway segments or study intersections are collision prone for level one or two criteria.



# 4. Conceptual Design Analysis

# 4.1. Option Development

The goal of the overall project is to develop short- and medium-term options to address operational deficiencies in the study area. Accordingly, the options have been separated into short- (within the next five years) and medium-term (within five to ten years) options. A long-term option is also provided for discussion purposes. It should be noted that all short and medium-term options were analyzed with existing volumes for purposes of this discussion.

## 4.1.1. Short-Term Options

Deficiencies at the Highway 99 / Lorimer Road intersection are related to the queues from the southbound lane merges (south of Village Gate Boulevard and south of Lake Placid Road) as well as the high demand (410 vph) for the WB left exiting the village. Currently, the second southbound lane is developed from the eastbound right turn lane, which has a much lower volume of 42 vph. This imbalance of lane allocation creates turbulence and reduction in capacity. Since addressing the operations of the lane merges is related to medium and longer term options (more costly options require more time to design and construct), the short-term recommendation is to provide an immediate additional westbound left-turn lane capacity at the Highway 99 / Lorimer Road intersection. This can be accomplished one of two ways (conceptual design sketches are attached in *Appendix E*):

- Re-stripe the through lane for shared through-left movements; split phase east-west operation (due to the shared lane, it is necessary to split-phase to ensure safe operation EB and WB); or
- Add a second lane in the median (minimum 75 m); protected only phasing for the WB left

With either option, the EB right-turn will need to become yield control (from free) as the WB left-turn will need to utilize both southbound lanes. This short-term improvement will increase capacity and intersection performance all year-round. The evaluations results are documented in *Section 5.3*.

## 4.1.2. Medium-Term Options

All medium-term options would include the WB left improvement at Highway 99 / Lorimer Road.

### Option 1 - Counterflow

This option would include a counterflow lane between Lake Placid Road to just north of Alpha Lake Road / Cheakamus Lake Road. Long-term, the counterflow lane could be extended to north of Lorimer Road, but since the main operational deficiency in the corridor is the southbound lane drop south of Lake Placid Road, it is not required in the medium term.

There are two options for a counterflow lane: a single lane separating northbound and southbound direction (similar to W. Georgia Street in downtown Vancouver, BC) that can be operated either direction depending on the need, including a three-lane cross section through intersections (i.e. no separate left-turn lanes); or a single lane separating northbound and southbound direction that can be operated either direction depending on the need, with widening to a five-lane cross section through intersections (i.e. with left-turn lanes).



The first option requires less widening of the roadway. However, with this operation, left-turns must be prohibited from the highway to prevent head-on collisions in the counterflow lane (drivers becoming confused where they should turn left) or rear-end collisions as a vehicle stops in the through lane to find gaps in the opposing direction. While this may be desirable in downtown Vancouver, most (if not all) of these intersections are the only option for access into the neighbourhood. Therefore, this is not likely an option, as it prohibits access for local residents and businesses.

The second option would require widening at any intersection that has a left-turn to accommodate left-turns from the highway during counterflow operation (schematic drawings are attached in *Appendix F*). For the medium-term option, this would require widening at three intersections (Bayshore Drive, Alta Lake Road, and Spring Creek Drive). However, long-term, this would include more than ten locations. While it would be feasible to widen at only the three intersections in the short-term, long-term, this would likely be cost prohibitive, potentially require closing some access points, and/or developing a parallel road system. Additionally, the operational deficiencies are mostly southbound (the northbound does not have the same pulse of traffic as the southbound during the Sunday PM, as vehicles arrive throughout the weekend rather than leave all around the same time), and therefore developing a counterflow lane does not seem to be a beneficial as it would likely be in southbound operation most of the time anyway. Therefore, a counterflow lane would not be recommended to address the corridors operational deficiencies.

#### Option 2 – Two Southbound Lanes from Taylor Way to Bayshore Drive

This option would continue the two southbound lanes from the current terminus point south of Lake Placid Road (lane drop to Taylor Way) to approximately 125 m south of Bayshore Drive (schematic drawings are attached in *Appendix G*).

As shown in *Table 8* with Option 1, the travel time northbound remains relatively unchanged when compared to Existing. However, southbound travel times are reduced by approximately 25%. The LOS also improves or remains consistent at all intersections, with the exception of the Highway 99 / Bayshore Drive intersection (shown in *Table 9*). The main reason for the degradation is that the two-lane section ends downstream of the intersection, causing queues to spillback through the intersection. In Existing conditions, since the bottleneck is upstream of the intersection, the intersection operates well.

#### Option 3 – Two Southbound Lanes from Taylor Way to Alpha Lake Road

This option would continue the two southbound lanes from the current terminus point south of Lake Placid Road (lane drop to Taylor Way) to just north of Alpha Lake Road / Cheakamus Lake Road, where the highway widens to two lanes southbound (and continues for approximately 2.5 km to the south). This can be accomplished one of two ways (schematic drawings are attached in *Appendix H*):

- a. Option 3A Drive on Shoulder: Widen the shoulder (approximately 1.5 m to 2.5 m depending on existing shoulder width) to accommodate vehicle travel on the shoulder during times of congestion (e.g. during winter weekend PM peak periods). This would require additional infrastructure (Intelligent Transportation Systems ITS) to monitor and warn drivers that they are allowed (or not) to drive on the shoulder. Additionally, bus bays (additional 3.0 m) would need to be accommodated, likely behind the shoulder, as well as emergency pullouts (additional 2.5 m) at about every 500 m to provide areas for vehicles to pull over (in an emergency) so they are not blocking the shoulder during drive-on-shoulder operation. Additional width will also be required for areas requiring concrete roadside barriers.
- b. Option 3B Two full southbound lanes: Widen southbound by an entire lane (3.6 m) plus standard shoulder. Additional width will be required for bus bays and areas requiring concrete roadside barriers.



The conceptual drawings also identified potential impacts to properties and areas requiring rock cuts or retaining walls due to the road widening.

As shown in *Table 8* with all three options, the northbound travel time remains relatively unchanged when compared to Existing. However, with Option 3A or 3B, southbound travel times are reduced by approximately 50% to 75% over the three-hour period in the Sunday afternoon.

With Option 3, the Level of Service (LOS) also improves or remains consistent at all intersections, with the exception of the Highway 99 / Alpha Lake Road / Cheakamus Lake Road intersection as shown in *Table 9*. The main reason for the degradation is that more vehicles are able to get through the corridor, and hence incur a little more delay at the intersection. However, it should be noted that the intersection still operates well.

Table 8: Travel Time Comparison

Direction	Time Period	Travel Time (m:s) <sup>(1)</sup>			
Direction	Time Period	Existing	Option 2	Option 3 <sup>(2)</sup>	
	3:15 – 4:15	9:31	9:27 <b>(0:04)</b>	9:30 (0:01)	
Northbound	4:15 – 5:15	9:31	9:26 <b>(0:05)</b>	9:29 <b>(0:02)</b>	
	5:15 – 6:15	9:08	9:07 <b>(0:01)</b>	9:01 <b>(0:07)</b>	
	3:15 – 4:15	26:01	20:56 <b>(5:05)</b>	13:17 <b>(12:44)</b>	
Southbound	4:15 – 5:15	43:22	31:40 <b>(11:42)</b>	14:59 (28:23)	
	5:15 – 6:15	46:32	36:30 <b>(10:02)</b>	12:50 <b>(33:42)</b>	

#### Notes:

Travel times are based on existing winter volumes.

- 1. xx (yy) = Option travel time (difference from Existing). Purple denotes travel time savings.
- 2. Option 3 performance is same for Options 3A and 3B.

Table 9: Intersection LOS Comparison

	Location	Existing	Option 2	Option 3
1.	Hwy 99 / Alpha Lake Rd / Cheakamus Lake Rd	15 (B)	15 (B)	20 (C)
2.	Hwy 99 / Alta Lake Rd	7 (A)	8 (A)	5 (A)
3.	Hwy 99 / Bayshore Dr	5 (A)	143 (F)	4 (A)
4.	Hwy 99 / Lake Placid Rd	203 (F)	173 (F)	21 (C)
5.	Hwy 99 / Blueberry Dr	49 (D)	41 (D)	8 (A)
6.	Hwy 99 / Village Gate Blvd	203 (F)	146 (F)	20 (C)
7.	Hwy 99 / Lorimer Rd	138 (F)	21 (C)	21 (C)

#### Notes:

Intersection LOS based on existing winter volumes.

Delay is presented in seconds/vehicle

xx (yy) = Delay (LOS)



## 4.1.3. Long-Term Option

While not part of the current task, McElhanney has developed a long-term option that provides two lanes southbound from Lorimer Road to Alpha Lake Road (schematic drawings are attached in *Appendix I*). This is provided for discussion purposes as it is likely, in the long-term, two southbound lanes will be required to accommodate the heavy southbound volume between Lorimer Road and Alpha Lake Road.



# 5. Option Evaluation

# 5.1. Methodology

The methodology for option evaluation was aimed at achieving as many of the project objectives as possible. The evaluation considered several key project objectives including cost, safety, traffic operations, drivers experience, compatibility with long-term options, constructability, and environmental impacts. A multiple account evaluation (MAE) framework was established with evaluation criteria used to qualitatively score each design option. Based on this option evaluation process, recommendations are presented for consideration.

## 5.2. Evaluation Criteria

#### Cost

To better compare conceptual design options, detailed construction cost estimates were prepared for each option using the Elemental Parametric estimation method (known as "Wolski method"). The key elements include items such as grade construction, drainage, structural construction, paving construction, signing and pavement markings/operational construction, electrical, landscaping, and utility construction. A 30% construction contingency was included in all construction cost estimates, as well as, 8% for First Nations Accommodations and 12% for MoTI Regional Cost Recoveries & Project Management. The total project cost does not include land acquisition costs. A breakdown of the detail Wolski cost estimates can be found in *Appendix J*.

#### Safety

The Ministry's ShortBEN tool was used to calculate the collision savings, which compares collision rates and severities of the Base and Proposed Cases. Specific collision severity (fatal, injury, PDO) is provided within the ShortBEN tool and is adjusted to reflect the specific improvements for each option.

The collision rate and severity distribution for the base case was assumed to be similar to the provincial average for a rural arterial undivided two-lane highway (RAU2). Provincial average data for rural arterial undivided three-lane highways is unavailable. Therefore, the collision rate and severity distribution for the proposed case was assumed to be the average of a rural arterial undivided four-lane highway (RAU4) and an RAU2.

The collision impacts, and the potential savings realized through proposed upgrades, were assessed over a 25-year benefit period. The net present value of the total benefit was obtained using a 6% discount rate, per the Ministry's Guideline.

To calculate the total cost for all collisions, the number of collisions saved was multiplied by the latest collision costs from the Ministry's default values for each collision type:

Fatal: \$8,087,204/incidentInjury: \$302,636/incidentPDO: \$13,518/incident



#### **Traffic Operations**

Travel time costs for the Highway 99 improvements were calculated using ShortBEN and are a function of:

- Number of vehicle trips
- Distance travelled
- Travel speed
- Value of time

The travel time costs for each trip origin and destination are calculated as:

Travel Time Cost = (Distance / Speed) x Trips x Value of Time

Travel speeds for the Base and Proposed Cases were estimated using field observations. For the base case it was assumed that the speed varied throughout the day based on congestion. During peak congestion periods it was assumed that traffic travelled at average speeds of 11 km/h. Vehicles speeds during shoulder and off-peak periods were assumed to be 23 km/h and 35 km/h, respectively.

It was also assumed that congestion only occurs on Saturdays and Sundays during the ski season (November to April) and on long weekends during the rest of the year (May to October). In total it is assumed that congestion occurs for 58 days throughout the year.

For the proposed cases it was assumed that congestion would be reduced. Therefore, it was assumed that travel speeds will be consistent throughout the day and are similar to speeds observed during the off-peak time (35 km/h).

### **Vehicle Operating Cost Savings**

Vehicle operating costs were calculated using the ShortBEN tool and are a function of:

- Number of vehicle trips
- Distance travelled
- Travel speeds
- Unit costs (e.g. fuel, depreciation, licensing, etc.)

Positive vehicle operating cost savings indicate less fuel consumption for an improvement option.

#### **Financial Performance**

The financial performance of the improvement options has been measured in terms of the benefit/cost ratio (B/C) and the net present value (NPV). A B/C ration greater than 1.0 is typically an indication that a proposed project presents a clear benefit, while a positive NPV indicates that the benefits associated with an improvement are greater than the costs. The B/C ratio and NPV for each option were determined assuming a discount rate of 6% and a benefit period of 25 years.

### **Greenhouse Gas Reduction**

Reducing congestion may also lead to a reduction in greenhouse gas (GHG) emissions. Changes in the GHG emissions were estimated using the ShortBEN tool.



### **Environmental Impact**

The design options to minimize impacts to adjacent parks and lakes by reducing the footprint of the highway upgrades as much as possible.

### **Driver Experience**

Drivers typically expect to travel at the posted speed of the highway facility. When congestion occurs, travel speeds decrease, and drivers can become frustrated. Counterflow lanes may not be intuitive to drivers and may cause confusion, particularly for out of town drivers. Driving on highway shoulders is not a standard practice and may also cause confusion to some drivers.

### Compatibility with Long-Term Option

The more a short-term option aligns with a long-term solution, the less chance there will be significant throwaway cost.

### Constructability

The construction of the improvement options should focus on minimizing disruption to the existing capacity of the highway and not impacting current accesses.



## 5.3. Evaluation Results

### **Short-Term Options**

The short-term options 1 and 2 are related to the westbound left-turn capacity improvements at the Highway 99 / Lorimer Road intersection. Evaluation results for the short-term options are summarized in *Table 10*.

Table 10: Short-Term Options

Short-Term Option 1 Criteria Hwy 99 / Lorimer Rd Intersection (Left/Shared Left-Through)		Short-Term Option 2 Hwy 99 / Lorimer Rd Intersection (Dual Left)		
Cost	\$0.2 M	•	\$0.4 M	
Safety	Creates diverging conflict point from left-through lane. Creates conflict between EBR and WBL.	•	Allows two designated left only lanes. Creates conflict between EBR and WBL.	•
Traffic Operations	Increases WBL capacity from Lorimer Road to Hwy 99. Changes EBR from a free movement to a yield movement. Requires split phasing	•	Increases WBL capacity from Lorimer Road to Hwy 99. Changes EBR from a free movement to a yield movement. Requires protected only left phasing.	•
Greenhouse Gas Reduction	GHG will be reduced from the existing condition.	•	GHG will be reduced from the existing condition.	•
Environmental Impact	Minor environmental impact	•	Slightly more environmental impact.	•
Driver Experience	Less common signal timing and traffic pattern through intersection	•	Common signal timing and traffic pattern through intersection.	•
Compatibility with Long-Term Option	Improves performance at the Hwy 99 / Lorimer Road intersection. Ties left- turn lanes into two lanes SB on Hwy 99.	•	Improves performance at the Hwy 99 / Lorimer Road intersection. Ties left-turn lanes into two lanes SB on Hwy 99.	•
Constructability	Minimal traffic disruption during pavement marking changes and island reconstruction	•	Traffic disruption during island removal and turning lane construction.	•
Total Score		21		22

### Legend

O Poor (0 points)	• Below Average (1 points)	Average (2 points)	Above Average (3 points)	Excellent (4 point)
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### Medium- & Long-Term Options

The medium- and long-term improvements focused on creating additional capacity on Highway 99 southbound to reduce travel time and improve safety. The evaluation results for these options are summarized in *Table 11*.

Table 11: Medium- and Long-Term Options

Criteria	Medium-Term Option 1 (Counterflow – between Lake Placid Rd to just north of Alpha Lake Rd / Cheakamus Lake Rd. 3.5 km)	Medium-Term Option 2 (2 SB Lanes from Taylor Way to Bayshore Dr. 0.5 km)		Medium-Term Option 3A (Shoulder Widening – Taylor Way Alpha Lake Rd. 3.2 km)	to	Medium-Term Option 3B (2 SB Lanes from Taylor Way to Alpha Lake Rd. 3.2 km)		Long-Term Option (2 SB Lanes from Lorimer Rd. to Alpha Lake Rd. 5.6 km)	Þ
Cost	\$31.8 M	\$5.3 M	•	\$24.3 M	•	\$29.6 M	•	\$60.2 M	0
Safety (Collision Savings)	\$5.6 M	\$0.7 M	1	\$5.0 M	•	\$5.0 M	•	\$8.8 M	•
Traffic Operations (Travel Time Savings)	\$9.0 M	\$1.2 M	1	\$8.2 M	•	\$8.2 M	•	\$14.4 M	•
Vehicle operating Savings	\$1.0 M	\$0.1 M	•	\$0.9 M	•	\$0.9 M	•	\$1.6 M	•
Financial Performance	B/C Ratio 0.63 NPV -\$9.0 M	B/C Ratio 0.51 NPV -\$2.0 M	•	B/C Ratio 0.79 NPV -\$3.8 M	•	B/C Ratio 0.65 NPV -\$7.8 M	•	B/C Ratio 0.56 NPV -\$19.6 M	•
Greenhouse Gas Reduction (tonnes/year)	119	15	1	109	•	109	•	191	•
Environmental Impact	Close proximity to Alpha Lake requiring retaining walls to contain earthworks from additional lane construction	No significant environmental impacts	•	Close proximity to Alpha Lake requiring retaining walls to contain earthworks from shoulder widening	•	Close proximity to Alpha Lake requiring retaining walls to contain earthworks from additional lane construction	•	Close proximity to Alpha Lake requiring retaining walls to contain earthworks from shoulder widening	1
Driver Experience	High likelihood of driver unfamiliarity with counterflow signing and operation, particularly for tourist traffic using the Highway.	Driver experience is improved by eliminating points of decision through lane drops or merge	•	High likelihood of driver unfamiliarity with shoulder lane signing and operation, particularly for tourist traffic using the Highway	•	Driver experience is improved by eliminating points of decision through lane drops or merges. Standard two SB lanes.	•	Driver experience is improved by eliminating points of decision through lane drops or merges	•
Compatibility with Long- Term Option	Requires widening at intersections for left- turns off the highway. Becomes operationally and economically unfeasible when extended from Lorimer Road to Alpha Lake Road.	Highly compatible with the long-term option of two full lanes southbound from Lorimer Rd to Alpha Lake Rd	•	Low compatibility with long-term option of two full lanes southbound from Lorimer Rd to Alpha Lake Rd	•	Highly compatible with the long-term option of two full lanes Southbound from Lorimer Rd to Alpha Lake Rd	•	Construction of additional northbound lane will not impact the southbound lanes.	•
Constructability	Counterflow lane and intersection widening will occur between the northbound and southbound lanes causing significant disruption to traffic along the Highway during construction.	Construction of additional southbound lane can be added to the west side of the Highway with minimal disruption to traffic along the Highway	•	Construction of shoulder widening can be added to the west side of the Highway with minimal disruption to traffic along the Highway	•	Construction of additional southbound lane can be added to the west side of the Highway with minimal disruption to traffic along the Highway	•	Construction of additional southbound lane can be added to the west side of the Highway with minimal disruption to traffic along the Highway	•
Total Score	19		25		26		28		29

### Legend

○ Poor (0 points)	Average (2 points)	◆ Above Average (3 points)	<ul><li>Excellent (4 point)</li></ul>
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Based on the results of the MAE, both short term options are fairly equal, however Option 2 (Dual Left) scores slightly better than Option 1. Option 2 also performs slightly better than Option 1 in terms of LOS.

For the medium-term options:

- The counterflow option is not recommended (refer to Section 4.1.2) but is shown in Table 11 for comparison. This option resulted in the lowest score (19 points) and has the lowest NPV at -\$9.0M.
- Option 2 is the lowest cost option but has the lowest B/C ratio (0.51). It also has the lowest travel time savings and safety benefits; therefore, it does not solve the congestion problem and simply shifts the queue further south.
- Option 3A and 3B are both viable options. Option 3A is a cheaper option with the highest B/C ratio (0.79) and only requires shoulder widening. Option 3B is more expensive than 3A with a slightly lower B/C ratio (0.65). However, Option 3B creates less confusion to drivers as it is two lanes full time operation; whereas, Option 3A (drive on shoulder) is only needed during peak time operation which relies on overhead lane use signals for guidance. Overtime, motorists are expected to be accustomed to Option 3A.

In the long-term, two southbound lanes from Lorimer Road to Alpha Lake Road can be considered, subject to further investigation and analysis. This is the most expensive option at \$60M with a low B/C 0.56 and an NPV of -\$19.6M.

# 6. Local Operational Issues

During the Highway 99 Capacity and Safety Review Draft Report meeting with the RMOW and MoTI, the team identified local operational problems/issues and potential improvements that could alleviate these issues.

These local issues are discussed in the following sections.

# 6.1. Understanding Internal Traffic Volumes

The RMOW provided traffic data from the permanent count station on Hwy 99 located near Brio (Hwy 99/Blueberry Dr intersection)<sup>1</sup>, which was compared to MoTI's permanent count station P-15-3NS located approximately 50 km south of the Highway 99 / Alpha Lake Road / Cheakamus Lake Road intersection, north of Squamish.

The Brio Entrance count station data can provide some insight to the number of internal trips within Whistler. Winter peak hour volumes for both count stations are shown in *Table 12*, *Table 13*, and *Table 14* for northbound, southbound, and both directions, respectively. Similarly, summer peak hour volumes for both count stations are shown in *Table 15*, *Table 16*, and *Table 17* for northbound, southbound, and both directions, respectively.

Table 12: Comparison of Winter Peak Hour Volumes - Northbound

	Winter – Northbound				
	P-15-3NS (Hwy 99, 10 P	m North of Squamish)	Hwy 99, North of Brio Entrance		
Peak Hour Period	АМ	PM	AM	PM	
Time	7:00 AM	4:00 PM	10:00 AM	6:00 PM	
Average (veh/h)	745	369	948	889	
Weekday (veh/h)	598	305	944	889	
Friday (veh/h)	747	668	989	1,030	
Weekend (veh/h)	1,063	358	936	869	
	Difference between Brio Entrance and P-15-3NS (Peak Hour Averages)		+ 203 (27%)	+ 520 (141%)	

<sup>&</sup>lt;sup>1</sup> This count station has been operated by the RMOW since MoTI upgraded this section of highway and decommissioned count station P-15-4 (200m north of Lake Placid Road) as part of the Whistler Creekside Development in the early 2000's.



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Table 13: Comparison of Winter Peak Hour Volumes - Southbound

	Winter – Southbound				
	P-15-3NS (Hwy 99, 10 I	km North of Squamish)	Hwy 99, North of Brio Entrance		
Peak Hour Period	АМ	PM	AM	PM	
Time	11:00 AM	4:00 PM	11:00 AM	5:00 PM	
Average (veh/h)	372	731	608	1,053	
Weekday (veh/h)	330	611	642	1,048	
Friday (veh/h)	332	684	629	1,090	
Weekend (veh/h)	484	1,016	614	1,138	
	Difference between Brio Entrance and P-15-3NS (Peak Hour Averages)		+ 236 (63%)	+ 322 (44%)	

Table 14: Comparison of Winter Peak Hour Volumes - Both Directions

	Winter – Both Directions				
	P-15-3NS (Hwy 99, 10 I	km North of Squamish)	Hwy 99, North of Brio Entrance		
Peak Hour Period	АМ	PM	AM	PM	
Time	7:00 AM	4:00 PM	10:00 AM	6:00 PM	
Average (veh/h)	865	1,100	1,556	1,942	
Weekday (veh/h)	736	916	1,586	1,937	
Friday (veh/h)	852	1,352	1,618	2,120	
Weekend (veh/h)	1,150	1,373	1,458	2,007	
	Difference between Brio Entrance and P-15-3NS (Peak Hour Averages)		+ 691 (80%)	+ 842 (77%)	

For the northbound volumes, the internal count station near Brio recorded approximately 200 more vehicles in the AM peak hour, and 520 more vehicles in the PM peak hour, compared to the count station north of Squamish. For southbound there were about 230 more vehicles in the AM peak hour and 320 more vehicles in the PM peak hour at the Brio count station than the external MoTI count station. All peak hours stayed relatively consistent except for the AM peak hour period at the count station north of Squamish; the P-15-3NS count station data had AM peak hours of either 7:00 AM or 11:00 AM, depending on direction of travel. Overall, the AM peak hour for both count stations was generally 10:00 AM / 11:00 AM and the PM peak hour was between 4:00 PM – 6:00 PM.

Table 15: Comparison of Summer Peak Hour Volumes - Northbound

	Summer – Northbound				
	P-15-3NS (Hwy 99, 10 I	km North of Squamish)	Hwy 99, North of Brio Entrance		
Peak Hour Period	АМ	PM	AM	PM	
Time	11:00 AM	4:00 PM	10:00 AM	6:00 PM	
Average (veh/h)	660	539	840	1,035	
Weekday (veh/h)	592	484	928	1,069	
Friday (veh/h)	644	802	894	1,116	
Weekend (veh/h)	810	518	807	930	
	Difference between Brio Entrance and P-15-3NS (Peak Hour Averages)		+ 180 (27%)	+ 496 (92%)	

Table 16: Comparison of Summer Peak Hour Volumes - Southbound

	Summer – Southbound			
	P-15-3NS (Hwy 99, 10 I	km North of Squamish)	Hwy 99, North c	of Brio Entrance
Peak Hour Period	АМ	PM	AM	PM
Time	11:00 AM	5:00 PM	11:00 AM	6:00 PM
Average (veh/h)	546	775	740	1,166
Weekday (veh/h)	511	752	791	1,211
Friday (veh/h)	550	695	800	1,141
Weekend (veh/h)	620	864	604	1,089
	Difference between Brio Entrance and P-15-3NS (Peak Hour Averages)		+ 194 (36%)	+ 391 (50%)

Table 17: Comparison of Summer Peak Hour Volumes - Both Directions

	Summer – Both Directions				
	P-15-3NS (Hwy 99, 10 I	km North of Squamish)	Hwy 99, North c	of Brio Entrance	
Peak Hour Period	АМ	PM	AM	PM	
Time	11:00 AM	4:00 PM	11:00 AM	6:00 PM	
Average (veh/h)	1,205	1,254	1,578	2,201	
Weekday (veh/h)	1,103	1,156	1,653	2,280	
Friday (veh/h)	1,194	1,485	1,658	2,258	
Weekend (veh/h)	1,429	1,348	1,410	2,010	
	Difference between P-15-3NS Peak Hour	Brio Entrance and Averages (% Change)	+ 373 (31%)	+ 947 (76%)	

For the northbound volumes, the internal count station near Brio recorded 180 more vehicles in the AM peak hour, and about 500 more vehicles in the PM peak hour, compared to the count station north of Squamish. Likewise, for the southbound there were approximately 200 more vehicles in the AM peak hour and about 400 more vehicles in the PM peak hour at the Brio count station than the external MoTI count station.

All peak hours stayed relatively consistent; the AM peak hour for both count stations was generally 10:00 AM / 11:00 AM and the PM peak hour was between 4:00 PM - 6:00 PM. Compared to the winter volumes, the summer AM peak hour was consistently in the late morning for both count stations, whereas the winter AM peak hour near Squamish was 7:00 AM to reflect the northbound traffic heading to the ski resort.

As shown in Tables 12 to 17, there is significant internal trips generated and circulating within Whistler. Winter and summer (AM and PM peak hours) volume graphs are in *Appendix K*.

# 6.2. Lack of Parallel Connectivity

The existing parallel connectivity in the area are at Alta Lake Road to Alpine Way on the west side of the highway. On the east side of the highway the parallel road connections are limited (Mons Road to Spruce Grove Way to Fitzsimmons Road back onto Blackcomb Way, as well as Whistler Road to Eva Lake Road to Garibaldi Way to Nordic Drive). This creates a heavy reliance on Highway 99 for local internal trips, as evident in the internal traffic volumes summarized in Section 6.1. Further internal parallel connectivity needs to be reviewed.

# 6.3. Opportunities for Intersection Improvements

During the review meeting, several intersection improvements were discussed that could help ease the congestion. Possible individual intersection improvements are summarized in sections below. It is noted that further internal parallel connectivity along with localized intersection improvements need to be analyzed and studied to confirm the issues and determine the most feasible solutions.



## 6.3.1. Function Junction Roundabout Feasibility

MoTI has addressed the suitability of installing a roundabout at the Highway 99 / Alpha Lake Road / Cheakamus Lake Road (Function Junction) intersection in their 2013 technical memo, *Re: Suitability of Roundabout on Highway 99 within Resort Municipality of Whistler*. In summary, a roundabout would be unfeasible at Highway 99 / Function Junction since traffic is unbalanced across the approaches; there are heavy north-south volumes along Highway 99 which can result in delays to Whistler traffic. Additionally, a roundabout would not be able to accommodate varying traffic flows, whereas a signal could be programed with "time of day" timing plans.

### 6.3.2. Alpha Lake Road / Cheakamus Lake Road (Function Junction)

This intersection is currently a signalized, four-legged intersection at the southern end of the Highway 99 study area. The addition of an eastbound to southbound acceleration lane could benefit the operations of this intersection; this may be more evident with the proposed gas station built in Function Junction (2020).

To improve transit connectivity and reduced transit delays, a transit exit only from the highway to Function Junction along Lynham Road may be considered as shown in *Figure 11* below.



Figure 11: Transit Exit Ramp from Highway

With the current signal timing plan, the southbound left-turn signal is delayed. Further investigation is required to determine if the northbound left-turn and southbound left-turn movements can go simultaneously. A truck template should also be run to determine if both northbound and southbound left-turn can occur concurrently. Moreover, an eastbound to northbound advanced left-turn phase could be considered if additional developments and increased in trips are expected at Function Junction.

## 6.3.3. Spring Creek Drive

Currently, buses are having difficulties making left-turns out of Spring Creek Drive as the posted speed on this section is 80 km/h. Reducing the posted speed from 80 km/h to 60 km/h or a possible protected left turn should be further investigated. However, motorists may not obey the lower speed limit in the section of roadway during off peak periods as the ambient condition does not match the feel of a lower speed facility.

Furthermore, the RMOW stated that there is a future plan to connect Cheakamus Way to Cheakamus Place for better transit connectivity (*Figure 12*).



Figure 12: Cheakamus Place to Cheakamus Way Connection

It is also recommended that traffic operations and safety at this intersection be reviewed and monitored for the possibility of a westbound to southbound protected left-turn, as well as a northbound acceleration lane.

### 6.3.4. Alta Lake Road

The T-intersection of Highway 99 with Alta Lake Road currently operates with a pedestrian-activated signal. Based on the site visit conducted on January 14, 2018, a significant queue for the eastbound right movement from Alta Lake Road to the highway was observed. The addition of a southbound acceleration lane could potentially alleviate the right-turning queues and should be further investigated. Consequently, the southbound bus stop south of the intersection would be relocated to the north of the intersection near the barrier flare.

In the long term, consider upgrading this intersection to be the main access to Bayshores / Millars Pond Neighbourhood and remove the existing Bayshore signalized intersection.

## 6.3.5. Bayshore Drive

This intersection is currently a signalized T-intersection with turning bays for all movements. It is recommended that traffic operations and safety at this intersection be reviewed and monitored for the possibility of a northbound acceleration lane.

Moreover, a bus queue jumper lane for the northbound direction to the Lake Placid Road intersection may be considered to accommodate transit vehicles serving Whistler Creekside.

In the long term, consider removing the signalized intersection in conjunction with a major upgrade to the Alta Lake Road intersection becoming the main access to Bayshores / Millars Pond Neighbourhood.

## 6.3.6. Taylor Way

The intersection of Highway 99 and Taylor Way currently operates as an unsignalized, RIRO intersection. Southbound queueing in the PM period was observed adjacent this intersection during the site visit in January 2018. The addition of a southbound acceleration lane as well as a southbound bus queue jumper lane will help ease the congestion.

Improvement on signage and paint lines for the southbound lane drop approaching this intersection should be reviewed to determine if further improvements are required. As one of the two southbound lanes on Highway 99 becomes a right-turn exit lane only, additional sign(s), such as the image to the right, notifying motorists of the lane drop would be beneficial.

Another option to consider is closing the SB right turn lane and creating a longer merge lane. Southbound right turn traffic would use the Lake Placid intersection.

### 6.3.7. Lake Placid Road

This signalized, four-legged intersection provides access to Whistler Creekside's residential and commercial areas on both sides of the highway. It is noted that the Creekside Gondola is located in Whistler Creekside and is a major access point for Whistler Mountain. Many skiers park here to access the mountain instead of going to Whistler Village. The Highway 99 / Lake Placid Road intersection experiences high traffic volumes during the winter season and is a key contributing factor in the traffic operation issues and long traffic queues affecting Whistler Creekside and nearby roadways, as observed during the site visit.

To optimize signal timing at this intersection, consider removing the south crosswalk so that additional green time can be provided to the WB left movement without conflicting with pedestrians. The existing southbound bus stop would then have to be relocated north of the intersection. To improve transit operations, consider installing a northbound bus queue jumper lane starting approximately between Bayshore Drive and Taylor Way, as well as a southbound bus queue jumper lane starting near London Lane.

### 6.3.8. London Lane & Whistler Road

Both London Lane and Whistler Road intersect Highway 99 and are unsignalized T-intersections. Transit operators have reported that they are having a difficult time making left-turns from Whistler Road. To improve safety, one option discussed during the meeting was to add a protected westbound to southbound left-turn lane



and tie it to the existing southbound left-turn lane to London Lane. This would eliminate buses having to merge into Highway 99 southbound traffic before entering the left turn lane at London Lane intersection, as illustrated in *Figure 13* below.

Additionally, it is recommended that traffic operations and safety at this intersection is reviewed and monitored for the possibility of a northbound acceleration lane at the Highway 99 / London Lane intersection.

Existing Left
Turn Lane

Sea to Sky Highway

Figure 13: Whistler Road to London Lane Protected Left-Turn Lane

### 6.3.9. Nordic Drive

The intersection of Highway 99 and Nordic Drive currently operates as an unsignalized T-intersection just south of an overhead pedestrian bridge that serves the Valley Trail network. Addition of a protected westbound to southbound left-turn lane at this intersection could help motorists enter the highway and reduce delay.

#### 6.3.10. Hillcrest Drive

This intersection is currently operating as an unsignalized T-intersection. Approximately 150m north of the intersection, the southbound shoulder begins to widen to develop the bus pullout. It has been reported that motorists (knowingly or mistakenly) making the southbound lane as a deceleration lane by utilizing this pullout. It is recommended that the bus pull out be better delineated with improved signing and pavement marking. If warranted, an addition of an eastbound to southbound acceleration lane could help traffic operation.

## 6.3.11. Blueberry Drive

The Highway 99 / Blueberry Drive intersection is currently a signalized T-intersection with turning bays for all movements. Southbound queueing was observed during the site visit at this intersection. To improve transit operation, northbound and southbound bus queue jumper lanes could be considered.

#### 6.3.12. Brio Entrance

The Highway 99 / Brio Entrance is currently operating as an unsignalized T-intersection. While there is a sign for no southbound left-turns from the highway, it is difficult to enforce. To eliminate the southbound left-in movement, a raised delta island will need to be installed to form a proper RIRO intersection.

There is currently a northbound bus pull out immediately north of the intersection. Pavement marking could be improved to prevent westbound to northbound motorists from using this pullout as an acceleration lane.

## 6.3.13. Panorama Ridge

There is currently a tapered northbound right turn lane. It is recommended that traffic operations and safety at this intersection be reviewed and monitored for the possibility of increasing the northbound deceleration lane length and adding a northbound acceleration lane. It is noted that there is currently a northbound bus pull out just north of the intersection which will need to be considered if an acceleration lane is added.

## 6.3.14. Village Gate Boulevard

The Highway 99 / Village Gate Boulevard intersection is currently signalized with turning bays for all movements, including dual westbound lefts. Village Gate Boulevard is the main access roadway to Whistler Village and services many commercial, residential, and recreational areas within the municipality, therefore experiences high traffic volumes. Based on the site, significant westbound queues were observed at this intersection as well as at the Highway 99 / Lorimer Road intersection, as skiers were leaving the Village. As discussed in previous sections of the study, the two WB to SB left turn traffic must merge into one lane further downstream; therefore, creates traffic backup, especially during the peak periods. The longer-term solution is to extend the two southbound lanes as discussed.

There is currently a NB bus pull out south of the overpass and then a right turn lane is developed north of the overpass. Some drivers may mistake the pullout as the right turn lane. The pavement marking and signing plan for the northbound bus stop should be reviewed and determine if improvements are needed to help reduce driver confusion.

## 6.3.15. Whistler Cay Drive

The Whistler Cay Drive intersection with Highway 99 is currently an unsignalized T-intersection. Pedestrians have been reported to be jaywalking across the highway to access the Valley Trail on the east side of the highway. To decrease jaywalking and improve safety, the possible addition of the Valley Trail west of Highway 99 to the Village Gate Boulevard intersection should be considered.



### 6.3.16. Lorimer Road

This signalized, four-legged intersection provides access to several commercial, residential, and recreational areas within the Village. Similar to the Village Gate Boulevard intersection, the Highway 99 / Lorimer Road intersection serves high traffic volumes during the winter season due to the local mountain resort. Westbound queues have been observed at this intersection during the site visit.

The southbound left-turn lane storage length should be reviewed as there has been a significant increase in traffic volume from the north in the past three years.

With regards to transit, a bus stop could be added approximately 50 m south of Lorimer Road intersection on the west side of highway for southbound transit vehicles. Additionally, there is an opportunity for a possible northbound bus stop location, south of Lorimer Road intersection. The design of these bus stops will have to be integrated safely with the existing acceleration or deceleration lanes.



## 7. Conclusion & Recommendations

The following is a summary of the findings from the initial review of the existing conditions within the study corridor:

- There is significant queuing during the Sunday PM Peak, with travel times in upwards of three to four times those of a typical trip.
- The primary issues appear to be due to reduced capacity at the lane drop south of Lake Placid Road and Village Gate Boulevard.
- Another factor for the poor operation is the sharp spike in traffic exiting the ski area which cannot be accommodated by the corridor with primarily one southbound lane.
- MoTI has implemented a max. green extension for southbound traffic to try to resolve queuing in the
  corridor. However, as the issues seem to be related to the lane drops and lack of roadway capacity,
  rather than the available green time, the additional green time tends to be wasted as vehicles are
  unable to proceed through the intersection with the traffic spillback.

Short-term, medium-term, and long-term concept options were developed to improve traffic operations throughout the project corridor, focusing primarily on the southbound poor performance during the Sunday Peak period. Two short-term and four medium-term concepts were evaluated using a MAE framework in order to determine which options achieved the most project objectives. Criteria that were used to evaluate the different design options were cost, safety, traffic operations, driver experience, compatibility with long-term option, constructability, and environmental impact.

Based on the results of the analysis and MAE, the following recommendations have been made:

- Short-term Option 2 (Lorimer Road intersection improvements) has the highest score and should be considered for implementation.
- In the medium-term (subject to funding), both Options 3A and 3B are viable and achieve the most project objectives. Moving forward, it is recommended that MoTI conduct additional analysis and design to determine the most appropriate medium-term option. MoTI should review the policy of "driving on shoulder" supported by overhead signals during peak periods as a potential option.
- MoTI should further review the constructability and feasibility of the long-term option.

Based on the meetings with the RMOW and MoTI, the internal traffic circulation was reviewed, and the local traffic and transit operational issues and opportunities were discussed and summarized in this report. By comparing count stations at Brio and with one near Squamish, it was found that both the northbound and southbound traffic volumes were higher at Brio. This confirms that there are many internal trips within Whistler. With a limited parallel road system, there is a heavy reliance on Highway 99 for local internal trips. Mixing internal trips, tourism traffic, recreational trips and regional trips create traffic congestion on this extremely constrained corridor, especially during the summer and winter seasons.

Further internal parallel connectivity along with localized intersection improvements need to be studied to determine the most feasible solutions. An improved bus network including bus queue jumpers would help improve transit travel time and promote transit ridership; thus, removing more vehicles from the highway. It is recommended that MoTI to work with RMOW and further review the local operational issues identified in



Section 6 and determine which issues require further studies to confirm these concerns and develop possible mitigation strategies.

It is also recommended that all the corridor pavement markings should be competed in early spring (before June 1 if possible) to improve visibility and safety.



	Highway 99 Capacity and Safety Review, Whistler (Alpha Lake Rd/Cheakamus Lake Rd to Lorimer Rd) Final Report
Appendix A – Existing Intersectio	on Counts

Hwy 99	/ Alnha	Lake Rd	/ Cheakamus Lake Rd

Hwy 99 / Alp	ha Lake Rd / (	Cheakamus Detector	Lake Rd Det2	Det21	Det9	Det6	Det14	Det13	B Det22	Det	t24	Det8	Det11	Det4	Det15	Det23	
		Loop # Movemen	L13 nt A1	L21/L22 A1 RT	L15 AX	L6 A2	L5 A2	L8 AY	L17/L1: A2 RT	8 L19 B2		L9 B2	L12 B2	L1 B1	L4 B1	L16 B1 RT	
		Direction		NBR	NBL	SBT1		SBL	SBR	SBF		WBT	WBL	EBT	EBL	EBR	
Data	T'																
	Time 12:00:00 AM			10	2	0	7	5	3	2	3	1		0	0	3	0
	12:15:00 AM			12	0	0	9	2	8	3	2	1		3	0	3	0
	12:30:00 AM			7	0	0	6	2	3	0	2	0		1	0	2	1
1/14/2018 1/14/2018	12:45:00 AM 1:00:00 AM			3	0	1 0	6 2	1 2	3 9	1 0	1 5	1		0 4	0	3 0	1 0
1/14/2018	1:15:00 AM			6	0	0	5	3	2	1	0	0		1	0	2	0
1/14/2018	1:30:00 AM			3	0	0	1	1	2	1	0	1		0	0	2	0
1/14/2018	1:45:00 AM			4	1	0	5	0	8	0	4	0		1	0	1	0
1/14/2018 1/14/2018	2:00:00 AM 2:15:00 AM			4 3	0	0 0	4 2	0 0	4 5	0 4	2	1		1 0	0 0	1 2	0 2
1/14/2018	2:30:00 AM			1	0	0	5	1	5	2	3	0		3	0	3	0
1/14/2018	2:45:00 AM			2	0	0	0	1	3	0	0	0		1	0	0	0
1/14/2018 1/14/2018	3:00:00 AM 3:15:00 AM			0 3	0 1	0 1	5 3	3 1	1 4	2 3	2	0		0 0	0 1	1 1	0
1/14/2018	3:30:00 AM			2	0	0	1	4	0	0	1	1		1	0	0	1
1/14/2018	3:45:00 AM			1	0	0	2	0	4	1	1	0		2	0	1	0
1/14/2018	4:00:00 AM			1	0	0	4	2	2	2	1	0		2	1	2	0
1/14/2018 1/14/2018	4:15:00 AM 4:30:00 AM			3 6	0	0 0	4 12	2	2 0	0 0	1	0		0 0	0 0	0 0	0
1/14/2018	4:45:00 AM			1	1	0	8	4	1	2	1	0		2	0	1	0
1/14/2018	5:00:00 AM			6	0	0	11	5	0	1	2	0		0	0	2	0
1/14/2018	5:15:00 AM			5	0	0	12	4	1	2	3	0		1	0	0	0
1/14/2018 1/14/2018	5:30:00 AM 5:45:00 AM			8 8	0 1	0 0	9 7	2 0	0 0	0 3	3 2	0		0 1	0 1	3 0	0
1/14/2018	6:00:00 AM			11	1	1	14	5	2	3	4	0		0	0	2	1
1/14/2018	6:15:00 AM			14	0	0	10	7	1	2	6	0		0	1	2	0
1/14/2018	6:30:00 AM			32	0	4	16	6	3	3	8	0		1	1	5	3
1/14/2018 1/14/2018	6:45:00 AM 7:00:00 AM			30 49	0	0 0	17 27	9 8	3	3 12	7 10	0		1 3	1 1	3 4	2 0
1/14/2018	7:15:00 AM		1	10	1	2	28	22	4	11	22	1		1	1	5	3
1/14/2018	7:30:00 AM		2	200	2	2	32	21	5	4	28	0		4	2	9	3
1/14/2018	7:45:00 AM			280	0	3	25	15	5	10	26	2		3	1	5	2
1/14/2018 1/14/2018	8:00:00 AM 8:15:00 AM			145	0	2 2	22 38	29 34	5 1	8 19	18 11	1		3 4	1 1	4 1	4 6
1/14/2018	8:30:00 AM			220	1	5	36	28	4	16	19	4		2	4	6	9
1/14/2018	8:45:00 AM		2	240	5	7	40	28	9	41	14	4		6	3	14	16
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1/14/2018	9:45:00 AM			.20	3	5	80	33	5	33	12	7		2	5	18	6
	10:00:00 AM			15	2	2	80	27	8	36	13	2		7	2	28	12
	10:15:00 AM 10:30:00 AM		1	.15 90	1	3 4	70 70	38 34	11 8	52 42	21 18	7		5 2	5 4	21 28	22 18
	10:45:00 AM			90	3	4	95	42	12	42	11	3		4	3	20	11
1/14/2018	11:00:00 AM			80	3	6	58	45	13	39	8	2		4	7	30	16
	11:15:00 AM		1	.05	2	5	75	39	13	52	14	2		6	4	19	9
	11:30:00 AM 11:45:00 AM			80 65	1	5 4	63 60	42 33	18 19	37 46	14 14	8		6 3	10 7	38 40	10 21
	12:00:00 PM			85	6	6	65	32	17	50	16	5		12	4	29	16
	12:15:00 PM			70	5	3	65	41	17	39	10	8		5	7	30	31
	12:30:00 PM 12:45:00 PM			85 80	3 4	8 8	70 65	33 43	20 17	37 47	20	6 8		2	6 5	30 38	14
1/14/2018				70	6	9	65	43	21	42	14 14	5		5	11	34	18 23
1/14/2018				80	4	8	95	33	18	57	17	1		6	6	27	22
1/14/2018				85	5	6	80	42	18	47	9	6		4	1	25	24
1/14/2018 1/14/2018				70 80	0 1	6 8	115 120	46 57	18 18	49 41	14 13	6		8 6	5 4	28 31	21 24
1/14/2018	2:15:00 PM			80	1	4	115	48	15	41	13	7		5	3	33	16
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1/14/2018			1	.00	4	6	165	90 80	20	37 46	19	9		8 7	10	36	32
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1/14/2018				90	3	5	185	85	18	37	10	5		6	9	30	14
1/14/2018 1/14/2018	4:15:00 PM 4:30:00 PM			90 80	3	6 9	180 190	95 95	25 12	29 29	13 20	4		8 5	2 3	23 20	19 20
1/14/2018	4:45:00 PM			75	7	7	190	75	20	25	11	3		10	5	20	15
1/14/2018	5:00:00 PM			80	3	8	185	80	17	26	14	10		4	6	20	20
1/14/2018	5:15:00 PM			85	3	2	185	80	17	12	8	2		6	2	22	13

1/14/2018	5:30:00 PM	65	3	9	190	80	19	21	8	3	4	6	21	7
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1/14/2018	6:30:00 PM	42	1	3	115	46	15	20	16	1	4	2	12	11
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1/14/2018	7:30:00 PM	34	2	1	65	20	16	11	5	0	2	2	6	7
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1/14/2018	8:30:00 PM	29	1	0	35	13	12	1	5	0	4	1	5	2
1/14/2018	8:45:00 PM	35	1	0	29	15	12	6	5	1	4	3	5	0
1/14/2018	9:00:00 PM	38	1	0	16	11	3	4	3	0	1	1	4	1
1/14/2018	9:15:00 PM	32	2	0	17	5	7	4	4	0	3	0	6	0
1/14/2018	9:30:00 PM	31	1	0	21	6	8	4	4	2	3	0	3	2
1/14/2018	9:45:00 PM	25	1	0	10	5	8	6	2	0	1	1	7	0
1/14/2018	10:00:00 PM	19	1	0	11	5	6	7	5	1	2	0	6	1
1/14/2018	10:15:00 PM	22	2	1	11	5	8	2	0	0	0	0	3	0
1/14/2018	10:30:00 PM	23	1	0	7	3	7	3	5	0	0	1	5	0
1/14/2018	10:45:00 PM	18	0	0	10	4	6	1	1	1	1	0	2	0
1/14/2018	11:00:00 PM	12	1	1	7	5	9	1	3	0	3	1	4	0
1/14/2018	11:15:00 PM	9	0	0	8	9	8	4	6	1	2	0	5	0
	11:30:00 PM	7	1	2	5	4	9	8	0	1	1	0	8	0
1/14/2018	11:45:00 PM	4	2	2	1	3	8	2	2	0	1	0	9	1

11Wy 33 / Buy3		Detector Loop # Movement Direction	Det2 L1 tA1 EBT	Det21 L9/L10 A1 > EBR	Det6 L2 A2 WBT		Det9 L4 A2 < WBL	Det12 L6 B NBT	Det23 L11/L12 B > NBR	2	
Date	Time										
	12:00:00 AM		2	6	1	20		9	2	4	
	12:15:00 AM		1		0	18		6	0	3	
	12:30:00 AM		1		3	15		5	1	8	
	12:45:00 AM		1		1	16		2	0	0	182
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1/14/2018	1:30:00 AM			9	0	9		8	2	4	143
1/14/2018	1:45:00 AM			0	0	14		3	1	2	142
1/14/2018	2:00:00 AM			8	1	10		2	0	1	120
1/14/2018	2:15:00 AM			6	1	13		5	0	4	113
1/14/2018	2:30:00 AM		1	0	0	10		4	2	0	107
1/14/2018	2:45:00 AM			4	0	7		5	1	3	97
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1/14/2018	3:30:00 AM			4	0	5		2	1	1	76
1/14/2018	3:45:00 AM			2	1	4		1	1	0	65
1/14/2018	4:00:00 AM			2	0	9		4	1	2	66
1/14/2018	4:15:00 AM			4	0	8		1	0	4	57
1/14/2018	4:30:00 AM			7	0	12		1	0	0	64
1/14/2018	4:45:00 AM			3	0	13		1	1	2	75
1/14/2018	5:00:00 AM		1	1	0	19		1	0	0	88
1/14/2018	5:15:00 AM			8	1	18		2	1	2	103
1/14/2018	5:30:00 AM		1	6	0	11		2	1	4	117
1/14/2018	5:45:00 AM		1	1	0	9		2	0	3	122
1/14/2018	6:00:00 AM		1	5	1	25		2	1	4	139
1/14/2018	6:15:00 AM		2	0	0	18		3	1	7	156
1/14/2018	6:30:00 AM		5	1	0	26		0	1	7	207
1/14/2018	6:45:00 AM		4	3	3	32		0	1	6	267
1/14/2018	7:00:00 AM		5	9	1	52		4	3	8	346
1/14/2018	7:15:00 AM		12		2	53		5	4	12	498
1/14/2018	7:30:00 AM		22	5	3	55		2	8	26	732
1/14/2018	7:45:00 AM		28		0	49		9	1	30	1016
1/14/2018	8:00:00 AM		27		0	61		9	3	22	1259
1/14/2018	8:15:00 AM		26		2	90		5	5	32	1457
1/14/2018	8:30:00 AM		27		0	80		5	1	28	1527
1/14/2018	8:45:00 AM		29		3	105	1		6	24	1598
1/14/2018	9:00:00 AM		29		1	95			3	22	1660
1/14/2018	9:15:00 AM		26		5	105	1		6	26	1673
1/14/2018	9:30:00 AM		14		2	115	1		3	15	1581
1/14/2018	9:45:00 AM		13		2	145		8	7	24	1462
	10:00:00 AM		17		5	155			11	31	1414
1/14/2018	10:15:00 AM		16	5	3	165		9	7	34	1385

1/14/2018	10:30:00 AM	160	7	155	9	8	21	1448
1/14/2018	10:45:00 AM	155	3	165	15	7	33	1505
1/14/2018	11:00:00 AM	140	3	150	16	8	18	1456
1/14/2018	11:15:00 AM	105	5	165	12	9	12	1381
1/14/2018	11:30:00 AM	155	2	160	13	8	26	1385
1/14/2018	11:45:00 AM	130	8	140	10	7	19	1321
1/14/2018	12:00:00 PM	140	5	160	12	4	23	1330
1/14/2018	12:15:00 PM	115	3	160	13	7	16	1336
1/14/2018	12:30:00 PM	125	1	145	17	3	24	1287
1/14/2018	12:45:00 PM	135	5	150	13	10	10	1296
1/14/2018	1:00:00 PM	125	12	150	16	5	9	1269
1/14/2018	1:15:00 PM	120	5	200	17	5	20	1322
1/14/2018	1:30:00 PM	120	4	190	24	7	20	1372
1/14/2018	1:45:00 PM	125	3	220	12	8	10	1427
1/14/2018	2:00:00 PM	120	5	220	26	6	14	1501
1/14/2018	2:15:00 PM	120	5	210	16	8	12	1505
1/14/2018	2:30:00 PM	150	5	215	18	7	28	1563
1/14/2018	2:45:00 PM	155	3	290	20	8	17	1678
1/14/2018	3:00:00 PM	140	4	315	25	4	16	1791
1/14/2018	3:15:00 PM	105	6	315	25	8	13	1892
1/14/2018	3:30:00 PM	140	4	315	16	12	13	1969
1/14/2018	3:45:00 PM	140	7	295	32	11	21	1982
1/14/2018	4:00:00 PM	115	13	295	17	8	14	1940
1/14/2018	4:15:00 PM	140	14	270	18	11	12	1933
1/14/2018	4:30:00 PM	150	12	250	10	9	16	1880
1/14/2018	4:45:00 PM	115	8	230	12	5	13	1757
1/14/2018	5:00:00 PM	125	9	255	14	7	14	1719
1/14/2018	5:15:00 PM	130	5	205	24	7	6	1631
1/14/2018	5:30:00 PM	115	12	245	27	7	14	1604
1/14/2018	5:45:00 PM	85	8	270	34	6	16	1640
1/14/2018	6:00:00 PM	95	13	270	17	6	18	1635
1/14/2018	6:15:00 PM	85	4	215	29	4	16	1611
1/14/2018	6:30:00 PM	75	2	190	15	6	8	1487
1/14/2018	6:45:00 PM	65	4	135	8	8	22	1310
1/14/2018	7:00:00 PM	65	0	125	20	3	9	1113
1/14/2018	7:15:00 PM	61	2	135	19	8	10	995
1/14/2018	7:30:00 PM	54	5	105	11	8	10	892
1/14/2018	7:45:00 PM	47	3	105	21	6	9	841
1/14/2018	8:00:00 PM	40	2	75	12	3	10	761
1/14/2018	8:15:00 PM	41	3	80	6	7	3	666
1/14/2018	8:30:00 PM	41	2	58	14	5	8	601
1/14/2018	8:45:00 PM	44	1	65	10	3	11	544
1/14/2018	9:00:00 PM	35	4	44	9	0	8	502
1/14/2018	9:15:00 PM	54	2	40	4	1	8	471
1/14/2018	9:30:00 PM	42	2	43	14	3	5	452
1/14/2018	9:45:00 PM	20	1	35	14	3	6	397
1/14/2018	10:00:00 PM	33	3	29	11	4	5	382
1/14/2018	10:15:00 PM	30	1	36	8	1	9	358
1/14/2018	10:30:00 PM	33	3	19	19	4	8	335

1/14/2018 10:45:00 PM	24	0	18	10	0	3	311
1/14/2018 11:00:00 PM	15	1	29	7	2	3	283
1/14/2018 11:15:00 PM	19	5	32	6	3	3	266
1/14/2018 11:30:00 PM	15	0	22	11	4	4	236
1/14/2018 11:45:00 PM	15	3	13	6	1	5	224

Hwy 99 / Lake Placid Rd											
		et17 Det			Det2	Det13	Det21	Det6	Det14	Det9	
	L10 L8		L4	L15/L16	L5	L7	L17/L18		L11	L14	
	C C:	> B	B<	B>	A1	A1<	A1>	A2	A2	A2<	
	EBT/L EI	BR WB	T WBL	WBR	NBT	NBL	NBR	SBT1	SBT2/R	SBL	
Date Time	_			_				_			_
1/14/2018 12:00:00 AM	7	1	2	2	1	27	1	2	13	16	2
1/14/2018 12:15:00 AM	9	1	3	0	1	16	2	3	16	7	2
1/14/2018 12:30:00 AM	10	0	1	5	2	14	2	4	11	11	3
1/14/2018 12:45:00 AM	6	2	2	2	1	9	4	0	14	7	2
1/14/2018 1:00:00 AM	9	2	2	1	0	11	2	2	16	9	3
1/14/2018 1:15:00 AM	6	2	1	1	1	13	2	3	10	9	4
1/14/2018 1:30:00 AM	6	2	0	1	0	12	2	1	10	4	3
1/14/2018 1:45:00 AM	5	1	1	0	0	8	1	1	11	11	3
1/14/2018 2:00:00 AM	6	1	1	1	3	8	1	0	6	8	3
1/14/2018 2:15:00 AM	6	1	2	1	1	8	1	1	9	10	2
1/14/2018 2:30:00 AM	6	3	1	0	1	7	3	1	5	12	2
1/14/2018 2:45:00 AM	6	0	2	0	1	4	1	2	8	3	5
1/14/2018 3:00:00 AM	5	3	1	1	1	3	2	2	3	2	1
1/14/2018 3:15:00 AM	3	0	2	2	1	8	1	0	12	2	2
1/14/2018 3:30:00 AM	4	0	1	0	0	4	0	0	5	5	4
1/14/2018 3:45:00 AM	3	0	0	0	1	2	0	0	4	5	2
1/14/2018	2	0	1	3	0	3	1	0	7	3	1
			0	0	0	3 7	0				
1/14/2018 4:15:00 AM	1	1						1	6	2	1
1/14/2018 4:30:00 AM	3	2	2	1	1	7	0	1	3	9	2
1/14/2018 4:45:00 AM	3	2	0	0	0	4	0	0	8	10	1
1/14/2018 5:00:00 AM	4	2	0	2	0	8	2	1	8	9	1
1/14/2018 5:15:00 AM	1	1	0	0	0	9	0	1	10	8	1
1/14/2018 5:30:00 AM	3	0	2	0	0	19	2	1	8	3	1
1/14/2018 5:45:00 AM	4	0	0	3	3	13	1	1	7	10	0
1/14/2018 6:00:00 AM	8	0	4	0	0	13	2	4	13	12	1
1/14/2018 6:15:00 AM	6	1	3	5	0	23	4	0	8	7	4
1/14/2018 6:30:00 AM	9	1	3	3	0	51	3	6	11	10	3
1/14/2018 6:45:00 AM	11	1	3	4	3	46	4	3	14	16	0
1/14/2018 7:00:00 AM	8	0	4	1	1	48	3	13	31	23	2
1/14/2018 7:15:00 AM	13	2	6	8	4	100	11	28	25	24	3
1/14/2018 7:30:00 AM	20	2	5	6	5	160	16	75	23	22	6
1/14/2018 7:45:00 AM	19	8	4	10	7	165	14 1	30	28	19	4
1/14/2018 8:00:00 AM	23	1	12	11	8	145		45	40	26	15
1/14/2018 8:15:00 AM	35	2	8		17	160		35	54	32	8
1/14/2018 8:30:00 AM	22	3	20		12	150		55	41	30	6
1/14/2018 8:45:00 AM	30	5	15	29	8	155		35	51	33	9
1/14/2018 9:00:00 AM	21	8	10		10	185		20	57	44	9
1/14/2018 9:15:00 AM	20	3	8		14	185	14	85	65	32	6
1/14/2018 9:30:00 AM	18	5	8	19	8	110	9	50	65	39	6
1/14/2018 9:45:00 AM	24	13	13	25	8	105	12	48	65	58	5
1/14/2018 9:49:00 AM	29	7	11		13	130	12	<del></del> -3	80	56	10
1/14/2018 10:00:00 AM	33	8	14		17	115	20	60	80	63	5
1/14/2018 10:30:00 AM	22	5	16		18	115	11	57	85	56	6
1/14/2018 10:45:00 AM	23	10	11		28	125	11	46 25	90	61	11
1/14/2018 11:00:00 AM	35	16	15		12	120	14	35	75 	65	14
1/14/2018 11:15:00 AM	31	12	16		11	85	8	21	75	58	8
1/14/2018 11:30:00 AM	26	10	19		13	125	12	44	80	53	7
1/14/2018 11:45:00 AM	34	8	22		13	95	19	33	75	54	10
1/14/2018 12:00:00 PM	25	13	15	26	9	115	14	32	80	59	11
1/14/2018 12:15:00 PM	28	11	6	26	8	90	11	28	80	55	14
1/14/2018 12:30:00 PM	24	3	16	30	9	110	24	25	70	54	10
1/14/2018 12:45:00 PM	29	10	8	28	5	100	9	29	65	55	7
1/14/2018 1:00:00 PM	12	10	17	33	7	90	11	30	80	65	5
1/14/2018 1:15:00 PM	29	11	15	34	10	105	11	25	95	65	9
1/14/2018 1:30:00 PM	24	11	15	34	5	105	14	19	105	57	5
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1/14/2018 2:00:00 PM	30	18	27	43	3	100	9	28	100	80	10
1/14/2018 2:15:00 PM	30	14	23		10	100	10	24	95	70	13
1/14/2018 2:30:00 PM	36	14	30		11	115	17	46	105	75	11
1/14/2018 2:45:00 PM	39	18	44		13	115	19	35		105	10
_,,	33	10		-							0

1/14/2018	3:00:00 PM	27	23	62	70	12	110	18	27	120	115	4
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1/14/2018	4:45:00 PM	26	7	51	45	6	90	15	22	70	70	4
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1/14/2018	5:45:00 PM	27	26	26	28	12	65	18	19	120	120	6
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1/14/2018		26	6	6	22	5	57	10	8	65	65	8
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1/14/2018		27	9	8	15	4	37	2	8	29	34	12
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1/14/2018	9:45:00 PM	12	0	3	4	3	24	3	3	25	26	5
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	10:15:00 PM	12	3	3	2	2	30	6	2	21	18	10
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	11:00:00 PM	11	2	4	4	2	14	3	2	20	11	3
1/14/2018	11:15:00 PM	6	4	5	1	0	14	5	3	25	16	3
	11:30:00 PM	3	1	2	3	0	17	0	3	22	9	1
1/14/2018	11:45:00 PM	7	1	3	1	1	16	2	1	12	12	3

,,	,	Det13 L9 A1< EBL	Det2 L7 A1 EBT		Det6 L6 A2 WBT	Det14 L5 A2> WBR	Det15 L4 B< SBL	Det4 L1 B SBT	
Date	Time								
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1/14/2018		0	1	29	3	3	3	4	0
	12:30:00 AM	0	3	39	4	1	1	3	0
1/14/2018	12:45:00 AM	0	1	21	3	0	6	5	0
1/14/2018	1:00:00 AM	0	1	28	3	7	8	6	0
1/14/2018	1:15:00 AM	0	1	20	2	7	6	7	2
1/14/2018	1:30:00 AM	0	1	30	3	6	6	6	1
1/14/2018	1:45:00 AM	0	0	23	3	5	5	6	1
1/14/2018	2:00:00 AM	0	1	25	2	5	3	3	0
1/14/2018	2:15:00 AM	0	0	16	2	3	6	2	2
1/14/2018	2:30:00 AM	0	1	19	2	9	6	4	1
1/14/2018	2:45:00 AM	0	1	14	1	6	5	4	2
1/14/2018	3:00:00 AM	0	0	8	1	9	0	1	0
1/14/2018	3:15:00 AM	0	1	16	1	8	3	1	1
1/14/2018	3:30:00 AM	0	0	10	1	8	1	0	0
1/14/2018	3:45:00 AM	0	0	11	1	4	0	0	0
1/14/2018	4:00:00 AM	0	1	3	1		3	1	0
1/14/2018	4:15:00 AM	0	0	12	1		0	1	1
1/14/2018	4:30:00 AM	0	0	13	1		0	0	1
1/14/2018	4:45:00 AM	0	0	10	1		0	0	0
1/14/2018	5:00:00 AM	0	0	11	2		2	1	2
1/14/2018	5:15:00 AM	0	1	13	1		0	3	0
1/14/2018	5:30:00 AM	0	0	26	1		1	1	1
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1/14/2018	6:00:00 AM	0	0	26	3		1	0	1
1/14/2018	6:15:00 AM	0	2	36	1		1	6	0
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1/14/2018	6:45:00 AM	0	0	65	3		0	1	1
1/14/2018	7:00:00 AM	0	1	65	7		0	5	5
1/14/2018	7:15:00 AM	0	0	125	6		2	9	4
1/14/2018	7:30:00 AM	0	3	185	8		2	6	5
1/14/2018	7:45:00 AM	0	1	220	8		2	15	4
1/14/2018	8:00:00 AM	0	1	210	9		4	17	9
1/14/2018	8:15:00 AM	0	4	215	12		4	16	15
1/14/2018	8:30:00 AM	0	6	210	10		7	22	7
1/14/2018	8:45:00 AM	0	9	210	9		12	21	6
1/14/2018	9:00:00 AM	0	7	215	11		4	15	21
1/14/2018	9:15:00 AM	0	7	245	11		7	17	14
1/14/2018	9:30:00 AM	0	0	155	12		6	18	5
1/14/2018	9:45:00 AM	0	4	155	14	0	11	21	14

1/14/2018	10:00:00 AM	0	8	200	155	5	21	17
1/14/2018	10:15:00 AM	0	11	180	170	10	15	14
1/14/2018	10:30:00 AM	0	4	185	150	12	14	24
1/14/2018	10:45:00 AM	0	7	210	170	4	20	8
1/14/2018	11:00:00 AM	0	1	195	175	13	20	12
1/14/2018	11:15:00 AM	0	6	160	170	11	7	9
1/14/2018	11:30:00 AM	0	5	180	145	9	12	14
1/14/2018	11:45:00 AM	0	9	160	170	6	8	11
1/14/2018	12:00:00 PM	0	2	170	155	11	12	10
1/14/2018	12:15:00 PM	0	4	145	165	10	8	12
1/14/2018	12:30:00 PM	0	5	140	135	10	12	14
1/14/2018	12:45:00 PM	0	7	150	160	14	10	14
1/14/2018	1:00:00 PM	0	5	125	160	15	11	15
1/14/2018	1:15:00 PM	0	8	145	185	7	14	9
1/14/2018	1:30:00 PM	0	10	145	205	9	9	9
1/14/2018	1:45:00 PM	0	3	165	215	9	14	10
1/14/2018	2:00:00 PM	0	6	130	195	11	11	9
1/14/2018	2:15:00 PM	0	8	135	225	12	8	8
1/14/2018	2:30:00 PM	0	3	160	240	10	12	11
1/14/2018	2:45:00 PM	0	10	190	285	18	15	17
1/14/2018	3:00:00 PM	0	9	185	320	12	10	6
1/14/2018	3:15:00 PM	0	6	145	315	17	11	12
1/14/2018	3:30:00 PM	0	12	185	230	12	12	14
1/14/2018	3:45:00 PM	0	7	180	130	3	14	15
1/14/2018	4:00:00 PM	0	11	175	225	11	19	28
1/14/2018	4:15:00 PM	0	12	165	180	9	15	25
1/14/2018	4:30:00 PM	0	6	150	135	9	19	26
1/14/2018	4:45:00 PM	0	10	145	130	10	16	30
1/14/2018	5:00:00 PM	0	5	140	175	8	13	29
1/14/2018	5:15:00 PM	0	12	150	185	10	22	23
1/14/2018	5:30:00 PM	0	6	145	160	13	9	11
1/14/2018	5:45:00 PM	0	11	110	280	17	15	21
1/14/2018	6:00:00 PM	0	5	115	195	6	9	10
1/14/2018	6:15:00 PM	0	7	120	210	11	18	2
1/14/2018	6:30:00 PM	0	1	125	185	9	11	9
1/14/2018	6:45:00 PM	0	3	85	145	6	8	5
1/14/2018	7:00:00 PM	0	6	95	145	18	13	8
1/14/2018	7:15:00 PM	0	2	85	135	7	10	8
1/14/2018	7:30:00 PM	0	1	80	135	13	5	3
1/14/2018	7:45:00 PM	0	7	80	130	3	11	7
1/14/2018	8:00:00 PM	0	4	55	125	14	10	6
1/14/2018	8:15:00 PM	0	4	70	110	8	4	3
1/14/2018	8:30:00 PM	0	5	65	95	4	5	4
1/14/2018	8:45:00 PM	0	4	80	90	6	5	2
1/14/2018	9:00:00 PM	0	2	61	65	5	5	3
1/14/2018	9:15:00 PM	0	5	70	75	9	8	2
1/14/2018	9:30:00 PM	0	1	55	61	9	3	2

1/14/2018	9:45:00 PM	0	3	54	80	6	5	2	
1/14/2018	10:00:00 PM	0	4	52	63	10	5	4	
1/14/2018	10:15:00 PM	0	4	54	62	2	8	2	
1/14/2018	10:30:00 PM	0	2	50	41	3	3	1	
1/14/2018	10:45:00 PM	0	3	37	50	1	6	2	
1/14/2018	11:00:00 PM	0	1	32	52	5	1	0	
1/14/2018	11:15:00 PM	0	0	29	61	8	4	1	
1/14/2018	11:30:00 PM	0	0	27	44	4	2	1	
1/14/2018	11:45:00 PM	0	0	31	40	1	1	0	

Hwy 99 / Villag	e Gate Blvd										
		Detector	Det11	Det12	Det8			Det21	Det6	Det14	Det9
		Loop#	L5	L3	L1	L	6 l	_11	L8	L7	L10
		Movemen	it B<	B<	B>	Α	.1	41>	A2	A2	A2<
		Direction	WBL1	WBL2	WBR	N	IBT I	NBR	SBT1	SBT2	SBL
Date 1	Time										
	12:00:00 AM	27	7 6	j	20	19	17	18	0	4	14
	12:15:00 AM	22			15	12	19	7			
	12:30:00 AM	34			20	14	21	9			
	12:45:00 AM	36		j	16	10	12	3		0	17
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1/14/2018	1:30:00 AM	36	5 8	3	8	6	28	7	0	1	. 8
1/14/2018	1:45:00 AM	19	) 3	}	25	3	22	10	0	0	10
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1/14/2018	2:30:00 AM	24	1 4	ļ.	13	4	16	5	0	0	17
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1/14/2018	3:00:00 AM	12	2 2	<u>)</u>	7	6	5	5	0	4	. 6
1/14/2018	3:15:00 AM	16	5 1		7	4	8	6	0	1	. 0
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1/14/2018	7:30:00 AM	23		5	8	37	125	33		9	
1/14/2018	7:45:00 AM	35			7	54	130	21			
1/14/2018	8:00:00 AM	41			5	53	145	19			
1/14/2018	8:15:00 AM	42			14	48	150	39			
1/14/2018	8:30:00 AM	38			19	61	135	25			
1/14/2018	8:45:00 AM	35			24	90	145	43			
1/14/2018	9:00:00 AM	40			16	75	145	37			
1/14/2018	9:15:00 AM	33			20	80	155	39			
1/14/2018	9:30:00 AM	33			13	80	95	41			
1/14/2018	9:45:00 AM	43			12	65	95	50			
	10:00:00 AM	48			13	85	115	41			
	10:15:00 AM	2			7	80	105	38			
	10:30:00 AM	46			27	85	105	38			
	10:45:00 AM	54			16	75	125	60			
	11:00:00 AM	61			17	75 65	130	56			
	11:15:00 AM	56			18	65 CF	100	48			
	11:30:00 AM	46			19	65 70	100	38			
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	12:15:00 PM	62			18	65 52	85 00	43			
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1/14/2018	1:00:00 PM	65	26	19	63	49	33	0	24	25
1/14/2018	1:15:00 PM	75	25	21	90	70	38	0	16	26
1/14/2018	1:30:00 PM	70	27	25	70	65	37	0	34	28
1/14/2018	1:45:00 PM	75	36	19	70	90	35	0	42	38
1/14/2018	2:00:00 PM	75	15	13	65	65	33	0	34	24
1/14/2018	2:15:00 PM	75	0	27	75	56	1	0	31	36
1/14/2018	2:30:00 PM	75	18	25	85	75	0	0	41	43
1/14/2018	2:45:00 PM	90	53	28	105	90	0	0	43	33
1/14/2018	3:00:00 PM	120	75	30	100	75	31	0	43	26
1/14/2018	3:15:00 PM	105	90	45	105	75	6	0	62	19
1/14/2018	3:30:00 PM	70	70	37	115	65	0	0	75	28
1/14/2018	3:45:00 PM	40	52	31	95	95	7	0	41	22
1/14/2018	4:00:00 PM	49	49	19	95	75	10	0	53	9
1/14/2018	4:15:00 PM	54	59	15	100	70	6	0	50	9
1/14/2018	4:30:00 PM	46	46	18	110	65	8	0	46	12
1/14/2018	4:45:00 PM	27	31	14	95	80	10	0	33	11
1/14/2018	5:00:00 PM	39	37	28	75	70	11	0	47	16
1/14/2018	5:15:00 PM	44	57	36	90	65	6	0	59	28
1/14/2018	5:30:00 PM	36	28	31	90	75	2	0	45	32
1/14/2018	5:45:00 PM	70	46	33	70	50	41	0	32	27
1/14/2018	6:00:00 PM	70	29	27	65	46	38	0	21	26
1/14/2018	6:15:00 PM	90	34	35	70	63	41	0	26	20
1/14/2018	6:30:00 PM	75	21	13	55	65	36	0	22	21
1/14/2018	6:45:00 PM	56	21	22	35	46	44	0	15	17
1/14/2018	7:00:00 PM	65	29	19	47	46	42	0	23	21
1/14/2018	7:15:00 PM	42	16	19	40	46	52	0	15	13
1/14/2018	7:30:00 PM	62	21	20	37	33	32	0	18	25
1/14/2018	7:45:00 PM	60	15	21	39	47	25	0	11	13
1/14/2018	8:00:00 PM	63	20	14	29	29	39	0	11	18
1/14/2018	8:15:00 PM	49	13	25	41	30	30	0	12	19
1/14/2018	8:30:00 PM	38	13	13	28	32	36	0	8	19
1/14/2018	8:45:00 PM	33	10	14	31	42	23	0	4	12
1/14/2018	9:00:00 PM	40	8	15	36	22	15	0	4	14
1/14/2018	9:15:00 PM	40	11	14	39	35	25	0	5	7
1/14/2018	9:30:00 PM	38	7	17	33	20	20	0	5	17
1/14/2018	9:45:00 PM	37	8	12	21	33	23	0	9	8
1/14/2018	10:00:00 PM	37	15	14	18	26	19	0	3	7
1/14/2018	10:15:00 PM	27	7	11	24	33	16	0	5	4
1/14/2018	10:30:00 PM	22	9	13	19	26	13	0	4	17
1/14/2018	10:45:00 PM	20	4	17	21	11	17	0	2	12
1/14/2018	11:00:00 PM	36	9	11	20	15	15	0	3	12
	11:15:00 PM	39	12	14	11	16	8	0	5	8
	11:30:00 PM	26	8	16	13	15	5	0	0	6
1/14/2018	11:45:00 PM	27	4	15	12	18	9	0	1	6

Hwy 99 / Lorimer Rd												
	Det15 De	et4 De	t23 Det	t11 Deta	B Def	t24 De	t13 Det	t2 De	et21 Det9	Det	5 Det	:22
	L4 L1	L15	5/L16 L11	. L8	L19	9/L20 L14	4 L12	2 L2	1/L22 L7	L5	L17	/L18
	B1< B1	. B1:	> B2<	K B2	B2	> A1	< A1	A1	L> A2<	A2	A2>	>
	EBL EB	ST EBI	R WE	BL WB	Γ WE	BR NB	BL NB	T N	BR SBL	SBT	SBR	t .
Data Time												
Date Time 1/14/2018 12:00:00 AM	1	3	6	14	2	11	_	24	0	4	12	1
1/14/2018 12:15:00 AM	1 1	1	6 4	5	2	5	5 2	24 20	0	4 4	12 8	1 2
1/14/2018 12:30:00 AM	0	1	8	5	4	9	7	22	0	6	12	0
1/14/2018 12:45:00 AM	1	0	5	1	4	7	2	20	0	3	13	0
1/14/2018 1:00:00 AM	0	1	5	5	2	9	5	22	0	4	11	1
1/14/2018 1:15:00 AM	2	2	2	2	1	7	3	13	0	7	12	1
1/14/2018 1:30:00 AM	0	0	2	5	3	4	0	10	0	6	11	0
1/14/2018 1:45:00 AM	1	1	4	6	3	3	8	20	0	3	12	0
1/14/2018 2:00:00 AM	2	1	6	2	4	4	3	12	0	5	13	1
1/14/2018 2:15:00 AM	1	1	5	3	5	1	6	12	0	1	9	0
1/14/2018 2:30:00 AM	1	1	4	5	1	1	4	11	0	1	12	0
1/14/2018 2:45:00 AM	0	0	9	2	1	6	7	10	0	6	7	0
1/14/2018 3:00:00 AM	0	3	3	3	4	3	4	7	0	4	7	0
1/14/2018 3:15:00 AM	0	0	1	1	2	2	0	8	0	1	6	1
1/14/2018 3:30:00 AM	2	1	0	3	0	3	2	12	0	2	4	0
1/14/2018 3:45:00 AM	1	0	0	0	1	3	1	4	0	4	4	0
1/14/2018 4:00:00 AM	0	0	2	0	0	2	2	3	0	0	3	0
1/14/2018 4:15:00 AM	1	1	2	3	0	0	1	6	0	4	1	0
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1/14/2018 5:15:00 AM	1	2	2	6	1	1	1	5	0	5	2	0
1/14/2018 5:30:00 AM	1	1	2	4	0	1	0	7	0	10	7	0
1/14/2018 5:45:00 AM	0	3	2	4	1	3	0	8	0	8	16	0
1/14/2018 6:00:00 AM	0	2	2	6	0	2	2	10	0	6	9	0
1/14/2018 6:15:00 AM	1	1	2	3	3	1	0	10	0	11	7	0
1/14/2018 6:30:00 AM	2	6	3	9	2	5	0	14	1	18	22	0
1/14/2018 6:45:00 AM	2	10	2	10	3	4	1	20	0	11	31	2
1/14/2018 7:00:00 AM	3	3	2	19	3	1	1	20	1	17	36	0
1/14/2018 7:15:00 AM	3	7	9	14	5	4	2	15	1	19	46	0
1/14/2018 7:30:00 AM	1	10	3	12	4	5	5	22	0	34	57	0
1/14/2018 7:45:00 AM	2	14	8	10	8	6	3	26	0	42	53	2
1/14/2018 8:00:00 AM	5	18	10	25	3	16	7	28	0	52	57	3
1/14/2018 8:15:00 AM	1	33	16	23	4	11	5	22	0	80	75	3
1/14/2018 8:30:00 AM	5	25	10	16	9	21	5	46	1	55	75	5
1/14/2018 8:45:00 AM	5	17	5	18	9	11	14	55	0	62	75	7
1/14/2018 9:00:00 AM	1	21	11	29	7	19	9	43	0	41	62	6
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1/14/2018 9:30:00 AM 1/14/2018 9:45:00 AM	6	18	15	36 41	10 11	21	10 5	52	0	54 65	70	7 4
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1/14/2018 10:00:00 AM 1/14/2018 10:15:00 AM	10	16	9	42	10	24	5	54	0	37	61	9
1/14/2018 10:30:00 AM	5	15	6	25	10	26	6	63	1	48	90	2
1/14/2018 10:45:00 AM	5	15	6	41	6	21	5	62	0	46	80	4
1/14/2018 11:00:00 AM	5	16	13	51	8	14	6	59	1	42	85	10
1/14/2018 11:15:00 AM	11	14	9	24	20	22	5	44	0	42	85	8
1/14/2018 11:30:00 AM	9	17	17	36	6	21	10	51	0	37	85	6
1/14/2018 11:45:00 AM	11	19	16	41	10	30	11	50	1	47	90	8
1/14/2018 12:00:00 PM	14	28	7	40	11	27	8	56	3	40	75	6
1/14/2018 12:15:00 PM	9	12	13	30	7	29	5	57	0	35	90	6
1/14/2018 12:30:00 PM	5	7	16	22	13	33	6	50	0	39	52	5
1/14/2018 12:45:00 PM	11	20	6	30	13	34	10	59	1	55	65	5
1/14/2018 1:00:00 PM	7	9	6	38	18	18	9	50	0	43	75	7
1/14/2018 1:15:00 PM	8	11	13	44	9	32	6	65 65	2	35	62	1
1/14/2018 1:30:00 PM	5	9	8	60 48	20	22	5	65 52	3	44 52	80 8E	7
1/14/2018 1:45:00 PM	5 8	11 11	10 14	48 60	10 21	34 31	7 4	52 49	1 0	52 33	85 75	5
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1/14/2018 2:30:00 PM	6	15	16	70	15	40	9	63	0	42	90	2
1/14/2018 2:45:00 PM	3	11	19	70 70	21	29	10	75	3	38	110	8
1/14/2018 3:00:00 PM	4	8	9	95	32	65	13	85	1	35	70	4
1/14/2018 3:15:00 PM	9	8	2	110	31	70	12	95	0	42	85	7
1/14/2018 3:30:00 PM	7	19	12	135	40	85	13	105	1	35	80	13
1/14/2018 3:45:00 PM	13	16	5	115	44	85	23	80	1	43	65	9
1/14/2018 4:00:00 PM	11	16	11	90	59	110	19	85	2	38	56	18

1/14/2018	4:15:00 PM	13	10	4	100	51	75	19	105	0	25	44	12
1/14/2018	4:30:00 PM	12	16	5	95	39	85	18	105	1	39	65	9
1/14/2018	4:45:00 PM	10	18	3	70	38	70	23	100	2	46	65	11
1/14/2018	5:00:00 PM	5	27	8	58	33	63	10	90	0	42	63	6
1/14/2018	5:15:00 PM	11	10	15	58	39	75	20	80	0	22	61	5
1/14/2018	5:30:00 PM	8	10	11	35	29	75	15	105	0	26	47	3
1/14/2018	5:45:00 PM	8	11	7	56	24	65	11	70	0	22	61	5
1/14/2018	6:00:00 PM	5	6	11	49	20	39	6	65	0	32	65	3
1/14/2018	6:15:00 PM	8	9	6	43	10	37	10	70	1	34	70	4
1/14/2018	6:30:00 PM	4	4	5	35	18	37	5	56	0	27	70	6
1/14/2018	6:45:00 PM	2	10	4	33	12	25	6	36	0	28	50	8
1/14/2018	7:00:00 PM	3	5	10	31	10	19	3	44	0	13	62	5
1/14/2018	7:15:00 PM	2	5	9	30	12	19	9	39	0	21	56	7
1/14/2018	7:30:00 PM	3	4	4	33	9	25	7	36	0	12	55	2
1/14/2018	7:45:00 PM	4	3	5	26	9	23	7	44	0	14	29	3
1/14/2018	8:00:00 PM	4	9	6	18	10	20	4	31	0	18	54	3
1/14/2018	8:15:00 PM	3	0	6	28	7	24	8	39	0	15	32	2
1/14/2018	8:30:00 PM	1	5	4	15	13	8	5	20	0	14	50	4
1/14/2018	8:45:00 PM	3	5	3	15	3	25	4	29	0	10	33	5
1/14/2018	9:00:00 PM	1	1	7	16	6	13	6	28	0	7	16	2
1/14/2018	9:15:00 PM	1	5	0	16	12	16	6	34	0	11	28	5
1/14/2018	9:30:00 PM	3	4	7	13	5	8	7	34	0	10	31	2
1/14/2018	9:45:00 PM	0	6	4	20	7	17	0	24	0	6	19	1
	10:00:00 PM	0	1	2	6	5	13	5	23	0	11	18	2
	10:15:00 PM	1	3	4	11	9	7	2	23	0	7	13	2
1/14/2018	10:30:00 PM	0	2	4	7	5	11	6	20	0	7	19	2
	10:45:00 PM	1	5	4	20	7	5	5	29	0	5	24	5
, ,	11:00:00 PM	2	2	6	11	6	16	4	20	0	9	11	1
	11:15:00 PM	2	1	3	7	4	9	5	15	0	5	15	1
	11:30:00 PM	0	1	4	5	2	9	6	17	0	7	4	1
1/14/2018	11:45:00 PM	0	0	3	6	1	10	4	18	0	1	12	0

	Highway 99 Capacity and Safety Review, Whistler (Alpha Lake Rd/Cheakamus Lake Rd to Lorimer Rd) Final Report
Appendix B – Collision History	



Н	lighway	Segment			Collision Weekday	Road surface condition	Weather conditions	Lighting conditions	Primary Occurence	Vehicle 1 - 1st contributing factor	
N	lumber	Number	Km Mark (	Collision Date	Time Description	code Description	code Description	code Description	Description	Description	Severity Type Description
	99	2944	50.3	1/28/2012	23:05 Saturday	Slush	Snowing/sleet	Dark/no illum.	Head on	Ability impaired by drugs	Fatal
	99	2944	50.3	10/12/2015	17:49 Monday	Wet	Cloudy	Dusk	Rear end	Driver inattentive	Personal injury
	99	2944	50.4	4/11/2007	11:00 Wednesday	Dry	Clear	Daylight	Rear end	Not applicable	Personal injury
	99	2944	50.4	12/17/2007	2:30 Monday	Slush	Snowing/sleet	Dark/no illum.	Off road right	Road condition (ice,snow,slush	Personal injury
	99	2944	50.4	2/1/2008	18:12 Friday	Snow	Snowing/sleet	Dark/no illum.	Unknown	Improper turning	Personal injury
	99	2944	50.4	11/10/2008	12:15 Monday	Dry	Cloudy	Daylight	Head on	Driver inattentive	Personal injury
	99	2944	50.4	11/19/2008	23:31 Wednesday	Dry	Clear	Dark/some illum.	Rear end	Ability impaired by alcohol	Personal injury
	99	2944	50.4	12/25/2008	8:37 Thursday	Ice	Clear	Daylight	Off road right	Road condition (ice,snow,slush	Property damage only
	99	2944	50.4	6/20/2009	6:57 Saturday	Wet	Raining	Daylight	Unknown	Driving too fast for condition	Personal injury
	99	2944	50.4	4/15/2010	16:20 Thursday	Dry	Clear	Daylight	Rear end	Driver inattentive	Property damage only
	99	2944	50.4	7/5/2010	15:00 Monday	Dry	Cloudy	Daylight	Rear end	Not applicable	Property damage only
	99	2944	50.4	8/13/2010	19:00 Friday	Dry	Clear	Daylight	Rear end	Driver inattentive	Property damage only
	99	2944	50.4	10/23/2010	19:25 Saturday	Wet	Raining	Dark/no illum.	Other	Weather (fog,sleet,rain,snow)	Property damage only
	99	2944	50.4	2/28/2011	10:10 Monday	Wet	Snowing/sleet	Daylight	Intersection 90'	Driver inattentive	Personal injury
	99	2944	50.4	3/22/2011	9:10 Tuesday	Dry	Clear	Daylight	Intersection 90'	Driver inattentive	Personal injury
	99	2944	50.4	2/13/2012	15:41 Monday	Dry	Clear	Daylight	Rear end	Driver inattentive	Property damage only
	99	2944	50.4	7/24/2012	23:18 Tuesday	Dry	Clear	Dark/no illum.	Off road left	Other	Property damage only
	99	2944	50.4	10/2/2012	17:50 Tuesday	Dry	Clear	Daylight	Rear end	Not applicable	Personal injury
	99	2944	50.4	12/28/2013	17:30 Saturday	Wet	Cloudy	Dusk	Left turn head on	Not applicable	Personal injury
	99	2944	50.4	11/28/2014	15:50 Friday	Wet	Raining	Daylight	Off road left	Driver inattentive	Personal injury
	99	2944	50.4	8/1/2015	17:24 Saturday	Dry	Clear	Daylight	Rear end	Not applicable	Property damage only
	99	2944	50.4	10/30/2015	5:58 Friday	Wet	Raining	Dawn	Off road left	Road condition (ice,snow,slush	Personal injury
	99	2944	50.4	12/3/2015	8:16 Thursday	Wet	Raining	Daylight	Rear end	Ability impaired by alcohol	Personal injury
	99	2944	50.4	12/12/2015	15:50 Saturday	Snow	Snowing/sleet	Dusk	Rear end	Road condition (ice,snow,slush	Personal injury
	99	2944	50.4	5/20/2016	17:56 Friday	Dry	Cloudy	Daylight	Rear end	Following too closely	Property damage only
	99	2944	50.4	7/8/2016	17:43 Friday	Dry	Cloudy	Daylight	Rear end	Driver inattentive	Personal injury
	99	2944	50.4	7/14/2016	16:30 Thursday	Wet	Raining	Daylight	Rear end	Not applicable	Property damage only
	99	2944	50.4	8/12/2016	17:01 Friday	Dry	Clear	Dusk	Rear end	Not applicable	Property damage only
	99	2944	50.4	8/17/2016	15:22 Wednesday		Clear	Daylight	Other	Wild animal	Property damage only
	99	2944	50.4	9/4/2016	11:55 Sunday	Dry	Clear	Daylight	Rear end	Driver inattentive	Personal injury
	99	2944	50.4	2/7/2017	17:45 Tuesday	Ice	Clear	Dusk	Intersection 90'	Not applicable	Personal injury
	99	2944	50.4	7/5/2017	17:29 Wednesday	Dry	Clear	Daylight	Unknown	Driver inattentive	Personal injury
	99	2944	50.6	1/21/2011	6:44 Friday	Snow	Snowing/sleet	Dark/no illum.	Off road left	Weather (fog,sleet,rain,snow)	Property damage only
	99	2944	50.9	12/21/2014	20:34 Sunday	Wet	Raining	Dark/some illum.	Off road left	Road condition (ice,snow,slush	Property damage only
	99	2944	51.1	1/18/2012	18:53 Wednesday	Ice	Snowing/sleet	Dark/no illum.	Off road right	Driving too fast for condition	Property damage only
	99	2944	51.2	12/24/2007	0:20 Monday	Snow	Snowing/sleet	Dark/no illum.	Rear end	Not applicable	Property damage only
	99	2944	51.2	7/9/2015	11:20 Thursday	Dry	Clear	Daylight	Off road left	Unknown	Personal injury
	99	2944	51.2	11/20/2016	17:34 Sunday	Wet	Raining	Dark/some illum.	Left turn rear end	Not applicable	Personal injury
	99	2944	51.2	1/5/2017	10:13 Thursday	Ice	Clear	Daylight	Off road right	Driving too fast for condition	Personal injury
	99	2944	51.5	11/17/2013	7:09 Sunday	Slush	Snowing/sleet	Dark/no illum.	Unknown	Road condition (ice,snow,slush	Property damage only
	99	2944	51.6	2/24/2011	13:16 Thursday	Dry	Clear	Daylight	Rear end	Driver inattentive	Property damage only
	99	2944	52	2/24/2007	19:43 Saturday	Ice	Snowing/sleet	Dark/some illum.	Rear end	Weather (fog,sleet,rain,snow)	Property damage only
	99		52.1	2/24/2007	19:00 Saturday	Snow	Snowing/sleet	Dark/no illum.	Off road left	Driver inattentive	Property damage only
	99		52.1	12/17/2008	9:15 Wednesday	Snow	Snowing/sleet	Daylight	Head on	Not applicable	Personal injury
	99	2944	52.1	5/26/2009	8:22 Tuesday	Wet	Raining	Daylight	Off road right	Alcohol suspected	Property damage only
	99	2944	52.1	12/9/2013	10:40 Monday	Ice	Cloudy	Daylight	Off road left	Road condition (ice,snow,slush	Personal injury
	99		52.5	7/3/2007	20:45 Tuesday	Wet	Cloudy	Dusk	Off road right	Ability impaired by alcohol	Property damage only
	99		52.5	6/25/2008	10:10 Wednesday	Dry	Clear	Daylight	Rear end	Wild animal	Personal injury
	99	2944	52.5	10/23/2008	10:57 Thursday	Wet	Clear	Daylight	Rear end	Domestic animal	Property damage only

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99	2944	52.5	9/7/2013	10:20 Saturday	Dry	Clear	Daylight	Rear end	Driver inattentive	Personal injury
99	2944	52.5	8/15/2016	23:49 Monday	Dry	Clear	Dark/no illum.	Rear end	Not applicable	Property damage only
99	2944	52.8	4/21/2007	1:20 Saturday	Dry	Clear	Dark/no illum.	Other	Alcohol suspected	Personal injury
99	2944	52.8	7/31/2007	17:19 Tuesday	Dry	Clear	Daylight	Rear end	Following too closely	Property damage only
99	2944	52.8	5/27/2008	0:20 Tuesday	Wet	Raining	Dark/some illum.	Off road left	Weather (fog,sleet,rain,snow)	Personal injury
99	2944	52.8	7/28/2009	9:58 Tuesday	Dry	Clear	Daylight	Rear end	Driver inattentive	Personal injury
99	2944	52.8	2/24/2012	12:22 Friday	Snow	Snowing/sleet	Daylight	Off road right	Driving too fast for condition	Property damage only
99	2944	52.8	12/1/2013	15:31 Sunday	Wet	Raining	Daylight	Right turn overtaking	Driver inattentive	Property damage only
99	2944	52.8	12/18/2013	16:50 Wednesday	Wet	Cloudy	Dusk	Left turn 90'	Improper turning	Property damage only
99	2944	52.8	12/15/2014	10:15 Monday	Dry	Clear	Daylight	Intersection 90'	Glare-sunlight	Property damage only
99	2944	52.8	4/12/2015	15:31 Sunday	Dry	Clear	Daylight	Rear end	Driver inattentive	Property damage only
99	2944	52.8	10/25/2015	9:05 Sunday	Wet	Cloudy	Dark/no illum.	Other	Ability impaired by alcohol	Personal injury
99	2944	52.8	3/23/2016	13:37 Wednesday		Cloudy	Daylight	Rear end	Driver inattentive	Personal injury
99	2944	52.8	8/26/2016	15:50 Friday	Dry	Clear	Daylight	Rear end	Not applicable	Personal injury
	2944			•	•					
99		52.9	2/13/2016	15:56 Saturday	Wet	Snowing/sleet	Daylight	Other	Driver inattentive	Property damage only
99	2944	53.2	3/27/2011	14:43 Sunday	Wet	Raining	Daylight	Head on	Other	Personal injury
99	2944	53.3	7/23/2008	16:52 Wednesday		Clear	Daylight	Unknown	Glare-sunlight	Property damage only
99	2944	53.3	7/23/2008	16:52 Wednesday		Clear	Daylight	Rear end	Not applicable	Property damage only
99	2944	53.3	10/4/2009	15:39 Sunday	Dry	Clear	Daylight	Left turn 90'	Driver inattentive	Personal injury
99	2944	53.3	6/22/2010	2:41 Tuesday	Dry	Clear	Dark/some illum.	Off road right	Alcohol suspected	Property damage only
99	2944	53.3	12/14/2010	19:34 Tuesday	Slush	Snowing/sleet	Dark/some illum.	Off road right	Road condition (ice,snow,slush	Property damage only
99	2944	53.3	1/29/2011	7:19 Saturday	Snow	Snowing/sleet	Dawn	Unknown	Road condition (ice,snow,slush	Property damage only
99	2944	53.3	8/16/2011	18:15 Tuesday	Dry	Clear	Daylight	Left turn 90'	Glare-sunlight	Personal injury
99	2944	53.3	9/2/2011	11:50 Friday	Dry	Clear	Daylight	Rear end	Not applicable	Property damage only
99	2944	53.3	9/8/2012	12:30 Saturday	Dry	Clear	Daylight	Other	Driver error/confusion	Property damage only
99	2944	53.3	8/7/2014	18:00 Thursday	Dry	Clear	Daylight	Rear end	Not applicable	Property damage only
99	2944	53.3	8/18/2016	13:16 Thursday	Dry	Clear	Daylight	Rear end	Driver inattentive	Property damage only
99	2944	53.4	8/3/2013	15:39 Saturday	Dry	Clear	Daylight	Rear end	Driver inattentive	Property damage only
99	2944	53.7	8/4/2009	5:13 Tuesday	Dry	Clear	Dark/some illum.	Off road right	Alcohol suspected	Property damage only
99	2944	53.7	6/6/2015	2:48 Saturday	Dry	Clear	Dark/some illum.	Off road left	Fell asleep	Personal injury
99	2944	53.7	8/3/2016	16:25 Wednesday		Clear	Daylight	Rear end	Not applicable	Property damage only
99	2944	53.7	8/5/2011	15:40 Friday	•	Clear	, 0	Rear end	Other	. , , ,
99				,	Dry		Daylight			Personal injury
	2944	53.9	1/26/2008	12:05 Saturday	Wet	Cloudy	Daylight	Rear end	Not applicable	Personal injury
99	2944	54	1/22/2007	7:35 Monday	Snow	Snowing/sleet	Dawn	Left turn head on	Road condition (ice,snow,slush	Property damage only
99	2944	54	2/15/2007	Thursday	Ice	Snowing/sleet	Dawn	Side swipe	Weather (fog,sleet,rain,snow)	Property damage only
99	2944	54	2/20/2007	15:24 Tuesday	Wet	Cloudy	Daylight	Other	Improper turning	Property damage only
99	2944	54	8/20/2007	12:42 Monday	Dry	Clear	Daylight	Left turn 90'	Driver inattentive	Property damage only
99	2944	54	1/27/2008	8:30 Sunday	Snow	Snowing/sleet	Dark/some illum.	Backing	Not applicable	Property damage only
99	2944	54	4/19/2008	15:50 Saturday	Dry	Clear	Daylight	Left turn 90'	Not applicable	Property damage only
99	2944	54	8/7/2008	16:30 Thursday	Dry	Clear	Daylight	Left turn 90'	Not applicable	Personal injury
99	2944	54	3/15/2009	16:21 Sunday	Wet	Cloudy	Daylight	Other	Cutting in	Property damage only
99	2944	54	4/6/2009	17:05 Monday	Dry	Clear	Daylight	Intersection 90'	Failing to yield right of way	Personal injury
99	2944	54	6/25/2009	14:20 Thursday	Dry	Cloudy	Daylight	Rear end	Driver inattentive	Property damage only
99	2944	54	9/15/2009	11:22 Tuesday	Dry	Clear	Daylight	Other	Driver internal/external distr	Personal injury
99	2944	54	2/16/2010	9:26 Tuesday	Wet	Raining	Daylight	Unknown	Driver internal/external distr	Personal injury
99	2944	54	2/17/2010		Dry	Clear	Daylight	Rear end	Not applicable	Personal injury
99	2944	54	6/13/2011	Monday	Dry	Cloudy	Daylight	Side swipe	Driver inattentive	Property damage only
99	2944	54	1/2/2012	16:32 Monday	Wet	Raining	Dark/full illum.	Intersection 90'	Failing to yield right of way	Personal injury
99	2944	54	10/9/2012	9:17 Tuesday	Dry	Clear	Daylight	Left turn rear end	Not applicable	Property damage only
99	2944	54	11/9/2012	7:12 Friday	Dry	Clear	Daylight	Left turn 90'	Driver inattentive	Personal injury
99	2944	54 54	7/27/2013	12:00 Saturday	Dry	Clear	Daylight	Unknown	Driver inattentive	Property damage only
99	2944 2944	54 54	8/22/2013	,	•	Clear		Left turn 90'	Driver inattentive	
				17:31 Thursday	Dry		Daylight			Personal injury
99	2944	54	1/24/2014	15:46 Friday	Dry	Clear	Daylight	Rear end	Not applicable	Property damage only
99	2944	54	1/11/2015	11:00 Sunday	Dry	Clear	Daylight	Rear end	Not applicable	Property damage only
99	2944	54	1/15/2015	12:56 Thursday	Wet	Raining	Daylight	Rear end	Driver inattentive	Personal injury
99	2944	54.1	7/18/2016	10:58 Monday	Dry	Clear	Daylight	Rear end	Driver inattentive	Property damage only
99	2944	54.3	12/30/2007	7:30 Sunday	Wet	Clear	Dark/full illum.	Other	Driver inattentive	Property damage only

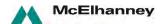
99	2944	54.3	12/5/2009	7:40 Saturday	Dry	Clear	Daylight	Rear end	Unknown	Property damage only
99	2944	54.3	12/11/2010	19:50 Saturday	Ice	Snowing/sleet	Dark/some illum.	Head on	Road condition (ice,snow,slush	Property damage only
99	2944	54.3	6/20/2014	19:42 Friday	Dry	Cloudy	Daylight	Left turn 90'	Driver inattentive	Property damage only
99	2944	54.3	8/1/2015	18:28 Saturday	Dry	Clear	Daylight	Left turn 90'	Failing to yield right of way	Property damage only
99	2944	54.4	6/28/2016	12:46 Tuesday	Dry	Clear	Daylight	Rear end	Driver internal/external distr	Property damage only
99	2944	54.6	1/28/2012	10:36 Saturday	Snow	Snowing/sleet	Daylight	Off road right	Improper passing	Property damage only
99	2944	54.6	9/12/2015	10:55 Saturday	Dry	Clear	Daylight	Rear end	Driver inattentive	Personal injury
99	2944	54.6	3/3/2017	14:50 Friday	Slush	Snowing/sleet	Daylight	Intersection 90'	Failing to yield right of way	Personal injury
99	2944	54.7	1/23/2009	0:27 Friday	Wet	Clear	Dark/some illum.	Head on	Ability impaired by alcohol	Personal injury
99	2944	54.8	12/25/2008	12:26 Thursday	Ice	Clear	Daylight	Head on	Road condition (ice,snow,slush	Personal injury
99	2944	54.8	3/30/2013	20:12 Saturday	Dry	Cloudy	Dusk	Right turn overtaking	Ability impaired by alcohol	Property damage only
99	2944	54.8	3/22/2014	8:57 Saturday	Snow	Snowing/sleet	Daylight	Other	Road condition (ice,snow,slush	Property damage only
99	2944	54.8	3/17/2016	9:53 Thursday	Dry	Clear	Daylight	Other	Driver inattentive	Property damage only
99	2944	55.1	3/8/2011	13:53 Tuesday	Wet	Cloudy	Daylight	Rear end	Other	Personal injury
99	2944	55.1	1/31/2015	17:14 Saturday	Dry	Clear	Dusk	Side swipe	Tires-failure/inadequate	Property damage only
99	2944	55.2	2/22/2008	8:05 Friday	Dry	Clear	Daylight	Left turn head on	Not applicable	Property damage only
99	2944	55.2	2/18/2009	13:47 Wednesday		Clear	Daylight	Left turn rear end	Driver inattentive	Property damage only
99	2944	55.2	4/3/2009	5:18 Friday	Slush	Snowing/sleet	Dark/some illum.	Off road right	Road condition (ice,snow,slush	Property damage only
99	2944	55.2	6/27/2013	13:24 Thursday	Dry	Cloudy	Daylight	Rear end	Following too closely	Personal injury
99	2944	55.3	1/28/2008	11:30 Monday	Ice	Clear	Daylight	Off road right	Road condition (ice,snow,slush	Property damage only
99	2944	55.4	10/4/2010	14:12 Monday	Wet	Cloudy	Daylight	Rear end	Driver inattentive	Personal injury
99	2944	55.4	4/29/2014	3:40 Tuesday	Dry	Clear	Dark/no illum.	Side swipe	Unknown	Personal injury
99	2944	55.4	8/1/2015	16:26 Saturday	Dry	Clear	Daylight	Other	Driver inattentive	Personal injury
99	2944	55.5	12/14/2007	14:30 Friday	Ice	Snowing/sleet	Dusk	Head on	Road condition (ice,snow,slush	Property damage only
99	2944	55.5	6/3/2008	20:38 Tuesday	Wet	Cloudy	Daylight	Off road right	Alcohol suspected	Property damage only
99	2944	55.5	3/16/2014	Sunday	Wet	Snowing/sleet	Dark/no illum.	Off road right	Ability impaired by alcohol	Personal injury
99	2944	55.6	11/14/2007		Muddy	Snowing/sleet	Dark/no illum.	Off road left	Road condition (ice,snow,slush	Property damage only
99	2944	55.6	11/5/2011	22:38 Saturday	Dry	Clear	Dark/no illum.	Off road right	Ability impaired by alcohol	Property damage only
99	2944	55.6	11/11/2012	15:49 Sunday	Ice	Snowing/sleet	Dark/some illum.	Head on	Road condition (ice,snow,slush	Property damage only
99	2944	55.6	2/22/2014	8:50 Saturday	Slush	Snowing/sleet	Daylight	Off road right	Not applicable	Personal injury
99	2944	55.6	8/22/2014	22:00 Friday	Dry	Clear	Dark/some illum.	Rear end	Insufficient traffic control	Property damage only
99	2944	55.7	10/19/2013	14:31 Saturday	Dry	Clear	Daylight	Off road left	Other	Fatal
99	2944	55.9	1/10/2017	11:40 Tuesday	Ice	Clear	Daylight	Off road right	Road condition (ice,snow,slush	Personal injury
99	2944	56	12/22/2014	19:12 Monday	Wet	Clear	Dark/some illum.	Unknown	Tires-failure/inadequate	Personal injury
99	2944	56.1	2/1/2015	7:26 Sunday	Slush	Snowing/sleet	Daylight	Unknown	Road condition (ice,snow,slush	Personal injury
99	2944	56.2	1/1/2011	16:16 Saturday	Dry	Clear	Daylight	Side swipe	Other	Property damage only
99	2944	56.4	1/2/2009	0:30 Friday	Unknown	Cloudy	Dark/some illum.	Off road right	Ability impaired by alcohol	Personal injury
99	2944	56.5	3/16/2007	22:53 Friday	Wet	Raining	Dark/no illum.	Other	Ability impaired by alcohol	Personal injury
99	2944	56.5	10/11/2007	2:47 Thursday	Wet	Raining	Dark/no illum.	Off road right	Not applicable	Property damage only
99	2944	56.5	10/26/2007	22:19 Friday	Dry	Clear	Dark/no illum.	Rear end	Driver inattentive	Property damage only
99	2944	56.5	8/23/2008	1:30 Saturday	Dry	Clear	Dark/some illum.	Off road right	Ability impaired by drugs	Personal injury
99	2944	56.5	11/12/2010	11:09 Friday	Dry	Cloudy	Daylight	Other	Driver inattentive	Property damage only
99	2944	56.6	5/27/2008	18:25 Tuesday	Dry	Cloudy	Daylight	Other	Driver inattentive	Personal injury
99	2944	56.7	11/10/2007	11:15 Saturday	Dry	Cloudy	Daylight	Rear end	Driver inattentive	Property damage only
99	2944	56.7	3/12/2010	13:32 Friday	Ice	Snowing/sleet	Daylight	Rear end	Road condition (ice,snow,slush	Personal injury
99	2944	56.7	8/1/2010	23:30 Sunday	Dry	Cloudy	Dark/no illum.	Other	Failing to yield right of way	Property damage only
99	2944	56.7	4/24/2011	16:35 Sunday	Dry	Cloudy	Daylight	Overtaking	Driver inattentive	Property damage only
99	2944	56.8	7/29/2007	2:26 Sunday	Dry	Cloudy	Dark/no illum.	Other	Other	Fatal
99	2944	56.8	8/14/2007	15:15 Tuesday	Dry	Clear	Daylight	Rear end	Following too closely	Property damage only
99	2944	56.8	3/5/2009	0:12 Thursday	Wet	Snowing/sleet	Dark/some illum.	Off road right	Ability impaired by alcohol	Property damage only
99	2944	56.8	4/17/2009	11:02 Friday	Wet	Raining	Daylight	Rear end	Other	Personal injury
99	2944	56.8	8/20/2009	11:02 Thursday	Dry	Clear	Daylight	Rear end	Following too closely	Property damage only
99 99	2944 2944	56.8 56.8	3/12/2010	13:27 Friday	lce	Snowing/sleet	Daylight	Rear end Rear end	Road condition (ice,snow,slush Driver inattentive	Property damage only
			10/10/2010	13:20 Sunday	Wet	Clear	Daylight			Property damage only
99	2944	56.8	12/29/2010	10:27 Wednesday		Cloudy	Daylight	Rear end	Driver inattentive	Property damage only
99 99	2944 2944	56.8 56.8	4/15/2011	17:56 Friday	Dry	Clear	Daylight	Unknown	Windows obstructed	Property damage only
99	2544	50.0	8/10/2012	12:52 Friday	Dry	Clear	Daylight	Left turn 90'	Road condition (ice,snow,slush	Personal injury

99	2944	56.8	9/21/2012	16:47 Friday	Dry	Clear	Daylight	Rear end	Following too closely	Personal injury
99	2944	56.8	8/31/2013	Saturday	Dry	Clear	Daylight	Rear end	Other	Personal injury
99	2944	56.8	12/21/2013	11:03 Saturday	Wet	Cloudy	Daylight	Rear end	Extreme fatigue	Property damage only
99	2944	56.8	3/8/2014	18:34 Saturday	Slush	Snowing/sleet	Dark/no illum.	Side swipe	Driving too fast for condition	Property damage only
99	2944	56.8	9/2/2014	12:23 Tuesday	Dry	Cloudy	Daylight	Rear end	Driver inattentive	Property damage only
99	2944	56.8	9/7/2014	12:31 Sunday	Dry	Clear	Daylight	Rear end	Not applicable	Property damage only
99	2944	56.8	1/1/2016	14:09 Friday	Slush	Clear	Daylight	Rear end	Not applicable	Property damage only
99	2944	56.8	6/21/2016	17:16 Tuesday	Dry	Clear	Daylight	Rear end	Driver inattentive	Property damage only
99	2944	56.8	5/25/2017	16:45 Thursday	Dry	Clear	Daylight	Rear end	Not applicable	Personal injury
99	2944	56.8	7/2/2017	15:14 Sunday	Dry	Clear	Daylight	Off road right	Extreme fatique	Personal injury
99	2944	56.8	7/13/2017	14:10 Thursday	Dry	Clear	Daylight	Rear end	Not applicable	Personal injury
99	2944	56.9	12/14/2007	14:13 Friday	Snow	Snowing/sleet	Dusk	Rear end	Following too closely	Property damage only
99	2944	56.9	12/20/2007	18:05 Thursday	Wet	Cloudy	Dark/some illum.	Rear end	Improper passing	Property damage only
99	2944	56.9	12/24/2008		Ice	Snowing/sleet	Daylight	Side swipe	Driving too fast for condition	Property damage only
99	2944	56.9	12/15/2009	19:36 Tuesday	Ice	Snowing/sleet	Dark/some illum.	Head on	Unknown	Property damage only
99	2944	56.9	3/12/2010	19:30 Friday	Wet	Cloudy	Dusk	Other	Ignoring officer/flagmn/guard	Personal injury
99	2944	56.9	4/30/2010	16:24 Friday	Dry	Cloudy	Daylight	Off road right	Ability impaired by alcohol	Personal injury
99	2944	56.9	1/27/2011	2:37 Thursday	Ice	Fog	Dark/some illum.	Off road right	Ability impaired by alcohol	Property damage only
99	2944	56.9	2/28/2013	9:15 Thursday	Wet	Cloudy	Daylight	Rear end	Driver inattentive	Property damage only
99	2944	56.9	8/9/2014	5:05 Saturday	Dry	Clear	Dayligitt	Off road right	Extreme fatique	Property damage only
99	2944	57.1	1/24/2016	14:00 Sunday	Slush	Clear	Daylight	Rear end	Driver inattentive	Property damage only
99	2944	57.1	7/9/2015	15:08 Thursday	Dry	Clear	Daylight	Overtaking	Not applicable	Property damage only
99	2944	57.2 57.2	9/26/2015	18:15 Saturday	Dry	Clear	Daylight	Side swipe	Unknown	Property damage only
99	2944	57.3	8/30/2015	11:48 Sunday	Wet	Raining	Daylight	Rear end	Driver inattentive	Property damage only
99	2944	57.5 57.5	2/18/2007	9:05 Sunday	Wet	Snowing/sleet	Daylight	Rear end	Driver inattentive	Personal injury
99	2944 2944	57.5 57.5	2/18/2007	0:49 Sunday	Wet	Raining	Daylight Dark/some illum.	Rear end	Driver error/confusion	Property damage only
99	2944 2944	57.5 57.5	6/28/2007			•		Other	Fell asleep	, , , ,
99	2944 2944	57.5 57.5	12/1/2007		Dry Wet	Cloudy	Daylight	Rear end	•	Property damage only
99	2944 2944	57.5 57.5	6/10/2011	11:19 Saturday		Cloudy Clear	Daylight	Off road right	Following too closely Alcohol suspected	Property damage only
				3:36 Friday	Dry		Dark/no illum.	U	•	Property damage only
99	2944	57.6	1/15/2012	1:58 Sunday	Wet	Cloudy	Dark/no illum.	Other	Road condition (ice,snow,slush	Personal injury
99	2944	57.6	7/5/2014	7:47 Saturday	Dry	Cloudy	Dark/no illum.	Head on	Not applicable	Personal injury
99	2944	57.6	2/18/2015	15:23 Wednesday		Cloudy	Daylight	Rear end	Avoiding veh./ped./cycle	Property damage only
99	2944	57.6	4/30/2016	17:23 Saturday	Dry	Clear	Daylight	Rear end	Not applicable	Property damage only
99	2944	57.6	5/2/2016	15:35 Monday	Dry	Clear	Daylight	Rear end	Not applicable	Personal injury
99	2944	58.1	3/18/2007	15:00 Sunday	Dry	Unknown	Unknown	Unknown	Not applicable	Property damage only
99	2944	58.1	4/18/2007	8:45 Wednesday		Unknown	Daylight	Other	Not applicable	Property damage only
99	2944	58.1	11/14/2007	19:22 Wednesday		Snowing/sleet	Dark/no illum.	Off road right	Road condition (ice,snow,slush	Property damage only
99	2944	58.1	1/6/2008	0:05 Sunday	Ice	Snowing/sleet	Dark/full illum.	Rear end	Backing unsafely	Personal injury
99	2944	58.1	9/25/2008	15:38 Thursday	Wet	Snowing/sleet	Daylight	Other	Road condition (ice,snow,slush	Property damage only
99	2944	58.1	12/29/2008	Monday	Snow	Clear	Dark/some illum.	Left turn 90'	Improper turning	Personal injury
99	2944	58.1	3/15/2009	8:29 Sunday	Ice	Cloudy	Daylight	Side swipe	Road condition (ice,snow,slush	Property damage only
99	2944	58.1	7/4/2009	19:10 Saturday	Dry	Clear	Daylight	Left turn head on	Not applicable	Property damage only
99	2944	58.1	1/16/2010	10:56 Saturday	Wet	Clear	Daylight	Left turn 90'	Glare-sunlight	Personal injury
99	2944	58.1	3/12/2010	12:48 Friday	Slush	Snowing/sleet	Daylight	Side swipe	Road condition (ice,snow,slush	Property damage only
99	2944	58.1	7/8/2010	14:00 Thursday	Dry	Clear	Daylight	Left turn 90'	Other	Property damage only
99	2944	58.1	8/21/2010	23:19 Saturday	Muddy	Raining	Dark/some illum.	Overtaking	Driver inattentive	Property damage only
99	2944	58.1	9/28/2012	11:14 Friday	Dry	Clear	Daylight	Left turn rear end	Other	Property damage only
99	2944	58.1	11/11/2012	16:13 Sunday	Ice	Snowing/sleet	Dark/some illum.	Left turn rear end	Road condition (ice,snow,slush	Property damage only
99	2944	58.1	1/6/2013	10:25 Sunday	Wet	Snowing/sleet	Daylight	Rear end	Driver inattentive	Property damage only
99	2944	58.1	1/23/2013	,	Snow	Snowing/sleet	Daylight	Other	Not applicable	Property damage only
99	2944	58.1	3/10/2013	5:52 Sunday	Dry	Cloudy	Daylight	Rear end	Avoiding veh./ped./cycle	Property damage only
99	2944	58.1	5/3/2014	9:25 Saturday	Wet	Raining	Dusk	Rear end	Not applicable	Property damage only
99	2944	58.1	2/5/2015	19:05 Thursday	Wet	Raining	Dark/no illum.	Left turn 90'	Other	Property damage only
99	2944	58.1	8/16/2015	12:27 Sunday	Dry	Cloudy	Daylight	Left turn 90'	Failing to yield right of way	Personal injury
99	2944	58.1	11/25/2015	14:59 Wednesday		Clear	Daylight	Rear end	Road condition (ice,snow,slush	Property damage only
99	2944	58.1	2/8/2016	23:24 Monday	Wet	Fog	Dark/full illum.	Intersection 90'	Not applicable	Property damage only
99	2944	58.1	7/18/2016	17:20 Monday	Dry	Cloudy	Daylight	Rear end	Not applicable	Property damage only

99	2944	58.1	2/9/2017	18:36 Thursday	Snow	Snowing/sleet	Dark/full illum.	Left turn 90'	Failing to yield right of way	Personal injury
99	2946	0	3/8/2016	21:22 Tuesday	Dry	Clear	Dark/full illum.	Rear end	Ability impaired by alcohol	Property damage only
99	2946	0	6/24/2017	15:33 Saturday	Dry	Clear	Daylight	Left turn 90'	Not applicable	Personal injury
99	2946	0.3	2/21/2008	21:20 Thursday	Dry	Clear	Dark/some illum.	Left turn 90'	Driver inattentive	Personal injury
99	2946	0.3	1/31/2009	0:21 Saturday	Ice	Cloudy	Dark/some illum.	Other	Ability impaired by alcohol	Property damage only
99	2946	0.3	1/29/2015	22:14 Thursday	Dry	Clear	Dark/no illum.	Unknown	Other	Personal injury
99	2946	0.4	2/13/2010	16:45 Saturday	Wet	Raining	Daylight	Rear end	Driver inattentive	Personal injury
99	2946	0.6	2/22/2007	19:00 Thursday	Dry	Clear	Dark/full illum.	Intersection 90'	Not applicable	Personal injury
99	2946	0.6	3/3/2008	16:22 Monday	Wet	Clear	Daylight	Other	Driver inattentive	Property damage only
99	2946	0.6	4/23/2008	13:00 Wednesday	Dry	Clear	Daylight	Intersection 90'	Not applicable	Property damage only
99	2946	0.6	12/6/2008	17:50 Saturday	Wet	Raining	Dark/some illum.	Left turn 90'	Driver inattentive	Property damage only
99	2946	0.6	12/30/2008	17:03 Tuesday	Wet	Clear	Dark/some illum.	Left turn 90'	Improper turning	Personal injury
99	2946	0.6	3/30/2009	8:48 Monday	Dry	Cloudy	Daylight	Other	Not applicable	Property damage only
99	2946	0.6	8/4/2009	16:25 Tuesday	Dry	Clear	Daylight	Rear end	Wild animal	Property damage only
99	2946	0.6	8/8/2010	16:30 Sunday	Dry	Clear	Daylight	Rear end	Other	Property damage only
99	2946	0.6	2/26/2011	12:20 Saturday	Dry	Cloudy	Daylight	Intersection 90'	Other	Property damage only
99	2946	0.6	8/13/2011	21:40 Saturday	Dry	Clear	Dark/no illum.	Left turn 90'	Driver inattentive	Personal injury
99	2946	0.6	12/22/2011	17:31 Thursday	Unknown	Clear	Dark/some illum.	Left turn head on	Failing to yield right of way	Property damage only
99	2946	0.6	1/1/2013	17:05 Tuesday	Wet	Clear	Dark/full illum.	Left turn 90'	Not applicable	Property damage only
99	2946	0.6	3/6/2013	Wednesday	Dry	Clear	Daylight	Rear end	Not applicable	Property damage only
99	2946	0.6	3/11/2013	13:40 Monday	Dry	Clear	Daylight	Intersection 90'	Improper turning	Personal injury
99	2946	0.6	3/12/2013	22:44 Tuesday	Wet	Raining	Dark/some illum.	Left turn head on	Ability impaired by alcohol	Property damage only
99	2946	0.6	5/22/2013	7:54 Wednesday	,	Clear	Daylight	Head on	Fell asleep	Personal injury
99	2946	0.6	11/30/2013	13:23 Saturday	Wet	Cloudy	Daylight	Intersection 90'	Site line obstruction	Personal injury
99	2946	0.6	8/25/2014	14:00 Monday	Dry	Cloudy	Daylight	Rear end	Not applicable	Personal injury
99	2946	0.6	9/12/2015	15:20 Saturday	Dry	Clear	Daylight	Right turn rear end	Driver inattentive	Personal injury
99	2946	0.6	11/25/2015	10:14 Wednesday	Ice	Clear	Daylight	Rear end	Not applicable	Property damage only
99	2946	0.6	2/6/2016	11:19 Saturday	Wet	Cloudy	Daylight	Rear end	Driver inattentive	Personal injury
99	2946	0.6	3/13/2016	21:24 Sunday	Wet	Raining	Dark/some illum.	Rear end	Driver error/confusion	Personal injury
99	2946	0.6	6/28/2016	14:55 Tuesday	Dry	Clear	Daylight	Left turn 90'	Not applicable	Property damage only
99	2946	8.0	1/6/2011	3:09 Thursday	Slush	Snowing/sleet	Dark/no illum.	Other	Driving too fast for condition	Fatal

(Alpha Lake Rd/Cheakamus Lake Rd to Lorimer Rd) Final Report		

Appendix C – Average Provincial Collision Rates, BC MoTI (2009-2013)



Highway 99 Capacity and Safety Review, Whistler

## British Columbia Ministry of Transportation and Infrastucture

# AVERAGE PROVINCIAL COLLISION RATES BY HIGHWAY SERVICE CLASS AND TRAFFIC VOLUME RANGE January 1, 2009 to December 31, 2013 Data (5 years)

All Collisions (intersection and non-intersection)

Average Daily	Highway Class																													
Traffic Volume		UAU2			UAU4			UAD4			UED4 **			UFD4 **			RAU2			RAU4			RAD4**			RED4**			RFD4 **	
(vpd)	(C/MVK)	(km)	(# coll)	(C/MVK)	(km)	(# coll)	(C/MVK)	(km)	(# coll)	(C/MVK)	(km)	(# coll)	(C/MVK)	(km)	(# coll)	(C/MVK)	(km)	(# coll)	(C/MVK)	(km)	(# coll)	(C/MVK)	(km)	(# coll)	(C/MVK)	(km)	(# coll)	(C/MVK)	(km)	(# coll)
1 - 5,000	0.78	239	920	1.37	7	43	0.66	2	7	1.92	4	54	0.00	0	0	0.41	8400	10713	0.40	150	337	0.33	49	104	0.73	2	8	0.26	526	934
5,001 - 10,000	0.55	79	521	0.94	33	469	0.83	8	98	1.08	4	54	0.00	0	0	0.36	974	4293	0.19	46	102	0.52	31	177	0.41	52	289	0.40	333	1491
10,001 - 15,000	0.63	53	723	0.88	16	333	0.00	0	0	0.41	2	18	2.63	0.1	7	0.29	139	936	0.22	40	212	0.21	47	226	0.37	121	995	0.26	28	136
15,001 - 20,000	0.32	19	194	0.79	20	505	1.37	2	99	0.56	20	333	0.20	24	170	0.17	17	94	0.32	18	187	0.30	22	220	0.28	15	136	0.23	11	76
over 20,000	0.42	4	62	0.67	37	1382	0.76	48	1842	0.30	16	377	0.30	130	3399	0.40	19	314	0.32	43	619	0.45	55	1205	0.31	49	723	0.23	263	3337
All Volumes	0.60	394	2420	0.76	113	2732	0.78	60	2046	0.42	46	836	0.29	153	3576	0.39	9548	16350	0.30	297	1457	0.38	204	1932	0.35	239	2151	0.26	1161	5974

Collisions Occurring At All Intersections (MV6020 Accident Location Code 01, LKI Landmarks A1, A2, A3 & A5). Zero radius from intersection point.

Average Daily															Highway	/ Class														
Traffic Volume		UAU2			UAU4			UAD4			UED4 **			UFD4 **			RAU2			RAU4			RAD4**			RED4**			RFD4 **	
(vpd)	(C/MV)	(# int)	(# coll)	(C/MV)	(# int)	(# coll)	(C/MV)	(# int)	(# coll)	(C/MV)	(# int)	(# coll)	(C/MV)	(# int)	(# coll)	(C/MV)	(# int)	(# coll)												
1 - 5,000	0.38	298	597	0.34	21	42	0.27	4	6	0.52	4	16	0.00	0	0	0.44	1912	3746	0.40	45	99	0.59	14	54	0.00	0	0	0.52	30	103
5,001 - 10,000	0.22	229	638	0.24	107	372	0.26	23	90	0.20	6	18	0.00	0	0	0.21	725	1911	0.21	20	50	0.24	17	45	0.25	54	221	0.26	54	154
10,001 - 15,000	0.16	123	438	0.24	85	473	0.19	5	23	0.14	5	16	0.00	0	0	0.16	168	620	0.20	20	97	0.29	20	128	0.22	85	417	0.16	16	55
15,001 - 20,000	0.12	50	183	0.19	56	354	0.25	12	101	0.40	16	195	0.28	4	38	0.17	76	408	0.19	27	164	0.22	36	268	0.32	28	279	0.18	10	57
over 20,000	0.12	13	70	0.20	122	1247	0.21	152	1639	0.20	23	354	0.10	126	1044	0.16	32	223	0.19	66	565	0.20	92	952	0.22	49	529	0.11	98	694
All Volumes	0.21	713	1926	0.21	391	2488	0.21	196	1859	0.24	54	599	0.10	130	1082	0.27	2913	6908	0.20	178	975	0.21	179	1447	0.24	216	1446	0.14	208	1063

Collisions Occurring At Non-Signalized Intersections (LKI Landmarks A1 & A2). Zero radius from intersection point.

Average Daily															Highway	/ Class														
Traffic Volume		UAU2			UAU4			UAD4			UED4 **			UFD4 **			RAU2			RAU4			RAD4**			RED4**			RFD4 **	
(vpd)	(C/MV)	(# int)	(# coll)	(C/MV)	(# int)	(# coll)	(C/MV)	(# int)	(# coll)	(C/MV)	(# int)	(# coll)	(C/MV)	(# int)	(# coll)	(C/MV)	(# int)	(# coll)												
1 - 5,000	0.38	260	510	0.29	14	22	0.18	2	2	0.58	1	4	0.00	0	0	0.45	1678	3380	0.40	39	84	0.21	1	1	0.00	0	0	1.10	6	33
5,001 - 10,000	0.19	193	453	0.20	63	186	0.23	9	31	0.37	2	11	0.00	0	0	0.21	594	1558	0.16	15	29	0.25	9	25	0.21	23	77	0.25	6	18
10,001 - 15,000	0.14	98	315	0.17	43	170	0.08	2	4	0.06	3	4	0.00	0	0	0.16	125	457	0.15	14	51	0.19	2	8	0.14	34	106	0.11	2	4
15,001 - 20,000	0.09	33	95	0.13	32	135	0.18	3	18	0.27	1	9	0.00	0	0	0.15	33	153	0.25	16	132	0.15	9	47	0.12	3	11	0.00	0	0
over 20,000	0.06	7	20	0.20	52	503	0.10	71	376	0.12	9	84	0.24	1	11	0.14	24	146	0.13	25	149	0.11	28	154	0.11	13	74	0.25	2	21
All Volumes	0.19	591	1393	0.18	204	1016	0.11	87	431	0.13	16	112	0.24	1	11	0.29	2454	5694	0.19	109	445	0.12	49	235	0.14	73	268	0.34	16	76

Collisions Occurring At Signalized Intersections (LKI Landmarks A3 & A5). Zero radius from intersection point.

Average Daily															Highway	/ Class														
Traffic Volume					UAU4			UAD4			UED4 **			UFD4 **			RAU2			RAU4			RAD4**			RED4**			RFD4 **	_
(vpd)	(C/MV)	(# int)	(# coll)	(C/MV)	(# int)	(# coll)	(C/MV)	(# int)	(# coll)	(C/MV)	(# int)	(# coll)	(C/MV)	(# int)	(# coll)	(C/MV)	(# int)	(# coll)												
1 - 5,000	0.71	16	71	0.52	5	17	0.36	2	4	0.00	0	0	0.00	0	0	0.88	7	35	1.54	1	10	0.61	13	53	0.00	0	0	0.31	4	8
5,001 - 10,000	0.50	22	157	0.48	22	155	0.38	8	46	0.07	1	1	0.00	0	0	0.65	14	122	0.50	3	19	0.00	0	0	0.72	7	81	0.00	0	0
10,001 - 15,000	0.30	21	138	0.42	29	281	0.26	3	19	0.26	2	12	0.00	0	0	0.56	10	136	0.32	5	41	0.35	13	105	0.47	25	260	0.00	0	0
15,001 - 20,000	0.25	9	66	0.36	19	226	0.38	5	65	0.76	4	98	0.00	0	0	0.36	14	153	0.60	1	21	0.38	15	194	0.40	16	198	0.00	0	0
over 20,000	0.34	3	43	0.32	43	738	0.42	60	1318	0.26	15	309	0.00	0	0	0.40	3	55	0.41	17	329	0.37	37	722	0.36	21	374	0.12	1	9
All Volumes	0.38	71	475	0.36	118	1417	0.42	78	1452	0.30	22	420	0.00	0	0	0.49	48	501	0.42	27	420	0.37	78	1074	0.42	69	913	0.17	5	17

Non-Intersection Collisions (collisions not occurring at intersections above)

Non-intersecti	on com	JIUIIJ (	COMISIO	ns not o	ccurrin	y at mit	er secuo	ทอ ลมบ	v c)																					
Average Daily															Highway	y Class														
Traffic Volume	UAU2				UAU4			UAD4			UED4 **			UFD4 **			RAU2			RAU4			RAD4**			RED4**			RFD4 **	
(vpd)	(C/MVK)	(km)	(# coll)	(C/MVK)	(km)	(# coll)	(C/MVK)	(km)	(# coll)	(C/MVK)	(km)	(# coll)	(C/MVK)	(km)	(# coll)	(C/MVK)	(km)	(# coll)	(C/MVK)	(km)	(# coll)	(C/MVK)	(km)	(# coll)	(C/MVK)	(km)	(# coll)	(C/MVK)	(km)	(# coll)
1 - 5,000	0.18	239	214	0.03	7	1	0.09	2	1	1.78	4	50	0.00	0	0	0.26	8400	6757	0.29	150	241	0.16	49	50	0.73	2	8	0.24	526	834
5,001 - 10,000	0.12	79	111	0.16	33	80	0.07	8	8	0.48	4	24	0.00	0	0	0.20	974	2399	0.13	46	67	0.39	31	132	0.22	52	152	0.36	333	1351
10,001 - 15,000	0.12	53	135	0.06	16	24	0.00	0	0	0.05	2	2	2.63	0.1	7	0.10	139	303	0.04	40	43	0.06	47	60	0.12	121	322	0.22	28	115
15,001 - 20,000	0.05	19	31	0.08	20	50	0.26	2	19	0.23	20	138	0.15	24	124	0.09	17	48	0.12	18	72	0.10	22	73	0.07	15	32	0.14	11	47
over 20,000	0.04	4	6	0.08	37	159	0.07	48	175	0.02	16	23	0.21	130	2363	0.10	19	78	0.06	43	122	0.06	55	173	0.08	49	191	0.17	263	2564
All Valumas	0.40	204	407	0.00	112	244	0.00	60	202	0.42	46	227	0.20	150	2404	0.22	OE 40	OFOE	0.11	207	EAE	0.00	204	400	0.11	220	705	0.24	1101	4011

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#### NOTES:

- 1. \*\* All RFD4 & UFD4 and most UED4, RED4, & RAD4 roadways have a separate LKI segment for each direction of travel (see the "opposing LKI segments" tab for details). Therefore, the length in the tables above, which represents LKI segment length, will differ from roadway length for these 5 service classes. As well, for these 5 classes the rate is based on the collisions and volumes for each 1-directional LKI segment. Therefore to find an average rate by volume range for any of these 5 classes use the volume range that best represents the 1way AADT at your site.
- 2. Provincial average intersection collision rates are artificially high due to the lack of cross-street volume data in the CIS and the fact that the CIS analysis does not include intersections where there are zero collisions when calculating provincial average rates.
- 3. As a general rule a sample of at least 25 collisions is necessary to have confidence in the calculated collision rate. Where the collision sample size is less than 25 collisions the rate has been blacked out. However, these rates can still be seen and may be used at the discretion of the analyst.
- 4. Analysis dates: 10th to 12th February 2015. CIS version 2.0.1 CIS collision data last updated 1 February 2015. Traffic volume updated to the end of 2013. Effective LKI: July 2014. Subsequent updates to the data may affect the results in this table.
- 5. Total annual collision counts (F/I/PDO) for 2009-13 are only 78% of what they were in 2006-10. Consequently Provincial average collision rates for 2009-13 in the tables above are also generally lower than they were in 2006-10. Many factors could be contributing to this reduction. Two significant known factors include a change to police reporting practices in 2008 and the Immediate Roadside Prohibition (IRP) introduced in 2012.

## LEGEND:

U = Urban R = Rural

A = Arterial

E = Expressway, multi-lanes with at grade intersections

F = Freeway, multi-lane with grade separations

U2 = Undivided Up to 3 Lanes

U4 = Undivided 4 or More Lanes

D4 = Divided 4 or More Lanes

vpd =Vehicles per Day

C/MVK = Collisions per Million Vehicle Kilometres C/MV = Collisions per Million Entering Vehicles

# coll = Number of Collisions

# int = Number of Intersections

A3 = Intersection with traffic control lights, no turning slots

A5 = Intersection with traffic control lights, and turning slots

MV6020 Form, Accident Location Code 01 = at intersection

A1 = Intersection with stop sign or flashing red lights, no turning slots

A2 = Intersection with stop sign or flashing red lights, and turning slots

Less than 25 collisions for this volume range and service class Zero collisions or no inventory for this volume range and service class

## British Columbia Ministry of Transportation and Infrastructure NUMBER OF COLLISIONS BY SERVICE CLASS, TRAFFIC VOLUME RANGE, AND SEVERITY January 1, 2009 to December 31, 2013 Data (5 years)

All Collisions	(intersec	tion and	l non-in	tersection
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Average Daily	Highway Class																																			
Traffic Volume			Į	JAU2					ı	JAU4					U	AD4						UED4					ı	UFD4					R	AU2		
(vpd)	FAT	%	INJ	%	PDO	%	FAT	%	INJ	%	PDO	%	FAT	%	INJ	%	PDO	%	FAT	%	INJ	%	PDO	%	FAT	%	INJ	%	PDO	%	FAT	%	INJ	%	PDO	%
1 - 5,000	12	1.30	388	42.20	520	56.50	0	0.00	11	25.60	32	74.40	0	0.00	4	57.10	3	42.90	0	0.00	20	37.00	34	63.00	0		0		0		326	3.00	4705	43.90	5682	53.00
5,001 - 10,000	5	1.00	212	40.70	304	58.30	6	1.30	206	43.90	257	54.80	1	1.00	45	45.90	52	53.10	1	1.90	16	29.60	37	68.50	0		0		0		115	2.70	1733	40.40	2445	57.00
10,001 - 15,000	5	0.70	329	45.50	389	53.80	1	0.30	135	40.50	197	59.20	0		0		0		0	0.00	8	44.40	10	55.60	0	0.00	2	28.60	5	71.40	20	2.10	461	49.30	455	48.60
15,001 - 20,000	5	2.60	103	53.10	86	44.30	6	1.20	197	39.00	302	59.80	1	1.00	36	36.40	62	62.60	2	0.60	132	39.60	199	59.80	2	1.20	58	34.10	110	64.70	6	6.40	43	45.70	45	47.90
over 20,000	0	0.00	33	53.20	29	46.80	18	1.30	704	50.90	660	47.80	10	0.50	819	44.50	1013	55.00	1	0.30	179	47.50	197	52.30	10	0.30	1377	40.50	2012	59.20	5	1.60	157	50.00	152	48.40
All Volumes	27	1.10	1065	44.00	1328	54.90	31	1.10	1253	45.90	1448	53.00	12	0.60	904	44.20	1130	55.20	4	0.50	355	42.50	477	57.10	12	0.30	1437	40.20	2127	59.50	472	2.90	7099	43.40	8779	53.70

Collisions Occurring At All Intersections	(MV6020 Accident Location Code 01. L	.KI Landmarks A1. A2. A3 & A5	i). Zero radius from intersection point.

Average Daily																		Highwa	y Clas	ss																
Traffic Volume			ı	JAU2						JAU4					ι	AD4						JED4						UFD4					R.	AU2		
(vpd)	FAT	%	INJ	%	PDO	%	FAT	%	INJ	%	PDO	%	FAT	%	INJ	%	PDO	%	FAT	%	INJ	%	PDO	%	FAT	%	INJ	%	PDO	%	FAT	%	INJ	%	PDO	%
1 - 5,000	8	1.30	252	42.20	337	56.40	0	0.00	10	23.80	32	76.20	0	0.00	4	66.70	2	33.30	0	0.00	8	50.00	8	50.00	0		0		0		68	1.80	1655	44.20	2023	54.00
5,001 - 10,000	4	0.60	252	39.50	382	59.90	5	1.30	170	45.70	197	53.00	0	0.00	42	46.70	48	53.30	0	0.00	4	22.20	14	77.80	0		0		0		38	2.00	833	43.60	1040	54.40
10,001 - 15,000	2	0.50	203	46.30	233	53.20	1	0.20	198	41.90	274	57.90	0	0.00	10	43.50	13	56.50	0	0.00	8	50.00	8	50.00	0		0		0		12	1.90	296	47.70	312	50.30
15,001 - 20,000	3	1.60	101	55.20	79	43.20	4	1.10	136	38.40	214	60.50	1	1.00	35	34.70	65	64.40	1	0.50	85	43.60	109	55.90	0	0.00	11	28.90	27	71.10	6	1.50	187	45.80	215	52.70
over 20,000	0	0.00	38	54.30	32	45.70	10	0.80	638	51.20	599	48.00	7	0.40	748	45.60	884	53.90	1	0.30	171	48.30	182	51.40	2	0.20	426	40.80	616	59.00	3	1.30	125	56.10	95	42.60
All Volumes	17	0.90	846	43.90	1063	55.20	20	0.80	1152	46.30	1316	52.90	8	0.40	839	45.10	1012	54.40	2	0.30	276	46.10	321	53.60	2	0.20	437	40.40	643	59.40	127	1.80	3096	44.80	3685	53.30

## Collisions Occurring At Non-Signalized Intersections (LKI Landmarks A1 & A2). Zero radius from intersection point.

Average Daily																		Highwa	y Cla	ss																
Traffic Volume			ı	JAU2						JAU4					ι	JAD4						UED4						UFD4					R.	AU2		
(vpd)	FAT	%	INJ	%	PDO	%	FAT	%	INJ	%	PDO	%	FAT	%	INJ	%	PDO	%	FAT	%	INJ	%	PDO	%	FAT	%	INJ	%	PDO	%	FAT	%	INJ	%	PDO	%
1 - 5,000	8	1.60	211	41.40	291	57.10	0	0.00	7	31.80	15	68.20	0	0.00	1	50.00	1	50.00	0	0.00	3	75.00	1	25.00	0		0		0		58	1.70	1501	44.40	1821	53.90
5,001 - 10,000	3	0.70	179	39.50	271	59.80	3	1.60	91	48.90	92	49.50	0	0.00	17	54.80	14	45.20	0	0.00	2	18.20	9	81.80	0		0		0		26	1.70	692	44.40	840	53.90
10,001 - 15,000	1	0.30	147	46.70	167	53.00	1	0.60	80	47.10	89	52.40	0	0.00	2	50.00	2	50.00	0	0.00	3	75.00	1	25.00	0		0		0		8	1.80	230	50.30	219	47.90
15,001 - 20,000	2	2.10	49	51.60	44	46.30	1	0.70	46	34.10	88	65.20	0	0.00	3	16.70	15	83.30	0	0.00	5	55.60	4	44.40	0		0		0		5	3.30	72	47.10	76	49.70
over 20,000	0	0.00	12	60.00	8	40.00	4	0.80	259	51.50	240	47.70	3	0.80	188	50.00	185	49.20	1	1.20	39	46.40	44	52.40	0	0.00	5	45.50	6	54.50	3	2.10	81	55.50	62	42.50
All Volumes	14	1.00	598	42.90	781	56.10	9	0.90	483	47.50	524	51.60	3	0.70	211	49.00	217	50.30	1	0.90	52	46.40	59	52.70	0	0.00	5	45.50	6	54.50	100	1.80	2576	45.20	3018	53.00

## Collisions Occurring At Signalized Intersections (LKI Landmarks A3 & A5). Zero radius from intersection point.

Average Daily																		Highwa	y Cla	SS																
Traffic Volume			ι	JAU2					ı	JAU4					ι	JAD4						UED4					ı	JFD4					R	AU2		
(vpd)	FAT	%	INJ	%	PDO	%	FAT	%	INJ	%	PDO	%	FAT	%	INJ	%	PDO	%	FAT	%	INJ	%	PDO	%	FAT	%	INJ	%	PDO	%	FAT	%	INJ	%	PDO	%
1 - 5,000	0	0.00	35	49.30	36	50.70	0	0.00	3	17.60	14	82.40	0	0.00	3	75.00	1	25.00	0		0		0		0		0		0		1	2.90	18	51.40	16	45.70
5,001 - 10,000	1	0.60	63	40.10	93	59.20	2	1.30	65	41.90	88	56.80	0	0.00	22	47.80	24	52.20	0	0.00	1	100.00	0	0.00	0		0		0		1	0.80	50	41.00	71	58.20
10,001 - 15,000	1	0.70	56	40.60	81	58.70	0	0.00	108	38.40	173	61.60	0	0.00	8	42.10	11	57.90	0	0.00	5	41.70	7	58.30	0		0		0		1	0.70	54	39.70	81	59.60
15,001 - 20,000	1	1.50	39	59.10	26	39.40	3	1.30	90	39.80	133	58.80	1	1.50	27	41.50	37	56.90	0	0.00	47	48.00	51	52.00	0		0		0		0	0.00	74	48.40	79	51.60
over 20,000	0	0.00	21	48.80	22	51.20	7	0.90	373	50.50	358	48.50	5	0.40	598	45.40	715	54.20	1	0.30	148	47.90	160	51.80	0		0		0		0	0.00	31	56.40	24	43.60
All Volumes	3	0.60	214	45.10	258	54.30	12	0.80	639	45.10	766	54.10	6	0.40	658	45.30	788	54.30	1	0.20	201	47.90	218	51.90	0		0		0		3	0.60	227	45.30	271	54.10

## Non-Intersection Collisions (collisions not occurring at intersections above)

Non-intersection Co	IIISI	0113 (C	UlliSi	ulis liu	i occi	urring	21 IIII	er seci	10113	above																										
Average Daily																		Highwa	y Clas	S																
Traffic Volume				UAU2					l	JAU4					U	JAD4						UED4					ı	JFD4			i e		R	AU2		
(vpd)	FAT	%	INJ	%	PDO	%	FAT	%	INJ	%	PDO	%	FAT	%	INJ	%	PDO	%	FAT	%	INJ	%	PDO	%	FAT	%	INJ	%	PDO	%	FAT	%	INJ	%	PDO	%
1 - 5,000	4	1.90	93	43.50	117	54.70	0	0.00	1	100.00	0	0.00	0	0.00	0	0.00	1	100.00	0	0.00	17	34.00	33	66.00	0		0		0		257	3.80	2954	43.70	3546	52.50
5,001 - 10,000	1	0.90	42	37.80	68	61.30	1	1.30	30	37.50	49	61.30	1	12.50	3	37.50	4	50.00	1	4.20	7	29.20	16	66.70	0		0		0		75	3.10	929	38.70	1395	58.10
10,001 - 15,000	4	3.00	69	51.10	62	45.90	1	4.20	6	25.00	17	70.80	0		0		0		0	0.00	0	0.00	2	100.00	0	0.00	2	28.60	5	71.40	10	3.30	144	47.50	149	49.20
15,001 - 20,000	1	3.20	12	38.70	18	58.10	1	2.00	22	44.00	27	54.00	0	0.00	5	26.30	14	73.70	1	0.70	47	34.10	90	65.20	2	1.60	44	35.50	78	62.90	3	6.30	22	45.80	23	47.90
over 20,000	0	0.00	4	66.70	2	33.30	8	5.00	79	49.70	72	45.30	3	1.70	64	36.60	108	61.70	0	0.00	8	34.80	15	65.20	8	0.30	954	40.40	1401	59.30	3	3.80	34	43.60	41	52.60
All Volumes	10	2.00	220	11 30	267	53.70	11	3 50	138	43.00	165	52 50	1	2.00	72	35 50	127	62.60	2	0.80	70	33 30	156	65.80	10	0.40	1000	40 10	1484	50 50	3/18	3.60	4083	42.60	515/	53.80

															Highway	Class														
		R	AU4					R	AD4					RE	D4					R	FD4					All 10	Highwa	y Class	es	
FAT	%	INJ	%	PDO	%	FAT	%	INJ	%	PDO	%	FAT	%	INJ	%	PDO	%	FAT	%	INJ	%	PDO	%	FAT	%	INJ	%	PDO	%	All
9	2.70	144	42.70	184	54.60	1	1.00	40	38.50	63	60.60	0	0.00	5	62.50	3	37.50	18	1.90	457	48.90	459	49.10	366	2.79	5774	44.01	6980	53.20	13120
2	2.00	47	46.10	53	52.00	3	1.70	70	39.50	104	58.80	5	1.70	115	39.80	169	58.50	18	1.20	647	43.40	826	55.40	156	2.08	3091	41.25	4247	56.67	7494
4	1.90	110	51.90	98	46.20	7	3.10	87	38.50	132	58.40	11	1.10	407	40.90	577	58.00	2	1.50	61	44.90	73	53.70	50	1.39	1600	44.62	1936	53.99	3586
4	2.10	85	45.50	98	52.40	3	1.40	86	39.10	131	59.50	1	0.70	52	38.20	83	61.00	0	0.00	35	46.10	41	53.90	30	1.49	827	41.06	1157	57.45	2014
11	1.80	292	47.20	316	51.10	13	1.10	533	44.20	659	54.70	8	1.10	331	45.80	384	53.10	27	0.80	1282	38.40	2028	60.80	103	0.78	5707	43.04	7450	56.18	13260
30	2.10	678	46.50	749	51.40	27	1.40	816	42.20	1089	56.40	25	1.20	910	42.30	1216	56.50	65	1.10	2482	41.50	3427	57.40	705	1.79	16999	43.06	21770	55.15	39474

															Highway	Class														
		R	AU4					R.	AD4					RE	D4					F	RFD4					All 10	Highwa	y Class	es	
FAT	%	INJ	%	PDO	%	FAT	%	INJ	%	PDO	%	FAT	%	INJ	%	PDO	%	FAT	%	INJ	%	PDO	%	FAT	%	INJ	%	PDO	%	All
1	1.00	44	44.40	54	54.50	0	0.00	20	37.00	34	63.00	0		0		0		0	0.00	45	43.70	58	56.30	77	1.65	2038	43.71	2548	54.64	4663
0	0.00	32	64.00	18	36.00	0	0.00	19	42.20	26	57.80	4	1.80	86	38.90	131	59.30	1	0.60	67	43.50	86	55.80	52	1.49	1505	43.01	1942	55.50	3499
1	1.00	54	55.70	42	43.30	2	1.60	53	41.40	73	57.00	5	1.20	177	42.40	235	56.40	1	1.80	18	32.70	36	65.50	24	1.06	1017	44.86	1226	54.08	2267
3	1.80	68	41.50	93	56.70	4	1.50	112	41.80	152	56.70	1	0.40	126	45.20	152	54.50	0	0.00	29	50.90	28	49.10	23	1.12	890	43.48	1134	55.40	2047
5	0.90	272	48.10	288	51.00	7	0.70	422	44.30	523	54.90	6	1.10	237	44.80	286	54.10	1	0.10	273	39.30	420	60.50	42	0.57	3350	45.78	3925	53.64	7317
10	1.00	470	48.20	495	50.80	13	0.90	626	43.30	808	55.80	16	1.10	626	43.30	804	55.60	3	0.30	432	40.60	628	59.10	218	1.10	8800	44.46	10775	54.44	19793

															Highway	Class														
		R	AU4					R.	AD4					RE	D4					F	RFD4					All 10	) Highwa	y Class	es	
FAT	%	INJ	%	PDO	%	FAT	%	INJ	%	PDO	%	FAT	%	INJ	%	PDO	%	FAT	%	INJ	%	PDO	%	FAT	%	INJ	%	PDO	%	All
1	1.20	40	47.60	43	51.20	0	0.00	1	100.00	0	0.00	0		0		0		0	0.00	15	45.50	18	54.50	67	1.66	1779	44.08	2190	54.26	4036
0	0.00	22	75.90	7	24.10	0	0.00	10	40.00	15	60.00	2	2.60	21	27.30	54	70.10	0	0.00	8	44.40	10	55.60	34	1.42	1042	43.63	1312	54.94	2388
1	2.00	30	58.80	20	39.20	0	0.00	4	50.00	4	50.00	5	4.70	42	39.60	59	55.70	1	25.00	2	50.00	1	25.00	17	1.52	540	48.26	562	50.22	1119
3	2.30	54	40.90	75	56.80	1	2.10	21	44.70	25	53.20	0	0.00	8	72.70	3	27.30	0		0		0		12	2.00	258	43.00	330	55.00	600
4	2.70	68	45.60	77	51.70	2	1.30	67	43.50	85	55.20	2	2.70	26	35.10	46	62.20	0	0.00	9	42.90	12	57.10	19	1.24	754	49.02	765	49.74	1538
9	2.00	214	48.10	222	49.90	3	1.30	103	43.80	129	54.90	9	3.40	97	36.20	162	60.40	1	1.30	34	44.70	41	53.90	149	1.54	4373	45.17	5159	53.29	9681

															Highway	Class														
		F	RAU4					R	AD4					RE	D4					F	RFD4					All 10	Highwa	y Class	es	
FAT	%	INJ	%	PDO	%	FAT	%	INJ	%	PDO	%	FAT	%	INJ	%	PDO	%	FAT	%	INJ	%	PDO	%	FAT	%	INJ	%	PDO	%	All
0	0.00	2	20.00	8	80.00	0	0.00	19	35.80	34	64.20	0		0		0		0	0.00	2	25.00	6	75.00	1	0.51	82	41.41	115	58.08	198
0	0.00	9	47.40	10	52.60	0		0		0		1	1.20	41	50.60	39	48.10	0		0		0		5	0.86	251	43.20	325	55.94	581
0	0.00	23	56.10	18	43.90	2	1.90	43	41.00	60	57.10	0	0.00	114	43.80	146	56.20	0		0		0		4	0.40	411	41.43	577	58.17	992
0	0.00	9	42.90	12	57.10	3	1.50	84	43.30	107	55.20	0	0.00	91	46.00	107	54.00	0		0		0		8	0.78	461	45.15	552	54.06	1021
0	0.00	165	50.20	164	49.80	5	0.70	310	42.90	407	56.40	4	1.10	181	48.40	189	50.50	0	0.00	0	0.00	9	100.00	22	0.56	1827	46.88	2048	52.55	3897
0	0.00	208	49.50	212	50.50	10	0.90	456	42.50	608	56.60	5	0.50	427	46.80	481	52.70	0	0.00	2	11.80	15	88.20	40	0.60	3032	45.33	3617	54.07	6689

															lighway	Class														
		R	RAU4					R	AD4					RE	D4					F	RFD4					All 10	Highwa	y Class	es	
FAT	%	INJ	%	PDO	%	FAT	%	INJ	%	PDO	%	FAT	%	INJ	%	PDO	%	FAT	%	INJ	%	PDO	%	FAT	%	INJ	%	PDO	%	All
8	3.30	101	41.90	132	54.80	1	2.00	20	40.00	29	58.00	0	0.00	5	62.50	3	37.50	18	2.20	410	49.20	406	48.70	288	3.53	3601	44.15	4267	52.32	8156
2	3.00	28	41.80	37	55.20	3	2.30	51	38.60	78	59.10	2	1.30	58	38.20	92	60.50	17	1.30	587	43.40	747	55.30	103	2.38	1735	40.12	2486	57.49	4324
3	7.00	16	37.20	24	55.80	4	6.70	18	30.00	38	63.30	5	1.60	120	37.30	197	61.20	1	0.90	51	44.30	63	54.80	28	2.77	426	42.14	557	55.09	1011
4	5.60	32	44.40	36	50.00	0	0.00	25	34.20	48	65.80	0	0.00	10	31.30	22	68.80	0	0.00	18	38.30	29	61.70	12	1.89	237	37.38	385	60.73	634
6	4.90	54	44.30	62	50.80	6	3.50	77	44.50	90	52.00	2	1.00	91	47.60	98	51.30	26	1.00	984	38.40	1554	60.60	62	1.06	2349	40.13	3443	58.81	5854
23	4.20	231	42.40	291	53.40	14	2.90	191	39.10	283	58.00	9	1.30	284	40.30	412	58.40	62	1.30	2050	41.70	2799	57.00	493	2.47	8348	41.78	11138	55.75	19979

Page 2 of 2

#### Notes:

- 1. Analysis dates: 10th to 12th February 2015. CIS version 2.0.1 CIS collision data last updated 1 February 2015. Effective LKI: July 2014. Subsequent updates to the data may affect the results in this table.
- 2. Statistically, severity proportions in these tables can be used with confidence if the collision sample size (#fat + #inj + #PDO) is at least:
- 1500 collisions, for fatal proportion 50 collisions, for injury and PDO proportions

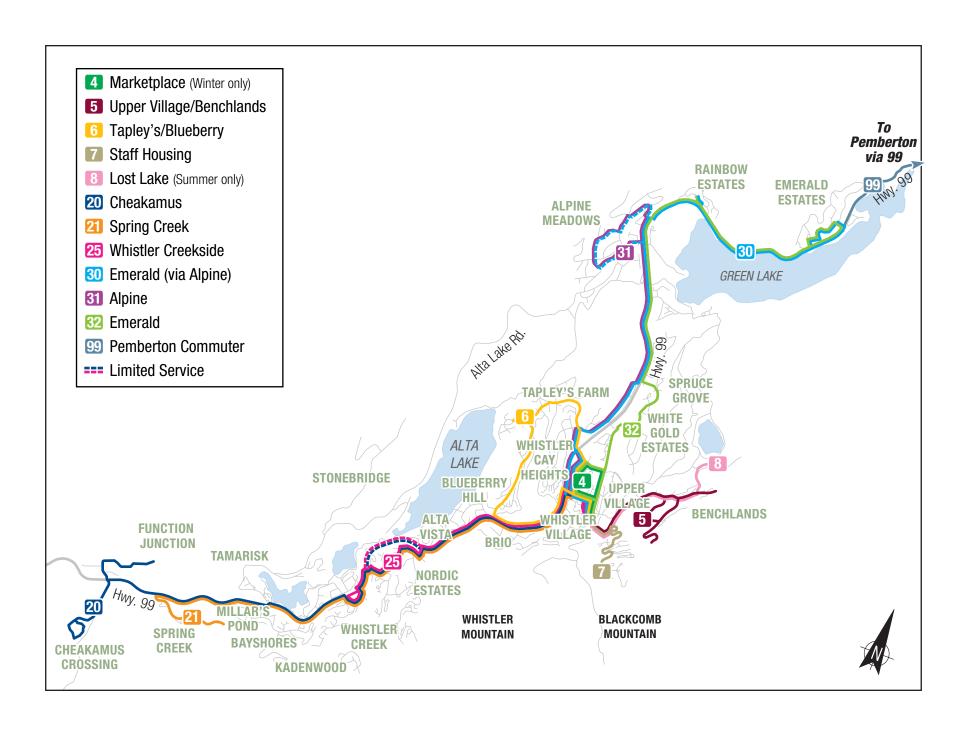
### Legend:

- U = Urban
- R = Rural
- A = Arterial
- E = Expressway, multi-lanes with at grade intersections
- F = Freeway, multi-lane with grade separations
- U2 = Undivided Up to 3 Lanes
- U4 = Undivided 4 or More Lanes
- D4 = Divided 4 or More Lanes
- vpd = Vehicles per Day
- FAT = Number of fatal collisions
- INJ = Number of injury collisions
- PDO = Number of Property Damage Only collisions
- A1 = Intersection with stop sign or flashing red lights, no turning slots
- A2 = Intersection with stop sign or flashing red lights, and turning slots
- A3 = Intersection with traffic control lights, no turning slots
- A5 = Intersection with traffic control lights, and turning slots MV6020 Form, Accident Location Code 01 = at intersection

Zero collisions or no inventory for this volume range and service class

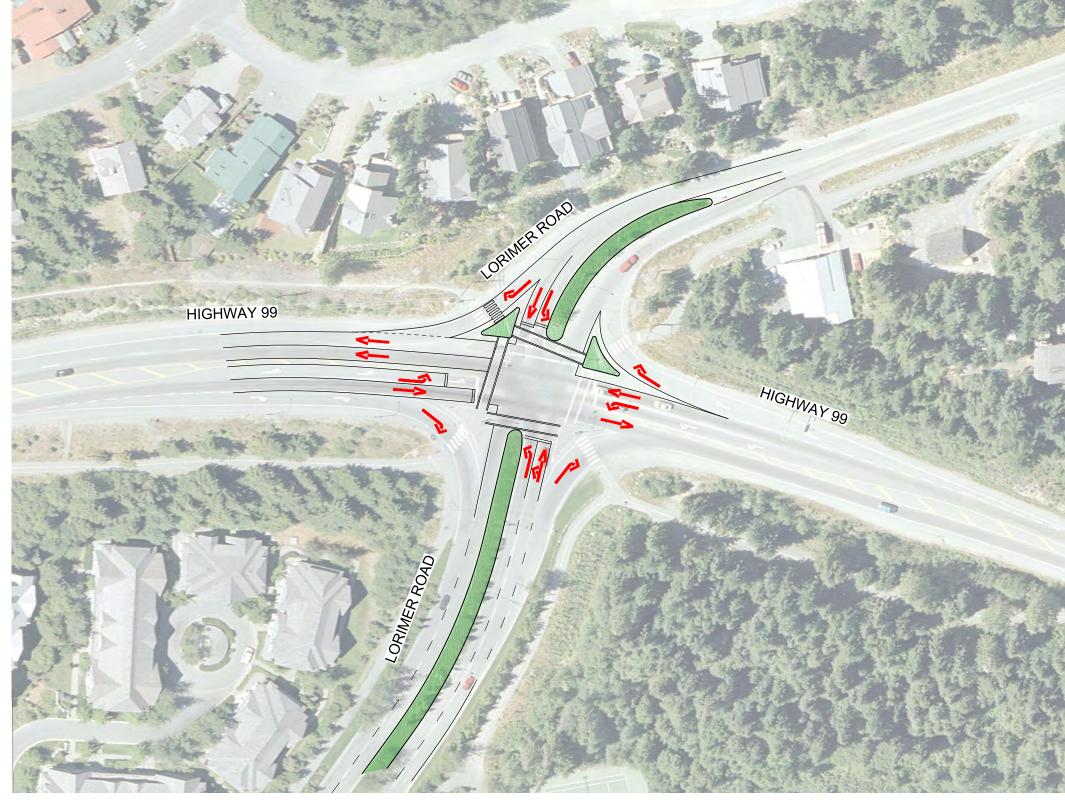
	Highway 99 Capacity and Safety Review, Whistler (Alpha Lake Rd/Cheakamus Lake Rd to Lorimer Rd) Final Report
Appendix D – Whistler Transit M	ар





	Highway 99 Capacity and Safety Review, Whistler (Alpha Lake Rd/Cheakamus Lake Rd to Lorimer Rd) Final Report
Appendix E – Short-Term Option	(Dual WB Left at Lorimer Road)





DESIGN VEHICLE (Lorimer Road WB to SB)

LEFT HSU

SHARED LEFT THROUGH WB20

HALFSIZE

FOR DISCUSSION ONLY

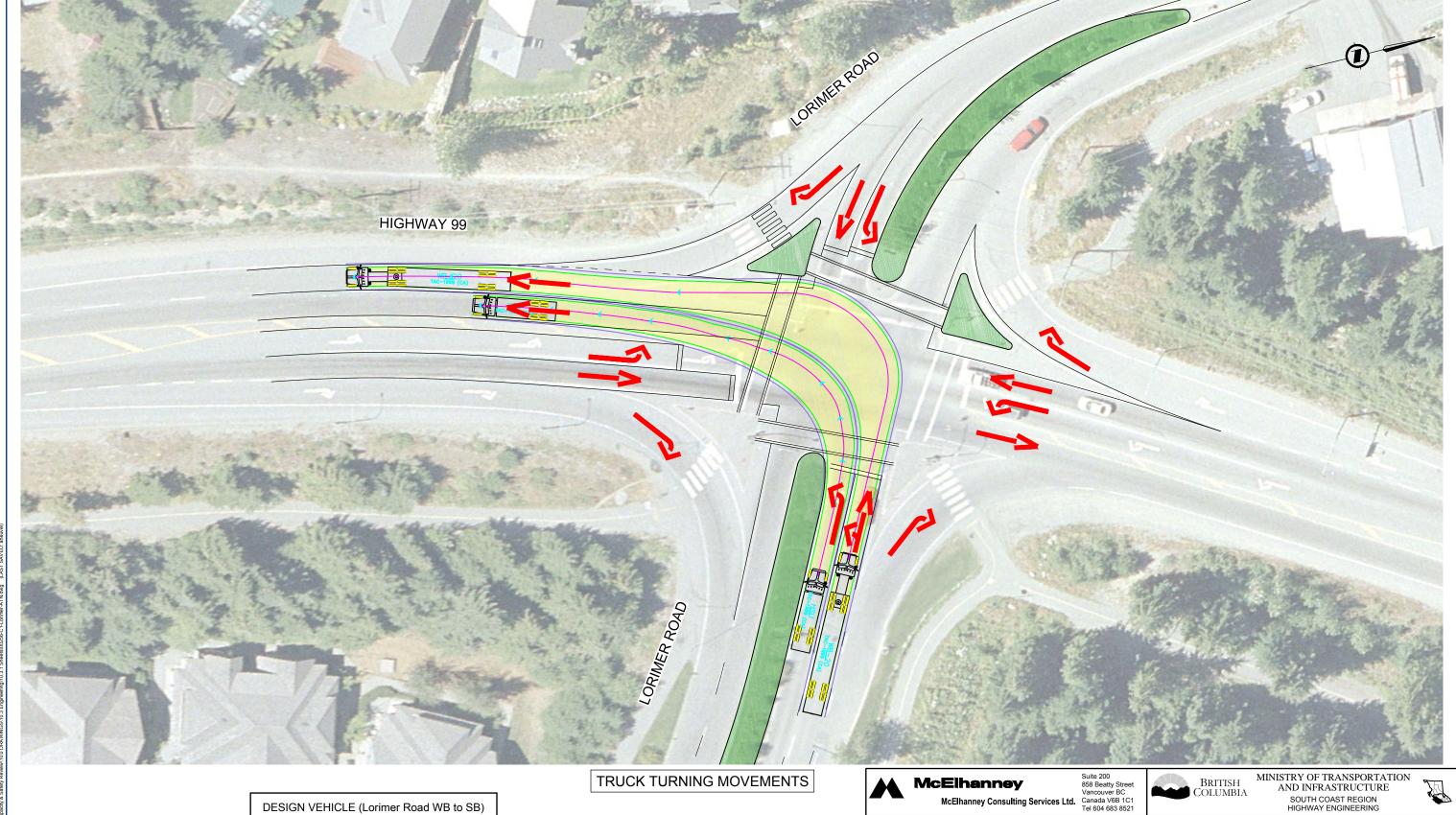
	4	M	McElhanney Consulting Services Ltd. Cana	e 200 Beatty Street couver BC ada V6B 1C1 604 683 8521	BRITISH COLUMBIL	MINISTRY OF AND INF SOUTH HIGHWA	RAST COAS	TRU(	CTURE SION	
	SC	ALE	0 5 1:500 25m CAD FILENAME_		MoTI WHISTLER	PLAN HIGHWAY 99 CAF		Y &	SAFETY REVIEW	
	REV	DATE	REVISIONS	SIGNATURE	LO	ORIMER ROAD INT	ERSE	ECTI	ON	
Professional Seal					SHORT-TERM (	OPTION A - LEFT /	SHAF	RED	LEFT-THROUGH	
								DESIG	NED DATE	
							QUALI	TY CON	TROL DATE	
					SENIOR DESIGNER		QUALITY	ASSURA	NCE DATE	
					DATE			DR	AWN DATE	
					FILE NUMBER	PROJECT NUMBER		REG	DRAWING NUMBER	REV
	А	2018-05-30	ISSUED FOR REVIEW	÷	2121-00288-02			1	R1-288-A-101	A

INFORMATION SHOWN ON THIS DRAWING REGARDING EXISTING UTILITIES IS COMPILED FROM SOME RECORD DRAWINGS AND SOME SURVEYS, AND MAY NOT BE COMPILETE. CONTRACTOR SHALL EXPOSE AND CONFIRM THE LOCATIONS AND ELEVATIONS OF ALL EXISTING UTILITIES AND ADVISE THE ENGINEER OF ANY POTENTIAL CONFLICT.

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Elhanney ANSI D (34 x 22 inches)

ờ: June 6, 2018 - 12:55 PM ≘: O:NProjt2121-00288-02 MoTl Whistler Hwy 99 Capacity & Safety Review/10.0 DRAWINGS\10.3 Engineering\10.3



INFORMATION SHOWN ON THIS DRAWING REGARDING EXISTING UTILITIES IS COMPILED FROM SOME RECORD DRAWINGS AND SOME SURVEYS, AND MAY NOT BE COMPILETE. CONTRACTOR SHALL EXPOSE AND CONFIRM THE LOCATIONS AND ELEVATIONS OF ALL EXISTING UTILITIES AND ADVISE THE ENGINEER OF ANY POTENTIAL CONFLICT.

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DESIGN VEHICLE (Lorimer Road WB to SB) HSU LEFT SHARED LEFT THROUGH WB20

HALFSIZE

FOR DISCUSSION ONLY

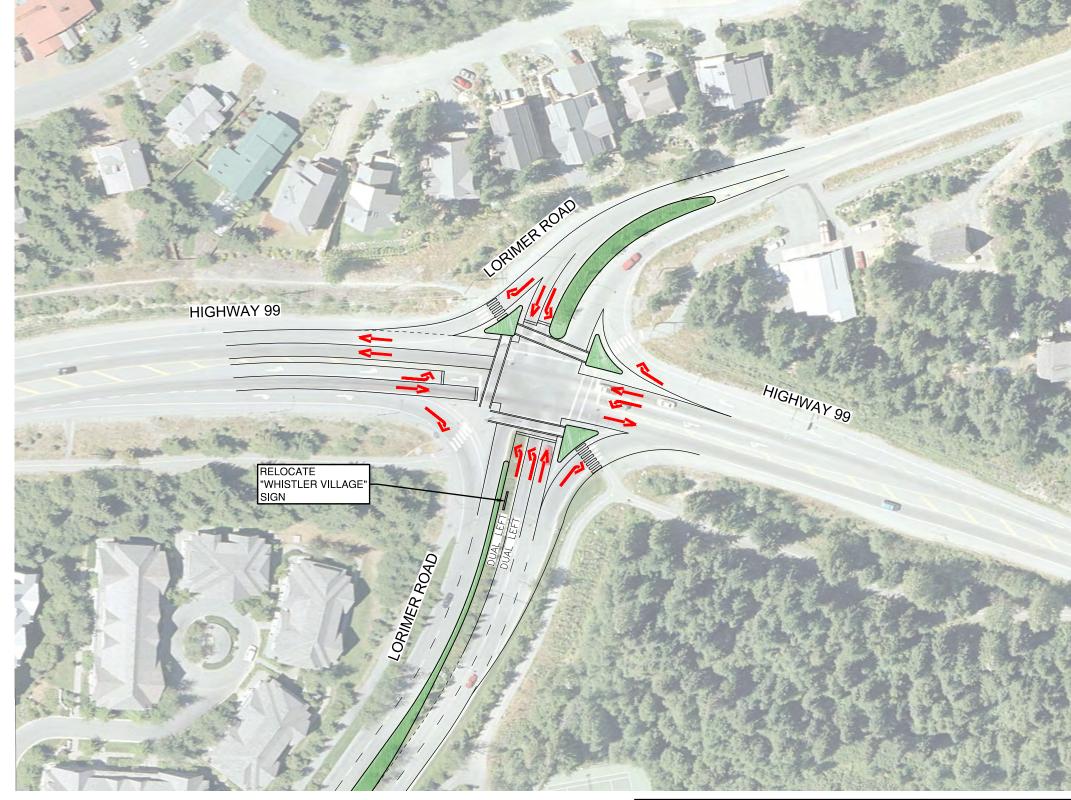
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PLAN

NOTI WHISTLER HIGHWAY 99 CAPACITY & SAFETY REVIEW LORIMER ROAD INTERSECTION

SHORT-TERM OPTION A - LEFT / SHARED LEFT-THROUGH

2121-00288-02 R1-288-A-102



DESIGN VEHICLE (Lorimer Road WB to SB)

DUAL LEFT INSIDE HSU

DUAL LEFT OUTSIDE WB20

HALFSIZE

FOR DISCUSSION ONLY

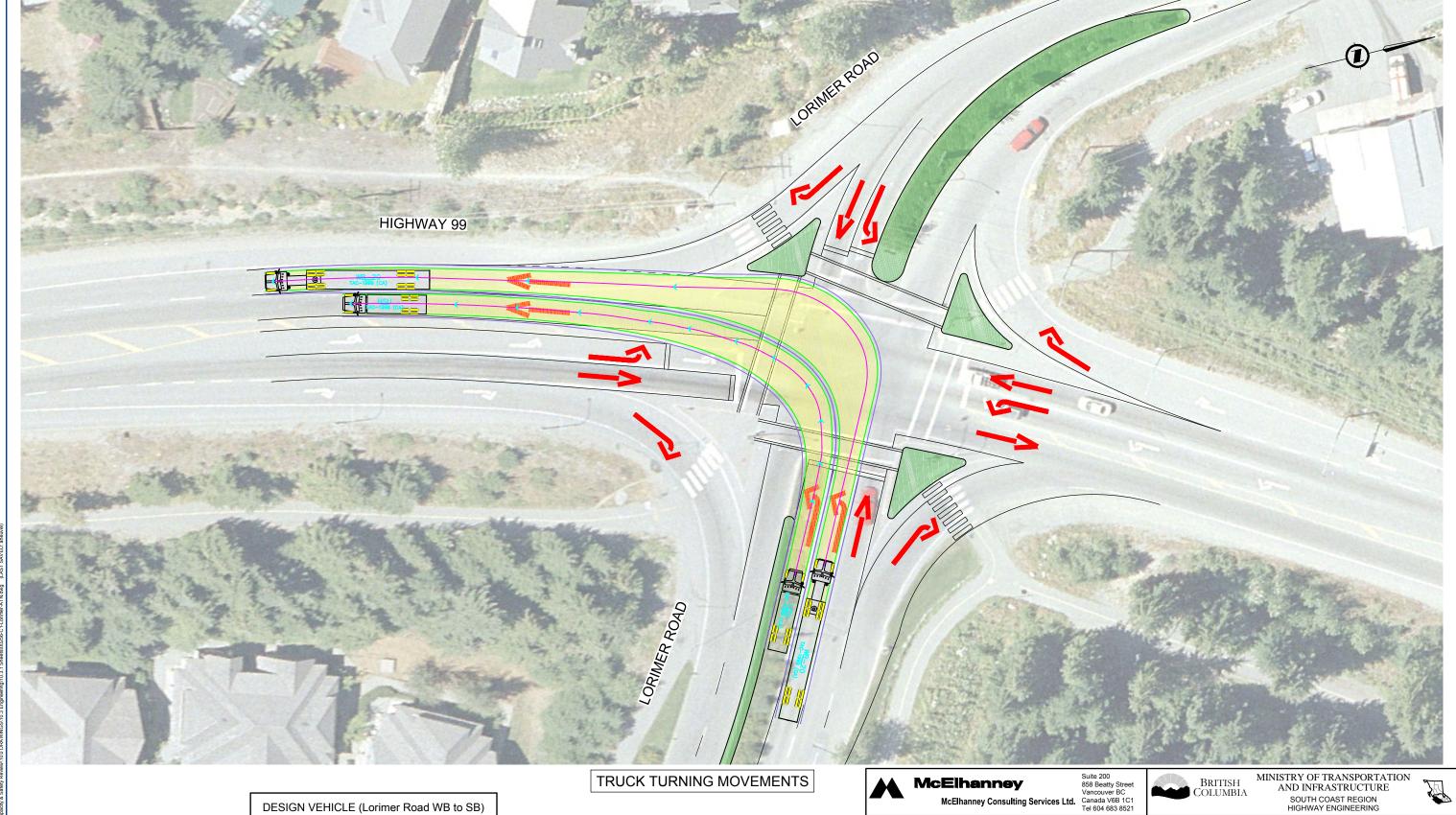
	4	M	McElhanney  McElhanney Consulting Services Ltd. Car	te 200 B Beatty Street accuver BC nada V6B 1C1 604 683 8521	BRITISH COLUMBIL	MINISTRY OF AND INF SOUTH HIGHWA	RAST	TRUC	CTURE GION	
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Elhanney ANSI D (34 x 22 inches)

PRINTED: June 6, 2018 - 12:54 PM CAD FILE: OvProit2121-00288-02 MoTI Whistler Hwy 99 Canacity & Safety Review\10,



INFORMATION SHOWN ON THIS DRAWING REGARDING EXISTING UTILITIES IS COMPILED FROM SOME RECORD DRAWINGS AND SOME SURVEYS, AND MAY NOT BE COMPILETE. CONTRACTOR SHALL EXPOSE AND CONFIRM THE LOCATIONS AND ELEVATIONS OF ALL EXISTING UTILITIES AND ADVISE THE ENGINEER OF ANY POTENTIAL CONFLICT.

DUAL LEFT INSIDE

DUAL LEFT OUTSIDE

HSU

WB20

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HALFSIZE

FOR DISCUSSION ONLY

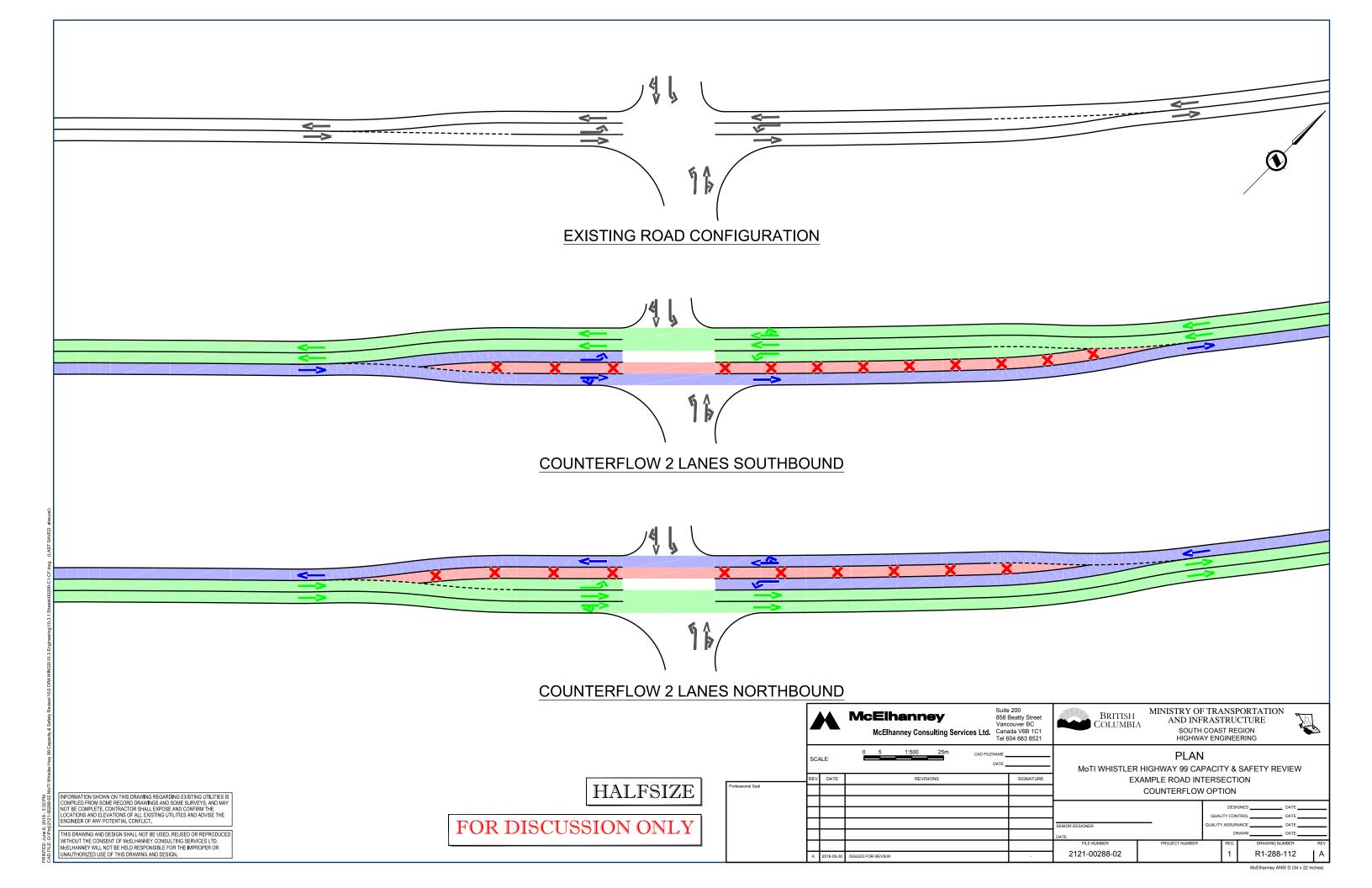
PLAN MoTI WHISTLER HIGHWAY 99 CAPACITY & SAFETY REVIEW

LORIMER ROAD INTERSECTION SHORT-TERM OPTION B - LEFT / DUAL LEFT

2121-00288-02 R1-288-B-102

	Highway 99 Capacity and Safety Review, Whistler (Alpha Lake Rd/Cheakamus Lake Rd to Lorimer Rd) Final Report
Appendix F – Medium-Term Optic	on 1 (Counterflow)

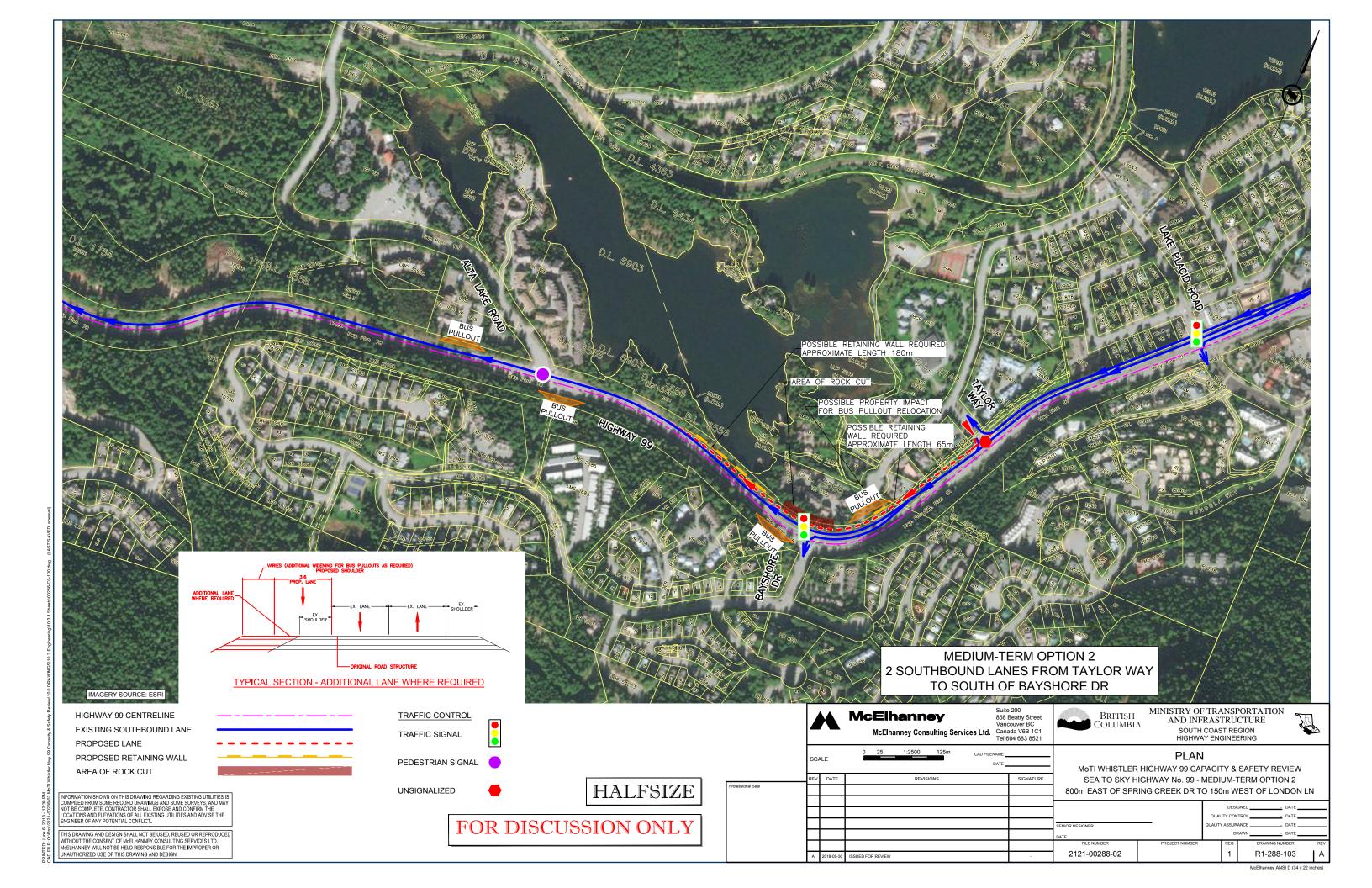




Appendix G – Medium-Term Optic Way to Bayshore Drive)	on 2 (Two SB Lanes from Taylor
	(Alpha Lake Rd/Cheakamus Lake Rd to Lorimer Rd) Final Report



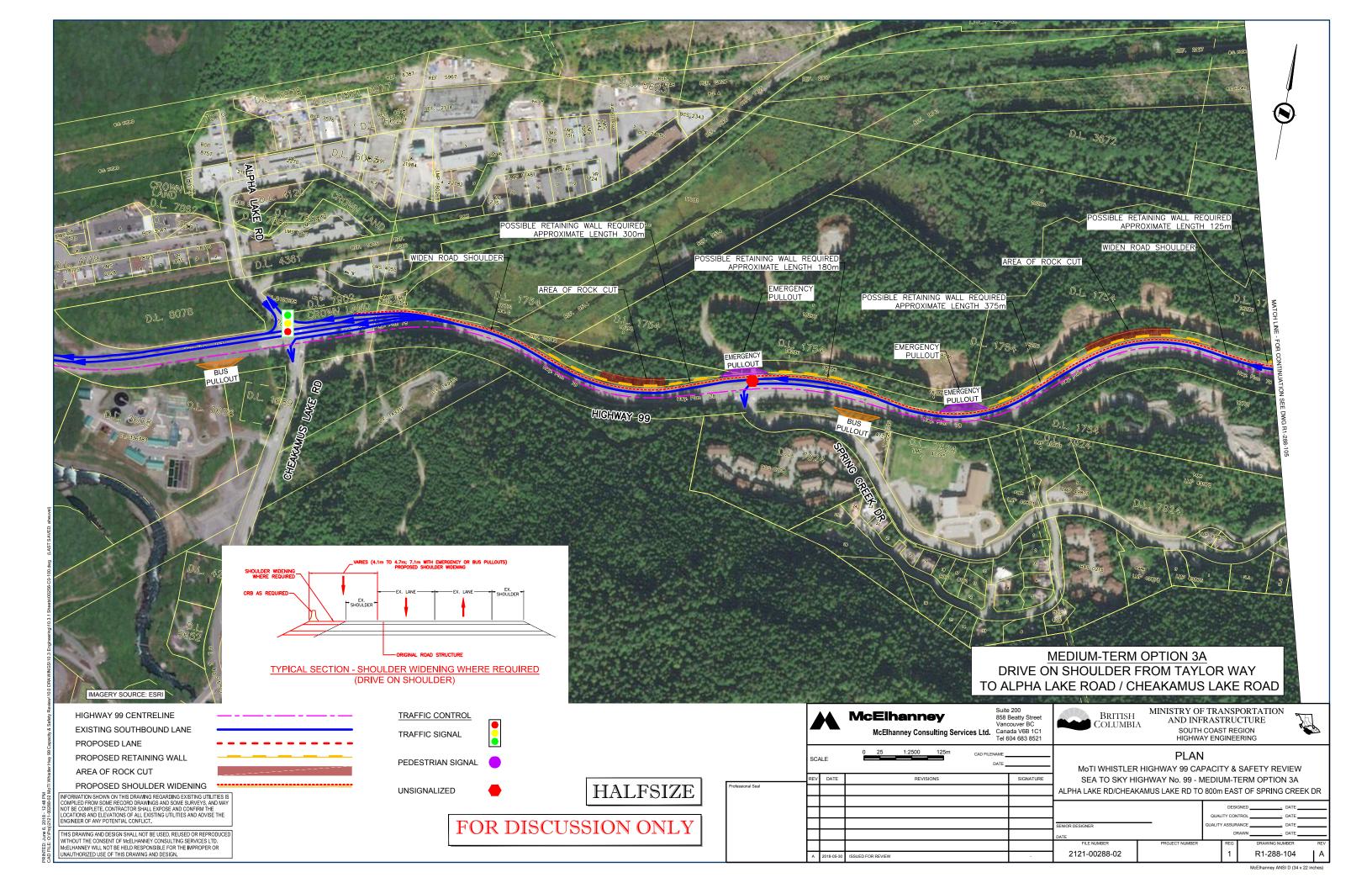
Highway 99 Capacity and Safety Review, Whistler

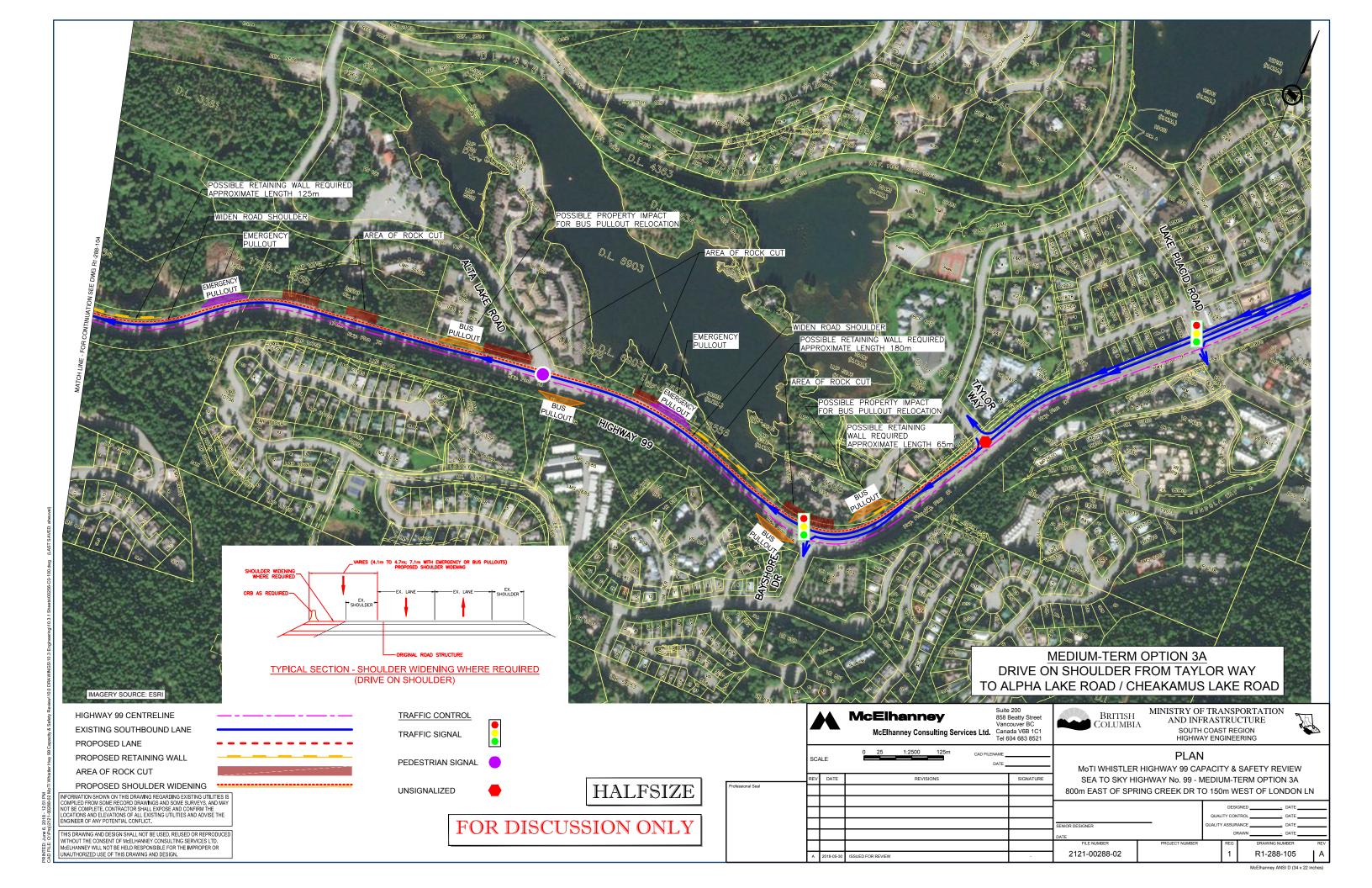


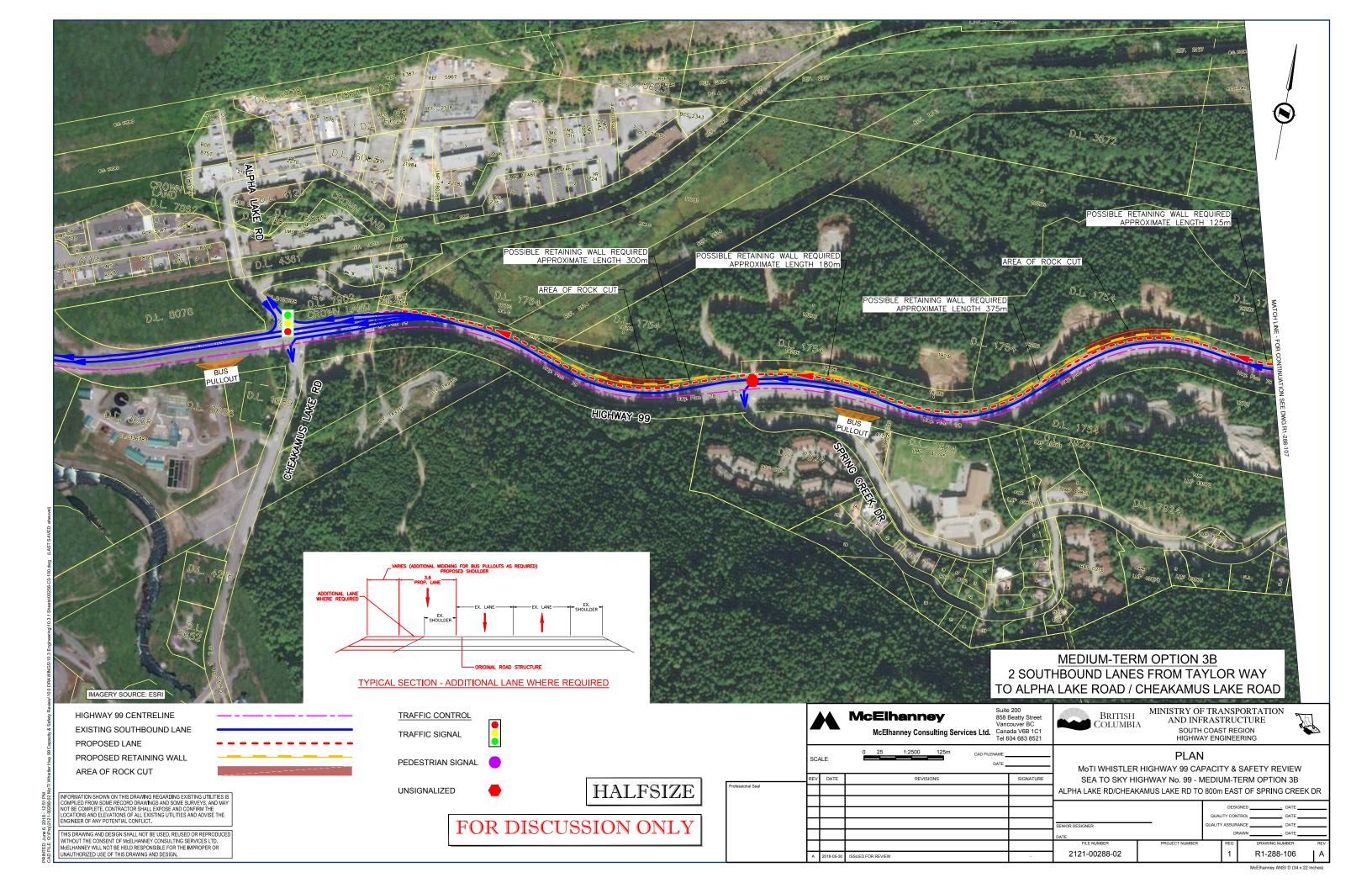
Appendix H – Medium-Term Optio	
	(Alpha Lake Rd/Cheakamus Lake Rd to Lorimer Rd) Final Report

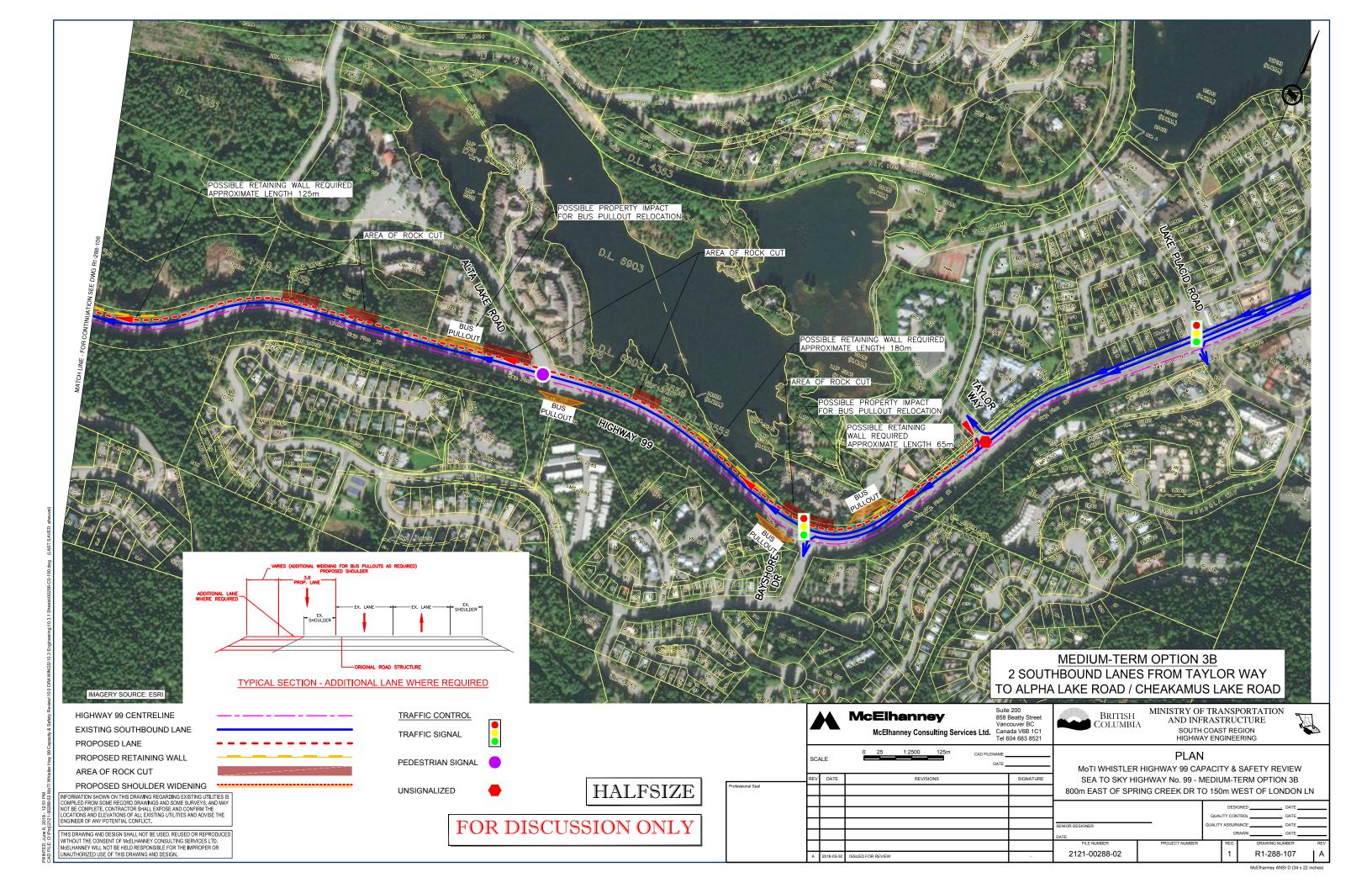


Highway 99 Capacity and Safety Review, Whistler





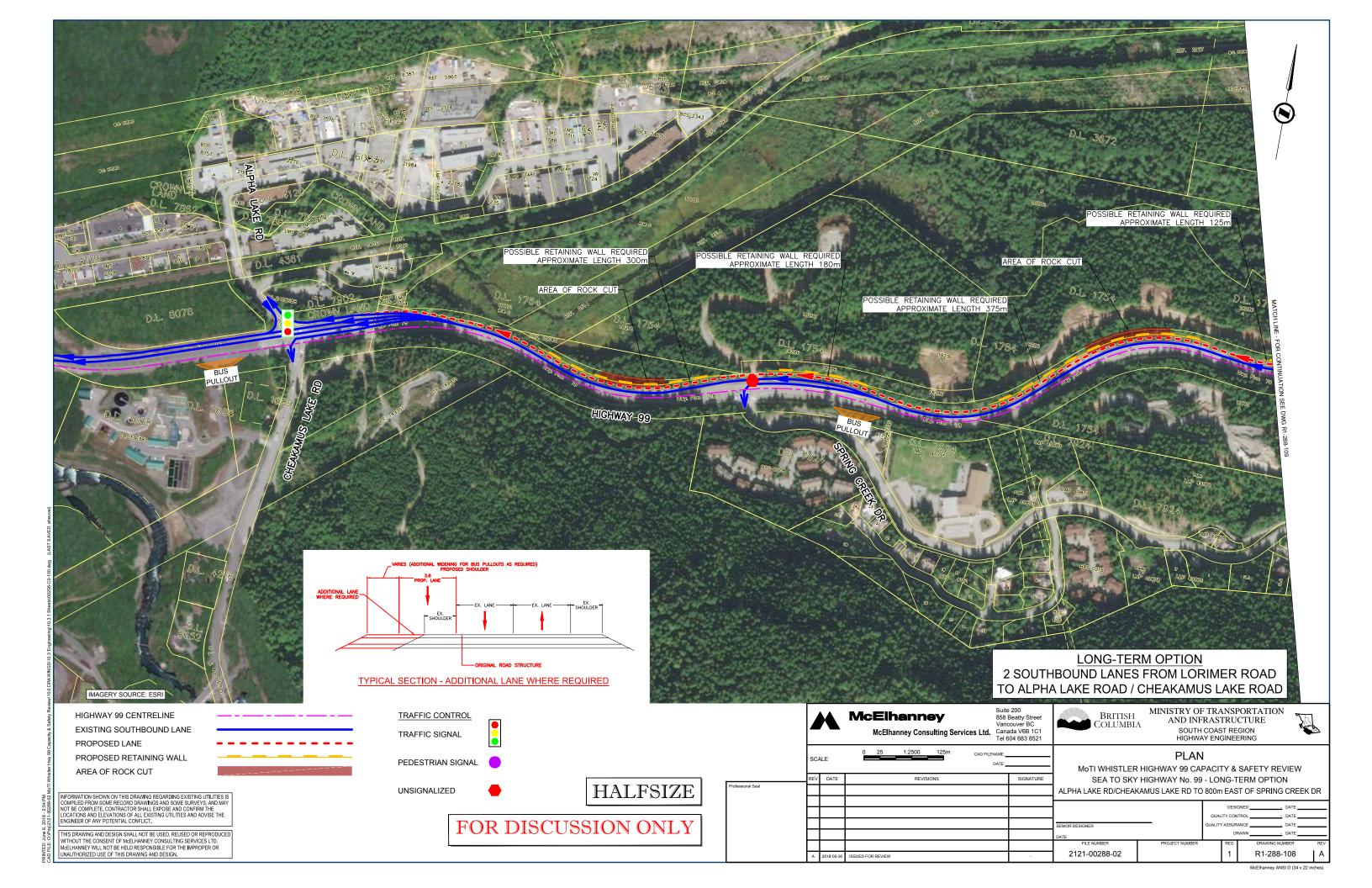


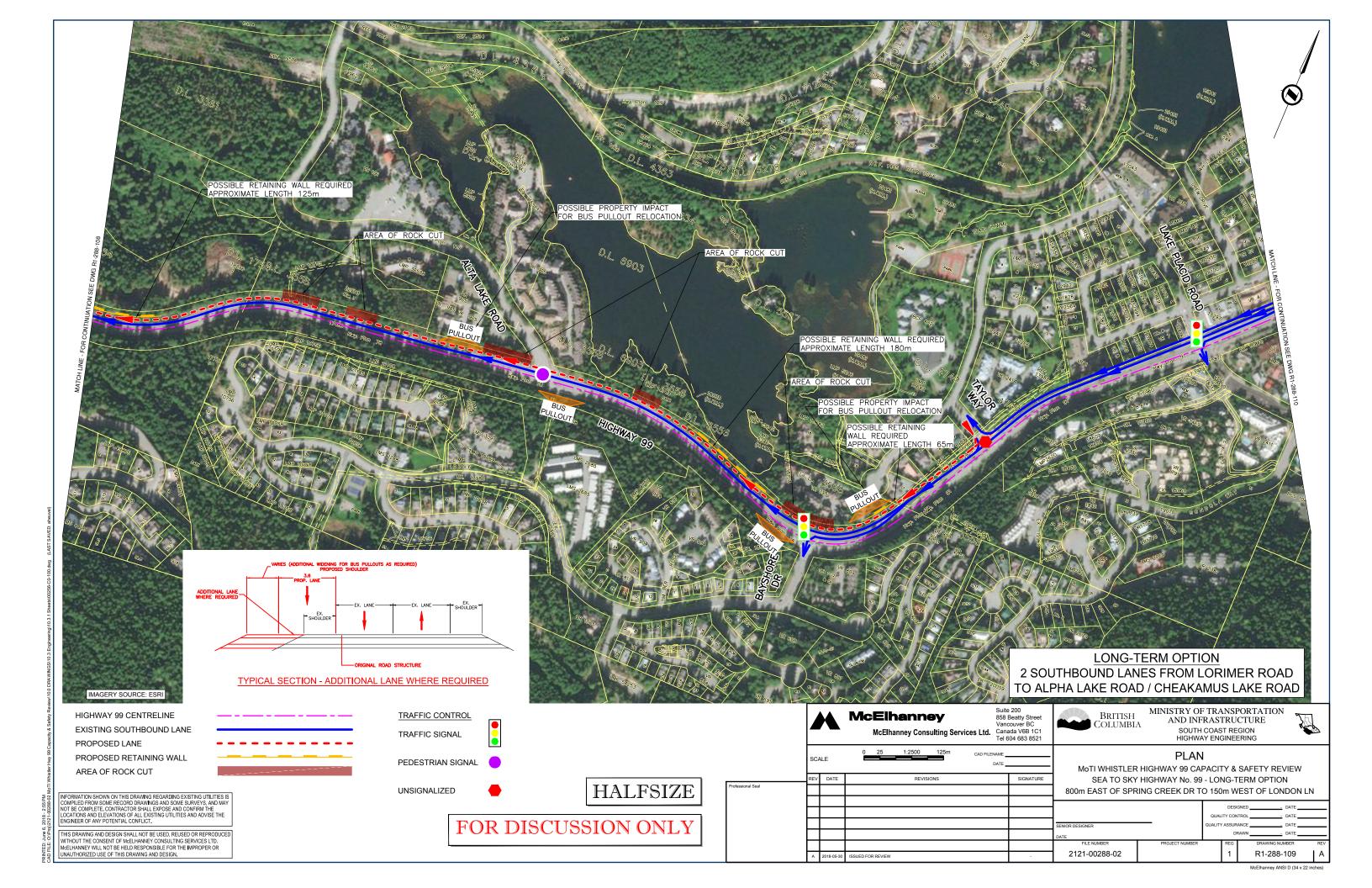


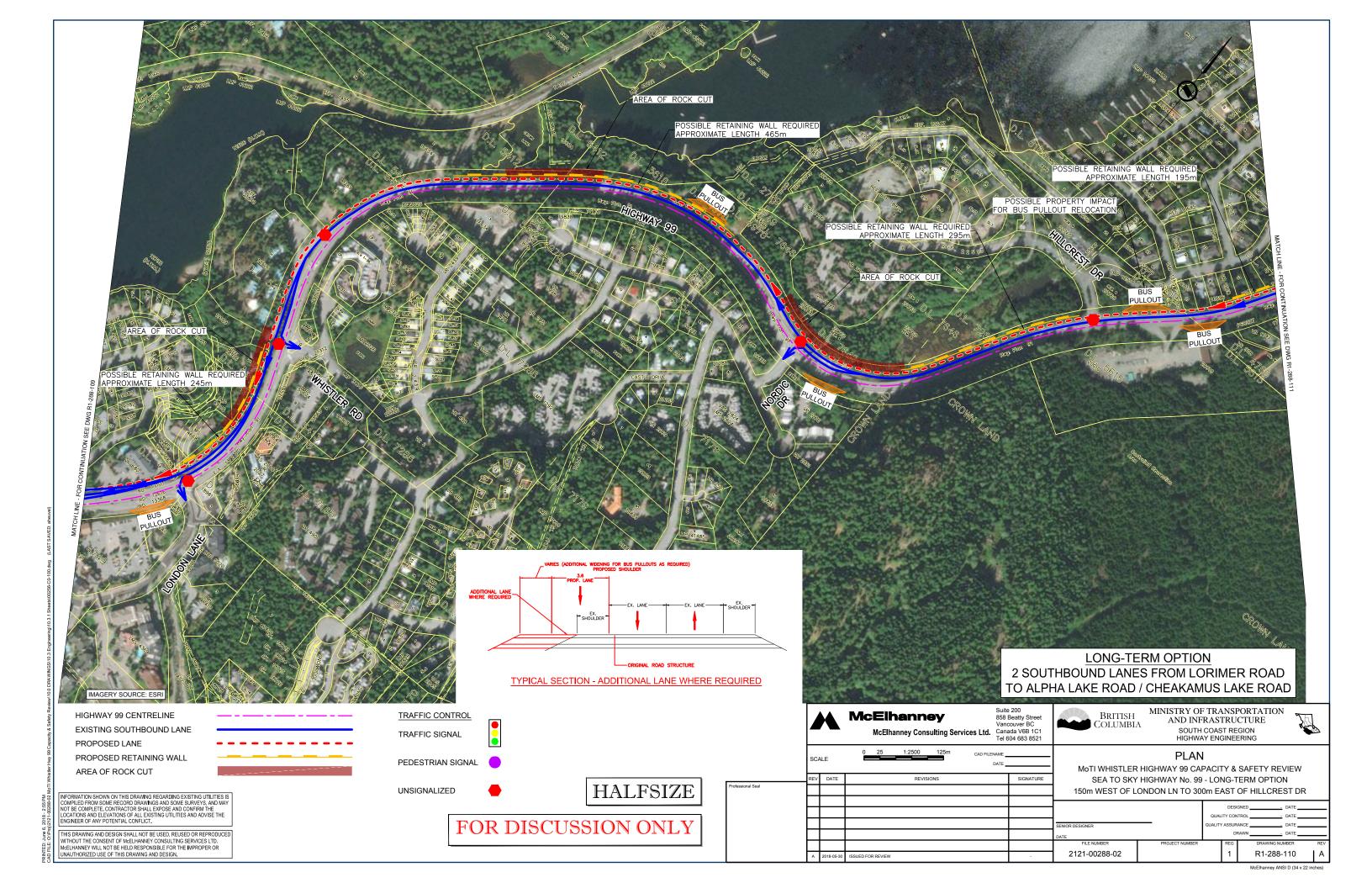
Highway 99 Capacity and Safety Review, Whistler (Alpha Lake Rd/Cheakamus Lake Rd to Lorimer Rd) Final Report

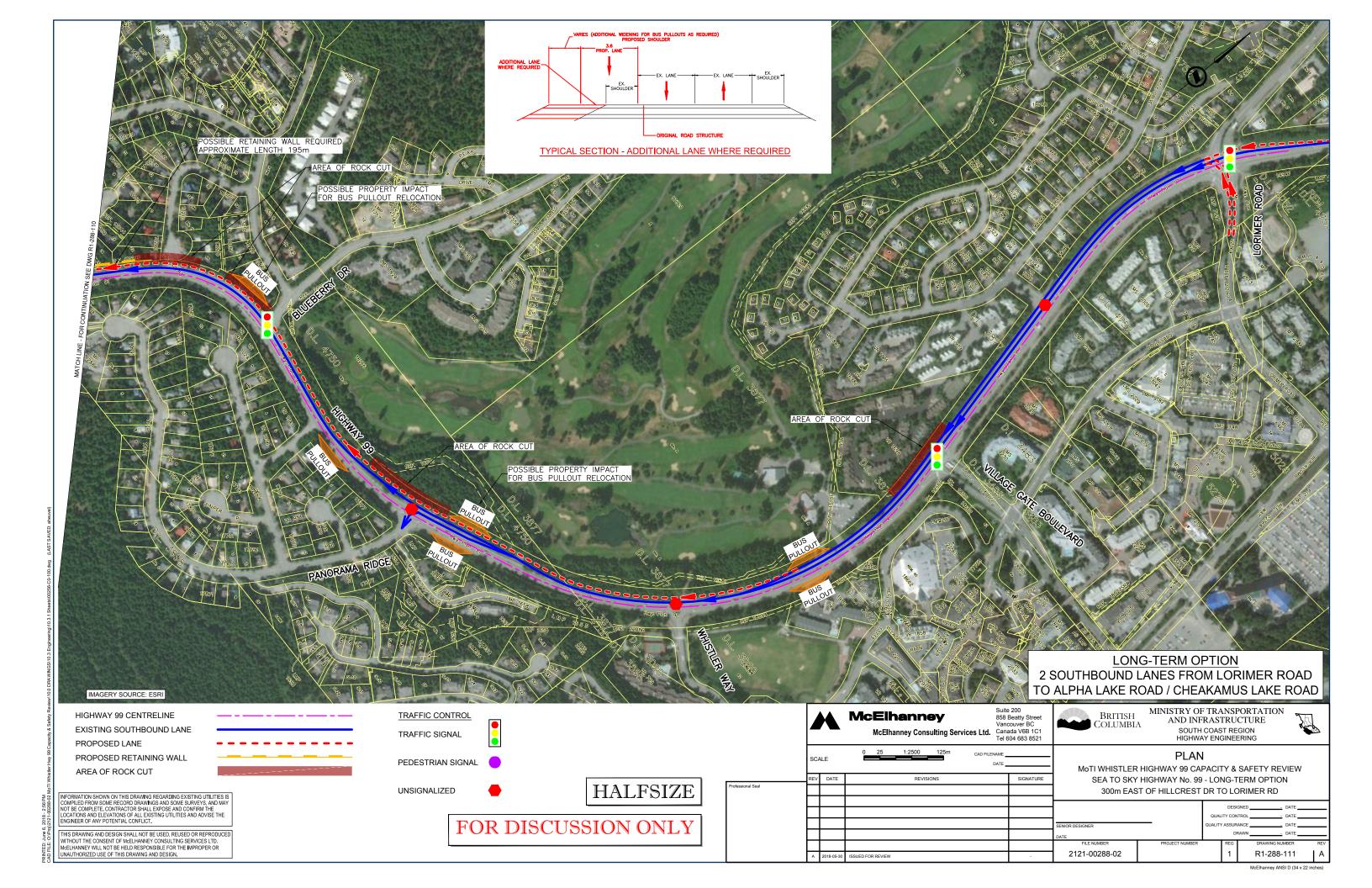
**Appendix I – Long-Term Option (Two SB Lanes from Lorimer Road to Alpha Lake Road)** 











(Alpha Lake Rd/Cheakamus Lake Rd to Lorimer Rd) Final Report



**Appendix J - Cost Estimates** 

Conceptual Design Project Cost Estimate

MCSL Proj #: 2121-00288-02

EST.DATE August, 2018

	Hwy 99 / Lorimer Rd ST-1	Hwy 99 / Lorimer Rd ST-2	Lake Placid Rd to Alpha MT-1	Lake Placid Rd to MT-2	Taylor Way to Alpha MT-3A	Taylor Way to Alpha MT-3B	Lorimer Rd to Alpha LT-1
Description	Short Term Option - 1 Left / Shared Left- Through	Short Term Option - 2 Dual Left		Medium Term Option - 2 2 SB lanes from Taylor Way to Bayshore Dr	Medium Term Option - 3A Shoulder Widening	Medium Term Option - 3B 2 Full Lanes SB	Long Term Option - 1 2 Full Lanes SB
Road Length	100	75	3500	450	3150	3150	5600
Grade Construction	\$25,601	\$68,982	\$4,358,866	\$666,196	\$3,130,333	\$3,859,634	\$8,086,178
Other Construction (Environmental Mitigation & Archaeological)	\$5,150	\$5,150	\$46,350	\$18,540	\$69,525	\$9,270	\$92,700
Drainage	\$278	\$9,200	\$161,421	\$20,754	\$110,557	\$145,279	\$572,136
Structural Construction (Including Retaining Walls)			\$9,967,825	\$1,782,003	\$7,974,260	\$9,967,825	\$20,294,090
Paving Construction	\$9,409	\$21,529	\$806,315	\$103,669	\$349,550	\$725,683	\$1,290,104
Signing & Pavement Markings / Operational Construction (Signing, Pavement Marking and Guard Rail ie. Barriers)	\$9,006	\$9,866	\$676,118	\$22,225	\$490,056	\$297,034	\$447,885
Electrical (Lighting and Signal)	\$56,650	\$91,670	\$529,935	\$176,645	\$459,895	\$459,895	\$529,935
Landscaping	\$508	\$691	\$62,028	\$6,625	\$55,046	\$55,825	\$81,101
Utility Construction (hydro, telephone, pipelines etc.)			\$336,000		\$302,400	\$302,400	\$537,600
Subtotal Construction	\$106,603	\$207,088	\$16,944,858	\$2,796,657	\$12,941,622	\$15,822,846	\$31,931,729
Construction Contingency 30%	\$31,981	\$62,126	\$5,083,457	\$838,997	\$3,882,487	\$4,746,854	\$9,579,519
Total Construction (Primary) Cost	\$138,583	\$269,214	\$22,028,315	\$3,635,654	\$16,824,109	\$20,569,699	\$41,511,248
Land acquisition							
Planning	\$2,662	\$5,190	\$111,794	\$26,351	\$83,845	\$83,845	\$268,304
Preliminary Design	\$5,148	\$10,296	\$210,210	\$50,193	\$162,162	\$135,135	\$528,528
Engineering	\$11,530	\$22,399	\$1,796,414	\$302,486	\$1,367,058	\$1,678,691	\$3,395,589
Project Management	\$9,153	\$17,775	\$1,388,706	\$231,040	\$1,059,818	\$1,291,893	\$2,626,279
Resident Engineering/Construction Supervision	\$13,800	\$26,396	\$1,907,795	\$320,023	\$1,446,845	\$1,770,765	\$3,569,867
First Nations Accommodations (8%)	\$11,087	\$21,537	\$1,762,265	\$290,852	\$1,345,929	\$1,645,576	\$3,320,900
MoTI Regional Cost Recoveries & Project Management (12%)	\$16,630	\$32,306	\$2,643,398	\$436,278	\$2,018,893	\$2,468,364	\$4,981,350
Total External Costs	\$70,010	\$135,900	\$9,820,582	\$1,657,225	\$7,484,551	\$9,074,269	\$18,690,817
Total Costs	\$208,593	\$405,114	\$31,848,897	\$5,292,879	\$24,308,660	\$29,643,968	\$60,202,065
COST / KM (With Structures)	\$2,085,931	\$5,401,514	\$9,099,685	\$11,761,953	\$7,717,035	\$9,410,784	\$10,750,369
COST / KM (Without Structures)	\$2,085,931	\$5,401,514	\$5,397,350	\$6,613,944	\$4,426,070	\$5,297,078	\$6,039,241
Cost Range							
Lower (-35%)	\$135,585	\$263,324	\$20,701,783	\$3,440,371	\$15,800,629	\$19,268,579	\$39,131,342
Estimated	\$208,593	\$405,114	\$31,848,897	\$5,292,879	\$24,308,660	\$29,643,968	\$60,202,065
Upper (+35%)	\$281,601	\$546,903	\$42,996,011	\$7,145,386	\$32,816,691	\$40,019,357	\$81,272,788

## Whistler Highway 99 Capacity and Safety Review

MCSL Proj #: 2121-00288-02

Conceptual Design Project Cost Estimate

EST.DATE August, 2018

	Hwy 99 / Lorimer Rd ST-1	Hwy 99 / Lorimer Rd ST-2	Pood / Chackening Lake Bd MT-1	Payabasa De MT-2	Taylor Way to Alpha Lake Rd MT-3A	Taylor Way to Alpha Lake Rd MT-3B	Lorimer Rd to Alpha Lake Rd LT-1
Description	Short Term Option - 1 Left / Shared Left-Through	Short Term Option - 2 Dual Left	Medium Term Option - 1 Counterflow	Medium Term Option - 2 2 SB lanes from Taylor Way to Bayshore Dr	Medium Term Option - 3A Shoulder Widening	Medium Term Option - 3B 2 Full Lanes SB	Long Term Option - 1 2 Full Lanes SB
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Drainage	\$278	\$9,200	\$161,421	\$20,754	\$110,557	\$145,279	\$572,136
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Total Costs	\$208,593	\$405,114	\$31,848,897	\$5,292,879	\$24,308,660	\$29,643,968	\$60,202,065
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Cost Range							
oost range							
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	\$135,585 \$208,593	\$263,324 \$405,114	\$20,701,783 \$31,848,897	\$3,440,371 \$5,292,879	\$15,800,629 \$24,308,660	\$19,268,579 \$29,643,968	\$39,131,342 \$60,202,065

O:\Proj\2121	1-00288-02 MoTl Whistler Hwy 99 Capacity & Safety	Hwv 99 / Lorimer Rd	Hwv 99 / Lorimer Ro	Alpha Lake Road / Ch	ncid Rd to South of Bay	vlor Wav to Alpha Lak	elor Wav to Alpha Lak	eimer Rd to Alpha Lake Rd
File: Review\4.0 l Compan	ENGINEERING DESIGN\4.3 Estimates\[20180824 y MCSL	ST-1	ST-2	MT-1	MT-2	MT-3A	MT-3B	LT-1
		Short Term Option -	Short Term Option -	Medium Term Option	Medium Term Option	iviedium Term Option	Medium Term Option	Long Term Option - 1
(2018 Dollars	s) Whistler Highway 99 Capacity and Safety Re Capacity and Safety Review	Left / Shared Left- Through	2 Dual Left	- 1 Counterflow	2 SB lanes from Taylor Way to	- 3A Shoulder Widening	- 3B 2 Full Lanes SB	2 Full Lanes SB
CODE	EST.DATE August, 2018	0	0	0	0	0	0	0
Conceptual Est		eft / Shared Left-Throu		Counterflow		Shoulder Widening	2 Full Lanes SB	2 Full Lanes SB MR
Blk Est. # 6.14A	Road Type		•			· ·		OR
Version Sept.1, 2002		100	75	3500	450	3150	3150	5600 TR
		MR	MR	MR	MR	MR	MR	MR
	Engineering	28,493	55,660		610,071	2,672,884		6,818,701
	Land Construction	0 152,384	0 295,610	0 23,936,110	0 2 055 677	0 18,270,954	0 22 240 464	0 45,081,114
	Management Reserve		295,610		3,955,677 0	16,270,954	22,340,464	45,061,114
	Escalation		0	0	0	0	0	0
	Total		351,271	27,443,234	4,565,748	20,943,838	25,530,028	51,899,815
	BASIC QUANTITY SUMMARY	 ]						
	Construct.Cost ONLY Per L.M.	1,524	3,941	6,839	8,790	5,800		8,050 \$/LM
	Land Area	0.0	0.1	3.9	0.5	2.5	3.5	5.6 ha
	Mobilization		6,032	483,753	81,456	368,133	452,052	914,392
	Land Cont.	0	0		0	0	0	0
	Construction Cont.	31,981	62,126		838,997	3,882,487		9,579,519
	Engineering Cont. Supervision Cont.	6,575 3,185	12,845 6,091	809,336 440,260	140,786 73,852	616,819 333,887		1,573,546 823,815
	Total Cont.	41,741	81,062		1,053,634	4,833,193		11,976,880
	S.G.S.B.	55	146		873	3,002		10,866 m3
	C.B.C. Asphalt	55 43	146 116		794 578	2,729 1,786		9,878 m3 7,197 t
	Concrete Barrier	0	0		135	2,205		3,360 lm
	Noise Attentuation Wall	Ō	Ō		0	0	0	0 m2
	No. of Light Poles		0		0	0	0	0 ea
	Sidewalk		0		0	0	0	
	Curb and Gutter Signals	25 0	120 0		0	0 2		0 lm 2 ea
	Bridge total area	0	0		0	0		
	Total Rock	0	0		2,041	7,442		38,102 m3
	Total OM	37	97		1,531	6,698		19,051 m3
	Total Stripping Total Borrow	0 18	0 49		794 1,956	4,217 10,047		9,878 m3 11,642 m3
	Total Cut/Excavation		146		6,322	28,403		78.674 m3
	Total Fill	37	97		4,763	20,837		59,270 m3
	Surplus or Deficit	18	4	12,128	1,559	7,566	10,915	19,404 m3
	ENG & PM	0.028	0.056		0.610	2.673		6.819
	LAND CONST.	0.000 0.152	0.000 0.296	0.000 9.883	0.000 1.443	0.000 7.028		0.000 16.470
	BRIDGES-R/W	0.152	0.296	9.883 14.053	1.443 2.513	7.028 11.243		16.470 28.611
	MANAGEMENT RESERVE		0.000		0.000	0.000		0.000
	ESCALATION	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	TOTAL (Millions) (2018 Dollars)	0.180	0.352	27.443	4.566	20.944	25.530	51.900
	TOTAL Cost per meter							
	Construction cost per meter	\$ 1,520	\$ 3,947	\$ 6,839	\$ 8,791	\$ 5,800	\$ 7,092	\$ 8,050

	1-00288-02 MoTI Whistler Hwy 99 Capacity & Safety ENGINEERING DESIGN\4.3 Estimates\[20180824	Hwy 99 / Lorimer Rd	Hwy 99 / Lorimer Ro	I Alpha Lake Road / Cl	hcid Rd to South of Bay	ylor Way to Alpha Lak	elor Way to Alpha Lak	eimer Rd to Alpha Lake
Compan	•	ST-1	ST-2	MT-1	MT-2	MT-3A	MT-3B	LT-1
	•	Short Term Option - 1	Short Term Option -	Medium Term Option	Medium Term Option - 2		Medium Term Option	Long Term Option - 1
		Left / Shared Left-	2 Dual Left	- 1 Counterflow	2 SB lanes from	- 3A Shoulder Widening	- 3B 2 Full Lanes SB	2 Full Lanes SB
*	s) Whistler Highway 99 Capacity and Safety R	€Through	Duai Leit	Counternow	Taylor Way to	Shoulder widering	Z I uli Lanes OD	
ACTIVITY	Capacity and Safety Review							
CODE	EST.DATE August, 2018	0	0	0	0	0	0	0
Conceptual Es		eft / Shared Left-Throu	ις Dual Left	Counterflow	from Taylor Way to E	Shoulder Widening	2 Full Lanes SB	2 Full Lanes SB
3lk Est. # 6.14A	Road Type							
Version Sept.1, 2002	DESCRIPTION \Length	100	75	3500	450	3150	3150	5600
OUBARA D		MR	MR	MR	MR	MR	MR	MR
	Y BY ACTIVITY LEVEL							
2000	PROJECT MANAGEMENT	7,041	13,673	1,068,236	177,723	815,245	993,764	2,020,215
2500	PLANNING	2,048	3,993	85,995	20,270	64,496	64,496	206,388
3000	PRELIMINARY DESIGN	3,960	7,920	161,700	38,610	124,740	103,950	406,560
3500	DETAILED DESIGN	8,869	17,230	1,381,857	232,682	1,051,583	1,291,301	2,611,992
	Total Engineering	14,877	29,142	1,629,552	291,562	1,240,820	1,459,747	3,224,940
4000	LAND ACQUISITION	0	0	0	0	0	0	0
5000	GRADE CONSTRUCTION	26,388				3,295,936		8,739,415
5200	ROAD SIDE CONSTRUCTION	0		•		0	0	0
5300 5500	OTHER CONSTRUCTION STRUCTURAL CONSTRUCTION	5,150 0		46,350 9.967.825		69,525 7,974,260		92,700 20,294,090
6000	PAVING CONSTRUCTION	9.409	•			7,974,260 349.550		1,290,104
6500	OPERATIONAL CONSTRUCTION	65,656				949,951	756.929	977,820
6700	UTILITY CONSTRUCTION	0		336,000		302,400		537,600
6800	RESIDENT ENGINEERING	10,616 0		1,467,535 0	246,172 0	1,112,958	1,362,127 0	2,746,051 0
	Total Construction			•		14,054,580	•	
9700	CONTINGENCY	41,741	81,062	6,333,054	1,053,634	4,833,193	5,891,545	11,976,880
	SUB-TOTAL	180,876	351,271	27,443,234	4,565,748	20,943,838	25,530,028	51,899,815
9800	MANAGEMENT RESERVE	0	0	0	0	0	0	0
	TOTAL	180,876	351,271	27,443,234	4,565,748	20,943,838	25,530,028	51,899,815
9900	ESCALATION	0	0	0	0	0	0	0
	TOTAL COST	180,876		27,443,234	4,565,748	20,943,838		51,899,815
	Const. Less Resident Eng.	106,603				12,941,622		31,931,729

001	ew\4.0 ENGINEERING DESIGN mpany <b>MCSL</b>		ST-1	ST-2	MT-1	MT-2	MT-3A	MT-3B	LT-1
			Short Term Option - 1	Short Term Option -	Medium Term Option	Medium Term Option	Medium Term Option	Medium Term Option	Long Term Option -
(2018 E	Dollars) Whistler Highway	99 Capacity and Safety R	Left / Shared Left-	2 Dual Left	- 1 Counterflow	2 SB lanes from Taylor Way to	- 3A Shoulder Widening	- 3B	2 Full Lanes SB
CTIVITY	Capacity and Safet	ty Review							
ODE	EST.DATE August,	2018	0	0	0	0	0	0	0
Conceptua	al Est.	Divison\site	eft / Shared Left-Throu	Dual Left	Counterflow	from Taylor Way to B	Shoulder Widening	2 Full Lanes SB	2 Full Lanes SB
Est. # 6.14.	A	Road Type	)						
rsion Sept.1	1, 2002	DESCRIPTION \Length	100	75	3500	450	3150	3150	5600
			MR	MR	MR	MR	MR	MR	MR
00	PLANNING								
	sultant - transport. planning	study	250	488			7,875	7,875	25,20
	sultant - corridor study		250	488			7,875	7,875	25,20
	sultant - functional plan. stu		250	488			7,875	7,875	25,20
	sultant  - functional plan. stu sultant sub-total	iuy	38 788	73			1,181	1,181	3,78
Cons	suitant SUD-TOTAI		/88	1,536	33,075	7,796	24,806	24,806	79,38
10 Clien	nt - project ident.		250	488	10,500	2,475	7,875	7,875	25,20
20 Clien	nt - transport, planning	study	250	488	10,500	2,475	7,875	7,875	25,20
30 Clien	nt - corridor study		350 350	683	14,700	3,465	11,025	11,025	35,28
540 Clien		- functional plan. study		683			11,025	11,025	35,28
01 Clien			60	117			1,890	1,890	6,04
Clien	nt Sub-total		1,260	2,457	52,920	12,474	39,690	39,690	127,00
99 Plann	ning Contingency		614	1,198	25,799	6,081	19,349	19,349	61,91
	TOTAL PLANNING		2,662	5,190		26,351	83,845	83,845	268,30
100	PRELIMINARY DES		===========	===========	= ==========	============	===========		==========
	sultant - aerial base plan	51014	300	600	12,250	2,925	9.450	7,875	30,80
	sultant - prel. design		360	720			11,340	9,450	36,96
	sultant - control survey		300	600			9,450	7,875	30.80
	sultant - environmental imp	act	600	1.200			18,900	15.750	61.60
	sultant - functroad field su		300	600			9,450	7.875	30,80
	sultant - functional design	•	240	480	9,800	2,340	7,560	6,300	24,64
51 Cons	sultant - funct. structural de	s.	180	360	7,350	1,755	5,670	4,725	18,48
61 Cons	sultant - geotechnical desig		1,500	3,000			47,250	39,375	154,00
71 Cons	sultant - right-of-way resea	rch	180	360	7,350	1,755	5,670	4,725	18,48
002 Cons	sultant - general		0	0	0	0	0	0	
Cons	sultant sub-total		3,960	7,920	161,700	38,610	124,740	103,950	406,56
10 Clien	nt - aerial base plan		0	0	0	0	0	0	
11 Clien	nt - prel. design		0	0	0	0	0	0	
12 Clien	nt - control survey		0	0	0	0	0	0	
20 Clien			0	0		0	0	0	
30 Clien		rvey	0	0	-	-	0	0	
40 Clien			0	0	-	-	0	0	
			0	0		-	0	0	
50 Clien			0	0	-	•	0	0	
50 Clien		rch	0	0			0	0	
50 Clien 60 Clien 70 Clien			0	0			0	0	
050 Clien 060 Clien 070 Clien 001 Clien			0	Λ	i n				
050 Clien 060 Clien 070 Clien 001 Clien Clien	nt Sub-total			0					
150 Clien 160 Clien 170 Clien 101 Clien Clien			1,188	2,376			37,422	31,185	121,96

	Review/4.0 ENGINEERING DESIGN/4.3 Estimates\(20180824 Company MCSL\)		ST-1 Short Term Option - 1 Left / Shared Left-	ST-2 Short Term Option - 2	MT-1 Medium Term Option - 1	MT-2	- 3A	MT-3B Medium Term Optior - 3B	LT-1	
	) Whistler Highway 99 Capacity a	nd Safety Re	Through	Dual Left	Counterflow	Taylor Way to	Shoulder Widening	2 Full Lanes SB		
ACTIVITY CODE	Capacity and Safety Review EST.DATE August, 2018		0	0	0	0	0	0	0	
Conceptual Est		Divison\site Road Type	eft / Shared Left-Throu	-	Counterflow	from Taylor Way to B	-	2 Full Lanes SB	2 Full Lanes SB	MF OR
Version Sept.1, 2002	DESCRIPT	ION \Length	100 MR	75 MR	3500 MR	450 MR	3150 MR	3150 MR	5600 MR	TR
6700	UTILITIES		0		204.000	2	204 600	004.000	250 400	_
6710 Util. Prov. 6711 Util. Prov.	- Hydro - Telephone		0	C		0	201,600 100,800	201,600 100,800	358,400 179,200	
Util. Prov.	sub-total		0	Ċ		0	302,400	302,400	537,600	
6712 Util.Others			0	C		0	0	0		
	<ul> <li>telecommunication</li> <li>storm &amp; sewer inspect.</li> </ul>		0	C		0	0	0	0	
	- storm & sewer inspect. - waterworks inspect.		0	C		0	0	0	0	
	- engineering services		0	Č	0	0	0	0	0	)
	- parks/recreation-prel.		0	Q		0	0	0	0	
6718 Util Others	<ul> <li>transit</li> <li>tr-ops/signs &amp; detours</li> </ul>		0	C	-	0	0	0	0	
6701 Util.Others			0	C		0	0	0	0	
Util.Others			0	Ċ	0	0	0	Ō	0	
6799 Util.Others	Contingency		0	C	100,800	0	90,720	90,720	161,280	-
TOTAL UT	ILITIES		0	C	436,800	0	393,120	393,120	698,880	_
5000	GRADE CONSTRUCTION									•
5032 Grade Con			0	C		0	0	0	0	
5033 Grade Con 5034 Grade Con			0	C		0	0	0	0	
5034 Grade Con			0	C	-	0	0	0		
	st- utility contingency		0	Č		0	0	0	0	)
Grade Con	st. Utilities Sub-total		0	C	0	0	0	0	0	_
5010 Grade Con	st- site prep./clear,grubbing		34	2,155		11,709	66,134	90,151	144,544	
	st- road grade/exc,placing,fill st- drainage/pipe,cul.		5,941 278	29,376 9,200		427,760 20,754	2,556,393 110,557	2,865,527 145,279	6,315,874 572,136	
5040 Grade Con	st- muiltiplate		0	0,200		0	0	0		
	st-SGSB/produce,place,comp		3,069	8,185		48,898	168,087	342,287	608,509	
	st-CBC/produce,place,comp st- grade finishing landscaping		3,289 506	8,770 627		47,628 4.417	163,721 36.697	333,396 37,217	592,704	
	st- grade imishing landscaping st- grade finishing hydro seed.		3	64		2,208	18,349	18,608	54,067 27,034	
	st- grade finishing fencing		Ö	Ċ		0	0	0	0	
5063 Grade Con			0	Q		0	0	0	0	
	st- passing lanes st- sidewalks,curb & gutter		0 1,500	7,200		0	0	0	0	
	st-detours c/w ex,bf,paving		11,000	11,000		110,000	80,000	110,000	170,000	
5001 Grade Con			769	2,297		20,201	95,998	118,274	254,546	
5099 Grade Con	st- Contingency struction Sub-total		7,916 34,304	23,662 102,535		208,072 901,647	988,781 4,284,717	1,218,222 5,278,960	2,621,824 11,361,239	
	ONSTRUCTION COSTS		34,304	102,535		901,647	4,284,717	5,278,960	11,361,239	
3510 Grade Eng	- detailed design		1,887	5,639		49,591	235,659	290,343	624,868	
	- detailed design/Contingency		566	1,692		14,877	70,698	87,103	187,460	
6810 Grade Eng	- general const. supervision		1,029	3,076	178,710	27,049	128,542	158,369	340,837	
	- quality assurance		686	2,051		18,033	85,694	105,579	227,225	
6812 Grade Eng	surveying Residency Contingency		686 720	2,051 2,153		18,033 18,935	85,694 89,979	105,579 110,858	227,225 238,586	
	ineering Sub-total		5,574	16,662		146,518	696,267	857,831	1,846,201	
Total Gra	ade Const. & Eng. Costs		39,878	119,197	6,925,023	1,048,165	4,980,983	6,136,791	13,207,440	-

File:		00288-02 MoTI Whistler Hwy 99 Capaci NGINEERING DESIGN\4.3 Estimates\[2		Hwy 99 / Lorimer Rd	Hwy 99 / Lorimer Ro	d Alpha Lake Road / C	hcid Rd to South of Bay	ylor Way to Alpha Lak	elor Way to Alpha Lak	eimer Rd to Alpha La	ake Rd
	Company	MCSL		ST-1	ST-2	MT-1	MT-2	MT-3A	MT-3B	LT-1	
			S	Short Term Option -	Short Term Option -	Medium Term Option	Medium Term Option	Medium Term Option	Medium Term Ontion	1	
			1		2	- 1	- 2	- 3A	- 3B	Long Term Option -	- 1
				eft / Shared Left-	Dual Left	Counterflow	2 SB lanes from	Shoulder Widening		2 Full Lanes SB	
		Whistler Highway 99 Capacity an	id Safety R∈⊺	hrough	Duai Leit	Counternow	Taylor Way to	Oriodide: Widerling	Z I dii Lancs OD		
ACTIV	'ITY	Capacity and Safety Review									
CODE	Ē	EST.DATE August, 2018		0	0	0	0	0	0	0	
Con	ceptual Est.		Divison\site :ff	/ Shared Left-Throu	Dual Left	Counterflow	from Taylor Way to B	Shoulder Widening	2 Full Lanes SB	2 Full Lanes SB	MF
Blk Est.	# 6.14A		Road Type								OR
Version	Sept.1, 2002	DESCRIPTION	ON \Lenath	100	75	3500	450	3150	3150	5600	TR
				MR	MR	MR	MR	MR	MR	MR	
			_								
5500		STRUCTURAL CONSTRUCTION									
	Struct.Const			0	C	) 0	0	0	0	ı	0
	Struct.Const			0	Č	) 0	0	0	Ö		o o
	Struct.Const			Ö	Č	0	Ō	Ō	Ö	ı	ō
5521		- mobilization		0	Ċ	) 0	0	0	0	ı	0
5599	Struct.Const	- utility contingency		0	Ċ	) 0	0	0	Ö	ı	0
		onst. Utilities Sub-total		0	Ċ	0	0	0	0	ı	0
5510	Struct Const	- tunnel site preparation	-		C	 ) 0	0				0
		- tunnel construction		0	Č			0	Ö		o o
		- snow shed site prep.		0	Ö	) 0	0	0	0	ı	0
		- snow shed site const.		0	Č	0	0	0	Ō	1	Ō
5514	Struct.Const	- bridge site preparation		0	C	) 0	0	0	0	117,77	73
		- bridge piers		0	Ċ	) 0	0	0	0	29.77	
		- bridge abutments		0	Ċ	0	0	0	0	63,00	00
5517	Struct.Const	- bridge superstructure		0	C	) 0	0	0	0	334,95	54
5518	Struct.Const	- retain, wall site prep.		0	C	) 0	0	0	0		0
5519	Struct.Const	- retaining wall const.		0	C	9,677,500	1,730,100	7,742,000	9,677,500	19,157,50	00
5501	Struct.Const	- mobilization		0	0	290,325	51,903	232,260	290,325	591,09	90
5529		- Contingency		0	C	2,990,348	534,601	2,392,278	2,990,348	6,088,22	27
	Structural Co	onstruction Sub-total		0	0	12,958,173	2,316,604	10,366,538	12,958,173	26,382,31	18
	STRUCTUR	AL CONSTRUCTION COSTS		0	C	12,958,173	2,316,604	10,366,538	12,958,173	26,382,31	18
3520	Struct. Eng.	- detailed design		0	C	712,699	127,413	570,160	712,699	1,451,02	27
		- detailed design/Contingency		0	Ċ	213,810	38,224	171,048	213,810		
		- general const. supervision		0	Ċ	518,327	92,664	414,662	518,327	1,055,29	93
		- quality assurance		0	C	259,163	46,332	207,331	259,163	527,64	16
6822	Struct. Eng.	- surveying		0	C	64,791	11,583	51,833	64,791	131,91	12
6829		- Residency Contingency		0	C	252,684	45,174	202,147	252,684	514,45	55
	Structural Er	ngineering Sub-total		0	C	2,021,475	361,390	1,617,180	2,021,475	4,115,64	12

	y MCSL	ST-1	ST-2	MT-1	MT-2	MT-3A	MT-3B	LT-1
		Short Term Option	- Short Term Option -	Medium Term Option	Medium Term Option	Medium Term Option	Medium Term Option	1 T O-6
(2018 Dollars) ACTIVITY	) Whistler Highway 99 Capacity and	1 Left / Shared Left- Safety R€Through	2 Dual Left	- 1 Counterflow	- 2 2 SB lanes from Taylor Way to	- 3A	- 3B 2 Full Lanes SB	Long Term Option - 2 Full Lanes SB
CODE	Capacity and Safety Review EST.DATE August, 2018	0	0	0	0	0	0	0
Conceptual Est.	<b>o</b> .	vison\site ft / Shared Left-Th	-	Counterflow	from Taylor Way to B	ŭ	2 Full Lanes SB	2 Full Lanes SB
lk Est. # 6.14A	_	oad Type	out Dual Leit	Counternow	moni rayior vvay to b	Orlowider Widerling	2 T dii Ediles OB	2 Tuli Lulics OD
ersion Sept.1, 2002		* '	75	3500	450	3150	3150	5600
		MR	MR	MR	MR	MR	MR	MR
6000	PAVING CONSTRUCTION							
	s- machine paving asphalt	9.1	35 20.901	782.830	100.650	339.369	704,547	1,252,52
	s- machine paving concrete		0 0	0	0	0	0	
040 Paving Cons	s- hot reprofiling		0 0	0	0	0	0	(
	s- shoulder paving		0 0	0	0	0	0	(
	s- pavement finishing		0 0	0	0	0	0	
070 Paving Cons			0 0	0	0	0	0	07.57
001 Paving Cons		2	74 627 0 0	23,485	3,019	10,181 0	21,136 0	37,57
10 Paving Cons - pavement design 99 Paving Cons - Contingency		2.8		241.894	31.101	104.865	217.705	387.03
	ONSTRUCTION COSTS	12,2	 32 27.987	1.048.209	134,770	454.415	943,388	1,677,13
		·	·					
	detailed design detailed design/Contingency		73 1,539 02 462	57,652 17.295	7,412 2,224	24,993 7.498	51,886 15.566	92,24: 27.67:
	general const. supervision		45 560	20.964	2.695	9.088	18.868	33.54
	quality assurance		12 1.399	52.410	6.738	22.721	47.169	83.85
862 Paving Eng.			31 140	5,241	674	2,272	4,717	8,38
	Residency Contingency	2	75 630	23,585	3,032	10,224	21,226	37,73
Paving Engi	ineering Sub-total	2,0	67 4,730	177,147	22,776	76,796	159,433	283,43
	ng Const. & Eng. Costs	14,3		1,225,357	157,546	531,212	1,102,821	1,960,57
500 510 Operat Cons	OPERATIONAL CONSTRUCTION		0 34.000	102.000	34.000	34.000	34.000	102.00
510 Operat.Cons 520 Operat.Cons		55,0		412.500	137.500	412.500	412.500	412.50
530 Operat.Cons		3.5		371.000	4.500	218.900	31.500	39.20
540 Operat.Cons		0,0	0 4,550	267,050	14,715	240,345		366,24
	is- pavement markings	5,24	43 5,079	18,375	2,363	16,538	16,538	29,40
	s- mobilization	1,9	12 2,957	35,128	5,792	27,668	22,046	28,48
501 Operat.Cons	s- contingency	19,6	97 30,461	361,816	59,661	284,985	227,079	293,34
				1.567.869	258,531	1,234,936	984,008	1,271,16
599 Operat.Cons	NAL CONSTRUCTION COSTS	85,3	52 131,997	1,507,009				
OPERATION OPERATION OPERATION OPERATION	g detailed design	4,6	94 7,260	86,233	14,219	67,921	54,120	
599 Operat.Cons OPERATION 540 Operat. Eng 549 Operat. Eng	g detailed design g detailed design/Contingency	4,6 <sup>1</sup>	94 7,260 08 2,178	86,233 25,870	4,266	20,376	16,236	69,91- 20,97-
599 Operat.Cons	g detailed design g detailed design/Contingency g general const. supervision	4,6 1,4 4,6	94 7,260 08 2,178 94 7,260	86,233 25,870 86,233	4,266 14,219	20,376 67,921	16,236 54,120	20,974 69,914
OPERATION OPERATION 540 Operat. Eng 640 Operat. Eng 840 Operat. Eng 841 Operat. Eng	g detailed design g detailed design/Contingency g general const. supervision g quality assurance	4,6: 1,4: 4,6: 1,7:	94 7,260 08 2,178 94 7,260 07 2,640	86,233 25,870 86,233 31,357	4,266 14,219 5,171	20,376 67,921 24,699	16,236 54,120 19,680	20,974 69,914 25,42
OPERATION OPERATION OPERATION OPERATION STATE OPERATION	g detailed design g detailed design/Contingency g general const. supervision g quality assurance g surveying	4,6 1,4 4,6 1,7 4.	94 7,260 108 2,178 104 7,260 107 2,640 107 660	86,233 25,870 86,233 31,357 7,839	4,266 14,219 5,171 1,293	20,376 67,921 24,699 6,175	16,236 54,120 19,680 4,920	20,97- 69,91- 25,42: 6,35
OPERATION OPERAT	g detailed design g detailed design/Contingency g general const. supervision g quality assurance	4,6: 1,4: 4,6: 1,7:	94 7,260 98 2,178 94 7,260 97 2,640 97 2,640 18 3,168	86,233 25,870 86,233 31,357	4,266 14,219 5,171	20,376 67,921 24,699	16,236 54,120 19,680	20,974 69,914 25,42

Company I	icsl		ST-1 Short Term Option -	ST-2	MT-1	MT-2 Medium Term Ontion	MT-3A	MT-3B	LT-1
			1		Medium Term Optior - 1	1 - 2	Medium Term Option	Medium Term Option	Long Term Option -
(2018 Dollars) <b>\</b>	Vhistler Highway 99 Capacity a		Left / Shared Left-	2 Dual Left	Counterflow	2 SB lanes from Taylor Way to	- 3A Shoulder Widening	05	2 Full Lanes SB
	Capacity and Safety Review		· · · · · · · · · · · · · · · · · · ·			rajio: rraj to			
	ST.DATE August, 2018		0	0	0	0	0	0	0
Conceptual Est.			eft / Shared Left-Throu	ις Dual Left	Counterflow	from Taylor Way to	B: Shoulder Widening	2 Full Lanes SB	2 Full Lanes SB
k Est. # 6.14A	DECORUPT.	Road Type			0500	450	0.450	0.450	5000
ersion Sept.1, 2002	DESCRIPT	ION \Length	100 MR	75 MR	3500 MR	450 MR	3150 MR	3150 MR	5600 MR
5200 F	ROAD SIDE CONSTRUCTION								
203 RoadSide Co			0	(	, .				
5204 RoadSide Cc- 5205 RoadSide Cc-			0	(					
202 RoadSide Cr			ő	Č					
5209 RoadSide Co-	Utility Contingency		0	(					
Road Side Co	nst. Utilities Sub-total		0	) 	)	0	0	0	
210 RoadSide Co-			0	C					
220 RoadSide Co-			0	(					
5230 RoadSide Cr- 5201 RoadSide Cr-	tourist rest & view areas		0	(					
299 RoadSide Cr			ő	Č					
Road Side Co	nstruction Sub-total		0		0	0	0	0	
ROAD SIDE	CONSTRUCTION COSTS		0	(	0	0	0	0	
550 RoadSide Er-			0	(					
	detailed design/Contingency general const. supervision		0	(					
i851 RoadSide Er-			0	(					
852 RoadSide Er-	surveying		Ö	Č					
	Residency Contingency gineering Sub-total		0	(					
	ide Const.& Eng.Costs		0			0			
		=======			= ========				
5300 ( 5303 Other Const	OTHER CONSTRUCTION		0	0	0	0	0	0	
304 Other Const.			0	(			-	-	
305 Other Const.			Ö	Č					
302 Other Const.			0	(				0	
309 Other Const.			0	(					
Other Const.	Utilities Sub-total		0	) 	)		0	0	
	railroads main & spur lines		0	(	, .				
320 Other Const 330 Other Const			0	(					
	environmental mitigations		5,000	5,000					90,00
5301 Other Const			150	150	1,350				2,70
399 Other Const			1,545	1,545				2,781	27,81
	uction Sub-total		6,695	6,695			i		120,51
	STRUCTION COSTS		6,695	6,695		i			120,51
570 Other Eng	detailed design detailed design/Contingency		368 110	368 110				663 199	6,62 1,98
	general const. supervision		268	268					4,82
871 Other Eng	quality assurance		134	134	1,205	482	1,808	241	2,41
872 Other Eng			67	67				121	1,20
	Residency Contingency ering Sub-total		141 1,088	141 1,088		506 3,917		253 1,958	2,53 19,58
_									

Printing Date: 8/24/2018 Time: 2:37 PM

File:			oTI Whistler Hwy 99 Cap G DESIGN\4.3 Estimate		Hwy 99 / Lorimer Rd	Hwy 99 / Lorimer Ro	I Alpha Lake Road / Cl	hcid Rd to South of Bay	rlor Way to Alpha Lake	elor Way to Alpha Lak	eimer Rd to Alpha Lak	ke Rd
	Company		o beoronnio edimate	0 (20 10002 1	ST-1	ST-2	MT-1	MT-2	MT-3A	MT-3B	LT-1	
	,				Short Term Option - 1	Short Term Option -	Medium Term Option		Medium Term Option	Medium Term Optior	Long Term Option -	1
			lighway 99 Capacity	and Safety Re	Left / Shared Left- Through	Dual Left	Counterflow	2 SB lanes from Taylor Way to		2 Full Lanes SB	2 Full Lanes SB	
ACTI\			and Safety Review									
CODI		EST.DATE	August, 2018		0	0	0	0	0	0	0	
	ceptual Est.	-			eft / Shared Left-Throu	Dual Left	Counterflow	from Taylor Way to B	Shoulder Widening	2 Full Lanes SB	2 Full Lanes SB	MR
Blk Est.	# 6.14A			Road Type								OR
Version	Sept.1, 2002	]	DESCRII	PTION \Length	100 MR	75 MR	3500 MR	450 MR	3150 MR	3150 MR	5600 MR	TR
3500		DETAILED										_
2520	from 35 Geotech. En		40,3550,3570		9,909 1,247	19,249 2.423		259,949 32,721	1,174,816 147.879	1,442,625 181.589		
	Geotech, En				374	2,423 727	194,324 58.297	9.816	44.364	54.477	110.193	
	TOTAL DET	AILED DE	SIGN COSTS		11,530	22,399	1,796,414	302,486	1,367,058	1,678,691	3,395,589	9
6800			FENGINEERING 1,6850,6860,6870		0 13,800	0 26,396	0 1,907,795	0 320,023	0 1,446,845	0 1,770,765	3,569,867	) 7
	TOTAL RES				13,800	26,396	1,907,795	320,023	1,446,845	1,770,765	3,569,867	7
					0	0	0	0	0	0	·	)
					0			·	0		٠	
					0	0	0	0	0	0		)
		PART 1	SUMMARY									_
				NSTRUCTION	106,603	207,088	16,944,858	2,796,657	12,941,622	15,822,846	31,931,729	9
			ENGINEERING &		25,492	49,447	3,097,087	537,734	2,353,778	2,821,874	5,970,991	
			CONTRACTUAL C	ONTINGENCY	39,629	76,960	6,012,583	1,000,317	4,588,620	5,593,416	11,370,816	3
					U			·	0		٠	
=====	CONSTRUC	TION COS	T TOTAL		171,724	333,495	26,054,528	4,334,708	19,884,020	24,238,136	49,273,536	6 =

Compan	y MCSL		ST-1 Short Term Option - 1 Left / Shared Left-	ST-2 Short Term Option - 2	MT-1 Medium Term Option - 1	MT-2 Medium Term Option - 2 2 SB lanes from	- 3A	MT-3B Medium Term Option - 3B	LT-1 Long Term Option - 2 Full Lanes SB	1
*	) Whistler Highway 99 Capacity			Dual Left	Counterflow	Taylor Way to	Shoulder Widening	2 Full Lanes SB	2 Full Laries SB	
CTIVITY CODE	Capacity and Safety Review EST.DATE August, 2018		0	0	0	0	0	0	0	
Conceptual Est		Divison\site:	eft / Shared Left-Throu		Counterflow	from Taylor Way to B		2 Full Lanes SB	2 Full Lanes SB	M
ersion Sept.1, 2002	<del></del>	TION \Length	100 MR	75 MR	3500 MR	450 MR	3150 MR	3150 MR	5600 MR	TF
	PROJECT MANAGEMENT n office costs wages n office costs - expenses		3,434 859	6,670 1,667		86,694 21,674	397,680 99,420	484,763 121,191	985,471 246,368	
2063 Project Mai 2061 Project Mai	n printing costs n general		0	0	0	0	0	0	(	0 0
	nager Sub-total		4,293	8,337		108,368	497,100	605,953	1,231,838	
2010 Client 2012 Client 2030 Client	- office costs wages - office costs - expenses - printing costs		1,717 859 0	3,335 1,667 0	130,273	43,347 21,674 0	198,840 99,420 0	242,381 121,191 0	492,735 246,368	8
2011 Client Client Sub-	- general		0 2,576	0 5,002	0	0 65,021	0 298,260	0 363,572	739,103	•
	- wages & expenses - adv., media, displays		0	 0 0		0 0	0	 0 0		•
2073 Public Rel. 2071 Public Rel.	<ul> <li>opening ceremonies</li> </ul>		0 0	0	0	0	0 0	0	Ċ	•
040 Legal Cost			172 0	 333 0		4,335 0	19,884	24,238 0	49,274 49,274	
2041 Legal Costs Legal Costs			172	333		4,335	19,884	24,238		•
2080 Insurance 2081 Insurance Legal Costs			0 0 0	0 0 0	0	0 0 0	0 0 0	0 0 0	( ( (	0
2099 Project Mai	nagement Contingency		2,112	4,102	320,471	53,317	244,573	298,129	606,064	4
	OJECT MANAGEMENT COSTS		9,153	17,775		231,040	1,059,818	1,291,893	2,626,279	
1000 1010 Land(Code Acquisition	LAND 4-Mrkt,ROW,Serv,Imp.V,Ease.C, Sub-total	Г	0 0 0	0 0 0	ő	0 0 0	0 0 0	0 0 0		Ö
	4-Bus.,5%,Mrg.P,Rel\$,P/Tax,Etc 4-Owners(LS,Apprsl,Rprt,Lgl,In		0	 0 0		0	0	0	 ( (	) 0
	4-Pro.Man,P.Tax,Util,Security		0	0	0 0 0	0	0	0	(	0
1060 Land(Code 1070 Land(Code 1080 Land(Code			0	0	0	0	0	0	(	) ) ()
090 Land(Code			0	0	0	0	0	0	(	0
			0	0	Ö	0 0 0	0	0	( (	) )
Associated	costs-sub-total		0	0	•	0	0	0	( 	ś
099 Land Conti	ngency Sub-total		0		0	0	0	0		)
	ND COSTS		0	0		0	0	0	C	_

Company	MCSL	ST-1	ST-2	MT-1	MT-2	MT-3A	MT-3B	LT-1
,		Short Term Option -	Short Term Option -	Medium Term Option	Medium Term Option	Medium Term Option	Medium Term Option	l a
		1	2	- 1	- 2	- 3A	- 3B	
(0040 D-II)	M/-1-41     -  00 0    0-f	Left / Shared Left-	Dual Left	Counterflow	2 SB lanes from	Shoulder Widening	2 Full Lanes SB	2 Full Lanes SB
. ,	Whistler Highway 99 Capacity and Safety I	KE I hrough			Taylor Way to	ŭ		
	Capacity and Safety Review							
	EST.DATE August, 2018	0	0	0	0	0	0	0
onceptual Est.	Divison\si	e:ft / Shared Left-Throu	ı( Dual Left	Counterflow	from Taylor Way to E	Shoulder Widening	2 Full Lanes SB	2 Full Lanes SB
Est. # 6.14A	Road Typ	e						
sion Sept.1, 2002	DESCRIPTION \Length	n 100	75	3500	450	3150	3150	5600
		<u>MR</u>	MR	MR	MR	MR	MR	MR
	MANAGEMENT RESERVE	0			0	0	0	
MAN. RES.		0	(	,	0	0	0	
	- preliminary design	0	(	0	0	0	0	
	- utility construction	0	(	) 0	0	0	0	
	- grade construction - structural construction	0	(	) 0	0	0	0	
	- structural construction - paving construction	0	(	) 0	0	0	0	
MAN RES.	- paying construction	0	(	) 0	0	0	0	
	- roadside construction	0	(	) 0	0	0	Ů.	
	- other construction	0	Č	) 0	0	0	n n	
	- project management	Ö	Č	) 0	Ö	Ö	ő	
MAN. RES.		0	Ċ	0	0	0	0	
MAN. RES.	- detailed eng.	0	(	0	0	0	0	
MAN. RES.	- residency eng.	0	(	) 0	0	0	0	
MAN. RES.	- risk contingency	0	(	) 0	0	0	0	
	AGEMENT RESERVE	0	(	,	0	0	0	
	S ESCALATION							
FISCAL								
00 ESCALATION								
YEAR	PROJECTED ESCALATION							
2002-2003		0	(		0	0	0	
2003 - 2004		0	(	0	0	0	0	
2004-2005 2005-2006		0	(	) 0	0	0	0	
2006-2007		0	(	) 0	0	0	0	
2007-2008		0	(	) 0	0	0	0	
2008-2009		0	(	) 0	0	0	0	
2009-2010		0	(	, ,	0	0	0	
2010-2011		Õ	Č		0	0	Ö	
TOTAL ESC	ALATION	0	(	) 0	0	0	0	
PART 2 SUI	MARY NON-CONSTRUCTION COSTS			= ========= )		0	0	=========
	Non-Construction	7,041	13,673			815,245	993,764	2,020,21
	Non-Const. Contingency	2,112				244,573	298,129	
	TOTAL NON CONCEDUCTION COSTS			4 000 700			4 004 000	0.000.07
	TOTAL NON-CONSTRUCTION COSTS	9,153	17,775	1,388,706	231,040	1,059,818	1,291,893	2,626,27

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#DIV/0!

#DIV/0!

3.5

ACTIVIT CODE	& Safety Revie Company 018 Dollars) TY	Whistler Highway 99 Capacity and Capacity and Safety Review EST.DATE August, 2018	Man. Reserve Contingency Division/Site Road Type Length	S	0.0% 30.0% Short Term C 1 100	•	Hwy 99 / Lorimer Rd ST-1 Short Term Option - 1 Left / Shared Left-	ST-1	1. 2ln Frontag r2. 2ln Acc Rds 3. 4ln Acc Rds 4.R4L-4L EXF	s P R/B	13.INST.R	XP D/M XP D/E/M LEXP D/M B/B-EX.RD	Est \$	
Blk Est.	nceptual Est. # 6.14A Sept.1, 2002	R1 DATE: R2 DATE: DESCRIPTION	Unit Price U	(	Cost-Quant. PerSection	Lump Sum Values	Through 1 100 MR		5.R2/3L-4L EX 6.Retr.4L-4LE 7.R4L-4LEX F 8. New 4L EX	X R/B R/B E/S	14.AS IS 20.I/C Str. 21. Bridge 22. Grade	&Ramps s	\$ 1,809 \$ 1,524	
2521 2531 2541	Consultant	<ul> <li>transport. planning study</li> <li>corridor study</li> <li>functional plan. study</li> <li>general</li> </ul>	2.50 L 2.50 L 2.50 L 5.0%	M	250 250 250 38		250 250 250 38 788	3 3 3 0 8	Description	No.	Units	Quantity	Rate	Total
2520 2530 2540	Client Client Client	- project ident. - transport. planning study - corridor study - functional study - general otal	2.50 L 2.50 L 3.50 L 3.50 L 5.0%	.M .M	250 250 350 350 60 1260	0	250 250 350 350 60 1,260	3 4 4 1 13				Description		- - - - - -
2599	Planning Co	ontingency	30.0%		614		614	6	Description	No.	Units	Quantity	Rate	Total -
	TOTAL PL	ANNING					2,662	27						-
3000 3013 3014 3015 3021 3031 3041 3051 3061 3071 3002	PRELIMIN Consultant	ARY DESIGN - aerial base plan - prel. design - control survey - environmental impact - functroad field survey - functional design - funct. des. structural - geotechnical design - right-of-way research - general sub-total	3.00 L 3.60 L 3.00 L 6.00 L 2.40 L 1.80 L 15.00 L 0.0%	.M .M .M .M .M .M .M .M	300 360 300 <b>600</b> 300 240 180 <b>1500</b> 180 0	0 0	300 360 300 600 300 240 180 1,500 180 0 3,960	0 40	Structural \$/Prop. \$ Description	0.50% 150 No.	Units	Description  Quantity	Rate	- - - - - - Total
3011 3012 3020 3030 3040 3050 3060 3070	Client Client Client Client Client Client Client	- aerial base plan - prel. design - control survey - environmental impact - functroad field survey - functional design - funct des. structural - geotechnical design - right-of-way research - general otal	0.00 L 0.00 L 0.00 L 0.00 L 0.00 L 0.00 L 0.00 L 0.00 L 0.00 S	.M .M .M .M .M .M	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Cantilever Fit Median Islant	1	ea m2	40	3,500.00	4,000 - - - - - - - -
3099		design Contingency	30.0%		1188		1,188	12						-
	TOTAL PR	RELIMINARY DESIGN					5,148	51				Description		4,000

ESTIMATED BY :P. Nahal

	O:\Proj\2121-00288-02 MoTI Whistler Hwy 99 Capacity					1	I						
File:	& Safety Review\4.0 ENGINEERING DESIGN\4.3	Man. Reser		0.0% 30.0%	Land 30.0%	Hwy 99 / Lorimer Rd ST-1	Hwy 99 / ST-1	Road Type 1. 2ln Fron		9. R-E4L-4			
(2	Company MCSL 2018 Dollars) Whistler Highway 99 Capacity and	Contingency Division/Site		Short Term (			-	r 2. 2ln Acc		10.N 4L E			
ACTIVI		Road Type	-	1		Short Term Option -		3. 4ln Acc			LEXP D/M		_
CODE	EST.DATE August, 2018	Length		100	L.M.			4.R4L-4L E	EXP R/B	13.INST.R	/B-EX.RD	Est \$	
Co	onceptual Est. R1 DATE:			=======		Left / Shared Left- Through		5.R2/3L-4L	EXP R/R	14.AS IS	15 Misc	180,876	
	# 6.14A R2 DATE:	Unit		Cost-Quant.	Lump Sum	1 mough	1	6.Retr.4L-4		20.I/C Str.		\$ 1,809	1
Version	Sept.1, 2002 DESCRIPTION	Price	Unit	PerSection	Values	100	100	7.R4L-4LE		21. Bridge		\$ 1,524	]
=====			===	========		MR	=====	8. New 4L	EXP R/B	22. Grade	Sep.		
	UTILITIES							Description	No.	Units	Quantity	Rate	Total
	Util. Prov Hydro	160.00		0		0	0	Haule Cost fo	5	m3 /km	0	1.00	-
6/11	Util. Prov Telephone Util. Prov. sub-total	80.00	IIII	0		0	0	Haul \$ for	5	m3 /km	_	1.00	-
								Surplus	_				-
	! Util.Others - pipelines	0.00		0		0	_	XXXXXXXX	0	ea	0		-
	Util.Others - telecommunication Util.Others - storm & sewer inspect.	450.00 0.0%		0		0		Rock Scaling Rock Bolting	0	m2 m		95.00 451.00	-
	Util.Others - waterworks inspect.	0.0%		0		0		Rock Wire m		m2		150.00	
	Util.Others - engineering services	0.00		ő		ő	ő	NOCK WITCH	·	1112		100.00	
	Util.Others - parks/recreation-prel.	0.00		0		0	0						-
	Util.Others - transit	0.00	LM	0		0	0				Description		-
	Util.Others - tr-ops/signs & detours	0.00		0		0	0		(m3)	(unit \$)	(\$)		
6701	Util.Others - general	0.0%		0		0	0	Fill	37	407.00	0	00/	
	Util.Others sub-total					0	0	Rock O.M.	37	107.66 29.11	1064	0%	
6799	Util.Others Contingency	30.0%		0	0	0	0	Strip.	0	49.54	0	0.000	
								Borrow	18	42.95	785		
	TOTAL UTILITIES					0	0	Misc./LS		29.11	1040	Surplus Mtl	Neat vol.cal
	GRADE CONSTRUCTION	U. Price	Unit	Quantity	Lump Sum		=====	Total	55 Spec	33.72 Spec	1848 PI/PL	PI/PL	Spec.
	Grade Cons- water	758.00		0	Lump Gum	0	0		Short Term Option		13.0	20.2	
	Grade Cons - sanitary	489.00	lm	0		0	0		Road		Ditch Width	Ditch Width	Road
	Grade Cons - storm	500.00		0		0		pl to pl	13.00	0.00		0.0	ONLY
	Grade Cons - mobilization	3.0%		0		0	0		2	0	Col L Vol.	Col. M Vol.	2
5039	Grade Cons - utility contingency Grade Const. Utilities Sub-total	30.0%		0		0	0	*lane wid *med	3.6 0.0	0.0 0.0	58 Pmt W=	10.2	3.6 0.0
	Grade Const. Utilities Sub-total					0		*shldrs tota		0.0	CBC. slope		0.0
5010	Grade Cons- site prep./clear,grubbing	26.000	ha	0.00	0	34	0	c.b.c.(w)	20.7	0.0	4.0	0.0	A.C. (mm)
	Grade Cons - road grade/exc,placing,fill	33.72	m3	58	4000	5,941	59	sgsb (w)	36.8	0.0	Pmt W=	17.4	50
	Grade Cons- drainage/pipe,cul.	1070.00		0	278	278			4.0	0.0			A.B.C. (mm)
	Grade Cons - muiltiplate	15000		0		0	0	[ ( . )	1.260	0.000	5%		0
	Grade Cons-SGSB/produce,place,comp	56.00 60.00		55 55		3,069 3,289		*road (I) *no.cul./kild	5.0	5.0	₱ <b>F</b> 000		45
	Grade Cons-CBC/produce,place,comp Grade Cons- grade finishing landscaping	2.00		3	500	506		cul.(I)	42.52	0.00			Appl. rate 1,50
	Grade Cons- grade finishing hydro seed.	1.00		3	300	3		*sqsb (d)	1.42	0.30	5%		1.00
	Grade Cons- grade finishing fencing	60.00		Ō		0	Ö	*cbc (d)	2.52	0.30	5%		
	Grade Cons - noise barriers	440.00		0		0	0	*Add.ROW		0.00			
	Grade Cons - passing lanes	0.00		0		0	0	X-m3/lm	57.55	0.00			_
5090 5005	Grade Cons- sidewalks,curb & gutter Grade Cons-detours c/w ex,bf,paving	160.71 100000		0 0.01	25 10000	1,500 11.000	15 110	C&G \$/LM	\$60.00 Decel.(T-lm)	Exp-100kr 520	r Exp- 80km; 440	Coll-80kmp 260	
	Grade Cons-detours C/W ex,bi,paving	3.0%		769	10000	769	8		Accel.(T-lm)	950	630	80	
	Grade Cons - Contingency	30.0%		7916		7,916	79		Left T.(T-lm)	716	596	456	
	Grade Construction Sub-total					34,304	343		TOTAL	2186	1666	796	
								Gravel 2.0					
	GRADE CONSTRUCTION COSTS				26388	34,304	343	Drainage Box Cul.	No. 0	Units	Quantity 45	Rate 8250	Total
3510		5.50%		1887		1,887	19	Head Walls	0	lm ea.	3	16500	-
	Grade Eng detailed design/Contingency	30.0%		566		566		Catch Basin		ea.	3	3,250	-
6810	Grade Eng general const. supervision	3.00%		1029		1,029		CB Leads	0	m	24	220	-
	Grade Eng quality assurance	2.00%		686		686		MH	0	ea.	1	4,500	-
	! Grade Eng surveying	2.00%		686 720		686 720	7	900mm CSP	0	lm	80	1,070	-
0019	Grade Eng Residency Contingency Grade Engineering Sub-total	30.0%		120		720 5.574		Structure Dra	. 0	lm	100	150.00	-
								Caudiale Die	. •	***	100	100.00	-

39,878

Total Grade Const. & Eng. Costs

ACTIVIT CODE Con Blk Est.	EST.DATE August, 2018  iceptual Est. R1 DATE: # 6.14A R2 DATE:	Road Type Length Unit	y e	====== Cost-Quant.	30.0% Option - 1 L.M. Lump Sum	Hwy 99 / Lorimer Rd ST-1 Short Term Option - 1 Left / Shared Left- Through	ST-1 Short Te	1. 2ln Fror r2. 2ln Acc 3. 4ln Acc 4.R4L-4L 5.R2/3L-4 6.Retr.4L-	ntage Rds Rds EXP R/B L EXP R/B 4LEX R/B	9. R-E4L-4 10.N 4L E: 11.N 4L E: 12.N2L;F4 13.INST.R 14.AS IS 20.I/C Str.	XP D/M XP D/E/M LEXP D/M /B-EX.RD 15. Misc. &Ramps	Est \$  180,876 \$ 1,809	
version	Sept.1, 2002 DESCRIPTION	Price	Unit	PerSection	Values	100 MR	100	8. New 4L	EX R/B E/S EXP R/B	<ol> <li>Bridge</li> <li>Grade</li> </ol>		\$ 1,524	J
=====		======	===	======	=======	========	=====				Drainage	-144	-
5522 5523 5524 5521	STRUCTURAL CONSTRUCTION Struct.Cons - water Struct.Cons - sanitary Struct.Cons - storm Struct.Cons - mobilization Struct.Cons - utility contingency Structural Const. Utilities Sub-total	Unit Price 758.00 489.00 500.00 3.0% 30.0%	lm	Quantity 0 0 0 0 0	Lump Sum	0 0 0 0 0	0 0 0 0 0	Brdge 1 2 3 4 5	Site \$	Piers \$ 160,504 177,516 177,516 177,516 177,516 Pier No.	Abut. \$ 145,800 109,800 109,800 109,800 109,800 P/\$/VLM 20063	abut. extra length (Im) 4 Abut/\$/HLM 4500	0% 0% 0% 0% 0%
5511 5512	Struct.Cons - tunnel site preparation Struct.Cons - tunnel construction Struct.Cons - snow shed site prep. Struct.Cons - snow shed site const.	0.00 - 0.00	lm	0 0 0	0	0 0 0 0	0 0 0	2 3 4 5	8 8 8 (W)	1 1 1	22190 22190 22190 22190 (\$/m2)	4500 4500 4500 4500 Net Cost	No. of Bridge
5514 5515 5516	Struct.Cons - Sriow shed site const.  Struct.Cons - bridge site preparation Struct.Cons - bridge piers Struct.Cons - bridge abutments Struct.Cons - bridge superstructure	1 1 1	LS LS LS LS	0 0 0 0	Demolition 0	0 0 0	0 0 0	DECK #1 DECK #2 DECK #3 DECK #4 DECK #5	12.2 12.2 12.2 12.2 12.2	(L) 0 0 0 0	1791 1981 1981 1981 1981	315493 295936 295936 295936 295936	No. of Bridge 0 0 0 0 0
5519 5501	Struct.Cons - retain. wall site prep. Struct.Cons - retaining wall const. Struct.Cons - mobilization Struct.Cons - Contingency Structural Construction Sub-total	1 1580 3.0% 30.0%	LS m2	0 0 0		0 0 0 0	0 0	Bridge #1 Bridge #2 Bridge #3 Bridge #4 Bridge #5			Gross/m2 #DIV/0! #DIV/0! #DIV/0! #DIV/0! #DIV/0!	Net/m2 #DIV/0! #DIV/0! #DIV/0! #DIV/0! #DIV/0!	Tnnl \$/lm -Net - Tnnl \$/lm -Gross
	STRUCTURAL CONSTRUCTION COSTS	3				0	0	Bridge #3	2lnSt.w-x	x-Pass.TI	shaft		-
3520	Struct. Eng detailed design	5.50%		0		0	0	Tunnel L=	1-D-Shape 0	2-D-Shape	1-Circle	Radius-1-D Per.S&Rf	7.267 24.32
3529	Struct. Eng detailed design/Contingency	30.0%		0		0	0	Tun. H1	5.100	2.550	Radius	m2/rkac	6.25
	Struct. Eng general const. supervision Struct. Eng quality assurance	4.00% 2.00%		0		0	0	C.Pt. H4 Tun.W	1.00 12.00	1.00 3.00	1.00 Wall Tk.	Tnnl height Radius-2-D	8. <b>27</b> 2.157
6822	Struct. Eng surveying	0.50%		0		0	0	RFLT.	0.250	0.250	0.250	Per.S&Rf	8.42
6829	Struct. Eng Residency Contingency	30.0%		0		0	0	WLT. BST.	0.250 0.500	0.250 0.200	SOBT	m2/rkac Tnnl height	6.25 3.16
	Structural Engineering Sub-total							TOBT	0.100		Excm3	-	-
	Total Structural & Eng. Costs		===			0	0	SOBT BOBT	0.100 0.100		Obk-m3 Liner-m3	-	-
								Items	Quantity	rate	Total \$	Avg.\$/ tot-Im	1-Circle
	PAVING CONSTRUCTION Paving Con - machine paving asphalt	151.00	ŧ	43	SM./OIL 504	9,135	91	Excm3 Obk-m3	0	125 2625	0		0
6030	Paving Con - machine paving concrete	0.00	m2		304	0	0	Rk anch-Ea	0	1125	0	#DIV/0!	0
	Paving Con - hot reprofiling Paving Con - shoulder paving	0.00		334 1		0	0	Misclm Liner-m3	0	2500 1050	0		10.00
	Paving Con - pavement finishing	100.00		0		Ö	0	Drainage-Im	0	550	0	#DIV/0!	%
	Paving Con - seal coating Paving Con - mobilization	0.00 3.0%		274		0 274	0	Lighting-m Mech-m	0	900 2100	0		5% 15%
	Paving Con - pavement design	0.0%		0		0	0	MiscIm	0	1000	0		3%
6099	Paving Con - Contingency	30.0%		2823		2,823	28		6.67m2/25mm		0		snowshed
	PAVING CONSTRUCTION COSTS					12,232	122	60kg=1m2 asphalt A.C.	(T)=mm . 100	1.5L =1M2 (F .25L =1M2 (7 100	T) 17		0.0 1.0 0.50
	Paving Eng - detailed design Paving Eng - detailed design/Contingency	5.50% 30.0%		673 202		673 202	7 2	A.B.C. \$Oil/Litre	. 0 \$1.50	0 5%	1.00 Walls	\$ 1,500.00 1.0	11.20
6860	Paving Eng - general const. supervision	2.00%		245		245	2	Appl. rate	1.75	1.75		\$ 1,580.00	-
	Paving Eng - quality assurance Paving Eng - surveying	5.00% 0.50%		612 61		612 61	6	Pavement m2	Removal \$/m2	(See I155) Total	Base	1.0	26.00
	Paving Eng - Surveying Paving Eng - Residency Contingency	30.0%		275		275	3	174			Excm3	1.0	37.00
	Paving Engineering Sub-total					2,067	21	Milling m2	\$/m2	Total	5.00 Drainage	\$ 60.00 \$ 500.00	: 1
=====	Total Paving Const. & Eng. Costs	======			========	14,300	143	30			Electrical Mech.	\$ 4,500.00 \$ 5,000.00	-
											Misc.	\$ 300.00 #DIV/0!	-

File:	O:\Proj\2121-00288-02 MoTI Whistler Hwy 99 Capacity & Safety Review4.0 ENGINEERING DESIGN/4.3 Company MCSL 18 Dollars) Whistler Highway 99 Capacity and Y Capacity and Safety Review EST.DATE August, 2018	Man. Reser Contingence Division/Sit Road Type Length	y e	0.0% 30.0% Short Term ( 1 100	30.0%	Short Term Option -	ST-1	Road Types 1. 2ln Fronta r2. 2ln Acc R 3. 4ln Acc R 4.R4L-4L E	age Ids Ids	9. R-E4L-4 10.N 4L E 11.N 4L E 12.N2L;F4 13.INST.R	XP D/M XP D/E/M LEXP D/M	Est \$	
Blk Est. # Version S	Sept.1, 2002 DESCRIPTION	Unit Price	Unit	Cost-Quant. PerSection	Lump Sum Values	Left / Shared Left- Through 1 100 MR	100	5.R2/3L-4L 6.Retr.4L-4l 7.R4L-4LEX 8. New 4L E	LEX R/B CR/B E/S EXP R/B	14.AS IS 20.I/C Str. 21. Bridge 22. Grade	&Ramps s	180,876 \$ 1,809 \$ 1,524	
6510 6520 6530 6540 6550 6501	OPERATIONAL CONSTRUCTION Operat.Con:- lighting Operat.Con:- signals Operat.Con:- signing Operat.Con:- guard rail Operat.Con:- pavement markings Operat.Con:- mobilization Operat.Con:- contingency	8500.00 275,000 35.00 109.00 1.75 3.0% 30.0%	Ea LM Im Im	0 0.20 3500 0 139 1912 19697	0 0 0 5000	0 55,000 3,500 0 5,243 1,912 19,697	0 550 35	Sp. (Im) 50 Signals Controller Sig, pol,base Wiring U/G	No. of Sides 0 No. 0 0	Length 100 Units ea ea ls	Quantity 1 4 1	Rate 55,000.00 45,000.00 40,000.00	Total 11,000 36,000 8,000
	OPERATIONAL CONSTRUCTION COST					85,352	854				Signals		55,000
	Operat. Eng- detailed design	5.50%		4694		4,694		LP \$/lm Ext. Lines	\$ 1.00 2.0	Refl. Sp.	- 5	Refl.\$/ea	\$ 15.00
3549 6840 6841 6842 6849	Operat. Eng - detailed design/Contingency Operat. Eng - general const. supervision Operat. Eng - quality assurance Operat. Eng - surveying Operat. Eng - Residency Contingency Operational Enginering Sub-total	30.0% 5.50% 2.00% 0.50% 30.0%		1408 4694 1707 427 2048		1,408 4,694 1,707 427 2,048 14,979	14 47 17 4 20 150	Weighscale Buildings Pit & Apron S&I W/S Parking Lot	No. 0 0 0 0	Units m2 m2 ea m2	Quantity 60 120 1 9000 1,500	Rate 2,800.00 400.00 80,000.00 40.00 40.00	Total - - - -
								Road Const. light/signs	0	lm Is	1,500	50,000.00	-
	Total Operational Const. & Eng. Costs	=======	===		========	100,331	1003				Weighscale		
5203 5204 5205 5202	ROAD SIDE CONSTRUCTION RoadSide C- water RoadSide C- sanitary RoadSide C- storm RoadSide C- mobilization	Unit Price 758.00 489.00 500.00 3.0%	lm lm	Quantity 0 0 0	Lump Sum	0 0 0	0 0 0 0	Safety Rest Area Class A&B Buildings Class C Site/toilets	No. 0 0	Units SAFETY RE m2 ea	100	3,000.00 12,500.00	Total - -
	RoadSide C- Utility Contingency Road Side Const. Utilities Sub-total	30.0%	)	0		0	0	Parking Lot Road Const.	0 0	m2 lm	2500 800	40.00 350.00	-
5220 5230 5201	RoadSide C- weighscales RoadSide C- safety rest areas RoadSide C- tourist rest & view areas RoadSide C- mobilization	40000 3.0%	)	0 0 0 0	0 0 0	0 0 0	0 0 0	Furnishings Landscaping light/signs	0 0 0	ls ls	SAFETY RES		- - - -
	RoadSide C- Contingency Road Side Construction Sub-total	30.0%	)	0		0	0	Description	No.	Units	Quantity	Rate -	Total -
	ROAD SIDE CONSTRUCTION COSTS					0	0		0		0	-	-
3559 6850 6851 6852 6859	RoadSide E - detailed design RoadSide E - detailed design/Contingency RoadSide E - general const. supervision RoadSide E - quality assurance RoadSide E - surveying RoadSide E - Residency Contingency Road Side Engineering Sub-total	10.00% 30.0% 6.00% 2.00% 1.00% 30.0%		0 0 0 0 0 0		0 0 0 0 0 0	0 0 0 0 0	Railway Removal Track Cnst. Ballast Sub-ballast I Resurfacing	No. 0 0 0 0 0	Units tklm tklm m3 m3 tklm	0 Description Quantity 200.00 200.00 500.00 500.00 1.00	Rate 50.00 700.00 60.00 56.00 30.00	- Total - - - -
	Total Road Side Const. & Eng. Costs					0	0	Tie-ins Turnout # 9	0	ea ea	1.00	5000.00 125000.00	-
5300	OTHER CONSTRUCTION	Unit Price	Unit	Quantity	Lump Sum	E	Earthworks	Others (see grading)	0 0 0	ls Im	1.00	1500.00 2000.00 400.00	- - -
	Other Const- water Other Const- sanitary	758.00 489.00		0		0	0	R/rd X-ing	No.	Units	Railway Quantity	Rate	Total
5305 5302 5309	Other Const- storm Other Const- mobilization Other Const- utility contingency Other Const. Utilities Sub-total	500.00 3.0% 30.0%	lm	0 0		0 0 0 0	0 0 0 0	Planks Sig./gates	0	tklm each	45 1 R/rd X-ing	2500.00 250000.00 - -	
	Other Const- railroads main & spur lines Other Const- railroad crossings	-	lm ea	0		0	0	Description	No.	Units	Quantity	Rate -	Total -
	Other Const- marine work Other Const- environmental mitigations	100,000	ea ea	0 0.05		0 5,000	0 50					-	-
5301 5399	Other Const- mobilization Other Const- Contingency Other Construction Sub-total	3.0% 30.0%	)	150 1545		150 1,545 6,695	1 15 67					- - -	- - -
	OTHER CONSTRUCTION COSTS					6,695	67				Description	-	-
	Other Eng detailed design Other Eng detailed design/Contingency Other Eng general const. supervision	5.50% 30.0% 4.00%	)	368 110 268	0	368 110 268	1	Environmenta Mitigation Ponds	No. 0 0	Units Is ea	Quantity 1 0	50,000 40,000	5,000
6870 6871 6872 6879	Other Eng quality assurance Other Eng surveying Other Eng Residency Contingency Other Engineering Sub-total	2.00% 1.00% 30.0%	)	134 67 141		134 67 141 1,088	1 1 1 11					- - -	- -

ACTIV CODE Co	& Safety Revi Company 2018 Dollars) ITY	Whistler Highway 99 Capacity and Capacity and Safety Review EST.DATE August, 2018  R1 DATE: R2 DATE:	Man. Reserve Contingency Division/Site Road Type Length Unit Price U	30.0% Short Term 0	30.0%	Hwy 99 / Lorimer Rd ST-1 Short Term Option - 1 Left / Shared Left- Through 1	ST-1 Short Te	Road Types 1. 2In Frontage 12. 2In Acc Rds 3. 4In Acc Rds 4.R4L-4L EXP 5.R2/3L-4L EXI 6.Retr.4L-4LEX 7.R4L-4LEXR	e 1 1 1 R/B 1 P R/B 1 K R/B 2	2.N2L;F4 3.INST.F 4.AS IS	XP D/M XP D/E/M 4LEXP D/M R/B-EX.RD 15. Misc. &Ramps	Est \$  180,876 \$ 1,809 \$ 1,524	
=====	 - ========	- 				MR =======	=====	8. New 4L EXP	P R/B 2	2. Grade	Sep.		
3530	Geotech. E	from 3510,3520,3540,3550,35 E - detailed design r - Contingency	70 0.90% 30.0%	<b>1247</b> 374	0	9,909 1,247 374	99 12 4	0 Bridge Tunion	1 inel S No.	1 Special - Units	Quantity	Rate	Total
		ETAILED DESIGN COSTS				11,530	115					-	-
		= ====================================		== =======	=======	13,800	=====					- - -	- - -
		ESIDENT ENG. COSTS				13,800	138				Description	-	-
=====	=======		=======================================	== =======	=======	=========	=====	Description	No.	Units	Quantity	Rate -	Total -
						0						-	-
=====			=======================================	== ======		0	0					-	-
	PART 1	SUMMARY CONSTRUCTION				106,603	1066				Description	-	-
		NGINEERING & SUPERVISION ONTRACTUAL CONTINGENCY				25,492 39,629	255 396	Description	No.	Units	Quantity	Rate -	Total -
	CONSTRI	JCTION COST TOTAL	DIVISION/SIT	 ΓΕ Short Term C	 Ontion - 1	171,724	1717					Ξ	Ξ
2000		MANAGEMENT	211101014/011	Land	-							-	-
		n - office costs wages n - office costs - expenses	2.00% 0.50%	3434 859	0	3,434 859	34 9					-	-
2063	Project Mar	n - printing costs n - general (MoTI Regional Cost l	0.00% 0.00%	0	0	0	0					-	-
		nager Sub-total				4,293	43					-	-
	Client	- office costs wages - office costs - expenses	1.00% 0.50%	1717 859	0	1,717 859	17 9	Description	No.	Units	Description Quantity	Rate	Total
2030	Client	- printing costs	0.00% 0.00%	0	0	0 0	0	Description	NO.	Office	Quantity	-	-
2011	Client Client Sub-	- general total	0.00%	U	U	2,576	26					-	-
		- wages & expenses	0.00%	0	0	0	0					-	-
2073	Public Rel.	<ul><li>adv., media, displays</li><li>opening ceremonies</li></ul>	0.00% 0.00%	0	0	0	0				Description	<u> </u>	-
2071		- general (FN Accomm.) tions Sub-total	0.00%	0	0	0	0	Description	No.	Units	Quantity	Rate -	Total -
		s - lawyers fees	0.10%	172	0	172	2					-	-
2041	Legal Costs Legal Costs		0.00%	0	0	0 172	0 2					-	-
		- const./ liability, E&O	0.00%	0	0	_	0					-	-
2081	Insurance Legal Costs		0.00%	0	0	0	0					-	-
2099	Project Mar	nagement Contingency	30.0%	2112		2,112	21					-	-
	TOTAL PR	ROJECT MANAGEMENT COST	'S			9,153	92	4.10%			Description		-
	= ======   LAND		====== = \$/Building	# buildings	LS	0	=====	1 Hectare = 10,	,000 Square	e Meters			
4010	Land(Code Acquisition	-Mrkt,ROW,Serv,Imp.V,Ease.C Sub-total		Res. 0	0	0		1 Hectare = 2.4 1 Acre = 43,560	471 Acres				
		-Bus.,5%,Mrg.P,Rel\$,P/Tax,Etc -Owners(LS,Apprsl,Rprt,Lgl,In	10.00% 7.00%	0	0	0	0	#DIV/0! Req.	. ROW st/Ha	0.0			
4040	Land(Code	-Demolition -Pro.Man,P.Tax,Util,Security	0.00% 1.00%	0	0	0	0	#DIV/0! Cos	st/M2 st /Acre	0.00	10.76		
4060	Land(Code	-Not Used	1.00 /0	U	U			Cos	st /Ft2	0.00			
4080		-Acq.F,M/Sal,TrvIV,Cntr.S,Appr		0	0	0	0		no./unit				
4090	Land(Code	-Surveys	0.00%	0	0	0	0	#DIV/0! Surve	rey /unit S	2,000 Units	Quantity	Rate	Total
												- - -	-
	Associated	d costs-sub-total		0		0	0					- -	-
4099	Land Cont	ingency Sub-total	30.0%	0	0	0	0					- -	-
	TOTAL LA	AND COSTS				0	0				Description		

ile: & Saféty Com	2121-00288-02 MoTI Whistler Hwy 99 Capacity Review4.0 ENGINEERING DESIGN4.3 pany MCSL lars) Whistler Highway 99 Capacity and S Capacity and Safety Review	Man. Reserve Contingency Division/Site Road Type	0.0% 30.0% Short Term 0	Land 30.0% Option - 1	Hwy 99 / Lorimer Rd ST-1 Short Term Option -	ST-1	Road Types 1. 2ln Frontage 2. 2ln Acc Rds 3. 4ln Acc Rds				
CODE  Conceptual  Ilk Est. # 6.14A  'ersion Sept.1,		Unit Price Unit	100 ===== Cost-Quant. nit PerSection	L.M.  Lump Sum  Values	Left / Shared Left- Through 1 100	100	4.R4L-4L EXP R/B 5.R2/3L-4L EXP R/I 6.Retr.4L-4LEX R/E 7.R4L-4LEX R/B E/ 8. New 4L EXP R/B	3 14.AS IS 20.I/C Str. S 21. Bridge	es	Est \$  180,876 \$ 1,809 \$ 1,524	
	CEMENT DECEDI/E	======= ==	========	=======	=======================================				•	D-4-	T-4-1
MAN. F MAN. F	GEMENT RESERVE RES planning RES preliminary design RES utility construction	0.0% 0.0% 0.0%	2662 5148		0 0	0 0 0	Description No.	Units	Quantity	Rate - -	<u>Total</u> - - -
MAN. F MAN. F MAN. F	RES grade construction RES structural construction RES paving construction	0.0% 0.0% 0.0%	34304 0 12232		0 0 0	0 0				- - -	- - -
MAN. F MAN. F	RES operation construction RES roadside construction RES other construction RES project management	0.0% 0.0% 0.0% 0.0%	85352 0 6695 9153		0 0 0	0 0 0				- - -	- - -
MAN. F MAN. F	RES project management RES detailed eng. RES residency eng.	0.0% 0.0% 0.0%	0 11530 13800		0	0 0				- - -	- - -
	RES Contingency	0.0%			0	0				-	-
	L MANAGEMENT RESERVE		180876		0	0			Description	-	-
TOTA FISC 9900 ESCA			0	180876			Description No.	Units	Quantity	Rate -	Total -
YEA	R PROJECTED ESCALATION		\$ DONE							-	
2016- 2017-	2018 0.6250%	5.00% 10.00%	0		0	0				-	-
2018- 2019- 2020-	2020 1.0000% 2021 1.0000%	35.00% 45.00% 5.00%	0 0 0		0 0 0	0 0 0				- - -	-
2021- 2022- 2023-	2023 1.0000% 2024 1.0000%	0.00% 0.00% 0.00%	0		0 0	0 0 0				- - -	- - -
	2025 1.0000% 	0.00%	0 		0	0				-	-
	2 SUMMARY NON-CONSTRUCTION		-		========	=====				-	-
	Non-Construction Non-Const. Contingency				7,041 2,112	70 21				-	-
	L NON-CONSTRUCTION COSTS				9,153	92				-	-
	=== ===================================	=======================================	=========	=======	=========	=====				_	-

ACTIVITOCODE Cor Blk Est.	& Safety Revie Company 018 Dollars) TY nceptual Est. # 6.14A Sept.1, 2002	Whistler Highway 99 Capacity and Capacity and Safety Review EST.DATE August, 2018	Road Type Length Unit	0.0% 30.0% Short Term 0 1 75 ====== Cost-Quant. it PerSection	30.0%	Hwy 99 / Lorin ST-2 Short Term C 2 Dual Le	Option -  oft 1 75	ST-2 Short Ter 1 75	1. 2In From 2. 2In Acc   3. 4In Acc   4.R4L-4L E 5.R2/3L-4L 6.Retr.4L-4 7.R4L-4LE 8. New 4L	tage Rds Rds EXP R/B . EXP R/B ILEX R/B X R/B E/S	9. R-E4L-4L I 10.N 4L EXP 11.N 4L EXP 12.N2L;F4LE 13.INST.R/B- 14.AS IS 15 20.I/C Str.&R 21. Bridges 22. Grade Se	D/M D/E/M XP D/M EX.RD 5. Misc. amps	Est \$ 351,271 \$ 4,684 \$ 3,941	
2000		PROJECT MANAGEMENT		Diff.	Estimate		13,673	182	3.9%	3.9%				
				-13673 										
2500 3000		PLANNING PRELIMINARY DESIGN		-3993 -7920	0		3,993 7,920	53 106	1.1% 2.3%	1.1% 2.3%				
3500		DETAILED DESIGN		-17230	0		17,230	230	4.9%	4.9%				
		Total Engineering	J 	-29142	0		29,142	389	8.3%	8.3%			42816	
4000		LAND ACQUISITION		0	0		0	0	0.0%	0.0%				
5000		GRADE CONSTRUCTION ROAD SIDE CONSTRUCTION	ı	-78873			78,873 0	1052 0	22.5% 0.0%	22.5% 0.0%				
5200 5300		OTHER CONSTRUCTION	4	-5150			5,150	69	1.5%	1.5%				
5500		STRUCTURAL CONSTRUCTION	ON	0	0		0	0	0.0%	0.0%				
6000 6500		PAVING CONSTRUCTION OPERATIONAL CONSTRUCT	ION	-21529 -101536			21,529 01,536	287 1354	6.1% 28.9%	6.1% 28.9%				
6700		UTILITY CONSTRUCTION	ION	-101536		'	01,550	0	0.0%	0.0%				
6800		RESIDENT ENGINEERING		-20305	_		20,305	271	5.8%	5.8%				
		Total Construction	1	-227393	0	2	27,393	3032	64.7%	64.7%				
9700		CONTINGENCY		-81062	0		81,062	1081	23.1%	23.1%				
0000		SUB-TOTAL		-351271	0	3	51,271	4684 0	100.0%	100.0%				
9800		MANAGEMENT RESERVETOTAL		0	 0		0	4684	0.0%	0.0%				
9900		ESCALATION		-351271 			51,271 0	0		0.0%				
		TOTAL COST	=======================================	-351271 = ========	0		51,271 =====	4684 =====	======	100.0%				
		Constr. Less Resident Eng		-207088	0		207,088	2761						
				ENG. & PM LAND			55,660 0	742 0	15.8% 0.0%					
				CONST.		2	95,610	3941	84.2%					
				MAN. RES.		_	0	0	0.0%					
				ESC.			0	0	0.0%					
				TOTAL		3	51,271	4684	100.0%					
														_
	Short Term	•	<u>Assumptions</u>			Shoulder	ı	Lane	Lane	Median	Lane La	ane	Shoulder	•
	1	Existing Right-Of -Way	, m		Existing Rd Pvmt Width		0.0	-	-	-	-	-	-	_
	2	Now Addition Dight Of May	partial taking		New Rd.	Shoulder	1 50		Lane	Median	Lane La	ane	Shoulder	Ditch W.
	2	New Addition Right-Of -Way ROW	11 m		Pvmt Width	1	1.50	_	lepth mm	100	0.00	116	Unit Price	\$ 151.0
						SCOPE			Bridge L.	Seg. L.			Tot. Vol.	
		Bridges			Length(m)	ODO		75	-	75		1.95		
	3.1 3.2	0		12.2 12.2		CBS		siope 4.0	D= meter 0.165		Unit Ro \$ 60.00 O	ock M	97	\$ 107.6 \$ 29.1
	3.3	0		12.2		SGSB			D= meter			ripping	-	\$ 49.5
	3.4	0		12.2	0.0			4.0	0.144		\$ 56.00 Bo	orrow	49	\$ 42.9
	3.5	0		12.2	0.0									
	4	Tunnels	Length(m)	Width(m)	Height(m)									
	4.1	2lnSt.w-x	0	12.0	8.27									
		x-Pass.TI	0	3.0										
		shaft snowshedlength (lm)	0 0	2.0	Diameter									
		• , ,		Gross\$/m2										
	3.1	Bridges 0	Net \$/M2 #DIV/0!	#DIV/0!	=									
	3.2	0	#DIV/0!	#DIV/0!										
	3.3	0	#DIV/0!	#DIV/0!										
	3.4	0	#DIV/0!	#DIV/0!										
	3.5	0	#DIV/0!	#DIV/0!	-									
						i .								

		57.112. 672.1120.10		u, oo	capacity and t	saioty i to viou	oupdoity and outory from	011 011011		2 dd. 20.t			. 490 2	
File:		0288-02 MoTI Whistler Hwy 99 Capacity w\4.0 ENGINEERING DESIGN\4.3	Man. Reser	rve	0.0%	Land	Hwy 99 / Lorimer Rd	Hwy ga	/ Road Types		9. R-E4L-	4I D/M		
	Company		Contingenc		30.0%			ST-2	1. 2ln Frontac	ae	10.N 4L E			
(20		Whistler Highway 99 Capacity and			Short Term C				er 2. 2ln Acc Rd		11.N 4L E			
ACTIVI		Capacity and Safety Review	Road Type		1		Short Term Option -		3. 4ln Acc Rd			LEXP D/M		
CODE		EST.DATE August, 2018	Length		75	L.M.	2		4.R4L-4L EXI	P R/B	13.INST.F	R/B-EX.RD	Est \$	
Cor	nceptual Est.		Ü		=======		Dual Left		5.R2/3L-4L E	XP R/B	14.AS IS	15. Misc.	351,271	
Blk Est.	# 6.14A	R2 DATE:	Unit		Cost-Quant.	Lump Sum	1	1	6.Retr.4L-4LE	EX R/B	20.I/C Str.	&Ramps	\$ 4,684	
Version	Sept.1, 2002	DESCRIPTION	Price	Unit	PerSection	Values	75	75	7.R4L-4LEX I	R/B E/S	21. Bridge	s	\$ 3,941	
							· MR		<ul> <li>8. New 4L EX</li> </ul>	(P R/B	22. Grade	Sep.		
	PLANNING													
		- transport. planning study	6.50		488		488	7	Description	No.	Units	Quantity	Rate	Total
		- corridor study	6.50		488		488	7						-
		- functional plan. study	6.50		488		488	7						-
2502	Consultant		5.0%	)	73		73	1						-
	Consultant s	sub-total					1,536	20						-
2510	Client	- project ident.	6.50	1 M	488		488	7	-					-
		- transport. planning study	6.50		488		488	7						-
		- corridor study	9.10		683		683	9						
		- functional study	9.10		683	0	683	9						_
		- general	5.0%		117	·	117	2						_
2001	Client Sub-to	0	0.070	•	2457		2.457	33				Description		
							_,		Description	No.	Units	Quantity	Rate	Total
2599	Planning Co	ontingency	30.0%	)	1198		1,198	16	Восстраст		010	quantity	11010	-
	TOTAL PL	ANNING					5,190	69						-
				===	=======		=========	=====						-
3000	PRELIMINA	ARY DESIGN												-
		- aerial base plan	8.00		600		600	8						-
		- prel. design	9.60		720		720	10						-
		- control survey	8.00		600		600	8						-
		- environmental impact	16.00		1200		1,200	16						-
		- functroad field survey	8.00		600		600	8						
		- functional design	6.40		480	0	480	6				Description		
		- funct. des. structural	4.80		360	0	360	5	Structural	0.50%				
		- geotechnical design	40.00		3000	_	3,000	40						
		- right-of-way research	4.80		360	0	360	5			11.9	0 "	Б.	<b>.</b>
3002	Consultant		0.0%	)	0		0	0	Description	No.	Units	Quantity	Rate	Total
	Consultant s	sub-total					7,920	106						-
3010	Client	- aerial base plan	0.00	1 1/4	0		0	^	Cantilever Fir	1	ea	0	3,500.00	-
		- prel. design	0.00		0		0	0		1	ea	U	3,500.00	-
		- control survey	0.00		0		0	0		4	m2	40	100.00	4.000
		- environmental impact	0.00		0		0		Island Remo	1	m2 m2	350	30.00	10,500
		- functroad field survey	0.00		0		0		Whistler Sign	1	ea	350	5,000.00	5,000
		- functional design	0.00		0		0		Tree Remova	1	ea	16	200.00	3,200
		- funct. des. structural	0.00		0		0		Light pole rer	1	ea	2	500.00	1.000
		- geotechnical design	0.00		0		0	0		1	ea	1	500.00	500
		- right-of-way research	0.00		0		0	0			ca		300.00	-
		- general	0.0%		0		0	Ö						-
5001	Client Sub-to		0.070	•	O		0	0						-
2000	Drolimina	docian Contingonay	30.0%		2376		0.276	32	-					-
3099		design Contingency	3U.U% 	·	23/0		2,376	32	-					-
	TOTAL PR	ELIMINARY DESIGN					10,296	137				Description		24,200

Total Grade Const. & Eng. Costs

		3	.,			.,,							
	O:\Proj\2121-00288-02 MoTI Whistler Hwy 9			0.00/			l						
File:	& Safety Review\4.0 ENGINEERING DESIG			0.0%	Land	Hwy 99 / Lorimer Rd				9. R-E4L-4			
(2)	Company MCSL 018 Dollars) Whistler Highway 99 Ca	Contingency		30.0% Short Term C	30.0%	ST-2	ST-2	1. 2ln Front r 2. 2ln Acc F		10.N 4L EX 11.N 4L EX			
ACTIVI				1	ριιοπ - 2	Short Term Option -	SHOIL TE	3. 4ln Acc F		12.N2L;F4			
CODE				•	L.M.	2		4.R4L-4L E		13.INST.R		Est \$	1
	nceptual Est. R1 DATE:	20.19.11		=======		Dual Left		5.R2/3L-4L		14.AS IS		351,271	
	# 6.14A R2 DATE:	Unit		Cost-Quant.	Lump Sum	1	1	6.Retr.4L-4		20.I/C Str.8		\$ 4,684	1
Version	Sept.1, 2002 DESCRIPTIO	N Price	Unit	PerSection	Values	75	75	7.R4L-4LEX	K R/B E/S	21. Bridges	S	\$ 3,941	]
			====			MR		8. New 4L I	EXP R/B	22. Grade	Sep.		
	UTILITIES							Description	No.	Units	Quantity	Rate	Total
	Util. Prov Hydro	160.00	lm	0		0	0		5	m3 /km	Quartity	1.00	- Total
	Util. Prov Telephone	80.00		0		0	0						-
	Util. Prov. sub-total					0	0	Haul \$ for	5	m3 /km	-	1.00	-
								Surplus					-
	Util.Others - pipelines	0.00		0		0		XXXXXXX	0	ea	0		-
	Util.Others - telecommunication	450.00		0		0	0		0	m2		95.00	-
	Util.Others - storm & sewer inspe			0		0		Rock Bolting	0	m		451.00	
	Util.Others - waterworks inspect.	0.0% s 0.00		0		0	0	Rock Wire m	0	m2		150.00	-
	Util.Others - engineering services Util.Others - parks/recreation-pre			0		0	0						-
	Util.Others - transit	0.00		0		0	0				Description		<del></del>
	Util.Others - tr-ops/signs & detou			0		0	0		(m3)	(unit \$)	(\$)		
	Util.Others - general	0.0%		Ö		Ö	0	Fill	97	(driit $\psi$ )	(4)		
	Util.Others sub-total					0	0	Rock	-	107.66	0	0%	
								O.M.	97	29.11	2837		
6799	Util.Others Contingency	30.0%		0	0	0	0		0	49.54	0	0.000	
								Borrow	49	42.95	2093		
	TOTAL UTILITIES					0	0		1.10	29.11		Surplus Mtl	Neat vol.cal
	GRADE CONSTRUCTION	U. Price	Unit		Lump Sum		=====	Total	146 Spec	33.72 Spec	4929 PI/PL	PI/PL	Spec.
	Grade Cons - water	758.00		Quantity 0	Lump Sum	0	0		Short Term Optio		11.0	18.2	
	Grade Cons - sanitary	489.00		0		0	0		Road		Ditch Width		Road
	Grade Cons - storm	500.00		Ö		Ö	Ő	pl to pl	11.05	0.00	1.0	0.0	ONLY
5031	Grade Cons - mobilization	3.0%		0		0	0	*no./lane	2	0	Col L Vol.	Col. M Vol.	2
5039	Grade Cons - utility contingency	30.0%		0		0	0	*lane wid	3.6	0.0	153	-	3.6
	Grade Const. Utilities Sub-total					0	0	mea	0.0	0.0	Pmt W=	10.2	0.0
								*shldrs tota	3.0		CBC. slope		10 ()
	Grade Cons- site prep./clear,grub			0.08	0	2,155		c.b.c.(w)	11.3	0.0	4.0		A.C. (mm)
	Grade Cons- road grade/exc,plac Grade Cons- drainage/pipe,cul.	ing,fill 33.72 1070.00		153 0	24200 9200	29,376 9,200		sgsb (w) SGSBslope :1	12.9 4.0	0.0 0.0	Pmt W=	17.4	50 A.B.C. (mm)
	Grade Cons - drainage/pipe,cui.	15000		0	9200	9,200	123		0.135	0.000	5%		A.B.C. (IIIII)
	Grade Cons-SGSB/produce,place			146		8,185	109		75	0.000	370		-85
	Grade Cons-CBC/produce,place,			146		8.770		*no.cul./kilc	5.0	5.0	\$ 5,060		Appl. rate
	Grade Cons- grade finishing lands			64	500	627	8		13.47	0.00			1.50
5061	Grade Cons- grade finishing hydro	o seed. 1.00	m2	64		64	1	*sgsb (d)	0.14	0.30	5%	•	
	Grade Cons- grade finishing fenci			0		0	0	*cbc (d)	0.16	0.30	5%		
	Grade Cons- noise barriers	440.00		0		0	0		-5.00	0.00			
	Grade Cons - passing lanes	0.00		0	400	0	0		2.05	0.00	F 001	0 11 001	_
	Grade Cons - sidewalks, curb & gu			0 0.01	120 10000	7,200	96	C&G \$/LM	\$60.00	Exp-100kn 520		Coll-80kmp 260	
	Grade Cons-detours c/w ex,bf,par Grade Cons- mobilization	ving 100000 3.0%		2297	10000	11,000 2,297	147 31		Decel.(T-lm) Accel.(T-lm)	950	440 630	80	
	Grade Cons - Mobilization Grade Cons - Contingency	30.0%		23662		23,662	315		Left T.(T-lm)	716	596	456	
0000	Grade Construction Sub-total	30.070		20002		102,535	1367		TOTAL	2186	1666	796	
								Gravel 2.01					
	GRADE CONSTRUCTION COS				78873	102,535	1367	Drainage	No.	Units	Quantity	Rate	Total
						=		Box Cul.	0	lm	45	8250	
	Grade Eng detailed design	5.50%		5639		5,639	75		0	ea.	3	16500	-
	Grade Eng detailed design/Con			1692		1,692	23		0	ea.	2	3,250	-
	Grade Eng general const. super Grade Eng quality assurance	rvision 3.00% 2.00%		3076 2051		3,076 2,051	41 27	CB Leads MH	0	m ea.	18 1	220 4,500	1
	Grade Eng quality assurance Grade Eng surveying	2.00%		2051		2,051	27	900mm CSP	0	ea. Im	1 80	1,070	1 [
	Grade Eng Residency Continge			2153		2,051	29	John Odr	•		30	1,070	
5510	Grade Engineering Sub-total	, 30.070		2.00		16,662		Structure Dra	0	lm	100	150.00	-
	<b>5 5</b>												

119,197

Mile   Company	ACTIVITO CODE  Cor  Blk Est.	EST.DATE August, 2018 nceptual Est. R1 DATE:	Road Type Length Unit	/ e	0.0% 30.0% Short Term ( 1 75 ======= Cost-Quant. PerSection	30.0%	Hwy 99 / Lorimer Rd ST-2 Short Term Option - 2 Dual Left 1 75	ST-2 Short Te	Road Type 1. 2In Fron 72. 2In Acc 3. 4In Acc 4.R4L-4L I 5.R2/3L-4I 6.Retr.4L- 7.R4L-4LE	itage Rds Rds EXP R/B L EXP R/B 4LEX R/B	9. R-E4L-4 10.N 4L E 11.N 4L E 12.N2L;F4 13.INST.R 14.AS IS 20.I/C Str. 21. Bridge	XP D/M XP D/E/M LEXP D/M L/B-EX.RD 15. Misc. &Ramps	Est \$ 351,271 \$ 4,684 \$ 3,941	
Section   Sect														
STRUCTURAL CONSTRUCTION	=====		======	===	=======	=======	=========	=====				Drainage		-
Shadurat Const. Utilities Sub-todas  510 Statut Const. Aurori alta perpartiation  1	5522 5523 5524	Struct.Cons - water Struct.Cons - sanitary Struct.Cons - storm	Price 758.00 489.00 500.00	lm lm	0 0 0		0	0	1 2 3 4	Site \$ - - - -	160,504 177,516 177,516 177,516	145,800 109,800 109,800 109,800	length (lm)	0% 0% 0%
Section   Struct Cons - turnel site preparation   0.00   m   0   0   0   0   3   8   1   22190   4500	5599	Struct.Cons - utility contingency	30.0%		0		0	0		Pier/Ht	Pier No.	P/\$/VLM	Abut/\$/HLM	
Since   Sinc		Structural Const. Utilities Sub-total					0	0			•			
Struct Const - bridge gelte preparation   1 LS   0   0   0   DECK #2   12.2   0   1981   295936   0   0   0   DECK #3   12.2   0   1981   295936   0   0   DECK #3   12.2   0   1981   295936   0   0   DECK #3   12.2   0   1981   295936   0   DECK #3   12.2   DECK #3   DECK	5511 5512	Struct.Cons - tunnel construction Struct.Cons - snow shed site prep.	0.00	lm lm	0		0	0	3 4 5	8 8 8 (W)	1 1 1 (L)	22190 22190 22190 (\$/m2)	4500 4500 4500 Net Cost	No. of Bridge
5516   Struct.com > bridge piers   1 LS   0   0   0   DECK #3   12.2   0   1981   259386   0   0   0   DECK #4   12.2   0   1981   259386   0   0   0   DECK #4   12.2   0   1981   259386   0   0   DECK #5   12.2   0   1981   259386   0   0   DECK #5   12.2   0   1981   259386   0   0   DECK #5   12.2   0   1981   259386   0   DECK #5   12.2   DECK #5	5514	Struct Cons - bridge site preparation	1	LS	0	Demoillon	0	0						0
Struct Cons - bridge superstructure					-									
Struct Cons - retain, wall site prep.   1 LS														
Struct Construction Substitution   1880 m2   0   0   0   0   0   0   0   0   0					0	0			DECK #5	12.2	0			0
					0			_	Bridge #1					
				1112										
STRUCTURAL CONSTRUCTION COSTS					0		0						#DIV/0!	Tnnl \$/Im -Net
STRUCTURAL CONSTRUCTION COSTS		Structural Construction Sub-total					0	0	Bridge #4			#DIV/0!		-
Struct. Eng detailed design									Bridge #5	01.01	D T		#DIV/0!	Tnnl \$/Im -Gross
3520   Struct. Eng detailed design   Contingency   30.0%   0   0   0   0   0   0   0   0   0		STRUCTURAL CONSTRUCTION COSTS	•				0	0					Podius 1 D	7.067
Struct. Eng setalized design/Contingency   30.0%   0   0   0   0   0   0   0   0   0	3520	Struct Eng - detailed design	5.50%		0		0	0	Tunnel I =	1-D-Shape	z-D-Shape			
Response   Struct Eng guelly assurance   2.00%   0   0   0   0   0   0   0   0   0		•					-	_		5 100	2 550	ľ		
6822   Struct. Eng surveying   0.50%   0   0   0   Tun.W   12.00   3.00   Wall Tk.   Radius-2-D   2.157   6822   Struct. Eng surveying   0.50%   0   0   0   W.L.T.   0.250   0.250   0.250   O.250   RFLT.   0.250   0.250   O.250								_						
Struct Eng Residency Contingency   30.0%   0   0   0   W.T.   0.250   0.250   0.200   0.1					0		0	0			3.00		Radius-2-D	2.157
Structural Engineering Sub-total   Structural & Eng. Costs														-
Total Structural & Eng. Costs	6829		30.0%		0									
Total Structural & Eng. Costs   SOBT   SOBT   0.100   0.100   Clok-m3   SOBT		Structural Engineering Sub-total					0	0					I nni neignt	3.16
SM/OIL   S		Total Structural & Eng. Costs					0	0					-	-
6000 PAVING CONSTRUCTION   SM./Olt   20,901   279	=====		======	===	=======	========	=========	-					-	-
6020   Paving Con - machine paving asphalt   151.00   t   116   421   20,901   279   Obk-m3   0   2625   0   #DIV/0!   0   0   6030   Paving Con - machine paving concrete   0.00 m2   0   0   Rk anch-Ea   0   1125   0   #DIV/0!   0   0   6060   Paving Con - shoulder paving   0.00 m2   0   0   0   Misclm   0   2500   0   #DIV/0!   0   0   0   0   0   0   0   0   0														
6030   Paving Con - machine paving concrete   0.00 m2   0   0.00 m2   153   0   0   0   0.00 m2   0.00 m			454.00		440		20.004	070						
6040   Paving Con - hot reprofiling   0.00 m2   153   0   0   Misclm   0   2500   0   #DIV/0!   0   0   0   0   0   0   0   0   0					116	421								
Boso Paving Con - shoulder paving   10.00 to 65   0   0   0   0   0   0   0   0   0					153									-
Comparison   Control   C								0	Liner-m3		1050	0		
Record   Paving Con - mobilization   3.0%   627   627   627   627   8   Mech-m   0   2100   0   #DIV/0!   15%   6010   Paving Con - pavement design   0.0%   0   0   0   Misclm   0   1000   0   #DIV/0!   3%   6099   Paving Con - Contingency   30.0%   6459				m2	0			-						
Color   Paving Con - pavement design   0.0%   0   0   0   0   0   0   0   0   0					627									
6099   Paving Con - Contingency   30.0%   6459   6,459   6,459   6,459   6,459   6,459   6,459   6,459   6,459   6,459   6,459   6,459   6,459   6,459   6,459   6,459   6,459   6,459   6,045														
PAVING CONSTRUCTION COSTS   27,987   373   asphalt   (T)=mm   25L=1M2 (T)   Roof   1.0							6.459	86						
A.C.   100   46   29.00   0.50   3560   Paving Eng - detailed design   5.50%   1539   1,539   21   A.B.C.   0   0   1.00   \$1,500.00   - 3569   Paving Eng - detailed design/Contingency   30.0%   462   462   6   \$Oil/Litre   \$1.50   5   Walls   1.0   11.20   11												P)		0.0
3560   Paving Eng - detailed design   5.50%   1539   1,539   21   A.B.C.   0   0   1.00   \$1,500.00   - 3569   Paving Eng - detailed design/Contingency   30.0%   462   462   6   \$0il/Litre   \$1.50   5%   Walls   1.0   11.20   11.20   11.20   1.0		PAVING CONSTRUCTION COSTS					27,987	373					Roof	
3569 Paving Eng - detailed design/Contingency 30.0% 462 462 6 \$Oil/Litre \$1.50 5% Walls 1.0 11.20 6860 Paving Eng - general const. supervision 2.00% 560 560 7 Appl. rate 1.75 1.75 3.00 \$1,580.00 - 6861 Paving Eng - quality assurance 5.00% 1399 1,399 19 Pavement Removal (See It55) Base 1.0 26.00 6862 Paving Eng - surveying 0.50% 140 140 2 m2 \$/m2 Total 7.00 \$1,000.00 - 6869 Paving Engineering Sub-total 4,730 63 Milling 5.00 \$5.00 \$60.00 - 7.00 \$5.00 \$60.00 - 7.00 \$5.00 \$60.00 - 7.00 \$5.00 \$60.00 - 7.00 \$5.00 \$60.00 - 7.00 \$5.00 \$60.00 - 7.00 \$5.00 \$60.00 - 7.00 \$5.00 \$60.00 - 7.00 \$60.00 \$5.00 \$60.00 - 7.00 \$60.00 \$5.00 \$60.00 \$6														0.50
6860 Paving Eng - general const. supervision 2.00% 560 560 7 Appl. rate 1.75 1.75 (See 1155) 1														11 20
6861 Paving Eng - quality assurance 5.00% 1399 1,399 1 Pavement Removal (See 1155) Base 1.0 26.00 6862 Paving Eng - surveying 0.50% 140 140 2 m2 \$/m2 Total 1.00 \$1,000.00 - 6.00														11.20
6862 Paving Eng - surveying 0.50% 140 140 2 m2 \$/m2 Total 1.00 \$ 1,000.00 - 6869 Paving Eng - Residency Contingency 30.0% 630 630 8 174 \$8.84 1538 Excm3 1.0 37.00 Annual Paving Engineering Sub-total 4,730 63 Milling 5.00 5.00 5.00 5.00 5.00 5.00 5.00 5.0												Base		26.00
6869 Paving Eng - Residency Contingency     30.0%     630     630     8     174     \$8.84     1538     Excm3     1.0     37.00       Paving Engineering Sub-total     4,730     63     Milling     5.00     60.00     -       Total Paving Const. & Eng. Costs     32,717     436     132     \$9.63     1266     Eccm3     1.0     37.00												1.00		-
Total Paving Const. & Eng. Costs 32,717 436 132 \$9.63 1266 Electrical \$4,500.00 - Electrica		Paving Eng - Residency Contingency						8	174					37.00
Total Paving Const. & Eng. Costs 32,717 436 132 \$9.63 1266 Electrical \$ 4,500.00 -		Paving Engineering Sub-total					4,730	63		0/ 0	<b>.</b>			-
===== ================================		Total Paying Conet 9 Fac Costs					20 747	420						-
Misc. \$ 300.00 -	=====			===					132	\$9.03	1206	1		-
	<b>-</b>		<b>_</b>		·	<b></b>								-
#511/10:													#DIV/0!	

	PRINTING DATE: 8/24/2018	vnistier Highw	ay 99	Capacity and	Safety Review (	Capacity and Safety Revi	ew Snort	erm Option -	2 Duai Leπ			Page 5	
(20	O:\Proj\2121-00288-02 MoTI Whistler Hwy 99 Capacity & Safety Review\4.0 ENGINEERING DESIGN\4.3 Company MCSL 118 Dollars) Whistler Highway 99 Capacity and		y e	0.0% 30.0% Short Term (	30.0%	Hwy 99 / Lorimer Rd ST-2 Short Term Option -	ST-2	1. 2ln Front er 2. 2ln Acc F	age Rds		XP D/M XP D/E/M		
ACTIVIT CODE	Y Capacity and Safety Review	Road Type		1 75	L.M.	2		3. 4ln Acc F 4.R4L-4L E			4LEXP D/M R/B-EX.RD	Est \$	
	EST.DATE August, 2018 ceptual Est. R1 DATE:	Length			L.IVI.	Dual Left		5.R2/3L-4L			15. Misc.	351,271	
Blk Est.		Unit Price	Lloit	Cost-Quant. PerSection	Lump Sum Values	1 75		6.Retr.4L-4 7.R4L-4LE		20.I/C Str 21. Bridge		\$ 4,684 \$ 3,941	
	Sept.1, 2002 DESCRIPTION				values	MR MR		8. New 4L I		22. Grade		\$ 3,941	
	OPERATIONAL CONSTRUCTION Operat.Con:- lighting	8500.00	Ea	0	34000	34,000	Pole 453	Sp. (lm) 50	No. of Sides	Length 75			
6520	Operat.Con:- signals	275,000	Ea	0.20	0	55,000	733		No.	Units	Quantity	Rate	Total
	Operat.Con:- signing Operat.Con:- guard rail	60.00 109.00		4500 0	0	4,500 0	60	Controller Sig, pol,base	0	ea ea	1 4	55,000.00 45,000.00	11,000 36,000
6550	Operat.Con:- pavement markings	1.75	lm	45	5000	5,079	68	Wiring U/G	0	ls	1	40,000.00	8,000
	Operat.Con:- mobilization Operat.Con:- contingency	3.0% 30.0%		2957 30461		2,957 30,461	39 406						-
													-
	OPERATIONAL CONSTRUCTION COST	S 				131,997	1760	LP \$/lm	\$ 1.00	Refl. Sp.	Signals 20.00	Refl.\$/ea	\$ 15.00
	Operat. Eng- detailed design	5.50%		7260		7,260	97	Ext. Lines	2.0	1.0	1.0		
	Operat. Eng- detailed design/Contingency Operat. Eng- general const. supervision	30.0% 5.50%		2178 7260		2,178 7,260	29 97	Weighscale Buildings	No. 0	Units m2	Quantity 60	Rate 2,800.00	Total -
6841	Operat. Eng- quality assurance	2.00%	)	2640		2,640	35	Pit & Apron	0	m2	120	400.00	-
	Operat. Eng- surveying Operat. Eng- Residency Contingency	0.50% 30.0%		660 3168		660 3,168	9 42		0	ea m2	9000		-
00.0	Operational Enginering Sub-total	00.070		0.00		23,165	309	Road Const.	0	lm	1,500	400.00	-
	Total Operational Const. & Eng. Costs					155,162	2069	- light/signs	0	ls	1	50,000.00	-
			===				=====				Weighscale		-
5200	ROAD SIDE CONSTRUCTION	Unit Price	Unit	Quantity	Lump Sum			Safety Rest Area	No.	Units	Quantity	Rate	Total
5203	RoadSide C- water	758.00	lm	0	-	0	0	Class A&B		SAFETY RE	ST AREAS		**
	RoadSide C- sanitary RoadSide C- storm	489.00 500.00		0		0	0		0	m2	100	3,000.00	-
5202	RoadSide C- mobilization	3.0%	)	0		0	0	Site/toilets	0	ea	2	12,500.00	-
5209	RoadSide C- Utility Contingency Road Side Const. Utilities Sub-total	30.0%	)	0		0	0		0 0	m2 Im	2500 800		-
5040				0	0			Furnishings	0	ls		10,000.00	-
	RoadSide C- weighscales RoadSide C- safety rest areas	-	ea ea	0	0	0	0	Landscaping light/signs	0 0	ls Is	1	5,000.00 50,000.00	-
	RoadSide C - tourist rest & view areas	40000		0	0	0	0				0.557/05/		-
	RoadSide C- mobilization RoadSide C- Contingency	3.0% 30.0%		0		0	0	Description	No.	Units	SAFETY RES	Rate	Total
	Road Side Construction Sub-total			0		0	0		0		0		-
	ROAD SIDE CONSTRUCTION COSTS					0	0	•	0		0		-
3550	RoadSide E- detailed design	10.00%		0		0	0		0		0 Description	-	
3559	RoadSide E- detailed design/Contingency	30.0%	)	0		0	0	Railway	No.	Units	Quantity	Rate	Total
	RoadSide E- general const. supervision RoadSide E- quality assurance	6.00% 2.00%		0		0	0	Removal Track Cnst.	0 0	tklm tklm	200.00 200.00		-
6852	RoadSide E- surveying	1.00%	)	0		0	0	Ballast	0	m3	500.00	60.00	-
6859	RoadSide E- Residency Contingency Road Side Engineering Sub-total	30.0%	)	0		0	0		0	m3 tklm	500.00 1.00		-
								Tie-ins	0	ea	1.00	5000.00	-
	Total Road Side Const. & Eng. Costs		===	=======	========	0	0	Turnout # 9 Others	0 0	ea Is	1.00 1.00		-
	OTHER CONSTRUCTION	Unit		Quantity	Lump				0			2000.00	-
	OTHER CONSTRUCTION Other Const- water	Price 758.00	Unit Im	0	Sum	0	arthworks 0	(see grading)	0	lm	Railway	400.00	-
5304	Other Const- sanitary	489.00	lm	0		0	0	R/rd X-ing	No.	Units	Quantity	Rate	Total
	Other Const- storm Other Const- mobilization	500.00 3.0%		0		0	0	Planks Sig./gates	0 0	tklm each	45 1		-
	Other Const- utility contingency	30.0%		0		0	0					-	-
	Other Const. Utilities Sub-total					0	0	-			R/rd X-ing	-	-
	Other Const- railroads main & spur lines	-	lm	0		0	0	Description	No.	Units	Quantity	Rate	Total
	Other Const- railroad crossings Other Const- marine work	-	ea ea	0		0	0					-	-
5340	Other Const- environmental mitigations	100,000	ea	0.05		5,000	67					-	-
	Other Const- mobilization Other Const- Contingency	3.0% 30.0%		150 1545		150 1,545	2 21					-	-
,	Other Construction Sub-total	20.070		.0.0		6,695	89					-	-
	OTHER CONSTRUCTION COSTS					6,695	89				Description	-	-
3570	Other Eng detailed design	5.50%	 )	368	0	368	5	Environmenta	No.	Units	Quantity	Rate	Total
3579	Other Eng detailed design/Contingency	30.0%	)	110		110	1	Mitigation	0.10	ls	1	50,000	5,000
	Other Eng general const. supervision Other Eng quality assurance	4.00% 2.00%		268 134	0	268 134	4 2		0.10	ea	0	40,000	-
	Other Eng surveying	1.00%	)	67		67	1					-	-
6872		A											
6872	Other Eng Residency Contingency Other Engineering Sub-total	30.0%	)	141		141 1,088	2 15					-	-

	TRIIVIIVO DATE. 0/24/2010	model riigiiway o	o Capacity and Car	icty iteview c	Dapacity and Galety Nevi	ew onort i	eriii Option - 2 Duai Leit		r age o	
File:		Man. Reserve Contingency Division/Site	0.0% 30.0% Short Term Op	Land 30.0% tion - 2	Hwy 99 / Lorimer Rd ST-2 Short Term Option -	ST-2	Road Types 1. 2ln Frontage r2. 2ln Acc Rds	9. R-E4L-4L D/M 10.N 4L EXP D/M 11.N 4L EXP D/E/M		
ACTIVIT CODE		Road Type Length	1 75 L	M	2		3. 4ln Acc Rds 4.R4L-4L EXP R/B	12.N2L;F4LEXP D/M 13.INST.R/B-EX.RD	Est \$	1
	nceptual Est. R1 DATE:	Lengui	75 L	.IVI.	Dual Left		5.R2/3L-4L EXP R/B	14.AS IS 15. Misc.	351,271	
Blk Est.		Unit Price Un		Lump Sum	1 75		6.Retr.4L-4LEX R/B 7.R4L-4LEX R/B E/S	20.I/C Str.&Ramps	\$ 4,684	
version	Sept.1, 2002 DESCRIPTION		it PerSection	Values	MR	75	8. New 4L EXP R/B	<ul><li>21. Bridges</li><li>22. Grade Sep.</li></ul>	\$ 3,941	i
	DETAILED DESIGN	=======================================	= ======= =	=======		=====	0 1	4		
3500	DETAILED DESIGN from 3510,3520,3540,3550,357	0			19,249	257	0 1 Bridge Tunnel	1 Special		
	Geotech. E - detailed design	0.90%	2423	0	2,423	32		-	Б.	T
3539	Geotech. Er - Contingency	30.0%	727 		727	10	Description No.	Units Quantity	Rate -	Total -
	TOTAL DETAILED DESIGN COSTS				22,399	299			-	-
	RESIDENT ENGINEERING	======= ==	= ======= =	=======	=========	=====			-	-
	from 6810,6820,6840,6850,686	60,6870			26,396				-	-
	TOTAL RESIDENT ENG. COSTS				26,396	352		Description	-	
			= ======= =		=========		Description No.	Units Quantity	Rate	Total
					0				_	-
										-
			= ======= =		0	0			_	-
	PART 1 SUMMARY				207.000	2761		Description	-	
	CONSTRUCTION ENGINEERING & SUPERVISION				207,088 49,447	659	Description No.	Units Quantity	Rate	Total
	CONTRACTUAL CONTINGENCY				76,960	1026			-	-
					0	0			Ξ.	-
		DIVISION/SITE	Short Term Op	tion - 2	333,495	4447			Ξ	=
	PROJECT MANAGEMENT Project Man - office costs wages	2.00%	Land 6670	- 0	6,670	89			-	-
	Project Man - office costs - expenses	0.50%	1667	0	1,667	22			-	-
	Project Man - printing costs	0.00%	0	0	0	0			-	-
2061	Project Man - general (MoTI Regional Cost F Project Manager Sub-total	0.00%	0	0	0 8,337	0 111			-	-
									-	
	Client - office costs wages Client - office costs - expenses	1.00% 0.50%	3335 1667	0	3,335 1,667	44 22	Description No.	Units Quantity	Rate	Total
	Client - printing costs	0.00%	0	0	0	0	Description 140.	Office Quartity	-	- Total
2011	Client - general	0.00%	0	0	0	0			-	-
	Client Sub-total				5,002	67			-	-
	Public Rel wages & expenses	0.00%	0	0	0	0			-	-
	Public Rel adv., media, displays Public Rel opening ceremonies	0.00% 0.00%	0	0	0	0		Description	-	
	Public Rel general (FN Accomm.)	0.00%	0	0	0	0	Description No.	Units Quantity	Rate	Total
	Public Relations Sub-total				0	0			_	-
	Legal Costs - lawyers fees	0.10%	333	0	333	4			-	-
2041	Legal Costs - general Legal Costs Sub-total	0.00%	0	0	0 333	0			-	-
									-	-
	Insurance - const./ liability, E&O	0.00% 0.00%	0	0	0	0			-	-
2081	Insurance - general Legal Costs Sub-total	0.00%	U	U	0	0			-	-
					4.400				-	-
2099	Project Management Contingency	30.0%	4102 		4,102	55		Description	<u> </u>	
	TOTAL PROJECT MANAGEMENT COSTS				17,775	237	4.10%	<u> </u>		
		\$/Building	= ====== =: # buildings	LS	0		1 Hectare = 10,000 Sq	uare Meters		
	${\sf Land}({\sf Code \ -Mrkt}, ROW, Serv, Imp.V, Ease.C$	250,000 Re	es. 0	0	0	0	1 Hectare = 2.471 Acre	es		
	Acquisition Sub-total	2,000,000 Co	om 0 	0	0	0	1 Acre = 43,560 squar Planned RO			
	Land(Code -Bus.,5%,Mrg.P,Rel\$,P/Tax,Etc		0	0	0	0	#DIV/0! Req. ROW	0.1		
	Land(Code -Owners(LS,Apprsl,Rprt,Lgl,In Land(Code -Demolition	7.00% 0.00%	0	0	0	0	#DIV/0! Cost/Ha #DIV/0! Cost/M2	0 107,633 0.00 10.76		
4050	Land(Code -Pro.Man,P.Tax,Util,Security	1.00%	ő	0	0	ő	#DIV/0! Cost /Acre	0 43,560	0	
	Land(Code -Not Used Land(Code -Not Used						Cost /Ft2 #DIV/0!	0.00 \$ 1.00	)	
4080	Land(Code -Acq.F,M/Sal,TrvIV,Cntr.S,Appr	7.00%	0	0	0	0		\$ 10,000		
	Land(Code -Surveys	0.00%	0	0	0	0	#DIV/0! Survey /unit	\$ 2,000	Б. 1	T-1.1
							Description No.	Units Quantity	Rate -	Total -
									<u>.</u>	-
	Associated costs-sub-total		0		0	0			-	-
4000	Land Contingency Sub-total	30.0%	 0	0	0	0			-	-
									-	
	TOTAL LAND COSTS				0	0		Description		-

			-,								5	
O:\Proj\2121-00288-02 MoTI Whistl		M D		0.00/	Land	Lharago (Lasissas Dal	00	/ Dand Times	0.0.541	41 D/M		
ile: & Safety Review\4.0 ENGINEERING	3 DESIGN\4.3	Man. Reser		0.0%		Hwy 99 / Lorimer Rd			9. R-E4L-4			
Company MCSL		Contingency		30.0%		ST-2	ST-2	1. 2ln Frontage	10.N 4L E			
(2018 Dollars) Whistler Highway			е ;	Short Term C	option - 2	Short Term Option -	Short 16	er 2. 2ln Acc Rds	11.N 4L E			
ACTIVITY Capacity and Safe		Road Type		1		2		3. 4ln Acc Rds		ILEXP D/M		
CODE EST.DATE Augu	ust, 2018	Length			L.M.			4.R4L-4L EXP R/B	13.INST.F		Est \$	
Conceptual Est. R1 DATE:				=======		Dual Left		5.R2/3L-4L EXP R/B	14.AS IS		351,271	
Blk Est. # 6.14A R2 DATE:		Unit		Cost-Quant.	Lump Sum	1	1	6.Retr.4L-4LEX R/B	20.I/C Str.	&Ramps	\$ 4,684	
Version Sept.1, 2002 DESCR	RIPTION	Price	Unit	PerSection	Values	75	75	7.R4L-4LEX R/B E/S	<ol><li>Bridge</li></ol>	:S	\$ 3,941	
						MR		- 8. New 4L EXP R/B	22. Grade	Sep.		
		======	=== :	=======	========		=====					
9800 MANAGEMENT RESERVE	E							Description No.	Units	Quantity	Rate	Total
MAN. RES planning		0.0%		5190		0	0				-	-
MAN. RES preliminary de	sign	0.0%		10296		0	0				-	-
MAN. RES utility construc	tion	0.0%		0		0	0				_	
MAN. RES grade constru		0.0%		102535		0	0				_	_
MAN. RES structural cons		0.0%		0		0	0				_	_
MAN. RES paving constru		0.0%		27987		0	0				_	-
MAN. RES operation cons		0.0%		131997		0	0					
MAN. RES roadside cons		0.0%		13 1997		0	0				_	
MAN. RES other construc		0.0%		6695		0	0					
		0.0%		17775		0	0				-	
MAN. RES project manag	gernent					0	0				-	
MAN. RES land		0.0%		0		•	•				-	
MAN. RES detailed eng.		0.0%		22399		0	0				-	-
MAN. RES residency eng		0.0%		26396		0	0				-	-
MAN. RES Contingency		0.0%		0		0	0				-	-
TOTAL MANAGEMENT R	ESERVE			351271		0	0	-			-	-
===== =================================		======	=== :	=======	========	==========	=====			Description		-
TOTAL LESS ESCALATION	N			0	351271			Description No.	Units	Quantity	Rate	Total
FISCAL								-			_	-
9900 ESCALATION											_	
YEAR PROJECTED	ESCALATION	COMPLETE	Ξ	\$ DONE							_	
2016-2017	0.5750%	5.00%		. 0		0	0				_	_
2017-2018	0.6250%	10.00%		0		0	ő				_	-
2018-2019	1.0000%	35.00%		n		0	0				_	_
2019-2020	1.0000%	45.00%		0		0	0					_
2020-2021	1.0000%	5.00%		0		0	0					
2021-2022	1.0000%	0.00%		0		0	0				-	
2021-2022	1.0000%	0.00%		0		0	0				-	
	1.0000%	0.00%		0		0	0				-	
2023-2024				-			-				-	
2024-2025	1.0000%	0.00%		0		0	0				-	-
TOTAL ESCALATION		100.00%		0		0	0	-			-	
DART O CUMMARDY NON			=== :		=======	===========	=====				-	-
PART 2 SUMMARY NON		NI CO212				40.070	400				-	-
Non-Construction						13,673	182				-	
Non-Const. Cor	ntingency					4,102	55				-	
TOTAL NON-CONSTRUC	TION COSTS					17,775	237	-			-	
TOTAL NON-CONSTRUC		=======	=== :	=======	========	17,775	237					
Short Term TOTAL FOR RO		1				351,271	4684			Description		
SHOIL ISHII I GIAL FOR NO	AD III L					001,271	7004			Description		

Company (2018 Dollars) ACTIVITY CODE Conceptual Est. Blk Est. # 6.14A Version Sept.1, 2002	Whistler Highway 99 Capacity and Capacity and Safety Review EST.DATE August, 2018	Road Type Length Unit	30.09 Medium Te	m Option - 1  L.M.  Lump Sum Values  Previous	Alpha Lake Road / C MT-1 Medium Term Optior - 1 Counterflow 1 3500 MR	MT-1 Medium	1. 2In Fron 12. 2In Acc 3. 4In Acc 4.R4L-4L E 5.R2/3L-4L 6.Retr.4L-4 7.R4L-4LE 8. New 4L	tage Rds Rds EXP R/B EXP R/B LEX R/B X R/B E/S	9. R-E4L-4L D/M 10.N 4L EXP D/M 11.N 4L EXP D/E/M 12.N2L;F4LEXP D/M 13.INST.R/B-EX.RD 14.AS IS 15. Misc. 20.I/C Str.&Ramps 21. Bridges 22. Grade Sep.	Est \$ 27,443,234 \$ 7,841 \$ 6,839	
2000	PROJECT MANAGEMENT		Diff. -106823	Estimate 0	1,068,236	305	3.9%	3.9%			
2500 3000 3500	PLANNING PRELIMINARY DESIGN DETAILED DESIGN			0 0	85,995 161,700 1,381,857	46	0.6%	0.6%			
0000	Total Engineering	ı	-162955		1,629,552					2697788	
4000	LAND ACQUISITION			0 0	0	0	0.0%	0.0%			
5000 5200 5300 5500 6000	GRADE CONSTRUCTION ROAD SIDE CONSTRUCTION OTHER CONSTRUCTION STRUCTURAL CONSTRUCTION PAVING CONSTRUCTION		-4635 -996782	0 0 0 0 5 0	4,582,315 0 46,350 9,967,825 806,315	0 13 2848	0.0% 0.2% 36.3%	0.0% 0.2% 36.3%			
6500	OPERATIONAL CONSTRUCT	ION	-80631 -120605	3 0	1,206,053	345	4.4%	4.4%			
6700 6800	UTILITY CONSTRUCTION RESIDENT ENGINEERING		-33600 -146753		336,000 1,467,535						
	Total Construction	1	-1841239	2 0	18,412,392	5261	67.1%				
9700	CONTINGENCY		-633305	4 0	6,333,054	1809	23.1%	23.1%			
9800	SUB-TOTAL MANAGEMENT RESERVE		-2744323	4 O	27,443,234		100.0% 0.0%				
	TOTAL		-2744323	4 0	27,443,234	7841	100.0%	100.0%			
9900	ESCALATION			0 0	0	0		0.0%			
	TOTAL COST		-2744323		27,443,234			100.0%			
		-	ENG. & PM LAND CONST. MAN. RES. ESC. TOTAL		3,507,124 0 23,936,110 0 0 27,443,234	0 6839 0	0.0% 87.2% 0.0%				
Medium Te	rm Option - 1	Assumptions	3		Chaulder	Long	Long	Madian	Lana Lana	Chaulder	-
1	Existing Right-Of -Way	partial taking	m I	Existing Rd Pvmt Width		Lane Lane	Lane Lane	Median - Median	Lane Lane Lane Lane	Shoulder - Shoulder	Ditch W.
2	New Addition Right-Of -Way ROW		m m	New Rd. Pvmt Width	1.50 5.1	- Asphalt	3.60 depth mm	100	Tonage t 4498	- B Unit Price	\$ 151.0
	Bridges		Width(m)	Length(m)	<u>SCOPE</u>	Road L. 3,500	Bridge L.	Seg. L. 3,500	X-sect./lm 14.05	Tot. Vol. 5 49,172	
3.1 3.2 3.3 3.4 3.5	0 0 0 0		12.2 12.2 12.2 12.2 12.2	2 0.0 2 0.0 2 0.0		4.0	D= meter	6174 Volume	Unit Rock \$ 60.00 OM Unit Stripping \$ 56.00 Borrow	13,230 11,907 6,174 17,861	\$ 29.1 \$ 49.5
4.1 4.2 4.3	Tunnels 2InSt.w-x x-Pass.TI shaft snowshedlength (Im)	Length(m) 0 0 0 0	Width(m) 12.0 3.0 2.0								
3.1 3.2 3.3 3.4 3.5	Bridges 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Net \$/M2 #DIV/0! #DIV/0! #DIV/0! #DIV/0! #DIV/0!	Gross\$/m2 #DIV/0! #DIV/0! #DIV/0! #DIV/0! #DIV/0!	_							

Company MCSL   Contingency   (2018 Datings) Whisten Highway 99 Capacity and 5 Division/State   Contingency   Capacity and 5 Division/State   Capac	File:	O:\Proj\2121-0 & Safety Revie	00288-02 MoTI Whistler Hwy 99 Capacity ew\4.0 ENGINEERING DESIGN\4.3	Man. Reser	rve	0.0%	Land	Alpha Lake Road / Ch	Lake Pla	acRoad Types		9. R-E4L-	4L D/M		
ACTIVITY   Capacity and safety Review   Fload Type   1											e				
ACTIVITY   Capacity and Subrig Water   State   State							ก Option - 1	Medium Term Ontion	Medium						
Contable Fix   Total   Contable Fix															
Second   Consultant   Consult				Length			L.M.	-							
DESCRIPTION   Price   Unit   PerSection   Values   MRR							_								
MR															
2500   PLANNING   2521   Consultant - transport, planning study   3.00   LM   10500   10,500   3   Description   No.   Units   Quantity   Rate   T   2521   Consultant - tunctional plan study   3.00   LM   10500   10,500   3   3   2   2   2   2   2   2   2   2	Version	Sept.1, 2002	DESCRIPTION	Price	Unit	PerSection	Values		3500					\$ 6,839	
2521 Consultant - transport, planning study   3.00 LM   10500   10,500   3   Description   No. Units   Quantity   Rate   T   2531 Consultant - Condrol study   3.00 LM   10500   10,500   3					,			· MR		<ul> <li>8. New 4L EX</li> </ul>	P R/B	22. Grade	Sep.		
2531 Consultant - corridor sludy				0.00		40500		40.500					0 "	D (	<b>.</b>
Zefs   Consultant - Incitional plan. study   3.00 LM   10500   10,500   3   33,075   9   2502 Consultant - general   5.0%   1575   1,575   0   33,075   9   2502 Consultant sub-total   10500   10,500   3   2   2   2   2   2   2   2   2   2											No.	Units	Quantity	Rate	Total
2502 Consultant - general   5.0%   1575   1.575   0								-,							-
Consultant sub-total   Consultant sub-total															-
2510 Client	2502			5.0%	6	15/5			_						-
2520 Client - transport, planning study		Consultant s	sub-total					33,075	9						-
2520 Client - transport, planning study   4.20 LM   14700   14,700   4   2540 Client - corridor study   4.20 LM   14700   0   14,700   4   2540 Client - functional study   4.20 LM   14700   0   14,700   4   2540 Client - general   5.0%   2520   52,920   15						40500		40.500		<del>-</del>					-
2530   Client - corridor study															-
2501 Client - functional study									_						-
2500   Client - general   Client - general   Client Sub-total   Client - general Client - ge															-
Client Sub-lotal   52920   52,990   7							0		4						-
Description   No.   Units   Quantity   Rate   T	2501			5.0%	1				1 1						
TOTAL PLANNING		Client Sub-to	otal			52920		52,920	15						
TOTAL PLANNING								-	-		No.	Units	Quantity	Rate	Total
3000 PRELIMINARY DESIGN   3.50 LM   12250   12,250   4	2599	Planning Co	Intingency	30.0%	,	25799		25,799	7	_					-
3000 PRELIMINARY DESIGN   3.50 LM   12250   12,250   4								-	-	-					-
3000   PRELIMINARY DESIGN   3.50 LM   12250   4   3013   Consultant - aerial base plan   3.50 LM   12250   12,250   4   3014   Consultant - control survey   3.50 LM   12250   12,250   4   3015   Consultant - control survey   3.50 LM   12250   24,500   7   3031   Consultant - functroad field survey   3.50 LM   12250   12,250   4   3041   Consultant - functroad field survey   3.50 LM   12250   12,250   4   3041   Consultant - functroad field survey   3.50 LM   12250   12,250   4   3041   Consultant - functroad field survey   3.50 LM   7350   0   7,350   2   Structural   0.50%   3051   Consultant - geotechnical design   17,50 LM   61250   61,250   18   3011   Consultant - geotechnical design   17,50 LM   61250   61,250   18   3012   Consultant - geotechnical design   17,50 LM   7350   0   7,350   2   S/Prop. \$ 150   150   3010   Cient - aerial base plan   0.00 LM   0   0   0   0   0   0   0   0   0								111,794	32						-
3013   Consultant - aerial base plan   3.50   LM   12250   12,250   4     14,700   4     3014   Consultant - prel. design   4.20   LM   14700   14,700   4     3015   Consultant - control survey   3.50   LM   12250   12,250   4     3021   Consultant - environmental impact   7.00   LM   24500   7.3031   Consultant - funct. road field survey   3.50   LM   2250   12,250   4				: =======	===	: =======	========	± =========	=====						-
3014   Consultant - prel. design   4.20   LM   14700   14,700   4     3015   Consultant - prel. design   3.50   LM   12250   12,250   4     3021   Consultant - environmental impact   7.00   LM   224500   224,500   7     3031   Consultant - functroad field survey   3.50   LM   12250   12,250   4     3041   Consultant - funct. old field survey   3.50   LM   9800   0   9,800   3     3051   Consultant - funct. des. structural   2.10   LM   7350   0   7,350   2   Structural   0.50%   3061   Consultant - geotechnical design   17,50   LM   61250   0   61,250   18   3071   Consultant - general   0.0%   0   0   0   0   0   0   0   0   0	3000	PRELIMIN/	ARY DESIGN												-
3015   Consultant - control survey   3.50   LM   12250   24,500   7   7   7   7   7   7   7   7   7															-
3021   Consultant - environmental impact   7.00   LM   24500   12,250   3.50   LM   12250   3.50   LM   3.50   L	3014	Consultant	- prel. design	4.20	LM	14700		14,700	4						-
3031   Consultant - functroad field survey   3.50   LM   12250   12,250   4   3041   Consultant - functional design   2.80   LM   9800   0   9,800   3   3	3015	Consultant	- control survey	3.50	LM	12250		12,250	4						-
3031   Consultant - functroad field survey   3.50   LM   12250   12,250   4   3041   Consultant - functional design   2.80   LM   9800   0   9,800   3   3	3021	Consultant	- environmental impact	7.00	LM	24500		24,500	7						-
3041   Consultant - functional design   2.80   LM   9800   0   9,800   3   3051   Consultant - funct. des. structural   2.10   LM   7350   0   7,350   18   3071   Consultant - geotechnical design   17,50   LM   61250   61,250   18   3071   Consultant - general   0.0%   0   0   0   0   0   0   0   0   0								12,250	4						-
3051   Consultant - funct. des. structural   2.10   LM   7350   0   7,350   2   Structural   0.50%				2.80	LM	9800	0	9,800	3				Description		_
3061   Consultant - geotechnical design   3071   Consultant - right-of-way research   2.10   LM   7350   0   7,350   2   \$/Prop. \$ 150   0   0   Description   No.   Units   Quantity   Rate   T   Consultant sub-total			· ·	2.10	LM	7350	0		2	Structural	0.50%				
3071   Consultant - right-of-way research   2.10   LM   7350   0   0   0   0   0   0   0   0   0							-	.,			0.00				
3002   Consultant - general   0.0%   0   161,700   46							0				150				
Consultant sub-total   161,700   46							-					Units	Quantity	Rate	Total
3010 Client - aerial base plan	000_			0.0,0		·			_		140.	Ornic	Quantity	- nato	-
3011   Client   - prel. design   0.00   LM   0   0   0   0   0   0   0   0   0										-					_
3011   Client   - prel. design   0.00   LM   0   0   0   0   0   0   0   0   0	3010	Client	- aerial base plan	0.00	LM	0		0	0	Cantilever Fir	1	ea	0	3.500.00	_
3012 Client   - control survey   0.00 LM   0   0   0   Barrier remo   1   Im   2450   50.00												Cu	·	0,000.00	_
3020 Client - environmental impact   0.00 LM   0   0   0   Electric sign   1   ea   1   20,000.00						-			_		1	lm	2450	50.00	122,500
3030 Client - functroad field survey 0.00 LM 0 0 0 Bus Pullout F 1 ea 2 10,000.00 3040 Client - functional design 0.00 LM 0 0 0 3050 Client - funct. des. structural 0.00 LM 0 0 0 3060 Client - geotechnical design 0.00 LM 0 0 0 3070 Client - right-of-way research 0.00 LM 0 0 0 3070 Client - general 0.0% 0 0 0 3001 Client - general 0.0% 0 0 0 Client Sub-total 0 0 0						•					•				20.000
3040 Client       - functional design       0.00 LM       0       0         3050 Client       - funct. des. structural       0.00 LM       0       0         3060 Client       - geotechnical design       0.00 LM       0       0         3070 Client       - right-of-way research       0.00 LM       0       0         3001 Client       - general       0.0%       0       0       0         Client Sub-total       0       0       0       0       0         3099 Preliminary design Contingency       30.0%       48510       48,510       14						U		•	_				· · · · · · · · · · · · · · · · · · ·	.,	20,000
3050   Client   - funct. des. structural   0.00   LM   0   0   0   0   0   0   0   0   0								•	_		1	ea	2	10,000.00	20,000
3060   Client   - geotechnical design   0.00   LM   0   0   0   0   0   0   0   0   0						•									-
3070   Client - right-of-way research   0.00   LM   0   0   0   0   0   0   0   0   0								-							-
3001 Client - general   0.0%   0   0   0   0   0   0   0   0   0								•							-
Client Sub-total         0         0           3099 Preliminary design Contingency         30.0%         48510         48,510         14						•			_						-
3099 Preliminary design Contingency 30.0% 48510 48,510 14	3001			0.0%	6	U									-
		Client Sup-to	otal					U	U						-
		Destinates		20.00/		40540		40.540		-					-
TOTAL PREI IMINARY DESIGN 210,210 60 Description	3099	Preliminary	/ design Contingency	30.0%	6	48510		48,510	14						-
TOTAL PRELIMINARY DESIGN I 210.210   60 Description								040.040							
101111 NELIMINAN DEGIN													Description		162,500

ACTIVIT CODE Con Bilk Est. # Version 9 6700 6710 6711 6712 6713 6714 6715 6716 6717 6718 6718	EST.DATE August, 2018 ceptual Est. R1 DATE:	Contingency	Unit Im	0.0% 30.0% Medium Term 1 3500  Cost-Quant. PerSection 1400 1400 0 0 0 0 0 0 0 0	•	Alpha Lake Road / Ch MT-1  Medium Term Option - 1  Counterflow 1 3500  MR  224,000 112,000 336,000	MT-1 Medium 1 3500 	1. 2In Front 12. 2In Acc I 3. 4In Acc I 4. R4L-4L 5. R2/3L-4L 6. Retr. 4L-4 7. R4L-4LE Description Haule Cost for Surplus XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	tage Rds Rds EXP R/B EXP R/B LEX R/B LEX R/B No.  5  0 0 0	9. R-E4L-4 10.N 4L E) 11.N 4L E) 12.N2L;F4 13.INST.R 14.AS IS 20.I/C Str.& 21. Bridget 22. Grade Units m3 /km m3 /km ea m2 m m2 (unit \$)	KP D/M KP D/E/M LEXP D/M /B-EX.RD 15. Misc. &Ramps	Est \$ 27,443,234 \$ 7,841 \$ 6,839  Rate  1.00  1.00  95.00 451.00 150.00	Total 30,870
	Util.Others sub-total			-		0	0	Rock O.M.	13,230 11907	107.66 29.11	1424298 346623	42%	
6799	Util.Others Contingency	30.0%		100800	0	100,800	29	Strip.	6174	49.54	305837	0.168	
	TOTAL UTILITIES					436,800	125	Borrow Misc./LS	17861	42.95 29.11		Surplus Mtl	Neat vol.cal
	GRADE CONSTRUCTION	U. Price	=== Unit	Quantity	Lump Sum	========	=====	Total	49172 Spec	57.84 Spec	2843909 PI/PL	PI/PL	49,172 Spec.
5032	Grade Cons - water	758.00	lm	0		0	0		Medium Term O		11.0	16.1	Resurface
	Grade Cons- sanitary Grade Cons- storm	489.00 500.00		0		0	0	pl to pl	Road 11.01	0.00	Ditch Width 1.0	Ditch Width 0.0	Road ONLY
	Grade Cons - storm Grade Cons - mobilization	3.0%		0		0	0	*no./lane	11.01		Col L Vol.		1
5039	Grade Cons- utility contingency	30.0%		0		0	0	*lane wid	3.6	0.0	51,630	Ξ.	3.6
	Grade Const. Utilities Sub-total					0	0	*med *shldrs tota	0.0 1.5	0.0	Pmt W= CBC. slope		0.0 1.5
	Grade Cons - site prep./clear,grubbing	26,000		3.85	0	100,168	29	c.b.c.(w)	6.5	0.0	4.0	0.0	A.C. (mm)
	Grade Cons- road grade/exc,placing,fill	57.84		51630	193370	3,179,474		sgsb (w)	8.8	0.0	Pmt W=	10.2	50
	Grade Cons- drainage/pipe,cul. Grade Cons- muiltiplate	1070.00 15000		0	161421	161,421 0	46	SGSBslope :1 *depth(d)	4.0 1.321	0.0	5%		A.B.C. (mm)
5050	Grade Cons-SGSB/produce,place,comp	56.00		6791		380,318	109		3500	0	0,0		0
	Grade Cons-CBC/produce,place,comp	60.00		6174		370,440		*no.cul./kild		5.0	\$ 2,530		Appl. rate
	Grade Cons- grade finishing landscaping Grade Cons- grade finishing hydro seed.	2.00 1.00		20676 20676		41,352 20,676	6	cul.(l) *sgsb (d)	9.64 0.21	0.00 0.30	\$ 1,070 5%		1.50
5062	Grade Cons- grade finishing fencing	60.00	lm	0		0	0	*cbc (d)	0.26	0.30	5%		
	Grade Cons- noise barriers Grade Cons- passing lanes	440.00 0.00		0		0	0	*Add.ROW X-m3/lm	-19.92 14.75	0.00 0.00			
	Grade Cons - passing lanes Grade Cons - sidewalks, curb & gutter	160.71		0		0	0	C&G \$/LM	\$60.00	Exp-100km	Exp- 80kmp	: Coll-80kmp	-
	Grade Cons-detours c/w ex,bf,paving	100000	NO	0.75	120000	195,000	56		Decel.(T-lm)	520	440	260	
	Grade Cons - mobilization Grade Cons - Contingency	3.0% 30.0%		133465 1374694		133,465 1,374,694	38 393		Accel.(T-lm) Left T.(T-lm)	950 716	630 596	80 456	
	Grade Construction Sub-total	30.070		107 4034		5,957,009	1702		TÒTAĹ	2186	1666	796	
	GRADE CONSTRUCTION COSTS				4582315	5,957,009	1702	Gravel 2.0 Drainage	Fonnes/m3 No.	Units	Quantity	Rate	Total
	Out 5 out desired desires			207020		207.020		Box Cul.	0	lm	45	8250	-
	Grade Eng detailed design Grade Eng detailed design/Contingency	5.50% 30.0%		327636 98291		327,636 98,291		Head Walls  Catch Basin	0 <b>0</b>	ea. ea.	3 <b>105</b>	16500 <b>3,250</b>	-
6810	Grade Eng general const. supervision	3.00%		178710		178,710	51	CB Leads	0	m	840	220	-
	Grade Eng quality assurance	2.00%		119140		119,140	-	MH	0	ea.	23	4,500	-
	Grade Eng surveying Grade Eng Residency Contingency	2.00% 30.0%		119140 125097		119,140 125,097	34	900mm CSP	0	lm	80	1,070	-
	Grade Engineering Sub-total	30.070		0001		968,014		Structure Dra	0	lm	100	150.00	-
	Total Grade Const. & Eng. Costs					6,925,023	1979						-
=====	=======================================	======	===	=======	=======	=======================================	=====				Drainage		

(22 ACTIVIT CODE CODE CODE CODE CODE CODE CODE CODE	Capacity and Safety Review EST.DATE August, 2018 CEPTUAL EST. R1 DATE:	Unit Price 758.00 489.00 500.00 3.0% 30.0%	Unit  Unit Im Im	0.0% 30.0% Medium Term 1 3500 ======= Cost-Quant. PerSection Quantity 0 0 0 0	•	Alpha Lake Road / Ch MT-1  Medium Term Option - 1  Counterflow 1 3500  MR  0 0 0 0 0 0 0 0 0 0 0	MT-1 Medium	1. 2In Fron 12. 2In Acc 3. 4In Acc 4.R4L-4L E 5.R2/3L-4L 6.Retr.4L-4 8. New 4L Brdge 1 2 3 4 5 5	tage Rds Rds EXP R/B EXP R/B LEX R/B X R/B E/S	9. R-E4L-4 10.N 4L E3 11.N 4L E3 12.N2L;4 13.INST.R 14.AS IS 20.I/C Str., 21. Bridge; 22. Grade  Piers \$ 160,504 177,516 177,516 177,516 177,516 177,516 171,516 171,516 171,516 171,516 171,516 171,516 171,516 171,516	XP D/M XP D/E/M LEXP D/M /B-EX.RD 15. Misc. &Ramps	Est \$	0% 0% 0% 0% 0%
5512	Struct.Cons - snow shed site prep.	0.00	lm	0		0	0	5	8	1	22190	4500	
5513	Struct.Cons - snow shed site const.	-	lm	0	Demolition	0	0	DECK #1	(W) 12.2	(L) 0	(\$/m2) 1791	Net Cost 315493	No. of Bridge
	Struct.Cons - bridge site preparation		LS	0		0	0	DECK #2	12.2	0	1981	295936	0
	Struct.Cons - bridge piers Struct.Cons - bridge abutments		LS LS	0		0	0	DECK #3 DECK #4	12.2 12.2	0 0	1981 1981	295936 295936	0
5517	Struct.Cons - bridge superstructure	1	LS	0	0	0	0	DECK #5	12.2	0	1981	295936	0
	Struct.Cons - retain. wall site prep. Struct.Cons - retaining wall const.	1580	LS m2	6125		9,677,500	0 2765	Bridge #1			Gross/m2 #DIV/0!	Net/m2 #DIV/0!	
	Struct.Cons - mobilization	3.0%		290325		290,325	83	Bridge #2			#DIV/0!	#DIV/0!	
5529	Struct.Cons - Contingency Structural Construction Sub-total	30.0%		2990348		2,990,348 12,958,173		Bridge #3 Bridge #4			#DIV/0! #DIV/0!	#DIV/0! #DIV/0!	Tnnl \$/Im -Net -
								Bridge #5	01.01		#DIV/0!	#DIV/0!	Tnnl \$/lm -Gross
	STRUCTURAL CONSTRUCTION COSTS	·				12,958,173	3702		2InSt.w-x 1-D-Shape	x-Pass.TI 2-D-Shape	shaft 1-Circle	Radius-1-D	7.267
3520	Struct. Eng detailed design	5.50%		712699		712,699	204	Tunnel L=	0	-		Per.S&Rf	24.32
	Struct. Eng detailed design/Contingency Struct. Eng general const. supervision	30.0% 4.00%		213810 518327		213,810 518,327	61 148	Tun. H1 C.Pt. H4	5.100 1.00	2.550 1.00	Radius 1.00	m2/rkac Tnnl height	6.25 8.27
	Struct. Eng quality assurance	2.00%		259163		259,163	74		12.00	3.00	Wall Tk.	Radius-2-D	2.157
	Struct. Eng surveying	0.50% 30.0%		64791 252684		64,791 252,684	19		0.250 0.250	0.250 0.250	0.250 SOBT	Per.S&Rf m2/rkac	8.42 6.25
0029	Struct. Eng Residency Contingency Structural Engineering Sub-total	30.0 %		232004		2,021,475	72 578		0.230	0.200	0.100	Tnnl height	3.16
						44.070.047	4000	TOBT	0.100	0.100	Excm3	-	-
=====	Total Structural & Eng. Costs	======	===	=======	=======	14,979,647	4280 =====	SOBT BOBT	0.100 0.100	0.100 0.100	Obk-m3 Liner-m3	-	-
2000	DAVING CONCEDUCTION				CM (OII			Items	Quantity	rate	Total \$	Avg.\$/ tot-Im	1-Circle
	PAVING CONSTRUCTION Paving Con - machine paving asphalt	151.00	t	4498	SM./OIL 31238	782,830	224	Excm3 Obk-m3	0	125 2625	0		0
	Paving Con - machine paving concrete	0.00		47050		0	0		0	1125	0		0
	Paving Con - hot reprofiling Paving Con - shoulder paving	0.00 0.00		<b>17850</b> 1512		0	0		0	2500 1050	0		10.00
	Paving Con - pavement finishing	100.00	m2	0		0	0		0	550	0		%
	Paving Con - seal coating Paving Con - mobilization	0.00 3.0%		23485		0 23,485	7	3	0	900 2100	0		5% 15%
	Paving Con - pavement design	0.0%		0		0	0	MiscIm	0	1000	0		3%
6099	Paving Con - Contingency	30.0%		241894		241,894		11 onne=16 60kg=1m2	6.67m2/25mm /25mm	1.5L =1M2 (F	0	#DIV/0! length (lm)	snowshed 0.0
	PAVING CONSTRUCTION COSTS					1,048,209	299		(T)=mm 100	.25L =1M2 (7		Roof 29.00	1.0 0.50
	Paving Eng - detailed design	5.50%		57652		57,652	16	A.B.C.	0	0	1.00	\$ 1,500.00	-
	Paving Eng - detailed design/Contingency Paving Eng - general const. supervision	30.0% 2.00%		17295 20964		17,295 20,964		\$Oil/Litre Appl. rate	\$1.50 1.75	5% 1.75	Walls 3.00	1.0 \$ 1,580.00	11.20
6861	Paving Eng - quality assurance	5.00%		52410		52,410	15	Pavement	Removal	(See I155)	Base	1.0	26.00
	Paving Eng - surveying Paving Eng - Residency Contingency	0.50% 30.0%		5241 23585		5,241 23,585	1 7	m2 700	\$/m2 \$8.84	Total 6188	1.00 Excm3	\$ 1,000.00 1.0	37.00
0009	Paving Engineering Sub-total	30.070		20000		177,147		Milling			5.00	\$ 60.00	-
	Total Poving Conet & Eng. Costs					1 225 257	2F0	m2	\$/m2	Total	Drainage	\$ 500.00	-
=====	Total Paving Const. & Eng. Costs	======	===	=======	=======	1,225,357	350 =====	5,250	\$9.63	50558	Electrical Mech.	\$ 4,500.00 \$ 5,000.00	-
											Misc.	\$ 300.00	-
						I	l				L	#DIV/0!	-

File:	O:\Proj\2121-00288-02 MoTI Whistler Hwy 99 Capacity & Safety Review\4.0 ENGINEERING DESIGN\4.3	Man. Reser	n.(0	0.0%	Land	Alpha Lake Road / Ch	I ako Bio	y Dood Typon		9. R-E4L-4	AL D/M		
riie.	& Sarety Review 4.0 ENGINEERING DESIGN 4.3  Company MCSL	Contingenc		30.0%	30.0%		MT-1	1. 2ln Fronta	ae	10.N 4L E			
(20	18 Dollars) Whistler Highway 99 Capacity and			Medium Term		Medium Term Option		12. 2ln Acc R		11.N 4L E			
ACTIVIT		Road Type		1	·	- 1		3. 4ln Acc R		,	LEXP D/M		
CODE	EST.DATE August, 2018	Length		3500	L.M.			4.R4L-4L EX		13.INST.R		Est \$	
Blk Est. #	ceptual Est. R1 DATE: 6.14A R2 DATE:	Unit		Cost-Quant.	Lump Sum	Counterflow 1	1	5.R2/3L-4L E 6.Retr.4L-4L		14.AS IS 20.I/C Str.		27,443,234 \$ 7,841	
	Gept.1, 2002 DESCRIPTION	Price	Unit	PerSection	Values	3500		7.R4L-4LEX		20.1/C Str. 21. Bridge		\$ 6,839	
						MR		8. New 4L E.		22. Grade			
	OPERATIONAL CONSTRUCTION			_				Sp. (lm) N		Length	•		
	Operat.Con:- lighting	8500.00		1.50	102000	102,000	29	50 Signala	O No	3500	Oceantity	Data	Tatal
	Operat.Con:- signals Operat.Con:- signing	275,000 6.00		1.50 21000	350000	412,500 371.000	118 106		No.	Units ea	Quantity 1	Rate 55,000.00	Total 82,500
	Operat.Con:- signing Operat.Con:- guard rail	109.00	_	2450	0	267,050		Sig, pol,base	2	ea	4	45,000.00	270,000
6550	Operat.Con:- pavement markings	1.75	lm	10500		18,375	5		2	Is	1	40,000.00	60,000
	Operat.Con:- mobilization	3.0%		35128		35,128	10						-
6599	Operat.Con:- contingency	30.0%	·	361816		361,816	103						-
	OPERATIONAL CONSTRUCTION COSTS	S				1,567,869	448	-			Signals		412,500
								LP \$/Im		Refl. Sp.	20.00	Refl.\$/ea	\$ 15.00
	Operat. Eng- detailed design	5.50%		86233		86,233		Ext. Lines	2.0			<u> </u>	
	Operat. Eng- detailed design/Contingency	30.0%		25870		25,870	7	Weighscale	No.	Units	Quantity	Rate	Total
	Operat. Eng- general const. supervision Operat. Eng- quality assurance	5.50% 2.00%		86233 31357		86,233 31,357	25 9	Buildings Pit & Apron	0 0	m2 m2	60 120	2,800.00 400.00	-
	Operat. Eng- quality assurance Operat. Eng- surveying	0.50%		7839		7,839	2		0	ea	120	80,000.00	
6849	Operat. Eng- Residency Contingency	30.0%		37629		37,629	11		0	m2	9000	40.00	-
•	Operational Enginering Sub-total					275,161	79		0	lm	1,500	400.00	-
	Total Operational Const. & Eng. Costs					1,843,029	527	light/signs	0	ls	1	50,000.00	-
	=======================================	======	===				=====				Weighscale		
5000	DOAD CIDE CONCEDUCTION	Unit	1.1:4	Quantity	Lump			Safety Rest	NI-	11-4-	0	D-4-	T-4-1
	ROAD SIDE CONSTRUCTION  RoadSide C- water	Price 758.00	Unit	0	Sum	0	0	Area Class A&B	No.	Units SAFETY RE	Quantity	Rate	Total
	RoadSide C- water	489.00		0		0	ő	Buildings	0	m2	100	3,000.00	-
	RoadSide C- storm	500.00		0		0	0	Class C				*	-
	RoadSide C - mobilization	3.0%		0		0	0	Site/toilets	0	ea	2	12,500.00	-
	RoadSide C- Utility Contingency	30.0%	•	0		0	0		0	m2	2500	40.00	-
1	Road Side Const. Utilities Sub-total					V	V	Road Const. Furnishings	0 0	lm Is	800	350.00 10,000.00	-
5210 I	RoadSide C- weighscales	-	ea	0	0	0	0	Landscaping	0	ls	1	5,000.00	-
	RoadSide C- safety rest areas		ea	0	0	0	0	light/signs	0	Is	-	50,000.00	-
	RoadSide C- tourist rest & view areas	40000		0	0	0	0						
5201	RoadSide C- mobilization	3.0%	1	0		0	0				SAFETY REST	I AREAS	
E200	DeadCide C. Contingonou	20.00/		^		0	0	Description	No	Lleite			Total
	RoadSide C- Contingency Road Side Construction Sub-total	30.0%		0		0	0	Description	No.	Units	Quantity	Rate	Total
	Road Side Construction Sub-total	30.0%		-		0	0		0	Units	Quantity 0 0		Total - -
		30.0%		-					0 0 0	Units	Quantity 0 0 0		Total - - -
	Road Side Construction Sub-total	30.0%		-		0	0		0	Units	Quantity 0 0		Total - - -
3550 I	Road Side Construction Sub-total  ROAD SIDE CONSTRUCTION COSTS  RoadSide E- detailed design  RoadSide E- detailed design/Contingency	10.00%		0		0 0	0 0		0 0 0	Units	Quantity 0 0 0 0 0		Total Total
3550 I 3559 I 6850 I	Road Side Construction Sub-total  ROAD SIDE CONSTRUCTION COSTS  RoadSide E- detailed design RoadSide E- detailed design/Contingency RoadSide E- general const. supervision	10.00% 30.0% 6.00%		0  0 0 0		0 0 0 0 0	0 0 0 0 0	Railway Removal	0 0 0 0	Units tklm	Quantity 0 0 0 0 Description Quantity 200.00	Rate	- - - -
3550   3559   6850   6851	Road Side Construction Sub-total  ROAD SIDE CONSTRUCTION COSTS  RoadSide E - detailed design  RoadSide E - detailed design/Contingency  RoadSide E - general const. supervision  RoadSide E - quality assurance	10.00% 30.0% 6.00% 2.00%		0 0 0 0 0		0 0 0 0 0	0 0 0 0 0 0	Railway Removal Track Cnst.	0 0 0 0	Units tklm tklm	Quantity  0 0 0 0 Description Quantity 200.00 200.00	Rate	- - - -
3550   3559   6850   6851   6852	Road Side Construction Sub-total  ROAD SIDE CONSTRUCTION COSTS  RoadSide E - detailed design RoadSide E - detailed design/Contingency RoadSide E - general const. supervision RoadSide E - quality assurance RoadSide E - surveying	10.00% 30.0% 6.00% 2.00% 1.00%		0 0 0 0 0 0 0		0 0 0 0 0 0	0 0 0 0 0 0	Railway Removal Track Cnst. Ballast	0 0 0 0 0 No.	Units tklm tklm m3	Quantity  0 0 0 0 0 Description Quantity 200.00 200.00 500.00	Rate	- - - -
3550   3559   6850   6851   6852   6859	Road Side Construction Sub-total  ROAD SIDE CONSTRUCTION COSTS  RoadSide E - detailed design  RoadSide E - detailed design/Contingency  RoadSide E - general const. supervision  RoadSide E - quality assurance	10.00% 30.0% 6.00% 2.00%		0 0 0 0 0		0 0 0 0 0	0 0 0 0 0 0	Railway Removal Track Cnst. Ballast Sub-ballast	0 0 0 0	Units tklm tklm	Quantity  0 0 0 0 Description Quantity 200.00 200.00	Rate	- - - -
3550   3559   6850   6851   6852   6859	Road Side Construction Sub-total  ROAD SIDE CONSTRUCTION COSTS  RoadSide E- detailed design RoadSide E- detailed design/Contingency RoadSide E- general const. supervision RoadSide E- quality assurance RoadSide E- surveying RoadSide E- Residency Contingency	10.00% 30.0% 6.00% 2.00% 1.00%		0 0 0 0 0 0 0		0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	Railway Removal Track Cnst. Ballast Sub-ballast	0 0 0 0 0 	Units tklm tklm m3 m3	Quantity  0 0 0 0 Description Quantity 200.00 200.00 500.00 500.00	Rate	- - - -
3550   3559   6850   6851   6852   6859	Road Side Construction Sub-total  ROAD SIDE CONSTRUCTION COSTS  RoadSide E - detailed design RoadSide E - detailed design/Contingency RoadSide E - general const. supervision RoadSide E - quality assurance RoadSide E - surveying RoadSide E - Residency Contingency Road Side E - Residency Contingency Road Side Engineering Sub-total  Total Road Side Const. & Eng. Costs	10.00% 30.0% 6.00% 2.00% 1.00% 30.0%		0 0 0 0 0 0		0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	Railway Removal Track Cnst. Ballast Sub-ballast I Resurfacing Tie-ins Turnout # 9	0 0 0 0 0 0 0 0 0	Units tklm tklm m3 m3 tklm ea	Quantity	Rate	- - - -
3550   3559   6850   6851   6852   6859	Road Side Construction Sub-total  ROAD SIDE CONSTRUCTION COSTS  RoadSide E- detailed design RoadSide E- detailed design/Contingency RoadSide E- general const. supervision RoadSide E- quality assurance RoadSide E- surveying RoadSide E- Residency Contingency Road Side Engineering Sub-total	10.00% 30.0% 6.00% 2.00% 1.00% 30.0%		0 0 0 0 0 0		0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	Railway Removal Track Cnst. Ballast Sub-ballast I Resurfacing Tie-ins	0 0 0 0 0 0 0 0 0 0 0	Units tklm tklm m3 m3 tklm ea	Quantity  0 0 0 0 0 0 Description Quantity 200.00 200.00 500.00 1.00 1.00	Rate	- - - -
3550   3559   6850   6851   6852   6859	Road Side Construction Sub-total  ROAD SIDE CONSTRUCTION COSTS  RoadSide E - detailed design RoadSide E - detailed design/Contingency RoadSide E - general const. supervision RoadSide E - quality assurance RoadSide E - surveying RoadSide E - Residency Contingency Road Side E - Residency Contingency Road Side Engineering Sub-total  Total Road Side Const. & Eng. Costs	10.00% 30.0% 6.00% 2.00% 1.00% 30.0%		0 0 0 0 0 0 0	Lump Sum	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0	Railway Removal Track Cnst. Ballast Sub-ballast I Resurfacing Tie-ins Turnout # 9	0 0 0 0 0 0 0 0 0	Units tklm tklm m3 m3 tklm ea	Quantity	Rate	- - - -
3550   3559   6850   6851   6852   6859	Road Side Construction Sub-total  ROAD SIDE CONSTRUCTION COSTS  RoadSide E- detailed design RoadSide E- detailed design/Contingency RoadSide E- general const. supervision RoadSide E- quality assurance RoadSide E- surveying RoadSide E- Residency Contingency Road Side E- Residency Contingency Road Side Engineering Sub-total  Total Road Side Const. & Eng. Costs	10.00% 30.0% 6.00% 2.00% 1.00% 30.0% 	 Unit Im	0 0 0 0 0 0 0	Lump	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0	Railway Removal Track Cnst. Ballast Sub-ballast I Resurfacing Tie-ins Turnout # 9 Others (see grading)	0 0 0 0 0 0 0 0 0 0 0	Units tklm tklm m3 m3 tklm ea ls	Quantity	Rate	- - - -
3550   3559   6850   6852   6852   6859   1	Road Side Construction Sub-total  ROAD SIDE CONSTRUCTION COSTS  RoadSide E- detailed design RoadSide E- detailed design/Contingency RoadSide E- general const. supervision RoadSide E- quality assurance RoadSide E- surveying RoadSide E- Residency Contingency RoadSide E- Residency Contingency Road Side Engineering Sub-total  Total Road Side Const. & Eng. Costs	10.00% 30.0% 6.00% 2.00% 1.00% 30.0%	Unit Im Im	0 0 0 0 0 0 0	Lump	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0	Railway Removal Track Cnst. Ballast Sub-ballast I Resurfacing Tie-ins Turnout # 9 Others (see grading)  R/rd X-ing	0 0 0 0 0 0 0 0 0 0 0 0 0	Units tklm tklm m3 m3 tklm ea ls	Quantity	Rate	- - - -
3550   3559   6850   6851   6852   6859	Road Side Construction Sub-total  ROAD SIDE CONSTRUCTION COSTS  RoadSide E- detailed design RoadSide E- general const. supervision RoadSide E- quality assurance RoadSide E- surveying RoadSide E- Residency Contingency RoadSide E- Residency Contingency Road Side Engineering Sub-total  Total Road Side Const. & Eng. Costs	10.00% 30.0% 6.00% 2.00% 1.00% 30.0% 	Unit Im Im Im	0 0 0 0 0 0 0 0 0	Lump	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Railway Removal Track Cnst. Ballast Sub-ballast I Resurfacing Tie-ins Turnout # 9 Others (see grading)  R/rd X-ing Planks	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Units tklm tklm m3 m3 tklm ea ea ls lm	Quantity	Rate	Total
3550   3559   6850   6851   6852   6859     1	Road Side Construction Sub-total  ROAD SIDE CONSTRUCTION COSTS  RoadSide E- detailed design RoadSide E- general const. supervision RoadSide E- quality assurance RoadSide E- surveying RoadSide E- surveying RoadSide E- Residency Contingency Road Side Engineering Sub-total  Total Road Side Const. & Eng. Costs	10.00% 30.0% 6.00% 2.00% 1.00% 30.0%	Unit Im Im Im	0 0 0 0 0 0 0 0	Lump	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Railway Removal Track Cnst. Ballast Sub-ballast I Resurfacing Tie-ins Turnout # 9 Others (see grading)  R/rd X-ing	0 0 0 0 0 0 0 0 0 0 0 0 0	Units tklm tklm m3 m3 tklm ea ls	Quantity	Rate	Total
3550   3559   6850   6851   6852   6859   1	Road Side Construction Sub-total  ROAD SIDE CONSTRUCTION COSTS  RoadSide E- detailed design RoadSide E- general const. supervision RoadSide E- quality assurance RoadSide E- surveying RoadSide E- Residency Contingency RoadSide E- Residency Contingency Road Side Engineering Sub-total  Total Road Side Const. & Eng. Costs	10.00% 30.0% 6.00% 2.00% 1.00% 30.0% 	Unit Im Im Im	0 0 0 0 0 0 0 0 0	Lump	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Railway Removal Track Cnst. Ballast Sub-ballast I Resurfacing Tie-ins Turnout # 9 Others (see grading)  R/rd X-ing Planks	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Units tklm tklm m3 m3 tklm ea ea ls lm	Quantity	Rate	Total
3550   3559   6850   6851   6852   6859   1	Road Side Construction Sub-total  ROAD SIDE CONSTRUCTION COSTS  RoadSide E - detailed design RoadSide E - general const. supervision RoadSide E - quality assurance RoadSide E - surveying RoadSide E - Residency Contingency RoadSide E - Residency Contingency Road Side E - Residency Contingency Road Side Engineering Sub-total  Total Road Side Const. & Eng. Costs	10.00% 30.0% 6.00% 2.00% 1.00% 30.0%		0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Lump	0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Railway Removal Track Cnst. Ballast Sub-ballast I Resurfacing Tie-ins Turnout # 9 Others (see grading)  R/rd X-ing Planks Sig/gates	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Units tklm tklm m3 m3 tklm ea ea ls lm Units tklm each	Quantity	Rate	Total
3550   3559   6850   6851   6852   6859   68	Road Side Construction Sub-total  ROAD SIDE CONSTRUCTION COSTS  RoadSide E - detailed design RoadSide E - general const. supervision RoadSide E - quality assurance RoadSide E - surveying RoadSide E - surveying RoadSide E - Residency Contingency RoadSide E - Residency Contingency Road Side Engineering Sub-total  Total Road Side Const. & Eng. Costs	10.00% 30.0% 6.00% 2.00% 1.00% 30.0%		0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Lump	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Railway Removal Track Cnst. Ballast Sub-ballast I Resurfacing Tie-ins Turnout # 9 Others (see grading)  R/rd X-ing Planks	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Units tklm tklm m3 m3 tklm ea ea ls lm	Quantity  0 0 0 0 0 0 Description Quantity 200.00 500.00 1.00 1.00 1.00 1.00 1.00 Quantity 45 1	Rate	Total
3550   3559   6850   6851   6852   6859   68	Road Side Construction Sub-total  ROAD SIDE CONSTRUCTION COSTS  RoadSide E- detailed design RoadSide E- detailed design/Contingency RoadSide E- general const. supervision RoadSide E- quality assurance RoadSide E- surveying RoadSide E- Residency Contingency RoadSide E- Residency Contingency Road Side Engineering Sub-total  Total Road Side Const. & Eng. Costs	10.00% 30.0% 6.00% 2.00% 1.00% 30.0%	Unit Im		Lump	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Railway Removal Track Cnst. Ballast Sub-ballast I Resurfacing Tie-ins Turnout # 9 Others (see grading)  R/rd X-ing Planks Sig/gates	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Units tklm tklm m3 m3 tklm ea ea ls lm Units tklm each	Quantity	Rate	Total
3550   3559   6850   6851   6852   6859   6851   5300   6853   5302   6859   68	Road Side Construction Sub-total  ROAD SIDE CONSTRUCTION COSTS  RoadSide E - detailed design RoadSide E - general const. supervision RoadSide E - quality assurance RoadSide E - surveying RoadSide E - surveying RoadSide E - Residency Contingency RoadSide E - Residency Contingency Road Side Engineering Sub-total  Total Road Side Const. & Eng. Costs	10.00% 30.0% 6.00% 2.00% 1.00% 30.0%	Unit Im Im Im ea ea ea	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Lump	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Railway Removal Track Cnst. Ballast Sub-ballast I Resurfacing Tie-ins Turnout # 9 Others (see grading)  R/rd X-ing Planks Sig/gates	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Units tklm tklm m3 m3 tklm ea ea ls lm Units tklm each	Quantity	Rate	Total
3550   3559   6850   6851   6852   6859   68	Road Side Construction Sub-total  ROAD SIDE CONSTRUCTION COSTS  RoadSide E - detailed design RoadSide E - detailed design/Contingency RoadSide E - general const. supervision RoadSide E - quality assurance RoadSide E - quality assurance RoadSide E - Residency Contingency RoadSide E - Residency Contingency Road Side Engineering Sub-total  Total Road Side Const. & Eng. Costs	10.00% 30.0% 6.00% 2.00% 1.00% 30.0%  ======= Unit Price 758.00 489.00 500.00 3.0% 30.0%	Unit Im Im ea ea ea	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Lump	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Railway Removal Track Cnst. Ballast Sub-ballast I Resurfacing Tie-ins Turnout # 9 Others (see grading)  R/rd X-ing Planks Sig/gates	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Units tklm tklm m3 m3 tklm ea ea ls lm Units tklm each	Quantity	Rate	Total
3550   3559   6850   6851   6852   6859   6851   5300   5303   5304   5305   5309   65300   5300   5300   6530	Road Side Construction Sub-total  ROAD SIDE CONSTRUCTION COSTS  RoadSide E- detailed design RoadSide E- detailed design/Contingency RoadSide E- general const. supervision RoadSide E- quality assurance RoadSide E- Residency Contingency RoadSide E- Residency Contingency RoadSide E- Residency Contingency Road Side Engineering Sub-total  Total Road Side Const. & Eng. Costs	10.00% 30.0% 6.00% 2.00% 1.00% 30.0% 	Unit Im Im ea ea ea	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Lump	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Railway Removal Track Cnst. Ballast Sub-ballast I Resurfacing Tie-ins Turnout # 9 Others (see grading)  R/rd X-ing Planks Sig/gates	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Units tklm tklm m3 m3 tklm ea ea ls lm Units tklm each	Quantity	Rate	Total
3550   3559   6850   6851   6852   6859   6851   5300   5303   5304   5305   5300   65320   5330   65320   5330   65320   5330   65320	Road Side Construction Sub-total  ROAD SIDE CONSTRUCTION COSTS  RoadSide E - detailed design RoadSide E - detailed design/Contingency RoadSide E - general const. supervision RoadSide E - quality assurance RoadSide E - quality assurance RoadSide E - Residency Contingency RoadSide E - Residency Contingency Road Side Engineering Sub-total  Total Road Side Const. & Eng. Costs	10.00% 30.0% 6.00% 2.00% 1.00% 30.0%  ======= Unit Price 758.00 489.00 500.00 3.0% 30.0%	Unit Im Im Im ea ea ea	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Lump	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Railway Removal Track Cnst. Ballast Sub-ballast I Resurfacing Tie-ins Turnout # 9 Others (see grading)  R/rd X-ing Planks Sig/gates	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Units tklm tklm m3 m3 tklm ea ea ls lm Units tklm each	Quantity	Rate	Total
3550   3559   6850   6851   6852   6859   6851   5300   5303   5304   5305   5302   65320   5330   5330   5330   65320   5330   65320	Road Side Construction Sub-total  ROAD SIDE CONSTRUCTION COSTS  RoadSide E- detailed design RoadSide E- detailed design/Contingency RoadSide E- general const. supervision RoadSide E- quality assurance RoadSide E- Residency Contingency RoadSide E- Residency Contingency RoadSide E- Residency Contingency Road Side Engineering Sub-total  Total Road Side Const. & Eng. Costs	10.00% 30.0% 6.00% 2.00% 1.00% 30.0%  ======= Unit Price 758.00 489.00 500.00 3.0% 30.0%	Unit Im Im Im ea ea ea	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Lump	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Railway Removal Track Cnst. Ballast Sub-ballast I Resurfacing Tie-ins Turnout # 9 Others (see grading)  R/rd X-ing Planks Sig/gates	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Units tklm tklm m3 m3 tklm ea ea ls lm Units tklm each	Quantity	Rate	Total
3550   3559   6850   6851   6852   6859   6851   6859   68	Road Side Construction Sub-total  ROAD SIDE CONSTRUCTION COSTS  RoadSide E - detailed design RoadSide E - detailed design/Contingency RoadSide E - general const. supervision RoadSide E - quality assurance RoadSide E - quality assurance RoadSide E - Residency Contingency RoadSide E - Residency Contingency Road Side Engineering Sub-total  Total Road Side Const. & Eng. Costs	10.00% 30.0% 6.00% 2.00% 1.00% 30.0%  ======= Unit Price 758.00 489.00 500.00 3.0% 30.0%	Unit Im Im ea ea	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Lump	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Railway Removal Track Cnst. Ballast Sub-ballast I Resurfacing Tie-ins Turnout # 9 Others (see grading)  R/rd X-ing Planks Sig /gates  Description	No. 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Units tklm tklm m3 m3 tklm ea ea ls lm Units tklm each	Quantity  0 0 0 0 0 Description Quantity 200.00 200.00 500.00 1.00 1.00 1.00 1.00 45 Railway Quantity 45 1  Rrird X-ing Quantity	Rate	Total
3550   3559   6850   6851   6852   6859   6851   5300   5303   5304   5305   5300   65320   5330   53340   5339   65320   6532	Road Side Construction Sub-total  ROAD SIDE CONSTRUCTION COSTS  RoadSide E- detailed design RoadSide E- detailed design/Contingency RoadSide E- general const. supervision RoadSide E- quality assurance RoadSide E- general const. supervision RoadSide E- general const. supervision RoadSide E- surveying RoadSide E- Residency Contingency Road Side Engineering Sub-total  Total Road Side Const. & Eng. Costs	10.00% 30.0% 6.00% 2.00% 1.00% 30.0%  ======= Unit Price 758.00 489.00 500.00 3.0% 30.0%  90,000 3.0% 30.0%	Unit Im Im Im ea ea	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Lump Sum	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Railway Removal Track Cnst. Ballast Sub-ballast I Resurfacing Tie-ins Turnout # 9 Others (see grading)  R/rd X-ing Planks Sig./gates  Description	No.  No.  No.  No.  No.  No.  No.  No.	Units tkIm tkIm m3 m3 tkIm ea ls lm  Units tkIm each	Quantity  O O O Description Quantity  200.00 200.00 500.00 1.00 1.00 1.00 1.00 1.00 1.	Rate	Total  Total  Total  Total  Total  Total  Total
3550   3559   6850   6851   6852   6859   6851   5300   651   5303   65304   65305   65300   6	Road Side Construction Sub-total  ROAD SIDE CONSTRUCTION COSTS  RoadSide E - detailed design  RoadSide E - general const. supervision  RoadSide E - quality assurance  RoadSide E - quality assurance  RoadSide E - Residency Contingency  RoadSide Engineering Sub-total  Total Road Side Const. & Eng. Costs	10.00% 30.0% 6.00% 2.00% 1.00% 30.0%  1.00% 30.0%	Unit Im Im Im ea ea ea ea	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Lump Sum	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Railway Removal Track Cnst. Ballast Sub-ballast I Resurfacing Tie-ins Turnout # 9 Others (see grading)  R/rd X-ing Planks Sig /gates  Description	No. 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Units tklm tklm m3 m3 tklm ea ls lm Units tklm each	Quantity  O O O O Description  Quantity  200.00 200.00 1.00 1.00 1.00 1.00 1.00	Rate	Total
3550   3559   6850   6851   6852   6859   68	Road Side Construction Sub-total  ROAD SIDE CONSTRUCTION COSTS  RoadSide E - detailed design RoadSide E - detailed design/Contingency RoadSide E - general const. supervision RoadSide E - quality assurance RoadSide E - surveying RoadSide E - surveying RoadSide E - Residency Contingency Road Side Engineering Sub-total  Total Road Side Const. & Eng. Costs	10.00% 30.0% 6.00% 2.00% 1.00% 30.0% 55.50% 30.0%	Unit Im Im ea ea	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Lump Sum	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Railway Removal Track Cnst. Ballast Sub-ballast I Resurfacing Tie-ins Turnout # 9 Others (see grading)  R/rd X-ing Planks Sig./gates  Description	No.  No.  No.  No.  No.  No.  No.  No.	Units tkIm tkIm m3 m3 tkIm ea ls lm  Units tkIm each	Quantity  O O O Description Quantity  200.00 200.00 500.00 1.00 1.00 1.00 1.00 1.00 1.	Rate	Total  Total  Total  Total  Total  Total  Total
3550   3559   6850   6851   6852   6859   6851   6852   6859   6851   6852   6859   6852   6859   6852   6852   6852   6852   6852   6852   6852   6872   68	Road Side Construction Sub-total  ROAD SIDE CONSTRUCTION COSTS  RoadSide E - detailed design  RoadSide E - general const. supervision  RoadSide E - quality assurance  RoadSide E - quality assurance  RoadSide E - Residency Contingency  RoadSide Engineering Sub-total  Total Road Side Const. & Eng. Costs	10.00% 30.0% 6.00% 2.00% 1.00% 30.0%  1.00% 30.0%	Unit Im Im Im ea ea	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Lump Sum	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Railway Removal Track Cnst. Ballast Sub-ballast I Resurfacing Tie-ins Turnout # 9 Others (see grading)  R/rd X-ing Planks Sig./gates  Description	No.  No.  No.  No.  No.  No.  No.  No.	Units tkIm tkIm m3 m3 tkIm ea ls lm  Units tkIm each	Quantity  O O O Description Quantity  200.00 200.00 500.00 1.00 1.00 1.00 1.00 1.00 1.	Rate	Total  Total  Total  Total  Total  Total  Total
3550   3559   6850   6851   6852   6859   6851   6852   6859   6851   6852   6859   6852   6859   6852   68	Road Side Construction Sub-total  ROAD SIDE CONSTRUCTION COSTS  RoadSide E - detailed design RoadSide E - detailed design/Contingency RoadSide E - general const. supervision RoadSide E - quality assurance RoadSide E - general const. supervision RoadSide E - general const. supervision RoadSide E - Residency Contingency Road Side E Residency Contingency Road Side Engineering Sub-total  Total Road Side Const. & Eng. Costs	10.00% 30.0% 6.00% 2.00% 1.00% 30.0%	Unit Im Im Im ea ea	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Lump Sum	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Railway Removal Track Cnst. Ballast Sub-ballast I Resurfacing Tie-ins Turnout # 9 Others (see grading)  R/rd X-ing Planks Sig./gates  Description	No.  No.  No.  No.  No.  No.  No.  No.	Units tkIm tkIm m3 m3 tkIm ea ls lm  Units tkIm each	Quantity  O O O Description Quantity  200.00 200.00 500.00 1.00 1.00 1.00 1.00 1.00 1.	Rate	Total  Total  Total  Total  Total  Total  Total
3550   3550   6850   6851   6852   6859   6851   6852   5300   6851   6852   6859   6852   6859   6852   6859   6852   68	Road Side Construction Sub-total  ROAD SIDE CONSTRUCTION COSTS  RoadSide E - detailed design  RoadSide E - general const. supervision  RoadSide E - quality assurance  RoadSide E - quality assurance  RoadSide E - Residency Contingency  RoadSide Engineering Sub-total  Total Road Side Const. & Eng. Costs	10.00% 30.0% 6.00% 2.00% 1.00% 30.0%	Unit Im Im Im ea ea	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Lump Sum	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Railway Removal Track Cnst. Ballast Sub-ballast I Resurfacing Tie-ins Turnout # 9 Others (see grading)  R/rd X-ing Planks Sig./gates  Description	No.  No.  No.  No.  No.  No.  No.  No.	Units tkIm tkIm m3 m3 tkIm ea ls lm  Units tkIm each	Quantity  O O O Description Quantity  200.00 200.00 500.00 1.00 1.00 1.00 1.00 1.00 1.	Rate	Total  Total  Total  Total  Total  Total  Total

COUNTY   C		& Safety Revie Company 018 Dollars)		Man. Reser Contingency Division/Site Road Type	y	0.0% 30.0% Medium Term	Land 30.0% n Option - 1	Medium Term Option	MT-1	a Road Types  1. 2In Frontage  12. 2In Acc Rds  3. 4In Acc Rds	9. R-E4L-4L D/M 10.N 4L EXP D/M 11.N 4L EXP D/E/M 12.N2L;F4LEXP D/M		
	CODE		EST.DATE August, 2018				L.M.			4.R4L-4L EXP R/B	13.INST.R/B-EX.RD		
A				Unit			Lump Sum		1				
1.543.75    1.54	Version	Sept.1, 2002	DESCRIPTION	Price	Unit	PerSection	Values		3500			\$ 6,839	
1982   1985	3500	DETAILED								0 1	1		
Stock   Contract   C	3530	Geotech, F				194324	0				Special		
TOTAL RESIDENT FINC INCISES   1,507.796							ŭ				Units Quantity	Rate	Total
## SESIDENT ENGINEERING ## 1007 789    TOTAL RESIDENT ENG. COSTS		TOTAL DE	TAILED DESIGN COSTS					1,796,414	513	-		-	-
TOTAL RESIDENT FINE, COSTS   1,007.795   565				======	===			=========	=====			-	-
PART 1 SUMMARY   CONSTRUCTION   16,944.898   April   Description   Revenue   Revenue	0000	REOIDEIT		60,6870				1,907,795				-	-
PART   SUMMARY CONSTRUCTION   16,044,658   4841		TOTAL RE	ESIDENT ENG. COSTS					1,907,795	545	-	Description	-	-
PART   SUMMARY COUSTRUCTION   36,948,958   4841   30,979,975   7444   176	=====	======	=======================================	======	===	=======		=======================================	=====	Description No.	Units Quantity	Rate	Total
PART   SUMMARY CONSTRUCTION   SUPERINSON   CONTROLLED   SUPERINSON								0				-	-
PART   SUMMARY CONSTRUCTION   SUPERINSON   CONTROLLED   SUPERINSON								0	0	•		-	-
CONSTRUCTION   September   S				=======	===	=======	=======	=========	=====			-	-
CONTRACTION COST TOTAL   DIVISIONISTE   Medium Term Option - 1   26.664.528   74.44		FARII		I				16,944,858	4841		Description	<u> </u>	-
CONSTRUCTION COST TOTAL   DIVISIONISTE Medium Term Option   1   26,054,505   7444											Units Quantity	Rate	Total
PROJECT MANAGERENT													=
2000   Project Man - office costs vages   2,00%   521091   0   521,091   149		CONSTRU	ICTION COST TOTAL	DIVISION/S	SITE	Medium Term	Option - 1	26,054,528	7444			-	=
2002   Project Man - printing costs   2005   100				0.000/			-					-	-
2003   Project Manager Sub-total   0.00%   0												-	-
Project Manager Sub-bial   Collect - office costs wages   1.00%   260545   0   260,545   74   2012 (Client - office costs -expenses   0.00%   0   0   0   0   0   0   0   0   0	2063	Project Man	- printing costs	0.00%		0	-	0				-	-
2012 Client   - office costs - expenses   0.50%   130273   0   0.00%   0   0   0   0   0   0   0   0   0	2061			F 0.00%		0	0					-	-
2012 Client   - office costs - expenses   0.50%   130273   0   0.00%   0   0   0   0   0   0   0   0   0	2010	Client	- office costs wares	1.00%		260545		260 545	74	-	Description	-	
Client   - general   0.00%   0   0   398,818   112     -	2012	Client	- office costs - expenses	0.50%				130,273	37	Description No.		Rate	Total
Client Sub-total   399.818   112												-	-
2072   Public Rel adv., media, displays   0.00%   0   0   0   0   0   0   0   0   0	20			0.0070		v	ŭ					-	-
2073   Public Rel opening ceremonies   0.00%   0   0   0   0   0   0   0   0   0	2070	Public Rel.	- wages & expenses	0.00%		0	0	0	0	•		-	-
2071   Public Rel - general (FN Accomm.)   0.00%   0   0   0   0   0   0   0   0   0						-			_		Description	-	
2040   Legal Costs - January   September   September		Public Rel.	- general (FN Accomm.)			-		0	0	Description No.		Rate	Total
Legal Costs - general		Public Relat	tions Sub-total					0	0	-		-	-
Legal Costs Sub-total   26,055   7												-	-
2081   Insurance - general   0.00%   0   0   0   0   0   0   0   0   0	2041			0.00%		U	U		_			-	-
2081   Insurance - general   0.00%   0   0   0   0   0   0   0   0   0	2080	Insurance	- const / liability F&O	0.00%		0	0	0	0	-		-	-
2099   Project Management Contingency   30.0%   320471   320,471   92		Insurance	- general				-	0	0			-	-
TOTAL PROJECT MANAGEMENT COSTS		Legal Costs	Sub-total					0	0				-
1,388,706   397   4.10%   397   4.10%   4.000   LAND   S/Building   # buildings   LS   0   0   1   Hectare = 10,000 Square Meters   0   1   Hectare = 2.471   Acres   0   1   Acre = 43,560 square feet   Planned ROW   3.9   4.000   Land(Code - Bus.,5%,Mrg.P,Rel\$,P/Tax,Etc   10.00%   0   0   0   0   0     MDIV/0!   Reg. ROW   3.9   0.000   0   MDIV/0!   Cost/Ha   0   107,637   0.000   0   0   MDIV/0!   Cost/Ha   0   107,637   0.000   0   MDIV/0!   Cost/MrZ   0.00   0.000   0   MDIV/0!   Cost/MrZ   0.00   0.000   0   MDIV/0!   Cost/MrZ   0.000   0.000   0   MDIV/0!   Cost/MrZ   0.000   MDIV/0!   Cost/M	2099			30.0%		320471		320,471	92		Description	-	-
A000 LAND				 rs				1,388,706	397	4.10%	Description		
A010   Land(Code -Mrkt,ROW,Serv,Imp.V,Ease.C   250,000   Res.   250,000					===		I.S.		=====	1 Hectare = 10 000 Sq	iare Meters		
According to the contingency Sub-total   According to the continuation		Land(Code		250,000		. 0	0	0		1 Hectare = 2.471 Acre	S		
4020   Land(Code - Bus., 5%, Mrg. P, Rel\$, P/Tax, Etc   10.00%   0   0   0   0   0   0   0   0   0		Acquisition S	Sub-total	2,000,000	Con	. 0	0	0	0				
4040 Land(Code -Demolition													
Cost /Ft2   0.00 \$ 1.00   4070   Land(Code -Not Used   #DIV/0!   mode   4080   Land(Code -Acq.F,M/Sal,TrvIV,Cntr.S,Appr   7.00%   0 0 0   0   mDIV/0!   Survey (unit   \$ 2,000   2.00	4040	Land(Code	-Demolition	0.00%		0	0	0	0	#DIV/0! Cost/M2	0.00 10.76		
4070 Land(Code -Not Used 4080 Land(Code -Acq.F,M/Sal,TrvIV,Cntr.S,Appr 7.00% 0 0 0 0 #DiV/0! Demo./unit \$ 10,000   4090 Land(Code -Surveys 0.00% 0 0 0 0 #Div/0! Demo./unit \$ 10,000   4090 Land(Code -Surveys 0.00% 0 0 0 0 #Description No. Units Quantity Rate Total  Associated costs-sub-total 0 0 0 0 0 Description				1.00%		0	0	0	0				
Associated costs-sub-total   0   0   0   0   0   0	4070	Land(Code	-Not Used			_				#DIV/0!			
Associated costs-sub-total 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0													
4099   Land Contingency Sub-total   30.0%   0   0   0   0			•			_						Rate	Total
4099   Land Contingency Sub-total   30.0%   0   0   0   0												-	-
TOTAL LAND COSTS 0 0 Description -		Associated	d costs-sub-total			0		0	0			<del>-</del>	-
TOTAL LAND COSTS 0 0 Description -	4099	Land Conti	ingency Sub-total	30.0%		n	0	0	n			-	-
									.	·	Beendage	-	-
				======	===	=======	=======				Description		-

CAProj\2121-00288-02 MoTI WFile: & Safety Review4.0 ENGINEER Company MCSL (2018 Dollars) Whistler Highw ACTIVITY Capacity and S CODE EST.DATE At Conceptual Est. R1 DATE: Blk Est. # 6.14A R2 DATE: Version Sept. 1, 2002 DESC	vay 99 Capacity and safety Review ugust, 2018	Man. Reserve Contingency Division/Site Road Type Length Unit Price	e 0.0% 30.0% Medium Terr 1 3500 Cost-Quant. PerSection	30.0% n Option - 1	Alpha Lake Road / Ch MT-1 Medium Term Option - 1 Counterflow 1 3500	MT-1 Medium 1	1. 2In Frontage 12. 2In Acc Rds 3. 4In Acc Rds 4.R4L-4L EXP R/B 5.R2/3L-4L EXP R/B 6.Retr.4L-4LEX R/B 7.R4L-4LEX R/B E/S	9. R-E4L-4L D/M 10.N 4L EXP D/M 11.N 4L EXP D/E/M 12.N2L;F4LEXP D/M 13.INST.R/B-EX.RD 14.AS IS 15. Misc. 20.I/C Str.&Ramps 21. Bridges 22. Grade Sep. Units Quantity	Est \$ 27,443,234 \$ 7,841 \$ 6,839	Total
MAN. RES planning		0.0%	111794		0	0			-	-
MAN. RES preliminary	design	0.0%	210210		0	0			-	-
MAN. RES utility consti	ruction	0.0%	436800		0	0			-	-
MAN. RES grade cons	truction	0.0%	5957009		0	0			-	-
MAN. RES structural co	onstruction	0.0%	12958173		0	0			-	-
MAN. RES paving cons	struction	0.0%	1048209		0	0			-	-
MAN. RES operation of	onstruction	0.0%	1567869		0	0			-	-
MAN. RES roadside co	nstruction	0.0%	0		0	0			-	-
MAN. RES other const	ruction	0.0%	60255		0	0			-	-
MAN. RES project mar	nagement	0.0%	1388706		0	0			-	-
MAN. RES land		0.0%	0		0	0			-	-
MAN. RES detailed eng	g.	0.0%	1796414		0	0			-	-
MAN. RES residency e	ng.	0.0%	1907795		0	0			-	-
MAN. RES Contingenc	y	0.0%	0		0	0			-	-
TOTAL MANAGEMENT	RESERVE		27443234		0	0	•		-	-
====== ================================		======= :		========	========	=====		Description		
TOTAL LESS ESCALAT	TION		0	27443234			Description No.	Units Quantity	Rate	Total
FISCAL			•	2			20001 2011 1101	ome quantity	-	
9900 ESCALATION									_	_
	D ESCALATION	COMPLETE	\$ DONE							_
2016-2017	0.5750%		0		0	0				_
2017-2018	0.6250%		0		0	0				_
2018-2019	1.0000%		0		o o	0				
2019-2020	1.0000%		0		0	0			-	-
2020-2021	1.0000%		0		0	0				_
2021-2022	1.0000%		0		0	0				-
2022-2023	1.0000%		0		0	0				_
2023-2024	1.0000%		0		0	0			-	-
2024-2025	1.0000%		0		0	0				_
									_	_
TOTAL ESCALATION		100.00%	0		0	0			-	-
				=======	==========	=====			-	-
PART 2 SUMMARY NO		ON COSTS			4 000 000	205			-	-
Non-Constru					1,068,236	305			-	-
Non-Const. 0	contingency				320,471	92			-	-
TOTAL NON-CONSTRU	ICTION COSTS				1.388.706	397	-		-	-
IOTAL NON-CONSTRU					1,308,700	397			-	-
Medium Te TOTAL FOR I		1			27,443,234	7841		Description	-	

CODE	& Safety Revie Company 018 Dollars) TY	Whistler Highway 99 Capacity and Capacity and Safety Review EST.DATE August, 2018	Man. Reserve Contingency Division/Site Road Type Length		30.0%	Medium Term - 2 2 SB lanes Taylor Wa	Option from y to	MT-2 Medium 1	1. 2In Front 2. 2In Acc I 3. 4In Acc I 4.R4L-4L E	age Rds Rds XP R/B	9. R-E4L-4 10.N 4L EX 11.N 4L EX 12.N2L;F4L 13.INST.R/	(P D/M (P D/E/M LEXP D/M (B-EX.RD	Est\$	]
Blk Est.	Sept.1, 2002	R2 DATE: DESCRIPTION	Unit Price Uni	Cost-Quant. t PerSection	Lump Sum Values	Bayshore MR	Dr 1 450	1 450	5.R2/3L-4L 6.Retr.4L-4 7.R4L-4LE 8. New 4L I	LEX R/B X R/B E/S EXP R/B	14.AS IS 20.I/C Str.8 21. Bridges 22. Grade \$	kRamps s	4,565,748 \$ 10,146 \$ 8,790	
2000	SUMMAR	Y BY ACTIVITY LEVEL PROJECT MANAGEMENT		Diff. -177723	Previous Estimate 0	1	77,723	Cost/LM 395	% of T 3.9%	% of TC 3.9%				
2500		PLANNING		-177723 			 20,270	 45	0.4%	0.4%				
3000 3500		PRELIMINARY DESIGN DETAILED DESIGN		-38610 -232682	0	;	38,610 32,682	86 517	0.8% 5.1%	0.8% 5.1%				
		Total Engineering	ı	-291562	0		91,562	648	6.4%	6.4%			469285	
4000		LAND ACQUISITION		0	0		0	0	0.0%	0.0%				
5000		GRADE CONSTRUCTION		-693575	_	6	93,575	1541	15.2%	15.2%				
5200 5300		ROAD SIDE CONSTRUCTION OTHER CONSTRUCTION		-18540	0		0 18,540	0 41	0.0% 0.4%	0.0% 0.4%				
5500 6000		STRUCTURAL CONSTRUCTION PAVING CONSTRUCTION	ON	-1782003 -103669	0		82,003 03,669	3960 230	39.0% 2.3%	39.0% 2.3%				
6500		OPERATIONAL CONSTRUCT	ION	-198870	0		98,870	442	4.4%	4.4%				
6700 6800		UTILITY CONSTRUCTION RESIDENT ENGINEERING		-246172		2	0 46,172	0 547	0.0% 5.4%	0.0% 5.4%				
		Total Construction	1	-3042829	0	3,0	42,829	6762	66.6%	66.6%				
9700		CONTINGENCY		-1053634	0	1,0	53,634	2341	23.1%	23.1%				
9800		SUB-TOTAL MANAGEMENT RESERVE		-4565748 0	0	4,5	65,748 0	10146 0	100.0%	100.0% 0.0%				
		TOTAL		-4565748	0	4,5	65,748	10146	100.0%	100.0%				
9900		ESCALATION		0	0		0	0		0.0%				
		TOTAL COST		-4565748	0		65,748	10146		100.0%				
=====	======	Constr. Less Resident Eng.		-2796657	0		96,657	6215	======	=======				
			_	ENG. & PM LAND CONST. MAN. RES. ESC. TOTAL		3,9	10,071 0 55,677 0 0 65,748	1356 0 8790 0 0	13.4% 0.0% 86.6% 0.0% 0.0% 100.0%					
	Medium Te	erm Option - 2	Assumptions			Shoulder		Lane	Lane	Median	Lane	Lane	Shoulder	=
	1	Existing Right-Of -Way	, m		Existing Rd Pvmt Width		0.0	-	-	-	-	-	-	j
	2	New Addition Right-Of -Way	partial taking		New Rd.	Shoulder	1.50	Lane	Lane 3.60	Median	Lane	Lane	Shoulder	Ditch W.
	-	ROW			Pvmt Width			Asphalt d	epth mm	100	Tonage t		Unit Price	\$ 151.00
		Bridges		Width(m)	Length(m)	<u>SCOPE</u>		450	Bridge L.	Seg. L. 450		X-sect./lm 14.05		
	3.1	0		12.2	0.0	CBS			D= meter			Rock	2,041	\$ 107.66
	3.2 3.3	0		12.2 12.2	0.0 0.0	SGSB		4.0 slope	0.257 D= meter		\$ 60.00 Unit	Stripping	1,531 794	
	3.4 3.5	0		12.2 12.2	0.0 0.0			4.0	0.210	873	\$ 56.00	Borrow	1,956	\$ 42.95
		-												
		Tunnels 2InSt.w-x	Length(m) 0	Width(m) 12.0	Height(m) 8.27									
	4.2	x-Pass.TI	0	3.0	3.16									
		shaft snowshedlength (lm)	0 0	2.0	Diameter									
		Bridges	Net \$/M2	Gross\$/m2										
	3.1	0	#DIV/0!	#DIV/0!	-									
	3.2 3.3	0	#DIV/0! #DIV/0!	#DIV/0! #DIV/0!										
	3.4	0	#DIV/0!	#DIV/0!										
	3.5	0	#DIV/0!	#DIV/0!	-									
						I								

					Wediam remi	Option - 2 2 0L	ianes nom rayior way t	Daysnore	5 01					
File:	O:\Proj\2121-0	0288-02 MoTI Whistler Hwy 99 Capacity	Man. Reser		0.0%	Land	cid Rd to South of Bar	I aka Bla	Pood Typos		9. R-E4L-4	II D/M		
riie.	Company	w\4.0 ENGINEERING DESIGN\4.3	Contingenc		30.0%			MT-2	1. 2ln Frontac	10	10.N 4L E			
(2		Whistler Highway 99 Capacity and			Medium Tern				12. 2ln Acc Rd		11.N 4L E.			
ACTIVI		Capacity and Safety Review	Road Type	-	1	ii Option - 2	Medium Term Option	Medium	3. 4ln Acc Rd		12.N2L;F4			
CODE		EST.DATE August, 2018	Length		450	LM	- 2		4.R4L-4L EXI		13.INST.R		Est \$	
CODL		LST.DATE August, 2010	Lengui		450	L.IVI.	2 SB lanes from		4.1\4L-4L LXI	IVD	13.1101.11	/b-LX.ND	∟δί ψ	
							Taylor Way to							
Co	nceptual Est.	R1 DATE:			=======		Bayshore Dr		5.R2/3L-4L E	XP R/B	14.AS IS	15 Misc	4.565.748	
	# 6.14A	R2 DATE:	Unit		Cost-Quant.	Lump Sum	Dayshore Di	1	6.Retr.4L-4LE		20.I/C Str.		\$ 10,146	
	Sept.1, 2002	DESCRIPTION	Price	Unit	PerSection	Values	450		7.R4L-4LEX I		21. Bridge		\$ 8,790	
							- MR		8. New 4L EX		22. Grade		7,	
2500	PLANNING	3												
2521	Consultant	- transport. planning study	5.50	LM	2475		2,475	6	Description	No.	Units	Quantity	Rate	Total
2531	Consultant	- corridor study	5.50	LM	2475		2,475	6						-
2541	Consultant	- functional plan. study	5.50	LM	2475		2,475	6						-
2502	Consultant	- general	5.0%		371		371	1						-
	Consultant	sub-total					7,796	17						-
														-
		- project ident.	5.50		2475		2,475	6						-
		- transport. planning study	5.50		2475		2,475	6						-
		- corridor study	7.70		3465		3,465	8						-
		- functional study	7.70		3465	0	-,	8						-
2501		- general	5.0%		594		594	1						
	Client Sub-t	otal			12474		12,474	28				Description		-
									Description	No.	Units	Quantity	Rate	Total
2599	Planning Co	ontingency	30.0%		6081		6,081	14						-
	TOTAL DI						00.054							-
	TOTAL PL	ANNING ============					26,351	59						-
		ARY DESIGN												-
		- aerial base plan	6.50	LM	2925		2,925	7						_
		- prel. design	7.80		3510		3,510	8						_
		- control survey	6.50		2925		2,925	7						_
		- environmental impact	13.00		5850		5,850	13						_
		- functroad field survey	6.50		2925		2,925	7						_
		- functional design	5.20	LM	2340	0		5	-			Description		_
		- funct. des. structural	3.90	LM	1755	0	1,755	4	Structural	0.50%				
		- geotechnical design	32.50		14625		14,625	33						
		- right-of-way research	3.90	LM	1755	0		4	\$/Prop. \$	150				
3002	Consultant	- general	0.0%		0		0	0	Description	No.	Units	Quantity	Rate	Total
	Consultant	sub-total					38,610	86	-			-		-
														-
	Client	- aerial base plan	0.00		0		0	0	Cantilever Fir	1	ea	0	3,500.00	-
	Client	- prel. design	0.00		0		0	0						-
		- control survey	0.00		0		0	0		1	lm	135	50.00	6,750
		- environmental impact	0.00		0		0	0	Bus Pullout F	1	ea	1	10,000.00	10,000
	Client	- functroad field survey	0.00		0		0	0						-
		- functional design	0.00		0		0	0						-
	Client	- funct. des. structural	0.00		0		0	0						-
	Client	- geotechnical design	0.00		0		0	0						-
	Client	- right-of-way research	0.00		0		0	0						-
3001		- general	0.0%		0		0	0						-
	Client Sub-t	otal					0	0						-
3000	Preliminan	design Contingency	30.0%		11583		11,583	26						-
3099	ı ı <del>c</del> ııılılıdı)		30.0%		11000		11,303	20						-
	TOTAL PR	RELIMINARY DESIGN					50.193	112				Description		16.750
=====	=======	=======================================		===	=======	=======	=======================================					_ 13011ptio11		10,100
							•	•						

Description	7,748 1,146 1,790 Total 1.00 3,969 - 1.00 -
6711 Uil. Prov Telephone	1.00 3,969
First   Util Others   - pipelines   0.00   m   0   0   0   0   0   0   0   0	
First   Util Others - transit   O.00 LM   O   O   O   O   O   O   O   O   O	- - - - - - - - - - - - - - - - - - -
Collaboration   Collaboratio	3,969
Source   Spec	185
Spec	Neat vol.cal 6.322
5010   Grade Cons- site prep./clear,grubbing   26,000   ha   0.45   0   11,709   26   c.b.c.(w)   6.5   11.8   4.0   5020   Grade Cons- road grade/exc,placing,fill   61.32   m3   6638   20719   427,760   951   sgsb (w)   8.8   11.8   Pmt W=   5030   Grade Cons- drainage/pipe,cul.   1070.00   LM   0   20754   20,754   46   sGSBslope :1   4.0   0.0   0   4   4   4   500   5050   Grade Cons- multiplate   15000   lm   0   0   4   4   5050   5050   Grade Cons- GBC/produce,place,comp   56.00   m3   873   48,898   109   *road (l)   450   0   5051   Grade Cons- GBC/produce,place,comp   60.00   m3   794   47,628   106   *no.cul./kilk   3.0   5.0   \$2,530   5060   Grade Cons- grade finishing landscaping   200   m2   2208   44,17   10   cul.(l)   9.64   11.80   \$1,070   5061   Grade Cons- grade finishing fencing   5063   Grade Cons- grade finishing fencing   5063   Grade Cons- passing lanes   5096   Grade Cons- sidewalks,curb & gutter   5095   Grade Cons- sidewalks,curb & gutter   100000   NO   0.50   60000   110,000   244   Decel.(T-lm)   520   440   520	Resurface th Road 0.0 ONLY ol. 1 - 3.6 16.9
5090 Grade Cons- sidewalks, curb & gutter 5005 Grade Cons-detours c/w ex,bf, paving 100000 NO 0.50 60000 110,000 244 Decel. (T-lm) 520 440	0.0 A.C. (mm) 50 A.B.C. (mm) 0 Appl. rate 1.50
5001 Grade Cons- mobilization         3.0%         20201         20,201         45         Accel.(T-Im)         950         630           5099 Grade Construction Sub-total         208072         208,072         462         Left T.(T-Im)         716         596           Grade Construction Sub-total         901,647         2004         TOTAL         2186         1666	
GRADE CONSTRUCTION COSTS 693575 901,647 2004 <u>Drainage No. Units Quantity R</u>	np 260 80 456 796
Solution	260 80 456 796
Total Grade Const. & Eng. Costs         1,048,165         2329	260 80 456 796

File:		3-02 MoTI Whistler Hwy 99 Capacity 0 ENGINEERING DESIGN\4.3	Man. Reser	ve	0.0%		cid Rd to South of Bay	ı	Road Type	es	9. R-E4L-4	4L D/M		
(2)	Company MC		Contingenc		30.0% Medium Tern		MT-2		1. 2ln Fron 2. 2ln Acc		10.N 4L E			
ACTIVI		istler Highway 99 Capacity and pacity and Safety Review	Road Type		1	n Option - 2	Medium Term Option	wealum	3. 4ln Acc		11.N 4L EX 12.N2L;F4	LEXP D/M		
CODE	EST	T.DATE August, 2018	Length		450	L.M.	- 2 2 SB lanes from		4.R4L-4L I	EXP R/B	13.INST.R	VB-EX.RD	Est \$	
							Taylor Way to							
	nceptual Est. R1		11-4			L O	Bayshore Dr		5.R2/3L-4I		14.AS IS		4,565,748	
	# 6.14A R2 Sept.1, 2002	DATE: DESCRIPTION	Unit Price	Unit	Cost-Quant. PerSection	Lump Sum Values	1 450		6.Retr.4L- 7.R4L-4LE		20.I/C Str. 21. Bridge		\$ 10,146 \$ 8,790	
							MR		8. New 4L		22. Grade			-
			Unit		Quantity	Lump			Brdge	Site \$	Piers \$	Abut. \$	abut. extra length (lm)	
		L CONSTRUCTION	Price	Unit	•	Sum			1	-	160,504	145,800	4	0%
	Struct.Cons - was Struct.Cons - sa		758.00 489.00		0		0	0	2	-	177,516 177,516	109,800 109,800		0% 0%
	Struct.Cons - st		500.00		0		0	0	4	-	177,516	109,800		0%
	Struct.Cons - m		3.0%		0		0	0	5	- Dior/Ut	177,516	109,800	A b +/6/1 11 A A	0%
5599		tility contingency t. Utilities Sub-total	30.0%		U		0	0	1	Pier/Ht 8	Pier No.	P/\$/VLM 20063	Abut/\$/HLM 4500	
5510	Ctores Comp. to	anal site proporation	0.00	lm	0	0	0	0	2	8	1	22190	4500	
		Innel site preparation Innel construction	0.00	lm	0	U	0	0	4	8	1	22190 22190	4500 4500	
5512	Struct.Cons - sr	now shed site prep.	0.00		0		0	0	5	8	1	22190	4500	
5513	Struct.Cons - sr	now shed site const.	-	lm	0	Demolition	0	0	DECK #1	(W) 12.2	(L) 0	(\$/m2) 1791	Net Cost 315493	No. of Bridge
		ridge site preparation		LS	0	Domondon	0	0	DECK #2	12.2	0	1981	295936	Ö
	Struct.Cons - br			LS LS	0		0		DECK #3 DECK #4	12.2 12.2	0 0	1981 1981	295936 295936	0
		ridge abutments ridge superstructure		LS	0	0	0	0	DECK #4	12.2	0	1981	295936	0
5518	Struct.Cons - re	etain. wall site prep.		LS	400=		0	0				Gross/m2	Net/m2	
5519 5501		etaining wall const.	1580 3.0%		1095 51903		1,730,100 51,903		Bridge #1 Bridge #2			#DIV/0! #DIV/0!	#DIV/0! #DIV/0!	
	Struct.Cons - C	ontingency	30.0%		534601		534,601	1188	Bridge #3			#DIV/0!	#DIV/0!	Tnnl \$/Im -Net
	Structural Const	truction Sub-total					2,316,604	5148	Bridge #4 Bridge #5			#DIV/0! #DIV/0!	#DIV/0! #DIV/0!	- Tnnl \$/lm -Gross
	STRUCTURAL	L CONSTRUCTION COSTS	3				2,316,604	5148	Bridge #3		x-Pass.TI	shaft		-
3520	Struct. Eng de	etailed design	5.50%		127413		127,413	283	Tunnel L=	1-D-Shape 0	2-D-Shape	1-Circle	Radius-1-D Per.S&Rf	7.267 24.32
	-	etailed design/Contingency	30.0%		38224		38,224	85	Tun. H1	5.100	2.550	Radius	m2/rkac	6.25
		eneral const. supervision uality assurance	4.00% 2.00%		92664 46332		92,664 46,332	206	C.Pt. H4 Tun.W	1.00 12.00	1.00 3.00	1.00 Wall Tk.	Tnnl height Radius-2-D	8. <b>27</b> 2.157
	Struct. Eng qu		0.50%		11583		11,583	26	RFLT.	0.250	0.250		Per.S&Rf	8.42
6829		esidency Contingency	30.0%		45174		45,174	100	WLT.	0.250	0.250	SOBT	m2/rkac	6.25
	Structural Engin	eering Sub-total					361,390	803	BST. TOBT	0.500 0.100	0.200 0.100	Excm3	Tnnl height	3.16
		ral & Eng. Costs					2,677,994	5951	SOBT	0.100 0.100		Obk-m3	-	-
									BOBT Items	Quantity	rate	Liner-m3 Total \$	Avg.\$/ tot-Im	1-Circle
	PAVING CON		454.00		570	SM./OIL	400.050	004	Excm3	0	125	0	#DIV/0!	0
		achine paving asphalt achine paving concrete	151.00		578	4016	100,650 0	224 0	Obk-m3 Rk anch-Ea	0	2625 1125	0		0
	Paving Con - ho		0.00		2295		0	0	MiscIm	0	2500	0		0
	Paving Con - sh	noulder paving avement finishing	0.00 100.00		194 0		0	0	Liner-m3 Drainage-lm	0	1050 550	0		10.00 %
	Paving Con - se		0.00				0	0	Lighting-m	0	900	0	#DIV/0!	5%
	Paving Con - m Paving Con - pa		3.0% 0.0%		3019 0		3,019 0	7	Mech-m Misclm	0	2100 1000	0		15% 3%
	Paving Con - Co		30.0%		31101		31,101	-		6.67m2/25mm		0	-	snowshed
	DAVING CON	STRUCTION COSTS					134,770	200	60kg=1m2 asphalt		1.5L =1M2 (F		length (lm)	0.0
							134,770	299	A.C.	(T)=mm 100	.25L =1M2 ( <sup>1</sup>	230		1.0 0.50
	Paving Eng - de	etailed design etailed design/Contingency	5.50% 30.0%		7412 2224		7,412 2,224	16	A.B.C. \$Oil/Litre	0 \$1.50	0 5%	1.00 Walls	\$ 1,500.00 1.0	11.20
		eneral const. supervision	2.00%		2695		2,224 2,695		Appl. rate	1.75	1.75		\$ 1,580.00	- 11.20
6861	Paving Eng - qu	uality assurance	5.00%		6738		6,738	15	Pavement	Removal	(See I155)	Base	1.0	26.00
	Paving Eng - St Paving Eng - Re	urveying esidency Contingency	0.50% 30.0%		674 3032		674 3,032	7	m2 90	\$/m2 \$8.84	Total 796		\$ 1,000.00 1.0	37.00
	Paving Enginee		22.370				22,776		Milling		•	5.00	\$ 60.00	-
	Total Daving	Const. & Eng. Costs					157,546	350	m2 675	\$/m2 \$9.63	Total 6500	Drainage Electrical	\$ 500.00 \$ 4,500.00	-
	Total Pavillo													
		======================================	======	===	=======			=====				Mech.	\$ 5,000.00	-
=====			======	===	=======	=======		=====				Mech. Misc.		-

3549   Operat Eng- detailed design   30.0%   4266   4266   9   Weighscale   No. Units   Quantit   14,219   14,219   32   Str. Lines   2.0   1.0   1.3   1.0   1.3   1.0   1.3   1.0   1.3   1.0   1.3   1.0   1.3   1.0   1.		
Concentrate		
Conception   Est   ATE   Conception   Est   ATE   Conception   Conce	Est \$	
Deptile   Dept	4,565,748 \$ 10,146 \$ 8,790	
Sept	Rate 1 55,000.00 4 45,000.00	Total 27,500 90,000
Section   Sect	1 40,000.00	20,000
14.219   14.219   32 Ext. Lines   2.0   1.0   1.5		137,500
Total Operational Const. & Eng. Costs	Rate 0 2,800.00 0 400.00 1 80,000.00 0 40.00 0 40.00	15.00 Total
Unit	1 50,000.00	
Solid RoadSide C - weighscales	3,000.00 2 12,500.00 0 40.00	Total
ROAD SIDE CONSTRUCTION COSTS	10,000.00 1 5,000.00 50,000.00 SSTAREAS Rate	- - - - Total
3550 RoadSide E - detailed design	0 -	-
Total Road Side Const. & Eng. Costs   Unit   Quantity   Lump   Sum   Earthworks   See grading   O   Im   Sum   Sum   Earthworks   See grading   O   Im   Sum   S	50.00 700.00 60.00 56.00 30.00	-  Total - - - -
Unit	125000.00	-
5304 Other Const- sanitary	0 1500.00 2000.00 1 400.00	- - -
Signature   Sign		Total
Signature   Sign	5 2500.00 1 250000.00 - -	- - -
5340 Other Const- environmental mitigations       90,000 ea       0.20       18,000       40         5301 Other Const- mobilization       3.0%       540       540       1         5399 Other Const- Contingency       30.0%       5562       5,562       12	Rate -	Total -
5301 Other Const- mobilization       3.0%       540       1         5399 Other Const- Contingency       30.0%       5562       5,562       12	-	-
	- - -	- - -
OTHER CONSTRUCTION COSTS 24,102 54	-	-
3570 Other Eng detailed design   5.50%   1326   0   1,326   3	Rate 1 50,000 1 40,000	Total 10,000 8,000 - - -
Total Other Const. & Eng. Costs 28,019 62 Environme	tal	18.000
	<u>ui</u>	10,000

				wedium rem	11 Option - 2 2 3E	lanes nom rayior way t	o baysilore	e Di			
File:	O:\Proj\2121-00288 & Safety Review\4.0	3-02 MoTI Whistler Hwy 99 Capacity 0 ENGINEERING DESIGN\4.3	Man. Reserv	re 0.0	% Land	cid Rd to South of Ba	Lake Pla	Road Types	9. R-E4L-4L D/M		
	Company MC	SL	Contingency	30.0	% 30.0%		MT-2	1. 2ln Frontage	10.N 4L EXP D/M		
(2) ACTIVI		istler Highway 99 Capacity and S pacity and Safety Review	Division/Site Road Type		rm Option - 2	Medium Term Option	Medium	12. 2ln Acc Rds 3. 4ln Acc Rds	11.N 4L EXP D/E/M 12.N2L;F4LEXP D/M		
CODE	•		Length		L.M.	- 2		4.R4L-4L EXP R/B	13.INST.R/B-EX.RD	Est \$	
						2 SB lanes from					
Cor	nceptual Est. R1	DATE:		=======	=	Taylor Way to Bayshore Dr		5.R2/3L-4L EXP R/B	14.AS IS 15. Misc.	4,565,748	
Blk Est.	# 6.14A R2	DATE:	Unit	Cost-Quant		1		6.Retr.4L-4LEX R/B	20.I/C Str.&Ramps	\$ 10,146	
Version	Sept.1, 2002	DESCRIPTION	Price	Unit PerSection	values	450 - MR		7.R4L-4LEX R/B E/S 8. New 4L EXP R/B	<ul><li>21. Bridges</li><li>22. Grade Sep.</li></ul>	\$ 8,790	
3500	DETAILED DE	ESIGN				IVIIX		0 1	1		
2520		m 3510,3520,3540,3550,357	0.90%	3272	1 0	259,949		Bridge Tunnel	Special		
	Geotech. E - de Geotech. Er - Co		30.0%	981		<b>32,721</b> 9,816	73 22	Description No.	Units Quantity	Rate	Total
									-	-	-
=====		ILED DESIGN COSTS	=======================================			302,486 ==========	672			-	-
6800	RESIDENT EN		0.0070			220,022				-	-
	tro	om 6810,6820,6840,6850,686 	00,6870			320,023				-	-
		DENT ENG. COSTS				320,023			Description		
=====	=======================================		=======			=========	=====	Description No.	Units Quantity	Rate	Total
						0				_	-
						0	0			-	-
=====			=======================================		= =======					-	-
	PART 1 SU	JMMARY CONSTRUCTION				2,796,657	6215		Description	-	<u> </u>
	ENGIN	NEERING & SUPERVISION				537,734	1195	Description No.	Units Quantity	Rate	Total
	CONT	RACTUAL CONTINGENCY				1,000,317				-	-
						0				Ξ	=
			DIVISION/SI	TE Medium Te	rm Option - 2	4,334,708	9633			Ξ.	-
	PROJECT MA	NAGEMENT ffice costs wages	2.00%	Land 8669	4 0	86,694	193			-	-
2062	Project Man - of	ffice costs - expenses	0.50%	2167	4 0	21,674	48			-	-
	Project Man - pr	rinting costs eneral (MoTI Regional Cost F	0.00% 0.00%		0 0 0 0					-	-
2001	Project Manage		0.00%		0 0	108,368	-			-	-
2040		fine costs was so	1.000/			42 247			Description	-	
		ffice costs wages ffice costs - expenses	1.00% 0.50%	4334 2167		- , -	96 48	Description No.	Units Quantity	Rate	Total
		rinting costs	0.00%		0 0	, -		Decemption 110.	Ormo Quartery	-	-
2011	Client - ge Client Sub-total	eneral	0.00%		0 0	0 65,021	144			-	-
							-			_	-
		ages & expenses dv., media, displays	0.00% 0.00%		0 0 0 0		-			-	-
		pening ceremonies	0.00%		0 0				Description	-	
2071		eneral (FN Accomm.)	0.00%		0 0			Description No.	Units Quantity	Rate	Total
	Public Relations	Sub-total				0	0			-	-
	Legal Costs - la		0.10%	433						-	-
2041	Legal Costs - ge Legal Costs Sub		0.00%		0 0	0 4,335				-	-
	·									-	-
		onst./ liability, E&O	0.00% 0.00%		0 0	0				-	-
2001	Insurance - ge Legal Costs Sub		0.0070		0 0	0				-	-
	D.:		20.00/			FO 047	440			-	-
2099	roject Manage	ment Contingency	30.0%	5331 	ı 	53,317	118		Description	<u>-</u>	-
		ECT MANAGEMENT COST				231,040		4.10%			
	LAND		\$/Building	=== ===== # buildings	LS	0		1 Hectare = 10,000 Sq	uare Meters		
	Land(Code -Mr	rkt,ROW,Serv,Imp.V,Ease.C	250,000	Res.	0 0	0	0	1 Hectare = 2.471 Acre	es		
	Acquisition Sub-	-total	2,000,000	Corr	0	0	0	1 Acre = 43,560 square Planned RO			
		 ıs.,5%,Mrg.P,Rel\$,P/Tax,Etc			0 0	0	0	#DIV/0! Req. ROW	0.5		
		wners(LS,Apprsl,Rprt,Lgl,In	7.00%		0 0			#DIV/0! Cost/Ha	0 107,637 0.00 10.76		
	Land(Code -De Land(Code -Pro	emolition o.Man,P.Tax,Util,Security	0.00% 1.00%		0 0		-	#DIV/0! Cost/M2 #DIV/0! Cost /Acre	0.00 10.76 0 43,560		
4060	Land(Code -No	ot Used						Cost /Ft2	0.00 \$ 1.00		
	Land(Code -No	ot Used :q.F,M/Sal,TrvlV,Cntr.S,Appr	7.00%		0	0	0	#DIV/0! Demo./unit	\$ 10,000		
	Land(Code -Ac		0.00%		0	0	-	#DIV/0! Survey /unit	\$ 2,000		
								Description No.	Units Quantity	Rate	Total
										-	-
	Associated cos	sts-sub-total			0	0	0			-	-
4000			20.00/				-			-	-
4099	Land Continge	Sub-lotal	30.0%		0	0	0			-	-
	TOTAL LAND					0	0		Description		-

			wealum Term C	)ption - 2 2 SB	ianes from Taylor Way to	Baysnore	Dr			
File: & Safety Review4.0 ENGINEERING Company MCSL (2018 Dollars) Whistler Highway S ACTIVITY Capacity and Safety CODE EST.DATE Augus	DESIGN/4.3 Mai Cor 9 Capacity and \$ Div / Review Roa	n. Reserve ntingency ision/Site ad Type ngth	0.0% 30.0% Medium Term 1 450	·	Medium Term Option - 2	MT-2	Road Types 1. 2In Frontage 2. 2In Acc Rds 3. 4In Acc Rds 4.R4L-4L EXP R/B	9. R-E4L-4L D/M 10.N 4L EXP D/M 11.N 4L EXP D/E/M 12.N2L;F4LEXP D/M 13.INST.R/B-EX.RD	Est \$	
Conceptual Est. R1 DATE: BIk Est. # 6.14A R2 DATE: Version Sept.1, 2002 DESCRIF		Unit Price Unit	Cost-Quant. t PerSection	Lump Sum Values	2 SB lanes from Taylor Way to Bayshore Dr 1 450 MR	450	5.R2/3L-4L EXP R/B 6.Retr.4L-4LEX R/B 7.R4L-4LEX R/B E/S 8. New 4L EXP R/B	14.AS IS 15. Misc. 20.I/C Str.&Ramps 21. Bridges 22. Grade Sep.	\$ 10,146 \$ 8,790	
9800 MANAGEMENT RESERVE MAN. RES planning MAN. RES preliminary des MAN. RES utility constructi		0.0% 0.0% 0.0%	26351 50193		0 0	0 0	Description No.	Units Quantity	Rate - -	Total - -
MAN. RES grade construct MAN. RES structural const MAN. RES paving construct MAN. RES operation const	ion ruction tion	0.0% 0.0% 0.0% 0.0%	901647 2316604 134770 258531		0 0	0 0 0 0			- - -	-
MAN. RES roadside constr MAN. RES other constructi MAN. RES project manage MAN. RES land	uction on	0.0% 0.0% 0.0% 0.0%	0 24102 231040 0		0 0 0	0 0 0 0			- - -	- - -
MAN. RES detailed eng. MAN. RES residency eng. MAN. RES Contingency		0.0% 0.0% 0.0%	302486 320023 0		0 0 0	0 0 0			- - -	- - -
TOTAL MANAGEMENT RE TOTAL LESS ESCALATION FISCAL	=======================================		4565748 = ===================================	======= 4565748	0	0	Description No.	Units Quantity	Rate	Total
9900 ESCALATION YEAR PROJECTED E 2016-2017 2017-2018	SCALATION CO 0.5750% 0.6250%	MPLETE 5.00% 10.00%	\$ DONE 0 0		0	0			- - -	- - -
2018-2019 2019-2020 2020-2021 2021-2022	1.0000% 1.0000% 1.0000% 1.0000%	35.00% 45.00% 5.00% 0.00%	0 0 0		0 0 0	0 0 0			- - -	- - -
2022-2023 2023-2024 2024-2025	1.0000% 1.0000% 1.0000%	0.00% 0.00% 0.00%	0 0 0		0 0	0 0 0			- - -	- - -
TOTAL ESCALATION  PART 2 SUMMARY NON-C Non-Construction	CONSTRUCTION (		0	=======	177,723	395			- - -	- - -
Non-Const. Cont	ON COSTS		·		53,317 231,040	118  513 ======			- - -	- - -
Medium Te TOTAL FOR ROA	O TYPE	1			4,565,748	10146		Description		-

CODE	& Safety Revie Company 018 Dollars) TY	Whistler Highway 99 Capacity and Capacity and Safety Review EST.DATE August, 2018	Man. Reserv Contingency Division/Site Road Type Length	30.0% Medium Terr 1 3150	30.0% m Option - 3A	Medium T	O Alpha Lake T-3A Term Option 3A r Widening	MT-3A Medium	1. 2ln Fron 2. 2ln Acc 3. 4ln Acc 4.R4L-4L E	tage Rds Rds EXP R/B	9. R-E4L-4 10.N 4L EX 11.N 4L EX 12.N2L;F4I 13.INST.R	(P D/M (P D/E/M LEXP D/M /B-EX.RD	Est \$	]
Blk Est.	# 6.14A Sept.1, 2002	R1 DATE: R2 DATE: DESCRIPTION	Unit Price	Cost-Quant. Unit PerSection	Lump Sum Values		1 3150 MR	3150	5.R2/3L-4L 6.Retr.4L-4 7.R4L-4LE 8. New 4L	ILEX R/B X R/B E/S	14.AS IS 20.I/C Str.8 21. Bridges 22. Grade	Ramps	20,943,838 \$ 6,649 \$ 5,800	
	SUMMAR	Y BY ACTIVITY LEVEL		Diff.	Previous Estimate			Cost/LM	% of T	% of TC				
2000		PROJECT MANAGEMENT		-815245	0		815,245	259	3.9%	3.9%				
2500		PLANNING		-64496			64,496 124,740	20	0.3%	0.3%				
3000 3500		PRELIMINARY DESIGN DETAILED DESIGN		-124740 -1051583			1,051,583	40 334	0.6% 5.0%	0.6% 5.0%				
		Total Engineering	l	-1240820	0		1,240,820	394	5.9%	5.9%			2056064	
4000		LAND ACQUISITION		0	0		0	0	0.0%	0.0%				
5000		GRADE CONSTRUCTION		-3295936			3,295,936	1046	15.7%	15.7%				
5200 5300		ROAD SIDE CONSTRUCTION OTHER CONSTRUCTION	l	-69525			0 69,525	0 22	0.0% 0.3%	0.0% 0.3%				
5500		STRUCTURAL CONSTRUCTION	ON	-7974260			7,974,260	2532	38.1%	38.1%				
6000 6500		PAVING CONSTRUCTION OPERATIONAL CONSTRUCT	ION	-349550 -949951	0		349,550 949,951	111 302	1.7% 4.5%	1.7% 4.5%				
6700		UTILITY CONSTRUCTION		-302400			302,400	96	1.4%	1.4%				
6800		RESIDENT ENGINEERING		-1112958	0		1,112,958	353	5.3%	5.3%				
		Total Construction	l 	-14054580			14,054,580	4462	67.1%	67.1%				
9700		CONTINGENCY		-4833193 			4,833,193	1534	23.1%	23.1%				
9800		SUB-TOTAL MANAGEMENT RESERVE		-20943838 0		2	20,943,838	6649 0	100.0% 0.0%	100.0% 0.0%				
		TOTAL		-20943838	0	2	20,943,838	6649	100.0%	100.0%				
9900		ESCALATION		0	0		0	0		0.0%				
		TOTAL COST		-20943838			20,943,838	6649		100.0%				
=====	=======	Constr. Less Resident Eng.		-12941622	_		======= 12,941,622	4108	======	=======				
				ENG. & PM			2,672,884	849	12.8%					
				LAND			0	0	0.0%					
				CONST.			18,270,954	5800	87.2%					
				MAN. RES. ESC.			0	0	0.0% 0.0%					
			-	TOTAL		2	20,943,838	6649	100.0%					
	Medium Te	rm Option - 3A	Assumptions	<u> </u>		<u> </u>		<u> </u>						-
	1	Existing Right-Of -Way		m	Existing Rd	Shoulder	_	Lane	Lane -	Median -	Lane -	Lane -	Shoulder	i
	•		partial taking		Pvmt Width		0.0	Lane	Lane	Median	Lane	Lane	Shoulder	Ditch W.
	2	New Addition Right-Of -Way	/ <u>NO</u> .	m	New Rd.		-	-	2.25	_	-	-	_	0.5
		ROW	8 1	m	Pvmt Width	SCOPE	2.3	Asphalt d	lepth mm Bridge L.		Tonage t	1786 X-sect./lm	Unit Price	\$ 151.00
		Bridges		Width(m)	Length(m)	0001 L		3,150	-	3,150		9.02		
	3.1	0		12.2		CBS			D= meter		Unit	Rock	7,442	
	3.2 3.3	0		12.2 12.2		SGSB		4.0 slope	0.231 D= meter	Volume	\$ 60.00 Unit	Stripping	6,698 4,217	\$ 29.11 \$ 49.54
	3.4	0		12.2	0.0			4.0	0.163		\$ 56.00		10,047	\$ 42.95
	3.5	0		12.2	0.0									
		Tunnels	Length(m)		Height(m)									
		2lnSt.w-x x-Pass.Tl	0	12.0 3.0										
		shaft	0		Diameter									
		snowshedlength (Im)	0											
		Bridges	Net \$/M2	Gross\$/m2	_									
	3.1 3.2	0	#DIV/0! #DIV/0!	#DIV/0! #DIV/0!										
	3.2	0	#DIV/0!	#DIV/0!										
	3.4	0	#DIV/0!	#DIV/0!										
	3.5	0	#DIV/0!	#DIV/0!	=									

	0.10	0000 00 M-TI Wiki-H I h 00 0						1	·		-		-	
File:	& Safety Revie	0288-02 MoTI Whistler Hwy 99 Capacity ew\4.0 ENGINEERING DESIGN\4.3	Man. Reser		0.0%		lor Way to Alpha Lake				9. R-E4L-			
	Company		Contingenc		30.0%		MT-3A		1. 2ln Frontag		10.N 4L E			
		Whistler Highway 99 Capacity and		9		n Option - 3A	Medium Term Option	Medium	12. 2ln Acc Rd			EXP D/E/M		
CODE		Capacity and Safety Review	Road Type		1 3150	I M	- 3A		3. 4ln Acc Rd 4.R4L-4L EXI			4LEXP D/M R/B-EX.RD	Est \$	
CODE		EST.DATE August, 2018	Length		3150	L.IVI.			4.R4L-4L EAI	P R/D	13.1101.1	VD-EX.RD	⊏SI ⊅	
Cor	nceptual Est.	R1 DATE:			=======		Shoulder Widening		5.R2/3L-4L E	XP R/B	14.AS IS	15. Misc.	20,943,838	
Blk Est.	# 6.14A	R2 DATE:	Unit		Cost-Quant.	Lump Sum	1	1	6.Retr.4L-4LE	EX R/B	20.I/C Str		\$ 6,649	
Version	Sept.1, 2002	DESCRIPTION	Price	Unit	PerSection	Values	3150	3150			21. Bridge		\$ 5,800	
							- MR		<ul> <li>8. New 4L EX</li> </ul>	(PR/B	22. Grade	e Sep.		
	PLANNING		0.50	1.84	7075		7.075	_	B d. e	NI-	11-4-	0	D-4-	T-4-1
		<ul> <li>transport. planning study</li> <li>corridor study</li> </ul>	2.50 2.50		7875 7875		7,875 7,875	3	Description	No.	Units	Quantity	Rate	Total
		- functional plan. study	2.50		7875		7,875	3						-
	Consultant		5.0%		1181		1,181	0						-
2502	Consultant s		3.070		1101		24,806	8						_
							21,000		-					-
2510		- project ident.	2.50		7875		7,875	3						-
		- transport. planning study	2.50		7875		7,875	3						-
		- corridor study	3.50		11025		11,025	4						-
		- functional study	3.50		11025	0	11,025	4						-
2501		- general	5.0%		1890		1,890	1						-
	Client Sub-t				39690		39,690	13				Description		
					40040		40.040		Description	No.	Units	Quantity	Rate	Total
2599	Planning Co	entingency	30.0%		19349		19,349	6	_					-
	TOTAL PL	ANNING					83,845	27						-
		ARY DESIGN	======	===	=======	=======	=========	=====						-
		- aerial base plan	3.00	LM	9450		9.450	3						-
		- prel. design	3.60		11340		11,340	4						_
		- control survey	3.00		9450		9.450	3						_
		- environmental impact	6.00		18900		18,900	6						_
		- functroad field survey	3.00	LM	9450		9,450	3						-
3041	Consultant	- functional design	2.40	LM	7560	0	7,560	2				Description		-
3051	Consultant	- funct. des. structural	1.80	LM	5670	0	5,670	2	Structural	0.50%	)			
3061		- geotechnical design	15.00		47250		47,250	15						
		<ul> <li>right-of-way research</li> </ul>	1.80		5670	0	5,670	2	\$/Prop. \$	150				
3002	Consultant		0.0%		0		0	0		No.	Units	Quantity	Rate	Total
	Consultant s	sub-total					124,740	40						-
2010	Client	- aerial base plan	0.00	1 N A	0		0		Cantilever Fir	1		0	2 500	-
		- aeriai base pian - prel. design	0.00		0		0	0		1	ea	0	3,500	-
		- prei. design - control survey	0.00		0		0	-	Barrier remov	1	lm	2205	50	110,250
		- environmental impact	0.00		0		0		Electric sign	1	ea	1	20,000	20,000
		- functroad field survey	0.00		0		0		Bus Pullout F	1	ea	2	10,000	20,000
		- functional design	0.00		0		0	0			Cu	_	10,000	-
		- funct. des. structural	0.00		0		l ő		ITS System		ea		200,000	
		- geotechnical design	0.00		0		0	ő						-
		- right-of-way research	0.00		0		0	Ö		1	ea	4	166,667	666,667
		- general	0.0%		0		0	0						-
	Client Sub-t						0	0						-
3000	Preliminan	design Contingency	30.0%		37422		37,422	12	-					-
3099			30.0%		31422		31,422	12	-					-
		RELIMINARY DESIGN					162,162	51				Description		816,917
	======		======	===	=======	=======		=====				•		•

File: (2) ACTIVI CODE		Man. Reserve Contingency Division/Site Road Type Length	0.0% 30.0% Medium Tern 1 3150	·	for Way to Alpha Lake MT-3A Medium Term Option - 3A	MT-3A	/ Road Type: 1. 2ln Front 12. 2ln Acc F 3. 4ln Acc F 4.R4L-4L E	age Rds Rds	9. R-E4L-4 10.N 4L E: 11.N 4L E: 12.N2L;F4 13.INST.R	XP D/M XP D/E/M LEXP D/M	Est \$	]
Blk Est.	nceptual Est. R1 DATE: #6,14A R2 DATE: Sept.1, 2002 DESCRIPTION	Unit Price Unit	Cost-Quant. PerSection	Lump Sum Values	Shoulder Widening 1 3150 MR	1 3150	5.R2/3L-4L 6.Retr.4L-4 7.R4L-4LEX 8. New 4L I	LEX R/B X R/B E/S	14.AS IS 20.I/C Str. 21. Bridge 22. Grade	&Ramps	20,943,838 \$ 6,649 \$ 5,800	
6710	UTILITIES Util. Prov Hydro Util. Prov Telephone Util. Prov. sub-total	160.00 lm 80.00 lm	1260 1260		201,600 100,800 302,400	64 32 96	Description Haule Cost fc Haul \$ for Surplus	<b>No</b> . 5	Units m3 /km m3 /km	Quantity 4217	1.00 1.00	Total 21,085 - -
6713 6714 6715 6716 6717	Util.Others - pipelines - telecommunication Util.Others - storm & sewer inspect. Util.Others - waterworks inspect. Util.Others - engineering services Util.Others - parks/recreation-prel.	0.00 lm 450.00 lm 0.0% 0.0% 0.00 LM 0.00 LM	0 0 0 0 0		0 0 0 0 0	0 0 0 0	xxxxxxxx Rock Scaling Rock Bolting Rock Wire m	0 0 0	ea m2 m m2	0	95.00 451.00 150.00	-   -   -   -   -
6719	Util.Others - transit Util.Others - tr-ops/signs & detours Util.Others - general util.Others - sub-total	0.00 LM 0.00 LM 0.0%	0 0		0 0 0 0	0 0 0 0	Fill Rock O.M.	(m3) 20,837 7,442 6698	(unit \$) 107.66 29.11	(\$) 0 801168 194975	41%	21,085
	Util.Others Contingency	30.0%	90720	0	90,720	29	Strip. Borrow	4217 10047	49.54 42.95	208898 431522	0.174	
	TOTAL UTILITIES	=======================================			393,120 ========	125 =====	Misc./LS Total	28403	29.11 57.62	0 1636563	Surplus Mtl	Neat vol.cal 28,403
5032 5033 5034 5031	GRADE CONSTRUCTION Grade Cons - water Grade Cons - sanitary Grade Cons - storm Grade Cons - mobilization Grade Cons - utility contingency Grade Const. Utilities Sub-total	U. Price Unit 758.00 lm 489.00 lm 500.00 lm 3.0% 30.0%	Quantity 0 0 0 0 0	Lump Sum	0 0 0 0 0	0 0 0 0 0	pl to pl *no./lane	Spec Medium Term O Road 8.07 1 2.3 0.0	11.80 2 3.6 0.0		0.0 Col. M Vol. - 14.1	Spec. Resurface Road ONLY  1 2.3 0.0 0.0
5020 5030 5040 5050 5051 5060 5061 5062 5063 5064 5090	Grade Cons - site prep./clear.grubbing Grade Cons - road grade/exc.placing,fill Grade Cons - drainage/pipe,cul. Grade Cons - muiltiplate Grade Cons - SGSB/produce,place,comp Grade Cons - GEC/produce,place,comp Grade Cons - grade finishing landscaping Grade Cons - grade finishing hydro seed. Grade Cons - grade finishing fencing Grade Cons - noise barriers Grade Cons - passing lanes Grade Cons - passing lanes Grade Cons - sidewalks,curb & gutter	26,000 ha 57.62 m3 1070.00 LM LM 15000 lm 56.00 m3 2.00 m2 1.00 m2 60.00 lm 440.00 m2 0.00 lm 160.71 lm	2.54 29823 0 0 3002 2729 18349 0 0	0 838002 110557	66,134 2,556,393 110,557 0 168,087 163,721 36,697 18,349 0 0	812 35 0 53 52 12 6 0 0	c.b.c.(w) sgsb (w) SGSBslope:1 *depth(d) *road (I) *no.cul./kilk cul.(I) *sgsb (d) *cbc (d) *Add.ROW X-m3/lm C&G \$/LM	3.6 5.6 4.0 1.252 3150 3.0 6.20 0.16 0.23 -18.50 9.47	11.8 11.8 0.0 0.0000 0 5.0 11.80 0.30 0.30 0.00 0.00 Exp-100kr	4.0 Pmt W= 5% \$ 2,530 \$ 1,070 5% 5%	0.0 16.3	A.C. (mm) 50 A.B.C. (mm) 0 Appl. rate 1.50
5001	Grade Cons-detours c/w ex,bf,paving Grade Cons- mobilization Grade Cons- Contingency Grade Construction Sub-total	3.0% 30.0%	0.50 95998 988781	30000	80,000 95,998 988,781 4,284,717	25 30 314 1360		Decel.(T-lm) Accel.(T-lm) Left T.(T-lm) TOTAL	520 950 716 2186	440 630 596 1666	260 80 456 796	
	GRADE CONSTRUCTION COSTS			3295936	4,284,717	1360		No.	Units Im	Quantity 45	Rate 8250	Total -
3519 6810 6811 6812	Grade Eng detailed design Grade Eng detailed design/Contingency Grade Eng general const. supervision Grade Eng quality assurance Grade Eng surveying Grade Eng Residency Contingency Grade Engineering Sub-	5.50% 30.0% 3.00% 2.00% 2.00% 30.0%	235659 70698 128542 85694 85694 89979		235,659 70,698 128,542 85,694 85,694 89,979 696,267	22 41	Head Walls Catch Basin CB Leads MH 900mm CSP	0 0 0 0 0	ea. ea. m ea. Im	3 95 756 21 80	16500 3,250 220 4,500 1,070	- - - - - -
======	Total Grade Const. & Eng. Costs	=======================================			4,980,983	1581				Drainage		
==					1					Drainage		

	FRINTING DATE. 0/24/2010 Whistief	riigiiway 99 C	apac	ity and Salety i	Neview Capacit	y and Salety Neview Med	ilulii i eiiii	Option - 3A c	onoulder widen	iiig		raye 4	
File:	O:\Proj\2121-00288-02 MoTI Whistler Hwy 99 Capacity & Safety Review\4.0 ENGINEERING DESIGN\4.3 Company MCSL 118 Dollars) Whistler Highway 99 Capacity and	Man. Reser Contingency	y	0.0% 30.0% Medium Tern	30.0%	rlor Way to Alpha Lake MT-3A	MT-3A	Road Type 1. 2ln Fron	tage	9. R-E4L-4 10.N 4L EX 11.N 4L EX	(PD/M		
ACTIVI		Road Type	•	1	TOPHON ON	Medium Term Option	Wicalani	3. 4ln Acc		12.N2L;F4l			
CODE		Length		3150	L.M.	- 3A		4.R4L-4L E	XP R/B	13.INST.R	B-EX.RD	Est \$	
Cou	nceptual Est. R1 DATE:			=======		<b>Shoulder Widening</b>		5.R2/3L-4L	EYD D/R	14.AS IS	15 Micc	20,943,838	
Blk Est.		Unit		Cost-Quant.	Lump Sum	1	1	6.Retr.4L-4		20.I/C Str.8		\$ 6,649	1
	Sept.1, 2002 DESCRIPTION		Unit	PerSection	Values	3150		7.R4L-4LE		21. Bridges		\$ 5,800	
	·					MR		8. New 4L	EXP R/B	22. Grade	Sep.		
		Unit		Quantity	Lump			Brdge	Site \$	Piers \$	Abut. \$	abut. extra length (lm)	
5500	STRUCTURAL CONSTRUCTION		Unit	Quartity	Sum			Druge 1	- Site φ	346,696	145,800	4	0%
5522	Struct.Cons - water	758.00		0		0	0	2	-	177,516	109,800		0%
	Struct.Cons - sanitary	489.00		0		0	0	3	-	177,516	109,800		0%
	Struct.Cons - storm Struct.Cons - mobilization	500.00 3.0%	ım	0		0	0	4 5	-	177,516 177,516	109,800 109,800		0% 0%
	Struct.Cons - utility contingency	30.0%		Ö		0	ő	·	Pier/Ht	Pier No.	P/\$/VLM	Abut/\$/HLM	070
	Structural Const. Utilities Sub-total					0	0	1	8	1	43337	4500	
5510	Struct.Cons - tunnel site preparation	0.00	lm	0	0	0	0	2	8	1	22190 22190	4500 4500	
	Struct.Cons - tunnel construction		lm	0	U	0	0	4	8	1	22190	4500	
	Struct.Cons - snow shed site prep.	0.00		0		0	Ö	5	8	1	22190	4500	
5513	Struct.Cons - snow shed site const.	-	lm	0		0	0	DE014 #4	(W)	(L)	(\$/m2)	Net Cost	No. of Bridge
EE11	Struct.Cons - bridge site preparation	1	LS	0	Demolition	0	_	DECK #1 DECK #2	12.2 12.2	0 0	3869 1981	507271 295936	0
	Struct.Cons - bridge site preparation Struct.Cons - bridge piers		LS	0		0	-	DECK #2	12.2	0	1981	295936	0
5516	Struct.Cons - bridge abutments		LS	0		0		DECK #4	12.2	Ō	1981	295936	0
	Struct.Cons - bridge superstructure		LS	0	0	0		DECK #5	12.2	0	1981	295936	0
	Struct.Cons - retain. wall site prep. Struct.Cons - retaining wall const.	1580	LS m2	4900	ı	7,742,000	0 2458	Bridge #1			Gross/m2 #DIV/0!	Net/m2 #DIV/0!	
	Struct.Cons - mobilization	3.0%	1112	232260		232,260		Bridge #2			#DIV/0!	#DIV/0!	
5529	Struct.Cons - Contingency	30.0%		2392278		2,392,278		Bridge #3			#DIV/0!	#DIV/0!	Tnnl \$/lm -Net
	Structural Construction Sub-total					10,366,538	3291	Bridge #4			#DIV/0! #DIV/0!	#DIV/0! #DIV/0!	-
	STRUCTURAL CONSTRUCTION COSTS	3				10,366,538	3291	Bridge #5	2lnSt.w-x	x-Pass.TI	shaft	#DIV/0!	Tnnl \$/Im -Gross
									1-D-Shape	2-D-Shape	1-Circle	Radius-1-D	7.267
	Struct. Eng detailed design	5.50%		570160		570,160	181	Tunnel L=	0	-	JI .	Per.S&Rf	24.32
	Struct. Eng detailed design/Contingency	30.0% 4.00%		171048		171,048 414,662	54	Tun. H1	5.100	2.550 1.00	Radius	m2/rkac Tnnl height	6.25
	Struct. Eng general const. supervision Struct. Eng quality assurance	2.00%		414662 207331		207,331	132 66		1.00 12.00		1.00 Wall Tk.	Radius-2-D	8. <b>27</b> 2.157
	Struct. Eng surveying	0.50%		51833		51,833	16	RFLT.	0.250	0.250		Per.S&Rf	8.42
6829	Struct. Eng Residency Contingency	30.0%		202147		202,147	64	WLT.	0.250		SOBT	m2/rkac	6.25
	Structural Engineering Sub-total					1,617,180	513	BST. TOBT	0.500 0.100	0.200 0.100	0.100 Excm3	Tnnl height	3.16
	Total Structural & Eng. Costs					11,983,718	3804	SOBT	0.100		Obk-m3	-	-
=====		======	===	=======	========	==========	=====	BOBT	0.100		Liner-m3	-	-
6000	PAVING CONSTRUCTION				SM./OIL			Items Excm3	Quantity 0	rate	Total \$	Avg.\$/ tot-Im #DIV/0!	1-Circle 0
	Paving Construction  Paving Con - machine paving asphalt	151.00	t	1786	12403	339,369	108	Obk-m3	0	125 2625	0	#DIV/0! #DIV/0!	0
6030	Paving Con - machine paving concrete	0.00	m2			0	0	Rk anch-Ea	0	1125	0	#DIV/0!	0
	Paving Con - hot reprofiling	0.00		7088		0	0	MiscIm	0	2500	0	#DIV/0!	0
	Paving Con - shoulder paving Paving Con - pavement finishing	0.00 100.00		0		0	0	Liner-m3 Drainage-Im	0	1050 550	0	#DIV/0! #DIV/0!	10.00 %
	Paving Con - seal coating	0.00	1112	· ·		0	0	Lighting-m	0	900	0	#DIV/0!	5%
6001	Paving Con - mobilization	3.0%		10181		10,181	3	Mech-m	0	2100	0	#DIV/0!	15%
	Paving Con - pavement design	0.0%		104965		104.965	0	MiscIm	0 6.67m2/25mm	1000	0	#DIV/0!	3%
6099	Paving Con - Contingency	30.0%		104865		104,865	33	60kg=1m2		1.5L =1M2 (F		#DIV/0! length (lm)	snowshed 0.0
	PAVING CONSTRUCTION COSTS					454,415	144	asphalt	(T)=mm	.25L =1M2 (T		Roof	1.0
								A.C.	100	100	709	29.00	0.50
	Paving Eng. detailed design	5.50%		24993		24,993	8	A.B.C. \$Oil/Litre	0 ¢1 50	0 5%	1.00		11 20
	Paving Eng - detailed design/Contingency Paving Eng - general const. supervision	30.0% 2.00%		7498 9088		7,498 9,088		Appl. rate	\$1.50 1.75	5% 1.75	3 00	1.0	11.20
	Paving Eng - quality assurance	5.00%		22721		22,721		Pavement		(See I155)	Base	1.0	26.00
	Paving Eng - surveying	0.50%		2272		2,272	1	m2	\$/m2	Total		\$ 1,000.00	-
6869	Paving Eng - Residency Contingency Paving Engineering Sub-total	30.0%		10224		10,224 76,796	3 24	630 Milling	\$8.84	5569	5.00	1.0 \$ 60.00	37.00
								m2	\$/m2	Total	Drainage	\$ 500.00	1 1
	Total Paving Const. & Eng. Costs					531,212	169	4,725	\$9.63	45502	Electrical	\$ 4,500.00	-
		======	===	======	=======	=========	=====				Mech.	\$ 5,000.00	-
						1	l				Misc.	\$ 300.00	-

File:	O:Proj/2121-00288-02 MoTI Whistler Hwy 99 Capacity & Safety Review'4.0 ENGINEERING DESIGN/4.3 Company MCSL 018 Dollars) Whistler Highway 99 Capacity and	Man. Reserve Contingency Division/Site	30.0%		vior Way to Alpha Lake	MT-3A	/ Road Types 1. 2ln Frontage 12. 2ln Acc Rds	9. R-E4L- 10.N 4L E 11.N 4L E	XP D/M		
ACTIVIT CODE	TY Capacity and Safety Review	Road Type Length	1 3150	·	Medium Term Option - 3A		3. 4ln Acc Rds 4.R4L-4L EXP R/B	12.N2L;F4	LEXP D/M R/B-EX.RD	Est \$	
Blk Est.	nceptual Est. R1 DATE: # 6.14A R2 DATE: Sept.1, 2002 DESCRIPTION	Unit Price L	======= Cost-Quant. Jnit PerSection	Lump Sum Values	Shoulder Widening 1 3150 MR		5.R2/3L-4L EXP R/B 6.Retr.4L-4LEX R/B 7.R4L-4LEX R/B E/S 8. New 4L EXP R/B	20.I/C Str 21. Bridge	es .	20,943,838 \$ 6,649 \$ 5,800	
6510 6520 6530 6540 6550 6501	OPERATIONAL CONSTRUCTION Operat.Con:- lighting Operat.Con:- signals Operat.Con:- signing Operat.Con:- guard rail Operat.Con:- pavement markings Operat.Con:- mobilization Operat.Con:- contingency	8500.00 E 275,000 E 6.00 L 109.00 Ir 1.75 Ir 3.0% 30.0%	Ea 1.50 LM 18900 m 2205	34000 0 200000 0	34,000 412,500 218,900 240,345 16,538 27,668 284,985	11 131 69	Sp. (Im) No. of Sides 50 C Signals No. Controller 2 Sig, pol,base 2	22. Grade Length 3150 Units ea ea Is	·	Rate 55,000.00 45,000.00 40,000.00	Total 82,500 270,000 60,000
	OPERATIONAL CONSTRUCTION COST	s			1,234,936	392			Signals		412,500
3549 6840 6841 6842	Operat. Eng - detailed design Operat. Eng - detailed design/Contingency Operat. Eng - general const. supervision Operat. Eng - quality assurance Operat. Eng - surveying Operat. Eng - Residency Contingency Operational Enginering Sub-total	5.50% 30.0% 5.50% 2.00% 0.50% 30.0%	67921 20376 67921 24699 6175 29638		67,921 20,376 67,921 24,699 6,175 29,638 216,731	22 6 22 8 2 9 69	Ext. Lines         2.0           Weighscale         No.           Buildings         0           Pit & Apron         0           S&I W/S         0           Parking Lot         0	Refl. Sp. 1.0 Units m2 m2 ea m2 lm ls	20.00 F 1.0 Quantity 60 120 1 9000 1,500	Refl.\$/ea  Rate  2,800.00  400.00  80,000.00  40.00  400.00  50,000.00	\$ 15.00 Total - - - - -
=====	Total Operational Const. & Eng. Costs	=======================================		=======	1,451,668	461 =====	ilgrivaigns 0	15	Weighscale	30,000.00	-
5200	ROAD SIDE CONSTRUCTION RoadSide C- water	Unit	Quantity Jnit	Lump Sum	0	0	Safety Rest Area No. Class A&B	Units	Quantity	Rate	Total
5204 5205 5202	RoadSide C - sanitary RoadSide C - storm RoadSide C - storm RoadSide C - mobilization RoadSide C - Utility Contingency Road Side Const. Utilities Sub-total	489.00 lr 500.00 lr 3.0% 30.0%	m 0		0 0 0 0	0 0 0 0	Buildings 0 Class C Site/toilets 0 Parking Lot 0 Road Const. 0	m2 ea m2 Im	100 2 2500 800	3,000.00 12,500.00 40.00 350.00	- - - -
5220 5230 5201	RoadSide C - weighscales RoadSide C - safety rest areas RoadSide C - tourist rest & view areas RoadSide C - mobilization RoadSide C - Contingency Road Side Construction Sub-total		ea 0 ea 0 ea 0 0	0 0 0	0 0 0 0 0	0 0 0 0	Furnishings 0 Landscaping 0 light/signs 0  Description No.	Is Is Is Is	SAFETY REST Quantity 0	10,000.00 5,000.00 50,000.00 AREAS Rate	- - - - - Total
	ROAD SIDE CONSTRUCTION COSTS				0	0			0 0	-	-
3559 6850 6851 6852	RoadSide E - detailed design RoadSide E - detailed design/Contingency RoadSide E - general const. supervision RoadSide E - quality assurance RoadSide E - surveying RoadSide E - Residency Contingency Road Side Engineering Sub-total	10.00% 30.0% 6.00% 2.00% 1.00% 30.0%	0 0 0 0 0		0 0 0 0 0 0	0 0 0 0 0 0	l Resurfacing 0	Units tklm tklm m3 m3 tklm	0 Description Quantity 200.00 200.00 500.00 500.00 1.00	Rate 50.00 700.00 60.00 56.00 30.00	- Total - - - -
	Total Road Side Const. & Eng. Costs				0	0	Tie-ins 0 Turnout # 9 0 Others 0	ea ea Is	1.00 1.00 1.00	5000.00 125000.00 1500.00	-
5300 5303 5304 5305 5302	OTHER CONSTRUCTION Other Consl - water Other Consl - sanitary Other Consl - storm Other Consl - mobilization Other Consl - utility contingency Other Const. Utilities Sub-total	Unit	Quantity Jnit m 0 m 0	Lump Sum			(see grading) 0  R/rd X-ing No.  Planks 0  Sig /gates 0	Im  Units tkIm each	Railway Quantity 45	2000.00 400.00 Rate 2500.00 250000.00	- - - Total - - -
5320 5330 5340 5301	Other Const- railroads main & spur lines Other Const- railroad crossings Other Const- marine work Other Const- environmental mitigations Other Const- mobilization Other Const- Contingency Other Construction Sub-total	- e	m 0 pa 0 pa 0 pa 0 pa 0.75 2025 20857		0 0 0 67,500 2,025 20,857 90,382	0 0 21 1 7 29	Description No.	Units	R/rd X-ing Quantity	Rate	Total
	OTHER CONSTRUCTION COSTS				90,382	29			Description	<u>-</u>	<u>-</u>
3579 6870 6871 6872	Other Eng detailed design Other Eng detailed design/Contingency Other Eng general const. supervision Other Eng quality assurance Other Eng surveying Other Eng Residency Contingency Other Engineering Sub-total	5.50% 30.0% 4.00% 2.00% 1.00% 30.0%	4971 1491 3615 1808 904 1898	0	4,971 1,491 3,615 1,808 904 1,898 14,687	2 0 1 1 0 1 5		Units Is ea	Quantity 1 1	Rate 50,000 40,000	Total 37,500 30,000 - - -
	Total Other Const. & Eng. Costs				105,070	33			Environmental	-	67,500

	TRIVING DATE: 0/24/2010 Whistier I	ngriway 55 Capac	ity and balety i	veview Capacit	y and balety iteview wet	adin renn	Option - 3A Oriodider Wid	ering	r age o	
File:	Company MCSL  O18 Dollars) Whistler Highway 99 Capacity and §		0.0% 30.0% Medium Tern	30.0%	dor Way to Alpha Lake MT-3A Medium Term Option	MT-3A	1. 2ln Frontage 12. 2ln Acc Rds	9. R-E4L-4L D/M 10.N 4L EXP D/M 11.N 4L EXP D/E/M		
ACTIVIT CODE		Road Type Length	1 3150	L.M.	- 3A		3. 4ln Acc Rds 4.R4L-4L EXP R/B	12.N2L;F4LEXP D/M 13.INST.R/B-EX.RD	Est \$	
	nceptual Est. R1 DATE:				Shoulder Widening		5.R2/3L-4L EXP R/B	14.AS IS 15. Misc.	20,943,838	
Blk Est.	# 6.14A R2 DATE: Sept.1, 2002 DESCRIPTION	Unit Price Unit	Cost-Quant. PerSection	Lump Sum Values	1 3150 MR		6.Retr.4L-4LEX R/B 7.R4L-4LEX R/B E/S 8. New 4L EXP R/B	20.I/C Str.&Ramps 21. Bridges 22. Grade Sep.	\$ 6,649 \$ 5,800	
	DETAILED DESIGN from 3510,3520,3540,3550,357				1,174,816		0 1 Bridge Tunnel	1 Special		
	Geotech. E - detailed design Geotech. Er - Contingency	<b>0.90%</b> 30.0%	147879 44364	0	147,879 44,364	47 14	Description No.	- Units Quantity	Rate	Total
	TOTAL DETAILED DESIGN COSTS				1,367,058	434			-	-
	RESIDENT ENGINEERING from 6810,6820,6840,6850,686		=======	=======	1,446,845	=====			-	- - -
	TOTAL RESIDENT ENG. COSTS				1,446,845	459		Description	-	
=====		=======================================	=======		=======================================	=====	Description No.	Units Quantity	Rate -	Total -
					0	0			-	-
	PART 1 SUMMARY	=======================================			=========	=====			Ē	-
	CONSTRUCTION				12,941,622	4108	Description No.	Description Overtity	Data	Total
	ENGINEERING & SUPERVISION CONTRACTUAL CONTINGENCY				2,353,778 4,588,620 0	747 1457 0	Description No.	Units Quantity	Rate -	Total -
	CONSTRUCTION COST TOTAL	DIVISION/SITE	Medium Tern	n Option - 3A	19,884,020	6312			- -	-
2000	PROJECT MANAGEMENT	2.00%	Land 397680	- 0	397,680	126			-	-
2062	Project Man - office costs wages Project Man - office costs - expenses	0.50%	99420	0	99,420	32			-	-
	Project Man - printing costs Project Man - general (MoTI Regional Cost F Project Manager Sub-total	0.00% 0.00%	0	0	0 0 497,100	0 0 158			-	-
2010	Client - office costs wages	1.00%	198840		198,840	63		Description	-	-
	Client - office costs - expenses Client - printing costs	0.50% 0.00%	99420 0	0	99,420 0	32 0	Description No.	Units Quantity	Rate	Total
	Client - general Client Sub-total	0.00%	0	0	0 298,260	0 95			-	- - -
	Public Rel wages & expenses	0.00%	0	0	0	0			-	-
2073	Public Rel adv., media, displays Public Rel opening ceremonies	0.00% 0.00%	0	0	0	0		Description	<u> </u>	
2071	Public Rel general (FN Accomm.) Public Relations Sub-total	0.00%	0	0	0	0	Description No.	Units Quantity	Rate -	Total -
	Legal Costs - lawyers fees	0.10%	19884	0	19,884	6			-	-
2041	Legal Costs - general Legal Costs Sub-total	0.00%	0	0	0 19,884	0 6			-	-
	Insurance - const./ liability, E&O	0.00%	0	0	0	0			-	-
2081	Insurance - general Legal Costs Sub-total	0.00%	0	0	0	0			-	-
2099	Project Management Contingency	30.0%	244573		244,573	78		Description	<u>-</u>	
	TOTAL PROJECT MANAGEMENT COSTS				1,059,818	336	4.10%	Description		
4000	LAND	\$/Building	# buildings	LS	0		1 Hectare = 10,000 Sq			
4010	Land(Code -Mrkt,ROW,Serv,Imp.V,Ease.C Acquisition Sub-total	250,000 Res 2,000,000 Con		0	0	0	1 Acre = 43,560 squar	e feet		
	Land(Code -Bus.,5%,Mrg.P,Rel\$,P/Tax,Etc	10.00%	0	0	0	0	#DIV/0! Req. ROW	2.5		
4040	Land(Code -Owners(LS,ApprsI,Rprt,LgI,In Land(Code -Demolition	7.00% 0.00%	0	0	0	0	#DIV/0! Cost/Ha #DIV/0! Cost/M2	0 107,637 0.00 10.76		
4060	Land(Code -Pro.Man,P.Tax,Util,Security Land(Code -Not Used	1.00%	0	0	0	0	#DIV/0! Cost /Acre Cost /Ft2	0 43,560 0.00 <b>\$</b> 1.00		
4080	Land(Code -Not Used Land(Code -Acq.F,M/Sal,TrvIV,Cntr.S,Appr	7.00%	0	0	0	0		\$ 10,000		
4090	Land(Code -Surveys	0.00%	0	0	0	0	#DIV/0! Survey /unit Description No.	\$ 2,000 Units Quantity	Rate	Total
									- - -	- -
	Associated costs-sub-total		0		0	0			-	-
4099	Land Contingency Sub-total	30.0%	0	0	0	0			-	<u>-</u>
	TOTAL LAND COSTS				0	0		Description		-

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O:\Proj\2121-00288-02 MoTI Whistle  & Safety Review\4.0 ENGINEERING		Man. Reser	ve	0.0%	Land	lor Way to Alpha Lake	Taylor W	/ Road Types	9. R-E4L-4	IL D/M		
Company MCSL		Contingenc		30.0%	30.0%	MT-3A		1. 2ln Frontage	10.N 4L E	XP D/M		
(2018 Dollars) Whistler Highway	99 Capacity and	Division/Site	éΝ	Medium Term	Option - 3A	Medium Term Option	Medium	12. 2ln Acc Rds	11.N 4L E	XP D/E/M		
CTIVITY Capacity and Safe	ety Review	Road Type		1		- 3A		3. 4ln Acc Rds	12.N2L;F4	LEXP D/M		
ODE EST.DATE Augu	ıst, 2018	Length		3150	L.M.	- 3A		4.R4L-4L EXP R/B	13.INST.R	/B-EX.RD	Est \$	
Conceptual Est. R1 DATE:			=			Shoulder Widening		5.R2/3L-4L EXP R/B	14.AS IS	15. Misc.	20,943,838	
Est. # 6.14A R2 DATE:		Unit		Cost-Quant.	Lump Sum	1	1	6.Retr.4L-4LEX R/B	20.I/C Str.	&Ramps	\$ 6,649	
rsion Sept.1, 2002 DESCR	IPTION	Price	Unit	PerSection	Values	3150	3150	7.R4L-4LEX R/B E/S	21. Bridge	s	\$ 5,800	
						MR		8. New 4L EXP R/B	22. Grade Units	Sep. Quantity	Data	Tota
9800 MANAGEMENT RESERVE MAN. RES planning	=	0.0%		83845		0	0	Description No.	Utilis	Quantity	Rate	Tota
MAN. RES preliminary de	eian	0.0%		162162			0				-	
MAN. RES utility construc		0.0%		393120			0				-	
MAN. RES grade constru		0.0%		4284717			0				-	
MAN. RES structural cons		0.0%		10366538		Ö	0				_	
MAN. RES paving constru		0.0%		454415		0	0				_	
MAN. RES operation cons		0.0%		1234936		0	0				_	
MAN. RES roadside cons		0.0%		0		Ŏ	0				_	
MAN. RES other construc		0.0%		90382		0	0				_	
MAN. RES project manac		0.0%		1059818		0	0				_	
MAN. RES land	,-	0.0%		0		0	0				_	
MAN. RES detailed eng.		0.0%		1367058		0	0				_	
MAN. RES residency eng		0.0%		1446845		0	0				-	
MAN. RES Contingency		0.0%		0		0	0				-	
TOTAL MANAGEMENT R	ESERVE			20943838		0	0				-	
	========	======	=== =		=======	=========	=====			Description		
TOTAL LESS ESCALATION	N			0	20943838			Description No.	Units	Quantity	Rate	Tota
FISCAL											-	
900 ESCALATION			_								-	
	ESCALATION			\$ DONE							-	
2016-2017	0.5750%			0		0	0				-	
2017-2018	0.6250%	10.00%		0		0	0				-	
2018-2019	1.0000%	35.00% 45.00%		0		0	0				-	
2019-2020	1.0000%	45.00% 5.00%		0		0	0				-	
2020-2021 2021-2022	1.0000% 1.0000%	0.00%		0			0				-	
2021-2022	1.0000%	0.00%		0		0	0				-	
2023-2024	1.0000%	0.00%		0			0					
2020-202 <del>4</del>	1.0000%	0.00%		0			0				-	
2024-2025											-	
						0	0				_	
TOTAL ESCALATION		100.00%		0		•	=====					
TOTAL ESCALATION					=======	•	-				-	
TOTAL ESCALATION	-CONSTRUCTION				=======	•	-				- - -	
TOTAL ESCALATION PART 2 SUMMARY NON-	-CONSTRUCTION				=======		=====				- - -	
TOTAL ESCALATION  PART 2 SUMMARY NON- Non-Construction Non-Const. Cor	-CONSTRUCTION on ntingency 					815,245 244,573	259 78				-	
TOTAL ESCALATION TOTAL ESCALATION PART 2 SUMMARY NON-Non-Construction	-CONSTRUCTION on ntingency TION COSTS	DN COSTS				815,245	259					

Concession Services S	& Safety Revie Company 118 Dollars) Y cceptual Est. # 6.14A Sept.1, 2002	Whistler Highway 99 Capacity and Capacity and Safety Review EST.DATE August, 2018 R1 DATE: R2 DATE: DESCRIPTION	Road Type Length Unit	0.0% 30.0% Medium Terr 1 3150 ======= Cost-Quant. it PerSection	30.0% m Option - 3B L.M. Lump Sum Values	MT Medium T - 2 Full L	Alpha Lake F-3B ferm Option 3B anes SB 1 3150 MR	MT-3B Medium - 1 3150	1. 2In Fron 12. 2In Acc 3. 4In Acc 4.R4L-4L E 5.R2/3L-4L 6.Retr.4L-4 7.R4L-4LE 8. New 4L	tage Rds Rds EXP R/B - EXP R/B 4LEX R/B X R/B E/S EXP R/B	9. R-E4L-4 10.N 4L EX 11.N 4L EX 12.N2L;F4 13.INST.R 14.AS IS 20.I/C Str.(21. Bridge: 22. Grade	XP D/M XP D/E/M LEXP D/M /B-EX.RD 15. Misc. &Ramps s	Est \$ 25,530,028 \$ 8,105 \$ 7,092	1
2000		PROJECT MANAGEMENT		Diff. -993764	Previous Estimate 0		993,764	Cost/LM 315	% of T 3.9%	% of TC 3.9%				
2500		PLANNING			0		64,496	20	0.3%	0.3%				
3000		PRELIMINARY DESIGN		-64496 -103950	0		103,950	33	0.3%					
3500		DETAILED DESIGN		-1291301	0		1,291,301	410	5.1%	5.1%				
		Total Engineering		-1459747	0		1,459,747	463	5.7%	5.7%			2453511	
4000		LAND ACQUISITION		0	0		0	0	0.0%	0.0%				
5000		GRADE CONSTRUCTION		-4060738	0		4,060,738	1289	15.9%	15.9%				
5200		ROAD SIDE CONSTRUCTION	1	0			0	0	0.0%					
5300 5500		OTHER CONSTRUCTION STRUCTURAL CONSTRUCTI	ON	-9270 -9967825	0		9,270 9,967,825	3 3164	0.0% 39.0%					
6000		PAVING CONSTRUCTION	ON	-725683			725,683	230	2.8%					
6500		OPERATIONAL CONSTRUCT	ION	-756929	0		756,929	240	3.0%					
6700		UTILITY CONSTRUCTION		-302400	0		302,400	96	1.2%					
6800		RESIDENT ENGINEERING		-1362127	0		1,362,127	432	5.3%	5.3%				
		Total Construction	) 	-17184972	0	1	17,184,972 	5456	67.3%	67.3%				
9700		CONTINGENCY		-5891545	0		5,891,545 	1870	23.1%	23.1%				
9800		SUB-TOTAL MANAGEMENT RESERVE		-25530028 0	0	2	25,530,028 0	8105 0	100.0% 0.0%					
		TOTAL		-25530028	0	2	25,530,028	8105	100.0%	100.0%				
9900		ESCALATION		0	0		0	0		0.0%				
		TOTAL COST		-25530028	0		25,530,028	8105		100.0%				
=====	======	Constr. Less Resident Eng		-15822846	0		15,822,846	5023	======					
				ENIC 9 DM			2 100 EG4	1013	10 50/					
				ENG. & PM LAND			3,189,564	0	12.5% 0.0%					
				CONST.		2	22,340,464	7092	87.5%					
				MAN. RES.			0	0	0.0%					
			_	ESC. TOTAL		2	0 25,530,028	8105	0.0% 100.0%					
	Medium Te	rm Option - 3B	<u>Assumptions</u>			ChI-I		1	1	Mardian	1	1	Ob a vilala a	_
	1	Existing Right-Of -Way	, m		Existing Rd		-	Lane -	Lane -	Median -	Lane -	Lane -	Shoulder -	_
			partial taking		Pvmt Width	Shoulder	0.0	Lane	Lane	Median	Lane	Lane	Shoulder	Ditch W.
	2	New Addition Right-Of -Way	/ NO m		New Rd.		1.50	-	3.60	-	-	_	_	0.
		ROW	/ 11 m		Pvmt Width		5.1		depth mm		Tonage t		Unit Price	\$ 151.0
		Bridges		Width(m)	Length(m)	<u>SCOPE</u>		3,150	Bridge L.	3,150		X-sect./lm 14.05		
	3.1	0		12.2		CBS			D= meter		Unit	Rock	11,907	\$ 107.6
	3.2	0		12.2				4.0			\$ 60.00		10,716	\$ 29.1
	3.3	0		12.2		SGSB			D= meter	Volume	Unit	Stripping	5,557	
		0		12.2	0.0			4.0	0.210	6112	\$ 56.00	Borrow	16,074	\$ 42.9
	3.4					1								
-	3.4 3.5	0		12.2	0.0									
-	3.5		Length(m)		Height(m)									
-	3.5 4 4.1	Tunnels 2lnSt.w-x	Length(m)		Height(m)									
-	3.5 4 4.1 4.2	0 Tunnels 2lnSt.w-x x-Pass.Tl	0	Width(m) 12.0 3.0	Height(m) 8.27 3.16									
-	3.5 4 4.1 4.2 4.3	Tunnels 2InSt.w-x x-Pass.TI shaft	0 0 0	Width(m) 12.0 3.0	Height(m) 8.27									
-	3.5 4 4.1 4.2 4.3 4.4	Tunnels 2InSt.w-x x-Pass.TI shaft snowshedlength (Im)	0 0 0 0	Width(m) 12.0 3.0 2.0	Height(m) 8.27 3.16 Diameter									
-	3.5 4 4.1 4.2 4.3 4.4	Tunnels 2InSt.w-x x-Pass.TI shaft snowshedlength (Im) Bridges	0 0 0 0 0 Net \$/M2	Width(m) 12.0 3.0 2.0 Gross\$/m2	Height(m) 8.27 3.16 Diameter									
-	3.5 4 4.1 4.2 4.3 4.4	Tunnels 2InSt.w-x x-Pass.TI shaft snowshedlength (Im) Bridges	0 0 0 0 0 Net \$/M2 #DIV/0!	Width(m) 12.0 3.0 2.0 Gross\$/m2 #DIV/0!	Height(m) 8.27 3.16 Diameter									
-	3.5 4 4.1 4.2 4.3 4.4 3.1 3.2	Tunnels 2InSt.w-x x-Pass.TI shaft snowshedlength (Im) Bridges	0 0 0 0 0 Net \$/M2 #DIV/0! #DIV/0!	Width(m) 12.0 3.0 2.0  Gross\$/m2 #DIV/0!	Height(m) 8.27 3.16 Diameter									
-	3.5 4 4.1 4.2 4.3 4.4	Tunnels 2InSt.w-x x-Pass.TI shaft snowshedlength (Im) Bridges 0 0	0 0 0 0 0 Net \$/M2 #DIV/0!	Width(m) 12.0 3.0 2.0 Gross\$/m2 #DIV/0!	Height(m) 8.27 3.16 Diameter									
-	3.5 4 4.1 4.2 4.3 4.4 3.1 3.2 3.3	0 Tunnels 2InSt.w-x x-Pass.TI shaft snowshedlength (Im) Bridges  0 0 0 0	0 0 0 0 0 Net \$/M2 #DIV/0! #DIV/0! #DIV/0! #DIV/0!	Width(m) 12.0 3.0 2.0  Gross\$/m2 #DIV/0! #DIV/0!	Height(m) 8.27 3.16 Diameter									
	3.5 4 4.1 4.2 4.3 4.4 3.1 3.2 3.3 3.4	Tunnels 2InSt.w-x x-Pass.TI shaft snowshedlength (Im) Bridges  0 0 0 0	0 0 0 0 Net \$/M2 #DIV/0! #DIV/0! #DIV/0! #DIV/0!	Width(m) 12.0 3.0 2.0  Gross\$/m2 #DIV/0! #DIV/0! #DIV/0! #DIV/0!	Height(m) 8.27 3.16 Diameter									
-	3.5 4 4.1 4.2 4.3 4.4 3.1 3.2 3.3 3.4	Tunnels 2InSt.w-x x-Pass.TI shaft snowshedlength (Im) Bridges  0 0 0 0	0 0 0 0 Net \$/M2 #DIV/0! #DIV/0! #DIV/0! #DIV/0!	Width(m) 12.0 3.0 2.0  Gross\$/m2 #DIV/0! #DIV/0! #DIV/0! #DIV/0!	Height(m) 8.27 3.16 Diameter									
-	3.5 4 4.1 4.2 4.3 4.4 3.1 3.2 3.3 3.4	Tunnels 2InSt.w-x x-Pass.TI shaft snowshedlength (Im) Bridges  0 0 0 0	0 0 0 0 Net \$/M2 #DIV/0! #DIV/0! #DIV/0! #DIV/0!	Width(m) 12.0 3.0 2.0  Gross\$/m2 #DIV/0! #DIV/0! #DIV/0! #DIV/0!	Height(m) 8.27 3.16 Diameter									
-	3.5 4 4.1 4.2 4.3 4.4 3.1 3.2 3.3 3.4	Tunnels 2InSt.w-x x-Pass.TI shaft snowshedlength (Im) Bridges  0 0 0 0	0 0 0 0 Net \$/M2 #DIV/0! #DIV/0! #DIV/0! #DIV/0!	Width(m) 12.0 3.0 2.0  Gross\$/m2 #DIV/0! #DIV/0! #DIV/0! #DIV/0!	Height(m) 8.27 3.16 Diameter									

CODE Cor Blk Est. Version 2500	& Safety Revie Company 018 Dollars) TY nceptual Est. # 6.14A Sept.1, 2002	Whistler Highway 99 Capacity and Capacity and Safety Review EST.DATE August, 2018 R1 DATE: R2 DATE: DESCRIPTION	Road Type Length Unit Price	y e Unit	0.0% 30.0% Medium Tern 1 3150 Cost-Quant. PerSection	•	for Way to Alpha Lake MT-3B Medium Term Option - 3B 2 Full Lanes SB 1 3150 MR	MT-3B Medium 1 3150	1. 2In Frontag 12. 2In Acc Rd: 3. 4In Acc Rd: 4.R4L-4L EXF 5.R2/3L-4L EXF 6.Retr.4L-4LEXF 7.R4L-4LEXF 8. New 4L EX	s s P R/B XP R/B EX R/B R/B E/S IP R/B	9. R-E4L-4 10.N 4L E: 11.N 4L E: 12.N2L;F4 13.INST.R 14.AS IS 20.I/C Str. 21. Bridge 22. Grade	XP D/M XP D/E/M LEXP D/M t/B-EX.RD 15. Misc. &Ramps s Sep.	Est \$ 25,530,028 \$ 8,105 \$ 7,092	
		<ul> <li>transport. planning study</li> <li>corridor study</li> </ul>	2.50 2.50		7875 7875		7,875 7.875	3	Description	No.	Units	Quantity	Rate	Total
		- functional plan. study	2.50		7875		7,875	3						-
	Consultant		5.0%		1181		1,181	0						-
	Consultant s	sub-total					24,806	8						-
2510	Client	- project ident.	2.50	LM	7875		7,875	3						-
		- transport. planning study	2.50		7875		7,875	3						-
		- corridor study	3.50		11025		11,025	4						-
		- functional study	3.50	LM	11025	0	11,025	4						-
2501		- general	5.0%		1890		1,890	1						
	Client Sub-to	otai 			39690		39,690	13	Description	No.	Units	Description Quantity	Rate	Total
2599	Planning Co		30.0%		19349		19,349	6	Description	INO.	Offics	Quantity	Nate	- TOTAL
	TOTAL PL	ANNING					83,845	27						-
			======	===			==========	=====						-
		ARY DESIGN												-
		- aerial base plan	2.50		7875		7,875	3						-
		- prel. design	3.00		9450		9,450	3						-
		- control survey	2.50		7875		7,875	3 5						-
		<ul> <li>environmental impact</li> <li>functroad field survey</li> </ul>	5.00 2.50		15750 7875		15,750 7,875	3						-
		- functional design	2.00		6300	0	6.300	2				Description		<del></del>
		- funct, des. structural	1.50		4725	0	4.725	2	Structural	0.50%		Description		
		- geotechnical design	12.50		39375	O	39.375	13	Otructural	0.5070	'			
		- right-of-way research	1.50		4725	0	4,725	2	\$/Prop. \$	150				
3002	Consultant	- general	0.0%		0		0	0	Description	No.	Units	Quantity	Rate	Total
	Consultant s	sub-total					103,950	33						-
3010	Client	- aerial base plan	0.00	LM	0		0	0	Cantilever Fir	1	ea	0	3,500.00	-
3011	Client	- prel. design	0.00		0		0	0						-
		- control survey	0.00		0		0		Barrier remov	1	lm	2205	50.00	110,250
		- environmental impact	0.00		0		0		Electric sign	1	ea	1	20,000.00	20,000
		- functroad field survey	0.00		0		0		Bus Pullout F	1	ea	2	10,000.00	20,000
		- functional design	0.00		0		0	0						-
		<ul> <li>funct. des. structural</li> <li>geotechnical design</li> </ul>	0.00		0		0	0						-
		- right-of-way research	0.00		0		0	0						
		- general	0.0%	LIVI	0		0	0						-
5551	Client Sub-to		3.070		Ŭ		ő	0						-
3099	Preliminary	design Contingency	30.0%		31185		31,185	10						-
														-
		ELIMINARY DESIGN					135,135	43				Description		150,250

	O:\Proj\2121-00288-02 MoTI Whistler Hwy 99 Capacity				Í	ı						
File:	& Safety Review\4.0 ENGINEERING DESIGN\4.3	Man. Reserve	0.0%	Land	lor Way to Alpha Lake	Taylor W	Road Type	s	9. R-E4L-4	L D/M		
	Company MCSL	Contingency	30.0%	30.0%	MT-3B		1. 2ln Front		10.N 4L EX			
	018 Dollars) Whistler Highway 99 Capacity and			n Option - 3B	Medium Term Option	Medium	12. 2ln Acc I		11.N 4L E			
ACTIVI		Road Type	1		- 3B		3. 4ln Acc I		12.N2L;F4		· ·	7
CODE	3	Length	3150	L.IVI.	2 Full Lanes SB		4.R4L-4L E 5.R2/3L-4L		13.INST.R		Est \$	
	nceptual Est. R1 DATE: # 6.14A R2 DATE:	Unit	Cost-Quant.	Lump Sum	2 Full Lanes 5B	1	5.R2/3L-4L 6.Retr.4L-4		14.AS IS 20.I/C Str.		25,530,028 \$ 8,105	4
	Sept.1, 2002 DESCRIPTION		PerSection	Values	3150	3150	7.R4L-4LE		21. Bridge:		\$ 7,092	
VEISIOII				v alues	- MR	3130	8. New 4L		22. Grade		φ 7,092	1
6700	UTILITIES				IVII C		Description	No.	Units	Quantity	Rate	Total
	Util. Prov Hydro	160.00 lm	1260		201,600	64			m3 /km	5557	1.00	27,783
	Util. Prov Telephone	80.00 lm	1260		100,800	32						-
	Util. Prov. sub-total				302,400	96		5	m3 /km	-	1.00	-
							Surplus					-
	Util.Others - pipelines	0.00 lm	0		0		XXXXXXX	0	ea	0		-
	Util.Others - telecommunication	450.00 lm	0		0	_	Rock Scaling	0	m2		95.00	-
	Util.Others - storm & sewer inspect.	0.0%	0		0	0		0	m		451.00	-
	Util.Others - waterworks inspect.	0.0% 0.00 LM	0		0	0	Rock Wire m	0	m2		150.00	-
	Util.Others - engineering services Util.Others - parks/recreation-prel.	0.00 LM	0		0	0						-
	Util.Others - transit	0.00 LM	0		0	0	-			Description		27 783
	Util.Others - tr-ops/signs & detours	0.00 LM	0		0	0		(m3)	(unit \$)	(\$)		21,100
	Util.Others - general	0.0%	0		0	0	Fill	33,340	(uriit $\phi$ )	(Ψ)		
0,01	Util.Others sub-total	0.070	Ü		0	ő	Rock	11,907	107.66	1281868	42%	
							O.M.	10716	29.11	311961	1270	
6799	Util.Others Contingency	30.0%	90720	0	90,720	29	Strip.	5557	49.54	275253	0.168	
							Borrow	16074	42.95	690435		
	TOTAL UTILITIES				393,120	125	Misc./LS		29.11	0	Surplus Mtl	Neat vol.cal
	=======================================				==========	=====	Total	44254	57.84	2559518		44,254
	GRADE CONSTRUCTION	U. Price Unit		Lump Sum				Spec	Spec	PI/PL	PI/PL	Spec.
	Grade Cons - water	758.00 lm	0		0	0		Medium Term O		22.8	27.9	Resurface
	Grade Cons- sanitary	489.00 lm	0		0	0		Road		Ditch Width		Road
	Grade Cons- storm	500.00 lm	0		0	0	P. 12 P.	11.01	11.80		0.0	ONLY
	Grade Cons- mobilization	3.0%	0		0	0		1	3.6	Col L Vol.	Col. IVI Vol.	1
5039	Grade Cons - utility contingency Grade Const. Utilities Sub-total	30.0%	U		0	0	*lane wid *med	3.6 0.0	0.0	46,467 Pmt W=	16.9	3.6 0.0
	Grade Const. Othilles Sub-total				U	0	*shldrs tota			CBC. slope		1.5
5010	Grade Cons- site prep./clear,grubbing	26.000 ha	3.47	0	90.151	29		6.5	11.8	4.0	0.0	A.C. (mm)
	Grade Cons - road grade/exc,placing,fill	57.84 m3	46467	178033	2,865,527	-	sqsb (w)	8.8	11.8	Pmt W=		50
	Grade Cons - drainage/pipe,cul.	1070.00 LM	0	145279	145,279	46		4.0	0.0			A.B.C. (mm)
	Grade Cons - muiltiplate	15000 lm	0		0	0	*depth(d)	1.321	0.000	5%		· o´
5050	Grade Cons-SGSB/produce,place,comp	56.00 m3	6112		342,287	109	*road (l)	3150	0			0
	Grade Cons-CBC/produce,place,comp	60.00 m3	5557		333,396	106	*no.cul./kild		5.0			Appl. rate
	Grade Cons- grade finishing landscaping	2.00 m2	18608		37,217		cul.(I)	9.64	11.80			1.50
	Grade Cons- grade finishing hydro seed.	1.00 m2	18608		18,608	6	- 3 ( - /	0.21	0.30	5%		
	Grade Cons- grade finishing fencing	60.00 lm	0		0	0	*cbc (d)	0.26	0.30	5%		
	Grade Cons - noise barriers	440.00 m2	0		0	0		-19.92	0.00			
	Grade Cons - passing lanes	0.00 lm	0		0	0	X-m3/lm C&G \$/LM	14.75	0.00	- Eva Olima	Call OOkma	-
	Grade Cons- sidewalks, curb & gutter Grade Cons-detours c/w ex,bf, paving	160.71 lm 100000 NO	0.50	60000	110,000	35	C&G \$/LIVI	\$60.00 Decel.(T-lm)	520 ± 520	i Exp- o∪kiiiļ 440	Coll-80kmp	
	Grade Cons-detours c/w ex,pr,paving Grade Cons- mobilization	3.0%	118274	60000	110,000	38		Accel.(T-lm)	950	630	80	
	Grade Cons - Contingency	30.0%	1218222		1,218,222	387		Left T.(T-Im)	716	596	456	
3033	Grade Construction Sub-total	30.070	1210222		5,278,960	1676		TOTAL	2186	1666	796	
							Gravel 2.0			.000	. 50	
	GRADE CONSTRUCTION COSTS			4060738	5,278,960	1676		No.	Units	Quantity	Rate	Total
							Box Cul.	0	lm	45	8250	-
	Grade Eng detailed design	5.50%	290343		290,343		Head Walls	0	ea.	3	16500	-
	Grade Eng detailed design/Contingency	30.0%	87103		87,103		Catch Basin	0	ea.	95	3,250	-
	Grade Eng general const. supervision	3.00%	158369		158,369	50		0	m	756	220	-
	Grade Eng quality assurance	2.00%	105579		105,579		MH	0	ea.	21	4,500	-
	Grade Eng surveying	2.00%	105579		105,579	34	900mm CSP	0	lm	80	1,070	-
6819	Grade Eng Residency Contingency	30.0%	110858		110,858	35	Oterrat 5			465	450.55	-
	Grade Engineering Sub-total				857,831	2/2	Structure Dra	0	lm	100	150.00	-
	Total Grade Const. & Eng. Costs				6.136.791	1948						-
=====	======================================		=======	=======						Drainage		<del></del>
	<del></del>					ı				Pramaye		

		0 ,				,		•				· ·	
File:	O:\Proj\2121-00288-02 MoTI Whistler Hwy 99 Capacity & Safety Review\4.0 ENGINEERING DESIGN\4.3	Man. Reser	V0	0.0%	Land	l lor Way to Alpha Lake	Taylor M	Poad Type	ne.	9. R-E4L-4	II D/M		
i iie.	Company MCSL	Contingenc		30.0%	30.0%	MT-3B		1. 2ln Fron		10.N 4L E			
	018 Dollars) Whistler Highway 99 Capacity and	Division/Site		Medium Term		Medium Term Option		2. 2ln Acc	Rds	11.N 4L E	XP D/E/M		
ACTIVI		Road Type		1		- 3B		3. 4ln Acc		12.N2L;F4		E 10	٦
CODE	EST.DATE August, 2018 nceptual Est. R1 DATE:	Length		3150	L.M.			4.R4L-4L		13.INST.R 14.AS IS		Est \$	
Blk Est.		Unit		Cost-Quant.	Lump Sum	2 Full Lanes SB	1	5.R2/3L-4l 6.Retr.4L-4		20.I/C Str.		25,530,028 \$ 8,105	1
	Sept.1, 2002 DESCRIPTION	Price	Unit	PerSection	Values	3150		7.R4L-4LE		21. Bridge		\$ 7,092	
						MR		8. New 4L	EXP R/B	22. Grade			•
									0".	D: 6		abut. extra	
5500	STRUCTURAL CONSTRUCTION	Unit	Llmit	Quantity	Lump			Brdge	Site \$	Piers \$	Abut. \$	length (lm)	00/
	Struct.Cons - water	Price 758.00	Unit Im	0	Sum	0	0	1 2		160,504 177,516	145,800 109,800	4	0% 0%
	Struct.Cons - sanitary	489.00		0		0	ő	3	_	177,516	109,800		0%
	Struct.Cons - storm	500.00		0		0	0	4	-	177,516	109,800		0%
	Struct.Cons - mobilization	3.0%		0		0	0	5	-	177,516	109,800		0%
5599	Struct.Cons - utility contingency	30.0%		0		0	0	1	Pier/Ht	Pier No.	P/\$/VLM	Abut/\$/HLM	
	Structural Const. Utilities Sub-total					0	0	1 2	8	1	20063 22190	4500 4500	
5510	Struct.Cons - tunnel site preparation	0.00	lm	0	0	0	0	3	8	1	22190	4500	
	Struct.Cons - tunnel construction	-	lm	0		0	0	4	8	1	22190	4500	
	Struct.Cons - snow shed site prep.	0.00		0		0	0	5	8	1	22190	4500	
5513	Struct.Cons - snow shed site const.	-	lm	0	D 199	0	0	DEOK #4	(W)	(L)	(\$/m2)	Net Cost	No. of Bridge
5514	Struct.Cons - bridge site preparation	1	LS	0	Demolition	0	0	DECK #1 DECK #2	12.2 12.2	0 0	1791 1981	315493 295936	0
	Struct.Cons - bridge site preparation Struct.Cons - bridge piers		LS	0		0		DECK #2	12.2	0	1981	295936	0
	Struct.Cons - bridge abutments		LS	0		0		DECK #4	12.2	0	1981	295936	0
5517	Struct.Cons - bridge superstructure	1	LS	0	0	0	0	DECK #5	12.2	0	1981	295936	0
	Struct.Cons - retain. wall site prep.		LS	010=		0	0	5 "4			Gross/m2	Net/m2	
	Struct.Cons - retaining wall const. Struct.Cons - mobilization	1580		6125		9,677,500		Bridge #1			#DIV/0!	#DIV/0!	
	Struct.Cons - Mobilization Struct.Cons - Contingency	3.0% 30.0%		290325 2990348		290,325 2,990,348		Bridge #2 Bridge #3			#DIV/0! #DIV/0!	#DIV/0! #DIV/0!	Tnnl \$/lm -Net
0020	Structural Construction Sub-total	00.070		2000040		12,958,173		Bridge #4			#DIV/0!	#DIV/0!	-
								Bridge #5			#DIV/0!	#DIV/0!	Tnnl \$/Im -Gross
	STRUCTURAL CONSTRUCTION COSTS					12,958,173	4114		2InSt.w-x 1-D-Shape	x-Pass.TI 2-D-Shape	shaft 1-Circle	Radius-1-D	7.267
	Struct. Eng detailed design	5.50%		712699		712,699	226	Tunnel L=	0	2-D-Shape -		Per.S&Rf	24.32
3529	Struct. Eng detailed design/Contingency	30.0%		213810		213,810	68	Tun. H1	5.100	2.550	Radius	m2/rkac	6.25
6820	Struct. Eng general const. supervision	4.00%		518327		518,327	165		1.00	1.00	1.00	Tnnl height	8.27
	Struct. Eng quality assurance	2.00%		259163		259,163	82		12.00	3.00	Wall Tk.	Radius-2-D	2.157
	Struct. Eng surveying Struct. Eng Residency Contingency	0.50% 30.0%		64791 252684		64,791 252,684	21 80	RFLT. WLT.	0.250 0.250	0.250 0.250	SOBT	Per.S&Rf m2/rkac	8.42 6.25
0029	Structural Engineering Sub-total	30.076		232004		2,021,475	642	BST.	0.230	0.200	0.100		3.16
						2,021,110		TOBT	0.100		Excm3		-
	Total Structural & Eng. Costs					14,979,647	4755	SOBT	0.100		Obk-m3	-	-
=====		======	===	=======	=======	=========	=====	BOBT	0.100		Liner-m3		-
6000	PAVING CONSTRUCTION				SM./OIL			Items Excm3	Quantity 0	rate 125	Total \$	Avg.\$/ tot-lm #DIV/0!	1-Circle 0
	Paving Construction  Paving Con - machine paving asphalt	151.00	t	4048	28114	704,547	224	Obk-m3	0	2625	0		0
	Paving Con - machine paving concrete	0.00		12.12		0	0	Rk anch-Ea	0	1125	0		0
	Paving Con - hot reprofiling	0.00		16065		0	0	MiscIm	0	2500	0		0
	Paving Con - shoulder paving	0.00		1361		0	0	Liner-m3	0	1050	0		10.00
	Paving Con - pavement finishing Paving Con - seal coating	100.00	m2	0		0	0	Drainage-Im Lighting-m	0	550 900	0		<u>%</u>
	Paving Con - Seal Coaling Paving Con - mobilization	3.0%		21136		21,136	7	Mech-m	0	2100	0		15%
	Paving Con - pavement design	0.0%		0		0	ó	MiscIm	0	1000	0		3%
	Paving Con - Contingency	30.0%		217705		217,705	69	1Tonne=1	6.67m2/25mm		0		snowshed
								60kg=1m2		1.5L =1M2 (F		length (lm)	0.0
	PAVING CONSTRUCTION COSTS					943,388	299	asphalt A.C.	(T)=mm 100	.25L =1M2 (1	1607	Roof 29.00	1.0 0.50
3560	Paving Eng - detailed design	5.50%		51886		51,886	16	A.B.C.	0	0	1.00		-
	Paving Eng - detailed design/Contingency	30.0%		15566		15,566		\$Oil/Litre	\$1.50	5%	Walls	1.0	11.20
	Paving Eng - general const. supervision	2.00%		18868		18,868		Appl. rate	1.75	1.75	3.00	\$ 1,580.00	
	Paving Eng - quality assurance	5.00%		47169		47,169		Pavement		(See I155)	Base	1.0	26.00
	Paving Eng - surveying Paving Eng - Residency Contingency	0.50% 30.0%		4717 21226		4,717 21,226	1 7	m2 630	\$/m2 \$8.84	Total 5569	1.00 Excm3	\$ 1,000.00 1.0	37.00
0009	Paving Engineering Sub-total	30.070		21220		159,433		Milling	Ψ0.04	3309	5.00		37.00
								m2	\$/m2	Total	Drainage	\$ 500.00	-
	Total Paving Const. & Eng. Costs					1,102,821	350	4,725	\$9.63	45502	Electrical	\$ 4,500.00	-
=====		======	===			=========	=====				Mech.	\$ 5,000.00	-
											Misc.	\$ 300.00 #DIV/0!	-
						l	l				L	#DIV/U!	-

File:	O\Proj\2121-00288-02 MoTI Whistler Hwy 99 Capacity & Safety Reviewi4.0 ENGINEERING DESIGN\4.3 Company MCSL 018 Dollars) Whistler Highway 99 Capacity and	Man. Reser	y	0.0% 30.0% Medium Tern	Land 30.0%	lor Way to Alpha Lake MT-3B	MT-3B	/ Road Type: 1. 2In Front 12. 2In Acc F	age	9. R-E4L- 10.N 4L E			
ACTIVI		Road Type		1	т Орион - эв	Medium Term Option	Medium	3. 4ln Acc F			4LEXP D/M		
CODE	EST.DATE August, 2018	Length		3150	L.M.	- 3B		4.R4L-4L E			R/B-EX.RD	Est \$	
	nceptual Est. R1 DATE: #6.14A R2 DATE:	Unit		Cost-Quant.	Lump Sum	2 Full Lanes SB	1	5.R2/3L-4L 6.Retr.4L-4		14.AS IS 20.I/C Str	15. Misc.	25,530,028 \$ 8,105	
	Sept.1, 2002 DESCRIPTION	Price	Unit	PerSection	Values	3150		7.R4L-4LE		21. Bridge		\$ 7,092	
						MR		8. New 4L I	EXP R/B	22. Grade		,,,,,	
	OPERATIONAL CONSTRUCTION	0500.00	Го	0	34000	24.000		Sp. (lm)	No. of Sides	Length			
	Operat.Con:- lighting Operat.Con:- signals	8500.00 275,000		1.50	34000	34,000 412,500	11 131	50 Signals	No.	3150 Units	Quantity	Rate	Total
	Operat.Con:- signing	10.00		31500	· ·	31,500	10		2	ea	1	55,000.00	82,500
	Operat.Con:- guard rail	109.00		2205	0	240,345		Sig, pol,base	2	ea	4	45,000.00	270,000
	Operat.Con:- pavement markings Operat.Con:- mobilization	1.75 3.0%		<b>9450</b> 22046		16,538 22,046	5 7	Wiring U/G	2	ls	1	40,000.00	60,000
	Operat.Con:- contingency	30.0%		227079		227,079	72						-
								·					-
	OPERATIONAL CONSTRUCTION COST					984,008	312	LP \$/Im	\$ 1.00	Refl. Sp.	Signals 20.00	Refl.\$/ea	\$ 15.00
3540	Operat. Eng- detailed design	5.50%		54120		54,120	17	Ext. Lines	2.0				ψ 13.00
	Operat. Eng- detailed design/Contingency	30.0%		16236		16,236	5		No.	Units	Quantity	Rate	Total
	Operat. Eng- general const. supervision	5.50%		54120		54,120	17	Buildings	0	m2	60	2,800.00	-
	Operat. Eng- quality assurance Operat. Eng- surveying	2.00% 0.50%		19680 4920		19,680 4,920	6 2	Pit & Apron S&I W/S	0 0	m2 ea	<b>120</b>	400.00 80,000.00	-
	Operat. Eng - Residency Contingency	30.0%		23616		23,616	7		Ö	m2	9000	40.00	-
	Operational Enginering Sub-total					172,693	55		0	lm	1,500	400.00	-
	Total Operational Const. & Eng. Costs					1,156,701	367	light/signs	0	Is	1	50,000.00	-
			===				=====				Weighscale		-
5200	ROAD SIDE CONSTRUCTION	Unit Price	Unit	Quantity	Lump Sum			Safety Rest Area	No.	Units	Quantity	Rate	Total
	RoadSide C - water	758.00	lm	0		0	0	Class A&B			ST AREAS		
	RoadSide C- sanitary	489.00		0		0	0	Buildings	0	m2	100	3,000.00	-
	RoadSide C- storm RoadSide C- mobilization	500.00 3.0%		0		0	0		0		2	12 500 00	-
	RoadSide C- Hibbilization  RoadSide C- Utility Contingency	30.0%		0		0	0	Site/toilets Parking Lot	0	ea m2	2500	12,500.00 40.00	-
0200	Road Side Const. Utilities Sub-total	00.070		· ·		0	Ö		0	lm	800	350.00	-
								Furnishings	0	ls		10,000.00	-
	RoadSide C- weighscales RoadSide C- safety rest areas	-	ea ea	0	0	0	0	Landscaping light/signs	0	ls Is	1	5,000.00 50,000.00	-
	RoadSide C- salety rest areas	40000		0	0	0	0	ligitivsigits	U	15	-	50,000.00	-
	RoadSide C- mobilization	3.0%		0		0	0				SAFETY RES	ST AREAS	-
5299	RoadSide C- Contingency	30.0%	·	0		0	0	Description	No.	Units	Quantity	Rate	Total
							-	Description	110.	O i iii C			rotai
	Road Side Construction Sub-total			0		0	0	Description	0	<u> </u>	0	-	-
	ROAD SIDE CONSTRUCTION COSTS			0		0	-		0 0 0	O.m.o	0 0 0	- - -	- - -
3550	ROAD SIDE CONSTRUCTION COSTS					0	0		0 0	J. III.	0 0 0	- - -	
	ROAD SIDE CONSTRUCTION COSTS  RoadSide E- detailed design	10.00%		0		0	0		0 0 0		0 0 0 0 Description	- - - -	- - - -
3559 6850	ROAD SIDE CONSTRUCTION COSTS  RoadSide E- detailed design RoadSide E- detailed design/Contingency RoadSide E- general const. supervision	30.0% 6.00%		0 0		0 0 0	0 0 0 0 0 0		0 0 0	Units tklm	0 0 0	- - -	Total
3559 6850 6851	ROAD SIDE CONSTRUCTION COSTS  RoadSide E - detailed design RoadSide E - detailed design/Contingency RoadSide E - general const. supervision RoadSide E - quality assurance	30.0% 6.00% 2.00%		0 0 0		0 0 0 0 0 0	0 0 0 0 0 0	Railway Removal Track Cnst.	0 0 0 0 0 No.	Units tklm tklm	0 0 0 0 Description Quantity 200.00 200.00	Rate 50.00 700.00	- - - -
3559 6850 6851 6852	ROAD SIDE CONSTRUCTION COSTS  RoadSide E - detailed design RoadSide E - detailed design/Contingency RoadSide E - general const. supervision RoadSide E - quality assurance RoadSide E - surveying	30.0% 6.00% 2.00% 1.00%				0 0 0 0 0	0 0 0 0 0 0	Railway Removal Track Cnst. Ballast	0 0 0 0 0 No.	Units tklm tklm m3	0 0 0 0 Description Quantity 200.00 200.00 500.00	Rate 50.00 700.00 60.00	- - - -
3559 6850 6851 6852	ROAD SIDE CONSTRUCTION COSTS  RoadSide E - detailed design RoadSide E - detailed design/Contingency RoadSide E - general const. supervision RoadSide E - quality assurance	30.0% 6.00% 2.00%		0 0 0		0 0 0 0 0 0	0 0 0 0 0 0 0	Railway Removal Track Cnst.	0 0 0 0 0 No.	Units tklm tklm	0 0 0 0 Description Quantity 200.00 200.00	Rate 50.00 700.00 60.00	- - - -
3559 6850 6851 6852	ROAD SIDE CONSTRUCTION COSTS  RoadSide E - detailed design RoadSide E - detailed design/Contingency RoadSide E - general const. supervision RoadSide E - quality assurance RoadSide E - surveying RoadSide E - Residency Contingency Road Side Engineering Sub-total	30.0% 6.00% 2.00% 1.00%				0 0 0 0 0 0 0 0	0 	Railway Removal Track Crist. Ballast Sub-ballast I Resurfacing Tie-ins	0 0 0 0 0  0 0 0	Units tklm tklm m3 m3	0 0 0 0 0 0 Description Quantity 200.00 200.00 500.00	Rate 50.00 700.00 60.00 56.00 30.00 5000.00	- - - -
3559 6850 6851 6852 6859	ROAD SIDE CONSTRUCTION COSTS  RoadSide E- detailed design RoadSide E- detailed design/Contingency RoadSide E- general const. supervision RoadSide E- quality assurance RoadSide E- surveying RoadSide E- Residency Contingency Road Side Engineering Sub-total  Total Road Side Const. & Eng. Costs	30.0% 6.00% 2.00% 1.00% 30.0%		0 0 0 0 0 0		0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	Railway Removal Track Crist. Ballast Sub-ballast I Resurfacing Tie-ins Turnout # 9	0 0 0 0 0 0 0 0 0 0	Units tklm tklm m3 m3 tklm ea	0 0 0 0 0 Description Quantity 200.00 500.00 500.00 1.00 1.00	Rate 50.00 700.00 60.00 56.00 30.00 5000.00 125000.00	- - - -
3559 6850 6851 6852 6859	ROAD SIDE CONSTRUCTION COSTS  RoadSide E - detailed design RoadSide E - detailed design/Contingency RoadSide E - general const. supervision RoadSide E - quality assurance RoadSide E - surveying RoadSide E - Residency Contingency Road Side Engineering Sub-total	30.0% 6.00% 2.00% 1.00% 30.0%		0 0 0 0 0 0		0 0 0 0 0 0 0 0	0 	Railway Removal Track Cnst. Ballast Sub-ballast I Resurfacing Tie-ins	0 0 0 0 0 0 0 0 0 0	Units tklm tklm m3 m3 tklm ea	0 0 0 0 Description Quantity 200.00 500.00 500.00 1.00	Rate 50.00 700.00 60.00 56.00 30.00 5000.00	- - - -
3559 6850 6851 6852 6859	ROAD SIDE CONSTRUCTION COSTS  RoadSide E- detailed design RoadSide E- detailed design/Contingency RoadSide E- general const. supervision RoadSide E- quality assurance RoadSide E- surveying RoadSide E- Residency Contingency Road Side Engineering Sub-total  Total Road Side Const. & Eng. Costs	30.0% 6.00% 2.00% 1.00% 30.0%		0 0 0 0 0 0		0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0	Railway Removal Track Crist. Ballast Sub-ballast I Resurfacing Tie-ins Turnout # 9	0 0 0 0 0 0 0 0 0 0 0	Units tklm tklm m3 m3 tklm ea	0 0 0 0 Description 200.00 200.00 500.00 1.00 1.00 1.00	Rate 50.00 700.00 60.00 56.00 30.00 5000.00 125000.00 1500.00	- - - -
3559 6850 6851 6852 6859  5300 5303	ROAD SIDE CONSTRUCTION COSTS  RoadSide E- detailed design RoadSide E- detailed design/Contingency RoadSide E- general const. supervision RoadSide E- quality assurance RoadSide E- surveying RoadSide E- Residency Contingency Road Side Engineering Sub-total  Total Road Side Const. & Eng. Costs	30.0% 6.00% 2.00% 1.00% 30.0% 	=== Unit Im	0 0 0 0 0 0 0	Lump	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0	Railway Removal Track Cnst. Ballast Sub-ballast I Resurfacing Tie-ins Turnout #9 Others (see grading)	0 0 0 0 0 0 0 0 0 0 0 0 0	Units tkim tkim m3 m3 tkim ea ea ls	0 0 0 0 0 Description 200.00 200.00 500.00 1.00 1.00 1.00	Rate 50.00 700.00 60.00 56.00 30.00 5000.00 125000.00 1500.00 2000.00 400.00	- - - - - - - - - - - - - - - - - - -
3559 6850 6851 6852 6859  5300 5303 5304	ROAD SIDE CONSTRUCTION COSTS  RoadSide E - detailed design RoadSide E - detailed design/Contingency RoadSide E - general const. supervision RoadSide E - quality assurance RoadSide E - surveying RoadSide E - Residency Contingency Road Side Engineering Sub-total  Total Road Side Const. & Eng. Costs  OTHER CONSTRUCTION Other Const - water Other Const - sanitary	30.0% 6.00% 2.00% 1.00% 30.0% 	 === Unit Im		Lump	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0	Railway Removal Track Cnst. Ballast Sub-ballast I Resurfacing Tie-ins Turnout #9 Others (see grading)  R/rd X-ing	0 0 0 0 0 0 0 0 0 0 0 0 0 0	Units tklm tklm m3 tklm ea ls	Description Quantity 200.00 500.00 1.00 1.00 1.00 1.00 Railway Quantity	Rate 50.00 700.00 60.00 56.00 30.00 5000.00 125000.00 1500.00 2000.00 400.00	- - - -
3559 6850 6851 6852 6859 	ROAD SIDE CONSTRUCTION COSTS  RoadSide E - detailed design RoadSide E - detailed design/Contingency RoadSide E - general const. supervision RoadSide E - quality assurance RoadSide E - surveying RoadSide E - surveying RoadSide E - Residency Contingency Road Side Engineering Sub-total  Total Road Side Const. & Eng. Costs	30.0% 6.00% 2.00% 1.00% 30.0% 	=== Unit Im Im	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Lump	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0	Railway Removal Track Cnst. Ballast Sub-ballast I Resurfacing Tie-ins Turnout #9 Others (see grading)  R/rd X-ing Planks	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Units tklm tklm m3 m3 tklm ea ea ls lm	Description Quantity 200.00 500.00 1.00 1.00 1.00 1.00 2 Quantity 45	Rate 50.00 700.00 60.00 56.00 30.00 5000.00 125000.00 1500.00 2000.00 400.00  Rate 2500.00	- - - - - - - - - - - - - - - - - - -
3559 6850 6851 6852 6859 	ROAD SIDE CONSTRUCTION COSTS  RoadSide E- detailed design RoadSide E- detailed design/Contingency RoadSide E- general const. supervision RoadSide E- quality assurance RoadSide E- surveying RoadSide E- Residency Contingency Road Side Engineering Sub-total  Total Road Side Const. & Eng. Costs	30.0% 6.00% 2.00% 1.00% 30.0% 	=== Unit Im Im Im		Lump	0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Railway Removal Track Cnst. Ballast Sub-ballast I Resurfacing Tie-ins Turnout #9 Others (see grading)  R/rd X-ing	0 0 0 0 0 0 0 0 0 0 0 0 0 0	Units tklm tklm m3 tklm ea ls	Description Quantity 200.00 500.00 1.00 1.00 1.00 1.00 Railway Quantity	Rate 50.00 700.00 60.00 56.00 30.00 5000.00 125000.00 1500.00 2000.00 400.00	- - - - - - - - - - - - - - - - - - -
3559 6850 6851 6852 6859 	ROAD SIDE CONSTRUCTION COSTS  RoadSide E - detailed design RoadSide E - detailed design/Contingency RoadSide E - general const. supervision RoadSide E - quality assurance RoadSide E - surveying RoadSide E - Residency Contingency Road Side Engineering Sub-total  Total Road Side Const. & Eng. Costs  OTHER CONSTRUCTION Other Const - sanitary Other Const - storm Other Const - mobilization	30.0% 6.00% 2.00% 1.00% 30.0% 	=== Unit Im Im Im		Lump	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Railway Removal Track Cnst. Ballast Sub-ballast I Resurfacing Tie-ins Turnout #9 Others (see grading)  R/rd X-ing Planks	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Units tklm tklm m3 m3 tklm ea ea ls lm	Description Quantity 200.00 500.00 500.00 1.00 1.00 1.00 1.00	Rate 50.00 700.00 60.00 56.00 30.00 5000.00 125000.00 1500.00 2000.00 400.00  Rate 2500.00	- - - - - - - - - - - - - - - - - - -
3559 6850 6851 6852 6859  5300 5303 5304 5305 5302 5309	ROAD SIDE CONSTRUCTION COSTS  RoadSide E - detailed design RoadSide E - detailed design/Contingency RoadSide E - general const. supervision RoadSide E - quality assurance RoadSide E - surveying RoadSide E - surveying RoadSide E - Residency Contingency Road Side Engineering Sub-total  Total Road Side Const. & Eng. Costs	30.0% 6.00% 2.00% 1.00% 30.0% 	Unit Im Im	0 0 0 0 0 0 0	Lump	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Railway Removal Track Cnst. Ballast Sub-ballast I Resurfacing Tie-ins Turnout #9 Others (see grading)  R/rd X-ing Planks Sig/gates	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Units tklm m3 m3 tklm ea ea ls Im Units tklm	Description Quantity 200.00 500.00 1.00 1.00 1.00 1.00 20.00 1.00 1.0	Rate 50.00 700.00 60.00 56.00 30.00 5000.00 125000.00 400.00 Rate 25000.00 250000.00	Total Total
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3559 6850 6851 6852 6859 	ROAD SIDE CONSTRUCTION COSTS  RoadSide E - detailed design RoadSide E - detailed design/Contingency RoadSide E - general const. supervision RoadSide E - quality assurance RoadSide E - surveying RoadSide E - Residency Contingency Road Side Engineering Sub-total  Total Road Side Const. & Eng. Costs	30.0% 6.00% 2.00% 1.00% 30.0% 	Unit Im Im ea ea		Lump	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Railway Removal Track Cnst. Ballast Sub-ballast I Resurfacing Tie-ins Turnout #9 Others (see grading)  R/rd X-ing Planks Sig/gates	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Units tklm m3 m3 tklm ea ea ls Im Units tklm	Description Quantity 200.00 500.00 1.00 1.00 1.00 1.00 20.00 1.00 1.0	Rate 50.00 700.00 60.00 56.00 30.00 5000.00 125000.00 400.00 Rate 25000.00 250000.00	Total Total
3559 6850 6851 6852 6859 5300 5303 5304 5305 5302 5309 5310 5320 5330 5340	ROAD SIDE CONSTRUCTION COSTS  RoadSide E - detailed design RoadSide E - detailed design/Contingency RoadSide E - general const. supervision RoadSide E - quality assurance RoadSide E - quality assurance RoadSide E - surveying RoadSide E - Residency Contingency Road Side Engineering Sub-total  Total Road Side Const. & Eng. Costs	30.0% 6.00% 2.00% 1.00% 30.0% 	Unit Im Im Im ea ea ea ea		Lump	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Railway Removal Track Cnst. Ballast Sub-ballast I Resurfacing Tie-ins Turnout #9 Others (see grading)  R/rd X-ing Planks Sig/gates	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Units tklm m3 m3 tklm ea ea ls Im Units tklm	Description Quantity 200.00 500.00 1.00 1.00 1.00 1.00 20.00 1.00 1.0	Rate 50.00 700.00 60.00 56.00 30.00 5000.00 125000.00 400.00 Rate 25000.00 250000.00	Total Total
3559 6850 6851 6852 6859 5300 5303 5304 5305 5302 5309 5310 5320 5340 5340 5340	ROAD SIDE CONSTRUCTION COSTS  RoadSide E- detailed design RoadSide E- detailed design/Contingency RoadSide E- general const. supervision RoadSide E- quality assurance RoadSide E- surveying RoadSide E- surveying RoadSide E- Residency Contingency Road Side Engineering Sub-total  Total Road Side Const. & Eng. Costs	30.0% 6.00% 2.00% 1.00% 30.0% 30.0% 30.0% 30.0%	=== Unit Im Im Im ea ea ea		Lump	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Railway Removal Track Cnst. Ballast Sub-ballast I Resurfacing Tie-ins Turnout #9 Others (see grading)  R/rd X-ing Planks Sig/gates	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Units tklm m3 m3 tklm ea ea ls Im Units tklm	Description Quantity 200.00 500.00 1.00 1.00 1.00 1.00 20.00 1.00 1.0	Rate 50.00 700.00 60.00 56.00 30.00 5000.00 125000.00 400.00 Rate 25000.00 250000.00	Total Total
3559 6850 6851 6852 6859 5300 5303 5304 5305 5302 5309 5310 5320 5340 5340 5340	ROAD SIDE CONSTRUCTION COSTS  RoadSide E - detailed design RoadSide E - detailed design/Contingency RoadSide E - general const. supervision RoadSide E - quality assurance RoadSide E - quality assurance RoadSide E - surveying RoadSide E - Residency Contingency Road Side Engineering Sub-total  Total Road Side Const. & Eng. Costs	30.0% 6.00% 2.00% 1.00% 30.0% 	=== Unit Im Im Im ea ea ea		Lump	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Railway Removal Track Cnst. Ballast Sub-ballast I Resurfacing Tie-ins Turnout #9 Others (see grading)  R/rd X-ing Planks Sig/gates	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Units tklm m3 m3 tklm ea ea ls Im Units tklm	Description Quantity 200.00 500.00 1.00 1.00 1.00 1.00 20.00 1.00 1.0	Rate 50.00 700.00 60.00 56.00 30.00 5000.00 125000.00 400.00 Rate 25000.00 250000.00	Total Total
3559 6850 6851 6852 6859 5300 5303 5304 5305 5302 5309 5310 5320 5330 5340 5340	ROAD SIDE CONSTRUCTION COSTS  RoadSide E - detailed design RoadSide E - detailed design/Contingency RoadSide E - general const. supervision RoadSide E - guality assurance RoadSide E - surveying RoadSide E - Residency Contingency Road Side Engineering Sub-total  Total Road Side Const. & Eng. Costs	30.0% 6.00% 2.00% 1.00% 30.0% 30.0% 30.0% 30.0%	=== Unit Im Im Im ea ea ea		Lump	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Railway Removal Track Cnst. Ballast Sub-ballast I Resurfacing Tie-ins Turnout #9 Others (see grading)  R/rd X-ing Planks Sig/gates	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Units tklm m3 m3 tklm ea ea ls Im Units tklm	Description Quantity 200.00 500.00 1.00 1.00 1.00 1.00 20.00 1.00 1.0	Rate 50.00 700.00 60.00 56.00 30.00 5000.00 125000.00 400.00 Rate 25000.00 250000.00	Total Total
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3559 6850 6851 6852 6859 5300 5303 5304 5305 5302 5309 5310 5320 5330 5340 5399	ROAD SIDE CONSTRUCTION COSTS  RoadSide E - detailed design RoadSide E - detailed design/Contingency RoadSide E - general const. supervision RoadSide E - quality assurance RoadSide E - quality assurance RoadSide E - surveying RoadSide E - Residency Contingency Road Side Engineering Sub-total  Total Road Side Const. & Eng. Costs	30.0% 6.00% 2.00% 1.00% 30.0% 1.00% 30.0%	Unit Im Im ea ea ea	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Lump Sum	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Railway Removal Track Cnst. Ballast Sub-ballast I Resurfacing Tie-ins Turnout # 9 Others (see grading)  R/rd X-ing Planks Sig./gates  Description  Environment: Mitigation Ponds	No.  No.  No.  No.  No.  No.  No.  No.	Units tklm tklm m3 tklm ea ls lm Units tklm cach Units	Description  Railway  Quantity  As a large of the following state of	Rate 50.00 700.00 60.00 56.00 30.00 560.00 125000.00 125000.00 400.00  Rate 2500.00 250000.00 Rate	Total
3559 6850 6851 6852 6859 5300 5303 5304 5305 5302 5309 5310 5320 5330 5340 5340 6870 6871 6872	ROAD SIDE CONSTRUCTION COSTS  RoadSide E - detailed design RoadSide E - detailed design/Contingency RoadSide E - general const. supervision RoadSide E - guality assurance RoadSide E - guality assurance RoadSide E - Residency Contingency Road Side Engineering Sub-total  Total Road Side Const. & Eng. Costs	30.0% 6.00% 2.00% 1.00% 30.0%	Unit Im Im ea ea ea	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Lump Sum	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Railway Removal Track Cnst. Ballast Sub-ballast I Resurfacing Tie-ins Turnout # 9 Others (see grading)  R/rd X-ing Planks Sig./gates  Description  Environment: Mitigation Ponds	No.  No.  No.  No.  No.  No.  No.  No.	Units tklm tklm m3 tklm ea ls lm Units tklm cach Units	Description  Railway  Quantity  As a large of the following state of	Rate 50.00 700.00 60.00 56.00 30.00 560.00 125000.00 125000.00 400.00  Rate 2500.00 250000.00 Rate	Total
3559 6850 6851 6852 6859 5300 5303 5304 5305 5302 5309 5310 5320 5330 5340 5340 6871 6871	ROAD SIDE CONSTRUCTION COSTS  RoadSide E - detailed design RoadSide E - detailed design/Contingency RoadSide E - general const. supervision RoadSide E - quality assurance RoadSide E - quality assurance RoadSide E - surveying RoadSide E - Residency Contingency Road Side Engineering Sub-total  Total Road Side Const. & Eng. Costs	30.0% 6.00% 2.00% 1.00% 30.0% 1.00% 30.0%	Unit Im Im ea ea ea	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Lump Sum	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Railway Removal Track Cnst. Ballast Sub-ballast I Resurfacing Tie-ins Turnout # 9 Others (see grading)  R/rd X-ing Planks Sig./gates  Description  Environment: Mitigation Ponds	No.  No.  No.  No.  No.  No.  No.  No.	Units tklm tklm m3 tklm ea ls lm Units tklm cach Units	Description  Railway  Quantity  As a large of the following state of	Rate 50.00 700.00 60.00 56.00 30.00 560.00 125000.00 125000.00 400.00  Rate 2500.00 250000.00 Rate	Total
3559 6850 6851 6852 6859 5300 5303 5304 5305 5302 5309 5310 5320 5330 5340 5340 6871 6871	ROAD SIDE CONSTRUCTION COSTS  RoadSide E - detailed design RoadSide E - detailed design/Contingency RoadSide E - general const. supervision RoadSide E - quality assurance RoadSide E - quality assurance RoadSide E - surveying RoadSide E - Residency Contingency Road Side Engineering Sub-total  Total Road Side Const. & Eng. Costs	30.0% 6.00% 2.00% 1.00% 30.0%	Unit Im Im ea ea ea	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Lump Sum	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Railway Removal Track Cnst. Ballast Sub-ballast I Resurfacing Tie-ins Turnout # 9 Others (see grading)  R/rd X-ing Planks Sig./gates  Description  Environment: Mitigation Ponds	No.  No.  No.  No.  No.  No.  No.  No.	Units tklm tklm m3 tklm ea ls lm Units tklm cach Units	Description  Railway  Quantity  As a large of the following state of	Rate 50.00 700.00 60.00 56.00 30.00 5000.00 125000.00 1500.00 2000.00 400.00  Rate 2500.00 250000.00 Rate 50,000 40,000	Total

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File:	& Safety Revie Company	00288-02 MoTI Whistler Hwy 99 Capacity ew/4.0 ENGINEERING DESIGN/4.3 MCSL Whistler Highway 99 Capacity and \$	Man. Reserv Contingency Division/Site	30.0%		nor Way to Alpha Lake	MT-3B	V Road Types 1. 2In Frontage ∃2. 2In Acc Rds	9. R-E4L-4L D/M 10.N 4L EXP D/M 11.N 4L EXP D/E/M		
ACTIVIT	ΓΥ	Capacity and Safety Review	Road Type	1		Medium Term Option - 3B		3. 4ln Acc Rds	12.N2L;F4LEXP D/M	· ·	7
CODE	nceptual Est.	EST.DATE August, 2018 R1 DATE:	Length	3150	L.M.	2 Full Lanes SB		4.R4L-4L EXP R/B 5.R2/3L-4L EXP R/B	13.INST.R/B-EX.RD 14.AS IS 15. Misc.	Est \$ 25,530,028	
Blk Est.	# 6.14A	R2 DATE:	Unit	Cost-Quant.	Lump Sum	1		6.Retr.4L-4LEX R/B	20.I/C Str.&Ramps	\$ 8,105	
Version	Sept.1, 2002	DESCRIPTION	Price	Unit PerSection	Values	3150 MR	3150	7.R4L-4LEX R/B E/S 8. New 4L EXP R/B	21. Bridges 22. Grade Sep.	\$ 7,092	]
3500	DETAILED	DESIGN				IVIR		0. New 4L EXP R/B	22. Grade Sep.		
		from 3510,3520,3540,3550,357				1,442,625		Bridge Tunnel	Special		
		: - detailed design r- Contingency	0.90% 30.0%	181589 54477	0	181,589 54,477	58 17	Description No.	- Units Quantity	Rate	Total
						34,477		Description 140.	Office Quartity	rate -	- Total
		ETAILED DESIGN COSTS				1,678,691	533			-	-
		T ENGINEERING	======	=== ======	=======	=========	=====			-	-
		from 6810,6820,6840,6850,686	60,6870			1,770,765				-	-
		ESIDENT ENG. COSTS				1,770,765	562		Description	-	
		======================================	======	=== =======		1,770,705	=====	Description No.	Units Quantity	Rate	Total
										-	-
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	PART 1	SUMMARY	======	=== ======	=======	=========	=====			-	-
	. / 11 1	CONSTRUCTION				15,822,846	5023		Description	-	<u> </u>
		NGINEERING & SUPERVISION				2,821,874	896	Description No.	Units Quantity	Rate	Total
	CC	ONTRACTUAL CONTINGENCY				5,593,416 0	1776 0			-	-
	CONSTRU	JCTION COST TOTAL	DIVISIONIS	ITE Medium Terr	n Ontion - 3₽	24,238,136	7695	-		Ξ.	Ξ.
2000					Option - 3B	24,230,130				Ī.,	-
		MANAGEMENT - office costs wages	2.00%	Land 484763	- 0	484,763	154			-	-
		n - office costs - expenses	0.50%	121191	0	121,191	38			-	-
		n - printing costs	0.00%	0	0	0	0			-	-
2061		n - general (MoTI Regional Cost F nager Sub-total	0.00%	0	0	0 605,953	0 192			-	-
								-		-	-
		<ul><li>office costs wages</li><li>office costs - expenses</li></ul>	1.00% 0.50%	242381 121191	0	242,381 121,191	77 38	Description No.	Units Quantity	Rate	Total
		- printing costs	0.00%	0	0	0	0		Offics Quartity	rate -	- TOLAI
2011	Client	- general	0.00%	0	0	0	0			-	-
	Client Sub-to	total				363,572	115			-	-
2070	Public Rel.	- wages & expenses	0.00%	0	0	0	0			-	-
		- adv., media, displays	0.00%	0	0	0	0			-	
		<ul><li>opening ceremonies</li><li>general (FN Accomm.)</li></ul>	0.00% 0.00%	0	0	0	0	Description No.	Description Units Quantity	Rate	Total
2071		tions Sub-total	0.0070	ŭ	v	0	0	Description 140.	Office Quartity	-	-
2040			0.400/	24220		24 220	8	-		-	-
	Legal Costs	s - lawyers fees s - general	0.10% 0.00%	24238 0	0	24,238	0				-
	Legal Costs					24,238	8			-	-
2080	Incurance	- const./ liability, E&O	0.00%	0	0	0	0	•		-	-
	Insurance		0.00%	0	0		0			-	-
	Legal Costs	s Sub-total				0	0			-	-
2099	Project Man	nagement Contingency	30.0%	298129		298,129	95	-		-	-
								-	Description		
		ROJECT MANAGEMENT COST		=== ======	===	1,291,893	410	4.10%			
	LAND		\$/Building	# buildings	LS	0		1 Hectare = 10,000 Sc	uare Meters		
4010		-Mrkt,ROW,Serv,Imp.V,Ease.C	250,000	Res. 0	0	0		1 Hectare = 2.471 Acr	es		
	Acquisition S	Sub-total	2,000,000	Cor 0	0	0	0	1 Acre = 43,560 squar Planned RO			
4020	Land(Code	-Bus.,5%,Mrg.P,Rel\$,P/Tax,Etc	10.00%	0	0	0	0		3.5		
		-Owners(LS,Apprsl,Rprt,Lgl,In	7.00%	0	0	0	0		0 107,637		
		-Demolition -Pro.Man,P.Tax,Util,Security	0.00% 1.00%	0	0	0	0		0.00 10.76 0 43,560		
4060	Land(Code	-Not Used		ŭ	·			Cost /Ft2	0.00 \$ 1.00		
	Land(Code		7 000/	•	•	_	_	#DIV/0!	0 40 000		
	Land(Code Land(Code	<ul><li>-Acq.F,M/Sal,TrvIV,Cntr.S,Appr</li><li>-Surveys</li></ul>	7.00% 0.00%	0	0	0	0		\$ 10,000 \$ 2,000		
.000			3.0070	ŭ	· ·			Description No.	Units Quantity	Rate	Total
										-	-
	Ang = -! : :	d agata aub t-t-!		-		_	_			Ξ.	Ξ.
	Associated	d costs-sub-total		0		0	0	-		-	-
		ingency Sub total	30.0%	0	0	0	0			_	-
4099	Land Conti	ingency Sub-total	30.070	ū			_				
4099		AND COSTS				0	0		Description	-	

	O:\Proi\2121 00	0288-02 MoTI Whistler Hwy 99 Capacity				1	1				
		v\4.0 ENGINEERING DESIGN\4.3	Man. Reser	ve 0.	0% Land	lor Way to Alpha Lake	Taylor W	Road Types	9. R-E4L-4L D/M		
	Company I		Contingency					1. 2ln Frontage	10.N 4L EXP D/M		
		Whistler Highway 99 Capacity and		Medium T	erm Option - 3B	Medium Term Option		2. 2ln Acc Rds	11.N 4L EXP D/E/M		
ACTIVIT		Capacity and Safety Review	Road Type		_1	- 3B		3. 4ln Acc Rds	12.N2L;F4LEXP D/M		
CODE		EST.DATE August, 2018	Length		50 L.M.			4.R4L-4L EXP R/B	13.INST.R/B-EX.RD	Est \$	
	ceptual Est. I			======		2 Full Lanes SB		5.R2/3L-4L EXP R/B	14.AS IS 15. Misc.	25,530,028	
Blk Est. #	-	R2 DATE:	Unit	Cost-Qua		1		6.Retr.4L-4LEX R/B		\$ 8,105	
Version 8	Sept.1, 2002	DESCRIPTION	Price	Unit PerSection	n Values	3150 MR		7.R4L-4LEX R/B E/S	21. Bridges	\$ 7,092	
0000	MANACEM	ENT RESERVE				- IVIR		8. New 4L EXP R/B Description No.	22. Grade Sep. Units Quantity	Rate	Total
	MAN. RES		0.0%	83	45	0	0	Description No.	Office Quartity	Nate	Total
		- preliminary design	0.0%	135		0	0				_
		- utility construction	0.0%	393		Ö	Ö			_	_
		- grade construction	0.0%	5278		0	0			_	_
		- structural construction	0.0%	12958		0	0			_	_
		- paving construction	0.0%	943	88	0	0			_	_
		- operation construction	0.0%	984		0	0			-	-
		- roadside construction	0.0%		0	0	0			-	-
	MAN. RES	- other construction	0.0%	12	151	0	0			-	-
	MAN. RES	- project management	0.0%	1291	193	0	0			-	-
	MAN. RES	- land	0.0%		0	0	0			-	-
	MAN. RES	- detailed eng.	0.0%	1678	91	0	0			-	-
		residency eng.	0.0%	1770	65	0	0			-	-
	MAN. RES	- Contingency	0.0%		0	0	0			-	-
		NAGEMENT RESERVE		25530		0	0			<u>-</u>	-
			======	=== ======		= ========	=====		Description		-
		SS ESCALATION			0 25530028			Description No.	Units Quantity	Rate	Total
	FISCAL									-	-
9900	ESCALATIO				_					-	-
	YEAR	PROJECTED ESCALATION		\$ DON						-	-
	2016-2017	0.5750%			0	0	0			-	-
	2017-2018	0.6250%			0	0	0			-	-
	2018-2019	1.0000%			0	0	0			-	-
	2019-2020	1.0000% 1.0000%			0	0	0			-	-
	2020-2021 2021-2022	1.0000%			0	0	0			-	-
	2021-2022	1.0000%			0	0	0				-
	2022-2023	1.0000%			0		0				-
	2023-2024	1.0000%			0	0	0			-	-
	TOTAL ES	CALATION	100.00%		0	0	0			-	-
	TOTAL ES				:= ======	=======================================	=====			-	-
	=======										_
	PART 2 SU	JMMARY NON-CONSTRUCTI					0.4-			-	
	PART 2 SU	JMMARY NON-CONSTRUCTING Non-Construction				993,764	315			-	-
	PART 2 SU	JMMARY NON-CONSTRUCTI				993,764 298,129	315 95			- - -	-
	PART 2 SU	JMMARY NON-CONSTRUCTING Non-Construction								- - - -	- - - -
	PART 2 SU	JMMARY NON-CONSTRUCTI Non-Construction Non-Const. Contingency	ON COSTS			298,129	95			- - - -	- - - -

File: & S (2018 ACTIVITY CODE	Safety Reviet Company B Dollars) eptual Est.	Whistler Highway 99 Capacity and Capacity and Safety Review EST.DATE August, 2018	Road Type Length Unit	0.0% 30.0% Long Term ( 1 5600 ====== Cost-Quant. PerSection	30.0%	Long Tern 2 Full L	n Option - 1  anes SB  1  5600	LT-1 Long Ter 1 5600	1. 2ln Fron 2. 2ln Acc 3. 4ln Acc 4.R4L-4L E 5.R2/3L-4L 6.Retr.4L-4 7.R4L-4LE	tage Rds Rds EXP R/B . EXP R/B ILEX R/B X R/B E/S	9. R-E4L-4l 10.N 4L EX 11.N 4L EX 12.N2L;F4L 13.INST.R/ 14.AS IS 20.I/C Str.8 21. Bridges	(P D/M (P D/E/M LEXP D/M B-EX.RD 15. Misc. (Ramps	Est \$ 51,899,815 \$ 9,268 \$ 8,050	
SI	UMMARY	BY ACTIVITY LEVEL		Diff	Previous	·	<b>MR</b>	Cost/LM	8. New 4L % of T	% of TC	22. Grade S	sep.		
2000		PROJECT MANAGEMENT		Diff. -2020215	Estimate 0		2,020,215	361	3.9%	3.9%				
2500		PLANNING		-206388	0		206,388	37	0.4%	0.4%				
3000 3500		PRELIMINARY DESIGN DETAILED DESIGN		-406560 -2611992			406,560 2,611,992	73 466	0.8% 5.0%	0.8% 5.0%				
		Total Engineering	J	-3224940	0		3,224,940	576	6.2%	6.2%			5245154	
4000		LAND ACQUISITION		0	0		0	0	0.0%	0.0%				
5000		GRADE CONSTRUCTION		 -8739415	0		8,739,415	1561	16.8%	16.8%				
5200 5300		ROAD SIDE CONSTRUCTION OTHER CONSTRUCTION	1	0	_		0 92,700	0 17	0.0% 0.2%	0.0% 0.2%				
5500		STRUCTURAL CONSTRUCTI	ON	-92700 -20294090	0	2	20,294,090	3624	39.1%	39.1%				
6000		PAVING CONSTRUCTION		-1290104	0		1,290,104	230	2.5%					
6500		OPERATIONAL CONSTRUCT	ION	-977820	0		977,820	175	1.9%	1.9%				
6700 6800		UTILITY CONSTRUCTION RESIDENT ENGINEERING		-537600 -2746051	0		537,600 2,746,051	96 490	1.0% 5.3%	1.0% 5.3%				
		Total Construction	1	-34677780	0	3	34,677,780	6192	66.8%	66.8%				
9700		CONTINGENCY		-11976880	0	1	11,976,880	2139	23.1%	23.1%				
		SUB-TOTAL		 -51899815	0		51,899,815	9268	100.0%	100.0%				
9800		MANAGEMENT RESERVE		0	0		0	0	0.0%	0.0%				
		TOTAL 		-51899815 	0		51,899,815	9268	100.0%	100.0%				
9900		ESCALATION		0	0		0	0		0.0%				
		TOTAL COST		-51899815			51,899,815	9268		100.0%				
		Constr. Less Resident Eng		-31931729	0		31,931,729	5702						
				ENG. & PM			6,818,701	1218	13.1%					
				LAND			0	0	0.0%					
				CONST.		4	15,081,114	8050	86.9%					
				MAN. RES. ESC.			0	0	0.0% 0.0%					
				TOTAL			51,899,815	9268	100.0%	•				
Lo	ong Term	Option - 1	Assumptions			Shoulder		Lane	Lane	Median	Lane	Lane	Shoulder	-
	1	Existing Right-Of -Way	, m		Existing Rd		-	-	-	-	-	-	-	j
			partial taking		Pvmt Width	Shoulder	0.0	Lane	Lane	Median	Lane	Lane	Shoulder	Ditch W.
	2	New Addition Right-Of -Way ROW	/ NO m		New Rd.		1.50	- Annhalt d	3.60	100	Tonggo t	7107	Linit Price	0.5
		KOW	10 111		Pvmt Width	SCOPE	5.1	Asphalt d	Bridge L.		Tonage t	X-sect./lm	Unit Price Tot. Vol.	\$ 151.00
		Bridges		Width(m)	Length(m)			5,540	60	5,600		14.20	78,674	_
	3.1	0		3.0	60.0	CBS		slope	D= meter	Volume		Rock	38,102	\$ 107.66
	3.2	0		3.0	0.0	CCCD		4.0	0.257 D= meter	9878	\$ 60.00 Unit		19,051 9,878	
	3.3 3.4	0		3.0 3.0	0.0 0.0	SGSB		4.0	0.210		\$ 56.00	Stripping Borrow	11,642	
	3.5	0		3.0	0.0				0.2.0	10000	ψ 00.00	20011	,	ų .2.00
		Tunnolo	Longth/n-\	\\/:\d4F/\	Unimb#/									
		Tunnels 2InSt.w-x	Length(m) 0	Width(m) 12.0	Height(m) 8.27	1								
		x-Pass.TI	0	3.0	3.16									
	4.3	shaft	0		Diameter									
	4.4	snowshedlength (Im)	0											
		Bridges	Net \$/M2	Gross\$/m2	_									
	3.1	0	\$ 2,692	\$ 3,500		1								
	3.2	0	#DIV/0!	#DIV/0!										
	3.3 3.4	0	#DIV/0! #DIV/0!	#DIV/0! #DIV/0!										
	3.5	0		#DIV/0!										
	0.0				_									
						1								

								Ü	•				-	
		0288-02 MoTI Whistler Hwy 99 Capacity	M D		0.00/			l	Dead Torres		0.0.54	41 D/M		
ile:		w\4.0 ENGINEERING DESIGN\4.3	Man. Reser		0.0%		imer Rd to Alpha Lake				9. R-E4L-4			
	Company		Contingency		30.0%		LT-1	LT-1	1. 2ln Frontag		10.N 4L E			
		Whistler Highway 99 Capacity and		9	Long Term O	ption - 1	T 0 " 4	Long Te	2. 2ln Acc Rd		11.N 4L E			
ACTIVIT		Capacity and Safety Review	Road Type		1		Long Term Option - 1		3. 4ln Acc Rd			LEXP D/M		
CODE		EST.DATE August, 2018	Length		5600	L.M.			4.R4L-4L EXF		13.INST.F		Est \$	
	ceptual Est.				=======		2 Full Lanes SB		5.R2/3L-4L E		14.AS IS		51,899,815	
3lk Est.		R2 DATE:	Unit		Cost-Quant.	Lump Sum	1		6.Retr.4L-4LE		20.I/C Str.			
/ersion	Sept.1, 2002	DESCRIPTION	Price	Unit	PerSection	Values	5600	5600	7.R4L-4LEX F		21. Bridge		8,050	
							MR		8. New 4L EX	P R/B	22. Grade	Sep.		
	PLANNING													
		<ul> <li>transport. planning study</li> </ul>	4.50		25200		25,200	5	Description	No.	Units	Quantity	Rate	Total
		- corridor study	4.50		25200		25,200	5						-
2541	Consultant	<ul> <li>functional plan. study</li> </ul>	4.50	LM	25200		25,200	5						-
2502	Consultant	- general	5.0%		3780		3,780	1						-
	Consultant s	sub-total					79,380	14						-
														-
		<ul> <li>project ident.</li> </ul>	4.50		25200		25,200	5						-
		- transport. planning study	4.50		25200		25,200	5						-
2530	Client	- corridor study	6.30	LM	35280		35,280	6						-
2540	Client	- functional study	6.30	LM	35280	0	35,280	6						-
2501	Client	- general	5.0%		6048		6,048	1						_
	Client Sub-to	otal			127008		127,008	23				Description		-
									Description	No.	Units	Quantity	Rate	Total
2599	Planning Co	ntingency	30.0%		61916		61,916	11				,		-
														-
	TOTAL PL						268,304	48						-
			=======	===	=======	=======	=========	=====						-
		ARY DESIGN												-
		- aerial base plan	5.50		30800		30,800	6						-
		- prel. design	6.60		36960		36,960	7						-
3015	Consultant	<ul> <li>control survey</li> </ul>	5.50	LM	30800		30,800	6						-
3021	Consultant	- environmental impact	11.00	LM	61600		61,600	11						-
3031	Consultant	- functroad field survey	5.50	LM	30800		30,800	6						-
3041	Consultant	- functional design	4.40	LM	24640	0	24,640	4				Description		-
		- funct. des. structural	3.30		18480	0	18.480	3	Structural	0.50%				
		- geotechnical design	27.50		154000	Ü	154,000	28		0.0070				
		- right-of-way research	3.30		18480	0	18,480	3	\$/Prop. <b>\$</b>	150				
	Consultant		0.0%		0	Ü	0	Ö	Description	No.	Units	Quantity	Rate	Total
0002	Consultant s		0.070		· ·		406.560	73	Description	110.	Orinto	Quantity	rato	- 10101
														-
3010	Client	- aerial base plan	0.00	I M	0		0	0						_
		- prel. design	0.00		0		0	-	Whistler Sign	1	ea	1	5,000	5,000
		- control survey	0.00		0		0		Tree Remova	1		16	200	3,200
					0		0			1	ea			
		- environmental impact	0.00				-		Light pole rer	1	ea	2	2,500	5,000
		- functroad field survey	0.00		0		0	0						-
		- functional design	0.00		0		0	0						-
		- funct. des. structural	0.00		0		0		Barrier remov	1	lm	3360	50	168,000
		- geotechnical design	0.00		0		0		Electric sign	1	ea	1	20,000	20,000
		- right-of-way research	0.00	LM	0		0	0	Bus Pullout F	1	ea	7	10,000	70,000
3001	Client	- general	0.0%		0		0	0						-
	Client Sub-to	otal					0	0	Valley Trail A	1	ea	2	3,500	7,000
														-
3099	Preliminary	design Contingency	30.0%		121968		121,968	22						-
									RIRO Recon:	1	ea	3	20,000	60,000
		ELIMINARY DESIGN					528.528	94				Description		

ACTIVI"		Road Type	30.0 Long Tern	% 30.0% Option - 1	imer Rd to Alpha Lake LT-1 Long Term Option - 1	LT-1	1. 2ln Fron r 2. 2ln Acc 3. 4ln Acc	tage Rds Rds	9. R-E4L-4 10.N 4L EX 11.N 4L EX 12.N2L;F4	XP D/M XP D/E/M LEXP D/M		
CODE	EST.DATE August, 2018 nceptual Est. R1 DATE:	Length	560	0 L.M.	2 Full Lanes SB		4.R4L-4L E 5.R2/3L-4L		13.INST.R 14.AS IS		Est \$ 51,899,815	
	# 6.14A R2 DATE:	Unit	Cost-Quar	_	2 Full Laries 3B	1	6.Retr.4L-4		20.I/C Str.		\$ 9,268	
	Sept.1, 2002 DESCRIPTION	Price I	Jnit PerSection	n Values	5600		7.R4L-4LE		21. Bridge		\$ 8,050	
	UTILITIES				- MR		8. New 4L	EXP R/B No.	22. Grade Units	Sep. Quantity	Rate	Total
	Util. Prov Hydro	160.00 I	m 224	0	358,400	64	Description Haule Cost for		m3 /km	9878	1.00	49,392
	Util. Prov Telephone	80.00 I			179,200	32						-
	Util. Prov. sub-total				537,600	96	Haul \$ for Surplus	5	m3 /km	-	1.00	-
6712	Util.Others - pipelines	0.00	m	0	0	0	xxxxxxxx	0	ea	0		-
6713	Util.Others - telecommunication	450.00 I	m	0	0	0	Rock Scaling		m2		95.00	-
	Util.Others - storm & sewer inspect.	0.0%		0	0		Rock Bolting		m		451.00	-
	Util.Others - waterworks inspect. Util.Others - engineering services	0.0% 0.00 I	M	0 0	0	0		0	m2		150.00	-
	Util.Others - parks/recreation-prel.	0.00 1		0	0	0						-
	Util.Others - transit	0.00		Ö	0	ő	-			Description		49,392
6719	Util.Others - tr-ops/signs & detours	0.00	_M	0	0	0		(m3)	(unit \$)	(\$)		
6701	Util.Others - general	0.0%		0	0	0	Fill	59,270		0		
	Util.Others sub-total				0	0	Rock O.M.	38,102 19051	107.66 29.11	4101979 554597	57%	
6799	Util.Others Contingency	30.0%	16128	0 0	161,280	29	Strip.	9878	49.54	489339	0.187	
							Borrow	11642	42.95	500068	0.107	
	TOTAL UTILITIES				698,880	125	Misc./LS		29.11	0	Surplus Mtl	Neat vol.cal
						=====	Total	78674	71.76	5645983	DUDI	78,674
	GRADE CONSTRUCTION Grade Cons - water	U. Price U	Jnit Quantity	Lump Sun	0	0		Spec	Spec	PI/PL 21.7	PI/PL 26.8	Spec. Resurface
	Grade Cons- water  Grade Cons- sanitary	489.00 I		0	0	0		Long Term Optio Road	m - 1	Ditch Width		Road
	Grade Cons- storm	500.00		0	0	0	pl to pl	9.93	11.80		0.0	ONLY
	Grade Cons - mobilization	3.0%		0	0	0		1		Col L Vol.	Col. M Vol.	1
5039	Grade Cons - utility contingency	30.0%		0	0	0		3.6	3.6	82,608	-	3.6
	Grade Const. Utilities Sub-total				0	0	*med *shldrs tota	0.0 1.5	0.0	Pmt W= CBC. slope		0.0 1.5
5010	Grade Cons- site prep./clear,grubbing	26,000 H	na 5.5	6 0	144,544	26		6.5	11.8	4.0	O.O	A.C. (mm)
	Grade Cons- road grade/exc,placing,fill	71.76					sgsb (w)	8.8	11.8	Pmt W=		50
	Grade Cons - drainage/pipe,cul.	1070.00 I		0 572136	572,136	102	SGSBslope :1	4.0	0.0			A.B.C. (mm)
	Grade Cons- muiltiplate	15000 I		0	0	0	[ ( . )	1.321	0.000	5%		0
	Grade Cons-SGSB/produce,place,comp Grade Cons-CBC/produce,place,comp	56.00 ii			608,509 592,704	109 106	( )	5600 5.0	5.0	\$ 5,060		O Appl. rate
	Grade Cons- grade finishing landscaping	2.00			54,067		cul.(I)	9.64	11.80			1.50
	Grade Cons- grade finishing hydro seed.	1.00			27,034	5		0.21	0.30	5%	•	
	Grade Cons - grade finishing fencing	60.00 I		0	0	0	( - )	0.26	0.30	5%		
	Grade Cons- noise barriers	440.00		0	0	0	,		0.00			
	Grade Cons- passing lanes Grade Cons- sidewalks,curb & gutter	0.00 I 160.71 I		0 0	0	0	X-m3/lm C&G \$/LM	14.75 \$60.00	0.00 Evp 100kg	r Evn 80kmr	Coll-80kmp	•
	Grade Cons-detours c/w ex,bf,paving	100000				30		Decel.(T-lm)	520	440	260	
	Grade Cons- mobilization	3.0%	25454		254,546	45		Accel.(T-lm)	950	630	80	
5099	Grade Cons - Contingency	30.0%	262182	4	2,621,824	468		Left T.(T-lm)	716	596	456	
	Grade Construction Sub-total				11,361,239	2029	0	TOTAL	2186	1666	796	
	GRADE CONSTRUCTION COSTS			8739415	11,361,239	2029	Cidvoi 2.0	No.	Units	Quantity	Rate	Total
							Box Cul.	0	lm	45	8250	-
	Grade Eng detailed design	5.50%	62486		624,868		Head Walls	0	ea.	3	16500	-
	Grade Eng detailed design/Contingency	30.0%	18746		187,460		Catch Basin		ea.	168	3,250	-
	Grade Eng general const. supervision Grade Eng quality assurance	3.00% 2.00%	34083 22722		340,837 227,225	-	CB Leads MH	0 0	m ea.	1344 37	220 4,500	-
	Grade Eng quality assurance Grade Eng surveying	2.00%	22722		227,225	41	900mm CSP		ea. Im	80	1,070	-
	Grade Eng Residency Contingency	30.0%	23858		238,586	43		-		•	.,0.0	-
	Grade Engineering Sub-total				1,846,201	330	Structure Dra	0	lm	100	150.00	-
	Total Grade Const 9 Fra Costs				12 207 440	2250						-
=====	Total Grade Const. & Eng. Costs	=======			13,207,440	2358	-			Drainage		<u> </u>
			<b></b>		1					Pramage		

File:	O:\Proj\2121-00288-02 MoTI Whistler Hwy 99 Capacity	Man. Reser		0.0%	Land	imer Rd to Alpha Lake	Lorimor	Poad Type	ne.	9. R-E4L-4	II D/M		
File:	& Safety Review\4.0 ENGINEERING DESIGN\4.3  Company MCSL	Contingence		30.0%			LT-1	1. 2ln Fror		9. R-E4L-4			
(2)	018 Dollars) Whistler Highway 99 Capacity and			Long Term O		LITT		2. 2ln Acc		11.N 4L E			
ACTIVI		Road Type		1	ption i	Long Term Option - 1	Long To	3. 4ln Acc		12.N2L;F4			
CODE		Length		5600	L.M.			4.R4L-4L I		13.INST.R		Est \$	1
	nceptual Est. R1 DATE:	209		=======		2 Full Lanes SB		5.R2/3L-4I		14.AS IS		51,899,815	
	# 6.14A R2 DATE:	Unit		Cost-Quant.	Lump Sum	1	1	6.Retr.4L-		20.I/C Str.		\$ 9,268	1
	Sept.1, 2002 DESCRIPTION	Price	Unit	PerSection	Values	5600	5600	7.R4L-4LE	X R/B E/S	21. Bridge		\$ 8,050	
	·					MR		8. New 4L	EXP R/B	22. Grade			•
												abut. extra	
		Unit		Quantity	Lump			Brdge	Site \$	Piers \$	Abut. \$	length (lm)	
	STRUCTURAL CONSTRUCTION	Price	Unit		Sum			1	42,772.76	29,774	63,000	4	10%
	Struct.Cons - water	758.00		0		0	0	2	-	31,699	27,000		0%
	Struct.Cons - sanitary	489.00		0		0	0	3	-	31,699	27,000		0%
	Struct.Cons - storm	500.00	lm	0		0	0	4	-	31,699	27,000		0%
	Struct.Cons - mobilization	3.0%		0		0	0	5	D:// It	31,699	27,000	A 1 4 (A) (1 11 A 4	0%
5599	Struct.Cons - utility contingency	30.0%		0		0	0	4	Pier/Ht	Pier No.	P/\$/VLM	Abut/\$/HLM	
	Structural Const. Utilities Sub-total					0	0	1 2	8	1	3722 3962	4500 4500	
5510	Struct.Cons - tunnel site preparation	0.00	lm	0	0	0	0	3	8	1	3962	4500	
	Struct.Cons - tunnel construction	-	lm	0	· ·	0	0	4	8	1	3962	4500	
	Struct.Cons - snow shed site prep.	0.00		0		0	0	5	8	1	3962	4500	
	Struct.Cons - snow shed site const.	-	lm	0		0	0	·	(W)	(L)	(\$/m2)	Net Cost	No. of Bridge
0010	Gradication and and are denote			Ü	Demolition			DECK #1	3.0	60	1861	484615	1 1
5514	Struct.Cons - bridge site preparation	1	LS	42773	75000	117,773	21	DECK #2	3.0	0	1981	60460	o O
	Struct.Cons - bridge piers		LS	29774		29,774		DECK #3	3.0	Ö	1981	60460	Ö
	Struct.Cons - bridge abutments		LS	63000		63,000		DECK #4	3.0	0	1981	60460	0
	Struct.Cons - bridge superstructure	1	LS	334954	0	334,954	60	DECK #5	3.0	0	1981	60460	0
5518	Struct.Cons - retain. wall site prep.	1	LS			0	0				Gross/m2	Net/m2	
5519	Struct.Cons - retaining wall const.	1580	m2	12125		19,157,500	3421	Bridge #1			3500	2692	
	Struct.Cons - mobilization	3.0%		591090		591,090		Bridge #2			#DIV/0!	#DIV/0!	
5529	Struct.Cons - Contingency	30.0%		6088227		6,088,227		Bridge #3			#DIV/0!	#DIV/0!	Tnnl \$/Im -Net
	Structural Construction Sub-total					26,382,318	4711	Bridge #4			#DIV/0!	#DIV/0!	-
	OTDLIOTUDAL OONOTDLIOTION OOOTO					00.000.040	4744	Bridge #5	01.01	-	#DIV/0!	#DIV/0!	Tnnl \$/Im -Gross
	STRUCTURAL CONSTRUCTION COSTS	•				26,382,318	4711		2InSt.w-x 1-D-Shape	x-Pass.TI 2-D-Shape	shaft 1-Circle	Radius-1-D	7.267
	Struct. Eng detailed design	5.50%		1451027		1,451,027	259	Tunnel L=	0	z-D-Shape		Per.S&Rf	24.32
	•	30.0%		435308		435,308	78		5.100	2.550	Radius	m2/rkac	6.25
	Struct. Eng detailed design/Contingency Struct. Eng general const. supervision	4.00%		1055293		1,055,293	188	Tun. H1 C.Pt. H4	1.00	1.00	1.00	Tnnl height	8.27
	Struct. Eng quality assurance	2.00%		527646		527,646	94	Tun.W	12.00	3.00	Wall Tk.	Radius-2-D	2.157
	Struct. Eng surveying	0.50%		131912		131,912	24	RFLT.	0.250	0.250		Per.S&Rf	8.42
	Struct. Eng Residency Contingency	30.0%		514455		514,455	92	WLT.	0.250	0.250	SOBT	m2/rkac	6.25
	Structural Engineering Sub-total					4,115,642	735	BST.	0.500	0.200	0.100		3.16
								TOBT	0.100	0.100	Excm3	-	-
	Total Structural & Eng. Costs					30,497,959	5446	SOBT	0.100		Obk-m3	-	-
=====	=======================================	======	===	=======	=======	=========	=====	BOBT	0.100	0.100	Liner-m3	-	-
								Items	Quantity	rate	Total \$	Avg.\$/ tot-Im	1-Circle
	PAVING CONSTRUCTION				SM./OIL			Excm3	0	125	0		0
	Paving Con - machine paving asphalt	151.00		7197	49980	1,252,528	224	Obk-m3	0	2625	0		0
	Paving Con - machine paving concrete	0.00		00500		0	0	Rk anch-Ea	0	1125	0		0
	Paving Con - hot reprofiling Paving Con - shoulder paving	0.00		28560 2410		0	0	MiscIm	0	2500	0		10.00
	Paving Con - shoulder paving Paving Con - pavement finishing	0.00 100.00		2419 0		0	0	Liner-m3 Drainage-lm	0	1050 550	0		10.00 %
	Paving Con - pavernerit irrisring Paving Con - seal coating	0.00	1112	U		0	0	Lighting-m	0	900	0		5%
	Paving Con - seal coating Paving Con - mobilization	3.0%		37576		37,576	7	Mech-m	0	2100	0		15%
	Paving Con - pavement design	0.0%		0		0	ó	MiscIm	0	1000	0		3%
	Paving Con - Contingency	30.0%		387031		387,031	69		6.67m2/25mm		0		snowshed
	·							60kg=1m2		1.5L =1M2 (F	2)	length (lm)	0.0
	PAVING CONSTRUCTION COSTS					1,677,135	299	asphalt	(T)=mm	.25L =1M2 (		Roof	1.0
								A.C.	100	100	2856	29.00	0.50
	Paving Eng - detailed design	5.50%		92242		92,242	16	A.B.C.	0	0	1.00	\$ 1,500.00	-
	Paving Eng - detailed design/Contingency	30.0%		27673		27,673		\$Oil/Litre	\$1.50	5%	Walls	1.0	11.20
	Paving Eng - general const. supervision	2.00%		33543		33,543		Appl. rate	1.75	1.75	3.00	\$ 1,580.00	-
	Paving Eng - quality assurance	5.00%		83857		83,857		Pavement		(See I155)	Base	1.0	26.00
	Paving Eng - surveying	0.50%		8386		8,386	1	m2	\$/m2	Total	1.00		-
6869	Paving Eng - Residency Contingency	30.0%		37736		37,736	7	1,120	\$8.84	9901	Excm3	1.0	37.00
	Paving Engineering Sub-total					283,436	51	Milling	¢/?	Total	5.00		-
	Total Paving Const. & Eng. Costs					1,960,571	350	m2	\$/m2 \$9.63	Total 80892	Drainage Electrical	\$ 500.00 \$ 4,500.00	-
=====	======================================	=======	===	=======	========	1,960,571	330	8,400	φ9.03	00092	Mech.	\$ 4,500.00	_ [ ]
		<del>_</del>		<b>-</b>	<b></b>						Misc.	\$ 3,000.00	_ [
												#DIV/0!	_
						į.	1				L		

(20 ACTIVITI CODE Cor Blk Est. Version 6500 6510 6520 6530 6540 6550 6550	EST.DATE August, 2018 nceptual Est. R1 DATE:	Road Type Length  Unit Price  8500.00 275,000 7.00 109.00 1.75 3.0% 30.0%	Unit  Ea EA LM Im	0.0% 30.0% Long Term C 1 5600	30.0% Option - 1	imer Rd to Alpha Lake LT-1 Long Term Option - 1 2 Full Lanes SB 1 5600 MR 102,000 412,500 39,200 366,240 29,400 28,480 293,346	LT-1 Long Te 1 5600 	1. 2In Fron r 2. 2In Acc 2. 2In Acc 3. 4In Acc 4. R4L-4L [ 5. R2/3L-4L 6. Retr. 4L-4 8. New 4L 9. Sp. (Im) 50 Signals Controller Sig, pol,base Wiring U/G	tage Rds Rds EXP R/B EXP R/B I EXX R/B I EX R/B I EX R/B I S R/B No. of Sides No. 2 2 2	12.N2L;F4 13.INST.F 14.AS IS 20.I/C Str 21. Bridge 22. Grade Length	EXP D/M EXP D/E/M EXP D/E/M EXP D/M EX	Est \$ 51,899,815 \$ 9,268 \$ 8,050  Rate 55,000.00 45,000.00 40,000.00	Total 82,500 270,000 60,000 412,500 \$ 15,00
3549 6840 6841 6842	Operat. Eng - detailed design Operat. Eng - detailed design/Contingency Operat. Eng - general const. supervision Operat. Eng - quality assurance Operat. Eng - surveying Operat. Eng - Residency Contingency Operational Enginering Sub-total	5.50% 30.0% 5.50% 2.00% 0.50% 30.0%		69914 20974 69914 25423 6356 30508		69,914 20,974 69,914 25,423 6,356 30,508 223,090	4 12 5 1 5 40	Ext. Lines Weighscale Buildings	2.0 No. 0 0 0 0			Rate 2,800.00 400.00 80,000.00 40.00 40.00 50,000.00	Total
=====	Total Operational Const. & Eng. Costs	=======	===	=======	=======	1,494,256	267				Weighscale		
5200 5203 5204 5205 5202	ROAD SIDE CONSTRUCTION RoadSide C - water RoadSide C - sanitary RoadSide C - storm RoadSide C - mobilization RoadSide C - Utility Contingency Road Side Const. Utilities Sub-total	Unit Price 758.00 489.00 500.00 3.0% 30.0%	lm	Quantity  0 0 0 0 0	Lump Sum	0 0 0 0 0	0 0 0 0 0		No. 0	Units SAFETY RE m2 ea m2 lm ls	Quantity EST AREAS 100 2 2500 800	Rate 3,000.00 12,500.00 40.00 350.00 10,000.00	
5220 5230 5201	RoadSide C- weighscales RoadSide C- safety rest areas RoadSide C- tourist rest & view areas RoadSide C- mobilization RoadSide C- Contingency Road Side Construction Sub-total	40000 3.0% 30.0%		0 0 0 0 0	0 0 0	0 0 0 0 0	0 0 0 0 0	Landscaping light/signs  Description	0	Is Is Units	SAFETY RES Quantity 0 0	5,000.00 50,000.00	- - - - Total -
3559 6850 6851 6852	ROAD SIDE CONSTRUCTION COSTS  RoadSide E - detailed design RoadSide E - detailed design/Contingency RoadSide E - general const. supervision RoadSide E - quality assurance RoadSide E - surveying RoadSide E - Residency Contingency Road Side Engineering Sub-total	10.00% 30.0% 6.00% 2.00% 1.00% 30.0%		0 0 0 0 0 0		0 0 0 0 0 0 0 0	0 0 0 0 0 0	Railway Removal Track Cnst. Ballast Sub-ballast I Resurfacing	0 0 0 0 0 0 0	Units tklm tklm m3 m3 tklm	0 0 Description Quantity 200.00 200.00 500.00 1.00	Rate 50.00 700.00 60.00 56.00 30.00	- - - Total - - - -
	Total Road Side Const. & Eng. Costs					0	0	Tie-ins Turnout # 9 Others	0 0 0	ea ea	1.00 1.00 1.00	5000.00 125000.00 1500.00	-
5300 5303 5304 5305 5302	OTHER CONSTRUCTION Other Consl- water Other Consl- sanitary Other Consl- mobilization Other Consl- mobilization Other Const. Utilities Sub-total	Unit Price 758.00 489.00 500.00 3.0% 30.0%	Unit Im Im Im	Quantity  0 0 0 0 0 0	Lump Sum	0 0 0 0 0	0 0 0 0 0	(see grading)  R/rd X-ing Planks Sig./gates	0 0 0 No.	Units tklm each	1 Railway Quantity 45	2000.00 400.00 Rate 2500.00 250000.00	Total
5320 5330 5340 5301	Other Const- railroads main & spur lines Other Const- railroad crossings Other Const- marine work Other Const- environmental mitigations Other Const- mobilization Other Const- Contingency Other Construction Sub-total	90,000 3.0% 30.0%		0 0 0 1.00 2700 27810		0 0 0 90,000 2,700 27,810 120,510	0 0 0 16 0 5	Description	No.	Units	R/rd X-ing Quantity	Rate	Total
	OTHER CONSTRUCTION COSTS					120,510	22				Description	-	-
3579 6870 6871 6872	Other Eng detailed design Other Eng detailed design/Contingency Other Eng general const. supervision Other Eng quality assurance Other Eng surveying Other Eng Residency Contingency Other Engineering Sub-total	5.50% 30.0% 4.00% 2.00% 1.00% 30.0%		6628 1988 4820 2410 1205 2531	0	6,628 1,988 4,820 2,410 1,205 2,531 19,583		Environment Mitigation Ponds	No. 1.00 1.00	Units Is ea	Quantity 1 1	Rate 50,000 40,000	Total 50,000 40,000
	Total Other Const. & Eng. Costs					140,093	25	·			Environmenta	- I	90,000
=====		=======	===	=======			=====						

ACTIVI' CODE Cor Blk Est. Version 3500 3530 3539	EST.DATE August, 2018  coeptual Est. R1 DATE: # 6.14A R2 DATE: Sept. 1, 2002 DESCRIPTION  DETAILED DESIGN from 3510,3520,3540,3550,357  Geotech. E - detailed design Geotech. Er- Contingency  TOTAL DETAILED DESIGN COSTS  RESIDENT ENGINEERING	Road Type Length  Unit Price U	30.0% Long Term C 1 5600 ——————————————————————————————————	30.0%  Option - 1  L.M.  Lump Sum Values	Long Term Option - 1  2 Full Lanes SB 1 5600 MR 2,918,084 367,311 110,193 3,395,589	LT-1 Long Te 1 5600 521 66	1. 2In Frontage r 2. 2In Acc Rds 3. 4In Acc Rds 4. R4L-4L EXP R/B 5. R2/3L-4L EXP R/B 6. Retr. 4L-4LEX R/B F/S 8. New 4L EXP R/B 1 1 Bridge Tunnel	9. R-E4L-4L D/M 10.N 4L EXP D/M 11.N 4L EXP D/E/M 12.N2L;F4LEXP D/M 13.INST.R/B-EX.RD 14.AS IS 15. Misc. 20.I/C Str.&Ramps 21. Bridges 22. Grade Sep. 1 Special Units Quantity	Est \$ 51,899,815 \$ 9,268 \$ 8,050  Rate	Total - - - -
	from 6810,6820,6840,6850,686	00,6870 			3,569,867				-	-
=====	TOTAL RESIDENT ENG. COSTS		=========			637	Description No.	Units Quantity	Rate -	Total -
					0				-	-
=====					0	0			-	-
	PART 1 SUMMARY  CONSTRUCTION ENGINEERING & SUPERVISION CONTRACTUAL CONTINGENCY				31,931,729 5,970,991 11,370,816 0	5702 1066 2031 0	Description No.	Description Units Quantity	Rate	Total
	CONSTRUCTION COST TOTAL	DIVISION/SI	 TE Long Term O	ntion - 1	49,273,536	8799				-
2000	PROJECT MANAGEMENT		Land						-	-
2060	Project Man - office costs wages	2.00%	985471	0	985,471	176			-	-
	Project Man - office costs - expenses Project Man - printing costs	0.50% 0.00%	246368 0	0	246,368 0	44			-	-
2061	Project Man - general (MoTI Regional Cost F Project Manager Sub-total	0.00%	0	0	0 1,231,838	220			-	- - -
	Client - office costs wages	1.00% 0.50%	492735 246368	0	492,735 246,368	88 44	Description No.	Description Overtity	Data	Total
	Client - office costs - expenses Client - printing costs	0.00%	246368	0	0	0	Description No.	Units Quantity	Rate -	Total -
2011	Client - general Client Sub-total	0.00%	0		739,103	132			-	- - -
	Public Rel wages & expenses Public Rel adv., media, displays	0.00% 0.00%	0	0	0	0			-	-
	Public Rel adv., media, displays  Public Rel opening ceremonies	0.00%	0	0	0	0		Description	-	
2071	Public Rel general (FN Accomm.) Public Relations Sub-total	0.00%	0	0	0	0	Description No.	Units Quantity	Rate	Total
									-	-
	Legal Costs - lawyers fees Legal Costs - general	0.10% 0.00%	49274 0	0	49,274 0	9			-	-
	Legal Costs Sub-total				49,274	9			-	-
2080	Insurance - const./ liability, E&O	0.00%	0	0	0	0			-	-
2081	Insurance - general Legal Costs Sub-total	0.00%	0	0	0	0			-	-
									-	-
2099	Project Management Contingency	30.0%	606064		606,064	108		Description	-	-
=====	TOTAL PROJECT MANAGEMENT COST	'S ======	== ======		2,626,279	469	4.10%			
4000	LAND	\$/Building	# buildings	LS	0		1 Hectare = 10,000 Sq			
4010	Land(Code -Mrkt,ROW,Serv,Imp.V,Ease.C Acquisition Sub-total	250,000 F 2,000,000 C		0	0	0	1 Hectare = 2.471 Acre 1 Acre = 43,560 square Planned RO	e feet		
	Land(Code -Bus.,5%,Mrg.P,Rel\$,P/Tax,Etc Land(Code -Owners(LS,Apprsl,Rprt,Lgl,In	10.00% 7.00%	0	0	0	0	#DIV/0! Req. ROW	5.6 0 107,637		
4040	Land(Code -Demolition	0.00%	0	0	0	0	#DIV/0! Cost/M2	0.00 10.76		
	Land(Code -Pro.Man,P.Tax,Util,Security Land(Code -Not Used	1.00%	0	0	0	0	#DIV/0! Cost /Acre Cost /Ft2	0 43,560 0.00 \$ 1.00		
4070	Land(Code -Not Used	7.000/	•	•			#DIV/0!			
	Land(Code -Acq.F,M/Sal,TrvIV,Cntr.S,Appr Land(Code -Surveys	7.00% 0.00%	0	0	0	0		\$ 10,000 \$ 2,000		
	-						Description No.	Units Quantity	Rate	Total
									- -	-
	Associated costs-sub-total		0		0	0			-	-
4099	Land Contingency Sub-total	30.0%	0	0	0	0			-	-
	TOTAL LAND COSTS				0	0	·	Description	-	-
						I				

O:\Proj\2121-00288-02 MoTI Whistler	Hwy 99 Capacity	an. Reserv	ve 0.0%	Lond	imer Rd to Alpha Lake	Larimar F F	load Tymas	9. R-E4L-4L D/M		
& Safety Review\4.0 ENGINEERING [										
Company MCSL		ontingency			LT-1		. 2In Frontage	10.N 4L EXP D/M		
(2018 Dollars) Whistler Highway 9				Option - 1	. T O " 4		. 2ln Acc Rds	11.N 4L EXP D/E/M		
VITY Capacity and Safet		oad Type	1		Long Term Option - 1		. 4ln Acc Rds	12.N2L;F4LEXP D/M		
DE EST.DATE Augus	t, 2018 Ler	ngth		L.M.			.R4L-4L EXP R/B	13.INST.R/B-EX.RD	Est \$	
Conceptual Est. R1 DATE:			=======		2 Full Lanes SB	5	.R2/3L-4L EXP R/B	14.AS IS 15. Misc.	51,899,815	
st. # 6.14A R2 DATE:		Unit	Cost-Quant.	Lump Sum	1	1 6	.Retr.4L-4LEX R/B	20.I/C Str.&Ramps	\$ 9,268	
on Sept.1, 2002 DESCRIF	PTION	Price	Unit PerSection	Values	5600	5600 7	R4L-4LEX R/B E/S	21. Bridges	\$ 8,050	
					MR	8	. New 4L EXP R/B	22. Grade Sep.		
00 MANAGEMENT RESERVE							escription No.	Units Quantity	Rate	Tota
MAN. RES planning		0.0%	268304		0	0			-	
MAN. RES preliminary desi	an	0.0%	528528	3	0	0			_	
MAN. RES utility construction		0.0%	698880	)	0	0			_	
MAN. RES grade construct		0.0%	11361239	1	0	0			_	
MAN. RES structural const		0.0%	26382318		0	Ō			_	
MAN. RES paving construc		0.0%	1677135		0	ľ				
MAN. RES operation const		0.0%	1271166		0	ő				
MAN. RES roadside constr		0.0%	1271100		0	0				
MAN. RES other constructi		0.0%	120510		0	0			-	
MAN. RES project manage		0.0%	2626279		0	0			-	
	ment				0	0			-	
MAN. RES land		0.0%	(		0	0			-	
MAN. RES detailed eng.		0.0%	3395589		_				-	
MAN. RES residency eng.		0.0%	3569867		0	0			-	
MAN. RES Contingency		0.0%	(	)	0	0			-	
TOTAL MANAGEMENT RE			51899815		0	0 _			-	
== ====================================		======						Description		
TOTAL LESS ESCALATION			C	51899815		_ <u>_</u>	escription No.	Units Quantity	Rate	Tota
FISCAL									-	
00 ESCALATION									-	
	SCALATION CC		\$ DONE						-	
2016-2017	0.5750%	5.00%	C		0	0			-	
2017-2018	0.6250%	10.00%	C		0	0			-	
2018-2019	1.0000%	35.00%	C		0	0			-	
2019-2020	1.0000%	45.00%	C		0	0			-	
2020-2021	1.0000%	5.00%	C		0	0			-	
		0.000/	_							
2021-2022	1.0000%	0.00%	C		0	0			-	
	1.0000% 1.0000%	0.00%	C		0	0			-	
2021-2022			0		_				-	
2021-2022 2022-2023	1.0000%	0.00%			0	0			- - -	
2021-2022 2022-2023 2023-2024	1.0000% 1.0000% 1.0000%	0.00% 0.00%	C	 	0	0			- - - - -	
2021-2022 2022-2023 2023-2024 2024-2025 TOTAL ESCALATION	1.0000% 1.0000% 1.0000%	0.00% 0.00% 0.00% 100.00%	 C		0 0 0	0 0 0			- - - - -	
2021-2022 2022-2023 2023-2024 2024-2025 TOTAL ESCALATION PART 2 SUMMARY NON-C	1.0000% 1.0000% 1.0000%	0.00% 0.00% 0.00% 100.00%	 C		0 0 0	0 0 0 0 0 ======			- - - - - -	
2021-2022 2022-2023 2023-2024 2024-2025 TOTAL ESCALATION	1.0000% 1.0000% 1.0000%	0.00% 0.00% 0.00% 100.00%	 C		0 0 0	0 0 0 0			-	
2021-2022 2022-2023 2023-2024 2024-2025 TOTAL ESCALATION PART 2 SUMMARY NON-C	1.0000% 1.0000% 1.0000%	0.00% 0.00% 0.00% 100.00%	 C		0 0 0	0 0 0 0 0 ======			-	
2021-2022 2022-2023 2023-2024 2024-2025 TOTAL ESCALATION  PART 2 SUMMARY NON-C Non-Constructior Non-Const. Cont	1.0000% 1.0000% 1.0000%	0.00% 0.00% 0.00% 100.00%	 C		0 0 0 0 2,020,215 606,064	0 0 0 0 0 ====== 361 108				
2021-2022 2022-2023 2023-2024 2024-2025 TOTAL ESCALATION PART 2 SUMMARY NON-C Non-Construction	1.0000% 1.0000% 1.0000%	0.00% 0.00% 0.00% 100.00% COSTS		=======	0 0 0 0 2,020,215 606,064 2,626,279	0 0 0 0 0 ======				

## **Project Location: South Coast - Lower Mainland**

		Avg. Unit	Highway No. 7 Four	Lougheed Highway	Highway 1	Evergreen Line Rapid	Nordel Way - Truck	
		Cost Used for Cost	Laning -	No. 7	Mountain	Transit	Parking	
Description	U of M	Est.	Silverdale Avenue to	Corridor Improveme	Highway Interchange	Project - Coquitlam	Area, Highway	Average of
					42795			Averages
			43160	43221	42/95	42491	42552	
			12452MJ0001	12452-0003	12573MJ2016	03901MJ0022	12641MJ0001	
Site Prep & Grading								
Clearing & Grubbing	ha	\$26,000	\$45,109	\$41,759	\$28,630	\$0	\$14,592	 \$26,018
Stripping	m <sup>3</sup>	\$50	\$86	\$46	\$37		\$29	 \$50
Rock Excavation - Type A	m <sup>3</sup>	\$108	\$108	446	400	400	44-	 \$108
Excavation (O.M Type D) Import Fill	m <sup>3</sup>	\$29 \$43	\$32	\$46	\$29 \$31	\$22 \$55	\$17	 \$29 \$42
SGSB	m <sup>3</sup>	\$56		\$64	\$53	\$55 \$56	\$50	 \$43 \$56
CBC	m <sup>3</sup>	\$60	\$56	\$70	\$56	\$58	\$60	 \$60
Rock Sacaling	m <sup>2</sup>	\$95		\$100		\$90		 \$95
Rock Bolting	m	\$451		\$570		\$332		 \$451
Shotcrete	m <sup>3</sup>	\$1,705		\$1,485		\$1,925		 \$1,705
Grade finishing landscaping	m <sup>2</sup>	\$2 \$1	\$2 \$1	Ċ1	Ć1	7.0167*0	ć4	 \$2
Grade finishing hydro seed  Drainage	m	\$1	\$1	\$1	\$1	7.9167*0	\$1	 \$1
Culverts (900mm Dia)	m	\$1,070	\$1,061	\$1,081				 \$1,071
Culvert Headwall	ea	\$10,120	\$10,119					 \$10,119
3000 x 1800 Concrete Box Culvert 2400 x 1500 Concrete Box Culvert	m m	\$8,250 \$5,260	\$8,250 \$5,260					 \$8,250 \$5,260
Concrete Headwall - Box Culvert	ea	\$16,500	\$16,500					\$16,500
CB Leads(200mm Ø)  Catch Basin	m	\$220 \$3,250	\$206		ĆF (27	\$300	\$164	 \$223
Double Catch Basin	ea ea	\$4,410	\$2,212 \$3,168		\$5,627 \$5,642		\$1,907	 \$3,249 \$4,405
Oil Grate Separator	ea	\$30,000	\$30,000					30000
Asphalt Spilways	ea 3	\$1,179		4224	\$1,179			 \$1,179
Class 10 kg Riprap  Non-Woven Geotextile (Supply and	m <sup>3</sup>	\$173	\$146	\$224	\$150			 \$173
Install)	m <sup>2</sup>	\$7	\$7					\$7
								 ,
Paving								 ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
Asphalt	tonne	\$151	\$172	\$119	\$220	\$100	\$142	\$151
Pavement Removal	m <sup>2</sup>	\$9	\$7	\$12	\$6	\$13	\$7	 \$9
Pavement Milling	m <sup>2</sup>	\$10	\$18	\$6	\$7		ćo	\$10
CDD			¢422	Ċ444	ćoo		\$8	 \$10
CRB Sidewalks / C&G (1.8 m wide)	m m	\$109	\$18 \$122	\$6 \$111 \$145	\$7 \$93 \$176		, , , , , , , , , , , , , , , , , , ,	 \$109
Sidewalks / C&G (1.8 m wide) Rumble Strips	m		\$122 \$1,515	\$111 \$145	\$93 \$176		58	\$109 \$161 \$1,515
Sidewalks / C&G (1.8 m wide) Rumble Strips Utilities	m m km	\$109 \$161 \$1,515		\$111 \$145	\$176		38	\$109 \$161 \$1,515
Sidewalks / C&G (1.8 m wide) Rumble Strips	m m km	\$109 \$161 \$1,515 \$758		\$145	\$176 \$758	\$445	78	\$109 \$161 \$1,515 \$758
Sidewalks / C&G (1.8 m wide) Rumble Strips Utilities Water Sanitary Storm	m m km	\$109 \$161 \$1,515 \$758 \$489 \$500		\$145 \$243	\$176 \$758 \$779	\$445	78	\$109 \$161 \$1,515
Sidewalks / C&G (1.8 m wide) Rumble Strips Utilities Water Sanitary Storm MH (1050mm Ø)	m m km	\$109 \$161 \$1,515 \$758 \$489	\$1,515	\$145	\$176 \$758	\$445	78	\$109 \$161 \$1,515 \$758 \$489
Sidewalks / C&G (1.8 m wide) Rumble Strips Utilities Water Sanitary Storm MH (1050mm Ø) Structures	m m km	\$109 \$161 \$1,515 \$758 \$489 \$500 \$4,500	\$1,515	\$145 \$243	\$176 \$758 \$779	\$445	78	\$109 \$161 \$1,515 \$758 \$489 \$500
Sidewalks / C&G (1.8 m wide) Rumble Strips Utilities Water Sanitary Storm MH (1050mm Ø)	m m km m m ea	\$109 \$161 \$1,515 \$758 \$489 \$500 \$4,500	\$1,515	\$145 \$243	\$176 \$758 \$779	\$445	78	\$109 \$161 \$1,515 \$758 \$489 \$500
Sidewalks / C&G (1.8 m wide) Rumble Strips Utilities Water Sanitary Storm MH (1050mm Ø) Structures Bridge Retaining Wall	m m km m m m ea m² of deck m²	\$109 \$161 \$1,515 \$758 \$489 \$500 \$4,500	\$1,515 \$500 \$1,440	\$145 \$243 \$4,900	\$176 \$758 \$779	\$445	20	\$109 \$161 \$1,515 \$758 \$489 \$500 \$4,500
Sidewalks / C&G (1.8 m wide) Rumble Strips Utilities Water Sanitary Storm MH (1050mm Ø) Structures Bridge Retaining Wall Lock Block Wall	m m km m m m ea m² of deck m² m²	\$109 \$161 \$1,515 \$758 \$489 \$500 \$4,500 \$1,580 \$840	\$1,515 \$500	\$145 \$243	\$176 \$758 \$779 \$4,100	\$445	70	\$109 \$161 \$1,515 \$758 \$489 \$500 \$4,500 \$1,583 \$844
Sidewalks / C&G (1.8 m wide) Rumble Strips Utilities Water Sanitary Storm MH (1050mm Ø) Structures Bridge Retaining Wall Lock Block Wall Sound Wall	m m km m m m m ea m² of deck m² m²	\$109 \$161 \$1,515 \$758 \$489 \$500 \$4,500 \$1,580 \$840 \$440	\$1,515 \$500 \$1,440	\$145 \$243 \$4,900	\$176 \$758 \$779 \$4,100 \$1,727	\$445	70	\$109 \$161 \$1,515 \$758 \$489 \$500 \$4,500 \$1,583 \$844 \$443
Sidewalks / C&G (1.8 m wide) Rumble Strips Utilities Water Sanitary Storm MH (1050mm Ø) Structures Bridge Retaining Wall Lock Block Wall	m m km m m m ea m² of deck m² m²	\$109 \$161 \$1,515 \$758 \$489 \$500 \$4,500 \$1,580 \$1,580 \$840 \$440 \$50	\$1,515 \$500 \$1,440	\$145 \$243 \$4,900	\$176 \$758 \$779 \$4,100 \$1,727 \$443 \$55	\$445	20	\$109 \$161 \$1,515 \$758 \$489 \$500 \$4,500 \$1,583 \$844 \$443 \$55
Sidewalks / C&G (1.8 m wide) Rumble Strips Utilities Water Sanitary Storm MH (1050mm Ø) Structures Bridge Retaining Wall Lock Block Wall Sound Wall Bridge End Fill Steel Fences Pedestrain Sidewalk Fence	m m km m m m m m m m m m ea m² of deck m² m² m² m² m² m² m² m³ m	\$109 \$161 \$1,515 \$758 \$489 \$500 \$4,500 \$1,580 \$840 \$440 \$50	\$1,515 \$500 \$1,440 \$768	\$145 \$243 \$4,900	\$176 \$758 \$779 \$4,100 \$1,727	\$445	20	\$109 \$161. \$1,515 \$758. \$489 \$500 \$4,500 \$1,583 \$844 \$443 \$55
Sidewalks / C&G (1.8 m wide) Rumble Strips Utilities Water Sanitary Storm MH (1050mm Ø) Structures Bridge Retaining Wall Lock Block Wall Sound Wall Bridge End Fill Steel Fences Pedestrain Sidewalk Fence Chainlink Fence	m m km m m m m m ea m² of deck m² m² m² m³	\$109 \$161 \$1,515 \$758 \$489 \$500 \$4,500 \$1,580 \$840 \$50	\$1,515 \$500 \$1,440 \$768	\$145 \$243 \$4,900	\$176 \$758 \$779 \$4,100 \$1,727 \$443 \$55	\$445	20	\$109 \$161. \$1,515 \$758 \$489 \$500 \$4,500 \$1,583 \$844 \$443 \$55
Sidewalks / C&G (1.8 m wide) Rumble Strips Utilities Water Sanitary Storm MH (1050mm Ø) Structures Bridge Retaining Wall Lock Block Wall Sound Wall Bridge End Fill Steel Fences Pedestrain Sidewalk Fence	m m km m m m m m m m m m ea m² of deck m² m² m² m² m² m² m² m³ m	\$109 \$161 \$1,515 \$758 \$489 \$500 \$4,500 \$1,580 \$840 \$440 \$50	\$1,515 \$500 \$1,440 \$768	\$145 \$243 \$4,900	\$176 \$758 \$779 \$4,100 \$1,727 \$443 \$55	\$445	20	\$109 \$161. \$1,515 \$758. \$489 \$500 \$4,500 \$1,583 \$844 \$443 \$55
Sidewalks / C&G (1.8 m wide) Rumble Strips Utilities Water Sanitary Storm MH (1050mm Ø) Structures Bridge Retaining Wall Lock Block Wall Sound Wall Bridge End Fill Steel Fences Pedestrain Sidewalk Fence Chainlink Fence Splash Pads for Conceret Lock Block Ret. Wall	m m km m m m m ea m² of deck m² m² m² m² m² m² m² m² m³ m	\$109 \$161 \$1,515 \$758 \$489 \$500 \$4,500 \$1,580 \$840 \$440 \$50	\$1,515 \$500 \$1,440 \$768	\$145 \$243 \$4,900	\$176 \$758 \$779 \$4,100 \$1,727 \$443 \$55	\$445	20	\$109 \$161 \$1,515 \$758 \$489 \$500 \$4,500 \$1,583 \$844 \$443 \$55 \$193 \$93
Sidewalks / C&G (1.8 m wide) Rumble Strips Utilities Water Sanitary Storm MH (1050mm Ø) Structures Bridge Retaining Wall Lock Block Wall Sound Wall Bridge End Fill Steel Fences Pedestrain Sidewalk Fence Chainlink Fence Splash Pads for Conceret Lock Block Ret. Wall Electrical (Operational Construction)	m m km m m m m m ea m² of deck m² m² m² m² m² m² m² m² m² m³ m m m ea	\$109 \$161 \$1,515 \$758 \$489 \$500 \$4,500 \$1,580 \$840 \$440 \$50 \$1,580 \$440 \$440 \$50	\$1,515 \$500 \$1,440 \$768 \$93 \$450	\$145 \$243 \$4,900	\$176 \$758 \$779 \$4,100 \$1,727 \$443 \$55	\$445		\$109 \$161. \$1,515 \$758. \$489 \$500 \$4,500 \$1,583 \$844 \$443 \$55 \$193 \$93 \$450
Sidewalks / C&G (1.8 m wide) Rumble Strips Utilities Water Sanitary Storm MH (1050mm Ø) Structures Bridge Retaining Wall Lock Block Wall Sound Wall Bridge End Fill Steel Fences Pedestrain Sidewalk Fence Chainlink Fence Splash Pads for Conceret Lock Block Ret. Wall	m m km m m m m ea m² of deck m² m² m² m² m² m² m² m² m³ m	\$109 \$161 \$1,515 \$758 \$489 \$500 \$4,500 \$1,580 \$1,580 \$440 \$50 \$190 \$90 \$450	\$1,515 \$500 \$1,440 \$768 \$93 \$450 \$8,500 \$475	\$145 \$243 \$4,900	\$176 \$758 \$779 \$4,100 \$1,727 \$443 \$55			\$109 \$161 \$1,515 \$758 \$489 \$500 \$4,500 \$4,500 \$1,583 \$844 \$443 \$55 \$193 \$93 \$450
Sidewalks / C&G (1.8 m wide) Rumble Strips Utilities Water Sanitary Storm MH (1050mm Ø) Structures Bridge Retaining Wall Lock Block Wall Sound Wall Bridge End Fill Steel Fences Pedestrain Sidewalk Fence Chainlink Fence Splash Pads for Conceret Lock Block Ret. Wall Electrical (Operational Construction) Lighting Signs Guide Signs	m m km m m m m ea m² of deck m² m² m² m² m² m² ea m³ m ea ea m² each ea ea ea	\$109 \$161 \$1,515 \$758 \$489 \$500 \$4,500 \$4,500 \$1,580 \$840 \$440 \$50 \$450 \$450 \$450 \$450 \$550	\$1,515 \$500 \$1,440 \$768 \$93 \$450 \$8,500 \$475 \$5,500	\$145 \$243 \$4,900 \$921	\$176 \$758 \$779 \$4,100 \$1,727 \$443 \$55	\$445		\$109 \$161 \$1,515 \$758 \$489 \$500 \$4,500 \$4,500 \$1,583 \$844 \$443 \$55 \$193 \$93 \$450 \$8,500 \$8,500
Sidewalks / C&G (1.8 m wide) Rumble Strips Utilities Water Sanitary Storm MH (1050mm Ø) Structures Bridge Retaining Wall Lock Block Wall Sound Wall Bridge End Fill Steel Fences Pedestrain Sidewalk Fence Chainlink Fence Splash Pads for Conceret Lock Block Ret. Wall Electrical (Operational Construction) Lighting Signs Guide Signs Project Sign	m m km m m m ea m² of deck m² m² m² m² m² ea m² ea ea ea ea ea ea ea	\$109 \$161 \$1,515 \$758 \$489 \$500 \$4,500 \$1,580 \$840 \$440 \$50 \$450 \$450 \$450 \$450 \$450 \$45	\$1,515 \$500 \$1,440 \$768 \$93 \$450 \$8,500 \$475	\$145 \$243 \$4,900 \$921	\$176 \$758 \$779 \$4,100 \$1,727 \$443 \$55			\$109 \$161 \$1,515 \$758 \$489 \$500 \$4,500 \$4,500 \$1,583 \$844 \$443 \$55 \$193 \$93 \$450
Sidewalks / C&G (1.8 m wide) Rumble Strips Utilities Water Sanitary Storm MH (1050mm Ø) Structures Bridge Retaining Wall Lock Block Wall Sound Wall Bridge End Fill Steel Fences Pedestrain Sidewalk Fence Chainlink Fence Splash Pads for Conceret Lock Block Ret. Wall Electrical (Operational Construction) Lighting Signs Guide Signs	m m km m m m m ea m² of deck m² m² m² m² m² m² ea m³ m ea ea m² each ea ea ea	\$109 \$161 \$1,515 \$758 \$489 \$500 \$4,500 \$1,580 \$840 \$440 \$50 \$90 \$450 \$90 \$450 \$50 \$25,500 \$275,000 \$190,000	\$1,515 \$500 \$1,440 \$768 \$93 \$450 \$8,500 \$475 \$5,500	\$145 \$243 \$4,900 \$921	\$176 \$758 \$779 \$4,100 \$1,727 \$443 \$55			\$109 \$161. \$1,515 \$758. \$489 \$500 \$4,500 \$4,500 \$1,583 \$844 \$443 \$55 \$193 \$93 \$450 \$550 \$5,500 \$5,500 \$2,500
Sidewalks / C&G (1.8 m wide) Rumble Strips Utilities Water Sanitary Storm MH (1050mm Ø) Structures Bridge Retaining Wall Lock Block Wall Sound Wall Bridge End Fill Steel Fences Pedestrain Sidewalk Fence Chainlink Fence Splash Pads for Conceret Lock Block Ret. Wall Electrical (Operational Construction) Lighting Signs Guide Signs Project Sign New traffic Signal Ped Activated Signal Hydro (Im)	m m m m m m ea m² of deck m² m² m³ m m m ea ea ea ea ea ea ea ea ea m m	\$109 \$161 \$1,515 \$758 \$489 \$500 \$4,500 \$1,580 \$840 \$440 \$50 \$190 \$90 \$450 \$50 \$50 \$190 \$50 \$190 \$190 \$190 \$190 \$190 \$190 \$190 \$19	\$1,515 \$500 \$1,440 \$768 \$93 \$450 \$8,500 \$2,500 \$2,500	\$145 \$243 \$4,900 \$921	\$176 \$758 \$779 \$4,100 \$1,727 \$443 \$55			\$109 \$161. \$1,515 \$758. \$489 \$500 \$4,500 \$4,500 \$1,583 \$844 \$443 \$55 \$193 \$93 \$450 \$5,500 \$5,500 \$2,500
Sidewalks / C&G (1.8 m wide) Rumble Strips Utilities Water Sanitary Storm MH (1050mm Ø) Structures Bridge Retaining Wall Lock Block Wall Sound Wall Bridge End Fill Steel Fences Pedestrain Sidewalk Fence Chainlink Fence Splash Pads for Conceret Lock Block Ret. Wall Electrical (Operational Construction) Lighting Signs Guide Signs Project Sign New traffic Signal Ped Activated Signal	m m km m m m m m m ea  m² of deck m² m² m² m³ m ea  each ea ea ea ea ea ea ea	\$109 \$161 \$1,515 \$758 \$489 \$500 \$4,500 \$1,580 \$840 \$440 \$50 \$450 \$450 \$450 \$450 \$450 \$45	\$1,515 \$500 \$1,440 \$768 \$93 \$450 \$8,500 \$475 \$5,500 \$2,500	\$145 \$243 \$4,900 \$921	\$176 \$758 \$779 \$4,100 \$1,727 \$443 \$55			\$109 \$161. \$1,515 \$758. \$489 \$500 \$4,500 \$4,500 \$1,583 \$844 \$443 \$55 \$193 \$93 \$450 \$55,500 \$5,500 \$2,500 \$160 \$80
Sidewalks / C&G (1.8 m wide) Rumble Strips Utilities Water Sanitary Storm MH (1050mm Ø) Structures Bridge Retaining Wall Lock Block Wall Sound Wall Bridge End Fill Steel Fences Pedestrain Sidewalk Fence Chainlink Fence Splash Pads for Conceret Lock Block Ret. Wall Electrical (Operational Construction) Lighting Signs Guide Signs Project Sign New traffic Signal Ped Activated Signal Hydro (Im)	m m m m m m ea m² of deck m² m² m³ m m m ea ea ea ea ea ea ea ea ea m m	\$109 \$161 \$1,515 \$758 \$489 \$500 \$4,500 \$1,580 \$840 \$440 \$50 \$450 \$450 \$450 \$450 \$450 \$45	\$1,515 \$500 \$1,440 \$768 \$93 \$450 \$8,500 \$2,500 \$2,500	\$145 \$243 \$4,900 \$921	\$176 \$758 \$779 \$4,100 \$1,727 \$443 \$55			\$109 \$161. \$1,515 \$758. \$489 \$500 \$4,500 \$4,500 \$1,583 \$844 \$443 \$55 \$193 \$93 \$450 \$5,500 \$5,500 \$2,500
Sidewalks / C&G (1.8 m wide) Rumble Strips Utilities Water Sanitary Storm MH (1050mm Ø) Structures Bridge Retaining Wall Lock Block Wall Sound Wall Bridge End Fill Steel Fences Pedestrain Sidewalk Fence Chainlink Fence Splash Pads for Conceret Lock Block Ret. Wall  Electrical (Operational Construction) Lighting Signs Guide Signs Project Sign New traffic Signal Ped Activated Signal Hydro (Im) Tel (Im)	m m km m m m ea m² of deck m² m² m² m³ m ea ea ea ea ea ea ea ea ea m m m	\$109 \$161 \$1,515 \$758 \$489 \$500 \$4,500 \$1,580 \$840 \$440 \$50 \$190 \$90 \$450 \$50 \$50 \$190 \$50 \$190 \$190 \$190 \$190 \$190 \$190 \$190 \$19	\$1,515 \$500 \$1,440 \$768 \$93 \$450 \$8,500 \$475 \$5,500 \$2,500 \$160 \$80	\$145 \$243 \$4,900 \$921	\$176 \$758 \$779 \$4,100 \$1,727 \$443 \$55			\$109 \$161. \$1,515 \$758. \$489 \$500 \$4,500 \$4,500 \$1,583 \$844 \$443 \$55 \$193 \$93 \$450 \$55,500 \$5,500 \$2,500 \$160 \$80
Sidewalks / C&G (1.8 m wide) Rumble Strips Utilities Water Sanitary Storm MH (1050mm Ø) Structures Bridge Retaining Wall Lock Block Wall Sound Wall Bridge End Fill Steel Fences Pedestrain Sidewalk Fence Chainlink Fence Splash Pads for Conceret Lock Block Ret. Wall  Electrical (Operational Construction) Lighting Signs Guide Signs Project Sign New traffic Signal Ped Activated Signal Hydro (Im) Tel (Im)	m m km m m m ea m² of deck m² m² m² m³ m ea ea ea ea ea ea ea ea ea m m m	\$109 \$161 \$1,515 \$758 \$489 \$500 \$4,500 \$1,580 \$840 \$440 \$50 \$450 \$450 \$450 \$450 \$450 \$45	\$1,515 \$500 \$1,440 \$768 \$93 \$450 \$8,500 \$475 \$5,500 \$2,500 \$160 \$80	\$145 \$243 \$4,900 \$921	\$176 \$758 \$779 \$4,100 \$1,727 \$443 \$55			\$109 \$161. \$1,515 \$758. \$489 \$500 \$4,500 \$4,500 \$1,583 \$844 \$443 \$55 \$193 \$93 \$450 \$55,500 \$5,500 \$2,500 \$160 \$80

## Whistler Highway 99 Capacity and Safety Review

Conceptual Design Notes

#### MCSL Proj #: 2121-00288-02

EST.DATE August, 2018

	EST.DATE August, 2016											
No.	Location	Issue ID	OPTION	Start Station	End Station	Total Dist.	Segment	Comments				
1	Hwy 99 / Lorimer Rd	ST-1	Short Term Option - 1	1+000	1+100	.1 km	Left / Shared Left-Through					
2	Hwy 99 / Lorimer Rd	ST-2	Short Term Option - 2	1+000	1+075	.1 km	Dual Left	- assuming 75m turning bay				
3	Lake Placid Rd to Alpha Lake Road / Cheakamus Lake Rd	MT-1	Medium Term Option - 1	1+000	4+500	3.5 km	Counterflow					
4	Lake Placid Rd to South of Bayshore Dr	MT-2	Medium Term Option - 2	1+000	1+450	.5 km	2 SB lanes from Taylor Way to Bayshore Dr					
5	Taylor Way to Alpha Lake Rd	MT-3A	Medium Term Option - 3A	1+000	4+150	3.2 km	Shoulder Widening	-used an average shoulder widening of 2.25m				
6	Taylor Way to Alpha Lake Rd	MT-3B	Medium Term Option - 3B	1+000	4+150	3.2 km	2 Full Lanes SB					
7	Lorimer Rd to Alpha Lake Rd	LT-1	Long Term Option - 1	1+000	6+600	5.6 km	2 Full Lanes SB					

Option Description
Re-stripe the through lane for shared through-left movements; split phase east-west operation (due to the shared lane, it is necessary to split-phase in order to ensure safe operation EB and WB)
Add a second lane in the median (minimum 75m); protected only phasing for the WB left
This option would include a counterflow lane between Lake Placid Road to just north of Alpha Lake Road / Cheakarms Lake Road . Long-term, the counterflow lane could be extended to north of Lorimer Road, but since the main operational deficiency in the corridor is the SSI lane drop south of Lake Placid Road, it is not required in the medium term.
This option would continue the two SB lanes from the current terminus point south of Lake Placid Road (lane drop to Tayfor Way) to approximately 125m south of Bayshore Drive
Option 3A – Drive on Shoulder: Widen the shoulder (approximately 1.5 to 2.5 m depending on existing shoulder width) to accommodate vehicle travel on the shoulder during times of congestion (e.g., during winter weekend PM peak periods). This would require additional inflantaturuder (Intelligent Transportation Systems—ITS) to monitor and warn drivers that they are allowed (or not) to drive on the shoulder. Additionally, bus bays (additional 3.0m) would need to be accommodated, likely behind the shoulder, as well as emergy pullouts (additional 2.5m) at about every 500m to provide areas for vehicles to pull over (in an emergency) so they are not blocking the shoulder during drive-on-shoulder operation. Additional width will also be required for areas requiring concrete roadside barriers.
Option 3B – 2 Full SB lanes: Widen SB by an entire lane (3.6m) plus standard shoulder. Additional width will be required for bus bays and areas requiring concrete roadside barriers.
While not part of the current task, McEihanney has developed a long-term option that provides two lanes SB from Lorimer Road to Alpha Lake Road (Atlachment E). This is provided for discussion purposes as it is likely, in the long term, two SB lanes will be required to accommodate the heavy SB volume between Lorimer Road and Alpha Lake

# **Whistler Highway 99 Capacity and Safety Review**

**Conceptual Design Volumes** 

MCSL Proj #: 2121-00288-02

EST.DATE August, 2018

No.		1	2	3	4	5	6	7
Option ID		ST-1	ST-2	MT-1	MT-2	MT-3A	MT-3B	LT-1
Option	U of M	Short Term Option - 1 Left / Shared Left- Through	Short Term Option - 2 Dual Left	Medium Term Option - 1 Counterflow	Medium Term Option - 2 2 SB lanes from Taylor Way to Bayshore Dr	Medium Term Option - 3A Shoulder Widening		Long Term Option - 1 2 Full Lanes SB
Start Sta.	m	1+000	1+000	1+000	1+000	1+000	1+000	1+000
End Sta.	m	1+100	1+075	4+500	1+450	4+150	4+150	6+600
Dist	km	0.10	0.08	3.50	0.45	3.15	3.15	5.60
Type A Excavation	m <sup>3</sup>	0	0	12,600	1,944	7,088	11,340	36,288
Type D Excavation	m <sup>3</sup>	35	93	11,340	1,458	6,379	10,206	18,144
Stripping	m <sup>3</sup>	0	0	5,880	756	4,016	5,292	9,408
Cl. & Gr. (3m off toe)	ha	0.0	0.0	3.0	0.4	2.3	2.7	4.8
Embankment (Fill)	m <sup>3</sup>	35	93	35,280	4,536	19,845	31,752	56,448
AP	ton	42	112	4,320	555	1,715	3,888	6,912
CBC	m <sup>3</sup>	52	139	5,880	756	2,599	5,292	9,408
SGSB	m <sup>3</sup>	52	139	6,468	832	2,859	5,821	10,349
Culverts	each	0	0	0	0	0	0	0
Pavement Removal	m <sup>2</sup>	174	174	700	90	630	630	1,120
Milling	m <sup>2</sup>	30	132	5,250	675	4,725	4,725	8,400
Signals	each	0	0	1.5	0.5	1.5	1.5	1.5
Lights	each	0	4	12	4	4	4	12
Guard Rail	m	0	0	2,450	135	2,205	2,205	3,360
Hydro	m	0	0	1,400	0	1,260	1,260	2,240
Telephone	m	0	0	1,400	0	1,260	1,260	2,240
Water	m	0	0	0	0	0	0	0
Sanitary	m	0	0	0	0	0	0	0
Storm	m	0	0	0	0	0	0	0
Ped Overpass	m <sup>2</sup>	0	0					180
Bridge 2	m <sup>2</sup>	0	0					
Bridge 3	m <sup>2</sup>	0	0					
Bridge 4	m <sup>2</sup>							
Bridge 5	m <sup>2</sup>							
Total Bridge Area	m <sup>2</sup>	0	0	0	0	0	0	180
Wall 1	m <sup>2</sup>	0	0	6,125	1,095	4,900	6,125	12,125
Wall 2	m <sup>2</sup>	0	0					
Wall 3	m <sup>2</sup>	0	0					
Wall 4	m <sup>2</sup>	0	0					
Wall 5	m <sup>2</sup>							
Total Wall Area	m <sup>2</sup>	0	0	6,125	1,095	4,900	6,125	12,125

# Whistler Highway 99 Capacity and Safety Review Conceptual Design Volumes

MCSL Proj #: 2121-00288-02 EST.DATE August, 2018

N	0.	Issue ID	Name	Start Station	End Station	Total Dist. (m)	Cut (Rock + OM)	Rock Cut	ОМ	Usable OM	Usable Fill	Stripping (All waste)	Fill	OM Borrow / Surplus	OM Waste	Total Vol. Req.	AP (ton)	CBC	SBSB
	1 S	T-1	Short Term Option - 1 Left / Shared Left-Through	1+000	1+100	0	35	0	35	17	17	0	35	(17)	17	52	42	52	52
	2 S	T-2	Short Term Option - 2 Dual Left	1+000	1+075	0	93	0	93	46	46	0	93	(46)	46	139	112	139	139
	3 N	ИТ-1	Medium Term Option - 1 Counterflow	1+000	4+500	4	23,940	12,600	11,340	5,670	18,270	5,880	35,280	(17,010)	5,670	46,830	4,320	5,880	6,468
	4 N	ЛТ-2	Medium Term Option - 2 2 SB lanes from Taylor Way to Bayshore Dr	1+000	1+450	0	3,402	1,944	1,458	729	2,673	756	4,536	(1,863)	729	6,021	555	756	832
	5 N	ЛТ-ЗА	Medium Term Option - 3A Shoulder Widening	1+000	4+150	3	13,466	7,088	6,379	3,189	10,277	4,016	19,845	(9,568)	3,189	27,051	1,715	2,599	2,859
	6 N	ИТ-ЗВ	Medium Term Option - 3B 2 Full Lanes SB	1+000	4+150	3	21,546	11,340	10,206	5,103	16,443	5,292	31,752	(15,309)	5,103	42,147	3,888	5,292	5,821
	7 L	T-1	Long Term Option - 1 2 Full Lanes SB	1+000	6+600	6	54,432	36,288	18,144	9,072	45,360	9,408	56,448	(11,088)	9,072	74,928	6,912	9,408	10,349

	Highway 99 Capacity and Safety Review, Whistler (Alpha Lake Rd/Cheakamus Lake Rd to Lorimer Rd) Final Report
Appendix K - Count Station Volui	me Graphs

