3.0 CANDIDATE EVALUATION

In order to evaluate and compare the various options, a multiple account evaluation (MAE) was developed and undertaken. In accordance with standard practices for transportation studies in both the province of British Columbia and the State of Washington four separate accounts were considered:

1. Financial Account
2. Customer Service Account
3. Socio-Community Account
4. Environmental Account

3.1 Financial Account

This includes the estimated present value capital cost estimates for each improvement option. In addition, the annual operating and maintenance costs have been included over a 20 year life cycle, which is discounted at 6% to a net present value.

3.1.1 Cost Estimate

In order to estimate the costs required for each improvement option a set of benchmark unit costs (CAD $ / m and USD $ / foot) were established based on the type of terrain encountered and the status of any existing roadway. Two types of terrain were identified:

1. Rolling Terrain – grades less than 4% and standard side slopes
2. Mountainous Terrain – grades higher than 4%, steep side slopes or rock cuts, and narrow curving alignment

In addition, for each type of terrain identified two levels of improvement were identified:

1. Reconstructed Highway – partial rehabilitation of an existing highway which may include:
    a. Resurfacing
    b. Widening and paving of shoulders to applicable design standards

    This generally applies to any improvements considered for an existing provincial highway (i.e. Hwy 22A) or an existing state highway (i.e. SR 25).

2. New Highway – either a new highway across virgin land or the complete reconstruction of an existing roadway. This would typically include:
    a. Complete reconstruction of the highway's base and surface structure
    b. Widening and paving of existing (if any) shoulders
    c. Improve to standard side slopes, ditches/drainage, and rock cuts

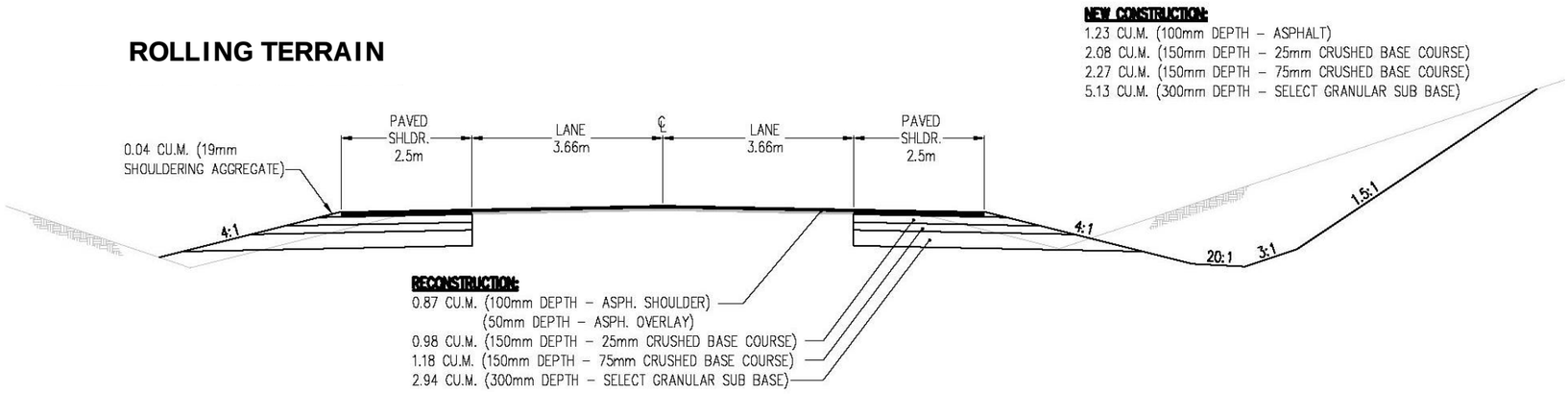
This category of improvement was typically applied to county roads (i.e. Northport-Boundary Road or Aladdin Road) which would have to be significantly improved to meet state highway design standards.

Each option was divided into segments based on the condition of the existing highway and the type of terrain, as determined during detailed site visits to each corridor. The length of each segment was then multiplied by the corresponding improvement category's unit rate to determine its estimated construction cost. In the case of new highways, where no existing roadway existed, the type of terrain was estimated based on nearby topography or from aerial photography.

3.1.1.1 Key Design Parameters

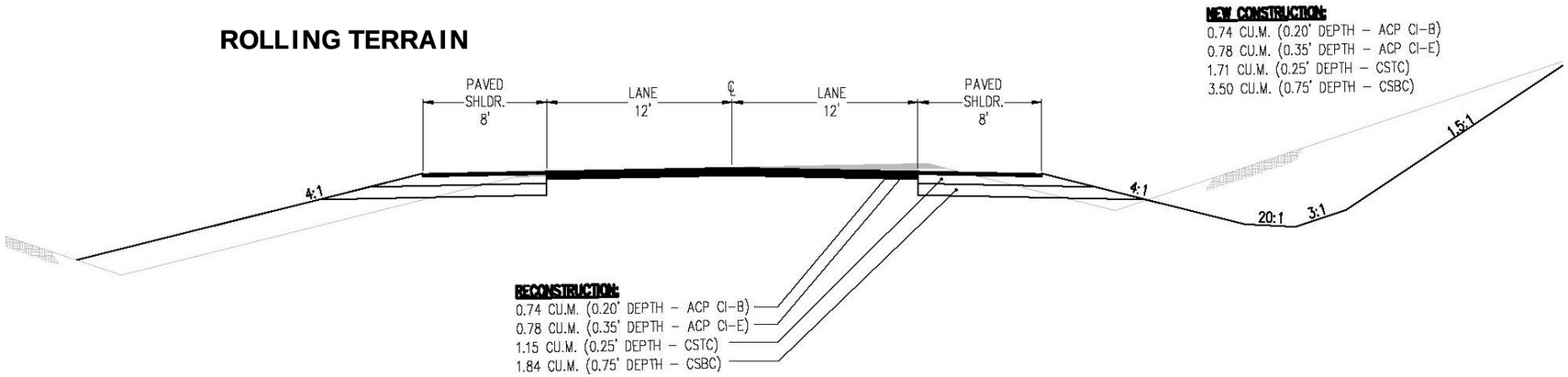
Based on the applicable highway design standards for both the Province of British Columbia and the State of Washington, a typical two-lane highway cross section was determined. This standard case was used to estimate the costs required to either improve an existing highway or to construct a new highway to these standards. The typical cross-sections used in each jurisdiction are as illustrated in Figure 57.

Figure 57: Rural Arterial Undivided (RAU) – with a 90 km/h Design Speed (British Columbia)



Based of the 1999 Transportation Association of Canada (TAC) Geometric Design Guide

Figure 58: All Weather Rural Highway – Principal Arterial (P-3) (State of Washington)



Based on the 2002 Washington State Department of Transportation Design Manual

3.1.1.2 Benchmark Unit Costs

Using the noted design parameters for each jurisdiction, benchmark unit costs were derived for each highway improvement category. Unit costs were based on typical line items of highway construction as provided by the British Columbia Ministry of Transportation and the Washington State Department of Transportation. A detailed derivation of the unit costs used can be found in **Appendix A**.

Table 8: Benchmark Unit Costs (per centerline meter or foot)

Improvement Type	British Columbia (CAD$ / m)		Washington State (USD$ / ft)	
	Rolling	Mountainous	Rolling	Mountainous
Reconstruction	$423	$1,089	$111	$274
New Highway	$563	$1,328	$166	$328

Many of the proposed improvement options include the construction of a new bridge structure over the Columbia River, Pend Oreille River, or Deep Creek. In order to establish a preliminary estimate of these costs a benchmark unit rate was used. Based on the recent construction of the Yoho Bridge near Golden, BC a unit rate of $2,500 per m^2 CAD ($190.45 per ft^2 USD) was determined. For a rural two lane bridge an 11.5 m (38 ft) bridge width was assumed. Using this and the estimated length of the crossing a preliminary cost estimate was calculated.

For the purposes of comparison the financial accounts were also summarized for the entire corridor in both Canadian and US dollars. Currency exchange rates at the time of the study (January 2005) were used.

- $ 1 CAD = $ 0.82 USD
- $ 1 USD = $ 1.22 CAD

3.2 Customer Service Account

This account considers the estimated benefits of each improvement option to its users, over a 20 year life cycle, discounted at 6%. Potential benefits are based on standard benchmark values established for both British Columbia and for the state of Washington.

Customer service accounts are calculated for the entire corridor option in both BCMoT benchmark rates and in WSDOT benchmark rates. Unit rates for the various customer accounts were taken from the latest available data provided by both agencies.

3.2.1 Benefit Estimate

3.2.1.1 Travel Time

The potential benefit of reduced travel time to individual users is estimated using standard province-wide or state wide rates estimating the value of each individual's time. These rates are based on a proportion of the average provincial or state wage rates, as described in both BCMoT's and WSDOT's documentation of benefit cost methodology. The estimated travel time savings can be monetized for each user and then converted to an annual benefit. These benefits are then accrued for all users over the 20 year life span of the project. Standard BCMoT and WSDOT rates for the value of user's travel time are shown in **Table 9** for both autos and trucks.

Table 9: Value of User's Travel Time and Vehicle Operating Costs

	2003 BCMoT (CAD $ per Hr)		2000 WSDOT (USD $ per Hr)	
	Autos	Trucks	Autos	Trucks
Travel Time Value	$11.17	$23.41	$6.12	$20.22
Veh. Op. Costs	$12.47	$53.30	$3.75	$32.85
Total User Costs	$23.64	$76.71	$9.87	$53.07

3.2.1.2 Vehicle Operation

Improved highway conditions and reduced travel time may also provide a benefit to users by reducing the cost to operate a vehicle. Operating costs typically include fuel, oil, tire wear, general maintenance, and depreciation. These values are summarized for an average vehicle type and an estimated hourly rate is calculated. As with travel time benefits, the estimated vehicle operating cost savings can be monetized for each user and then converted to an annual benefit. These benefits are then accrued for all users over the 20 year life span of the project. Standard vehicle operating costs used by BCMoT and WSDOT are summarized in **Table 9** for both autos and trucks.

3.2.1.3 Collision Reduction

Improved highway conditions generally decrease the likelihood of traffic collisions and thereby reduce the cost of these collisions to society. This benefit is estimated by determining the collision rates on the existing highway based on provincial or state records. The cost to society of various severities of collision has also been estimated for

each jurisdiction and is used to determine the monetary cost of accidents on the existing highway.

Each jurisdiction quantifies the cost of various collision severities to society differently, as shown in **Table 10**. In addition, while BCMoT calculates the cost of all types of injury incidents together, WSDOT breaks these down into several sub-groups such as; disabling injury, evident injury, and possible injury. For the purposes of maintaining consistency and comparison these categories were aggregated using a weighted average of the total number of each injury type in Northeast Washington.

Table 10: Costs of Highway Accidents

Accident Type	2003 BCMoT (CAD $)	2000 WSDOT (USD $)
Fatality	$5,693,594	$1,100,000
Injury	$99,999	$119,325
PDO (Property Damage Only)	$7,342	$6,500

Highway improvements such as widening the travel lanes, widening or paving shoulders, and reducing side slopes typically reduce the likelihood of highway accidents by a standard percentage, as determined by studies of historic data. For example WSDOT methodology for estimating safety benefits of proposed highway projects use standard reduction factors shown in **Table 11**. For the purposes of this study these reduction factors were used for both British Columbia and Washington State calculations.

Table 11: Estimated Accident Reductions by Highway Improvement Type

Highway Improvement Type	Fatality & Injury	PDO
Widen Traveled Way – Two Lane Rural	30%	40%
Widen Shoulder – Two Lane Rural	5%	0%
Flatten Slopes – Two Lane Rural	20%	20%

3.3 Socio-Community Account

This account is more qualitative and takes into consideration the estimated impact of each option to the local communities. This may include concerns such as:

- Community Displacement – the relative measurement of projected property takings to residents or businesses

- Quality of Life – community concerns such as noise and vibration due to increased truck traffic will be considered here, as well as the impact of increased traffic to local residents
- Archaeological – the potential impact of each option on known historic or First Nation/Native American tribal sites will be considered based on available information.

Potential socio-community impacts will be rated as low, medium, or high impact. Where:

- Low – Few significant negative impacts and mitigation of impacts is feasible
- Medium – Some significant negative impacts and mitigation measures are possible
- High – Significant negative impacts and mitigation opportunities are limited

3.4 Environmental Account

The estimated affect of each option, both during construction and during its service life, on the environment will be considered based on available information. Environmental impacts which may be assessed include:

- Air Pollution – traffic exhaust
- Water Pollution – increased run-off and silt deposits
- Wildlife Impacts - impacts to both terrestrial and aquatic habitats
- Significant Changes to existing land use

Potential environmental impacts will be rated as low, medium, or high impact. Where:

- Low – Few significant negative impacts and mitigation of impacts is feasible
- Medium – Some significant negative impacts and mitigation measures are possible
- High – Significant negative impacts and mitigation opportunities are limited

3.5 Multiple Account Evaluation – Northern Sub-Area

Each proposed improvement option for the northern section (from Trail, BC to Northport, WA) was evaluated and compared based upon the noted four accounts.

3.5.1 Existing Route(s) – Highway 22A and Northport-Boundary Road

This option considers the upgrading of the existing route from Trail, BC to Northport, WA via the Waneta/Boundary border crossings. On the Canadian side Highway 22A is in reasonably good condition, but would require some rehabilitation and widening in order to accommodate increased truck traffic. In addition, the existing one-way bridge over the Pend Oreille River (Waneta Bridge) would need to be replaced, as it is currently the oldest bridge in British Columbia and is nearing the end of its service life. Also as a one-way bridge it would not be suitable for significant commercial traffic in its current configuration and therefore any improvement to this corridor must consider the replacement of this bridge, as illustrated in **Figure 59**. On the US side the Northport-Boundary Road is a sub-standard County Road which would require substantial upgrades to accommodate increased truck traffic. Since the existing grades and switchbacks approaching the existing Deep Creek crossing would not be suitable for significant commercial traffic, a new and substantial crossing was included, as shown in **Figure 60**.

Figure 59: Proposed Waneta Crossings

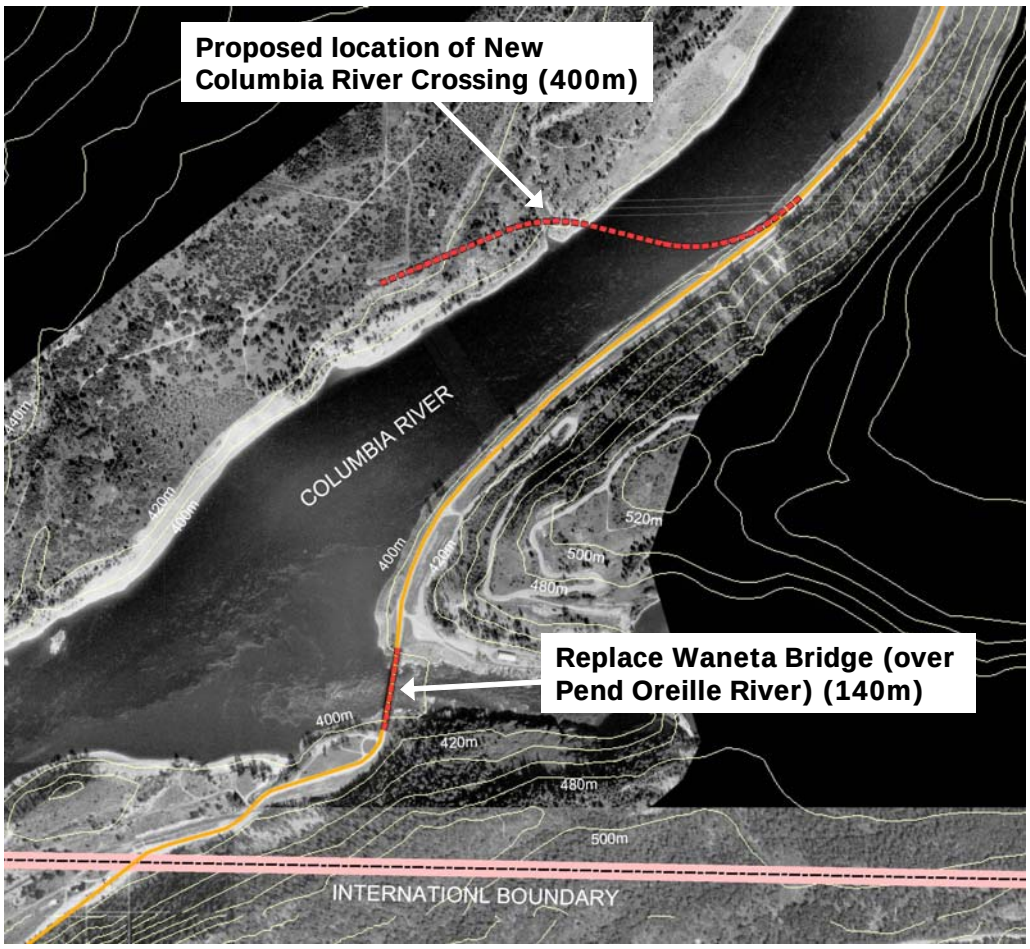
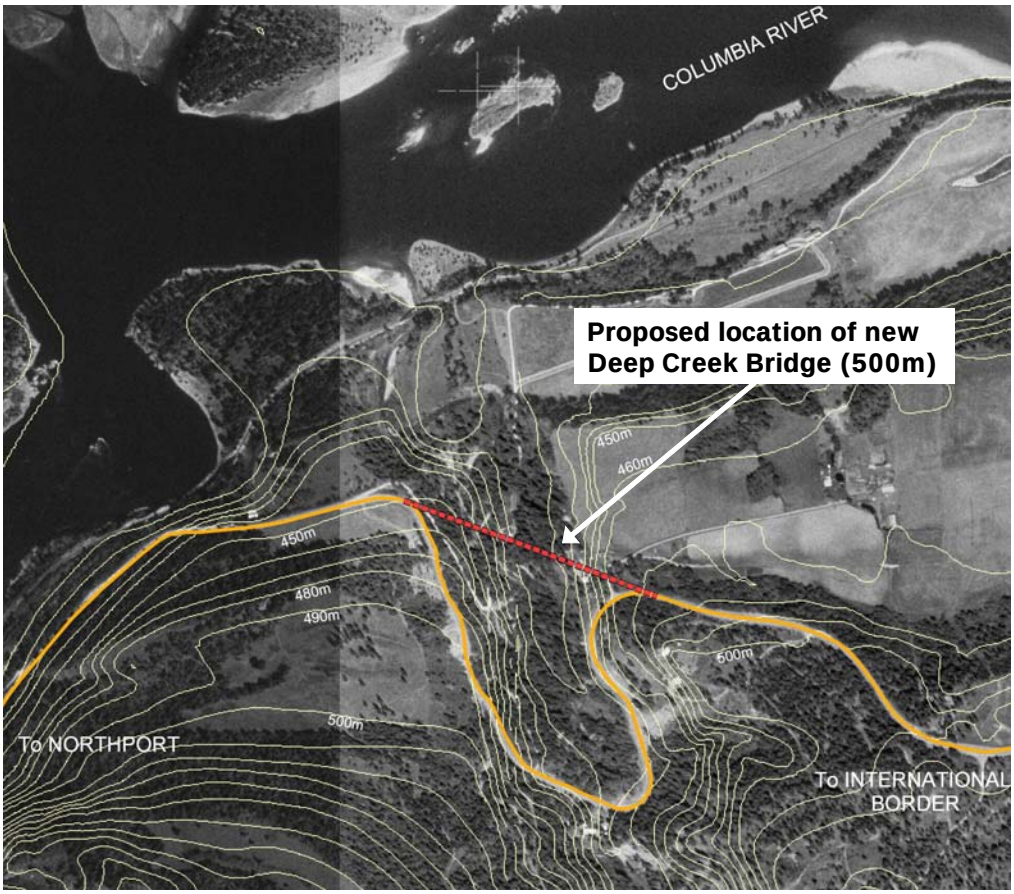


Figure 60: Proposed Deep Creek Crossing



3.5.1.1 Financial Account

Table 12: Estimated Improvement Costs

Trail, BC to US Border		
Improve Highway 22A		$ 7,089,427 CAD
New Waneta Bridge (Pend Oreille River) – 140m		$ 4,025,000 CAD
Salvage Value (20% of Construction Costs)		$ 2,222,885 CAD
Additional Maintenance Costs (over 20 years)		n/a
	Subtotal	**$8,891,542 CAD**
Canadian Border to Northport, WA		
Improve Northport-Boundary Road		$ 16,925,703 USD
New Deep Creek Bridge – 500m		$ 11,787,500 USD
Salvage Value (20% of Construction Costs)		$ 5,742,640 USD
Additional Maintenance Costs (over 20 years)		$ 943,748 USD
	Subtotal	**$23,914,311 USD**
Total Financial Account	**$ 38,067,000 CAD**	**$ 31,205,374 USD**

3.5.1.2 Customer Service Account

By improving and upgrading the existing highway, this option would provide an estimated 6 minute travel time savings from the existing 36 minutes on the base route (via Patterson/Frontier). This travel time savings can then be equated to a mobility benefit to both user costs and vehicle operating costs. In addition, since this option considers the upgrading of an existing route not only will vehicles re-routed from the base Patterson/Frontier route benefit, but also vehicles which are already using the existing route. These mobility benefits to existing traffic have been accounted for separately. All mobility benefits were accrued for all vehicles over 20 years and discounted by 6% to determine the present value of the estimated benefit.

Table 13: Estimated Mobility Benefits

Mobility Benefit (20 years)	BC MoT Rates $ CAD	WSDOT Rates $ USD
Re-routed from Patterson / Frontier	$ 5,271,883	$ 4,368,807
Existing Traffic	$ 9,654,249	$ 5,272,289

Potential safety benefits have also been estimated using existing accident data on each corridor as the base case. Accident reduction factors were applied corresponding to the types of improvements being considered. Safety benefits could not be estimated for the Northport-Boundary Road since existing accident data on this county roadway was not available. All potential safety benefits were accrued over the 20 year life cycle of the project and converted to its present value using a 6% discount rate.

Table 14: Estimated Safety Benefits

Safety Benefit (20 years)	BC MoT Rates $ CAD	WSDOT Rates $ USD
Improved Existing Roadway	$ 1,677,009	$ 495,397

3.5.1.3 Socio-Community Account

While introducing a new commercial corridor across the Waneta/Boundary crossing would re-route additional truck and passenger car traffic through Trail and along Highway 22A, this option was deemed to have medium socio-community impacts. Given that this proposed option involves the upgrading of existing routes, re-routed truck traffic would use existing truck routes along Highway 3B and Highway 22A. It is likely that given the increased traffic some mitigation measures would be required through Trail, BC and possibly Northport, WA.

While increased truck traffic, noise, and vibration would cause negative socio-community impacts to residents along this corridor, the communities of Rossland and Warfield would see positive impacts with the removal of a significant proportion of truck traffic (as with all three options). On the other hand, the community of Northport, WA would not bear significant adverse impacts as cross border traffic is routed through their community regardless of which border crossing is used.

It is unlikely that any historical or First Nations/Tribal concerns would be encountered since this option follows existing highways and does not introduce any new corridors.

3.5.1.4 Environmental Account

Environmental impacts for this option were rated as low since only existing routes would be upgraded. While it is difficult to determine the intensity of environmental impacts at this level of planning, considering the relatively minor scope of the improvements being considered it is unlikely that significant environmental impact legislation on either side of the border would be triggered.

The Canadian Environmental Assessment Act (CEAA) specifically excludes roadway modifications within existing right-of-way. Under Provincial legislation, the British Columbia Environmental Assessment Act (BCEAA) is not normally a consideration for all but the largest highway projects. A non-legislated, self-directed Highway Environmental Assessment Process is most often applied and is designed to be flexible in scope and level of assessment based on the needs of each particular project. It is unlikely that this proposed option would trigger provisions in either the National Environmental Policy Act (NEPA) or the Washington State Environmental Policy Act (SEPA). Improvements to existing roadways are typically categorically exempt from NEPA and SEPA provisions.

It should be noted that with advanced stages of design, including potential alignment changes, the level of improvement could change sufficiently that increased environmental considerations would need to be accounted for. In addition, as this option does propose the replacement of both the Waneta and Deep Creek bridges, special consideration would be required to assess and mitigate any environmental impacts during the construction and service of these structures. This may include CEAA/BCEAA, or NEPA/SEPA provisions. Any requirement for additional environmental reviews could potentially impact project schedule and budget.

3.5.2 New Route – West Side of the Columbia River

This option considers the construction of a completely new highway on the west side of the Columbia River from Trail, BC to Northport, WA. While there are some existing roads along portions of this route (Riverside Avenue east of Trail and Mitchell Road northeast of Northport) it is assumed that a completely new highway would be required due to the sub-standard condition of these facilities. In addition, in order to avoid insurmountable impacts to downtown Trail, a new bridge structure is included across the Columbia River just east of Trail, as illustrated in **Figure 61**. The costs associated with the creation of a new border crossing facility in this or any other option were not considered for the purposes of this analysis.

Figure 61: Proposed Columbia River Crossing

Table 15: Estimated Improvement Costs

Trail, BC to US Border		
New Highway – West of Columbia River		$ 8,674,054 CAD
New Bridge (Columbia River) – 300m		$ 8,625,000 CAD
Salvage Value (20% of Construction Costs)		$ 3,459,810 CAD
Additional Maintenance Costs (over 20 years)		$ 1,088,300 CAD
	Subtotal	**$14,927,544 CAD**
Canadian Border to Northport, WA		
New Highway – West of Columbia River		$ 24,037,805 USD
Salvage Value (20% of Construction Costs)		$ 4,807,561 USD
Additional Maintenance Costs (over 20 years)		$ 928,171 USD
	Subtotal	**$20,158,415 USD**
Total Financial Account	**$ 39,520,806 CAD**	**$ 32,398,998 USD**

3.5.2.2 Customer Service Account

This new highway would reduce travel times to 34 minutes from 36 minutes on the existing route via Patterson/Frontier. Since this option considers the construction of a completely new route not only will vehicles re-routed from the base Patterson/Frontier route benefit, but also cross-border trips which would be re-routed from the existing Waneta/Boundary crossing. As this is a new roadway, no potential benefits to existing traffic were considered. All mobility benefits were accrued for all vehicles over 20 years and discounted by 6% to determine the present value of the estimated benefit.

Table 16: Estimated Mobility Benefits

Mobility Benefit (20 years)	BC MoT Rates $ CAD	WSDOT Rates $ USD
Re-routed from Patterson / Frontier	$ 1,757,294	$ 1,456,269
Existing Traffic	$ 3,043,565	$ 1,303,571

Note that safety benefits were not considered since this is a new roadway.

3.5.2.3 Socio-Community Account

Socio-community impacts were considered to be high for this option. The construction of a new highway on the west side of the Columbia River would cause significant impacts to local residents of downtown Trail. Previous studies have assumed that a new route on the west side of the Columbia River would connect to Highway 3B through

downtown Trail (along Bay Street). However, through discussions with the City of Trail it was determined that this impact would likely be so great that this option was completely removed from consideration. In this case, a new crossing of the Columbia River was assumed east of the Victoria Street Bridge. Depending upon the location of this new crossing, it is possible that socio-community impacts due to property takings and reduced quality of life could remain high.

In Washington State, socio-community impacts would likely be less severe, considering the relatively sparse population along the west side of Columbia River. It is also possible that there would be local opposition to this option from residents along Mitchell Road, due to increased truck traffic and reduced quality of life.

According to available information, no historical, First Nations, or Tribal sites have been identified along the proposed route on either the Canadian or US side of the border. In addition, the lands along the proposed alignment do not fall into any claimed lands of local tribes. However, as this option does not follow an existing highway alignment the likelihood of potential archaeological concerns is increased. Dialogue with all relevant tribes would be required before moving forward on any new highway corridor.

3.5.2.4 Environmental Account

Due to the fact that this option involves the construction of a new highway, on virgin land in many cases, environmental impacts were determined to be high. It is likely that environmental provisions through CEAA/BCEAA and NEPA/SEPA would not be exempt in this case. While no known significant public lands or wetlands are located within the corridor, the environmental impacts would remain high. In addition, a new highway would likely bisect deer wintering areas and cut off access to water sources significantly impacting wildlife populations.

Depending on the final location and scope of a Columbia River crossing just east of Trail, further environmental assessments and provisions may be required.

3.5.3 Combined Route – Highway 22A & West Side of Columbia River

This option combines features of the first two options by improving the existing Highway 22A to the international boundary and then constructing a new highway on the west side of the Columbia River from the border to Northport, WA. In this case, a new crossing of the Columbia River would be required in place of the existing bridge over the Pend Oreille River at Waneta.

3.5.3.1 Financial Account

Table 17: Estimated Improvement Costs

Trail, BC to US Border		
Improve Highway 22A		$ 7,089,427 CAD
New Columbia River Bridge (at Waneta) – 400m		$ 11,500,000 CAD
Salvage Value (20% of Construction Costs)		$ 3,717,885 CAD
Additional Maintenance Costs (over 20 years)		-
	Subtotal	**$14,871,542 CAD**
Canadian Border to Northport, WA		
New Highway – West of Columbia River		$ 24,037,805 USD
Salvage Value (20% of Construction Costs)		$ 4,807,561 USD
Additional Maintenance Costs (over 20 years)		$ 928,171 USD
	Subtotal	**$20,158,415 USD**
Total Financial Account	**$ 39,464,808 CAD**	**$ 32,353,079 USD**

3.5.3.2 Customer Service Account

This option would provide an estimated 7 minute travel time savings over the existing 36 minute trip (via Patterson/Frontier). This travel time savings can be converted to a mobility benefit to both user costs and vehicle operating costs. As with the first option not only will vehicles re-routed from the base Patterson/Frontier route benefit, but also vehicles which are already using the existing Highway 22A. In addition, with the new Columbia River crossing and the new highway on the west side of the Columbia River all traffic crossing the existing Waneta/Frontier boundary will benefit due to the reduction in travel time from the border to Northport. These mobility benefits were accrued for all vehicles over 20 years and discounted by 6% to determine the present value of the estimated benefit.

Table 18: Estimated Mobility Benefits

Mobility Benefit (20 years)	**BC MoT Rates $ CAD**	**WSDOT Rates $ USD**
Re-routed from Patterson / Frontier	$ 1,757,294	$ 1,456,269
Existing Traffic	$ 10,528,244	$ 5,656,900

Potential safety benefits have also been estimated using existing collision data on each corridor as the base case. Accident reduction factors were applied corresponding to the types of improvements being considered. Potential safety benefits were accrued over

the 20 year life cycle of the project and converted to its present value using a 6% discount rate.

Table 19: Estimated Safety Benefits

Safety Benefit (20 years)	BC MoT Rates $ CAD	WSDOT Rates $ USD
Improved Existing Roadway	$ 1,677,009	$ 495,397

3.5.3.3 Socio-Community Account

Socio-community impacts were rated as medium for this option, since it combines the upgrading of an existing route north of the border and a new highway south of the border. Impacts to local communities along Highway 3B and 22A in British Columbia would need to be mitigated where possible. As this is an existing route it is unlikely that historic or First Nations archaeological concerns would be encountered north of the border.

While impacts on the south side of the border would likely be minimal, local opposition is possible from residents in the Mitchell Road area due to increased traffic and reduced quality of life. Native American or tribal concerns are not known based on available data, however as this part of the option would cross virgin territory the likelihood of encountering sensitive sites on usual or accustomed tribal lands is increased.

3.5.3.4 Environmental Account

Medium level environmental impacts were also estimated for this option. By making use of the existing Highway 22A, impacts would be reduced on the north side of the border and would likely be exempt from CEAA/BCEAA provisions. On the other hand, since a new highway corridor would be constructed south of the border it is likely that this portion of the option would not be exempt from NEPA or SEPA provisions.

In addition, due to the requirement for a new Columbia River crossing near Waneta increased consideration of environmental impacts would be required based on more detailed information being available at a later date.

3.6 Multiple Account Evaluation – Southern Sub-Area

Each proposed improvement option for the southern section (from Northport, WA to Colville, WA) was evaluated and compared based on the same four accounts. Since

each option is located completely within Washington State only WSDOT benchmarks and unit costs were used.

3.6.1 Existing Route(s) – SR 25 & US 395

This option would improve the existing highway along SR 25 and US 395 which is currently the primary commercial route from Northport to Colville. In this case, only improvements to SR 25 were considered.

3.6.1.1 Financial Account

Table 20: Estimated Improvement Costs

Northport, WA to Colville, WA	
Improve SR 25	$ 42,538,905 USD
Salvage Value (20% of Construction Costs)	$ 8,507,781 USD
Additional Maintenance Costs (over 20 years)	-
Total Financial Account	**$ 34,031,124 USD**

3.6.1.2 Customer Service Account

This option would reduce the estimated travel time along this corridor from approximately 56 minutes to 54 minutes. Since all existing cross border traffic using either the Patterson/Frontier route or the Waneta/Boundary route already use this corridor, no benefits to re-routed vehicles was considered. Mobility benefits were only estimated to existing traffic along SR 25, these were accrued over 20 years for all vehicles and finally converted to present value using a 6% discount rate.

Table 21: Estimated Mobility Benefits

Mobility Benefit (20 years)	$ USD
All SR 25 Traffic	$ 28,936,644

Potential safety benefits have also been estimated using existing collision data on each corridor as the base case. Collision reduction factors were applied corresponding to the types of improvements being considered. Potential safety benefits were accrued over the 20 year life cycle of the project and converted to its present value using a 6% discount rate.

Table 22: Estimated Safety Benefits

Safety Benefit (20 years)	$ USD
Improved Existing Roadway	$ 105,695

3.6.1.3 Socio-Community Account

This option involves the improvement and upgrading of the existing SR 25 from Northport to Kettle Falls. In this case the socio-community impacts were rated as medium. While this route is currently used by truck traffic, increased traffic may adversely affect residents of Kettle Falls in particular. It may be necessary to mitigate potential impacts to Kettle Falls in this option.

It appears to be that this route does not cross any known tribal lands and as it is an existing corridor archaeological impacts would likely be minimal.

3.6.1.4 Environmental Account

NEPA and SEPA provisions would likely be categorically exempt for this option, considering that only existing corridors would be upgraded. While it appears that US 395 may run through a known wetland, since no improvements have been proposed for US 395 mitigation measures are likely not required. Additionally, no new bridge or water crossings that would trigger additional environmental review are proposed for this corridor and no known public lands are located in the area. For these reasons environmental impacts for this option are rated as low.

3.6.2 Existing Route(s) – SR 25 & Williams Lake Road

As with the previous option this proposed improvement would upgrade the existing SR 25, however the existing Williams Lake Road is used as an alternate route. Williams Lake Road is under Stevens County jurisdiction; however it is in reasonably good condition and offers significant time savings on the Northport to Colville trip. Some improvements would also likely be required along the Williams Lake Road. Additional maintenance costs were included for this option, since it is assumed that this route would likely be added to the inventory of roads to be maintained by the state.

3.6.2.1 Financial Account

Table 23: Estimated Improvement Costs

Northport, WA to Colville, WA	
Improve SR 25 & Williams Lake Road	$ 38,148,822 USD
Salvage Value (20% of Construction Costs)	$ 7,629,764 USD
Additional Maintenance Costs (over 20 years)	$ 1,832,520 USD
Total Financial Account	**$ 32,351,577 USD**

3.6.2.2 Customer Service Account

Due to the improved SR 25 and the use of Williams Lake Road the estimated travel time can be reduced from 56 minutes to 42 minutes. In this case, it was assumed that all cross border traffic would re-route from SR 25 via Kettle Falls to Williams Lake Road. Additionally, mobility benefits to existing users of both SR 25 and Williams Lake Road was considered. All potential benefits were accrued over 20 years and converted to present value using a discount rate of 6%.

Table 24: Estimated Mobility Benefits

Mobility Benefit (20 years)	WSDOT Rates $ USD
Re-routed from SR 25 to Williams Lake Rd	$ 10,600,843
Existing Traffic	$ 14,759,935

Note that safety benefits were not considered due to a lack of base collision rates/data.

3.6.2.3 Socio-Community Account

Socio-community impacts were rated as medium for this option. As this proposed improvement option would re-route a portion of truck traffic from SR 25 to Williams Lake Road adverse impacts due to increased traffic and reduced quality of life would be expected. While Williams Lake Road is currently in good condition and a significant amount of truck traffic already make use of the corridor it should be noted that local opposition to this route would likely be high. On the other hand, the community of Kettle Falls may see a positive impact due to reduced truck traffic. It should be noted that due to several trucking destinations in Kettle Falls, a portion of the truck traffic will be required to remain on this route in any case.

No known tribal lands are located along this corridor, therefore archaeological concerns are not expected to be encountered at this time.

3.6.2.4 Environmental Account

As this option involves the upgrading of existing highways, it is likely that NEPA and SEPA provisions would be exempt. No known wetlands or public lands are located with the corridor, therefore environmental impacts were estimated to be low for this option.

3.6.3 New Route – Aladdin Road

This option would make use of the existing Aladdin Road as an alternate route from Northport to Colville. As this road is currently Stevens County Road it is assumed that a complete re-construction would be required to meet State standards. Additional maintenance costs were also considered for this option as an improved Aladdin Road would likely be added to the inventory of routes maintained by the state.

3.6.3.1 Financial Account

Table 25: Estimated Improvement Costs

Northport, WA to Colville, WA	
Improve Aladdin Road	$ 55,961,930 USD
Salvage Value (20% of Construction Costs)	$ 11,192,386 USD
Additional Maintenance Costs (over 20 years)	$ 3,433,226 USD
Total Financial Account	**$ 48,202,770 USD**

3.6.3.2 Customer Service Account

An improved Aladdin Road would likely offer a reduced travel time of 46 minutes as compared to 56 minutes using the existing route along SR 25 and US 395. Mobility benefits would be applied to all cross-border traffic in addition to the existing traffic using Aladdin Road. Benefits are accrued over 20 years and a discount value of 6% is applied to determine its present value, as illustrated in **Table 26**.

Table 26: Estimated Mobility Benefits

Mobility Benefit (20 years)	WSDOT Rates $ USD
Re-routed from SR 25 to Aladdin Rd	$ 7,572,030
Existing Traffic	$ 29,295,680

Note that safety benefits were not considered due to a lack of base collision rates/data.

3.6.3.3 Socio-Community Account

As this option would introduce new truck traffic to the Aladdin corridor, medium level socio-community impacts are expected. While this is currently an existing route, it is not used by significant truck traffic at this time. While local residents and communities along Aladdin Road would likely bear negative impacts due to increased traffic and reduced quality of life, other communities such as Kettle Falls may see some positive impacts. In addition, due to the location of Aladdin Road as it enters Colville some mitigation measures would likely be required in order to connect the route through downtown Colville to the US 395 corridor.

As with the other options, no known tribal lands are found along this corridor.

3.6.3.4 Environmental Account

While no known major wetlands or public lands are located along this corridor, this option was estimated to have high environmental impacts due to the topography and existing land uses. As Aladdin Road is currently a very minor and local county road, improvements proposed in this case would likely be more substantial than previous options and would not be exempt from NEPA or SEPA provisions.

3.7 Multiple Account Evaluation Summary

This section summarizes the multiple account evaluation results to allow for option comparison and evaluation. Process results for the northern section are summarized in **Table 27**, and results for the southern section are summarized in **Table 28**.

Table 27: Multiple Account Evaluation Summary

	Northern Section					
	Existing Route *Hwy 22A & SR25*		***New Route*** *West Side of Columbia River*		***Combined Route*** *Hwy 22A & West Side of Columbia River*	
	CAD	USD	CAD	USD	CAD	USD
Benefit Estimate	$16.6 M	$10.1 M	$4.8 M	$2.8 M	$14.0 M	$7.6 M
Cost Estimate	$38.1 M	$31.2 M	$39.5 M	$32.4 M	$39.5 M	$32.4 M
B/C Ratio	0.44	0.32	0.12	0.09	0.35	0.24
NPV	($21.5 M)	($21.1 M)	($34.7 M)	($29.6 M)	($25.5 M)	($24.7 M)
Environmental Impacts	○ Low		● High		◉ Medium	
Socio-Community Impacts	◉ Medium		● High		◉ Medium	

The option of improving the existing route(s) is the most favourable of the three northern options. Potential benefits to user mobility and safety are highest in this option, mostly due to the fact that a significant volume of existing traffic on Highway 22A (including truck traffic from the Waneta Reload Centre) would benefit from proposed improvements to the existing corridor. In addition, since this option would involve the upgrading of existing routes, as opposed to the constructing of new routes, it is likely that this option would be the most favourable in terms of costs, socio-community impacts, and environmental impacts. While achieving a benefit-cost ratio greater than 1.0 is generally preferred, this result does not suggest that significant positive benefits to the community would not be achieved. In keeping with the goals of this study, this option would result in reduced travel times, reduced operating costs, and improved safety as compared to the existing conditions.

Table 28: Multiple Account Evaluation Summary (in USD)

	Southern Section		
	Existing Route *SR25 & US395*	***New Route*** *SR25 & Williams Lake Road*	***Combined Route*** *Aladdin Road*
Benefit Estimate	$29.0 M	$25.4 M	$36.9 M
Cost Estimate	$34.0 M	$32.4 M	$48.2 M
B/C Ratio	0.85	0.78	0.76
NPV	($5.0 M)	($7.0 M)	($11.3 M)
Environmental Impacts	○ Low	○ Low	● High
Socio-Community Impacts	◉ Medium	◉ Medium	◉ Medium

Similarly, the most favourable option in the southern section is improvements to the existing SR 25 and US 395 routes. This option results in the greatest benefit cost ratio, as well as significant mobility and safety benefits. As with the northern sub-area, since this option would involve the upgrading of existing routes, as opposed to the constructing of new routes, it is likely that this option would be the most favourable in terms of costs, socio-community impacts, and environmental impacts. While improving the existing SR 25 and US 395 routes results in a benefit cost ratio slightly less than 1.0, this option would still result in reduced travel times, reduced vehicle operating costs, and improved safety consistent with the goals of this study.

According to the multiple account evaluation (MAE) the two most favourable improvement options are:

- Improve the Existing Route(s) – Highway 22A & Northport-Boundary Road
- Improve the Existing Route(s) – SR 25 and US 395

For the purposes of comparison and evaluation, all options in the northern sub-area were analyzed as a single corridor (irrespective of the international boundary). Given that the preferred option crosses the international border, it is likely that each agency would need to consider both the costs and benefits which would be attributed to their respective jurisdictions. The following table summarizes the benefits, costs, and corresponding economic indicators for improvements on both the British Columbia and the Washington State side of the boundary.

Table 29: Economic Indicators by Jurisdiction

	Northern Section	
	British Columbia (CAD)	*Washington State (USD)*
Benefit Estimate	$18.3 M	($1.8 M)
Cost Estimate	$8.9 M	$24.0 M
B/C Ratio	2.06	-0.07
NPV	$9.4 M	($25.7 M)

As most of the cost of the preferred option is geographically located in Washington State, the economic performance indices are challenging on the US side of the border.