

Rethinking Malahat Solutions

Or, Why Spend Billions if Million-Dollar Solutions are Better Overall?

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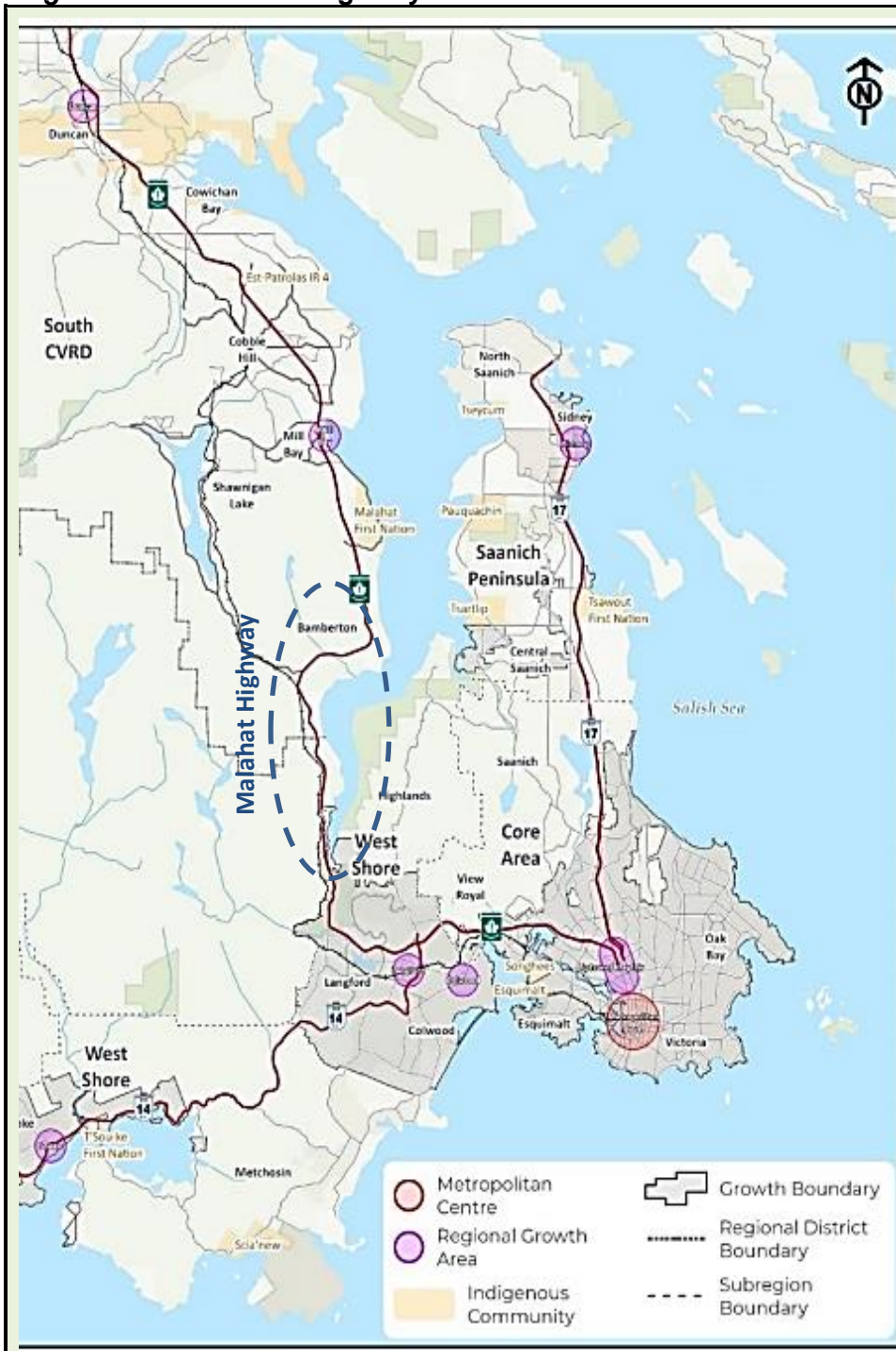


The Malahat Highway can be difficult and dangerous to drive due to heavy traffic volumes and adverse weather. There is currently minimal public transit service on the corridor.

Abstract

This report evaluates possible ways to improve travel over the Malahat Highway including roadway expansions, new bypass and bridges, reestablishing rail, and improved bus service. This analysis indicates that frequent and affordable bus service, with transportation demand management incentives, could attract 10-30% of trips, providing large reductions in traffic congestion, crashes, user costs and pollution on that corridor, and downstream. It is significantly cheaper and provides more benefits than alternatives. Frequent and affordable transit helps achieve social equity goals. In contrast, highway expansions are inherently unfair and regressive; they provide little benefit to non-drivers, and by inducing more vehicle travel they increase downstream traffic problems. More comprehensive analysis is needed to evaluate the full benefits of multimodal solutions such as frequent and affordable public transit.

Figure 1 Malahat Highway



The Malahat Highway is a busy, narrow, steep and windy 25-kilometer stretch of the Trans-Canada Highway 1, along the west side of Saanich Inlet. It is a congested and dangerous bottleneck between Victoria and areas north on Vancouver Island. There are frequent calls to expand the roadway, create bypass routes, and apply targeted safety strategies.

Those solutions provide limited benefits. At best, they can improve traffic conditions on that stretch of road, but do nothing to increase affordability or improve mobility options for non-drivers, and by inducing additional vehicle travel, they could increase traffic problems on other roads.

An alternative solution is to provide frequent and affordable bus service between Victoria, Nanaimo, with TDM incentives for motorists to shift to transit. This is far cheaper than other options provides a broader range of benefits to users and other travellers.

A new organization, *Better Island Transit* (<https://betterislandtransit.ca>) is now working to advocate for multimodal solutions to Malahat traffic problems.

Introduction

The Malahat is a busy, narrow and steep 25-kilometer stretch of highway between Victoria and Duncan. It is often congested, and averages about 50 crashes and 12 closures annually (Leyne 2019). As a result, there is considerable interest in improving travel conditions on this corridor.

This report evaluates potential Malahat corridor improvement options, such as those described in the recent *South Island Transportation Strategy* (MoTH 2020), including expanded or new highway routes, new bridges across the Saanich Inlet, and new rail service, plus one overlooked option: frequent and affordable bus service, with transportation demand management (TDM) incentives, such as those listed in the box below.

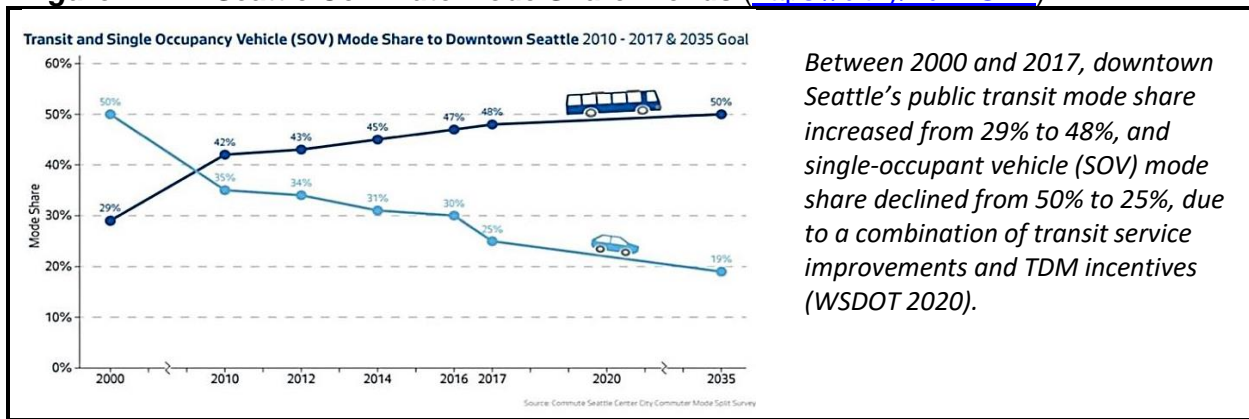
Box 1 **Transportation Demand Management (TDM) Incentives** (CARB 2014; Litman and Pan 2023)

- | | | |
|-----------------------------------|--------------------------------------|--------------------------------------|
| • Bus and station amenities | • Improved transit payment systems | • Efficient parking pricing |
| • Commute trip reduction programs | • Walking and bicycling improvements | • Transit-oriented development |
| • Bus/HOV priority | • Mobility management marketing | • Transit fare incentives |
| | | • Pay-as-you-drive insurance pricing |

This corridor currently has minimal public transit service. Four commuter buses depart Duncan between 5:30 and 6:30 am, and return between 3:15 and 5:15 pm weekdays. There is no reverse-commute or evening service, and only three weekend trips. The fare is \$10 each way. Service between Victoria and Nanaimo is even worse. The Island Link bus makes from one to five daily trips (except Sunday), depending on season, with \$40 one-way fares (Island Link 2023). This combination of poor service and high prices explains why transit serves less than 0.1% of trips over the Malahat (MoTH 2020c, pp. 8 & 9).

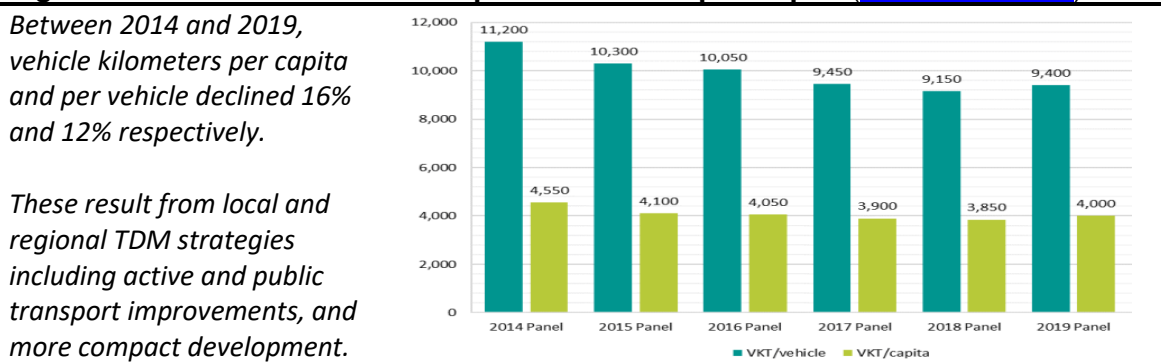
Experience elsewhere indicates that many interregional travellers will choose transit if it is convenient and affordable. For example, 12% of total trips and 22% of peak-period trips between Sooke and Victoria are by transit (CRD 2017, p. 118). The #61 bus makes 43 daily round trips between 6:00 am and midnight, including peak-period express service. Fares are just \$2.50 one-way or \$5.00 for an unlimited-use daily pass. Similarly, 20-40% of weekday trips between Fraser Valley towns, such as Langley and Pitt Meadows, and Vancouver, are by public transit (Translink 2011, p. 66, 71 and 76). Service is frequent and fares are just \$3-12 one way.

Figure 2 **Seattle Commute Mode Share Trends** (<https://bit.ly/2u2FGDL>)



By improving travel options and implementing TDM incentives, Seattle and Vancouver significantly reduced vehicle travel and increased transit mode shares (McElhanney 2019; Peterson 2017), as illustrated in Figures 2 and 3.

Figure 3 Vehicle-Kilometers per Vehicle and per Capita ([Vancouver 2021](#))



Although few motorists want to forego driving altogether, surveys indicate that many would prefer to drive less and rely more on alternatives, provided they are convenient, comfortable and affordable (MNP 2023; NAR 2017; Pembina 2014). Current demographic and economic trends (aging population, changing consumer preferences, and growing affordability, health and environmental concerns) are increasing non-auto travel demands. In response, many jurisdictions are implementing multimodal planning and mode shift targets (FHWA 2012; Sriraj, et al. 2017). For example, Victoria's *Climate Action Leadership Plan* has a 25% transit mode share target, and the Capital Regional District and Cowichan Valley transport plans have 15% transit mode share targets (MoTI 2020). Provincial goals also support multi-modal transport (Horgan 2017). Achieving these targets can provide many benefits, as summarized in Table 1.

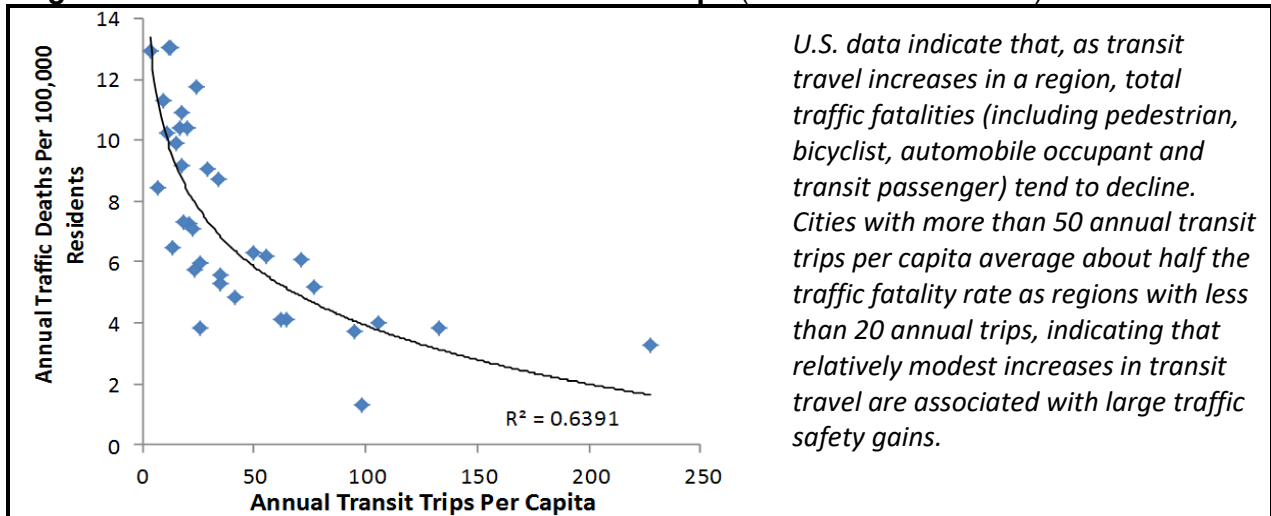
Table 1 Frequent and Affordable Public Transit Benefits

Improved Transit Service	Increased Transit Travel	Reduced Automobile Travel	Transit-Oriented Development
<ul style="list-style-type: none"> Improved passenger comfort, convenience and productivity. Affordability (savings to lower-income households). Equity (benefits disadvantaged people). Operating efficiencies (e.g. from bus lanes). Improved security. 	<ul style="list-style-type: none"> Mobility benefits to new users. Increased fare revenue. Public fitness and health (since most transit trips include walking and cycling). Increased security as law-abiding citizens ride transit. 	<ul style="list-style-type: none"> Reduced traffic congestion. Road and parking facility cost savings. Consumer savings. Reduced chauffeuring burdens. Increased traffic safety. Energy conservation. Reduced pollution. 	<ul style="list-style-type: none"> Additional vehicle travel reductions ("leverage effects"). Improved accessibility, particularly for non-drivers. More efficient development (lower infrastructure costs). Farmland and habitat preservation.

Public transit can provide numerous benefits, some of which tend to be undervalued by conventional planning.

Because frequent and affordable transit services tend to attract peak-period, higher risk and high polluting motorists, it can provide particularly large savings and benefits. For example, commuters and seniors who dislike driving on high-speed highways, impaired or fatigued travellers, and motorists who own older cars that are less reliable and inefficient are particularly likely to choose convenient and affordable bus trips. Many traffic safety strategies (graduated licenses, senior driver tests, anti-impaired and distracted driving campaigns, etc.) discourage higher-risk driving; their effectiveness depends on travellers having viable alternatives to driving (UITP 2020; USDOT 2017). This explains why traffic crash rates tend to decline as transit ridership increases (Litman 2019; Stimpson, et al. 2014), as illustrated in Figure 4.

Figure 4 Traffic Fatalities Versus Transit Trips (FTA and NHTSA data)



These effects are likely to occur on the Malahat corridor: frequent and affordable transit service is likely to attract many peak-period, higher risk, high polluting and lower-income travelers, providing proportionately large reductions in driver stress, congestion, crashes, emissions and user costs, as discussed in detail later in this report.

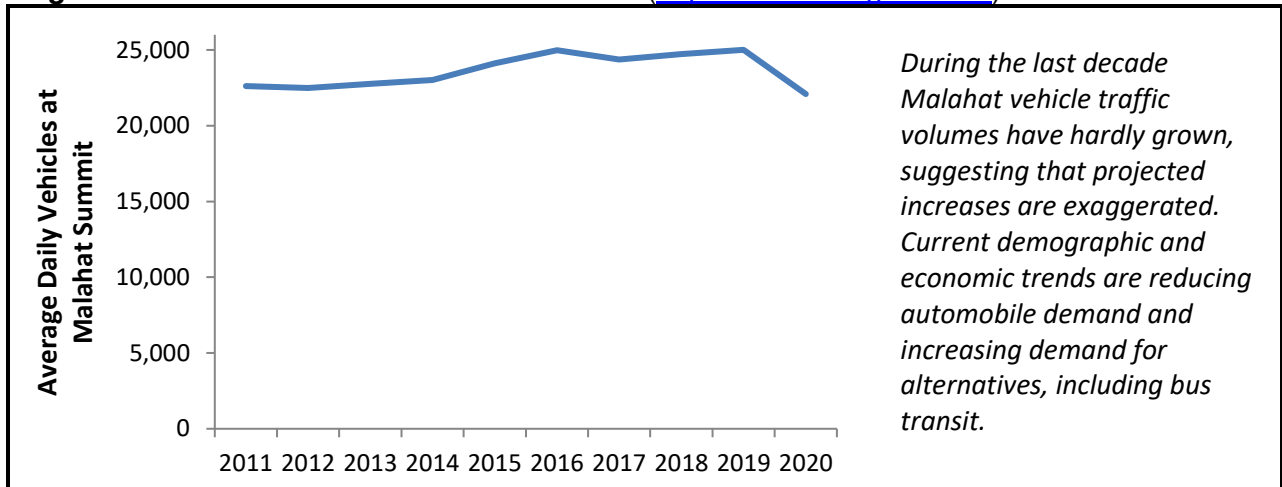
Analysis

The *South Island Transportation Strategy* (MoTH 2020) evaluates various Malahat improvement options, including new or expanded highways, new Saanich Inlet bridges, and rail services, but transit improvements between Victoria and the West Shore, plus mobility hubs and TDM incentives, and the *Vancouver Island Rail Initial Business Case* (ICF 2022), proposes a cheaper rail option, but provides no independent analysis so its estimates are unreliable. Neither consider a frequent and affordable bus service option. This analysis fills that gap.

As previously described, there is probably significant latent demand for frequent and affordable public transit service on the Malahat corridor by people who cannot drive, and by motorists who want less stressful and cheaper alternatives to driving on a narrow, congested highway. Experience on similar corridors, such as Sooke-to-Victoria and Fraser Valley-to-Vancouver, indicate that convenient and affordable interregional bus transit can attract 10-30% of trips, and more if integrated with strong TDM incentives, as in Seattle.

Currently, about 25,000 vehicles and 30,000 people travel over the Malahat each day, and these are projected to increase 24% by 2038 (MoTH 2020, Technical Report 2), although those predictions are probably exaggerated. Vehicle traffic has hardly grown during the last decade (Figure 5), and current trends – aging population, rising fuel prices, improved alternatives (such as telecommuting), and rising environmental and health concerns – are reducing automobile travel demand and increasing demand for alternatives.

Figure 5 Malahat Vehicle Traffic Trends (<https://tradas.th.gov.bc.ca>)



Of course, actual future traffic will depend on travel conditions. Traffic congestion tends to maintain equilibrium: traffic volumes increase until delays discourage some potential vehicle trips. If roadway capacity expands, total vehicle trips are likely to increase as some travellers take advantage of the added capacity. This is called *induced travel* (Handy and Boarnet 2014). Public transit improvements can increase passenger trips but reduce vehicle trips.

Transportation Demand Management (TDM) can significantly increase public transit ridership and reduce automobile travel. On major corridors frequent and affordable transit will typically serve 10-30% of trips, and more with TDM incentives (Sriraj, et al. 2017; TTI 214). For example, in 2017, 22% of peak-period trips on the similar Sooke-to-Victoria corridor were by transit bus (CRD 2017). There were 32 daily buses and fares were an affordable \$2.50 per trip, but the corridor lacked transit priority, commute trip reduction programs or financial incentives for commuters to use transit, so an even higher mode share is possible. To increase transit use local, regional and provincial governments could provide commute trip reduction programs for their employees and required them for large employers, as in Washington State (Peterson 2017; WDOT 2020; CRD 2018; Horgan 2017; MoTH 2020).

Figure 6 compares estimated Duncan-to-Victoria travel times for various modes. According to Google Maps, driving takes 54 minutes during uncongested periods and 74 minutes under congested conditions. According to the *South Island Transportation Strategy*, the proposed Northern Crossing (a new highway and floating bridge across the Saanich Inlet, costing \$2.7 billion) would reduce auto travel times by 8-16 minutes. With major track improvements, trains could travel between Duncan and Victoria in 65 minutes, with a cost over \$1.0 billion. The Island Corridor Foundation claims that these costs could be reduced (ICF 2022), but their analysis is

incomplete and unverified, and so should be treated with caution. Route 66 buses are scheduled to take 70 minutes during off-peak and 77 minutes during peak periods, which is often faster than driving due to the new Victoria-to-Langford bus lanes. Although public transit requires additional time to access stops and wait for buses and trains, under favorable conditions (pleasant walking and waiting conditions, comfortable vehicles, and amenities such as on-board wifi) passengers can rest or work while travelling, so their travel time unit costs (dollars per hour) are lower than driving on congested roads. As a result, many passengers will choose a bus or train trip even if it takes longer than driving.

Figure 6 Victoria to Duncan Travel Times (Google Maps, MoTH 2020c)

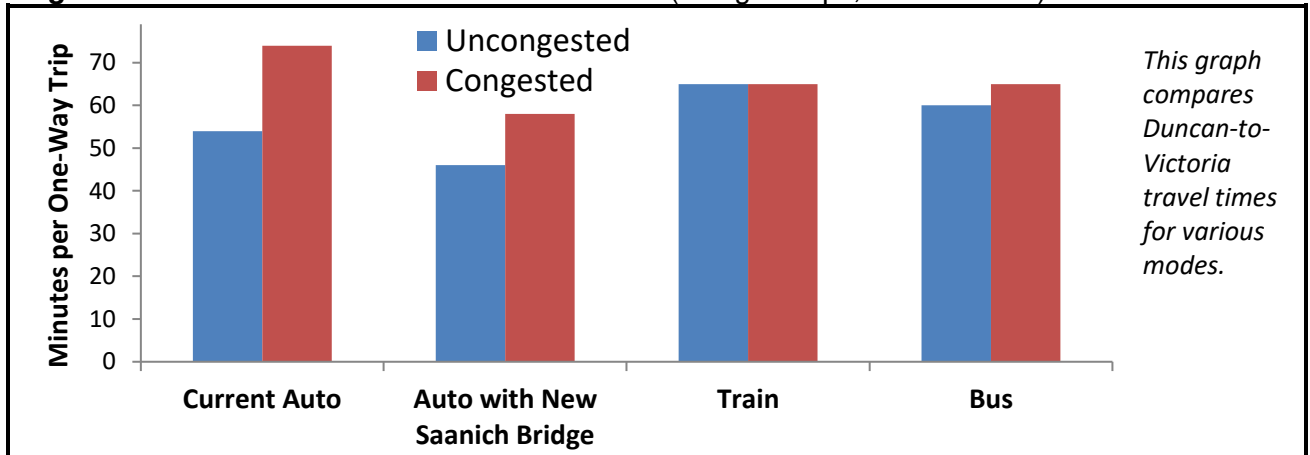


Table 2 estimates the costs of providing 43 daily bus trips between Duncan and Victoria, which is the current service frequency between Sooke and Victoria.

Table 2 Frequent and Affordable Duncan-to-Victoria Bus Service

Daily round-trips	43
Average hours per one-way trip (assuming 70-80 minute trips with 20-30 minute layover).	2
Annual bus-hours (86 x 365 x 2)	62,780
Cost per bus-hour (BC Transit 2020/2021 Service Plan, p. 13)	\$120
Total annual operating costs (62,780 x \$120)	\$7,533,600
Cost recovery rate (15%)	\$1,130,040
Annual subsidy required	\$6,403,560

Providing frequent and affordable bus service between Duncan and Victoria would require about \$6.4 million dollars in annual subsidy.

This analysis assumes that bus services will require about \$10 million infrastructure improvements, such as improved bus stops and stations. Table 3 summarizes and compares per-trip public infrastructure costs for this bus service with other Malahat improvement options described in the *South Island Transportation Strategy Technical Report*.

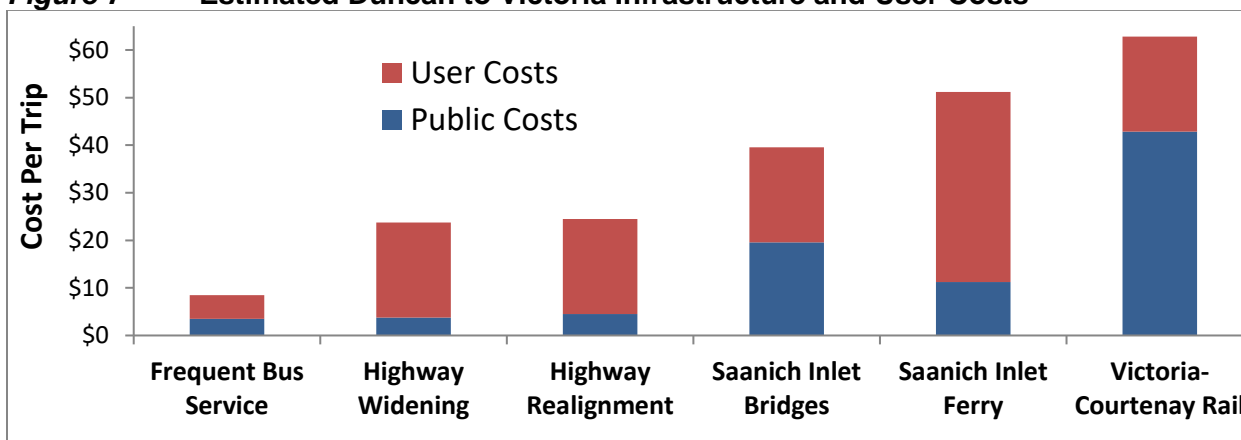
Table 3 Public Infrastructure Costs Compared (MoTH 2020c)¹

Malahat Improvement Option	Capital Cost (Millions)	Annual Pmt. (Million/Yr.)	Operation (Million/Yr.)	2038 Daily Users	Cost Per Trip
	A	B	C	D	E
<i>Transit and TDM</i>	\$10	\$0.5	\$6.4	2,500	\$10
Malahat Highway Widening	\$561	\$41	\$28	33,000	\$6
Malahat Highway Realignment	\$967	\$70	\$48	33,000	\$10
Saanich Inlet Ferry	\$122	\$8.9	\$6.10	960	\$43
North Saanich Inlet Bridge	\$2,250	\$163	\$113	10,000	\$76
South Saanich Inlet Bridge	\$2,740	\$199	\$137	11,000	\$84
Victoria to Courtenay Rail	\$1,007	\$73	\$50	1,610	\$210

This table calculates and compares costs per trip for various Malahat improvement options.

Travelling the 60 kilometers between Victoria and Duncan costs users about \$20 by either car (for fuel and depreciation) or rail (for fares), and car trips impose about \$5 per day parking costs at destinations, paid either by users, governments or businesses. Saanich Inlet Ferry fares are about \$20 per vehicle trip. Bus travel is significantly cheaper. Figure 7 compares Duncan to Victoria infrastructure costs plus user expenses. This indicates that frequent and affordable bus service with TDM incentives is by far the most cost-effective option overall.

Figure 7 Estimated Duncan to Victoria Infrastructure and User Costs



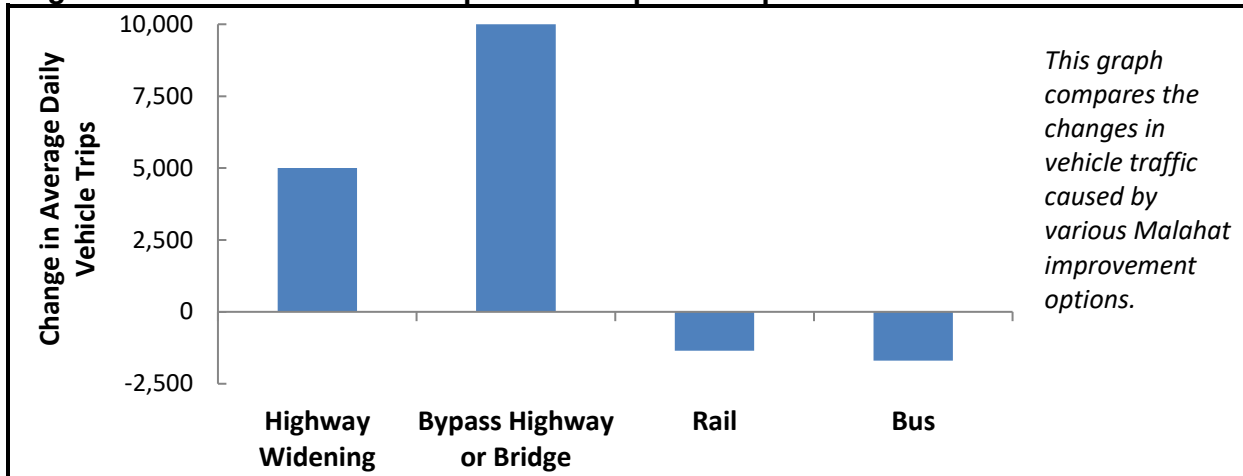
This figure compares infrastructure and user costs of a one-way trip assuming \$5 bus fares, \$20 Victoria-Duncan vehicle expenses, \$5 daily parking costs, \$20 Saanich Inlet ferry fare, and \$20 Victoria-Duncan rail fares.

Frequent and affordable bus service provides additional benefits. Compared with congested highway driving, transit travel is less stressful and allows passengers to rest or work. Frequent and affordable transit provides independent mobility for non-drivers, which helps achieve social equity goals: it ensures that non-drivers can access economic and social opportunities, and receive their fair share of provincial transportation spending.

¹ Column A and D are based on MoTH 2020c. Column B estimates annual depreciation, using the BC standard of 6% interest over 25 years (MoTI 2014). Column C assumes annual maintenance and operating expenses average 4% of capital costs. Column E sums column B and C, and divides that by column D times 365.

How would these options affect *total* vehicle traffic? Roadway expansions tend to induce additional vehicle travel. Adding a lane on a congested highway typically induces 4,000-8,000 daily vehicle trips (CALTRANS 2020; Litman 2001). In contrast, high quality transit reduces vehicle travel. Figure 8 compares these impacts. It assumes that highway widening adds one lane that induces 5,000 daily vehicle trips; a highway bypass or Saanich Inlet bridge adds two lanes that induce 10,000 daily vehicle trips; rail service attract 2,030 passengers, of which two thirds (1,352) would substitute for an auto trip; and frequent and affordable bus service would carry 2,500 daily passengers of which two-thirds would substitute for an auto trip.

Figure 8 Malahat Traffic Impacts of Proposed Improvements



In 2017 the CRD had 1.1 million daily trips, of which approximately 620,000 is by automobile (CRD 2017). Total travel is expected to increase 24% during the next 18 years, resulting in approximately 750,000 daily vehicle trips in 2038. By inducing 10,000 additional vehicle trips a bypass highway or new bridge would increase total regional vehicle traffic 1.3%; in contrast, frequent and affordable public transit would reduce vehicle trips by 0.7%, with particularly large reductions in major activity centers such as downtown. If a quarter of the 10,000 additional vehicle trips induced by a highway bypass or bridge travel to downtown, this would increase downtown traffic volumes by 20%.

How much could frequent and affordable bus service with TDM reduce **congestion**? Travellers who shift from driving to transit experience less congestion, and high quality transit reduces the intensity of congestion on parallel roadways (Aftabuzzaman, Currie and Sarvi 2011). Congestion does not disappear but is less severe than would otherwise occur. Shifting 10-30% of Malahat travel from automobiles to buses could significantly reduce congestion on that highway, and reduce congestion on urban streets. Expanding the Malahat Highway may reduce congestion on that length of roadway, but will increase downstream congestion.



How much could bus improvements and TDM incentives reduce *crashes*? Shifts from automobile to transit tend to provide proportionately larger crash reductions, so each 1% vehicle travel reduction reduces crashes more than 1% (Litman 2019; Small 2018; Stimpson, et al. 2014). Two factors contribute to this effect. First, higher risk drivers are particularly likely to shift mode. For example; a senior who finds high-speed highway driving difficult, a lower-income motorist with an old unreliable car, and a celebrant returning from drinking, is particularly likely to shift from driving to public transit. Second, since about 70% of casualty crashes involve multiple vehicles, vehicle travel reductions reduce risks to both the motorists who drive less *and* to other road users. According to one study, a 10% reduction in vehicle mileage reduces total crashes by 14% or more (Edlin and Karaca-Mandic 2006).

This suggests that, if public transit reduces Malahat traffic by 20%, crashes *on the entire corridor* should decline by more than 20%. This provides much larger total crash reductions than safety strategies that only apply on the Malahat (Figure 9). For example, point-to-point speed cameras might reduce Malahat crashes 10-20% (assuming speed-related crashes decline by half, which represent 25-30% of all casualty crashes). Similarly, grade-separation might reduce Malahat Highway crashes by 30-50%, but by inducing additional vehicle traffic is likely to increase downstream crash risk, including risks to pedestrians and bicyclists.

What about **rail transit**? Rail is considered more comfortable and prestigious than bus travel, so some people argue it would attract more passengers, but bus transit has other advantages:

- Proposed bus service is far more frequent than rail, providing 43 daily departures in each direction, compared with one to two daily train departures proposed in the *South Island Transportation Strategy*, and two to four daily departures proposed by the Island Corridor Foundation (ICF 2022).
- Buses would be faster than rail for most trips. Buses can operate at 80-100 kilometers per hour (kph) on the Malahat, and bus lanes allow buses to avoid congestion between Victoria and the West Shore. Trains would operate at 38-55 kph between Victoria and Shawnigan Lake, and 50-90 kph from Shawnigan Lake to Courtenay (WSP 2020, p. 49).
- Buses can serve more destinations and routes, for example, providing direct service from downtown Victoria, UVic and Langford to Shawnigan Lake, Duncan and Nanaimo. A train would stop at four stations north of the Malahat, and five south, and terminate in Vic-West, requiring passengers to transfer to buses to most destinations (MoTH 2020c, pp. 23, 28).
- Bus fares are much cheaper than rail. Interregional bus fares would be no more than \$5 between Victoria and Nanaimo, compared with \$20-30 one-way fares proposed for rail.

As a result, frequent and affordable bus service is likely to be more efficient for most trips and attract more total passengers than rail (Walker 2011). Based on experience in other similar travel corridors, it should attract far more daily commuters than rail, which tends to attract more tourists. Of course, it is possible to develop both transit modes: rail may be justified to carry large peak period volumes and tourist travel, but frequent and affordable bus service is still needed for off-peak and reverse commute services.

Roadway expansions displace greenspace directly, and indirectly by encouraging vehicle travel and sprawl. For example, proposed Malahat Highway expansions would disrupt parts of Goldstream Park, and allow more Victoria-area workers to live in the Cowichan Valley, stimulating more low-density development. As a result, these projects face significant community opposition (Leyne 2019). Rail improvements displace less greenspace, and buses use existing roadways which requires no additional pavement. High quality transit reduces total vehicle trips, and therefore road and parking pavement area, and encourages more compact development, which protects greenspace.

Major highway and rail projects generally require years for planning, approval and construction, and are inflexible. Frequent and affordable bus service can be operating in a few months, and can easily change to accommodate changing needs and conditions.

Table 4 evaluates four Malahat improvement options according to ten impacts. Although all options can reduce Malahat Highway traffic congestion, public transit improvements with TDM provide a wider range of benefits.

Table 4 Comparing Malahat Improvement Options

Impacts	Widen Highway	New Highway	Rail Service	Bus and TDM
Infrastructure costs	High	Very High	High	Low
User savings	No significant savings. Requires automobile travel.		No savings due to high fares.	Large savings due to low fares
User stress and productivity	No change. Requires driving.		Passengers can rest or work.	Passengers can rest or work.
Mobility for non-drivers	No benefit. Requires driving.		Moderate, due to limited service and high fares.	Large due to frequent service and low fares.
Traffic congestion	Reduced until new capacity fills with induced traffic. Increases downstream congestion.		Small reduction.	Small to moderate reduction.
Traffic safety	Depends on design: grade separation may reduce crashes. More downstream crashes.		Small crash reductions.	Moderate to large crash reductions
Pollution emissions	Increased due to induced vehicle travel.		Small reductions.	Moderate reductions
Parking costs	Large increase due to induced vehicle travel.		Small reduction	Moderate reductions
Greenspace	Moderate losses	Large losses	Small losses	No losses
Land development	Encourages sprawl		Encourages compact development.	
Project speed and flexibility	Projects take many years for planning, approval and construction, and once built are inflexible.			Fast and flexible.

This table summarizes various impacts. By providing an alternative to driving and reducing total vehicle travel, public transit improvements provide a wider range of benefits than highway expansions.

Comment: Regardless of rail plans, Vancouver Island needs frequent, affordable bus service
Public transit service north of the Malahat is terrible.

By Todd Litman, *Times Colonist*, 22 Feb. 2023

(<https://tinyurl.com/33xfe7r4>)

Vancouver Island badly needs convenient and affordable public transportation. This provides basic mobility for travellers who cannot, should not, or prefer not to drive, and high-quality transit helps to reduce traffic and parking congestion, crashes and pollution emissions.

Even people who don't use transit benefit when it reduces their chauffeuring burdens and traffic problems.

A few Island corridors have good transit services. New bus lanes save 13 to 20 minutes between the West Shore and Victoria, making buses faster than private -vehicles on that route. Between Sooke and Victoria there are 32 daily buses with \$2.50 one-way fares.

This frequent and affordable transit service carries 22 per cent of peak-period trips, reducing traffic congestion and emissions on that corridor. Sooke residents benefit from independence, cost savings and reduced stress.

However, north of the Malahat, transit service is terrible. Between Duncan and Victoria there are just four weekday buses and three Saturday buses, with \$10 one-way fares. Between Nanaimo and Victoria there are only three weekly buses with \$40 one-way fares.

As a result of this poor service and these high prices, transit serves an insignificant portion of travel on this corridor. This is unfair and inefficient. People who don't drive lack basic mobility, and a lack of efficient travel options increases congestion, crashes and -pollution.

Next month the federal government will decide whether to re-establish rail service on the E&N corridor. That would be nice, but I hope that everybody involved understands the high costs and limitations of that -service.

Contrary to what some optimists claim, rail service would not be convenient or affordable, and so is unlikely to attract significant ridership. We need more than rail can provide.

The Island Corridor Foundation claims that rebuilding E&N rail infrastructure would only cost \$431 million, but construction costs are rising and the service will require operating subsidies, so total costs are likely to be much higher.

That investment would only finance two to four daily passenger trains operating at 30 kilometres an hour. It will take at least 92 minutes to travel between Duncan and Vic West, where most passengers would transfer to another bus to reach their destinations. The current proposal assumes \$19 one-way fares, which is more expensive than driving for most trips.

As a result, rail would provide limited benefits. It may attract affluent tourists who have plenty of time and money but few local residents with busy schedules and limited budgets.

The proposed rail service would not be fast or frequent enough to serve most commuters, would not operate late enough to serve evening -travellers, and would be expensive.

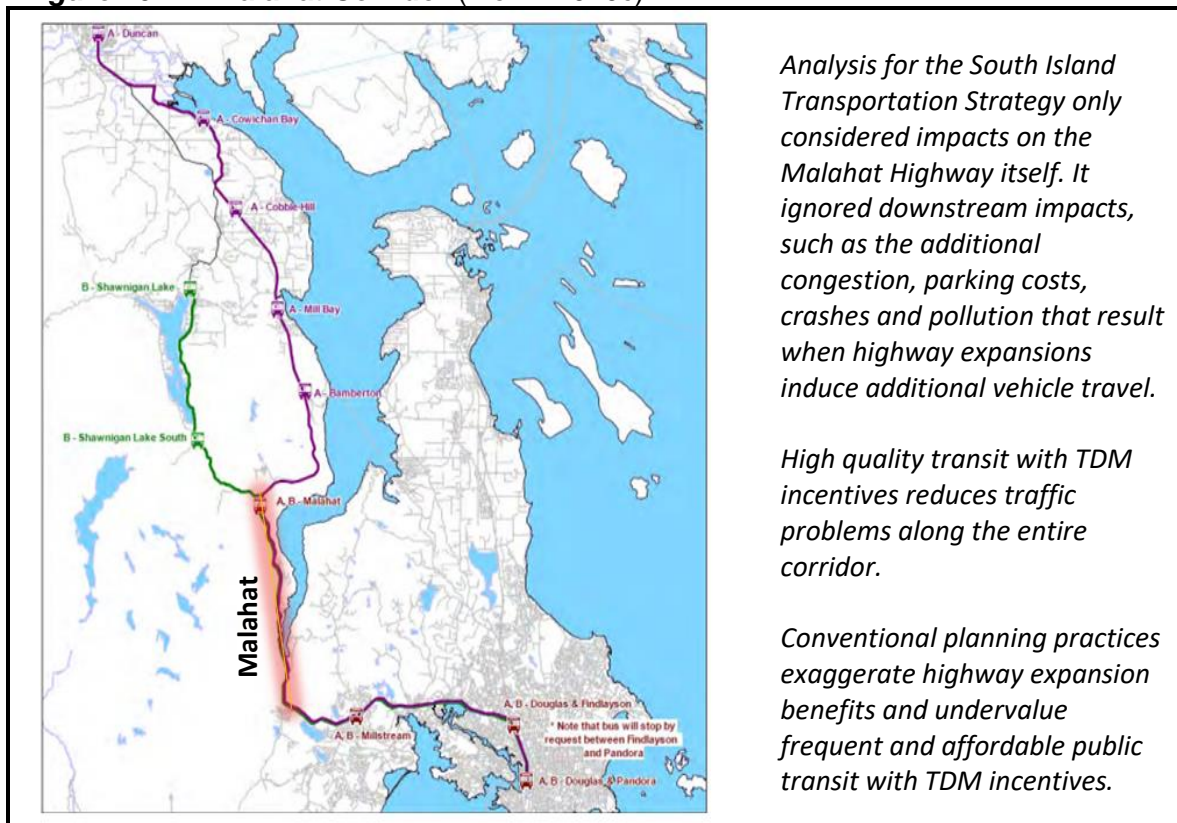
Even if rail service is re-established we will also need high quality bus service for off-peak, reverse commute, and evening travel. Coach buses with on-board washrooms, bucket seats and free wifi can provide comfortable service with direct connections to multiple destinations: downtown, Uptown and UVic.

Even if federal and provincial governments decide to rebuild the E&N rail line, it will be years before rail service begins operation. Frequent, affordable bus service could be established in months and start building transit ridership on this critical corridor.

Regardless of the federal government's decision on the E&N rail, we need frequent and affordable bus service between Nanaimo and Victoria. There is no reason to delay.

To be useful and maximize ridership public transit must be convenient, frequent and affordable, and supported with TDM incentives (Walker 2011). Conventional planning tends to overlook and undervalue many of these factors. For example, the *South Island Transportation Strategy's* evaluation framework (MoTH 2020c) considers travel speed but not service frequency. It identifies affordability and social equity as general goals but does not consider them when evaluating specific options. It recognizes the benefits of “redundancy” (i.e., additional routes) for motorists, but not the redundancy benefits of increasing non-auto travel options. The analysis only considers impacts on the Malahat Highway itself, ignoring downstream impacts, such as the additional traffic problems that result if Malahat Highway expansions induce additional vehicle travel, and the additional benefits that occur if public transit improvements with TDM incentives reduce total vehicle travel and therefore downstream traffic impacts.

Figure 10 Malahat Corridor (MoTH 2020c)



This analysis is challenging because some future costs are difficult to predict. The *South Island Transportation Strategy* compares the various options' estimated capital costs but ignores future maintenance and operating costs. This analysis assumes that these costs will average 4% of capital costs annually, which may be too high for highway expansions, but is probably low for new highways, major new bridges, and especially for new rail services that will require both track maintenance and operating subsidies.

Critique of the Island Corridor Foundation's *Vancouver Island Rail Initial Business Case*

In 2020 the BC Ministry of Transportation and Infrastructure (MoTI) published the *South Island Transportation Strategy* (MoTI 2020) which included detailed cost estimates for various Malahat improvement options. It estimated that reestablishing rail service between Victoria and Courtenay would require \$1,007 million in capital costs, plus ongoing infrastructure maintenance and operating expenses.

In 2022 the Island Corridor Foundation (ICF) published the *Vancouver Island Rail Initial Business Case* which estimated a much lower total capital costs of \$431 million to operate two daily trains between Courtney and Victoria, plus two daily trains between Victoria and Duncan (ICF 2022). It estimated that, with one-way fares of \$11 between Duncan and Victoria, and \$20 fares between Courtney and Victoria, it would attract 8-20% of travel over the Malahat. There are good reasons to be skeptical of these estimates. The ICF study:

- Ignores the impacts that infrequent service, with only two to four daily trains over the Malahat, and high proposed fares, two to four times higher than local transit fares, would have on ridership and automobile traffic reductions, particularly by commuters and other utilitarian travellers.
- Included just \$5 million contingency funding for project engineering and supervision, compared with \$111 million estimated by the MoTI. Rebuilding tracks, 40 bridges and numerous road crossings that have not been used or maintained for more than a decade is likely to present many engineering and construction problems that will require significant additional funding.
- Only includes \$3 million to rebuild twelve station platforms, and no funding for station amenities such as washrooms and vehicle parking. The MoTI study included \$81 million for stations.
- Estimates travel times to "Victoria," referring to the Vic West terminal. In fact, most trips will require an additional 10 to 30 minutes to reach common destinations such as downtown, Uptown and UVic. This will make rail significantly slower than automobile travel or buses with direct service routes.
- Includes no funds negotiating First Nations land rights. The MoTI study included \$42 million for this activity.
- Included no funding for a maintenance and storage facility, transit hub, or improved level crossing signals. The MoTI included \$241 million for these activities.
- Includes no funding for safe walking and bicycling paths along the corridors.
- Uses unrealistic emission reduction estimates. In fact, diesel trains would only reduce emissions if they have very high load factors, and most of the projected freight traffic would be between Port Alberni and Nanaimo, to be barged to Vancouver. There would be little reduction in truck traffic over the Malahat.
- Claims that rail would provide a practical alternative when the highway is closed, although rail service could accommodate less than 5% the 30,000 passengers who travel over the Malahat each day. Most travellers would taking the Mill Bay ferry, driving Highway 14 to Lake Cowichan, or waiting for the Malahat to reopen.

Conclusions

The Malahat Highway is a significant bottleneck on a major travel corridor. There are frequent calls for improvements to reduce driver stress, congestion delays and crashes. This report evaluates various options, including highway expansions, new rail services, plus frequent and affordable bus transit with TDM incentives.

Expanding the highway with more lanes, bypass routes or bridges would cost hundreds of millions of dollars, and by inducing more vehicle travel would exacerbate downstream congestion, parking costs, crashes and pollution problems. Reintroducing rail service is also costly and would provide limited service, just two to six daily trips and stop in Vic West, requiring transfers to most destinations. Major highway expansions and rail service would also incur many millions of dollars in additional annual maintenance and operating costs.

This analysis indicates that frequent and affordable bus service with TDM incentives is the most cost-effective and beneficial option. This service could start small and expand as demand increases. A basic program could provide 43 daily trips between Duncan and Victoria, as between Sooke and Victoria, with one-way fares less than \$5. As demand grows, service could expand to include more routes that connect to more destinations. Experience elsewhere indicates that this could attract 10-30% of corridor travel, and more during peak periods.

Proposed highway expansions would induce as many as 10,000 additional vehicle trips on the corridor, increasing regional traffic volumes 1.3%, and up to 20% in major commercial centers. Frequent and affordable bus service could reduce regional traffic 0.7%, with larger reductions in major centers. This service should be particularly attractive to higher-risk and higher-cost motorists, such as those who find high-speed highway driving stressful, are fatigued or impaired, or have unreliable or inefficient car. As a result, each 1% of automobile travel shifted to transit should reduce congestion, crashes, emissions, and user costs more than 1%.

Convenient and affordable transit service provides a wider range of benefits than other Malahat improvement options, including user savings and benefits, social equity goals, safety, and emission reductions, as summarized in Table 6. Highway expansions may reduce congestion and crashes on that stretch of roadway, but increase downstream traffic problems.

Table 6 Comparing Benefits

Planning Objectives	Roadway Expansion	Commuter Rail	Bus and TDM
Reduced stress and increased productivity		✓	✓
Independent mobility for non-drivers		✓	✓
Reduced congestion	✓	✓	✓
Infrastructure savings	×		✓
Parking cost savings	×	✓	✓
Consumer savings and affordability	×		✓
Traffic safety	✓/×	✓	✓
Energy savings and emission reductions	×	✓	✓
Physical fitness and health		✓	✓
Encourage more compact development	×	✓	✓

Roadway expansions provide few benefits (✓) and contradicts other objectives (×). At best they reduce congestion and crash rates on that roadway, but these benefit decline as induced traffic fills the added capacity and increases downstream traffic problems. Transit with TDM provides more diverse benefits.

Some people favor rail over bus transit because they consider it more comfortable, prestigious and reliable, but bus service would be more frequent, direct, affordable, and faster door-to-door for most trips. As a result, bus transit is likely to attract more passengers and provide more total benefits. Bus service improvements can be implemented more quickly than alternatives, and can respond quickly to changing needs. Rail and bus are not mutually exclusive: even with rail, many travellers will want frequent and affordable bus transit for reverse commuting, evening and weekend service.

The *South Island Transportation Strategy* overlooks many of these impacts. It considers capital but not future operating costs. It assumes that highway expansions would reduce congestion, crashes and pollution, ignoring induced travel effects. It considers the redundancy benefits of increased highway routes but not from increased modes. Similarly, the *Vancouver Island Rail Initial Business Case* makes optimistic and unjustified claims concerning the rail network reconstruction costs, travel speeds, and ridership levels. Highway expansions are inherently unfair and regressive; they provide minimal benefits to non-drivers and contradict the province's goals to encourage active travel, increase affordability, and reduce emissions. In contrast, frequent and low fare transit improves mobility for non-drivers, increases affordability and reduces traffic problems on local streets, including delay and risks that vehicle traffic imposes on pedestrians and bicyclists, which helps achieve community goals.

Current demographic and economic, including aging populations, changing consumer preferences, plus increasing health and environmental concerns are increasing demand for convenient and affordable public transit, and transit-oriented development on this corridor. In the past, provincial transportation planning ignored these demands; previous Malahat studies evaluated public transit based only on its ability to reduce motor vehicle congestion and crash risks on that link, ignoring other community goals. The recent *South Island Transportation Strategy* represents significant but incomplete progress towards the new paradigm. It considers some non-auto modes, but ignores frequent and affordable interregional bus services. It considers a wider variety of impacts than previous studies, but still ignores many costs of highway expansions and many benefits of frequent and affordable public transit.

This analysis is not anti-car. Motorists have every reason to support frequent and affordable public transit because it is generally the fastest and most cost effective way to reduce their congestion, crash risk, and chauffeuring burdens.

This is an important and timely issue. Many Vancouver Island residents and communities want better mobility options in order to help achieve various economic, social and environmental goals. The *South Island Transportation Strategy* identifies various Malahat corridor mobility improvements, but overlooks the best. This analysis indicates that frequent and affordable bus service is the most cost efficient and beneficial way to achieve our community goals.

A new organization, *Better Island Transit* (<https://betterislandtransit.ca>) is now working to advocate for multimodal solutions to Malahat traffic problems.

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