NZ TRANSPORT AGENCY
WAKA KOTAHI

Memo

Address

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From	David Mitchell
Date	21/10/2024
Subject	Tolling Proposal for Belfast to Pegasus (B2P)

This memo sets out a pathway for considering tolling options for the B2P project. Items covered include:

- Toll locations
- Revenue
- Diversion
- Objectives

This memo also provides economic responses to the options (BCR's), provided by the project team.

Toll locations

The project consists of two main sections. The first, south of Pineacres, is widening the existing two laned SH1 motorway into a four-lane median divided motorway. There are two local road alternatives to this section, with both alternative routes formed as two-lane local roads. Williams Street is an "urban connector" under the One Network Framework (ONF) with low traffic volumes through an urban residential environment with a local school. Revells Road is a "local road" under ONF and is around 6.5m wide with no shoulders providing local access to Māori Reserve 873 and Tuahiwi marae.

The second section is the new bypass of Woodend through to Pegasus. This will be formed to RoNS standards and be a four-lane median divided motorway with grade separated interchanges at Pineacres (Williams St) and Pegasus.

Scenarios considered include;

- A single gantry north of Pineacres
- A single gantry south of Pineacres
- Two gantries, one north and one south of Pineacres.

There are no other local accesses to the motorway along these sections, meaning that one gantry will register all vehicles on the particular piece of road being considered.

Revenue

A number of tests have been undertaken to calculate potential revenue over a 35-year duration. A no project and untolled project has also been analysed to allow consideration of the project objectives and local impacts.

During discussions on the future form of SH1 through Woodend, a strong indication was provided by the Waimakariri District Council that the speed limit would be lowered as part of an urban transformation project for the town centre. Without a speed reduction, modelling shows a higher diversion away from the bypass and through Woodend, therefore a 30 km/hr speed limit reduction in the town centre has been assumed in the key scenario tests carried out.

The scenarios proposed reflect the tolling guidance document and local knowledge input, as a starting point, and include[1];

- No project

[1] Rates for light vehicles only. Heavy vehicles assessed and 2 x light vehicle rate, toll analysis period 35 years. End to end traffic is only charged once for administration costs (ie, not at two gantries, if this applies).

- With project, no toll
- Tolling north of Pineacres, no change to Woodend speed (50km/hr), $1.25 toll
- Tolling north of Pineacres, 30km/h through Woodend, $1.25 toll
- Tolling south of Pineacres, 30km/h through Woodend, $1.25 toll
- Tolling south of Pineacres, 30km/h through Woodend, $2.50 toll
- Tolling south of Pineacres, 30km/h through Woodend, $4.50 toll
- Tolling north and south of Pineacres, 30km/h through Woodend, $1.25 toll each
- Tolling north and south of Pineacres, 30km/h through Woodend, $2.50 toll each

The revenue calculations are based on 6% discounting and 35 year toll period;

	Toll collection point		
Scenario	North of Pineacres	South of Pineacres	Both north and south of Pineacres
$1.25 toll, no Woodend speed reduction	$29,466,426	-	-
$1.25 toll, with Woodend speed reduction	$ 38,931,623	$ 54,271,353	$ 125,088,731
$2.50 toll, with Woodend speed reduction		$ 128,958,812	$ 156,705,317
$4.50 toll, with Woodend speed reduction		$ 173,141,541	

Diversion

The revenue figures provide one aspect to consider within a recommended toll strategy. This is because costs and transport outcomes are also affected by the toll rates. Higher toll rates result in more vehicles diverting off the toll road (compared with a no toll scenario), meaning that project objectives may not be met to their fullest possible extent, plus increased maintenance costs to local roads and lower crash savings. Additional costs may be incurred on the wider local network to manage the impacts of diversion if a lower diversion rate is desired (i.e. more speed control, banning turns, intersections changes such as altering priority).

The diversion rates and resultant traffic volume on the RoNS shown below summate light and heavy vehicles, and compare tolled volumes to untolled volumes (e.g. if untolled volumes on the bypass are 10,000vpd and tolled volumes are 7,500vpd, the diversion rate is 25%).

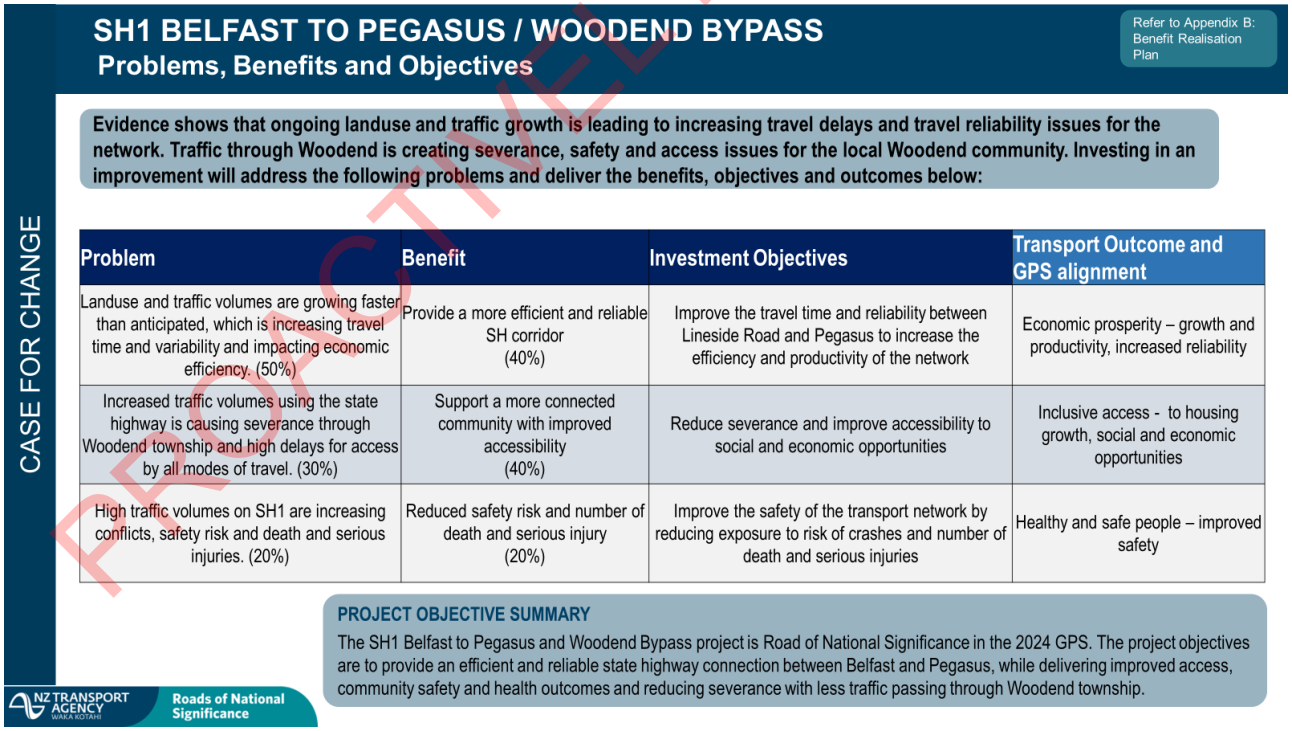
Scenario	Light vehicle toll rate		2028 Forecast Daily Traffic Flows (vpd total)				% Diversion from existing SH1
	North of Pineacres	South of Pineacres	B2P north of Pineacres	B2P South of Pineacres	Through Woodend	Revells Road	
No Toll		$-	17,000	27,300	7,500	1,000	-
Option 1	$1.25	$-	9,200	23,400	12,500	2,500	63%
Option 2 Single gantry		$1.25	12,600	14,600	8,500	8,100	26%

Option 3 Single gantry		$2.50	8,200	9,100	12,000	9,500	52%
Option 4	$1.25	$1.25	7,500	10,600	12,800	9,200	56%
Option 5 (Maximise revenue) Single gantry		$4.50	4,300	4,800	13,700	9,000	75%
Option 6	$2.50	$2.50	2,700	5,600	15,100	9,300	84%

This shows that the toll location and value has different impacts across the network. From an end-to-end perspective, a $1.25 toll results in a 20-40% diversion, a $2.50 toll results in a 50-60% diversion and a $4.50 toll results in a 70-80% diversion, all of which reduce the resultant volumes on the RoNS corridor and increase traffic and impacts on the local road network.

Objectives

The project objectives are shown in the table below.



These objectives are supported by key performance measures that can be used to consider the effect of tolls at different levels. In terms of economic performance, a no toll scenario has a benefit cost ratio (BCR) of around 1.0. The tolling scenarios divert traffic to varying degrees which then reduces the contribution to project objectives, the BCR and raises associated risk to the perceived success of the project. The additional capacity is key to providing for increased growth in the wider area, but Woodend has been specifically mentioned as an area where traffic flow reductions will reduce

severance, improve safety and access for all modes. This aligns with the One Network Framework (ONF) planning for the Woodend township that suggests traffic volumes of less that 12,000vpd would support the expected increase in local activity to social and economic opportunities, including more walking and cycling trips. The 2038 modelled volumes through Woodend are;

2038 volume through Woodend

Scenario	Woodend 2038 total volume, vpd
No project	24,974
With project, no toll	8,351
$1.25 toll north of Pineacres, no Woodend speed reduction	17,502
$1.25 toll north of Pineacres, with Woodend speed reduction	13,114
$1.25 toll south of Pineacres, with Woodend speed reduction	8,578
$2.50 toll south of Pineacres, with Woodend speed reduction	11,477
$4.50 toll south of Pineacres, with Woodend speed reduction	13,673
$1.25 toll north and south of Pineacres, with Woodend speed reduction	12,396
$2.50 toll north and south of Pineacres, with Woodend speed reduction	14,936

The conclusion is that a toll south of Pineacres results in generally lower volumes through Woodend. This is not unsurprising for two reasons; 1. Traffic diverts away from the toll road earlier onto local roads, so could enter Woodend via routes other than the main road and 2. Northbound through traffic in particular will have paid the toll at the southern end, so are more inclined to use the full length of the bypass. The other area affected by traffic diversion is the Ravenswood key activity centre. The northern end of traffic diversion must pass through the critical intersection at Bob Robertson/Garlick Street and would likely require a substantial upgrade from roundabout to traffic signals to manage the additional traffic flows.

Local Road Risks

As applying a toll has a demand response, this affects State Highways and local roads in different way. The new bypass will attract traffic away from Woodend and reduce volumes, but applying a toll at a specific location will encourage a proportion of people to divert around the area, potentially increasing traffic on local roads.

The impact to the project costs are reflected in revocation and mitigation costs. Revocation of the existing SH1 will revoke the highway designation and it will revert to a local road through Woodend. NZTA has a policy around revocation and the work needed to ensure that a revoked state highway is ‘fit for purpose’ in terms of the new function of the road.

Mitigation looks at effects beyond the new and existing state highways. There is no policy or legislative guidance around mitigation, and questions around whether NZTA or local authorities are best placed to manage and fund these changes. Given the project specific nature of the effects, it is recommended that early engagement with local authorities is undertaken once preliminary modelling results are available, to prepare a Network Response Plan. This will identify works that could be undertaken to reduce or manage local road increased traffic volumes and then tested via the project traffic models. This information would then support both NZTA and local authority funding applications for works, including timeframes and responsibilities.

Conclusions and Recommendation

Tolling introduces the need to consider financial, economic and objective outcomes and either balance these key areas or prefer one or more of them. GPS 2024 introduces a new expectation for NZTA to consider tolling to support the

construction and maintenance of all new roads, including the Roads of National Significance. Increased tolling on new roads will protect existing funding in the NLTF for maintaining existing roads.

It is clear that without tolling the B2P project, the project and community expectations will be met to the fullest extent possible, and the benefit cost ratio will be optimised as flows on the Motorway extension and Bypass are maximised. There will however be no revenue.

Tolling brings a revenue component to the funding discussion but does reduce the effectiveness of the project to respond to the economic and objectives outcomes This will reduce the economic benefits of the project.

Looking at the results, the following conclusions can be drawn;

- Having a toll point north of Pineacres produces a lower toll revenue, but also does not achieve the desired traffic reduction through Woodend . This results in a low revenue and low outcome in respect of objectives.
- With a toll point south of Pineacres, revenues are increased and at a $2.50 toll, diversion rates are in the 40-50% range but importantly creates diversion onto local roads not suitable for the traffic, especially Revells Road through the Maori Reserve at Tuahiwi. The impacts on the local Revells Road will likely raise strong Iwi and community objection.
- A toll north and south of Pineacres produces the highest revenue but does not meet the traffic reduction expectations in Woodend. A $1.25 toll at each gantry reduces diversion away from the southern end, while adding to the overall revenue with a single administration charge. The additional cost of gantry equipment will be offset by the increased revenue.

The table below shows the response in terms of the response to key areas for the likely preferred options.

Scenario	Light vehicle toll rate***		2028 Forecast Daily Traffic Flows (vpd total)				% Diversion from existing SH1*	35-year NPV Revenue (@ 6 discount rate)*
	North of Pineacres	South of Pineacres	B2P north of Pineacres	B2P South of Pineacres	Through Woodend	Revells Road		
No Toll		$-	17,000	27,300	7,500	1,000	-	$0m
Option 1	$1.25	$-	9,200	23,400	12,500	2,500	63%	$38.9m
Option 2 Single gantry		$1.25	12,600	14,600	8,500	8,100	26%	$54.3m
Option 3 Single gantry		$2.50	8,200	9,100	12,000	9,500	52%	$129m
Option 4 (Recommended)**	**$1.25**	**$1.25**	**7,500**	**10,600**	**12,800**	**9,200**	**56%**	**$125m**
Option 5 (Maximise revenue) Single gantry		$4.50	4,300	4,800	13,700	9,000	75%	$173m
Option 6**	$2.50	$2.50	2,700	5,600	15,100	9,300	84%	$156m

*-measured north of Pineacres

**-only one admin charge applies to through traffic

***-heavy vehicles charged at 2 x light vehicle rate

Preferred

Based in the above, the preferred option is a **two gantry system, with $1.25 toll applied to each**. This arrangement will generate good levels of revenue but also not disproportionately affect people accessing Woodend. There will be diversion onto local roads towards the southern end of the project – this occurs with any toll scenario that includes a toll point south of Pineacres.

Alternative

There are two alternatives that could be considered (in order);

- **Alternative 1 - $1.25 Toll north of Pineacres (Woodend Bypass)** – This scenario has the highest response to achieving objectives and maximising overall economic returns. The revenue is considerably lower than other options, but will be better received by iwi, Councils and the wider public.
- **Alternative 2 - $2.50 Toll south of Pineacres (north of Lineside)** – this maximises revenue, but also has the lowest response to project objectives and economics. This option will likely not be well received through the consultation period.