DEMONSTRATING THE VALUE OF SCHOOL TRAVEL PLANS

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ABSTRACT

School travel plans can be a very effective way to encourage active travel and improve road safety for school children. As part of the model community projects rolled out by the Let's Go team at New Plymouth District Council, school travel plans are being implemented across the district. The performance of the travel plans has been monitored through annual travel surveys.

This study considers the mode shift that has been realised to value the Let's Go school travel plans using cost benefit analysis. The methodology used to calculate a benefit cost ratio is based on simplified procedure 11 for walking and cycling facilities in the NZ Transport Agency's Economic Evaluation Manual. For interest, the mode shift results are also compared against the diversion assumptions that underlie simplified procedure 12, travel behaviour change, in the Economic Evaluation Manual.

Overall the current performance of the school travel plans to date and the expected performance over the next 6-8 years results in a benefit cost ratio of 7.5. The mode shift achieved has been higher to date than the mode shift assumed in simplified procedure 12. This paper provides an understanding of how successful school travel planning can be in a community where there is support for active travel modes relative to the averages contained in the economic evaluation guidance.

INTRODUCTION

In 2010 New Plymouth was named as one of two model communities for walking and cycling in New Zealand. "Model communities are urban environments where walking and cycling are offered to the community as the easiest transport choices. The intention is to deliver safer environments for novice users, with a range of community destinations within reasonable riding or walking distance from residential population centres" (NZ Transport Agency, 2013a). New Plymouth branded their model community project Let's Go. Let's Go encompasses both the hard and soft aspects of encouraging more people to walk and cycle (New Plymouth District Council, 2013).

School Travel Planning in New Plymouth

A key component of the New Plymouth District Council (NPDC) Let's Go project is a school travel planning programme, which was launched in 2011. The Let's Go team targeted schools in New Plymouth City first to start the travel planning process. The Let's Go travel plan initiative has produced very positive results with significant reductions in the number of students who are driven to the school gates. School travel planning in New Plymouth has a focus on encouraging people to travel by active modes (Walk, Cycle and Scoot/Skate). In many schools, 'park and walk' sites have been implemented to fit the needs of parents who are dropping their children off on the way to/from somewhere else. These sites are located approximately 1km from the relevant school and their purpose is to encourage parents to refrain from dropping/picking up their children at the school gate and encourage active travel for part of the journey to school.

Economic Evaluation of School Travel Plans

The NZ Transport Agency's Economic Evaluation Manual (EEM) (2013b) sets out economic evaluation procedures for evaluating a range of hard and soft transport activities. Simplified Procedure 11 (SP11) considers walking and cycling facilities and Simplified Procedure 12 (SP12) has been developed to appraise travel behaviour change activities such as work place travel plans and school travel plans.

SP12 includes in-built assumptions about how mode change is anticipated to change with school travel plans. **Table 1** shows the assumed mode shifts for the life of a school travel plan. It assumes that in all schools the number of children driven to school reduces by 9%. In Primary schools 17% of the 9% reduction is anticipated to be converted to children who cycle to school and 83% to people who walk.

Reduction in Target Population				**Mode Shared of the Mode Change**		
School Type	Car as Driver	Car as Passenger		Public Transport	Cycling	Walking
Primary	0.0%	-9.0%		0%	17%	83%
Secondary/ Intermediate	0.0%	-9.0%		55%	6%	39%

Table 1: SP12 Assumed Mode Shift with School Travel Plans (NZ Transport Agency, 2013b)

SP12 applies composite benefit values to the school role to determine the total value of benefits that can be expected at a school. As stated by NZ Transport Agency (2013b) the composite benefit values of mode change incorporate benefits such as reduced health costs, crash cost savings, vehicle operating cost savings and environmental benefits.

SP11 considers health benefits to new pedestrians and cyclists, road traffic reduction benefits due to mode change and safety, travel time and quality benefits to existing users. SP11 requires the number of existing and new users to be quantified as part of the analysis rather than using an in-built mode shift percentage or rate.

This study considers the average value of the Let's Go school travel plan initiative in primary/intermediate schools and conducts an economic efficiency analysis to determine the

benefit cost ratio of the travel planning across New Plymouth. The study also compares the realised mode change in New Plymouth to what is assumed by SP12.

METHODOLOGY

This evaluation looks back to understand the mode change that has been realised by a sample of 15 primary/intermediate schools included in the Let's Go school travel planning programme. An assumption of how travel modes may change going forward is then applied to the life of the activity. The analysis draws from SP11 to apply the benefits. Results are calculated over 10 years with a 6% discount rate, as required by the NZ Transport Agency (2013b) for travel demand management activities. Schools started the travel planning process at different times however the first year of travel planning for each school has been normalised to represent 'year 0'. This allows results for different schools to be combined in a way which represents the average value of a school travel plan across the 15 schools. The majority of schools considered have had a pre-travel plan survey and two post-travel plan surveys, however this varies by school. The inputs to the BCR calculation are detailed below.

Inputs and Assumptions for the BCR Analysis

The inputs to the analysis are shown **table 2**. The benefits considered in this analysis are health benefits and road traffic reduction benefits. No safety, quality or travel time benefits have been considered as the cost of infrastructure upgrades at sites of concern is not included in this analysis. It is anticipated that some safety benefits will have been realised for example through cycle and scooter skills training, however these are not considered in this analysis.

Input	Value	Source
Pre-travel plan student travel mode	Various	NPDC Pre-Travel Plan surveys
Post-travel plan student travel mode	Various	NPDC Post-Travel Plan surveys over time (each year at least)
Post-travel plan student travel mode (modal split after last travel survey)	Increase in active mode split reduces linearly to 50% if increase over three years.	Assumption.
Average Travel Distance by Mode.	Walk: Varies from 0.7-1.7km by school Cycle/Scoot/Skate: Varies from 0.7-2.1km by school Park and Walk: 1km	Based on GIS information from pre-travel plan surveys. Park and Walk distance approximation provided by NPDC.
Proportion of children accompanied by adults	15%	Assumption.
Vehicle Occupancy	1.25	Based on Survey Data provided by NPDC.
Trips per person per day	1.87	Based on Survey Data provided by NPDC. Pickup, drop off comparison.
Fine weather school days per year	135	Ministry of Education (2014) adjusted to include assumption that 30% of days may have poor weather conditions.
School role growth per annum	0%	Conservative assumption.
Health benefits of walking	$2.60 per km travelled	NZ Transport Agency (2013b) Table A20.3
Health benefits of cycling and scooting/skating	$1.30 per km travelled	NZ Transport Agency (2013b) Table A20.4
Road Traffic Reduction Benefits	$0.10 per km travelled	NZ Transport Agency (2013b) Table A20.3 NB. Not considered for students who use the park and walk facility.

Input	Value	Source
2013 update factor for walking and cycling benefits	1.12	NZ Transport Agency (2013b) Table A12.2
Project establishment costs	Varies by school from $9,000 to $18,000 distributed over the time that the school's travel plan has been in place. Total cost over 15 schools is $208,000 over three years.	Let's Go School Travel Plan Reports
Ongoing skills and travel planning costs	Dependent on school size: Less than 200 Students - $3,000 per annum 200-300 Students - $4,000 per annum Over 300 students - $5,000 per Annum	As advised NPDC

Table 2: Analysis Inputs

For 'park and walk' sites, health benefits have been assumed however no road traffic reduction benefits are considered. Bus travel has been excluded from the analysis as the number of students travelling by bus is not observed to be changing significantly over time.

This analysis assumes that 50% of the increase in active mode share, between year 0 and the most recent pre-travel plan survey, will die off over three years to a more stable 'long term state'. It is recognised that Let's Go will offer continued support to the analysed schools to ensure that the steep drop off in active mode use assumed in the calculations doesn't eventuate. The assumption that the uptake of active transport will decrease significantly is conservative and allows a 'minimum' BCR to be calculated. If the uptake of active transport is maintained or continues to increase in the analysed schools, the actual BCR will be significantly higher than reported in this analysis. The assumed reduction in active mode use has been applied after the last surveyed year for each school.

Summer survey data has been used in the analysis. A reduction for poor weather on 30% of school days is included in the analysis and is considered to account for the potential of lower active travel over the winter. Five of the fifteen schools have undertaken winter surveys to supplement their summer datasets. Active transport use recorded in the winter surveys is generally slightly lower than the summer surveys but significantly higher than recorded in the pre-travel plan surveys.

The health benefits of skating and scooting have conservatively been assumed to be equal to cycling. This assumption is based on the work of Genter et al (2008), which was conducted to inform the health benefit values included within NZ Transport Agency (2013b). This research shows that the value of scooting/skating lies between the values of walking and cycling in terms of health benefits but is closer to cycling.

Mode Change Comparison

The realised mode shift after three years of travel planning has been used to compare the New Plymouth results to SP12. The shift away from car passengers and the proportion of the mode shift that is taken up by each mode is considered.

RESULTS AND DISCUSSION

All active modes experienced an increase due to the Let's Go school travel plan initiative. As shown in **table 3** a large proportion of the overall mode change is attributed to the park and walk sites implemented near schools. While park and walk users don't reduce the number of vehicles on the road they do improve safety at the school gate and generate health benefits due to students and some parents walking for part of their trip. It is understood that the Let's Go team are now working to convert people from park and walk to fully active modes (New Plymouth District Council,

2014).

			Mode Share of Mode Change				
	Analysis	**Reduction in Car Passengers**	**PT**	**Cycle**	**Walk**	**Scoot/ Skate**	**Park and Walk**
A	SP12	9%	0%	17%	83%	n/a	n/a
B	New Plymouth -Year 2	43%	0%	3%	13%	16%	68%
C	New Plymouth -Year 2 (excluding Park and Walk)	14%	0%	9%	40%	49%	n/a
D	New Plymouth Assumed Long Term State	21%	0%	3%	13%	16%	68%

Table 3: SP12 Mode Change Comparison

The mode shift from car passenger that has been achieved in New Plymouth is higher than the value assumed in SP12 for both the overall change and the mode change when park and walk is excluded as shown in **table 3**.

The Let's Go project is implementing improvements to walking and cycling infrastructure contemporaneously with the school travel plans. While this infrastructure was generally not implemented specifically for the schools, it is expected that it will be used by students travelling to and from school. Therefore it is considered that some of the performance of the Let's Go School Travel Plans above the anticipated mode shift in SP12 could be attributed to the development of high quality infrastructure and the focus on walking and cycling within the community.

There are two modes considered in the New Plymouth Travel Plans that are not included in SP12: scooting/skating and park and walk. In recent years scooting/skating has become a popular mode of travel to school. As shown by **table 3**, scoot/skate is a more popular travel mode than either walking or cycling and may have also contributed to the highly successful performance of the New Plymouth travel plans relative to the averages in SP12. Because scooting/skating has become such a popular active school travel mode it may be advantageous to consider further how this change impacts the mode shifts included in SP12.

Initiatives such as park and walk sites are also not included in SP12. These are site specific and for this reason are probably not appropriate to include in a national average such as SP12. However when evaluating the anticipated benefits of school travel plans the impacts of new initiatives should be considered as part of the analysis. Comparison of rows A and C to rows B and D of Table 3 show that the park and walk initiative is a very significant component of the New Plymouth School Travel Plans.

The results of the benefit and cost analysis are shown in **table 4**. The overall BCR for the school travel planning is significantly greater than the NZ Transport Agency's (2014) Investment Assessment Framework highest benefit and cost appraisal rating of 5. This indicates that the Let's Go school travel planning initiative is providing a very significant return on investment. Overall the benefit value of the Let's Go school travel plan initiative equates to $947.97 per enrolled student over 10 years. The equivalent cost is $126.09 per enrolled student for establishment, skills training and travel planning.

	Value
Present Value of Benefits (10 years)	$ 3,889,043
Present Value of Costs (10 years)	$ 517,270
10 Year BCR	**7.5**

Table 4 Analysis Results

CONCLUSIONS

This study uses realised mode shift to value the New Plymouth Let's Go school travel plans using cost benefit analysis. The analysis shows that the Let's Go school travel plan initiative is performing exceptionally well with a 'minimum' benefit cost ratio of 7.5 over 10 years. Given that the analysis is based on recorded mode change this shows that the travel planning is also highly effective.

The mode change realised in New Plymouth has been compared to the mode change assumed in SP12 Travel Behaviour Change. This analysis shows that when school travel plans are implemented alongside different initiatives such as 'park and walk' sites within a community where the goal is that walking and cycling are offered as the easiest transport choice the mode shift can be significantly higher than what is assumed in SP12.

This study has highlighted that scooting/skating are popular transport modes for primary and intermediate age children. Scooting/skating is not explicitly considered in the SP12 procedures. Analysis of the mode shift realised in New Plymouth against the SP12 assumptions shows that the popularity of scooting/skating may be a factor in the large difference between what has been realised in New Plymouth and the averages included in SP12. Any future update to SP12 and the associated information within the Economic evaluation manual should therefore explicitly consider scooting/skating.

Overall this analysis shows that school travel plans can be very effective at encouraging mode shift and provide an excellent return on investment. They have the ability to significantly improve safety issues at the school gate as well as a positive impact on the health of the community. In communities where there is a strong motivation to encourage walking and cycling, the benefits of school travel plans using the SP12 methodology could be being under-estimated.

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