

Modelling Safe Walking and Cycling Routes for Adolescents in Dunedin, New Zealand

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Introduction

- Road safety is a major concern to encourage walking and cycling to/ from school among adolescents.
- The built environment features, school neighbourhood, and route to school characteristics influence adolescents' walking and cycling route choice to school.

- However, these characteristics could be optimised to create safe walking/cycling school routes for adolescents.

Examine objectively and subjectively assessed built environmental features of school neighbourhoods in order to model safe walking and cycling routes to secondary schools in Dunedin, New Zealand.

Why Dunedin is an interesting case!!

- Road safety is one of the major concerns in Dunedin for pedestrian and cyclists.
- Dunedin's pedestrian and cycling network are not friendly to pedestrian and cyclists. The condition of footpath (22.5%) is poor or very poor (Dunedin City Council, 2017).

- The rate of walking and using cycling is decreasing.

Travel modes	Financial year in 2015-2016	Financial year in 2016-2017	Trend
Drove truck, van or car (no passengers)	37%	41%	Increase
Privately owned vehicle	Not measured	Not measured	-
Company owned vehicle	Not measured	Not measured	-
Drove truck, van or car (with passengers)	11%	13%	Increase
Walk or jog	9%	8%	Decrease
Work from home	5%	4%	Decrease
Passenger in truck, van or car	3%	4%	Increase
Public Transport (Bus)	5%	4%	Decrease
Bicycle	4%	3%	Decrease
Motorcycle	0%	1%	Increase
Other	3%	2%	Decrease

Source: Dunedin City Council (2017)

Factors affecting walking and cycling route choice

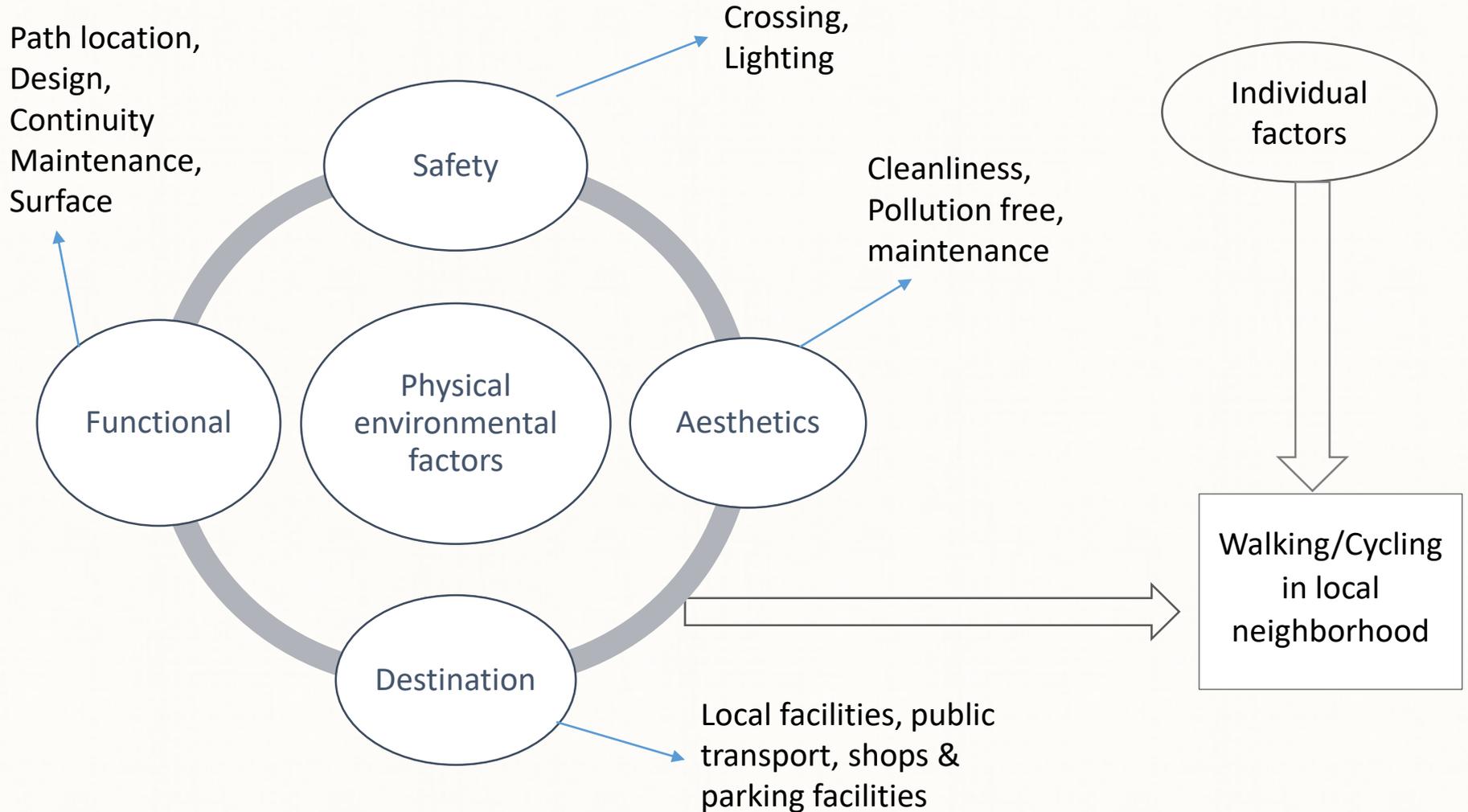


Figure 1. Physical environmental factors that may influence walking or cycling in local neighborhood

Source: Pikora et al. (2003)

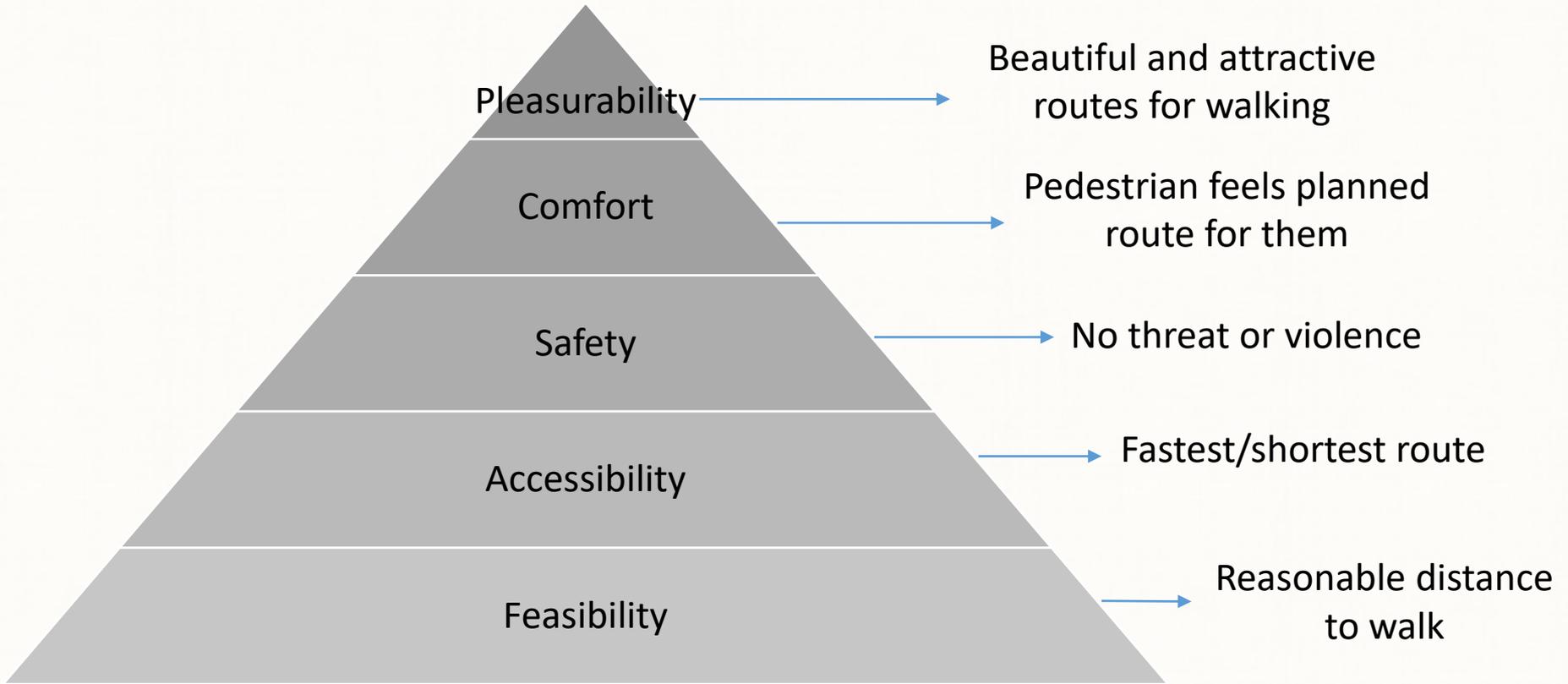


Figure 2. Hierarchy of walking needs.

Source: Alfonzo (2005); Lindelöw et al. (2014)

Table 1. Factors that may influence route choice for cyclists

Groups	Factors
Characteristics of the roads	Width / number of traffic lanes
	Type and condition of pavement
	Gradient (slope) of the road
	Existence of infrastructure for cyclists
	Type of parking along the road
Characteristics of the traffic	Traffic volume and speed – perception of safety
	Sharing the road with motor vehicles
	Functional classification of the road
Characteristics of the environment	Perception of security
	Adjacent land use
Characteristics of the trip	Length and duration
Characteristics of the route	Number of roundabouts and intersections
	Intersection signalization (stop signs and traffic lights)

Source: Segadilha and da Penha Sanches (2014)

What could be done???

1. Assessing adolescents' perceptions of the school neighborhood environment for walking and cycling;
2. Modelling safe walking and cycling routes for each of the 12 secondary schools in Dunedin; and
3. Incorporating feedback received from students, teachers, and the school principal of each school on the modelled safe walking and cycling routes to finalize school-specific route maps.

How to achieve??

- Survey data about adolescents' perceptions of their school neighborhoods;
- Geographic information science (GIS) calculated built environment variables;
- Environmental scan of school neighborhoods; and
- Adolescents' mapping of the school neighborhoods.

Contribution to the knowledge and literature

This research may contribute:

- to take decision making regarding transport infrastructure investment.
- the design of future interventions for promoting active transport to school along the recommended/safe walking/cycling routes to school.

**Thank you very much for kind
attention!!**