

## PEER REVIEW HISTORY

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### ARTICLE DETAILS

<b>TITLE (PROVISIONAL)</b>	BUILT ENVIRONMENT AND PHYSICAL ACTIVITY IN NEW ZEALAND ADOLESCENTS: A PROTOCOL FOR A CROSS SECTIONAL STUDY
<b>AUTHORS</b>	Hinckson, Erica; Duncan, Scott; Oliver, Melody; Mavoia, Suzanne; Cerin, Ester; badland, hannah; Stewart, Tom; Ivory, Vivienne; McPhee, Julia; Schofield, Grant

### VERSION 1 - REVIEW

<b>REVIEWER</b>	Allana LeBlanc Healthy Active Living and Obesity Research Group, Children's Hospital of Eastern Ontario Research Institute
<b>REVIEW RETURNED</b>	14-Jan-2014

<b>GENERAL COMMENTS</b>	This is a methods paper and does not present results. That being said, it is well written and interesting.
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<b>REVIEWER</b>	Jean-Michel Oppert University Pierre et Marie Curie-Paris6 Paris, France
<b>REVIEW RETURNED</b>	13-Feb-2014

<b>GENERAL COMMENTS</b>	<p>This is an interesting paper, describing the rationale and design of a study to be performed in adolescents in New Zealand. There are some issues about the survey that would deserve to be detailed a bit more.</p> <p>In this paper, Hinckson and colleagues describe the design of a cross sectional study, to be performed in New Zealand adolescents, to investigate the relationships between characteristics of the built environment and physical activity, sedentary behaviour, anthropometrics and some social variables. This is an important public health research topic where there is a paucity of data in this age range.</p> <p>An original feature of the planned study is the use of a web-based structured interview using a specific software (VERITAS), together with GPS measures, to better assess neighborhood boundaries as reported by participants and localize the place where activities will take place. Another interesting feature of the planned study is to include qualitative assessment of factors associated with behaviours of interest in a subsample.</p> <p>There are some issues of concern. One is about the use of the VERITAS software, very likely an innovative aspect of the study. The</p>
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	<p>applicability and feasibility of this method to an adolescent population is however not detailed. Also, from the protocol, it seems that there will no physical activity questionnaire used. It may be of interest though to know the proportion of active mobility vs. total physical activity, as well as other types of activity in youth, for which questionnaires remain an important assessment tool.</p> <p>Specific comments</p> <p>-Page 6, 2nd para: it is stated that “GIS will be used to calculate three built environmental measures”. The authors should be more specific about the GIS databases they plan to use, the scale of the data, what the “raw scores” they mention will be, and how this relates to other indices described in other studies.</p> <p>-Page 7, 1st para: here the authors mention the Maori subsample, but there is no mention earlier in the text about the ethnic differences to be studied</p> <p>-Page 13, last para; how will self-selection be taken in to account could be explained in more details</p>
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### VERSION 1 – AUTHOR RESPONSE

Reviewer: 1

Reviewer Name Allana LeBlanc

Institution and Country Healthy Active Living and Obesity Research Group, Children's Hospital of Eastern Ontario Research Institute

Please state any competing interests or state 'None declared': None declared

This is a methods paper and does not present results. That being said, it is well written and interesting.

Thank you for your time in reviewing this manuscript

Reviewer: 2

Reviewer Name Jean-Michel Oppert

Institution and Country University Pierre et Marie Curie-Paris6  
Paris, France

Please state any competing interests or state 'None declared': 'None declared'

This is an interesting paper, describing the rationale and design of a study to be performed in adolescents in New Zealand. There are some issues about the survey that would deserve to be detailed a bit more.

Thank you for your time in reviewing this manuscript

General comments

In this paper, Hinckson and colleagues describe the design of a cross sectional study, to be performed in New Zealand adolescents, to investigate the relationships between characteristics of the built environment and physical activity, sedentary behaviour, anthropometrics and some social variables. This is an important public health research topic where there is a paucity of data in this age range.

An original feature of the planned study is the use of a web-based structured interview using a specific software (VERITAS), together with GPS measures, to better assess neighborhood boundaries as reported by participants and localize the place where activities will take place. Another interesting feature of the planned study is to include qualitative assessment of factors associated with behaviours of interest in a subsample.

There are some issues of concern. One is about the use of the VERITAS software, very likely an innovative aspect of the study. The applicability and feasibility of this method to an adolescent population is however not detailed. Also, from the protocol, it seems that there will no physical activity questionnaire used. It may be of interest though to know the proportion of active mobility vs. total physical activity, as well as other types of activity in youth, for which questionnaires remain an important assessment tool.

Indeed, VERITAS is the innovative aspect of the study and has never been trialed within an adolescent sample before other than the work we have done recently. We have submitted a paper which demonstrates its feasibility in adolescents, but the paper is still under review "A novel assessment of adolescent mobility: A pilot study". We have included this reference in the main manuscript and added this sentence: "The applicability and feasibility of this method to an adolescent population is detailed elsewhere [72]".

The proportion of active mobility vs. total physical activity, as well as other types of activity in youth, will be derived from the study's survey that includes NEWS-Y questionnaire a main component of this study. We have added a paragraph that clearly articulates this.

"Self-reported physical activity, sedentary behaviour and commuting to school  
In addition to perceived neighbourhood walkability and psychosocial indicators, participants will be asked to report on commuting (to and from school, walking and biking, barriers to walking and cycling) [83-85], physical activity (at and outside of school, places for, barriers in the neighbourhood, decisions about, confidence about, enjoyment of, social support, workout equipment, activity rules, and athletic ability) [86-88], and sedentary behavior (during school and weekend days, things in the bedroom and personal electronics) [89]. The scales have shown to be reliable and valid in the adolescent population [83-85,89]."

#### Specific comments

-Page 6, 2nd para: it is stated that "GIS will be used to calculate three built environmental measures". The authors should be more specific about the GIS databases they plan to use, the scale of the data, what the "raw scores" they mention will be, and how this relates to other indices described in other studies.

We have amended the section to: "Street connectivity will be calculated by dividing the number of 3-or-more-way intersections by the area in square kilometres. To avoid edge effects associated with meshblocks delineated by street centrelines, street connectivity will be calculated for 20 m meshblock buffers. Intersections will be extracted from 2013 street network datasets provided by territorial authorities. Residential density will be calculated by dividing the number of dwellings by the residential land area. The number of dwellings will be obtained from the 2006 census data provided at the meshblock level. Residential land area will be derived from 2013 zoning datasets provided by territorial authorities. Land use mix will be calculated using the area of five land use categories (residential, commercial, industrial, open space, other) in an entropy equation [50]. Land uses will be determined using 2013 zoning datasets provided by territorial authorities. The raw scores for these three built environment measures will be normalised (converted to deciles) and summed to create a basic walkability index. This basic meshblock level walkability index will only be used in school and participant selection. The GIS-based built environment indices that will be created for each participant and used in analyses are described in a later section."

-Page 7, 1st para: here the authors mention the Maori subsample, but there is no mention earlier in the text about the ethnic differences to be studied

The following sentence has been introduced in the Design section of the manuscript: "Moreover, differences between non-Māori and Māori population groups will be explored."

-Page 13, last para; how will self-selection be taken in to account could be explained in more details

The following sentence was added under the section "Neighborhood, school and participant selection": "At the time of consent parents will be asked to rate the importance of a variety of reasons for choosing to live in their neighbourhood". In addition, on page 13 after, last paragraph we added the sentence: "As mentioned earlier, parents will be asked to rank the importance of a variety of reasons for choosing to reside in the particular neighbourhood. The reasons (that address self-selection) could be: easy access to services, walkable environment, and/or access to recreational and sporting facilities. This information will be used in the analysis."