

# By Cyclists, for Cyclists: Road Grade and Elevation Estimation from Crowd-sourced Fitness Application Data

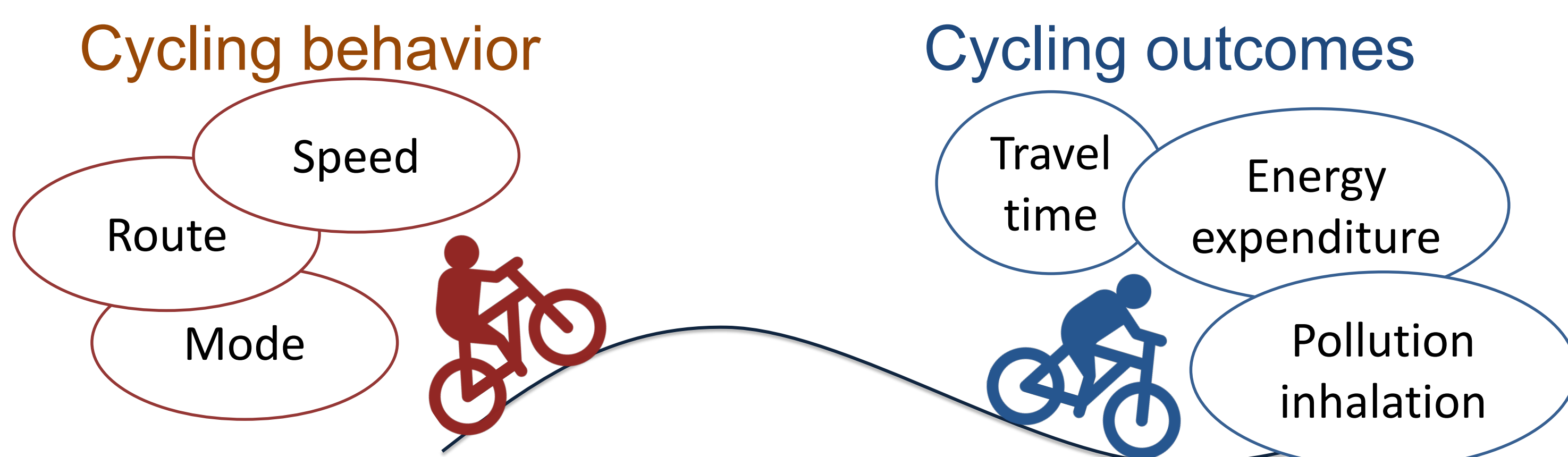
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reactlab.civil.ubc.ca

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## Introduction

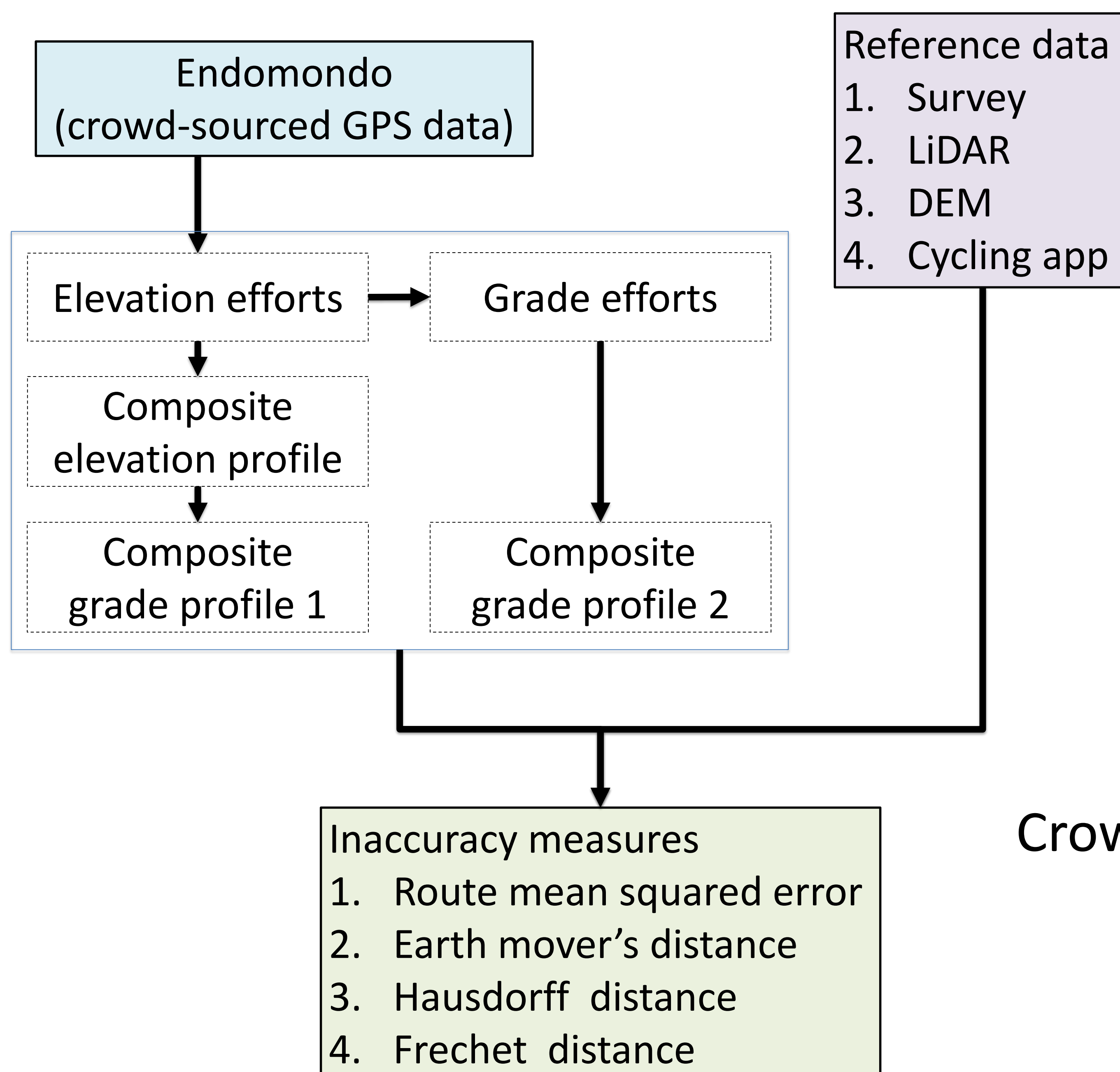
Road grade influences:



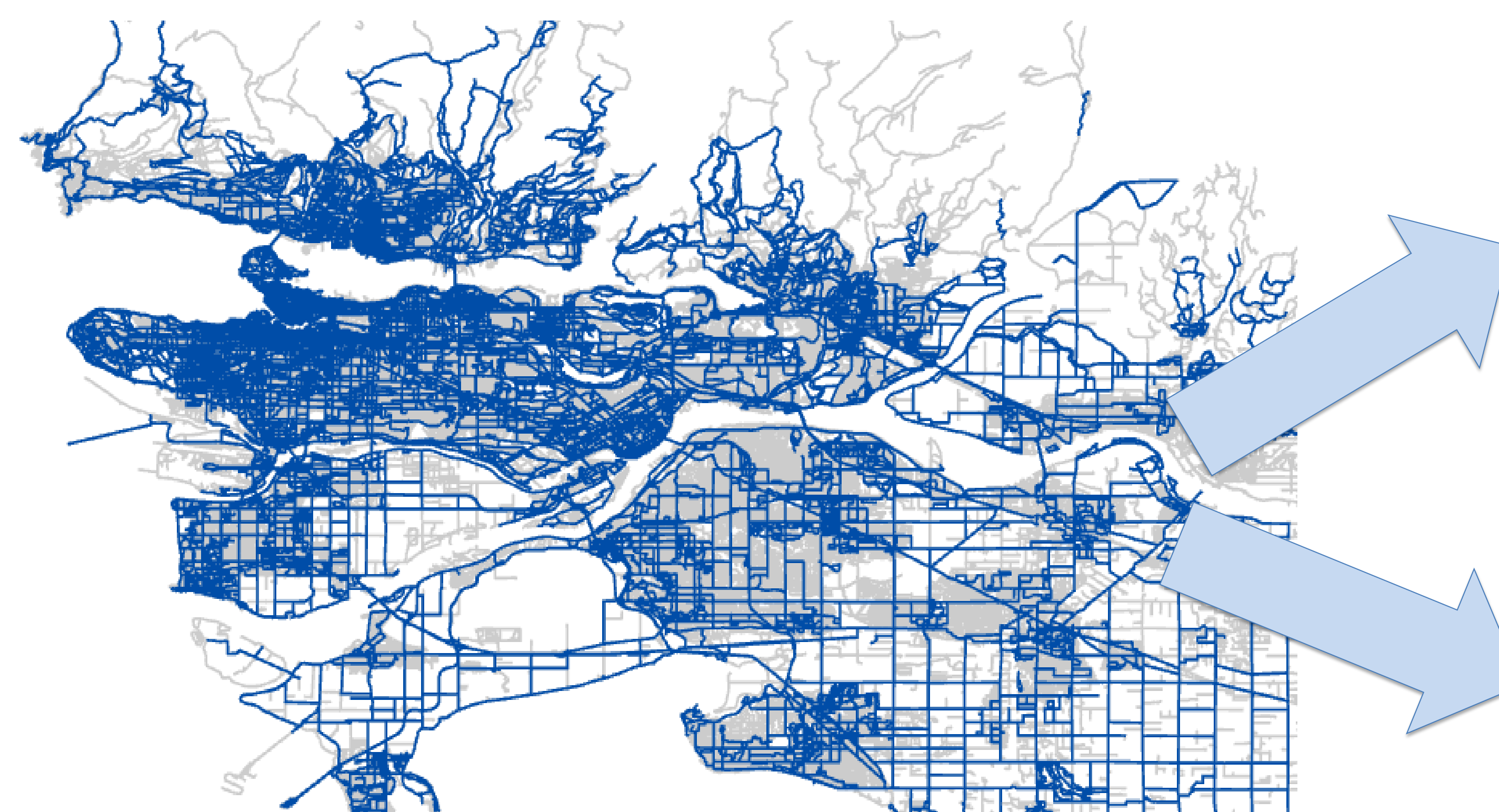
## Objectives

1. External validation of method to estimate elevation from crowd-sourced GPS data (McKenzie & Janowicz, 2017)
2. Develop method to estimate grade from crowd-sourced GPS data

## Method

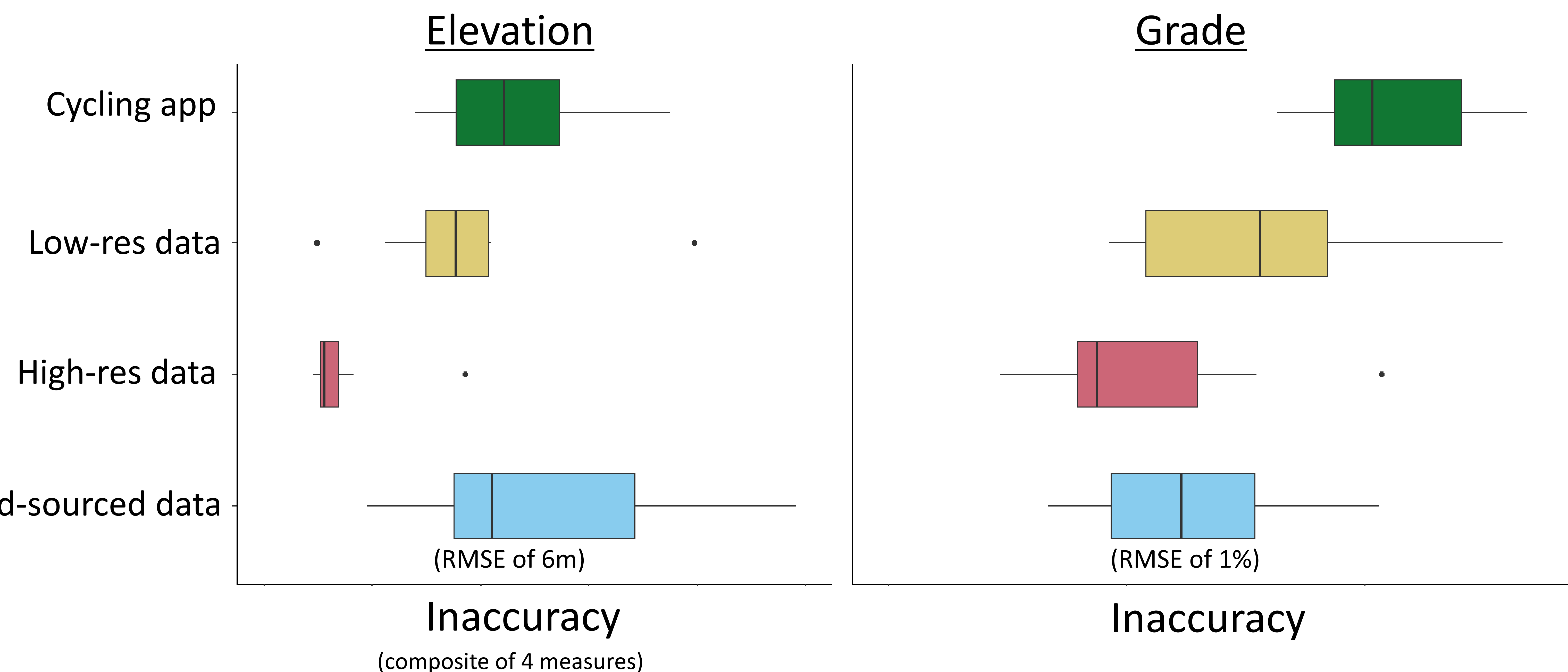


## Crowd-sourced GPS data



Best method direct from GPS data, not from elevation profile

## Findings



## Inferred elevation & grade

