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Innovative Traffic Data Sources for South Africa

Megan Bruwer: Civil Engineering

26 May 2023

Innovative Traffic Data Sources for South Africa

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Presentation Overview

- Transportation research at the Department of Civil Engineering
- Stellenbosch Smart Mobility Lab
- Floating car data
- Research: FCD applications in South Africa
  - FCD in the context of South Africa
  - Congestion measurement
  - Pothole detection

Transportation Engineering

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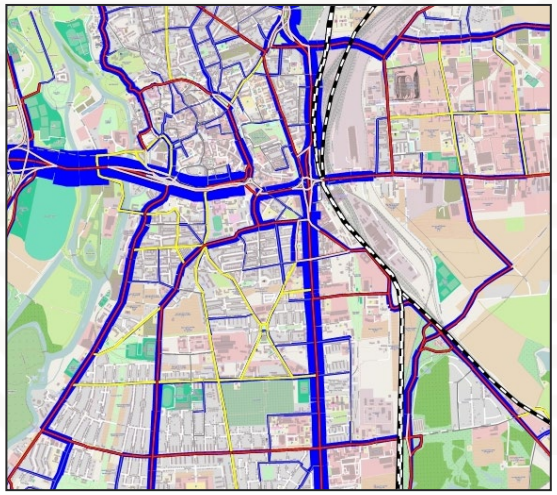
Research Environments

Road safety	Traffic engineering	Geometric design	Transportation planning
Intelligent Transport Systems (ITS)	Sustainable transport solutions	Transport in the developing country context	Public- and Para-transit



SSML
STELLENBOSCH SMART MOBILITY LAB

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Research unit for mobility studies, focus on ITS and sustainability

- **Established in 2014** in response to education and training needs of transport industry in South Africa
- Three components of the SSML programme:
  - Engineering education (undergrad and postgrad)
  - Research
  - Industry training
- Multidisciplinary approach
- Developing country context
- Industry link (research needs and partnerships)

SANRAL BUILDING SOUTH AFRICA THROUGH BETTER ROADS
STELLENBOSCH MUNICIPALITY
TOMTOM
ITS South Africa Smart Mobility
syntell
PTV GROUP
transport Department: Transport REPUBLIC OF SOUTH AFRICA

Research Model: Test-bed environment

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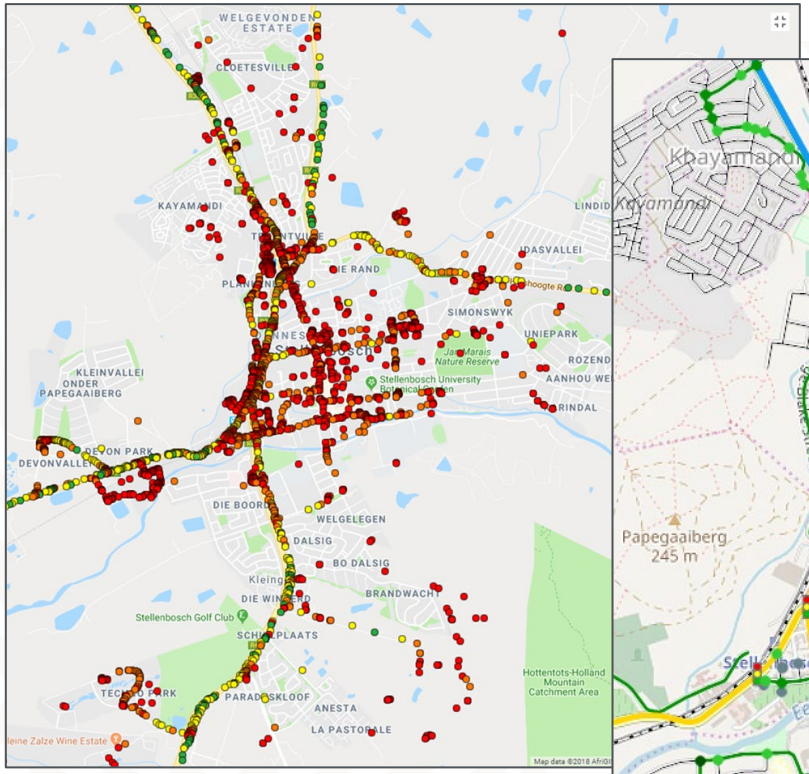
Real-world laboratory

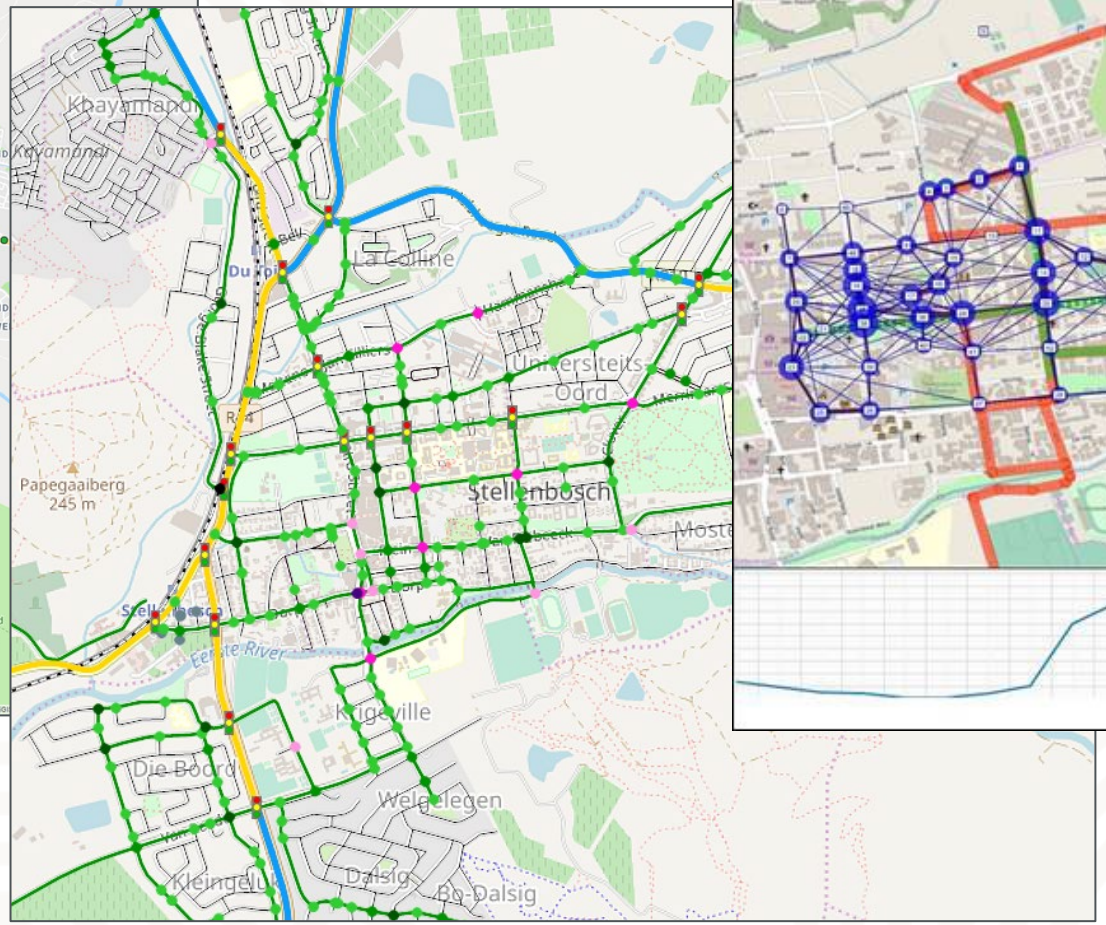
WHY Stellenbosch?

- Clear urban boundary and separation from other urban centres
- BIG traffic problems
- Student centre (research AND early-uptakers)
- Good interaction with local municipality
- Close to Cape Town

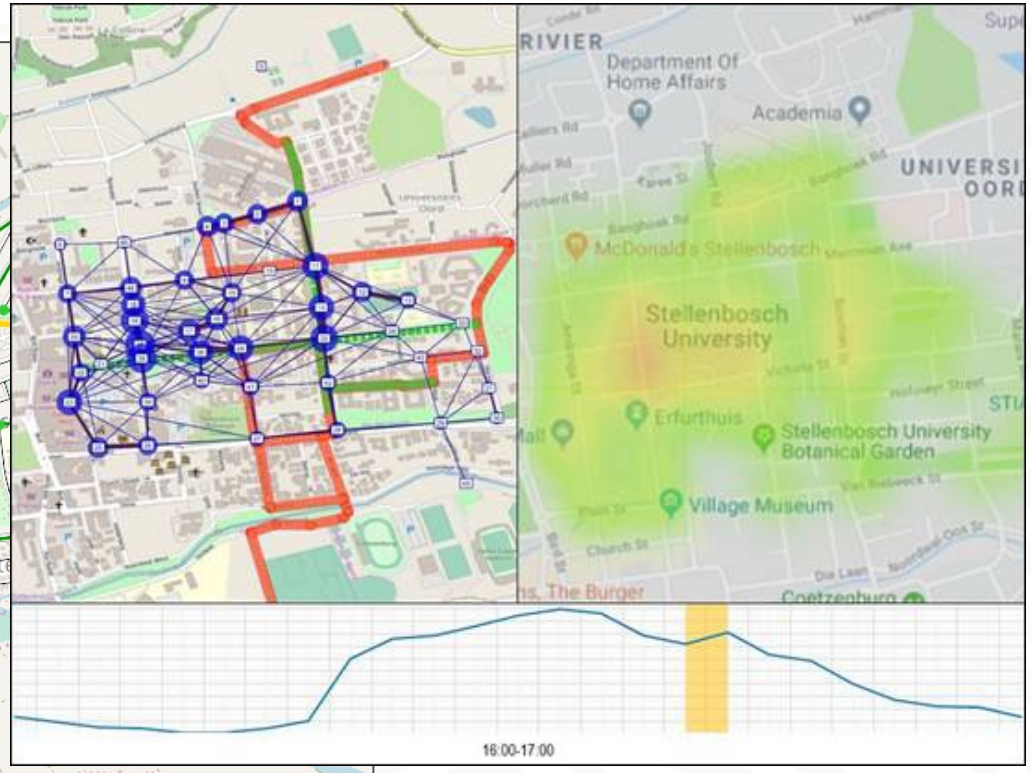
SSML traffic data sources



Local telematics companies



Collaborative traffic monitoring with Stellenbosch Municipality



Short-term technology-based data collection strategies

SSML traffic Data Sources

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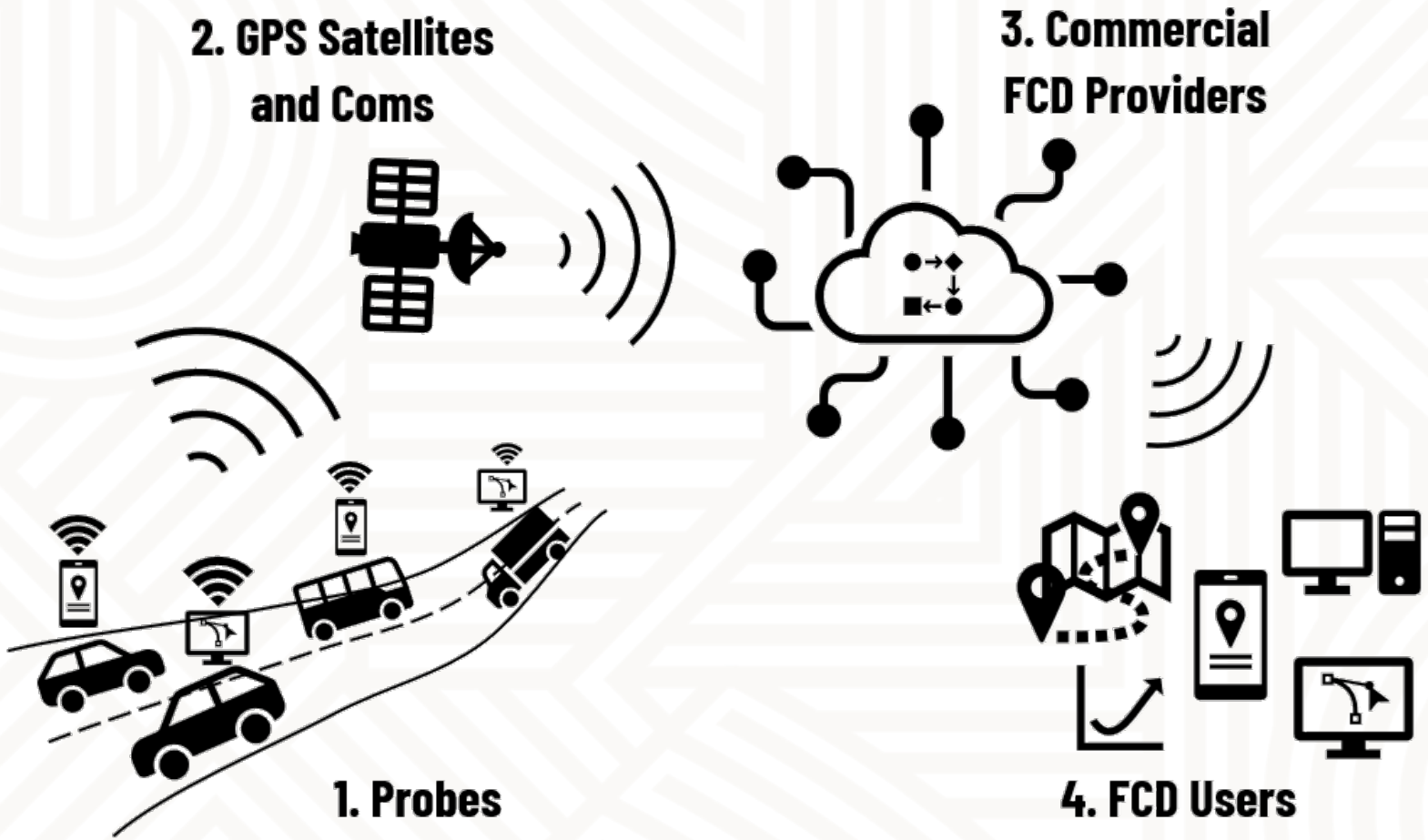
Commercial FCD



tomtom

ALTECH NETSTAR
Leaders in Vehicle Tracking & Recovery

Research: FCD applications in South Africa

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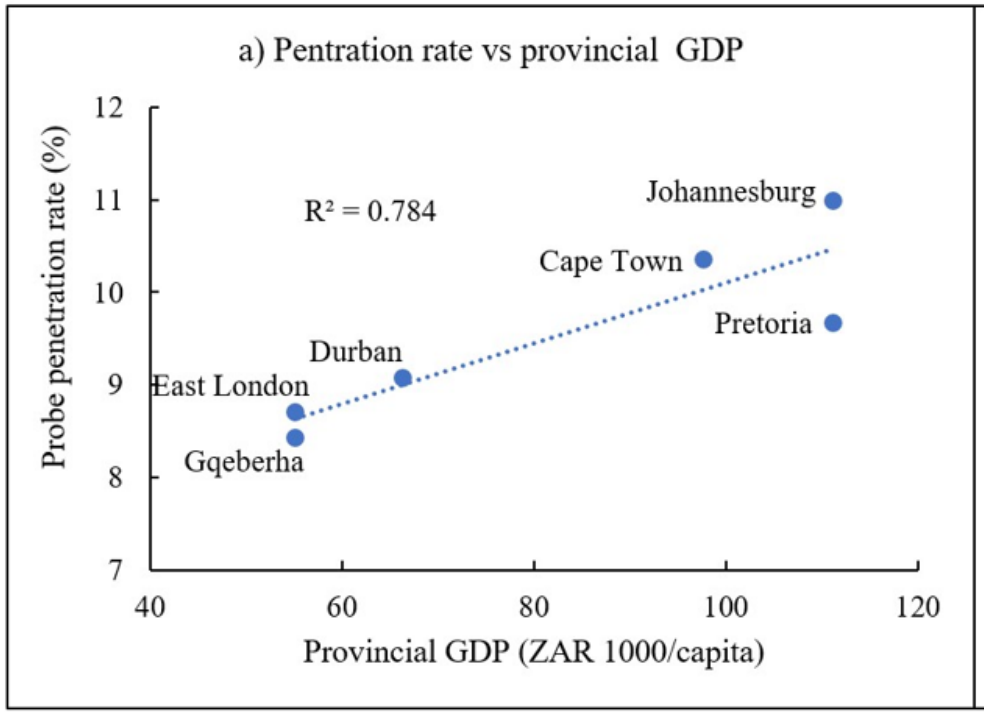
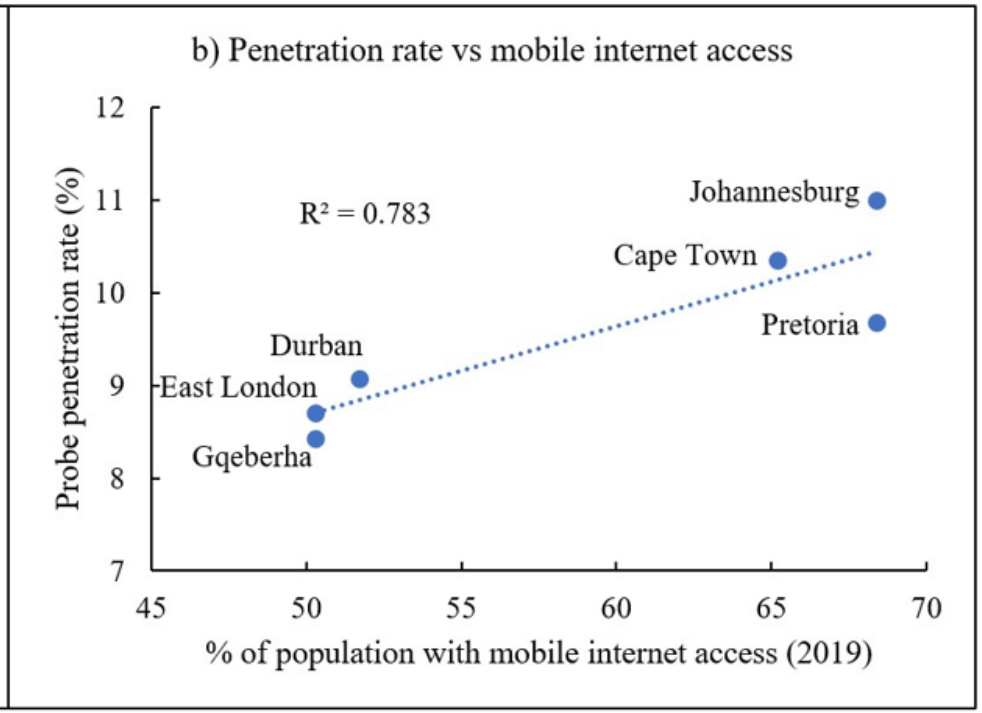
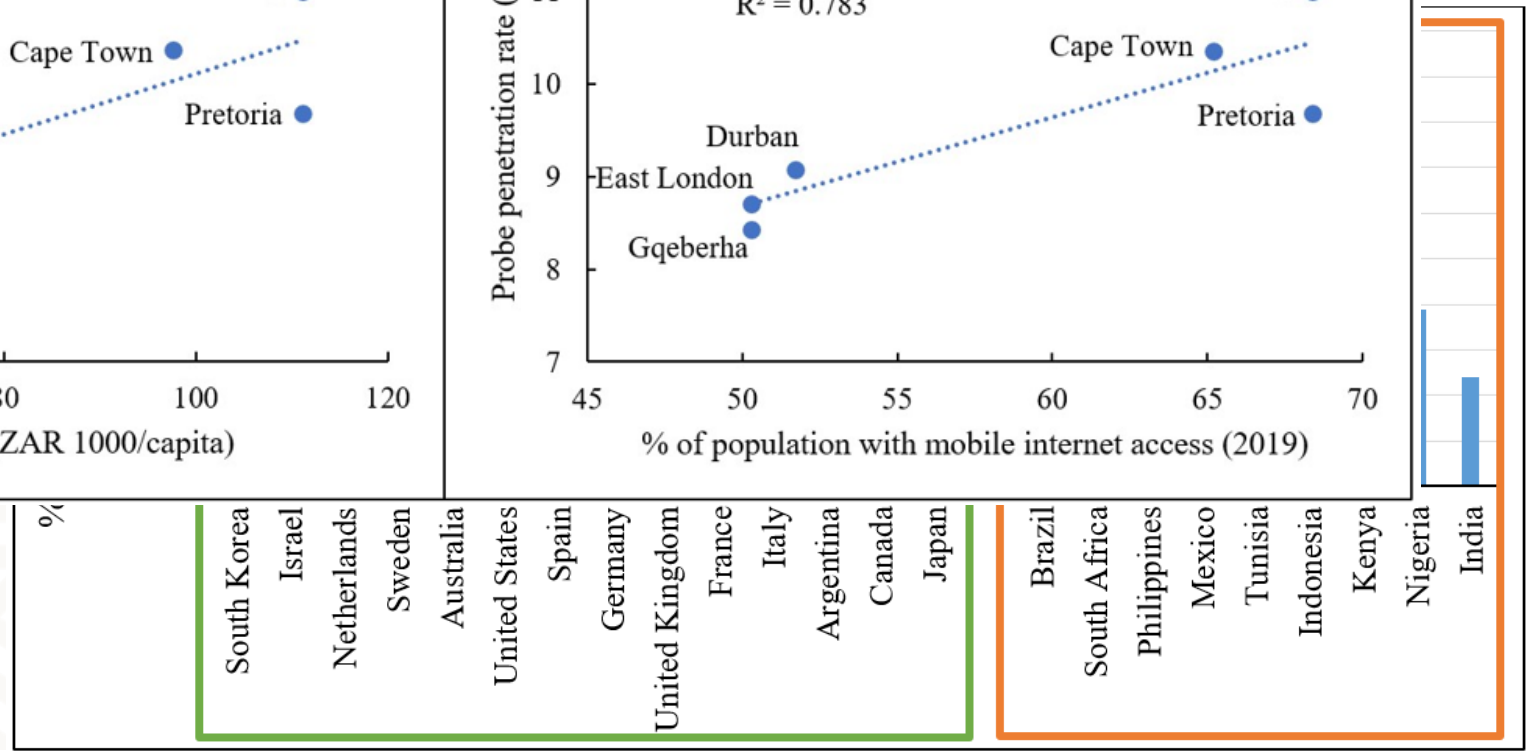
FCD in the context of South Africa







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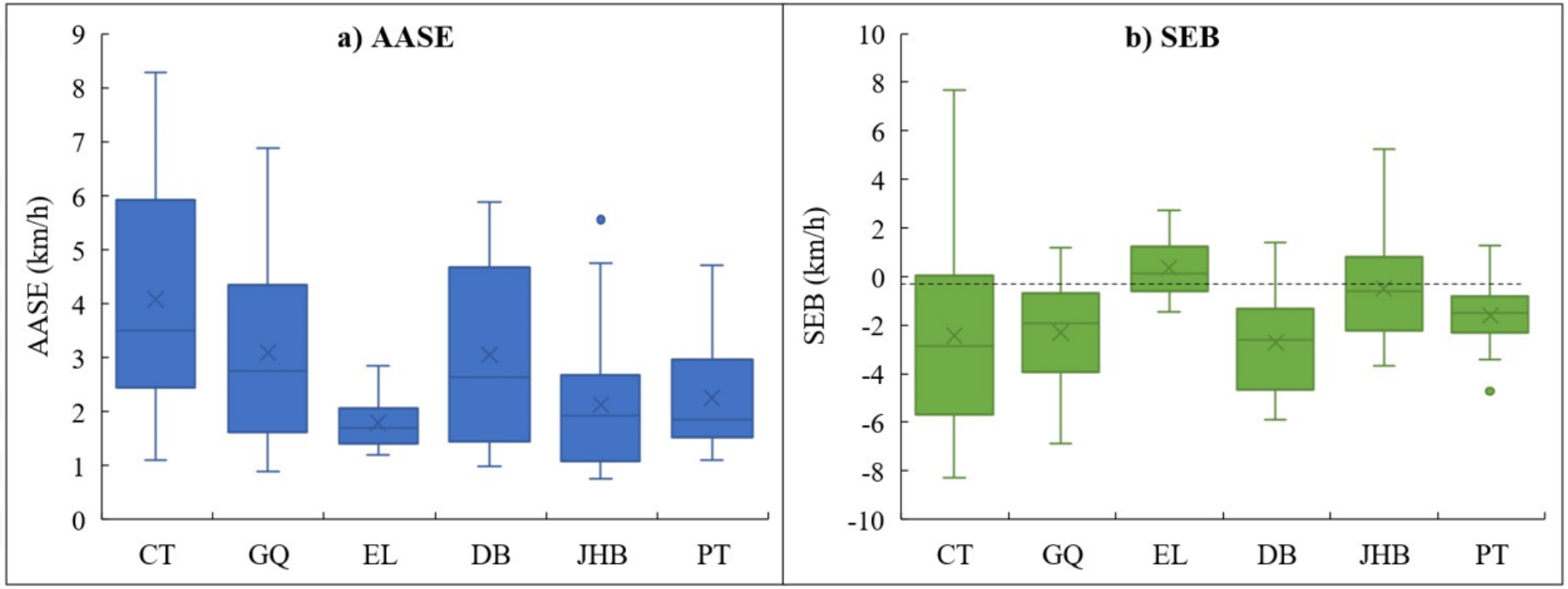

Research: FCD applications in South Africa

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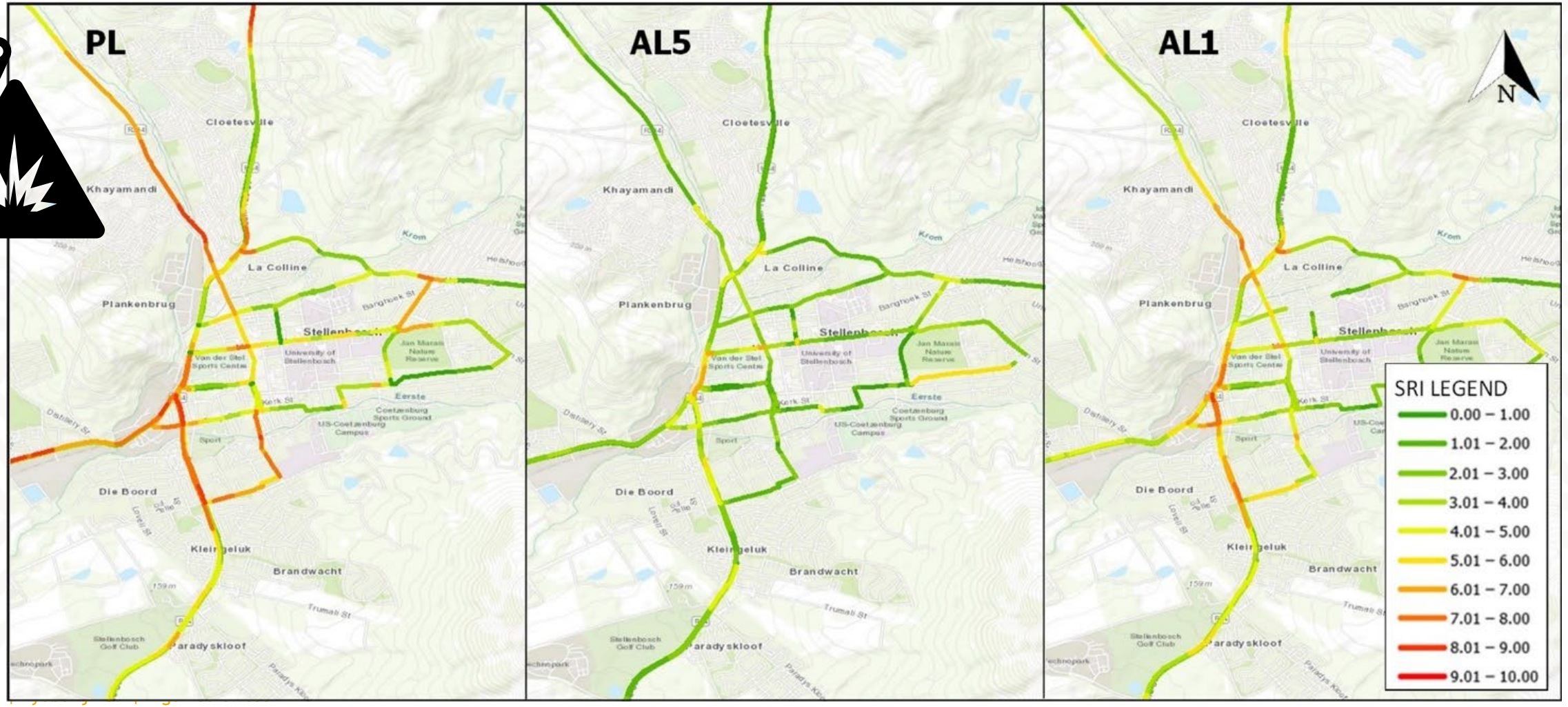
Congestion measurement

$$SRI = \left[1 - \frac{u}{u_{FFS}}\right] \times 10$$



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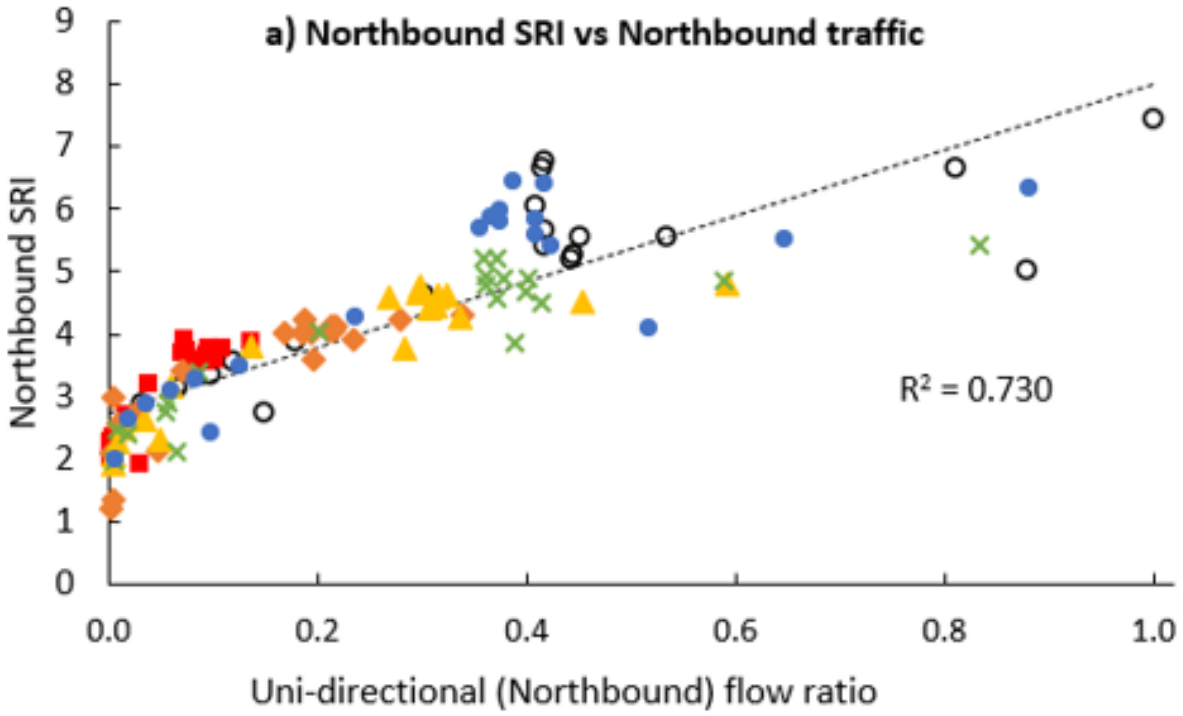

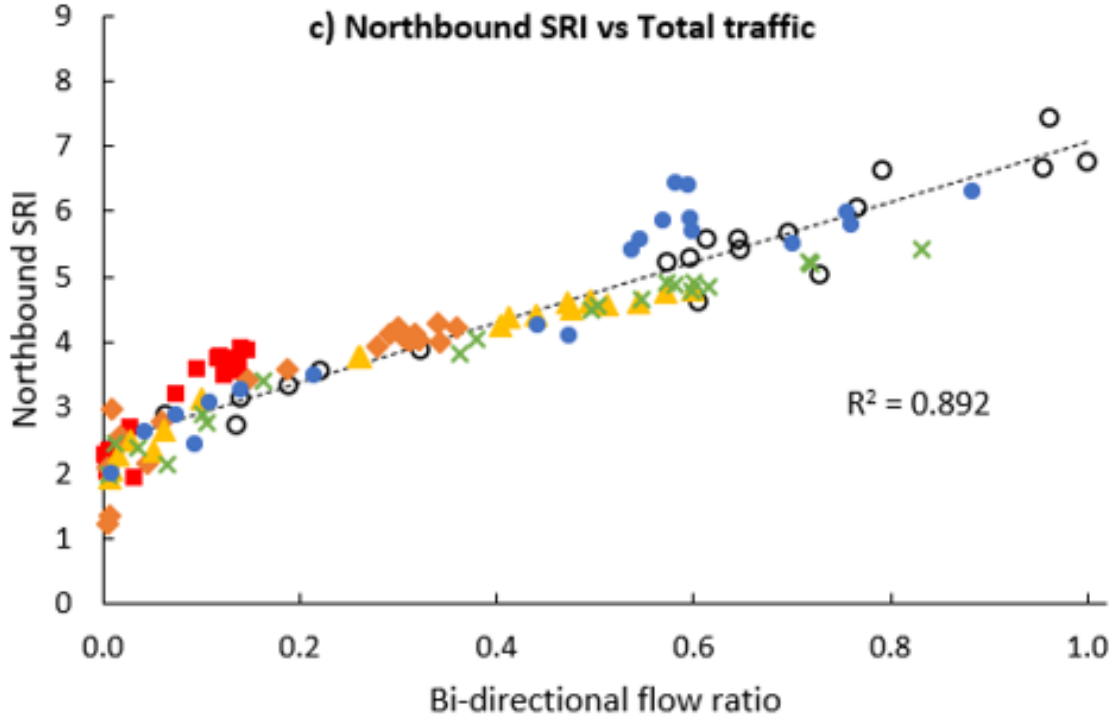

PL AL5 AL4 AL3 AL2 AL1 Regression

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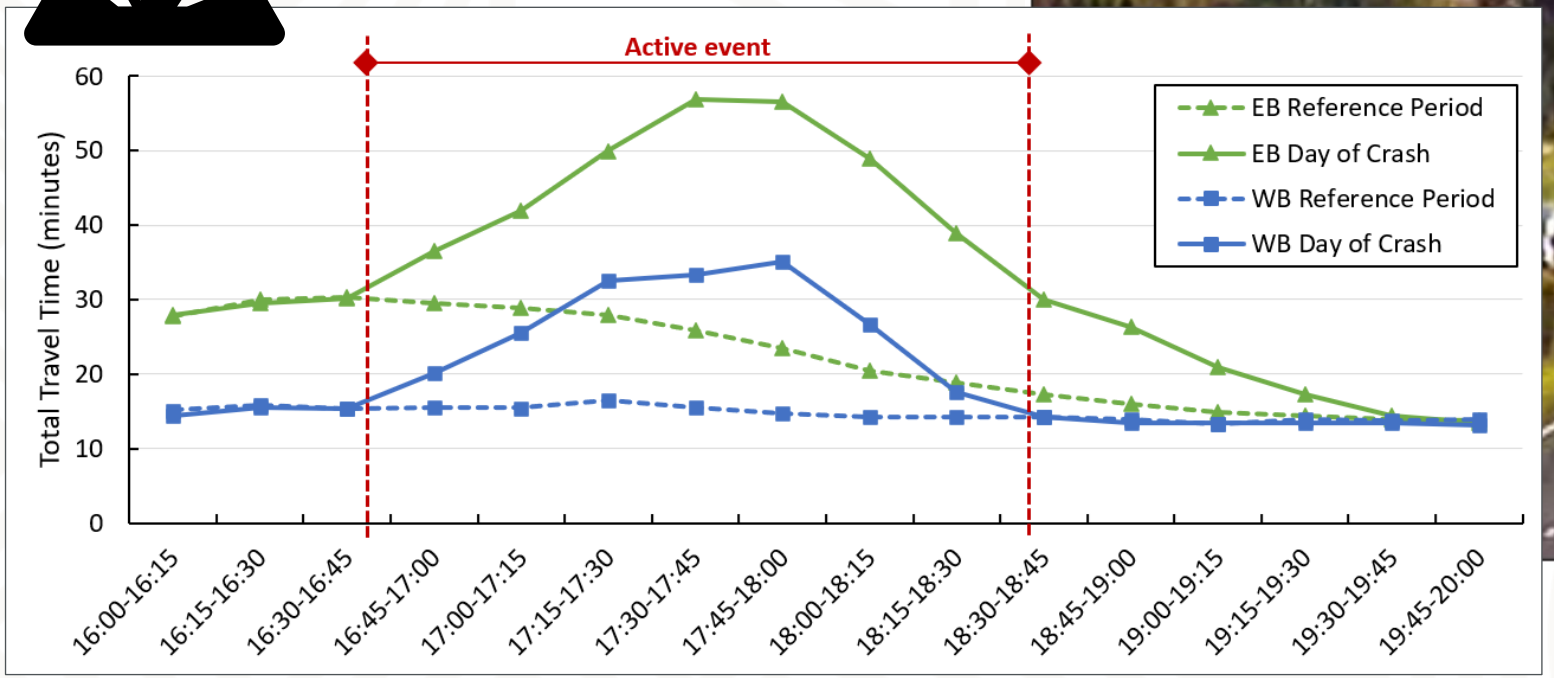

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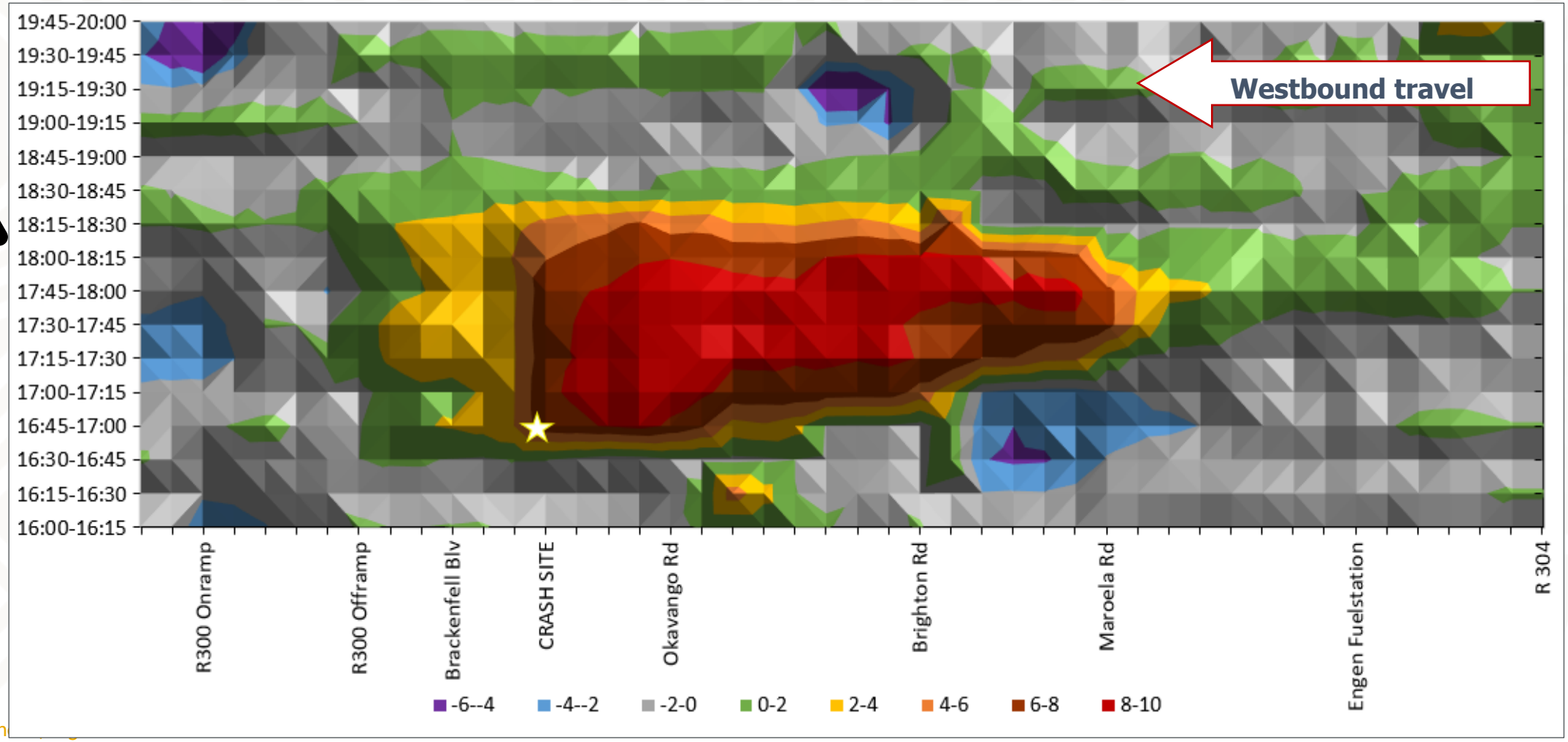
Congestion measurement

$$(SRI_{NR})_{a,b} = \left[1 - \frac{(u_I)_{a,b}}{(u_T)_{a,b}}\right] \times 10$$



Research: FCD applications in South Africa

Pothole detection

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Pothole detection

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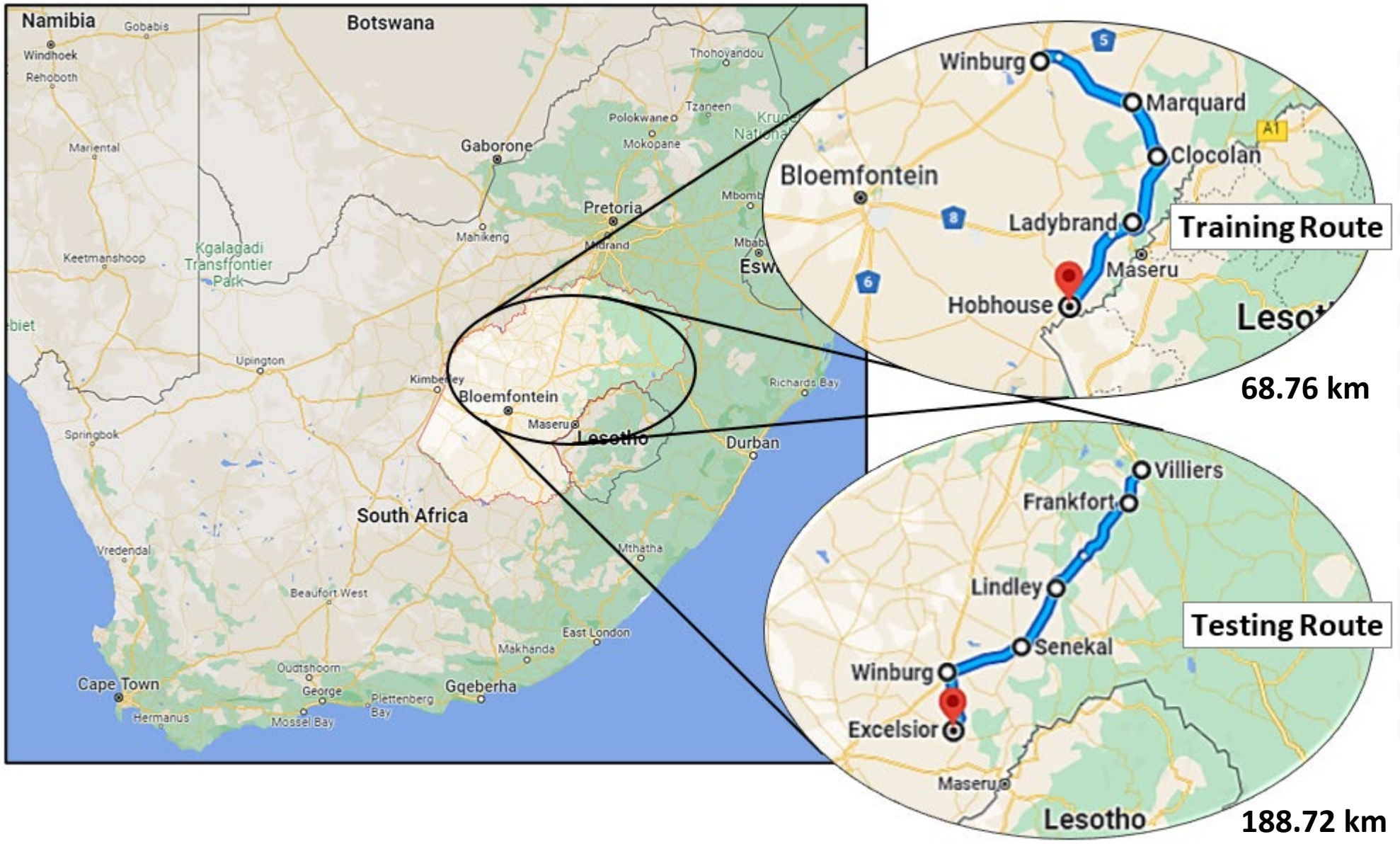
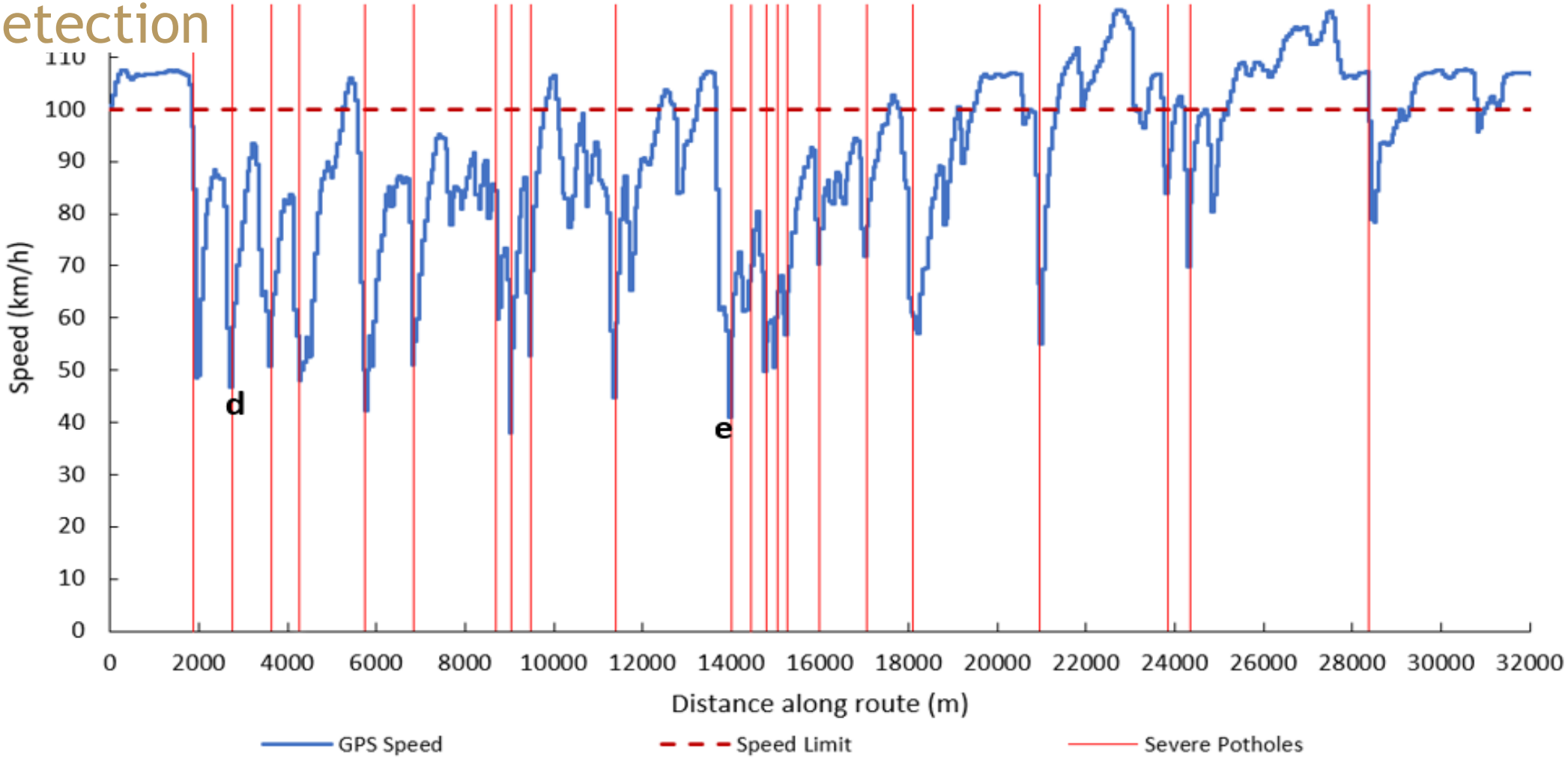
Pothole det



Research: FCD applications in South Africa

Pothole detection



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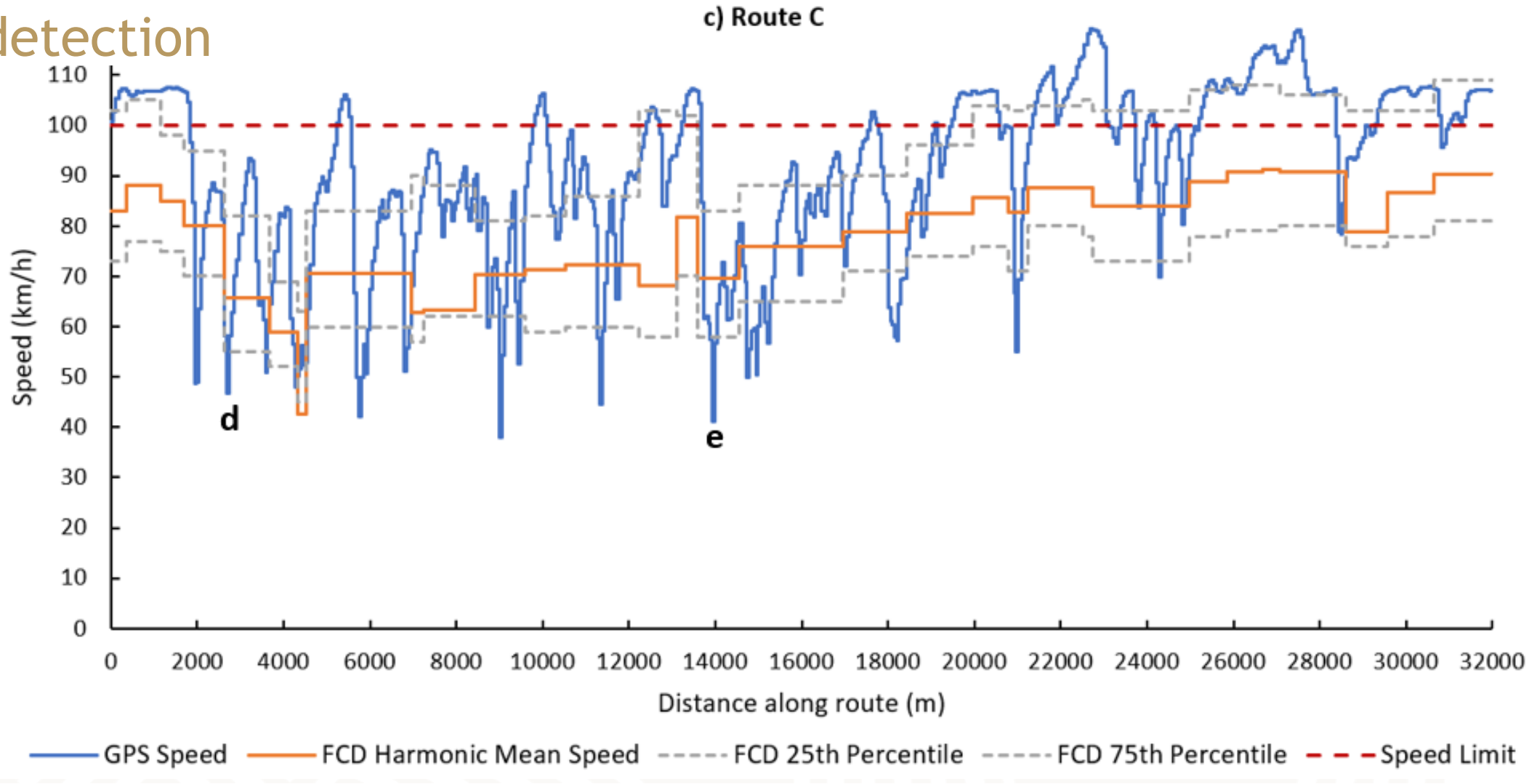

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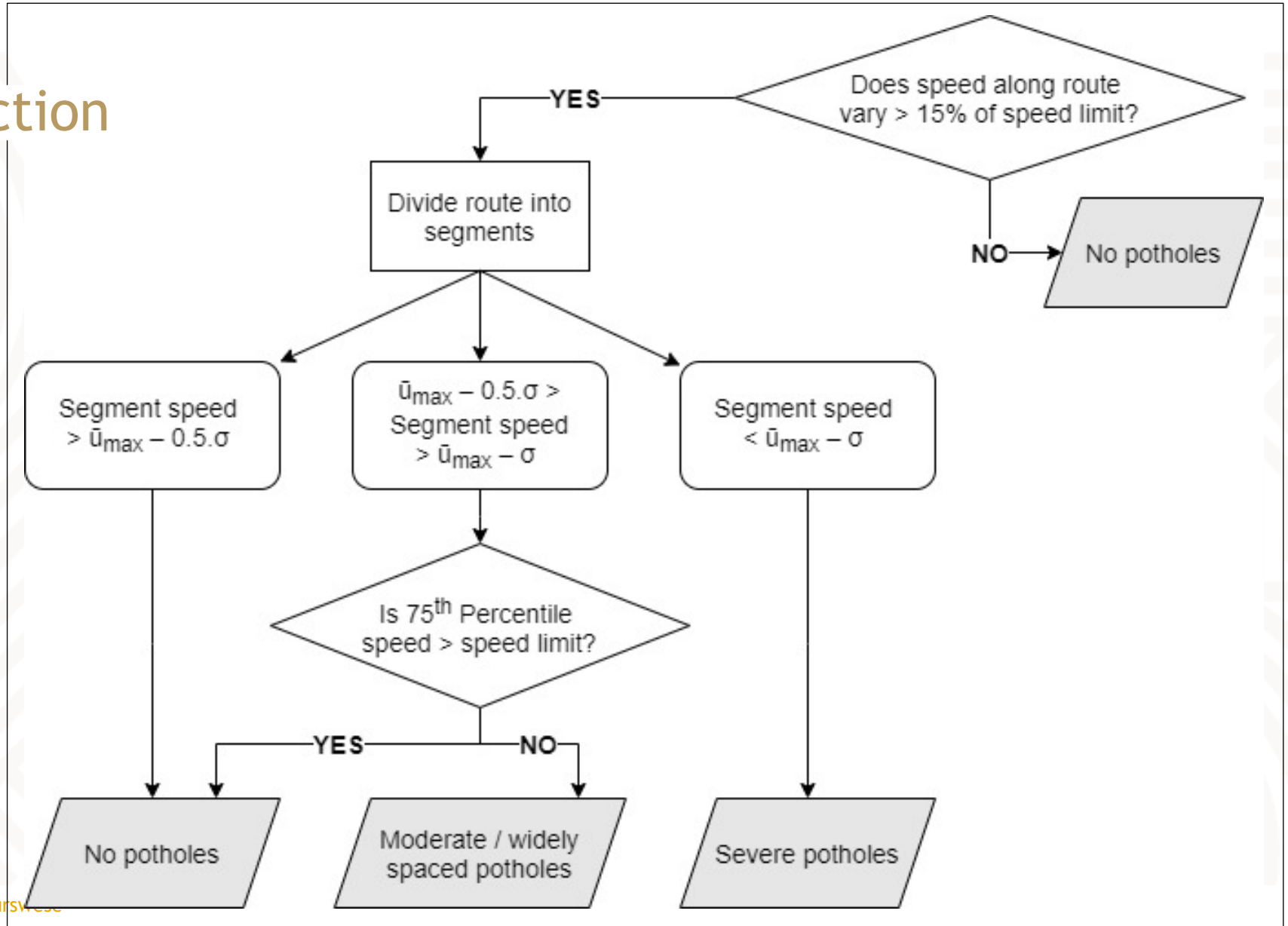

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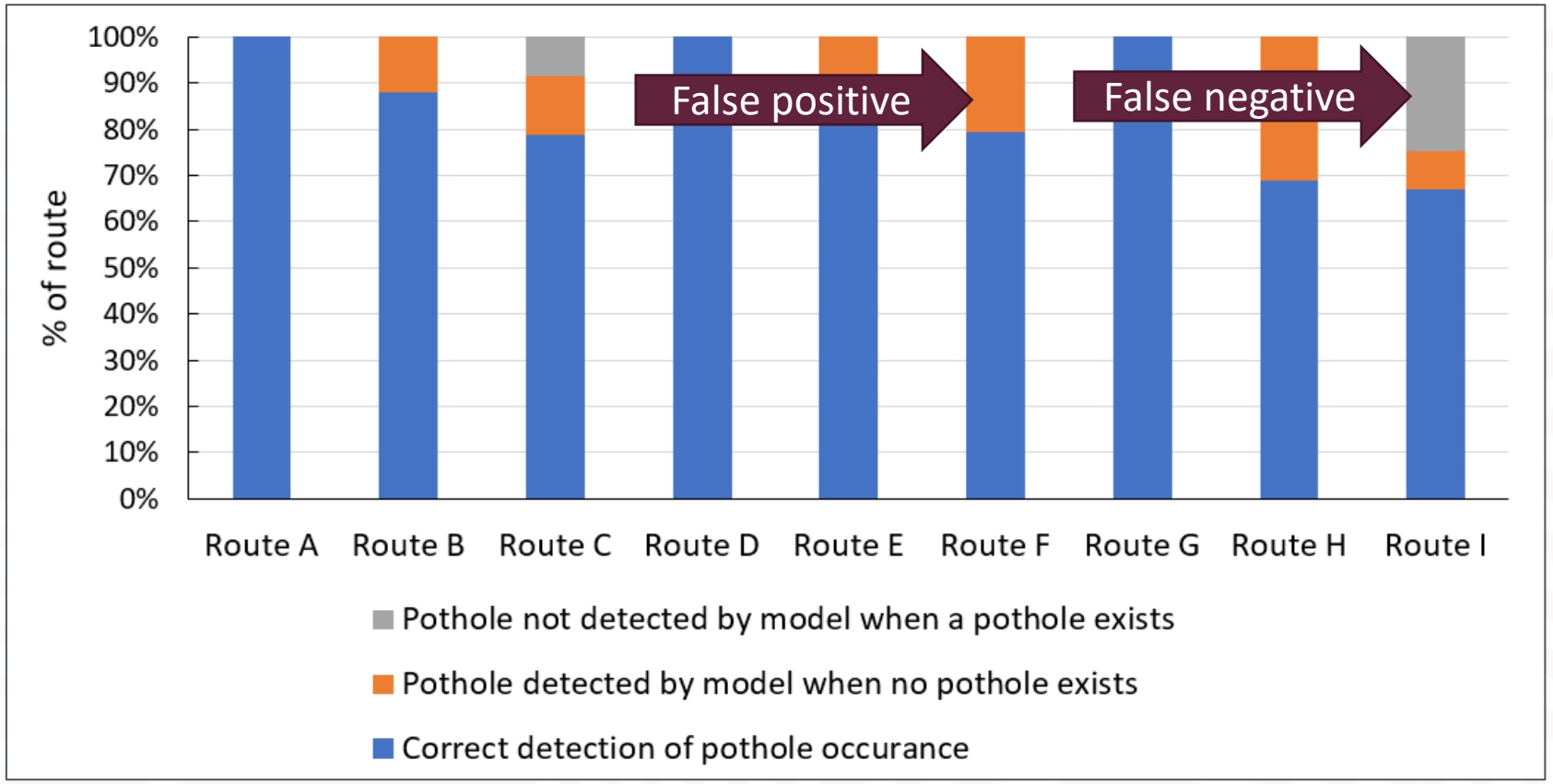

Table 8-2: Analysis of pothole detection for segments with potholes

	E	F	H	I	Average
CORRECT outcome: pothole detected	100%	100%	100%	83%	96%
INCORRECT outcome: no pothole detected	0%	0%	0%	17%	4%

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Other use-cases for FCD in traffic monitoring

Calibration of traffic models

Real-time detection of traffic incidents

Real-time input to traffic control

Measuring Level of Service of transport facilities

Monitoring speed control strategies

Measuring levels of accessibility

Observation of routes and areas avoided by drivers

Estimation of traffic volumes

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Thank you
Enkosi
Dankie

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Photo by Stefan Els

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