

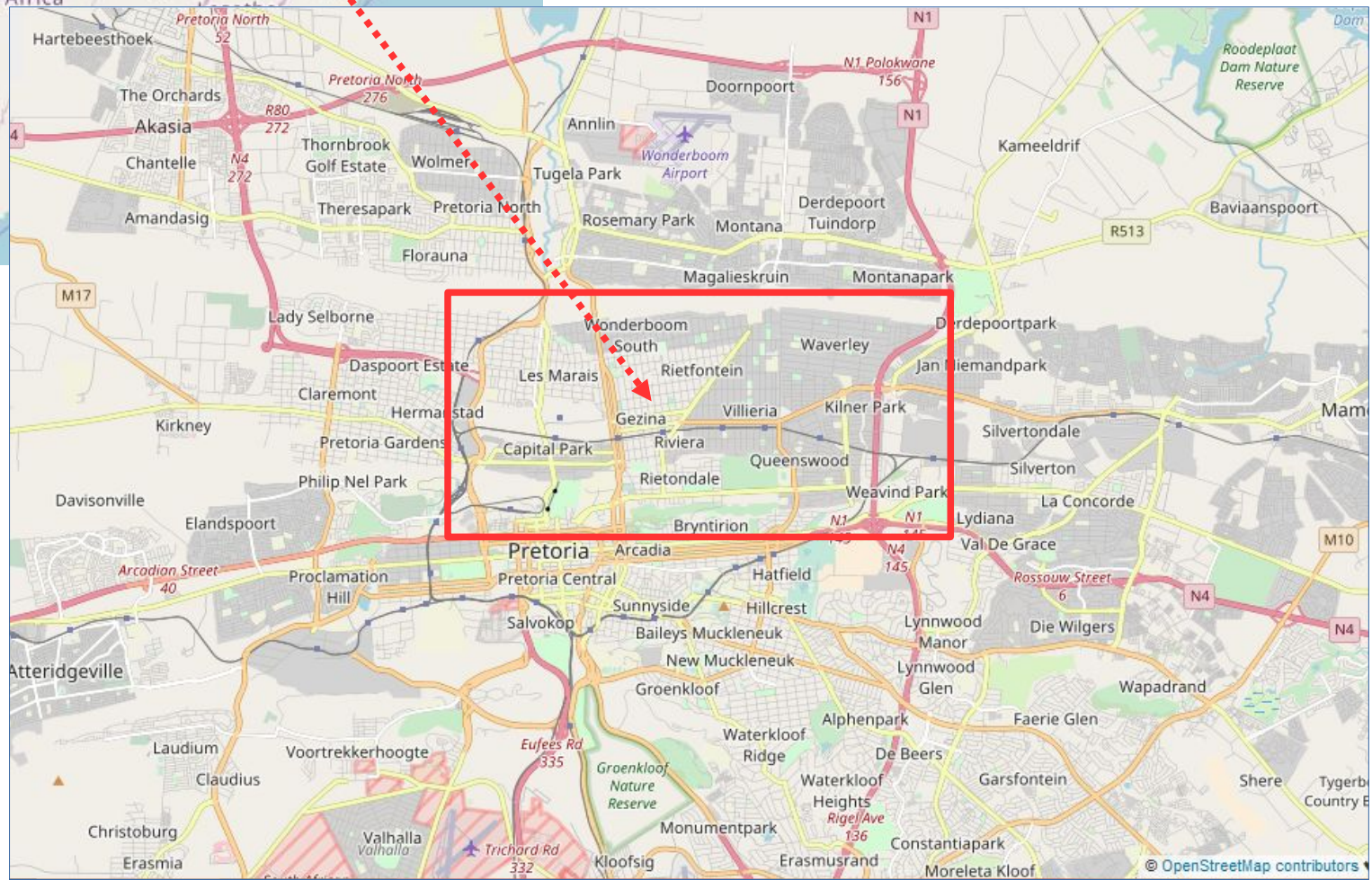
2<sup>nd</sup> International Workshop on Spatial Data Quality (SDQ 2018)  
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# Assessing the quality of OpenStreetMap road data in part of Tshwane, South Africa

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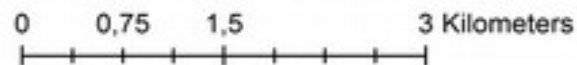


### City of Tshwane road network



### Legend

- Reference frame  
— City of Tshwane road network



Coordinate System: WG29  
Projection: Transverse Mercator

Date: 2017-12-18

Author: Ernest Yzel

## OpenStreetMap road network



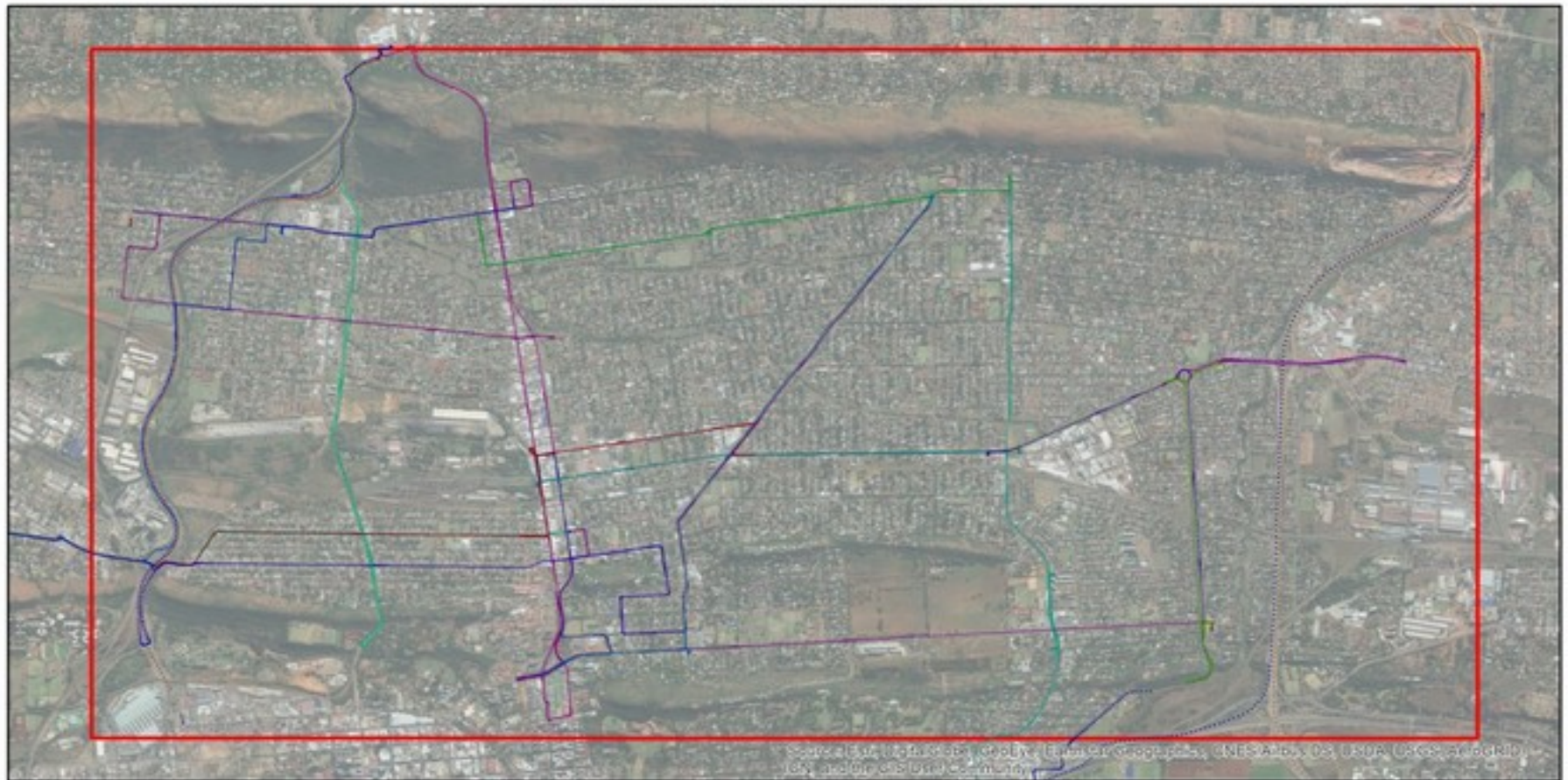
### Legend

- Reference frame
- OpenStreetMap road network

0 0,75 1,5 3 Kilometers



## Handheld road network



### Legend

- |                              |                     |                           |
|------------------------------|---------------------|---------------------------|
| Adcock to Flower             | Frates road 2       | Nico smith drive 2        |
| CR Swart Drive 1             | Fred Nickolson road | Soutpansberg Road 1       |
| CR Swart Drive 2             | Fredrika Street     | Soutpansberg Road 2       |
| De Beer Street               | Paul Kruger         | Stead/Codonia street      |
| Denyssen Street              | Meyer street        | Steve Biko to Johan Heyns |
| Es'kia Mphahlele Drive North | N1 North            | Stormvoel street          |
| Es'kia Mphahlele Drive South | N1 South            | Trouw street              |
| Frates road 1                | Nico Smith drive 1  | Reference frame           |

0 0,75 1,5 3 Kilometers



Coordinate System: WG29  
Projection: Transverse Mercator

Date: 2017-12-20

Author: Ernest Yzel

## Cell phone road network



### Legend

- Cell phone road network
- Reference frame

0 0,75 1,5 3 Kilometers



## City of Tshwane buffers



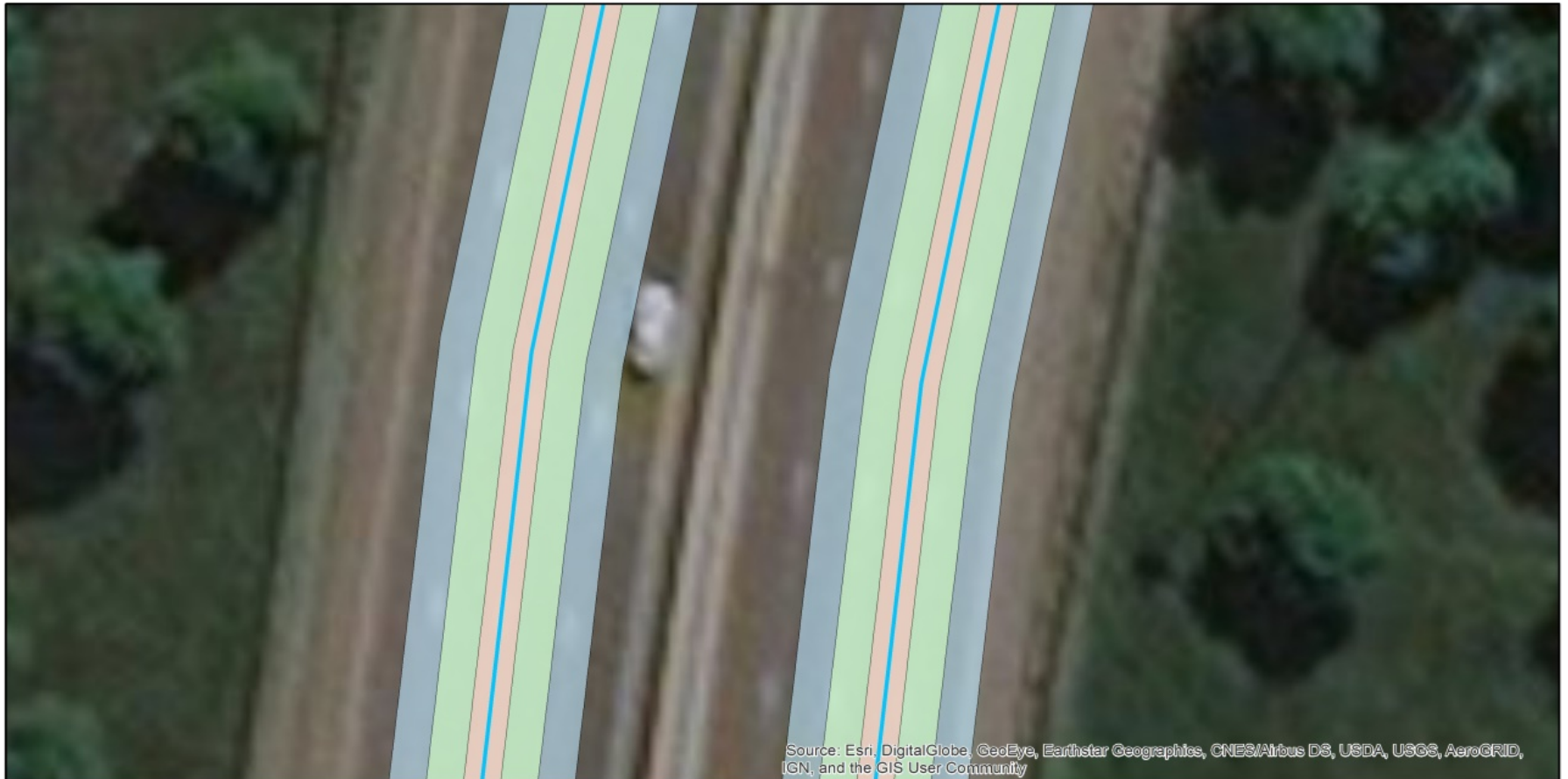
### Legend

- City of Tshwane road network (final version)
- City of Tshwane Buffer - 1m
- City of Tshwane Buffer - 3m
- City of Tshwane Buffer - 5m

0 0,005 0,01 0,02 Kilometers



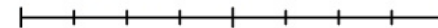
## OpenStreetMap buffers



### Legend

- OpenStreetMap road network (final version)
- OpenStreetMap Buffer - 1m
- OpenStreetMap Buffer - 3m
- OpenStreetMap Buffer - 5m

0 0,005 0,01 0,02 Kilometers



## OpenStreetMap vs City of Tshwane (all roads)

Buffer	Overlap
1 m	33%
3 m	81%
5 m	100%

**Positional accuracy  
assessment for  
OpenStreetMap  
versus City of  
Tshwane**

**Positional  
accuracy  
assessment for  
City of  
Tshwane  
versus In-field  
measurements**

CoT vs In-field measurements	Hand-held (major roads)	Cell phone (major roads)
Buffer	Overlap	Overlap
1 m	37 %	42 %
3 m	82 %	88 %
5 m	93 %	92 %

# Completeness analysis and results

## Length completeness

OBJECTID	NAME	....	len (in meters)
16241	Stanza Bopape St (Church)	...	245,4512993
16242	Hilda	...	163,5370267
16257	Johannes Ramokhoase St (Proes)	...	245,9167753
16258	Paul Kruger	...	163,2991853
16514	Bernard	...	28,73582599
16515	Osborne	...	108,6817511
16516	East	...	69,97559921
16517	Es'kia Mphahlele	...	124,6266493
16668	Bloed	...	246,3737645
16669	Sophie de Bruyn St (Schubart)	...	162,5474816
16670	Lilian Ngoyi St (Van der Walt)	...	81,78567972
16677	Pretoria	...	767,1896373
16683	Du Toit	...	90,94729342

## Name Completeness

Using the dataset where only one unique road name was used (no repeating road names or grouping of names)

City of Tshwane	OpenStreetMap
10TH AVENUE	10th Avenue
11TH AVENUE	11th Avenue
12TH AVENUE	12th Avenue
13TH AVENUE	13th Avenue
14TH AVENUE	14th Avenue
15TH AVENUE	15th Avenue
16TH AVENUE	16th Avenue
17TH AVENUE	17th Avenue
18TH AVENUE	18th Avenue
19TH AVENUE	19th Avenue
20TH AVENUE	20th Avenue
21ST AVENUE	21st Avenue
22ND AVENUE	22nd Avenue
23RD AVENUE	23rd Avenue
24TH AVENUE	24th Avenue
25TH AVENUE	25th Avenue
26TH AVENUE	26th Avenue
27TH AVENUE	27th Avenue

## Thematic Name accuracy analysis and results

### Using the major roads

Official road name	OpenStreetMap Names	City of Tshwane Names
15th Avenue	15th Avenue	15TH AVENUE
Behrens Street	Behrens Street	BEHRENS STREET
C R Swart Drive	C R Swart Drive	C R SWART DRIVE
De Beer Street	De Beer Street	DE BEER STREET
Es'kia Mphahlele Drive	DF Malan Drive E'skia Mphahlele Drive	E'SKIA MPHAHLELE DR (D F MALAN) ES'KIA MPHAHLELE DRIVE
Johan Heyns Drive	Johan Heyns Drive	JOHAN HEYNS DR (H F VERWOERD)
Nico Smith Street	Nico Smith Avenue Nico Smith Street	NICO SMITH ST (MICHAEL BRINK)
Paul Kruger Street	Paul Kruger Street Paul Kruger Paul Kruger; DF Malan Drive	PAUL KRUGER STREET
Steve Biko Road	Steve Biko Road Steve Biko Street	STEVE BIKO RD (VOORTREKKERS)
Stormvoël Road	Stormvoel Road	STORMVOËL ROAD

# Thematic Name accuracy analysis and results

## Using the whole dataset

Official road name	City of Tshwane Names	OpenStreetMap Names
ADAM LANE	ADAM LANE	Adam Lane
ANNIE BOTHA AVENUE	ANNIE BOTHA AVENUE	Annie Botha Avenue
ANTOINETTE STREET	ANTOINETTE STREET	Antionette Street
ATTIE NIEUWOUDT STREET	ATTIE NIEUWOUDT STREET	Attie Nieuwoudt Street
BARRETT STREET	BARRETT STREET	Barret Street
BEN SWART STREET	BEN SWART STREET	Ben Swart Street
BEN VAN TONDER AVENUE	BEN VAN TONDER AVENUE	Ben Van Tonder Avenue
BLESBOK AVENUE	BLESBOK AVENUE	Blesbok Avenue
BLOEDRIVIER STREET	BLOEDRIVIER STREET	Bloed Rivier Street

# *Thank you!*

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