
Changes in the quality of the OSM Road Network 2009 : 2011

– according to Navteq 2008

Angi Voss, Maike Krause-Traudes, Ahmet Ocakli

2009

Goals

A quality assessment of OSM for business geomatics in Germany

- Compare to a market leader -> Navteq
- Coverage: Germany's populated roads -> no motorways, no trunks
- Include attributes
- Easy to reproduce -> OSM being a moving target

Data

- OSM April 2009 <-> Navteq III 2008

Publications

- Ina Ludwig, Diploma thesis, Bonn University
- Agile 2011

2011

Question

- What has changed in the last 2 years?

Data

- OSM April 2011 <-> Navteq III 2008

Done by

- Haolin Zhi and Deepti Gupta
„Information Systems Lab“ 2011, Bonn University

Matching objects in Navteq and OSM

n:m

	OSM_ID	NAV_ID	HIGHWAY	KAT	OSM_NAME	OSM_NAME2	NAV_NAME	NAV_NAME2	OSM_SEGLENGE	NAV_LAENGE
1	732573	52391634	residential	4	Sternegasse	...	OBERNDORFER STRASSE	L3303	0,911571553708428	43,446851141503
2	732579	52391867	residential	7	Sternegasse	...	PFUNGSTÄDTER STRASSE	...	5,52365671260275	57,33931319863
3	733598	52391965	residential	7	Wilhelm-Leuschner-Straße	...	JAHNSTRASSE	...	2,28876790208404	266,89146124556
4	733598	57289167	residential	7	Wilhelm-Leuschner-Straße	...	WILHELM-LEUSCHNER-STRASSE	...	106,55094214234	127,00479914288
5	733598	90228982	residential	7	Wilhelm-Leuschner-Straße	...	FRANZ-LISZT-STRASSE	...	10,0037441259549	70,702364079601
6	733598	52391958	residential	7	Wilhelm-Leuschner-Straße	...	WILHELM-LEUSCHNER-STRASSE	...	112,19384630589	114,8075143276
7	733598	52391956	residential	7	Wilhelm-Leuschner-Straße	...	ZÖLLERSTRASSE	...	0,795129518959175	163,06429773220
8	733598	52391827	residential	7	Wilhelm-Leuschner-Straße	...	MOZARTSTRASSE	...	10,0126390529011	175,57651121450
9	733598	52391929	residential	7	Wilhelm-Leuschner-Straße	...	HAYDNSTRASSE	...	10,0261617062356	191,73937838716
10	733598	52391964	residential	7	Wilhelm-Leuschner-Straße	...	WILHELM-LEUSCHNER-STRASSE	...	116,588527312344	112,01499127618
11	733598	52391924	residential	7	Wilhelm-Leuschner-Straße	...	BRAHMSSTRASSE	...	10,0146182140797	237,76315901637
12	733598	567289166	residential	7	Wilhelm-Leuschner-Straße	...	WILHELM-LEUSCHNER-STRASSE	...	82,3558945126769	74,973938356113
13	1022918	52391716	residential	7	Mittelweg	...	SCHÖNEWEIBERGASSE	...	6,55273904234887	54,461463484814
14	1022918	52391997	residential	7	Mittelweg	...	MITTELWEG	...	67,9318656213001	88,808280691373
15	1198147	576423763	residential	7	Georgstraße	...	GEORGSTRASSE	...	33,2862103692619	25,72892735767
16	1198147	52391876	residential	7	Georgstraße	...	GEORGSTRASSE	...	118,751610671265	108,52657011509
17	1198147	52423364	residential	7	Georgstraße	...	ZÖLLERPLATZ	...	8,15777779108071	51,39126895677
18	1198147	52391742	residential	7	Georgstraße	...	GEORGSTRASSE	...	35,496609512344	29,484485428907
19	1198147	52391741	residential	7	Georgstraße	...	SANDGASSE	...	6,45849189197477	31,949945338850

- Highly automated
- Eventually to transfer market data from Navteq to OSM

Quantities

Changes	2009	2011
Matched Navteq segments	58%	77%
Matched OSM objects	55%	37%
Matches per OSM object	3,1	2,5



Objects	total (Mio)	before matching	matched
Navteq 2008	7	5,3	3,1 ← 4,1
OSM 2009	2,1	1,8	1 ←
OSM 2011	4,6	4,2	1,6 ←

Relative quality measures

- Object completeness
- Positional precision: 5m, 10m, 30m
- Properties: one way, pedestrian precinct, foot path
- Attributes: speed limit

Road objects of interest in one data set

Those with matches and
the property to be compared

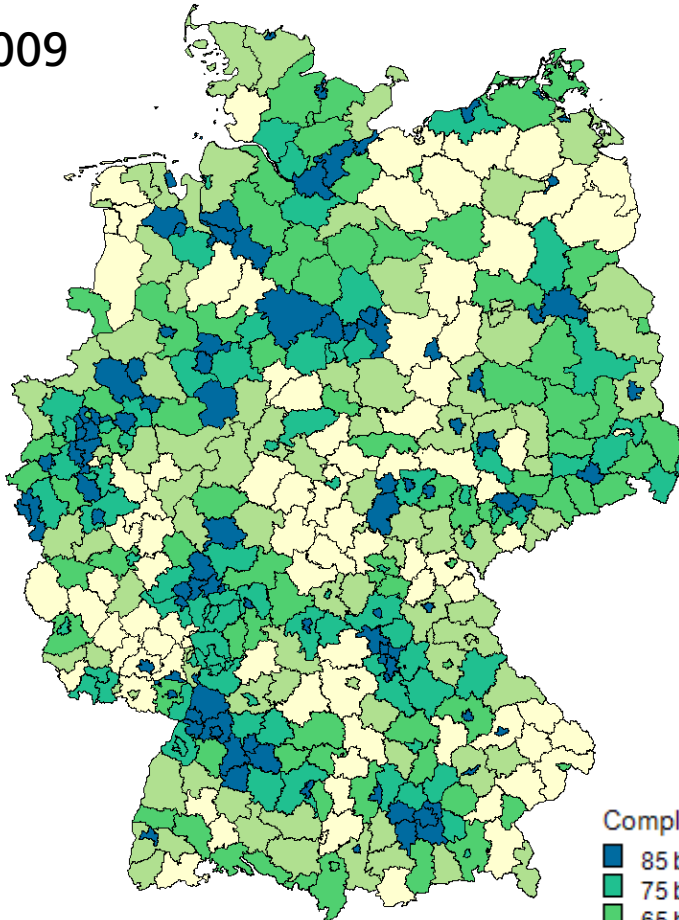
Those whose matches have
the property to be compared



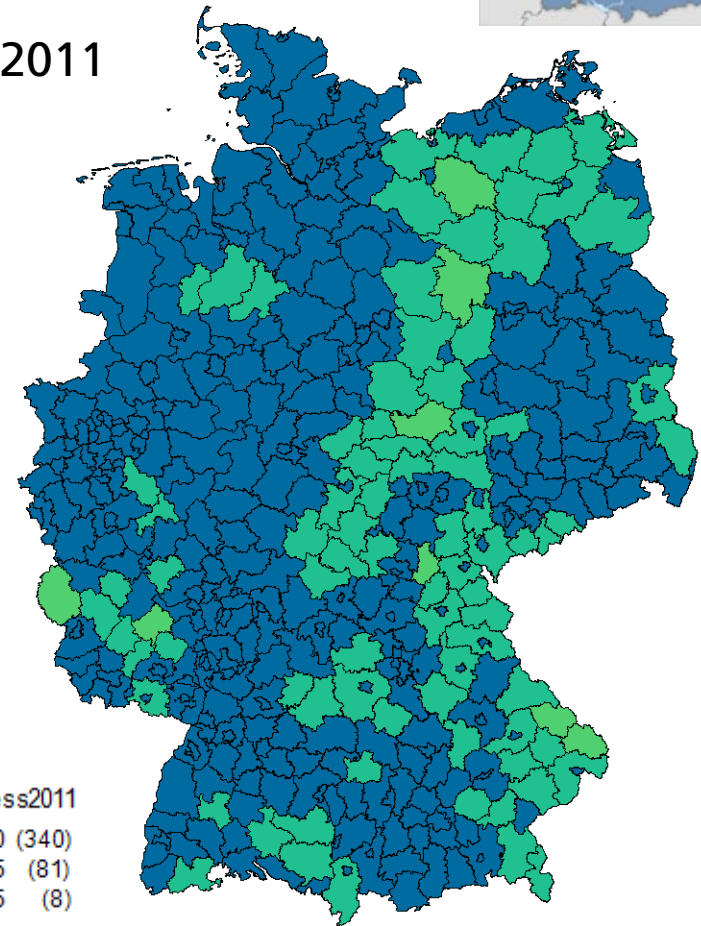
Navteq-relative object completeness



2009

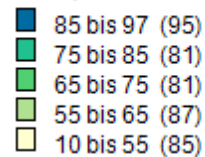


2011

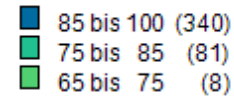


Districts
Quantiles 2009

Completeness 2009

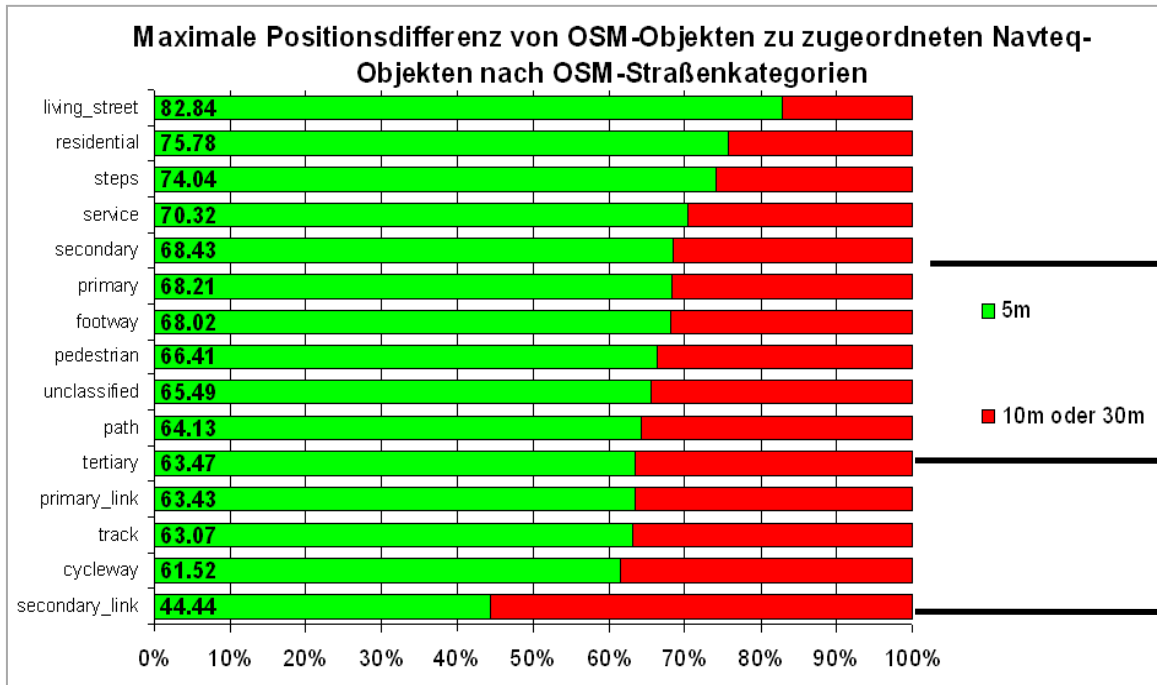


Completeness 2011



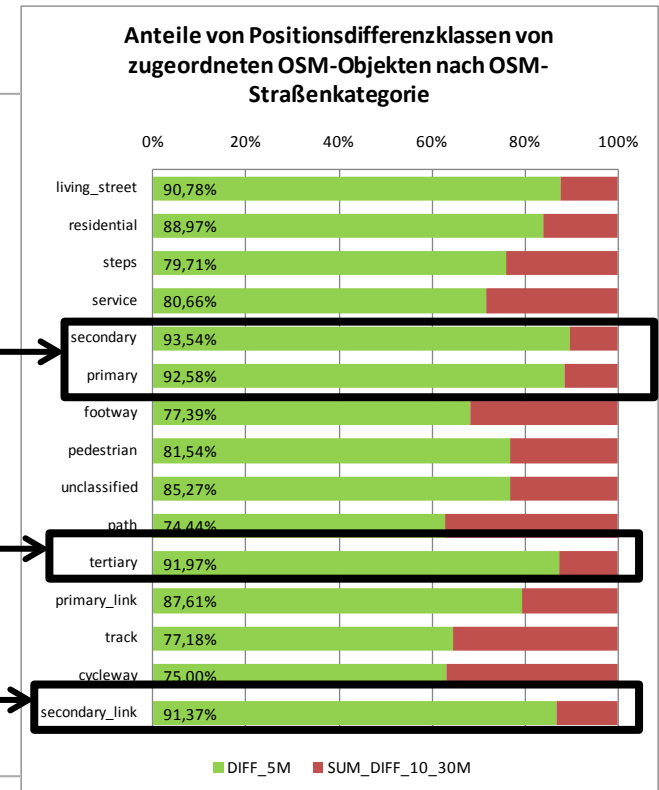
Position relative to Navteq: 5m, 30m?

2009:
better for non-motorized roads

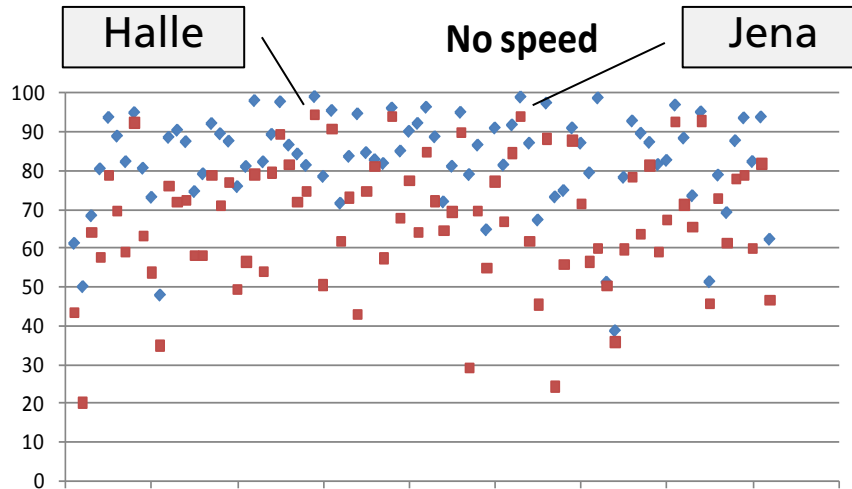


per Navteq road category

2011:
top road categories improved



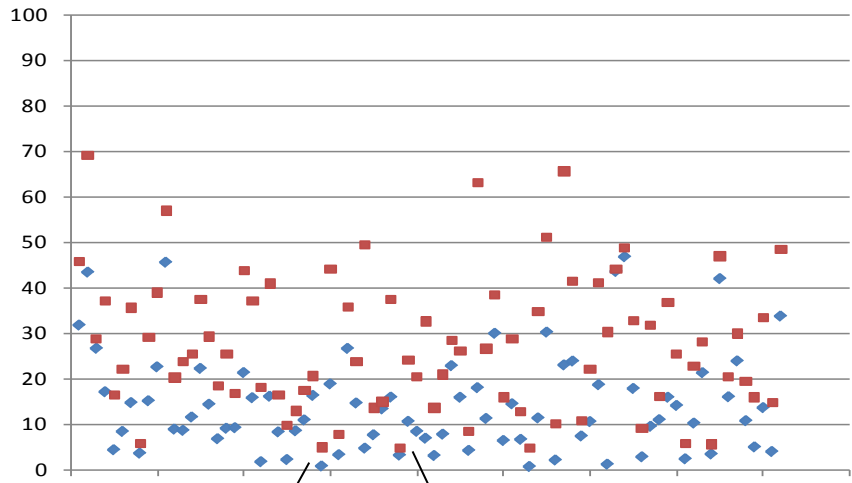
Largest cities – speed limit



◆ no Speed 2009
■ no Speed 2011

Speed limits have been added,
values get more comparable

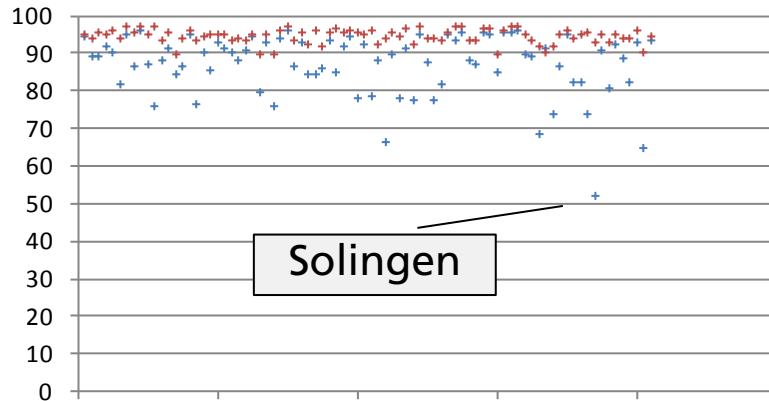
Same speed class



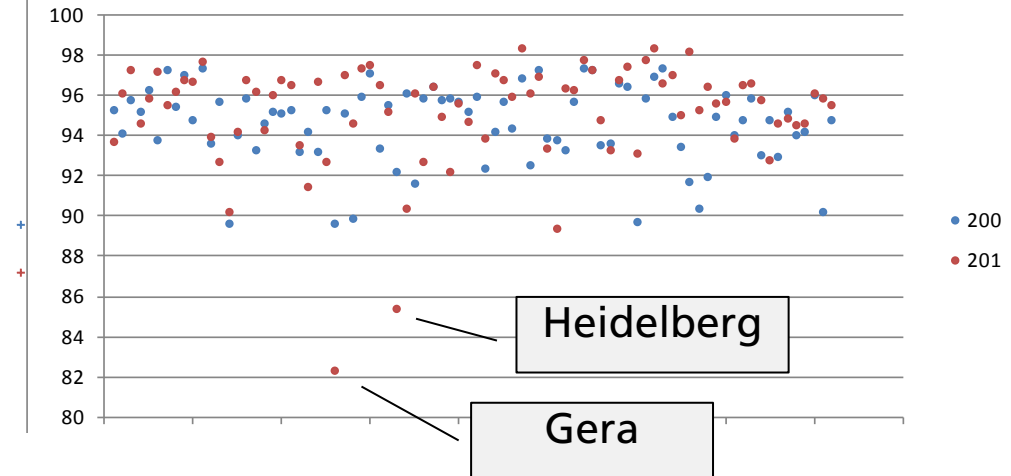
◆ same speed class 2009
■ same speed class 2011

Largest cities

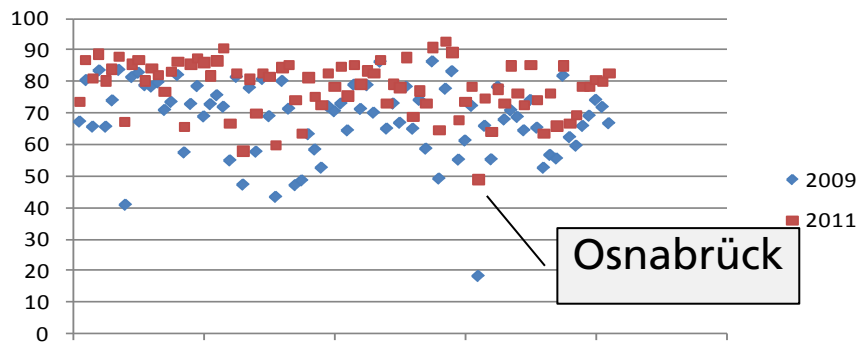
Object completeness



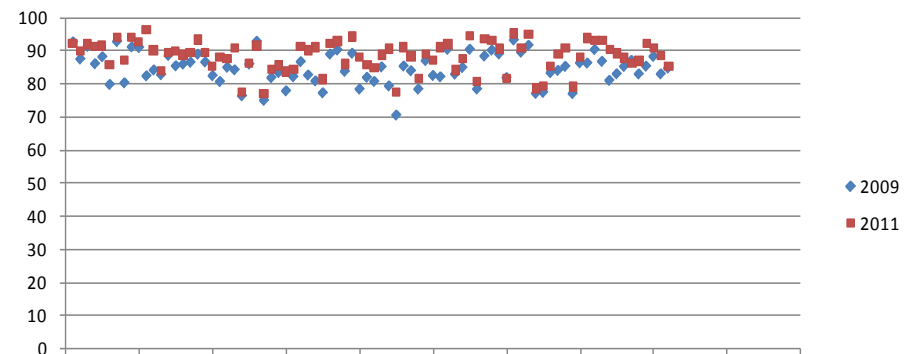
Name completeness



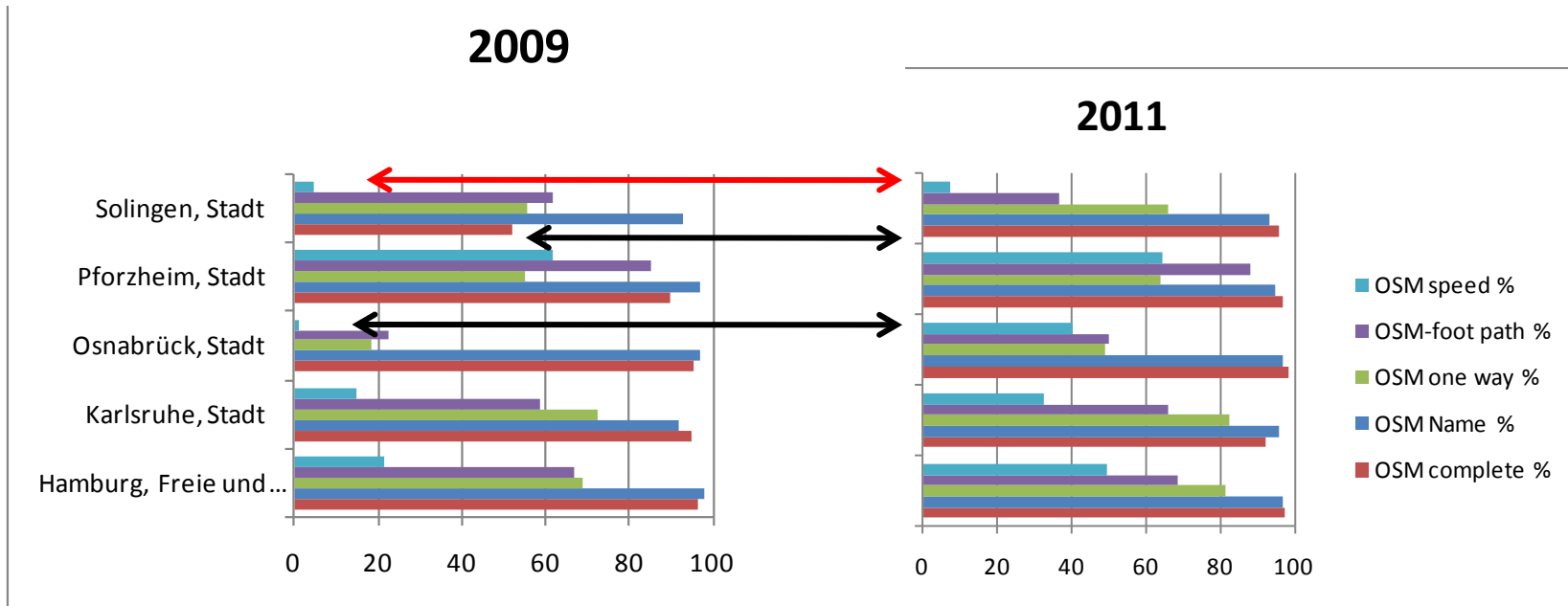
One way completeness



5 m buffer



Cities with heterogeneous qualities in 2009



Most gaps have been reduced.

Possible extensions

Contact:

angi.voss@iais.fraunhofer.de

www.iais.fraunhofer.de/5272.html

Planned

- More analysis of 2009 – 2011
- OSM 2011 – new Navteq data
- Completeness of Navteq relative to OSM?
- Extend matching to all roads
- Extend to points of interest

But, according to ODbL,

OSM cannot be combined with proprietary market data for
business geomatics applications for small and medium enterprises