

# Appendix

**OverPass queries used to extract the national boundaries:**

## **Belgium**

```
[out:json][timeout:36000];
{{geocodeArea:belgium}}->.searchArea;
// gather results
(
  // query part for: "admin_level=*"
  nwr["admin_level"="2"](area.searchArea);

);
// print results
out body;
>;
out skel qt;
```

## **The Netherlands**

```
[out:json][timeout:36000];
{{geocodeArea:Netherlands}}->.searchArea;
// gather results
(
  // query part for: "admin_level=*"
  nwr["admin_level"="2"](area.searchArea);

);
// print results
out body;
>;
out skel qt;
```

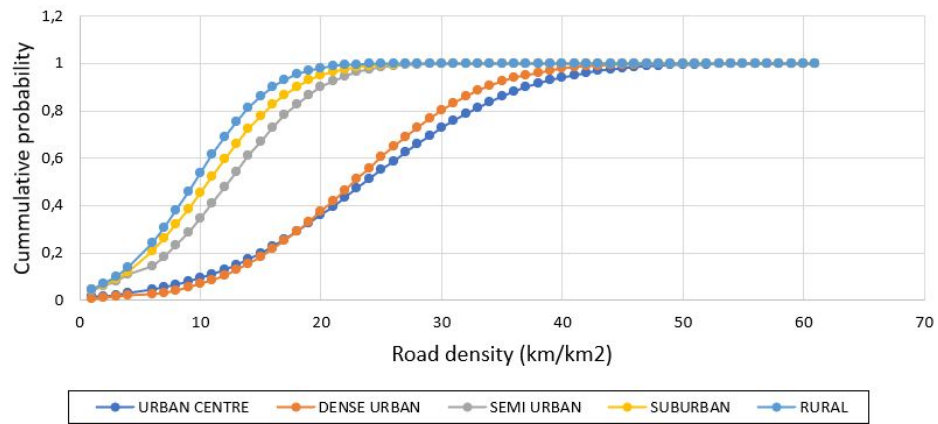
## **Central African Republic**

```
[out:json][timeout:36000];
{{geocodeArea:Netherlands}}->.searchArea;
// gather results
(
  // query part for: "admin_level=*"
  nwr["admin_level"="2"](area.searchArea);

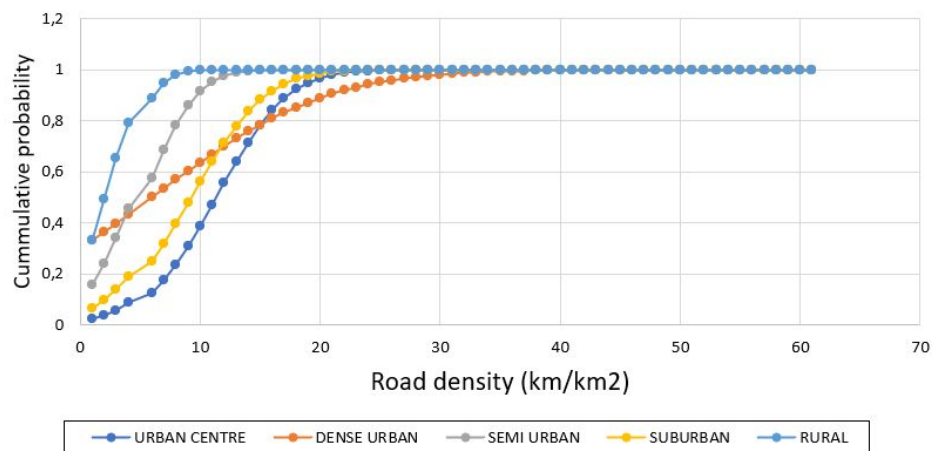
);
// print results
out body;
>;
out skel qt;
```

# Cumulative probability distribution

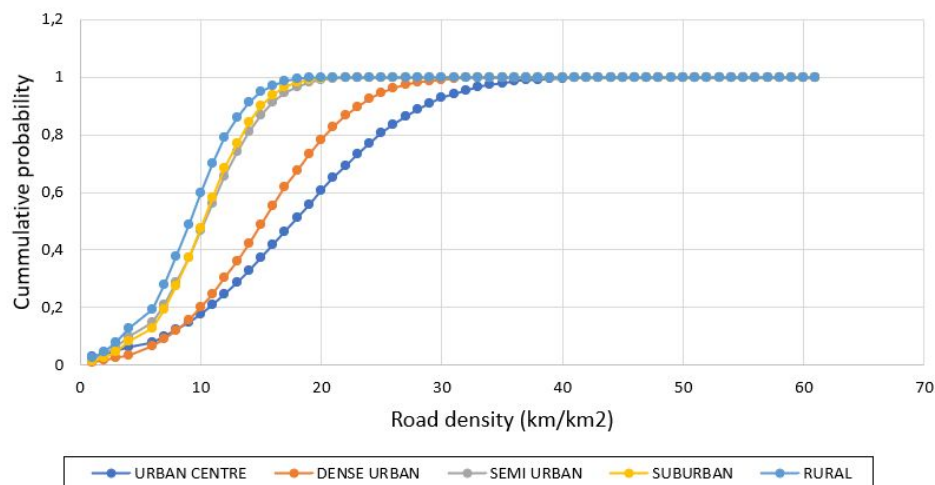
**Cummulative probability distribution w.r.t road density in the Netherlands**



**Cummulative probability distribution w.r.t road density in central african republic**



**Cummulative probability distribution w.r.t road density in Belgium**



## Statistical values

**Table 1:** The statistical functions with respect to three case study areas

Belgium					
Land use class	URBAN CENTRE	DENSE URBAN	SEMI URBAN	SUBURBAN	RURAL
mean	16,75580577	15,1743649	9,341176471	9,224214382	8,106038292
SD	8,397284845	6,144621491	4,14646779	3,739500248	3,601457004
$\mu + \sigma$	25,15309062	21,31898639	13,48764426	12,96371463	11,7074953
$\mu - \sigma$	8,358520926	9,029743405	5,194708681	5,484714134	4,504581287

The Netherlands					
Land use class	URBAN CENTRE	DENSE URBAN	SEMI URBAN	SUBURBAN	RURAL
mean	23,69834254	21,7279597	11,33990895	10,64414843	9,525046382
SD	10,36202962	8,561939804	5,952427973	5,67447457	5,056682943
$\mu + \sigma$	34,06037216	30,2898995	17,29233693	16,318623	14,58172933
$\mu - \sigma$	13,33631293	13,16601989	5,38748098	4,96967386	4,468363439

Central African Republic					
Land use class	URBAN CENTRE	DENSE URBAN	SEMI URBAN	SUBURBAN	RURAL
mean	10,33727811	5,959183673	4,357142857	8,271428571	2,041186161
SD	4,660573544	5,518808918	3,353730489	4,826131822	2,424077039
$\mu + \sigma$	14,99785165	11,47799259	7,710873346	13,09756039	4,4652632
$\mu - \sigma$	5,676704563	0,440374756	1,003412368	3,445296749	-0,382890877

**Table 2:** The differences in statistical values between land use classes moving in descending order (from Urban Centre to Rural)

Belgium				
	(URBAN CENTRE) - (DENSE URBAN)	(DENSE URBAN) - (SEMI URBAN)	(SEMI URBAN) - (SUBURBAN)	(SUBURBAN) - (RURAL)
Difference in mean	1,581440875	5,833188425	0,116962088	1,118176091
Difference in SD	2,252663354	1,998153701	0,406967542	0,138043243
Difference in $(\mu + \sigma)$	3,834104228	7,831342127	0,523929631	1,256219334
Difference in $(\mu - \sigma)$	-0,671222479	3,835034724	-0,290005454	0,980132847

The Netherlands				
	(URBAN CENTRE) - (DENSE URBAN)	(DENSE URBAN) - (SEMI URBAN)	(SEMI URBAN) - (SUBURBAN)	(SUBURBAN) - (RURAL)
Difference in mean	1,970382844	10,38805074	0,695760523	1,119102048
Difference in SD	1,800089812	2,609511831	0,277953403	0,617791627
Difference in $(\mu + \sigma)$	3,770472656	12,99756258	0,973713926	1,736893675
Difference in $(\mu - \sigma)$	0,170293031	7,778538914	0,41780712	0,501310421

Central African Republic				
	(URBAN CENTRE) - (DENSE URBAN)	(DENSE URBAN) - (SEMI URBAN)	(SEMI URBAN) - (SUBURBAN)	(SUBURBAN) - (RURAL)
Difference in mean	4,378094433	1,602040816	-3,914285714	6,23024241
Difference in SD	-0,858235374	2,165078428	-1,472401333	2,402054784

Difference in ( $\mu + \sigma$ )	3,519859059	3,767119245	-5,386687048	8,632297194
Difference in ( $\mu - \sigma$ )	5,236329807	-0,563037612	-2,441884381	3,828187626