Sun wind water **traffic** earth life living, legends for design

AR2U070 Territory (design) 5ECTS
AR0112 Civil engineering for dummies (calculations) 2ECTS

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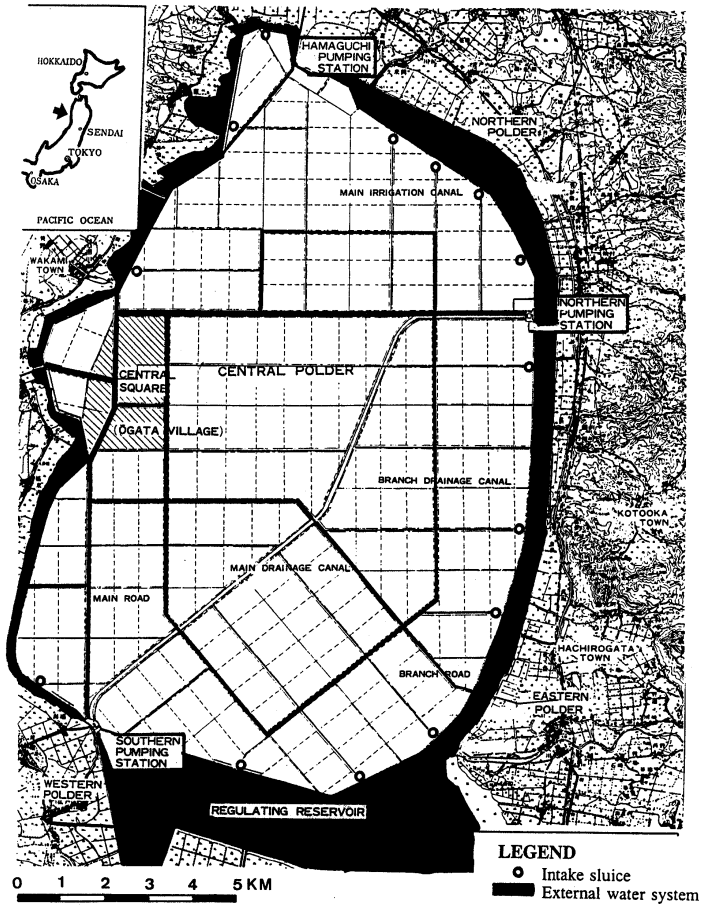
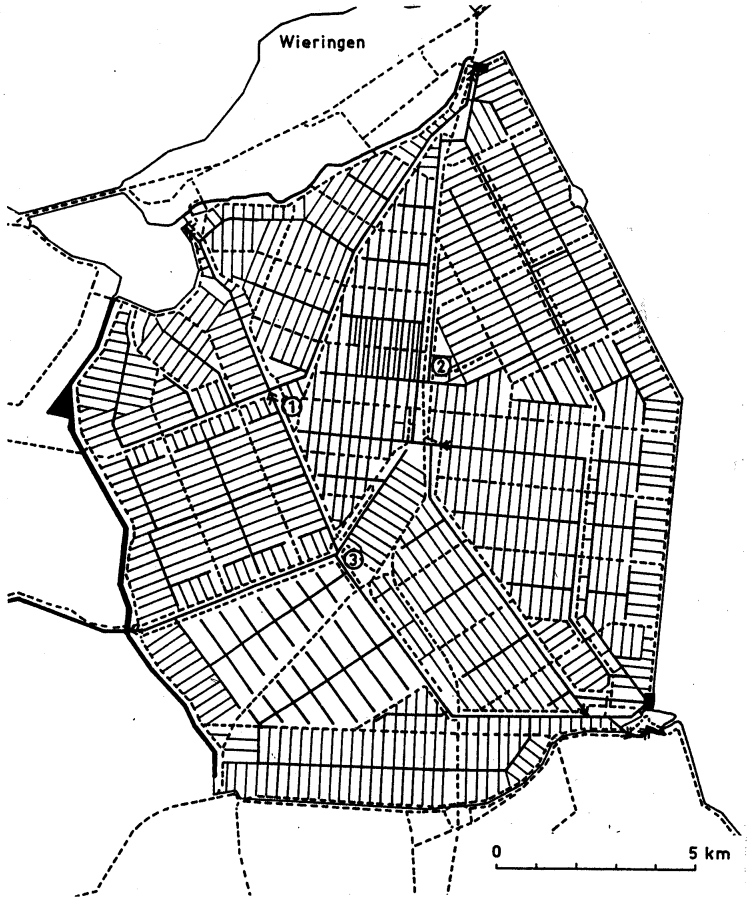
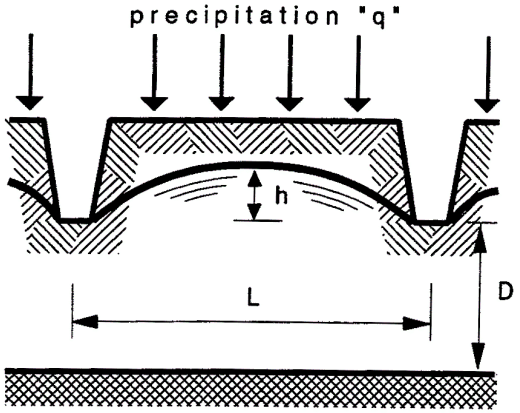
Wet networks

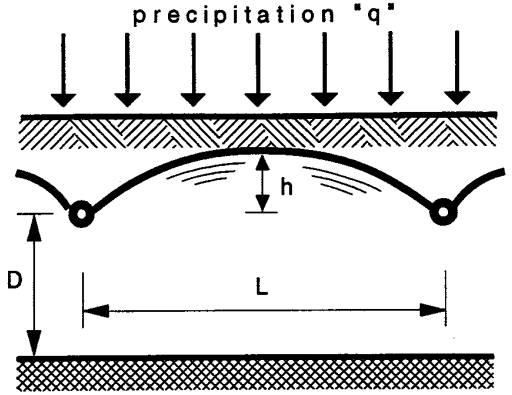




Distance between trenches



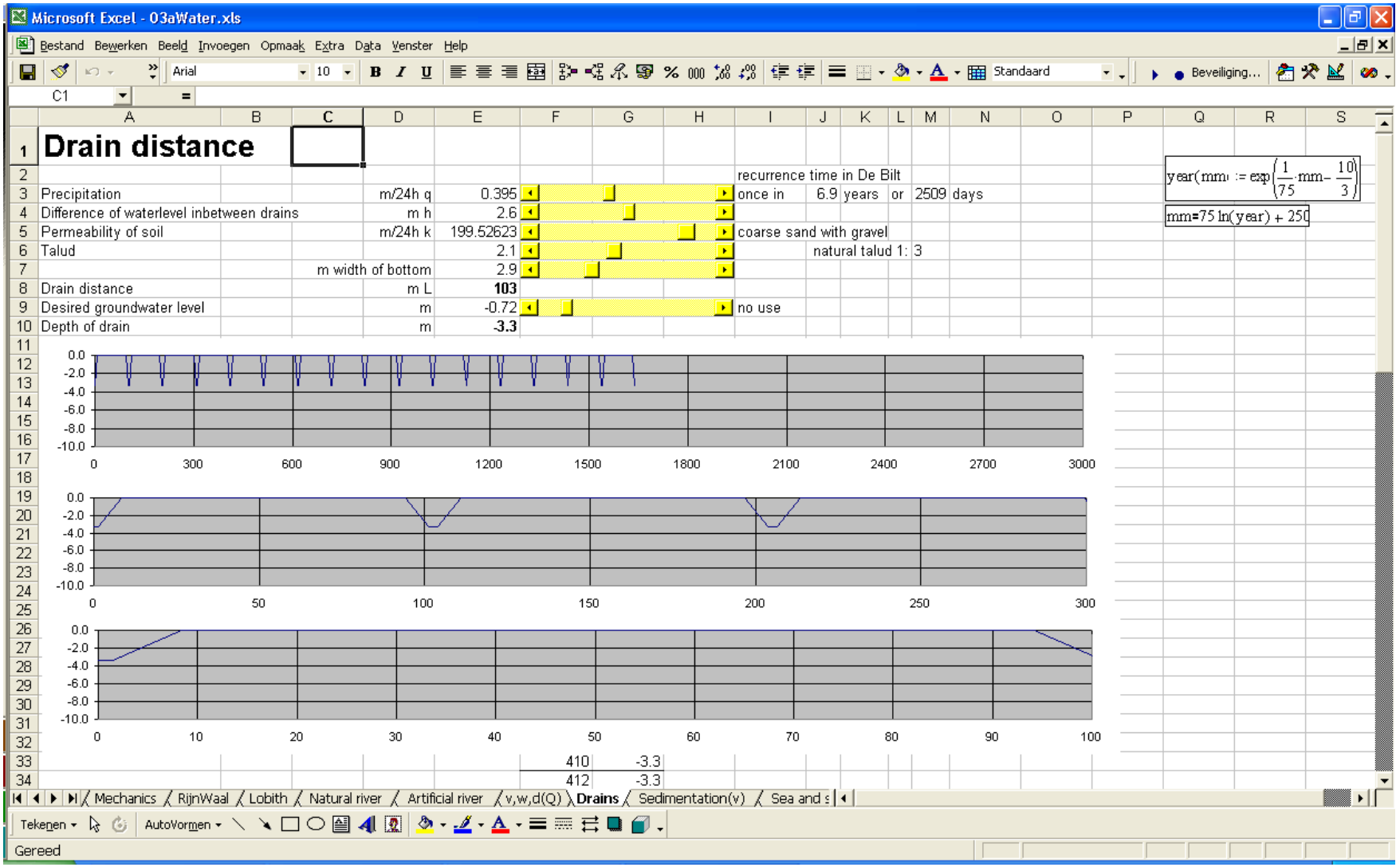
Hooghoudt Formula for Trenches



Hooghoudt Formula for Drains

The necessary distance L between smallest ditches or drain pipes is determined by precipation q [m/24h], the maximally accepted height h [m] of ground water above drainage basis between drains and by soil characteristics. Soil is characterised by its permeability k [m/24h]. A simple formula is $L=2\sqrt{(2kh/q)}$.

Calculating the distance



Wet network density by soil

$$d(k,N,h)=250\sqrt{(2N/kh)}\ km/km^2$$

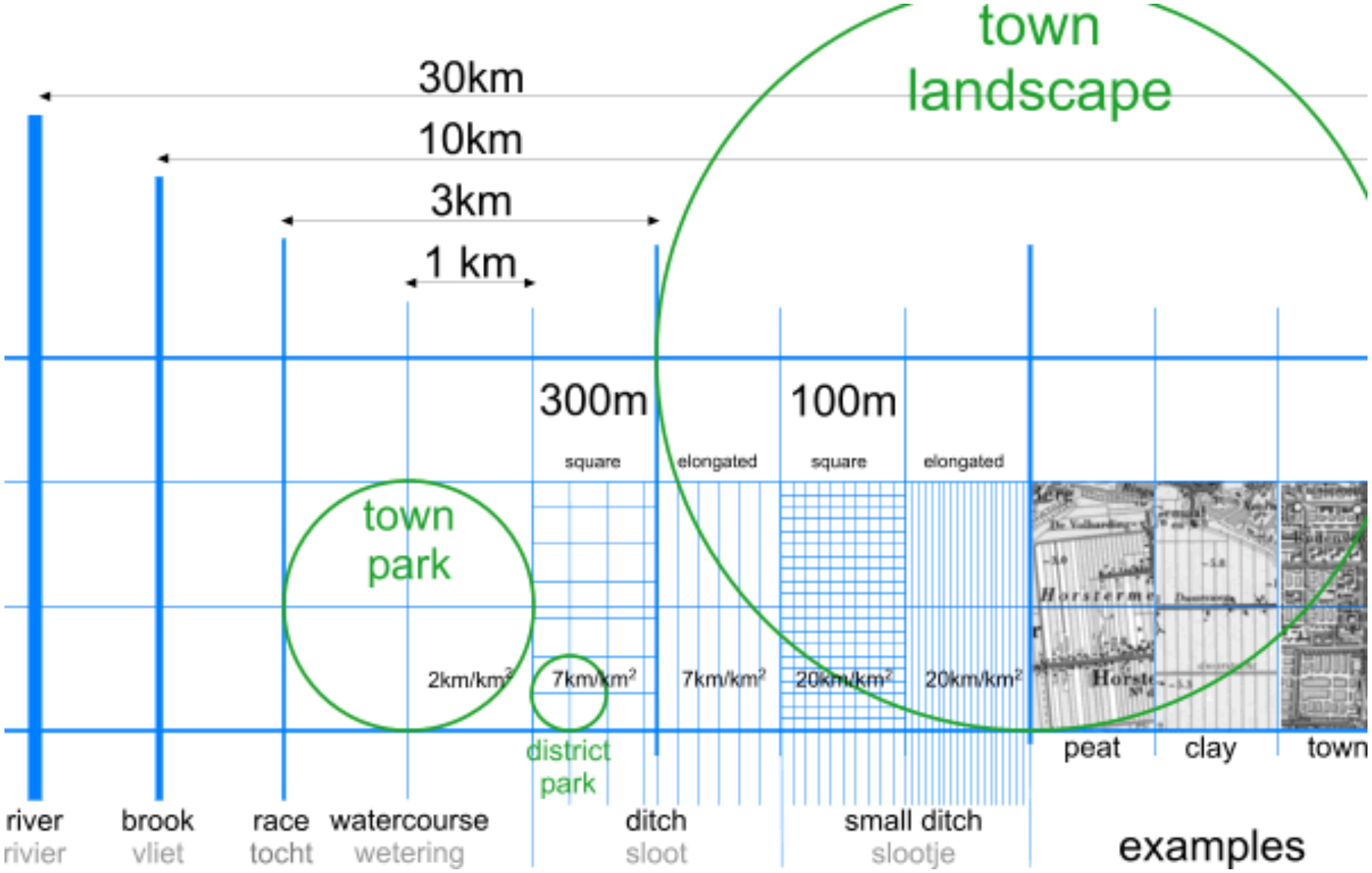
	Peat	Clay	Sand
Percolation k [m/24h]	6	23	280
Precipitation N [m/24h]	0.007	0.007	0.008
Waterlevel between ditches h [m]	0.4	0.4	0.4
Network density d [km/km^2]	**20**	**10**	**3**

Two networks

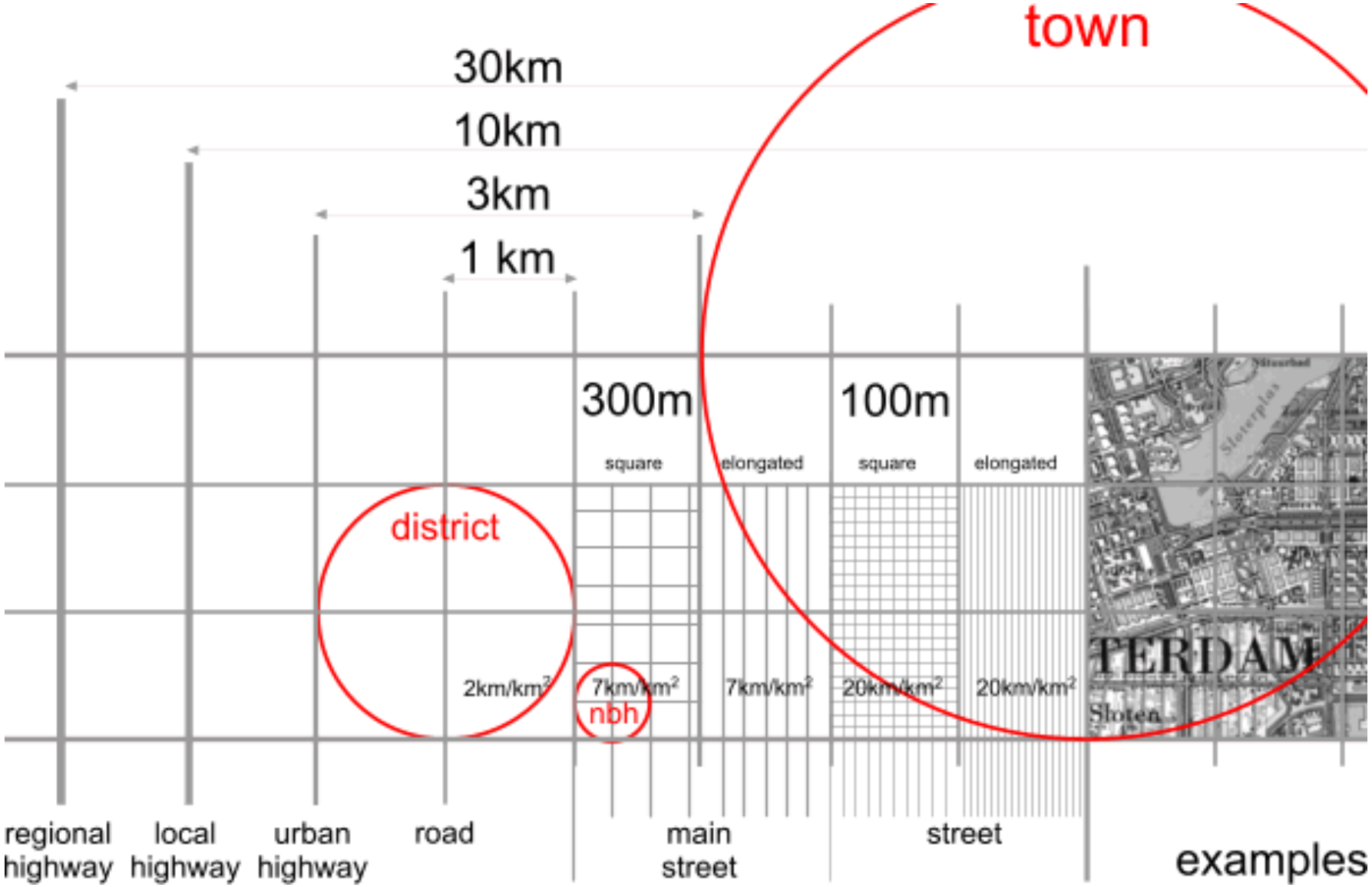
Names of networks

NETWORK		BLUE LEGEND		BLACK LEGEND	
density	mesh/ exit interval		NAME	nominal width	NAME
km/km^2	km nominally	width 1%		m	
0.002	1000	≥10000	**sea**		
0.007	300	3000	**lake**	120	**continental highway**
0.02	100	1000	**stream/pond**	100	**national highway**
0.07	30	300	**river/waterway**	80	**regional highway**
0,2	10	100	**brook/canal**	70	**local highway**
0.7	3	30	**race**	60	**urban highway**
2	1	10	**watercourse**	40	**district road**
7	0.3	3	**ditch**	30	**main street**
20	0.1	1	**small ditch**	20	**street**
70	0.03	0.3	**trench**	10	**path**

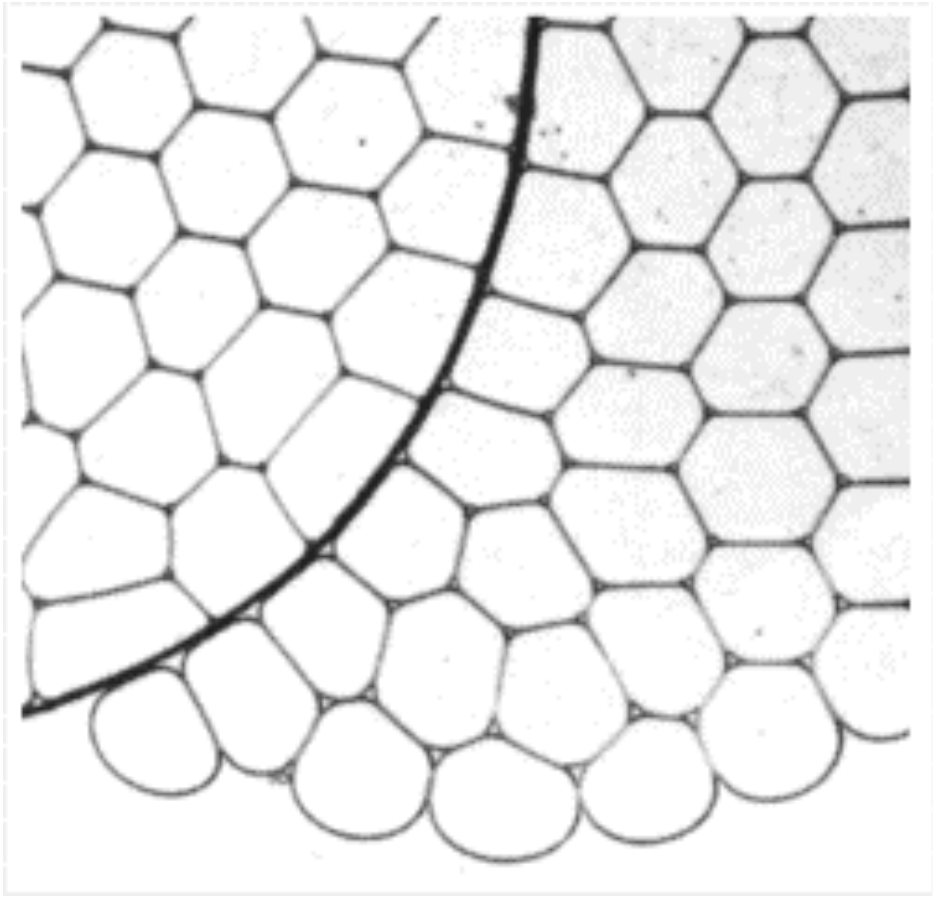
Nominal hierarchy wet connections

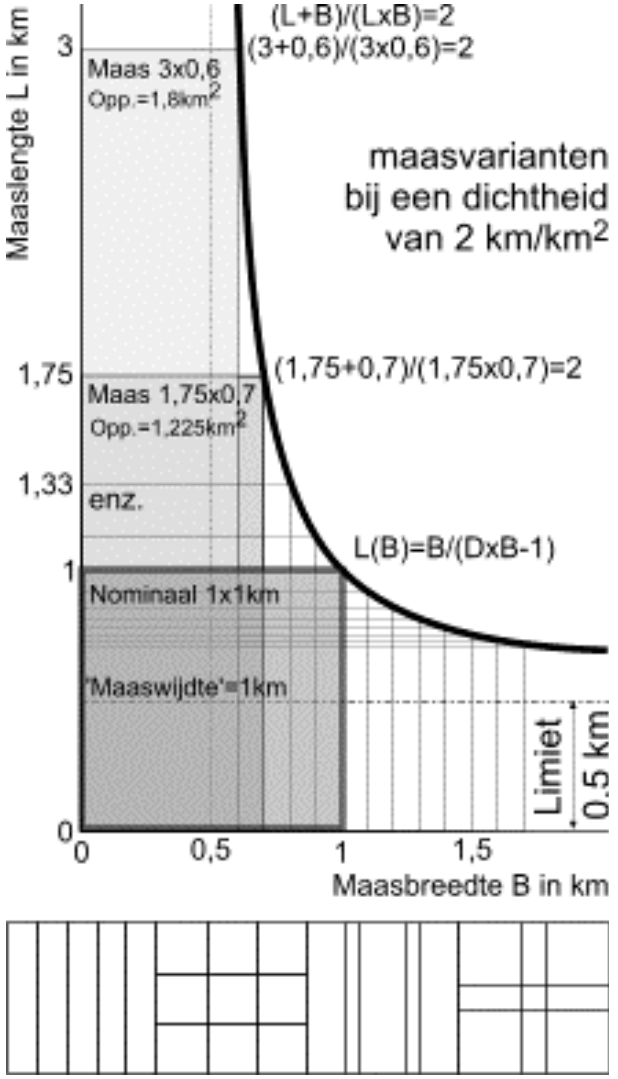


Nominal hierarchy dry connections



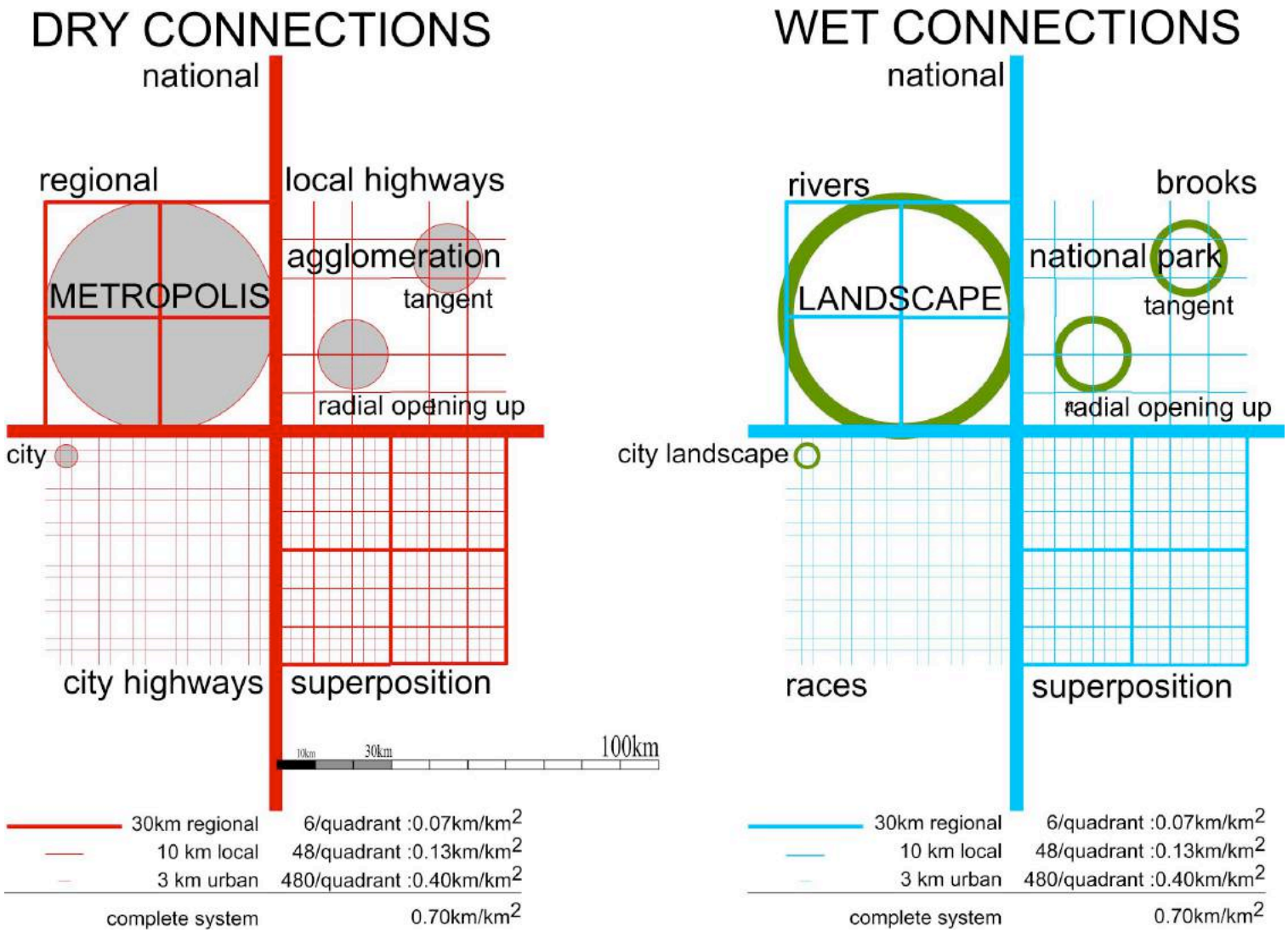
The formation of right angles



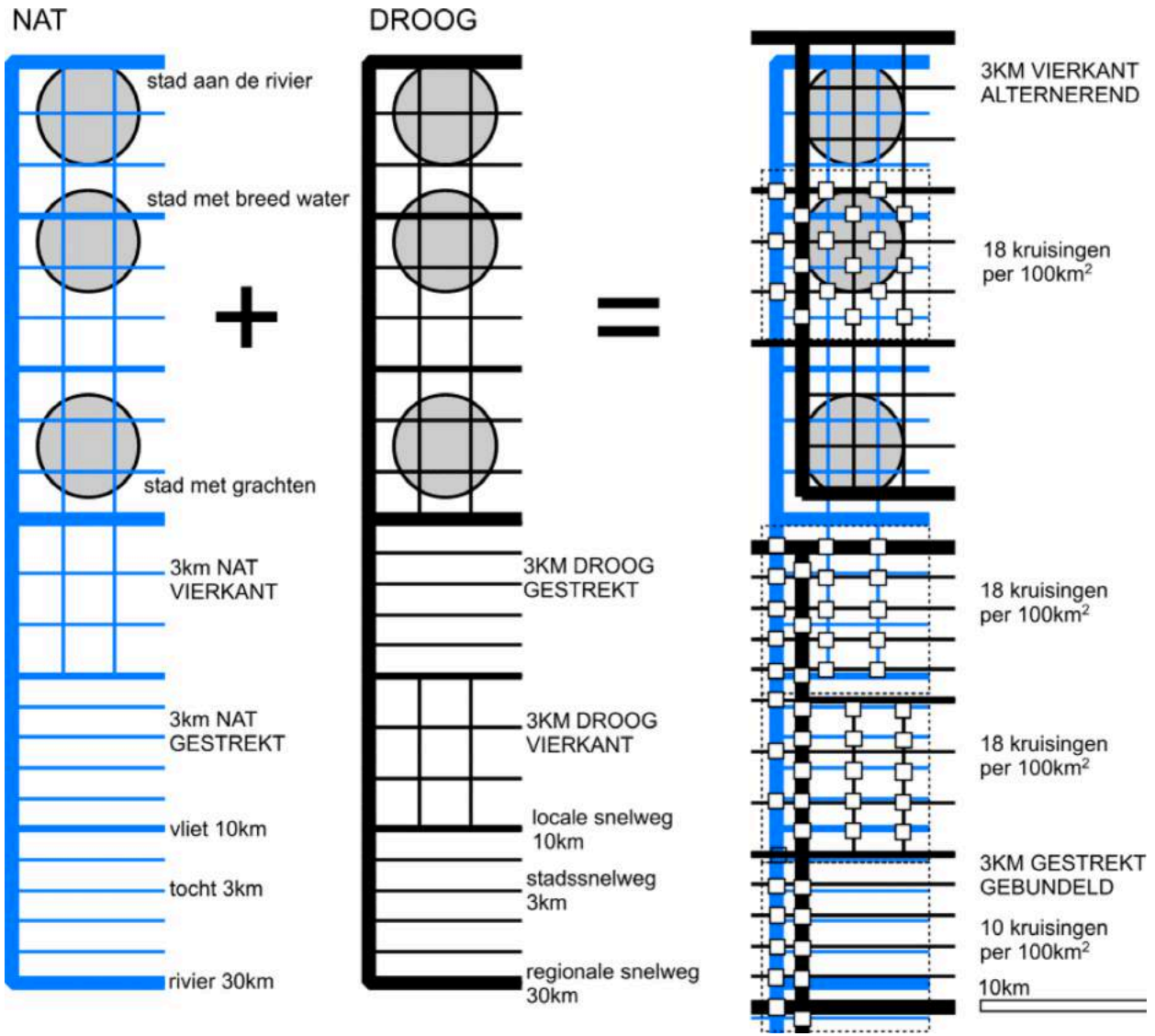


Length (L) and width (W) of the mesh for a given net density of (D=2)

Superposition of networks

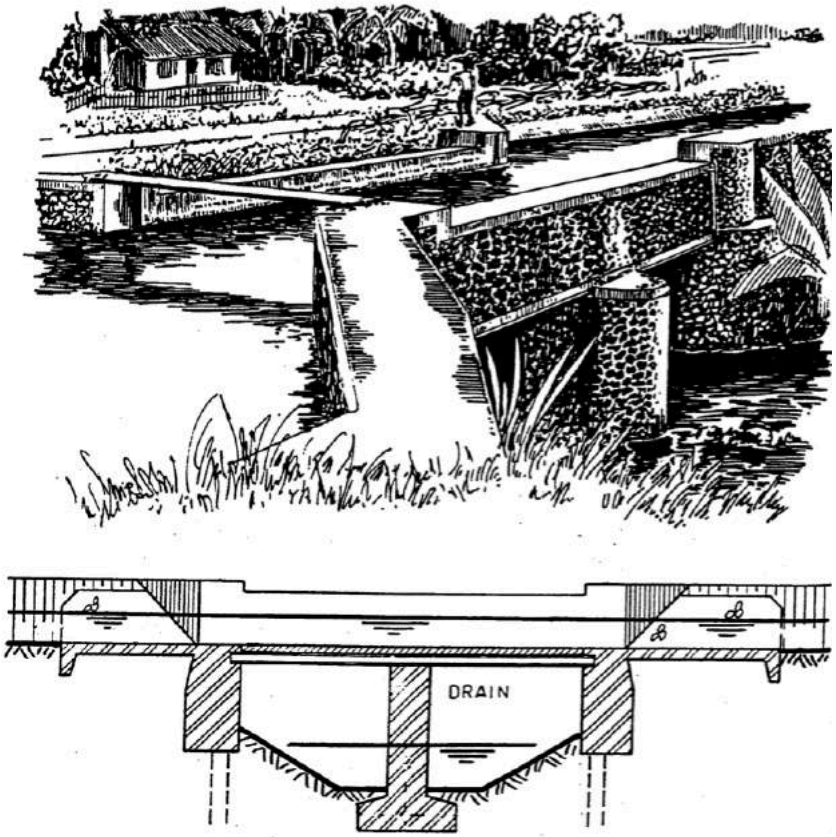


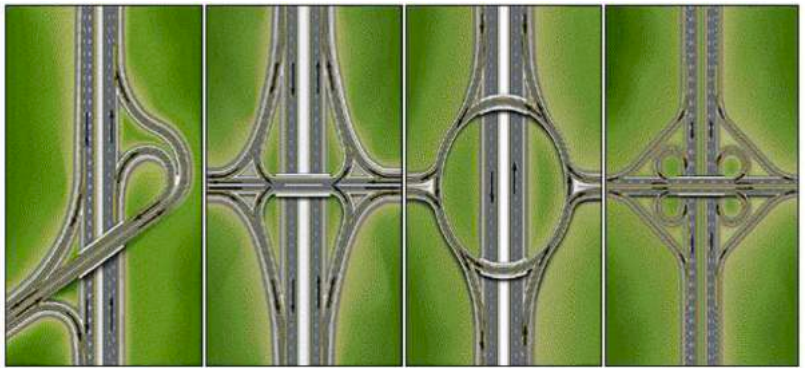
Interference of networks



Crossings

Wet and dry crossings





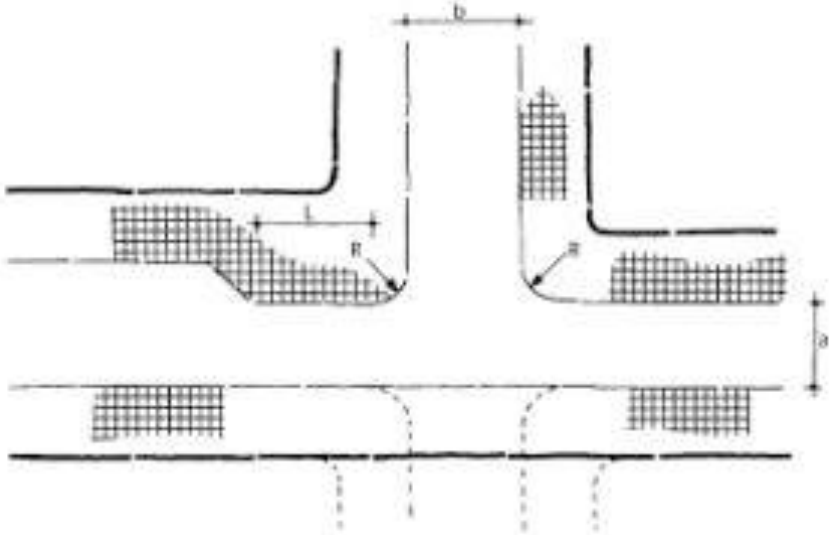
Rivers, canals and brooks

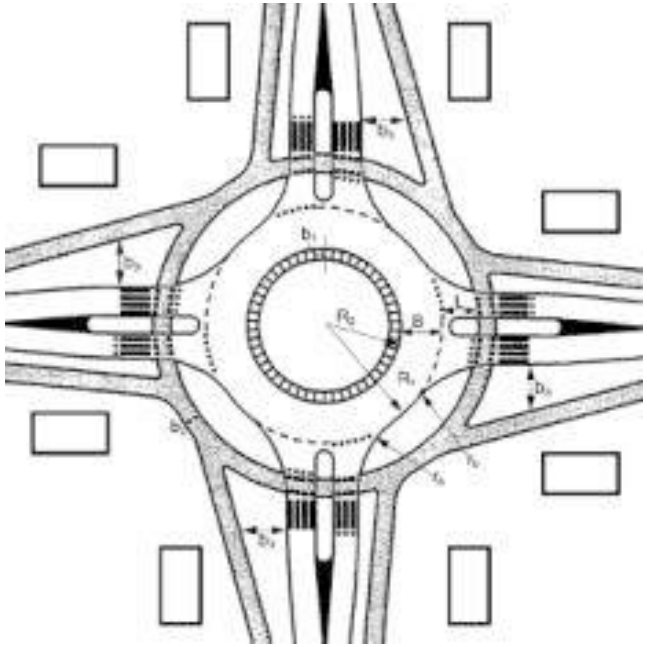
Superposition races

Interference with highways

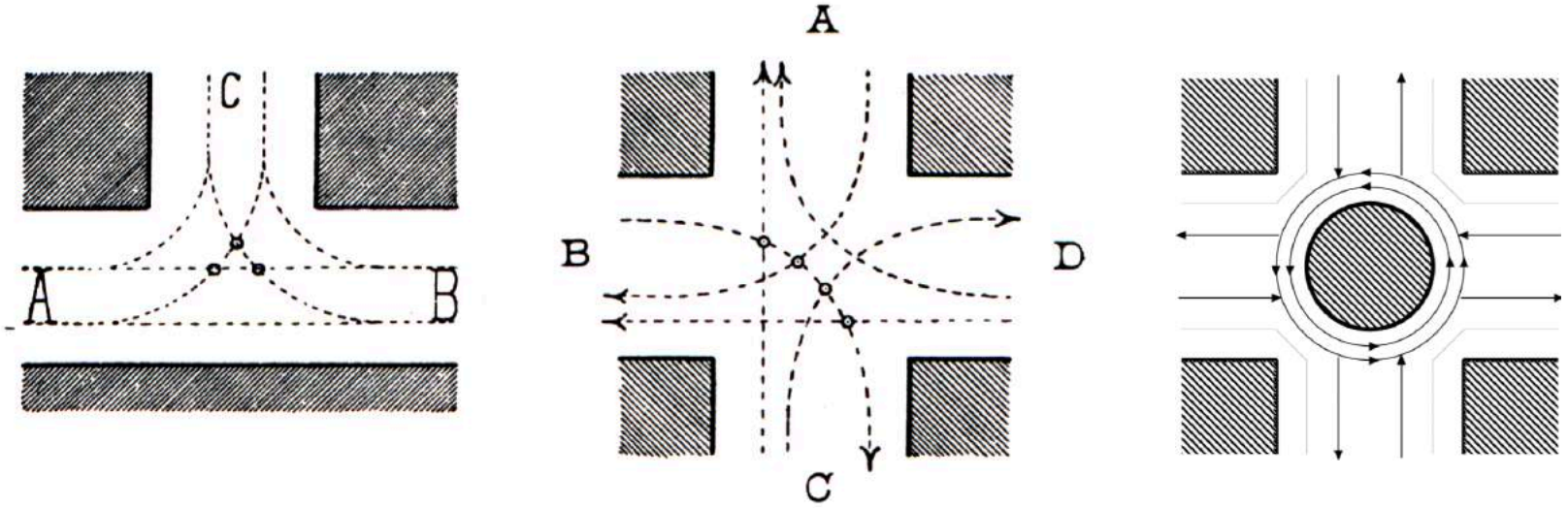
Interference highways and railways

The same kind and level

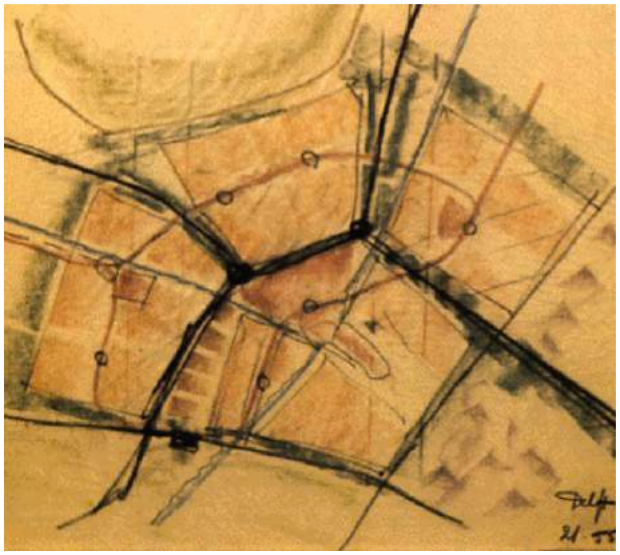




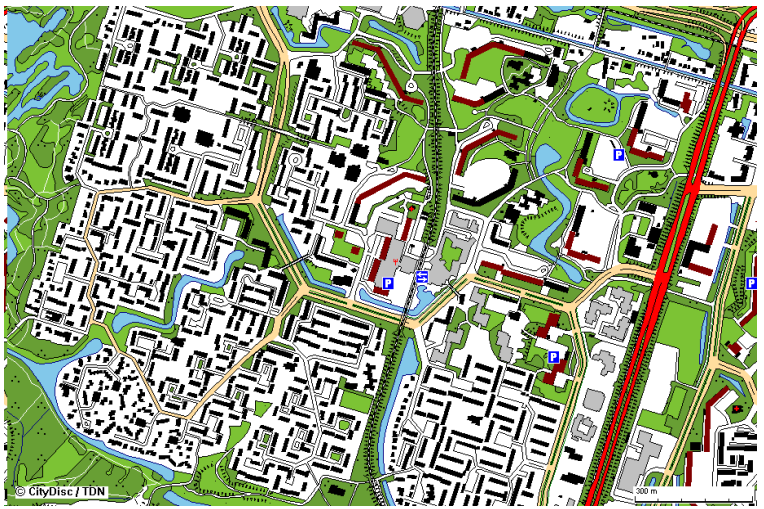
Limitating crossing movements



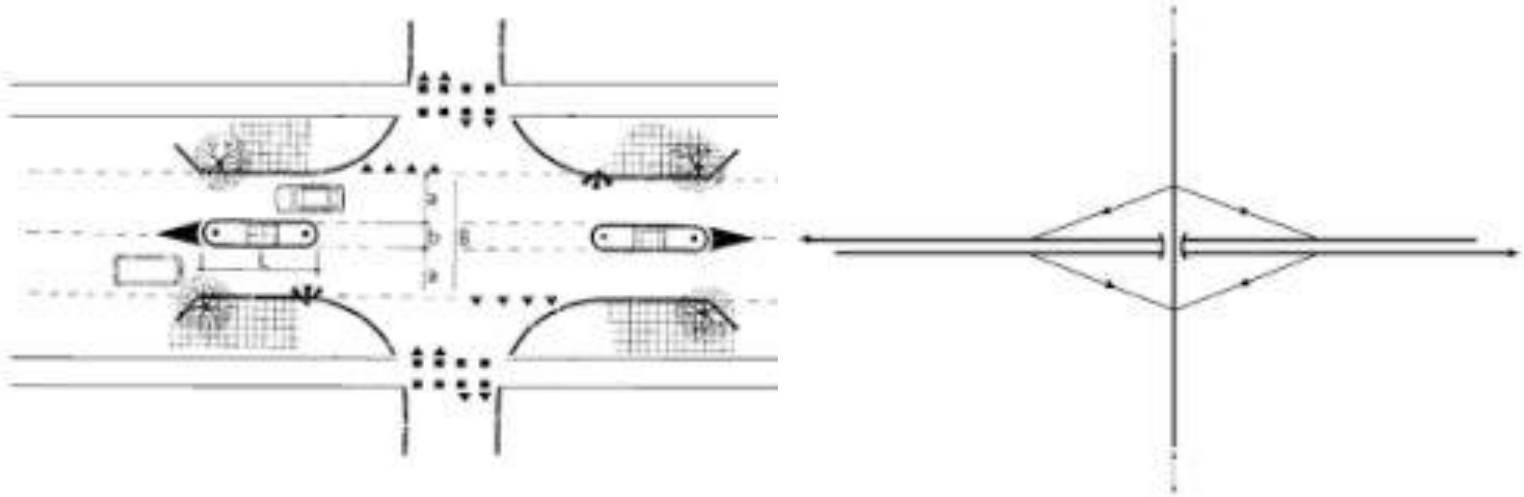
T-crossings in Zoetermeer



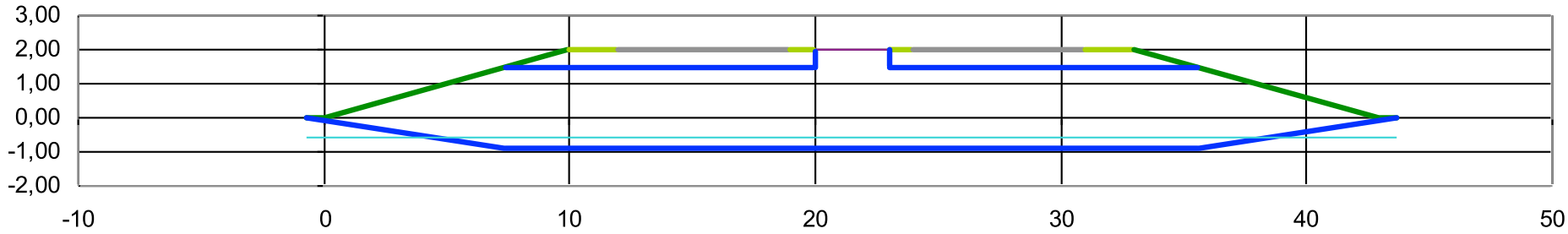
T-crossings in Meerzicht

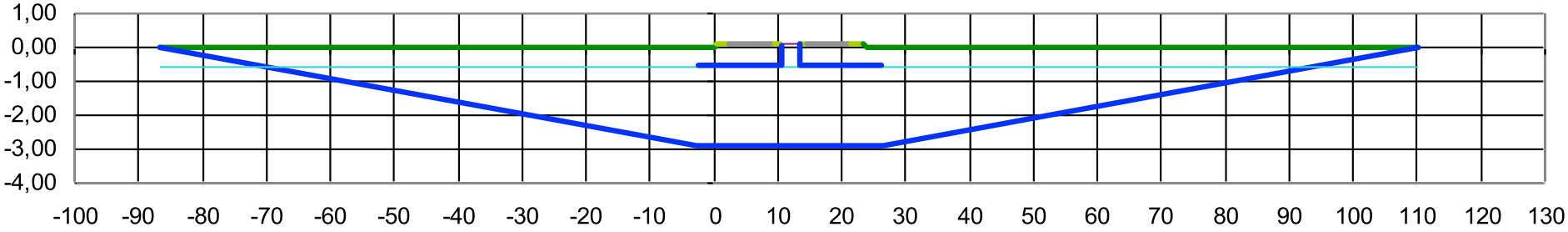


Crossings of the same kind and different level



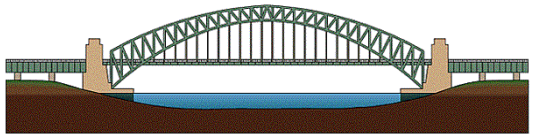
Tunnels and slopes





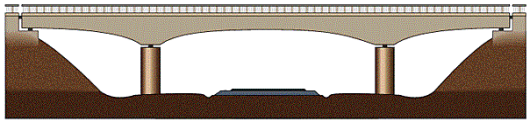
Bridges

based on pressure



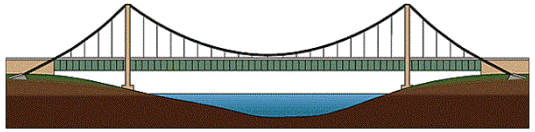
arch bridge (boogbrug)
approach ramp(aanbrug
thrust (horizontale druk)
deck (rijvloer)
trussed arch with upper and lower chord (vakwerkboog boog met boven- en onderrrand)
abutment (landhoofd)

or



beam bridge (balk- of liggerbrug)
abutment (landhoofd)
overpass, underpass (bovenkruising, onderdoorgang)
deck (brugdek)
continuous beam (doorgaande ligger)
pier (pijler)
parapet (leuning)

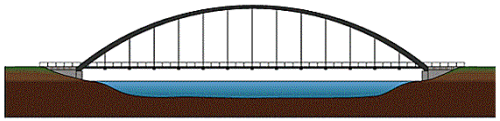
on tension



suspension bridge (hangbrug)
anchorage block (ankerblok)
suspension cable (hangkabel)
suspender (hanger)
deck (rijvloer)
center span (middenoverspanning)
tower (toren)
side span (zijoverspanning)
abutment (landhoofd)

Bridges

based on pressure

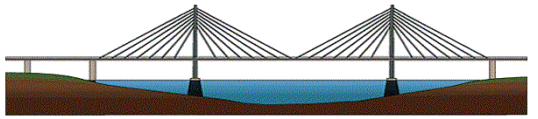


trough arch bridge (boogbrug met laaggelegen rijvloer)

or

multiple span beam bridge (balk- of liggerbrug met meer overspanningen)

on tension

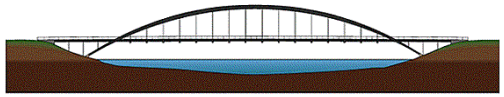


fan cable stayed bridge (waaiertuibrug)

cable stay anchorage (tuiverankering)

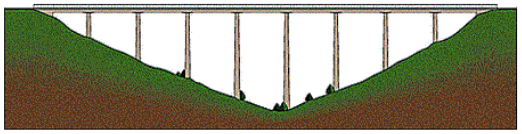
Bridges

based on pressure



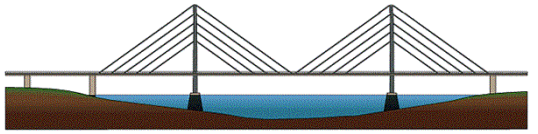
half-through arch bridge (boogbrug met tussengelegen rijvloer)

or



viaduct

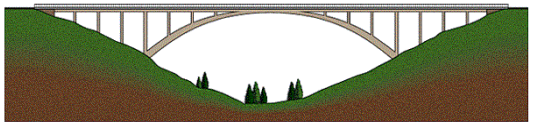
on tension



harp cable stayed bridge (harptuibrug)

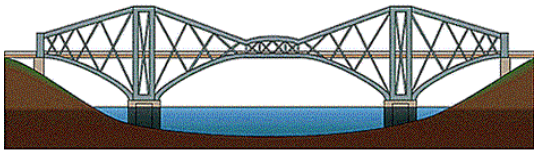
Bridges

based on pressure



deck arch bridge
(boogbrug met hooggelegen rijvloer)

or

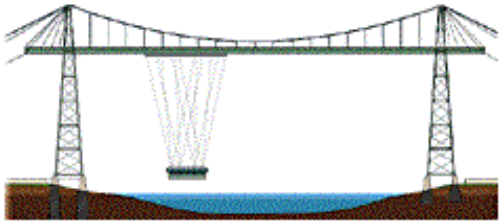


cantilever bridge
(kraagliggerbrug, cantileverbrug)

suspended span
(zwevend brugdeel)

cantilever span
(uitkragende zijoverspanning)

on tension



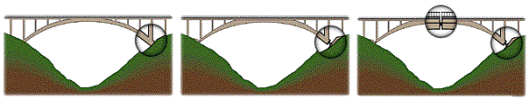
transporter bridge
(zweefbrug)

trolley (wagen)

platform
(platform)

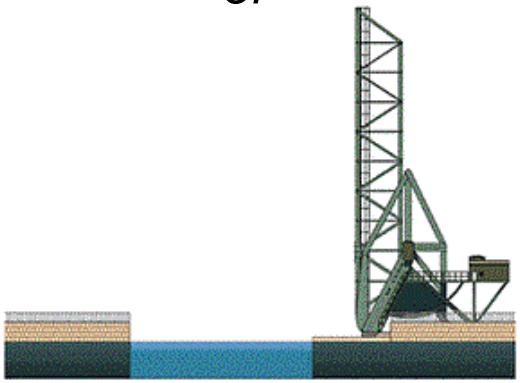
Bridges

based on pressure



fixed two-hinged three-hinged arch (ingeklemde, tweescharnier~, driescharnierboog)

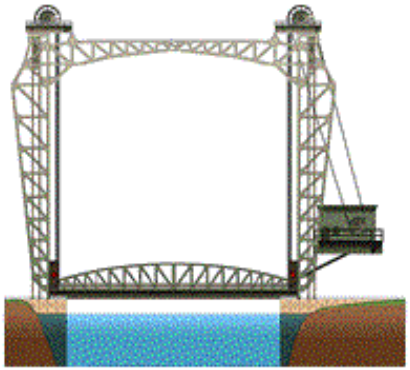
or



single-leaf bascule bridge (enkele basculebrug)

counterweight (contragewicht

on tension



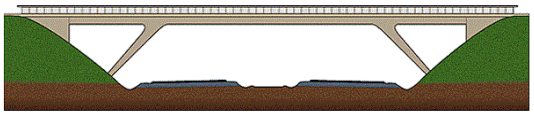
lift bridge (hefbrug)

guiding tower (heftoren)

lift span (val)

Bridges

based on pressure

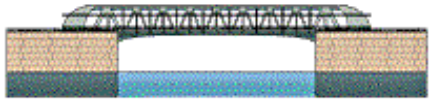


portal bridge
(schoorbrug)

portal frame
(portaal)

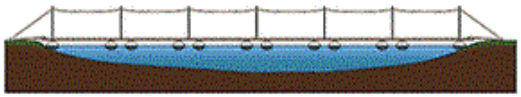
pier (pijler)

or



double-leaf
bascule bridge
(dubbele
basculebrug)

on tension

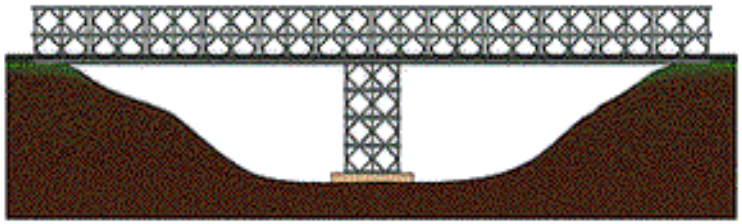


floating bridge
(pontonbrug)

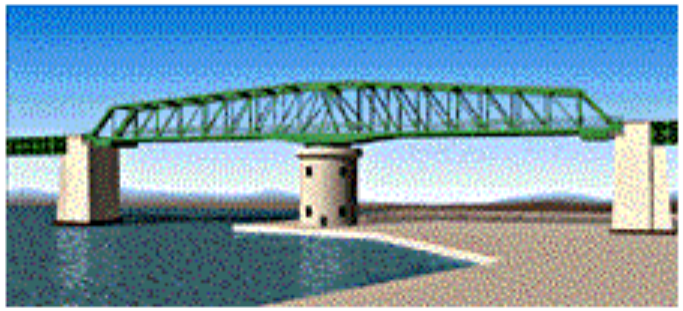
manrope
(mantouw)

pontoon
(ponton)

Bridges

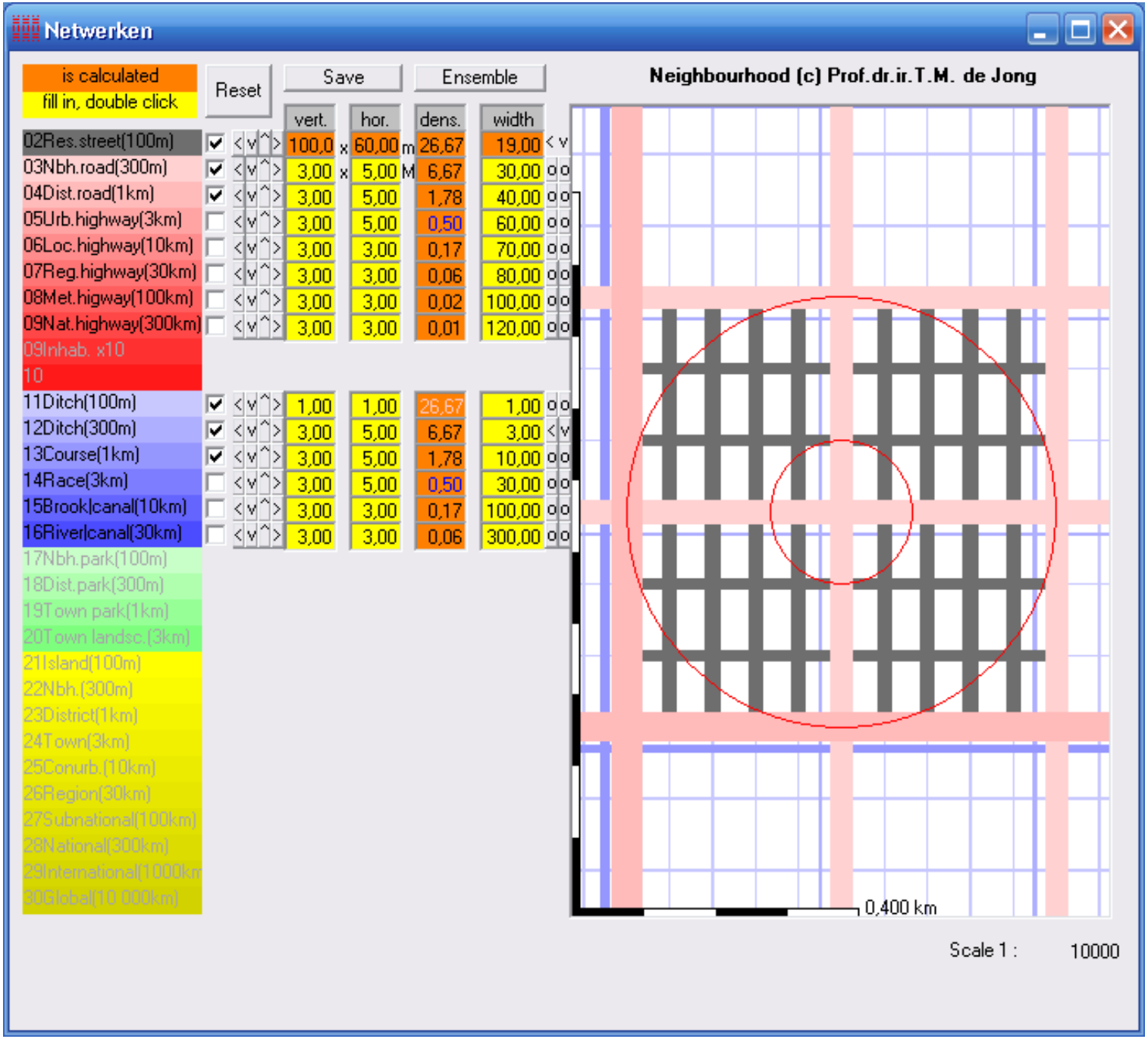


Bailey bridge (baileybrug)



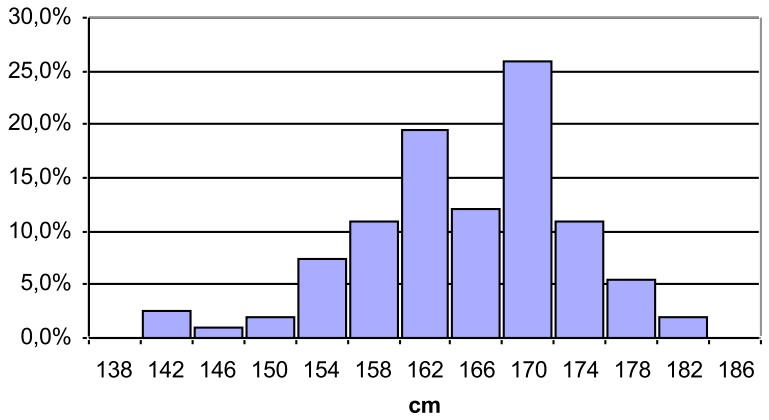
swing bridge (draaibrug)

Crossings of different kind and level

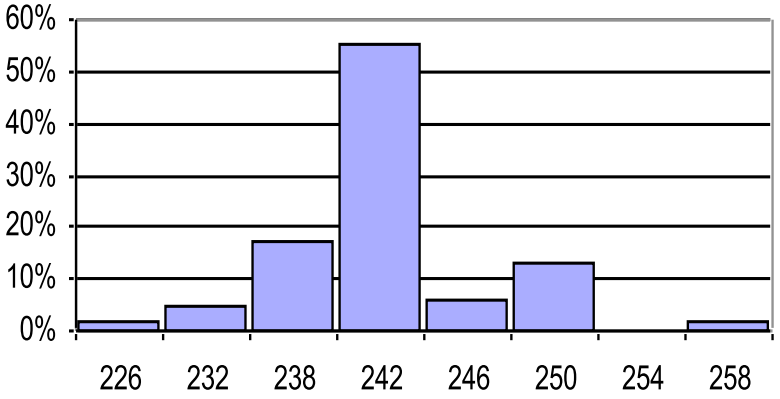

Netwerken
is calculated
fill in, double click
Reset
Save
Ensemble
Neighbourhood (c) Prof.dr.ir.T.M. de Jong
vert.
hor.
dens.
width
02Res.street(100m) 100,0 x 60,00 m 26,67 19,00
03Nbh.road(300m) 3,00 x 5,00 M 6,67 30,00
04Dist.road(1km) 3,00 5,00 1,78 40,00
05Urb.highway(3km) 3,00 5,00 0,50 60,00
06Loc.highway(10km) 3,00 3,00 0,17 70,00
07Reg.highway(30km) 3,00 3,00 0,06 80,00
08Met.higway(100km) 3,00 3,00 0,02 100,00
09Nat.highway(300km) 3,00 3,00 0,01 120,00
09Inhab. x10
10
11Ditch(100m) 1,00 1,00 26,67 1,00
12Ditch(300m) 3,00 5,00 6,67 3,00
13Course(1km) 3,00 5,00 1,78 10,00
14Race(3km) 3,00 5,00 0,50 30,00
15Brook|canal(10km) 3,00 3,00 0,17 100,00
16River|canal(30km) 3,00 3,00 0,06 300,00
17Nbh.park(100m)
18Dist.park(300m)
19Town park(1km)
20Town landsc.(3km)
21Island(100m)
22Nbh.(300m)
23District(1km)
24Town(3km)
25Conurb.(10km)
26Region(30km)
27Subnational(100km)
28National(300km)
29International(1000km
30Global(10 000km)
0,400 km
Scale 1 : 10000

Measures in traffic

Design measures are deduced from the dispersion of actual measures.
Normally the 5% largest measures are left aside for design (95 percentile).



Dispersion of real car widths in 2004; 95 percentile is 1.80m

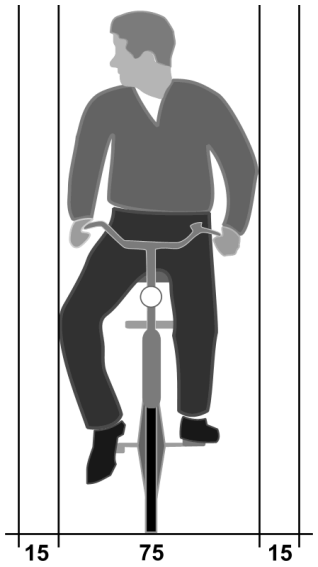


Dispersion of the width of parking places in 1980; 95 percentile is 2.50m

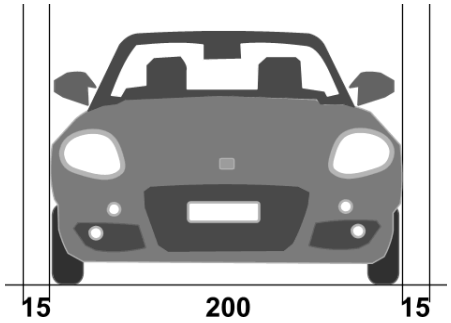
A sidewalk tile as measure of reference

Primary profile spaces needed

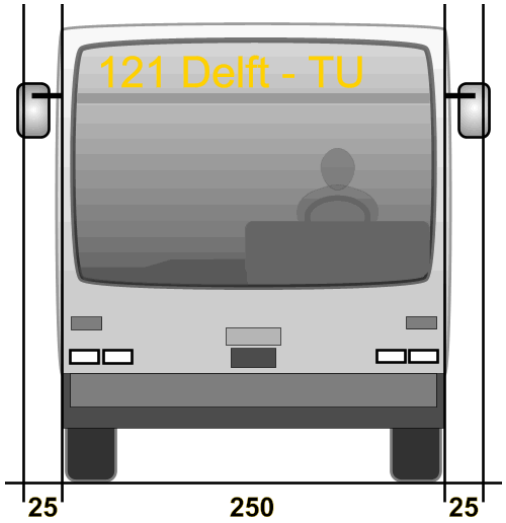
Pedestrian
50 + 2 x 5 ≅
60 cm



Cyclist
75 + 2 x 15 ≅
100 cm

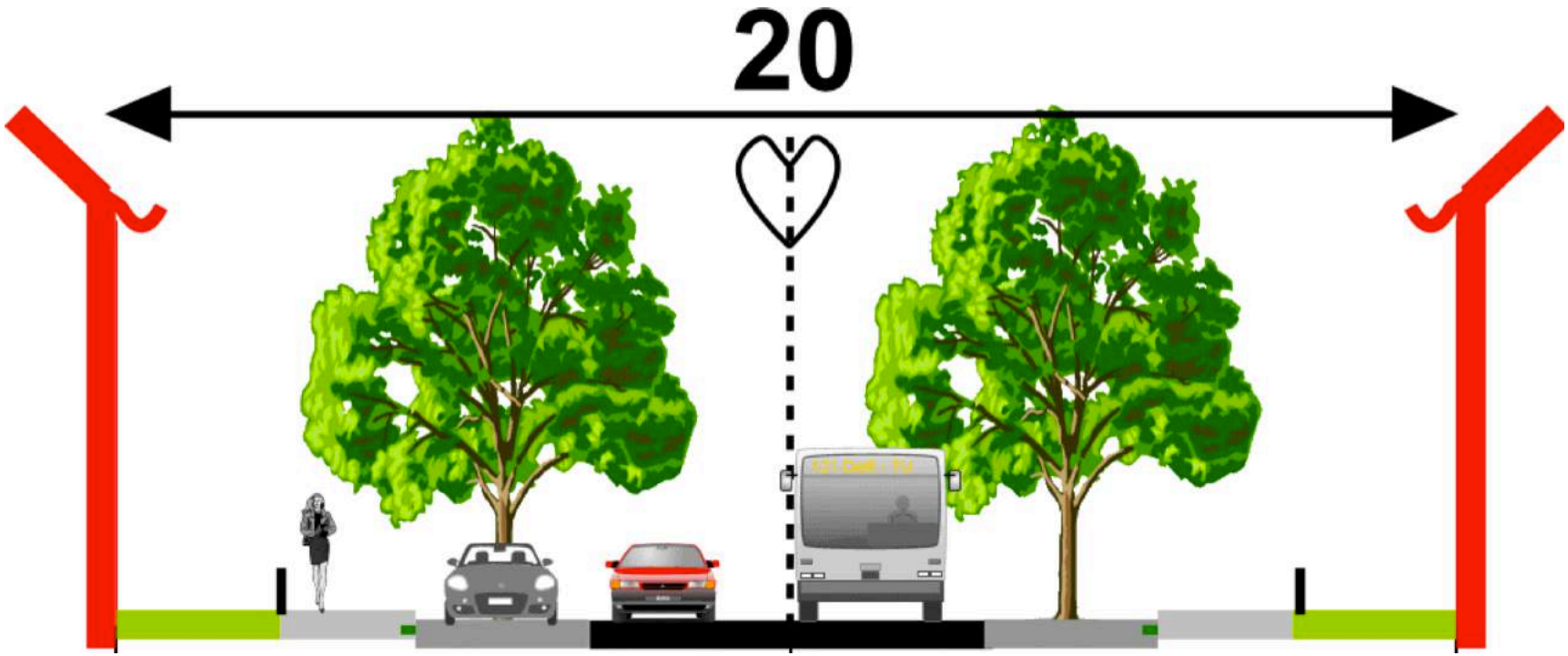


Car 30 km/h
200 + 2 x 15 ≅
230 cm



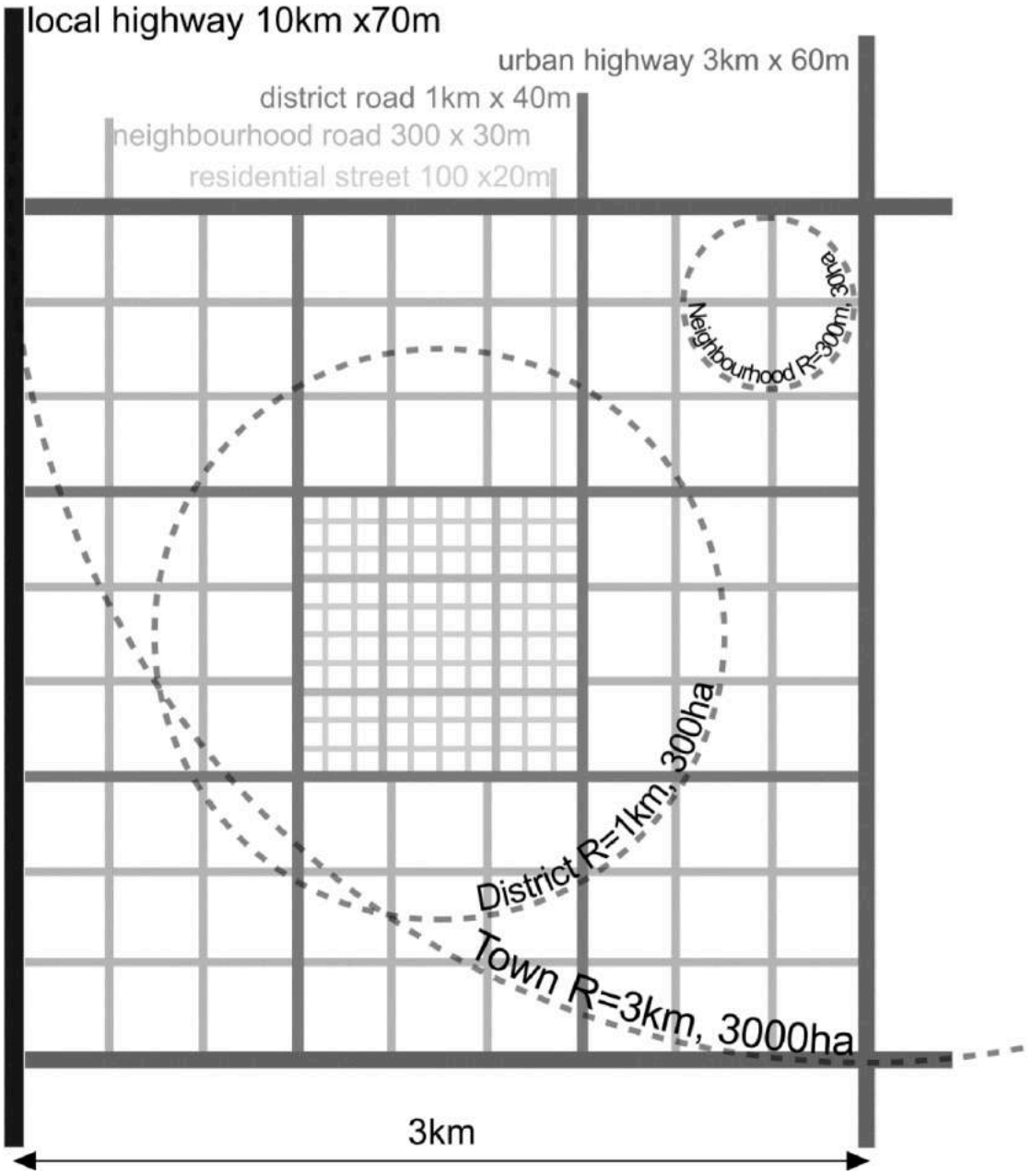
Bus 50 km/h
255 +2 x 25≅
300 cm

A residential street

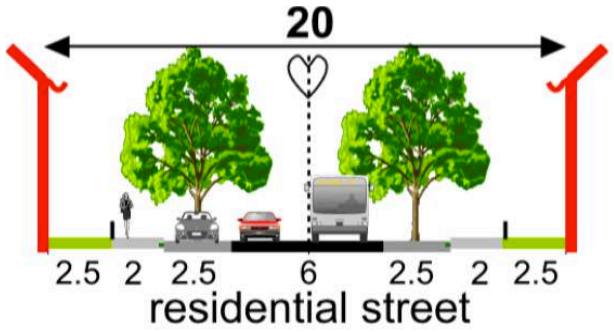


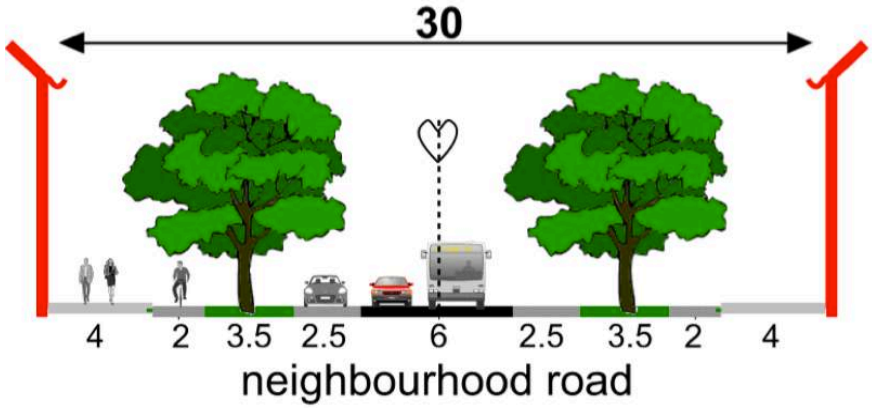
2.5 + 2 + 2.5 + 6 + 2.5 + 2 + 2.5 = 20m

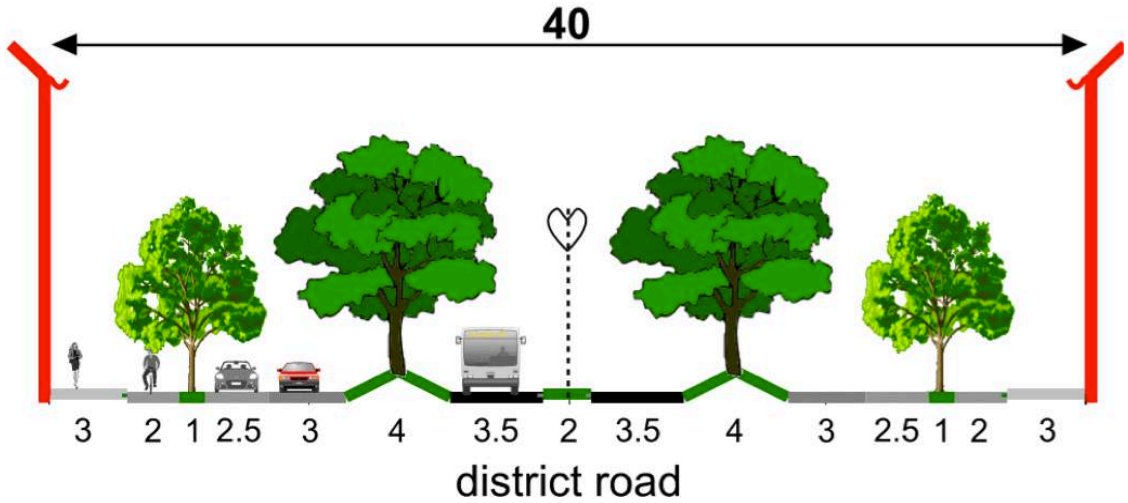
Road hierarchy



Profiles


20
2.5 2 2.5 6 2.5 2 2.5
residential street


30
4 2 3.5 2.5 6 2.5 3.5 2 4
neighbourhood road


40
3 2 1 2.5 3 4 3.5 2 3.5 4 3 2.5 1 2 3
district road

A road hierarchy

Nominal values	fill in number	green: parameters to be improved or changed							
(variable between neighbour values)	**8**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
	of road hierachy >	**residential path**	**residential street**	**neighbourhood road**	**district road**	**urban highway**	**highway**	**regional highway**	**metropolitan highway**
	metropolitan highway								
Dutch	direkt bediend gebied	metropolitaine regio	erf	ensemble	buurt	wijk	stad	agglomeratie	regio	metropolitaine regio
English	directly served area	metropolitan region	estate	ensemble	neighbourhood	district	town	conurbation	region	metropolitan region
m radius | mesh | turn distance		**30000**	**30**	**100**	**300**	**1000**	**3000**	**10000**	**30000**	**30000**
	directly served inhabitants	10000000	10	100	1000	10000	100000	1000000	2000000	10000000
	number of dwelling layers	10	1	2	3	4	6	7	8	10

The urban area around Dordrecht

Papendrecht detail

A central Dordrecht detail

Dordrecht some 350 years ago

Managing surface

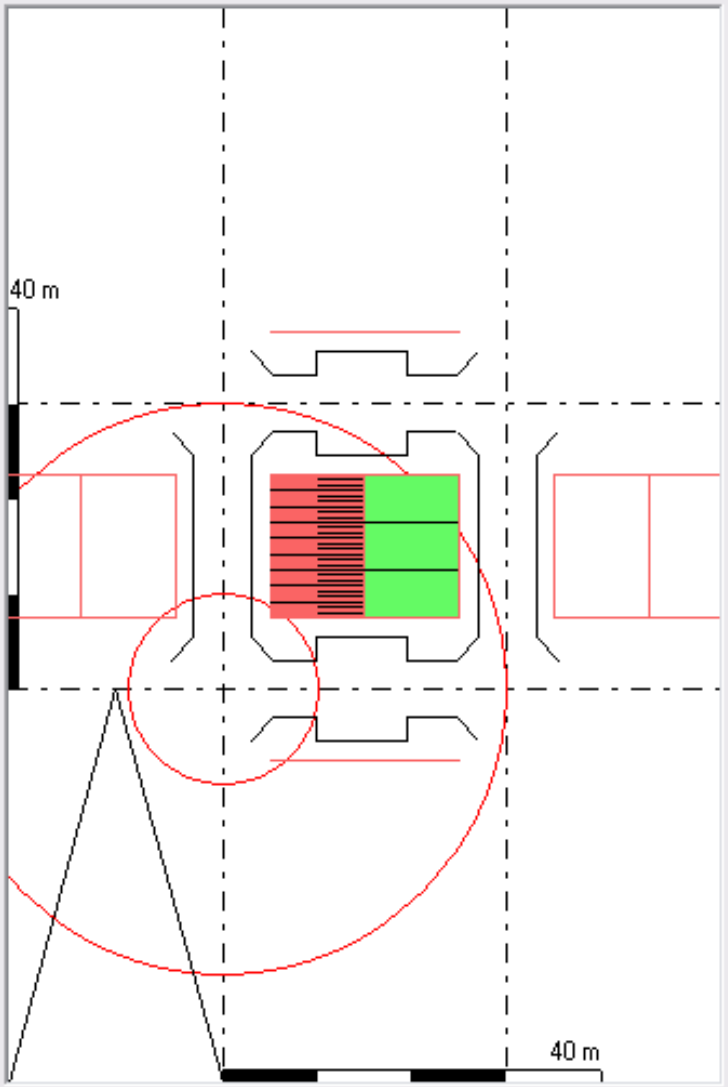
Standaardverkaveling

fill in, dubbleclick
is calculated

Save | Neighbourhood

Ensemble (c) Prof.dr.ir.T.M. de Jong

	left	above	right	below
01 Plot surface (m2)	100,00	0,00	0,00	0,00
02 G.floor surface (m2)	50,00	0,00	0,00	0,00
03 Number of storeys	2,00	2,00	2,00	2,00
04 Roof height (m)	3,00	3,00	3,00	3,00
05 House width(m)	5,00	5,00	5,00	5,00
06 Number of plots/block	3,00	4,00	3,00	4,00
07 Width garden aside(m)	0,00	0,00	0,00	0,00
08 Length block + gard.(m)	15,00	20,00	15,00	20,00
09 House depth(m)	10,00	0,00	0,00	0,00
10 House volume (m3)	345,00	0,00	0,00	0,00
11 Floor space (m2)	120,00	0,00	0,00	0,00
12 Plot length(m)	20,00	0,00	0,00	0,00
13 Tot. length garden (m)	10,00	0,00	0,00	0,00
14 Rear garden(m)	10,00	0,00	0,00	0,00
15 Front garden(m)	0,00	0,00	0,00	0,00
16 Width ped.pavement (m)	2,00	2,00	2,00	2,00
17 Width green verge(m2)	0,00	0,00	0,00	0,00
18 Width parking space (m)	0,00	2,50	0,00	2,50
19 Width street (m)	6,00	6,00	6,00	6,00
20 Path round the back (m)	0,00	0,00	0,00	0,00
21 Plot depth (m)	25,00	7,50	5,00	7,50
22 Total surface (ha)	0,04	0,02	0,01	0,02
23 Density(houses/ha)	80,00	0,00	0,00	0,00
24 Common green fields(m2)	0,00	9,75	0,00	9,75
25 Paved area(m2)	75,00	440,25	75,00	440,25
26 C.green per house(m2)	0,00	0,00	0,00	0,00
27 Paved per house (m2)	25,00	0,00	0,00	0,00
28 Floor density(m2/m2)	0,96	0,00	0,00	0,00
29 Number of houses	3,00	0,00	0,00	0,00
30 N. of parking spaces	0,00	2,00	0,00	2,00



Number of houses 3 Density 33,33 houses/ha. FSI 0,40 Surface: 30,00 m x 30,00 m = 0,09 ha. Scale1 : 1000

PER HOUSE 1,33 parking spaces; 100,00 m2 for sale; 6,50 m2 green; 343,5m2 paved area; i.e. resp. 22 ; 1 and 76 %.

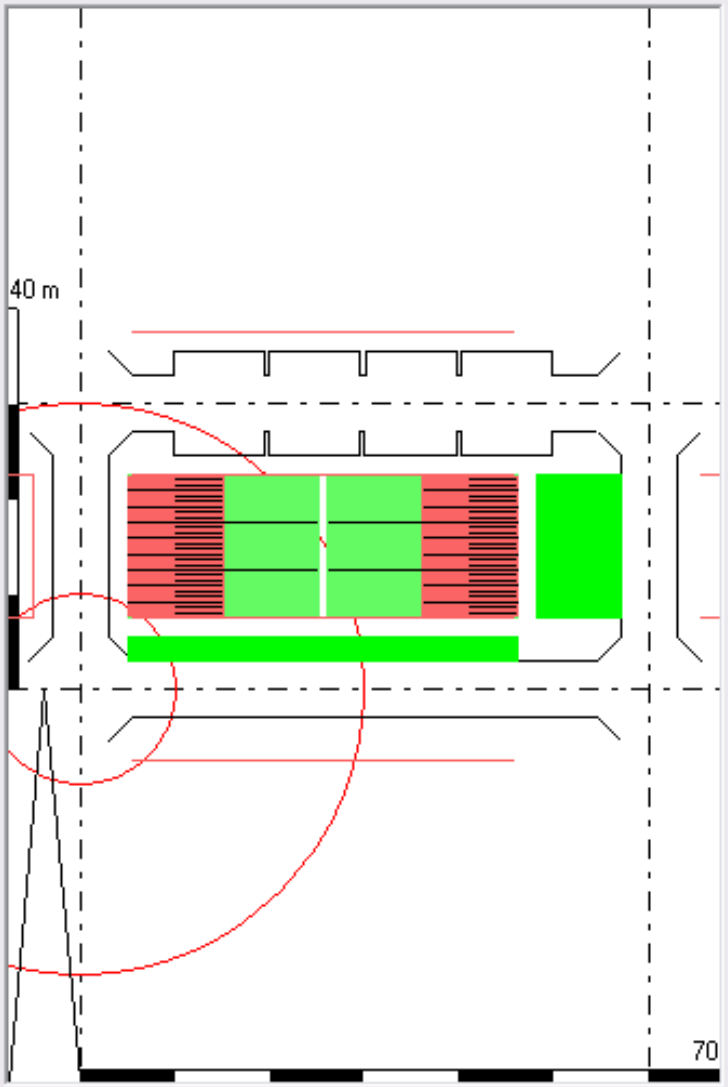
Standaardverkaveling

fill in, dubbleclick
is calculated

Save | Neighbourhood

	left	above	right	below
01 Plot surface (m2)	100,00	0,00	100,00	0,00
02 G.floor surface (m2)	50,00	0,00	50,00	0,00
03 Number of storeys	2,00	2,00	2,00	2,00
04 Roof height (m)	3,00	3,00	3,00	3,00
05 House width(m)	5,00	5,00	5,00	5,00
06 Number of plots/block	3,00	8,00	3,00	8,00
07 Width garden aside(m)	0,00	0,50	0,00	0,50
08 Length block + gard.(m)	15,00	41,00	15,00	41,00
09 House depth(m)	10,00	0,00	10,00	0,00
10 House volume (m3)	345,00	0,00	345,00	0,00
11 Floor space (m2)	120,00	0,00	120,00	0,00
12 Plot length(m)	20,00	0,00	20,00	0,00
13 Tot. length garden (m)	10,00	0,00	10,00	0,00
14 Rear garden(m)	10,00	0,00	10,00	0,00
15 Front garden(m)	0,00	0,00	0,00	0,00
16 Width ped.pavement (m)	2,00	2,00	2,00	2,00
17 Width green verge(m2)	0,00	0,00	9,00	2,50
18 Width parking space (m)	0,00	2,50	0,00	0,00
19 Width street (m)	6,00	6,00	6,00	6,00
20 Path round the back (m)	1,00	0,00	1,00	0,00
21 Plot depth (m)	25,50	7,50	34,50	7,50
22 Total surface (ha)	0,04	0,05	0,05	0,05
23 Density(houses/ha)	78,43	0,00	57,97	0,00
24 Common green fields(m2)	0,00	27,00	135,00	148,00
25 Paved area(m2)	75,00	888,25	75,00	792,50
26 C.green per house(m2)	0,00	0,00	45,00	0,00
27 Paved per house (m2)	25,00	0,00	25,00	0,00
28 Floor density(m2/m2)	0,94	0,00	0,70	0,00
29 Number of houses	3,00	0,00	3,00	0,00
30 N. of parking spaces	0,00	8,00	0,00	0,00

Ensemble (c) Prof.dr.ir.T.M. de Jong



Number of houses 6 Density 33,33 houses/ha. FSI 0,40 Surface: 30,00 m x 60,00 m = 0,18 ha. Scale1 : 1000

PER HOUSE 1,33 parking spaces; 100,00 m2 for sale; 51,67 m2 green; 305,1 m2 paved area; i.e. resp. 22 ; 11 and 67 %.

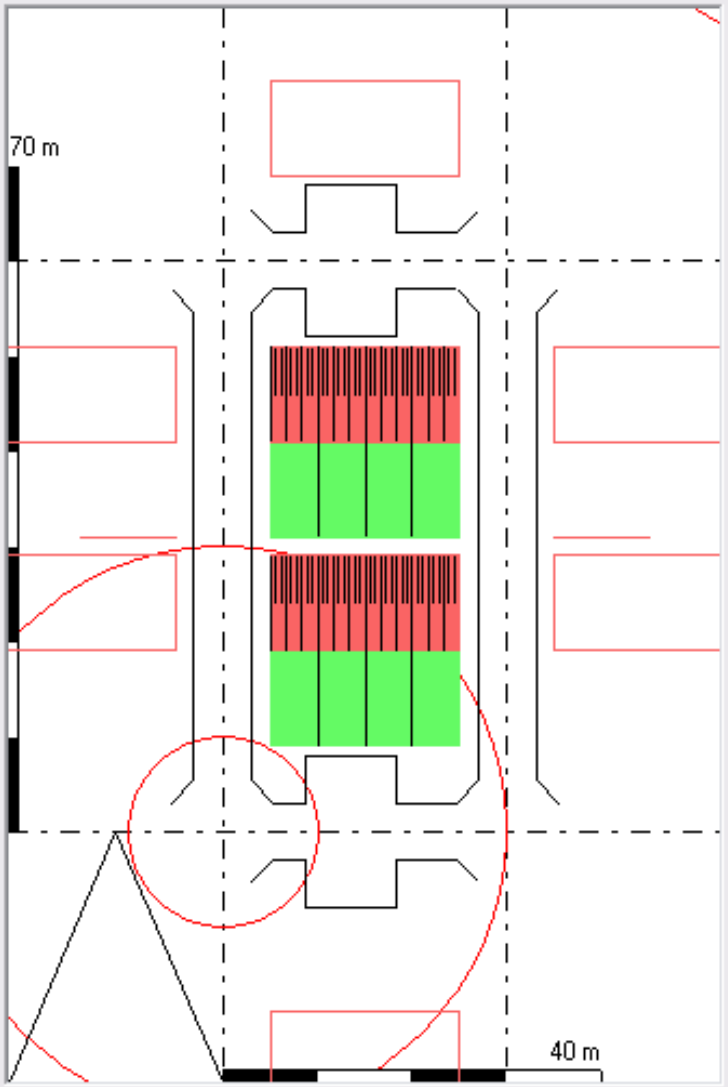
Standaardverkaveling

fill in, dubbleclick
is calculated

Save | Neighbourhood

Ensemble (c) Prof.dr.ir.T.M. de Jong

	left	above	right	below
01 Plot surface (m2)	50,00	100,00	50,00	100,00
02 G.floor surface (m2)	50,00	50,00	50,00	50,00
03 Number of storeys	2,00	2,00	2,00	2,00
04 Roof height (m)	3,00	3,00	3,00	3,00
05 House width(m)	5,00	5,00	5,00	5,00
06 Number of plots/block	0,00	4,00	0,00	4,00
07 Width garden aside(m)	0,00	0,00	0,00	0,00
08 Length block + gard.(m)	0,00	20,00	0,00	20,00
09 House depth(m)	10,00	10,00	10,00	10,00
10 House volume (m3)	345,00	345,00	345,00	345,00
11 Floor space (m2)	120,00	120,00	120,00	120,00
12 Plot length(m)	10,00	20,00	10,00	20,00
13 Tot. length garden (m)	0,00	10,00	0,00	10,00
14 Rear garden(m)	0,00	10,00	0,00	0,00
15 Front garden(m)	0,00	0,00	0,00	10,00
16 Width ped.pavement (m)	2,00	1,00	2,00	1,00
17 Width green verge(m2)	0,00	0,00	0,00	0,00
18 Width parking space (m)	0,00	5,00	0,00	5,00
19 Width street (m)	6,00	6,00	6,00	6,00
20 Path round the back (m)	0,00	0,00	0,00	2,00
21 Plot depth (m)	15,00	29,00	15,00	30,00
22 Total surface (ha)	0,00	0,09	0,00	0,09
23 Density(houses/ha)	0,00	45,98	0,00	44,44
24 Common green fields(m2)	0,00	6,88	0,00	6,88
25 Paved area(m2)	5,00	733,13	5,00	763,13
26 C.green per house(m2)	0,00	1,72	0,00	1,72
27 Paved per house (m2)	0,00	183,28	0,00	190,78
28 Floor density(m2/m2)	0,00	0,55	0,00	0,53
29 Number of houses	0,00	4,00	0,00	4,00
30 N. of parking spaces	0,00	5,00	0,00	5,00



Number of houses 8 Density 44,44 houses/ha. FSI 0,53 Surface: 60,00 m x 30,00 m = 0,18 ha. Scale1 : 1000

PER HOUSE 1,25 parking spaces; 100,00 m2 for sale; 1,72 m2 green; 188,2!m2 paved area; i.e. resp. 34 ; 1 and 65 %.

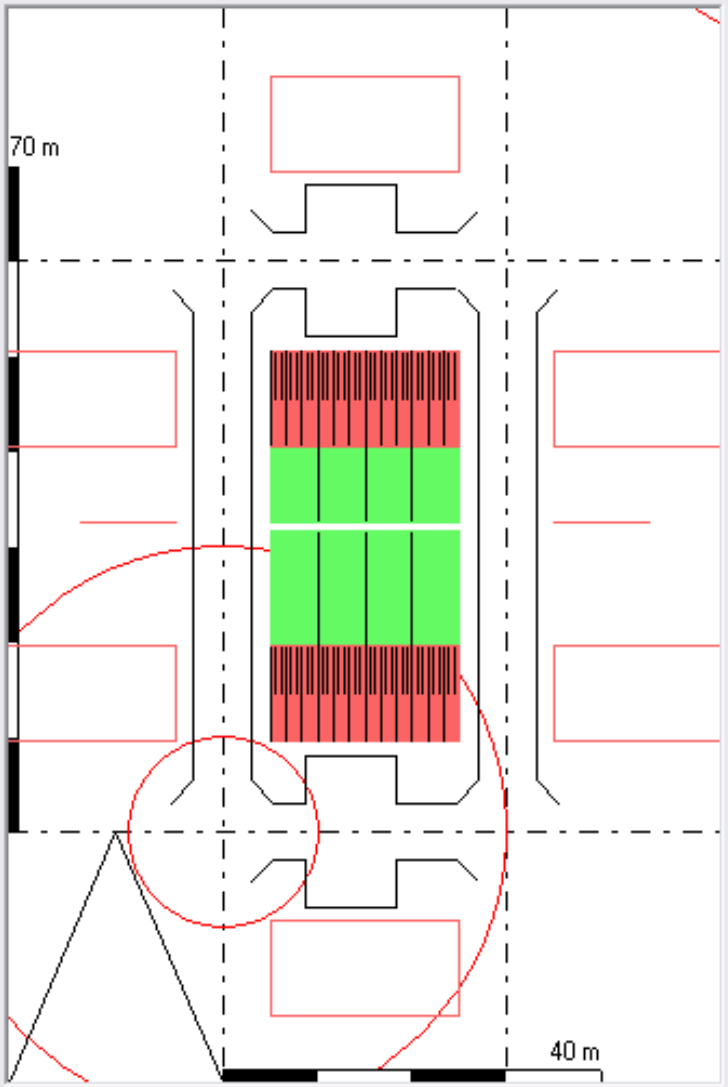
Standaardverkaveling

fill in, dubbleclick
is calculated

Save | Neighbourhood

Ensemble (c) Prof.dr.ir.T.M. de Jong

	left	above	right	below
01 Plot surface (m2)	50,00	90,00	50,00	110,00
02 G.floor surface (m2)	50,00	50,00	50,00	50,00
03 Number of storeys	2,00	2,00	2,00	2,00
04 Roof height (m)	3,00	3,00	3,00	3,00
05 House width(m)	5,00	5,00	5,00	5,00
06 Number of plots/block	0,00	4,00	0,00	4,00
07 Width garden aside(m)	0,00	0,00	0,00	0,00
08 Length block + gard.(m)	0,00	20,00	0,00	20,00
09 House depth(m)	10,00	10,00	10,00	10,00
10 House volume (m3)	345,00	345,00	345,00	345,00
11 Floor space (m2)	120,00	120,00	120,00	120,00
12 Plot length(m)	10,00	18,00	10,00	22,00
13 Tot. length garden (m)	0,00	8,00	0,00	12,00
14 Rear garden(m)	0,00	8,00	0,00	12,00
15 Front garden(m)	0,00	0,00	0,00	0,00
16 Width ped.pavement (m)	2,00	1,50	2,00	1,50
17 Width green verge(m2)	0,00	0,00	0,00	0,00
18 Width parking space (m)	0,00	5,00	0,00	5,00
19 Width street (m)	6,00	6,00	6,00	6,00
20 Path round the back (m)	0,00	0,00	0,00	1,00
21 Plot depth (m)	15,00	27,50	15,00	32,00
22 Total surface (ha)	0,00	0,08	0,00	0,10
23 Density(houses/ha)	0,00	48,48	0,00	41,67
24 Common green fields(m2)	0,00	6,88	0,00	6,88
25 Paved area(m2)	2,50	743,13	2,50	798,13
26 C.green per house(m2)	0,00	1,72	0,00	1,72
27 Paved per house (m2)	0,00	185,78	0,00	199,53
28 Floor density(m2/m2)	0,00	0,58	0,00	0,50
29 Number of houses	0,00	4,00	0,00	4,00
30 N. of parking spaces	0,00	5,00	0,00	5,00



Number of houses 8 Density 44,44 houses/ha. FSI 0,53 Surface: 60,00 m x 30,00 m = 0,18 ha. Scale1 : 1000

PER HOUSE 1,25 parking spaces; 100,00 m2 for sale; 1,72 m2 green; 193,2!m2 paved area; i.e. resp. 34 ; 1 and 66 %.

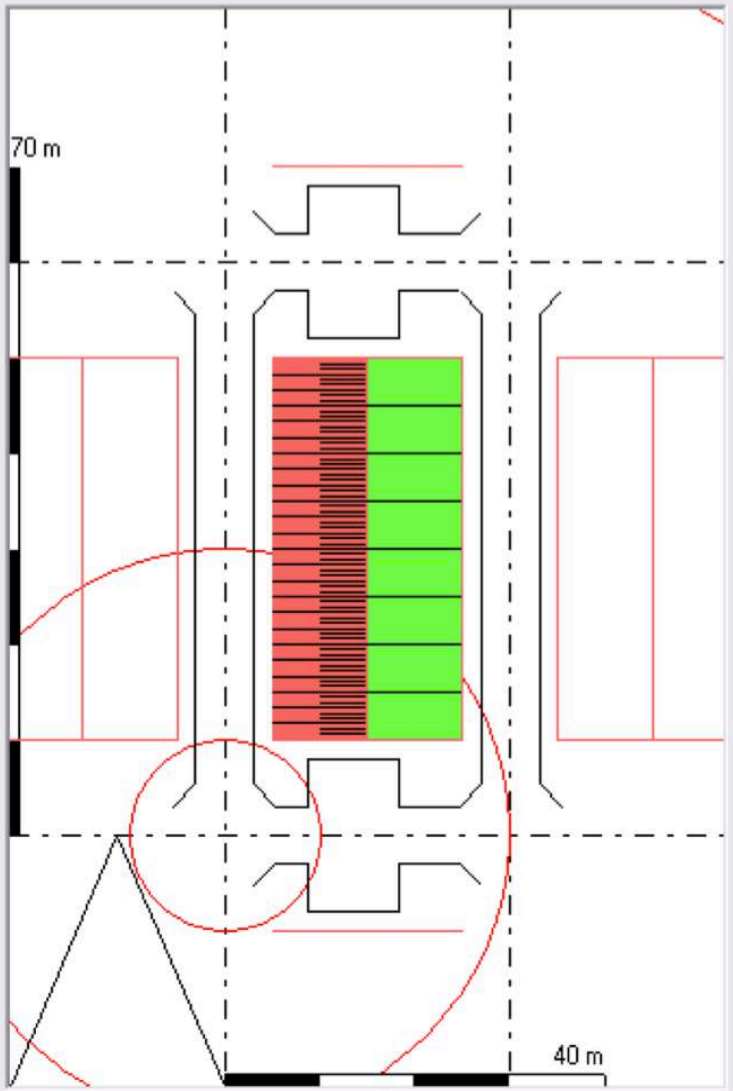
Standaardverkaveling

fill in, dubbleclick
is calculated

Save | Neighbourhood

	left	above	right	below
01 Plot surface (m2)	100,00	0,00	0,00	0,00
02 G.floor surface (m2)	50,00	0,00	0,00	0,00
03 Number of storeys	2,00	2,00	2,00	2,00
04 Roof height (m)	3,00	3,00	3,00	3,00
05 House width(m)	5,00	5,00	5,00	5,00
06 Number of plots/block	8,00	4,00	8,00	4,00
07 Width garden aside(m)	0,00	0,00	0,00	0,00
08 Length block + gard.(m)	40,00	20,00	40,00	20,00
09 House depth(m)	10,00	0,00	0,00	0,00
10 House volume (m3)	345,00	0,00	0,00	0,00
11 Floor space (m2)	120,00	0,00	0,00	0,00
12 Plot length(m)	20,00	0,00	0,00	0,00
13 Tot. length garden (m)	10,00	0,00	0,00	0,00
14 Rear garden(m)	10,00	0,00	0,00	0,00
15 Front garden(m)	0,00	0,00	0,00	0,00
16 Width ped.pavement (m)	2,00	2,00	2,00	2,00
17 Width green verge(m2)	0,00	0,00	0,00	0,00
18 Width parking space (m)	0,00	5,00	0,00	5,00
19 Width street (m)	6,00	6,00	6,00	6,00
20 Path round the back (m)	0,00	0,00	0,00	0,00
21 Plot depth (m)	25,00	10,00	5,00	10,00
22 Total surface (ha)	0,10	0,03	0,02	0,03
23 Density(houses/ha)	80,00	0,00	0,00	0,00
24 Common green fields(m2)	0,00	6,88	0,00	6,88
25 Paved area(m2)	200,00	593,13	200,00	593,13
26 C.green per house(m2)	0,00	0,00	0,00	0,00
27 Paved per house (m2)	25,00	0,00	0,00	0,00
28 Floor density(m2/m2)	0,96	0,00	0,00	0,00
29 Number of houses	8,00	0,00	0,00	0,00
30 N. of parking spaces	0,00	5,00	0,00	5,00

Ensemble (c) Prof.dr.ir.T.M. de Jong



Number of houses 8 Density 44,44 houses/ha. FSI 0,53 Surface: 60,00 m x 30,00 m = 0,18 ha. Scale1 : 1000

PER HOUSE 1,25 parking spaces; 100,00 m2 for sale; 1,72 m2 green; 198,2!m2 paved area; i.e. resp. 33 ; 1 and 66 %.

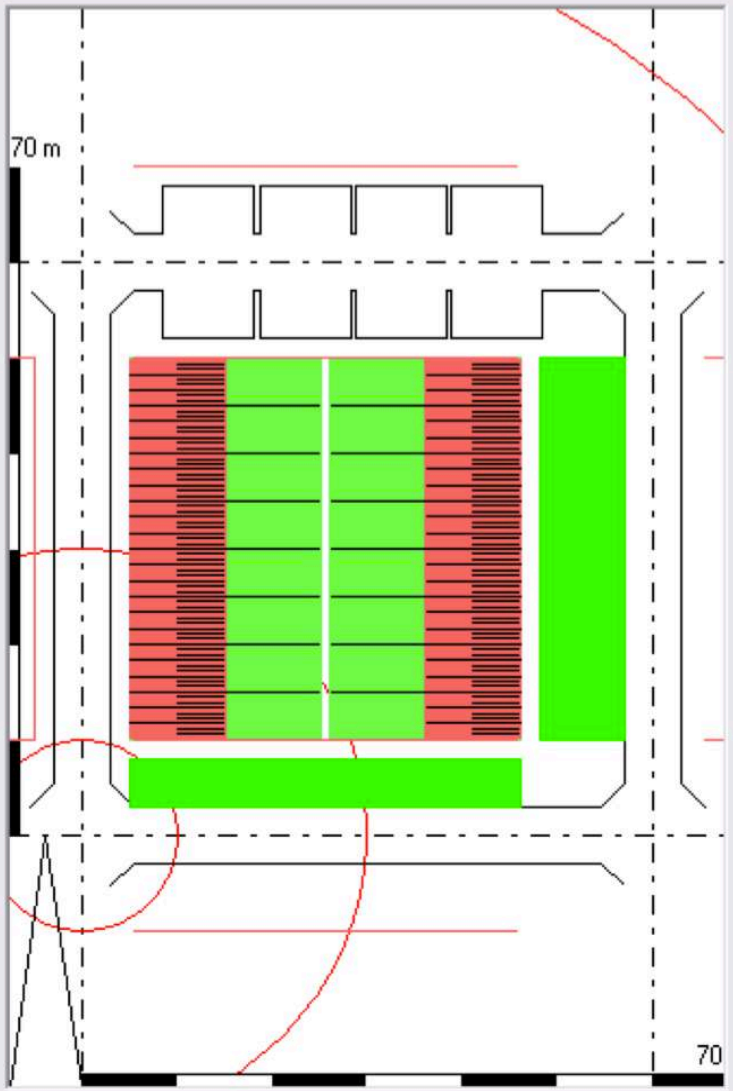
Standaardverkaveling

fill in, dubbleclick
is calculated

Save | Neighbourhood

Ensemble (c) Prof.dr.ir.T.M. de Jong

	left	above	right	below
01 Plot surface (m2)	100,00	0,00	100,00	0,00
02 G.floor surface (m2)	50,00	0,00	50,00	0,00
03 Number of storeys	2,00	2,00	2,00	2,00
04 Roof height (m)	3,00	3,00	3,00	3,00
05 House width(m)	5,00	5,00	5,00	5,00
06 Number of plots/block	8,00	8,00	8,00	8,00
07 Width garden aside(m)	0,00	0,50	0,00	0,50
08 Length block + gard.(m)	40,00	41,00	40,00	41,00
09 House depth(m)	10,00	0,00	10,00	0,00
10 House volume (m3)	345,00	0,00	345,00	0,00
11 Floor space (m2)	120,00	0,00	120,00	0,00
12 Plot length(m)	20,00	0,00	20,00	0,00
13 Tot. length garden (m)	10,00	0,00	10,00	0,00
14 Rear garden(m)	10,00	0,00	10,00	0,00
15 Front garden(m)	0,00	0,00	0,00	0,00
16 Width ped.pavement (m)	2,00	2,00	2,00	2,00
17 Width green verge(m2)	0,00	0,00	9,00	5,00
18 Width parking space (m)	0,00	5,00	0,00	0,00
19 Width street (m)	6,00	6,00	6,00	6,00
20 Path round the back (m)	1,00	0,00	1,00	0,00
21 Plot depth (m)	25,50	10,00	34,50	10,00
22 Total surface (ha)	0,10	0,06	0,14	0,06
23 Density(houses/ha)	78,43	0,00	57,97	0,00
24 Common green fields(m2)	0,00	23,38	360,00	278,00
25 Paved area(m2)	200,00	1176,6	200,00	870,00
26 C.green per house(m2)	0,00	0,00	45,00	0,00
27 Paved per house (m2)	25,00	0,00	25,00	0,00
28 Floor density(m2/m2)	0,94	0,00	0,70	0,00
29 Number of houses	8,00	0,00	8,00	0,00
30 N. of parking spaces	0,00	17,00	0,00	0,00



Number of houses 16 Density 44,44 houses/ha. FSI 0,53 Surface: 60,00 m x 60,00 m = 0,36 ha. Scale1 : 1000

PER HOUSE 1,06 parking spaces; 100,00 m2 for sale; 41,34 m2 green; 152,9 m2 paved area; i.e. resp. 34 ; 14 and 52 %.

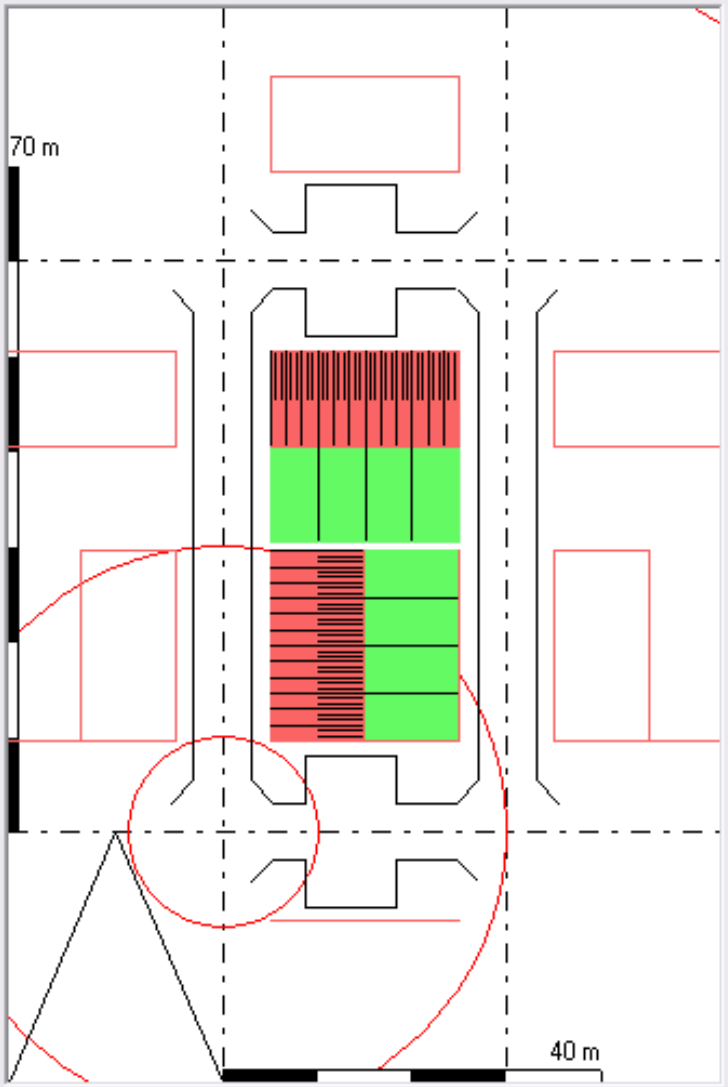
Standaardverkaveling

fill in, dubbleclick
is calculated

Save | Neighbourhood

	left	above	right	below
01 Plot surface (m2)	100,00	100,00	0,00	0,00
02 G.floor surface (m2)	50,00	50,00	0,00	0,00
03 Number of storeys	2,00	2,00	2,00	2,00
04 Roof height (m)	3,00	3,00	3,00	3,00
05 House width(m)	5,00	5,00	5,00	5,00
06 Number of plots/block	4,00	4,00	4,00	4,00
07 Width garden aside(m)	0,00	0,00	0,00	0,00
08 Length block + gard.(m)	20,00	20,00	20,00	20,00
09 House depth(m)	10,00	10,00	0,00	0,00
10 House volume (m3)	345,00	345,00	0,00	0,00
11 Floor space (m2)	120,00	120,00	0,00	0,00
12 Plot length(m)	20,00	20,00	0,00	0,00
13 Tot. length garden (m)	10,00	10,00	0,00	0,00
14 Rear garden(m)	10,00	10,00	0,00	0,00
15 Front garden(m)	0,00	0,00	0,00	0,00
16 Width ped.pavement (m)	2,00	1,50	2,00	1,50
17 Width green verge(m2)	0,00	0,00	0,00	0,00
18 Width parking space (m)	0,00	5,00	0,00	5,00
19 Width street (m)	6,00	6,00	6,00	6,00
20 Path round the back (m)	0,00	1,00	0,00	0,00
21 Plot depth (m)	25,00	30,00	5,00	9,50
22 Total surface (ha)	0,05	0,09	0,01	0,03
23 Density(houses/ha)	78,05	44,44	0,00	0,00
24 Common green fields(m2)	0,00	6,88	0,00	6,88
25 Paved area(m2)	102,50	778,13	102,50	563,13
26 C.green per house(m2)	0,00	1,72	0,00	0,00
27 Paved per house (m2)	25,63	194,53	0,00	0,00
28 Floor density(m2/m2)	0,94	0,53	0,00	0,00
29 Number of houses	4,00	4,00	0,00	0,00
30 N. of parking spaces	0,00	5,00	0,00	5,00

Ensemble (c) Prof.dr.ir.T.M. de Jong



Number of houses 8 Density 44,44 houses/ha. FSI 0,53 Surface: 60,00 m x 30,00 m = 0,18 ha. Scale1 : 1000

PER HOUSE 1,25 parking spaces; 100,00 m2 for sale; 1,72 m2 green; 193,2!m2 paved area; i.e. resp. 34 ; 1 and 66 %.

Standaardverkaveling

fill in, dubbleclick
is calculated

Save | Neighbourhood

	left	above	right	below
01 Plot surface (m2)	100,00	100,00	100,00	0,00
02 G.floor surface (m2)	50,00	50,00	50,00	0,00
03 Number of storeys	2,00	2,00	2,00	2,00
04 Roof height (m)	3,00	3,00	3,00	3,00
05 House width(m)	5,00	5,00	5,00	5,00
06 Number of plots/block	4,00	8,00	4,00	8,00
07 Width garden aside(m)	0,00	0,50	0,00	0,50
08 Length block + gard.(m)	20,00	41,00	20,00	41,00
09 House depth(m)	10,00	10,00	10,00	0,00
10 House volume (m3)	345,00	345,00	345,00	0,00
11 Floor space (m2)	120,00	120,00	120,00	0,00
12 Plot length(m)	20,00	19,51	20,00	0,00
13 Tot. length garden (m)	10,00	9,51	10,00	0,00
14 Rear garden(m)	10,00	9,51	10,00	0,00
15 Front garden(m)	0,00	0,00	0,00	0,00
16 Width ped.pavement (m)	2,00	2,00	2,00	2,00
17 Width green verge(m2)	0,00	0,00	9,00	4,49
18 Width parking space (m)	0,00	5,00	0,00	0,00
19 Width street (m)	6,00	6,00	6,00	6,00
20 Path round the back (m)	1,00	1,00	1,00	0,00
21 Plot depth (m)	25,50	30,01	34,50	9,49
22 Total surface (ha)	0,05	0,18	0,07	0,06
23 Density(houses/ha)	76,52	44,43	56,56	0,00
24 Common green fields(m2)	0,00	203,48	180,00	251,48
25 Paved area(m2)	102,50	1397,2	102,50	860,80
26 C.green per house(m2)	0,00	25,44	45,00	0,00
27 Paved per house (m2)	25,63	174,66	25,63	0,00
28 Floor density(m2/m2)	0,92	0,53	0,68	0,00
29 Number of houses	4,00	8,00	4,00	0,00
30 N. of parking spaces	0,00	17,00	0,00	0,00

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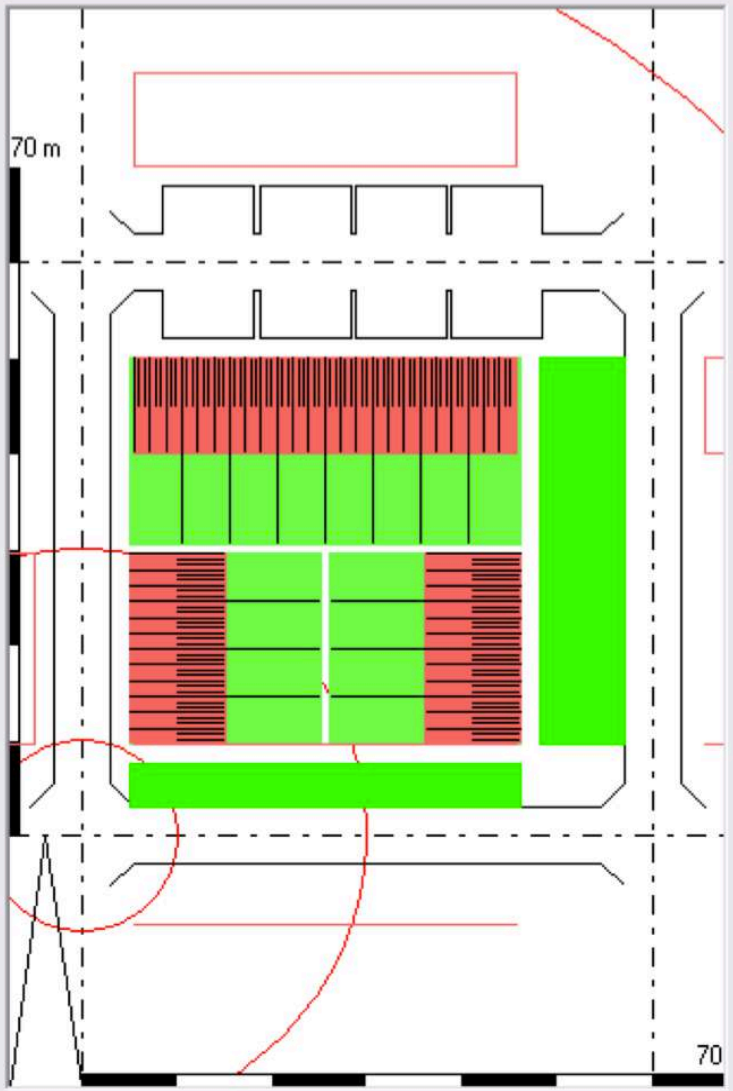


Number of houses 16 Density 44,44 houses/ha. FSI 0,53 Surface: 60,00 m x 60,00 m = 0,36 ha. Scale1 : 1000

PER HOUSE 1,06 parking spaces; 100,00 m2 for sale; 39,69 m2 green; 153,9 m2 paved area; i.e. resp. 34 ; 14 and 52 %.

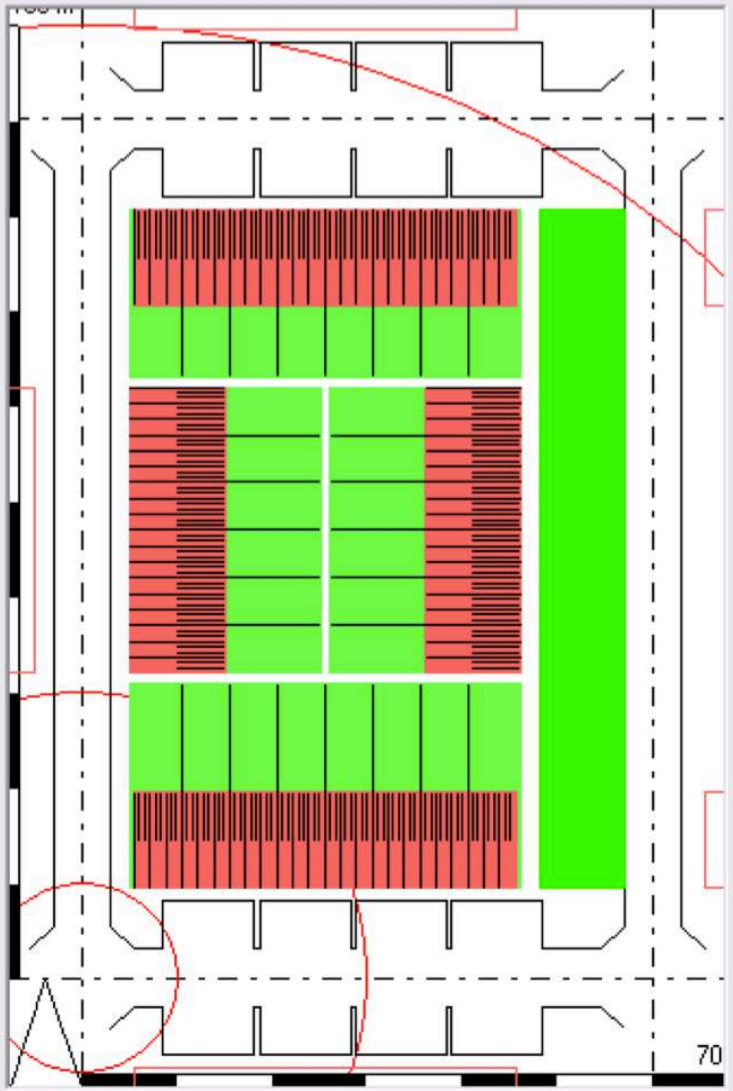
Standaardverkaveling

fill in, dubbleclick
is calculated

Save | Neighbourhood

Ensemble (c) Prof.dr.ir.T.M. de Jong

	left	above	right	below
01 Plot surface (m2)	100,00	90,00	100,00	110,00
02 G.floor surface (m2)	50,00	50,00	50,00	50,00
03 Number of storeys	2,00	2,00	2,00	2,00
04 Roof height (m)	3,00	3,00	3,00	3,00
05 House width(m)	5,00	5,00	5,00	5,00
06 Number of plots/block	6,00	8,00	6,00	8,00
07 Width garden aside(m)	0,00	0,50	0,00	0,50
08 Length block + gard.(m)	30,00	41,00	30,00	41,00
09 House depth(m)	10,00	10,00	10,00	10,00
10 House volume (m3)	345,00	345,00	345,00	345,00
11 Floor space (m2)	120,00	120,00	120,00	120,00
12 Plot length(m)	20,00	17,56	20,00	21,46
13 Tot. length garden (m)	10,00	7,56	10,00	11,46
14 Rear garden(m)	10,00	7,56	10,00	11,46
15 Front garden(m)	0,00	0,00	0,00	0,00
16 Width ped.pavement (m)	2,00	1,49	2,00	1,49
17 Width green verge(m2)	0,00	0,00	9,00	0,00
18 Width parking space (m)	0,00	5,00	0,00	5,00
19 Width street (m)	6,00	6,00	6,00	6,00
20 Path round the back (m)	1,00	1,00	1,00	1,00
21 Plot depth (m)	25,50	27,55	34,50	31,45
22 Total surface (ha)	0,08	0,17	0,11	0,19
23 Density(houses/ha)	75,90	48,40	56,10	42,39
24 Common green fields(m2)	0,00	181,33	270,00	216,46
25 Paved area(m2)	155,00	1321,1	155,00	1377,7
26 C.green per house(m2)	0,00	22,67	45,00	27,06
27 Paved per house (m2)	25,83	165,14	25,83	172,21
28 Floor density(m2/m2)	0,91	0,58	0,67	0,51
29 Number of houses	6,00	8,00	6,00	8,00
30 N. of parking spaces	0,00	17,00	0,00	17,00



Number of houses 28 Density 51,85 houses/ha. FSI 0,62 Surface: 90,00 m x 60,00 m = 0,54 ha. Scale1 : 1000

PER HOUSE 1,21 parking spaces; 100,00 m2 for sale; 23,85 m2 green; 107,4m2 paved area; i.e. resp. 43 ; 10 and 46 %.

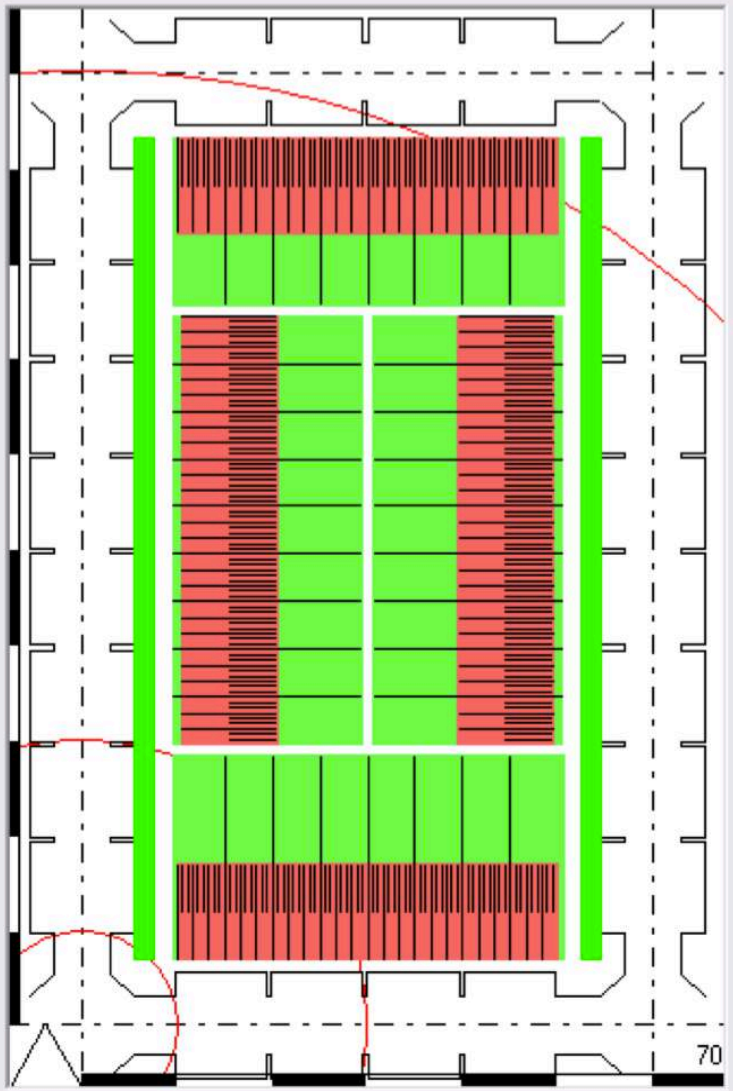
Standaardverkaveling

fill in, dubbleclick
is calculated

Save | Neighbourhood

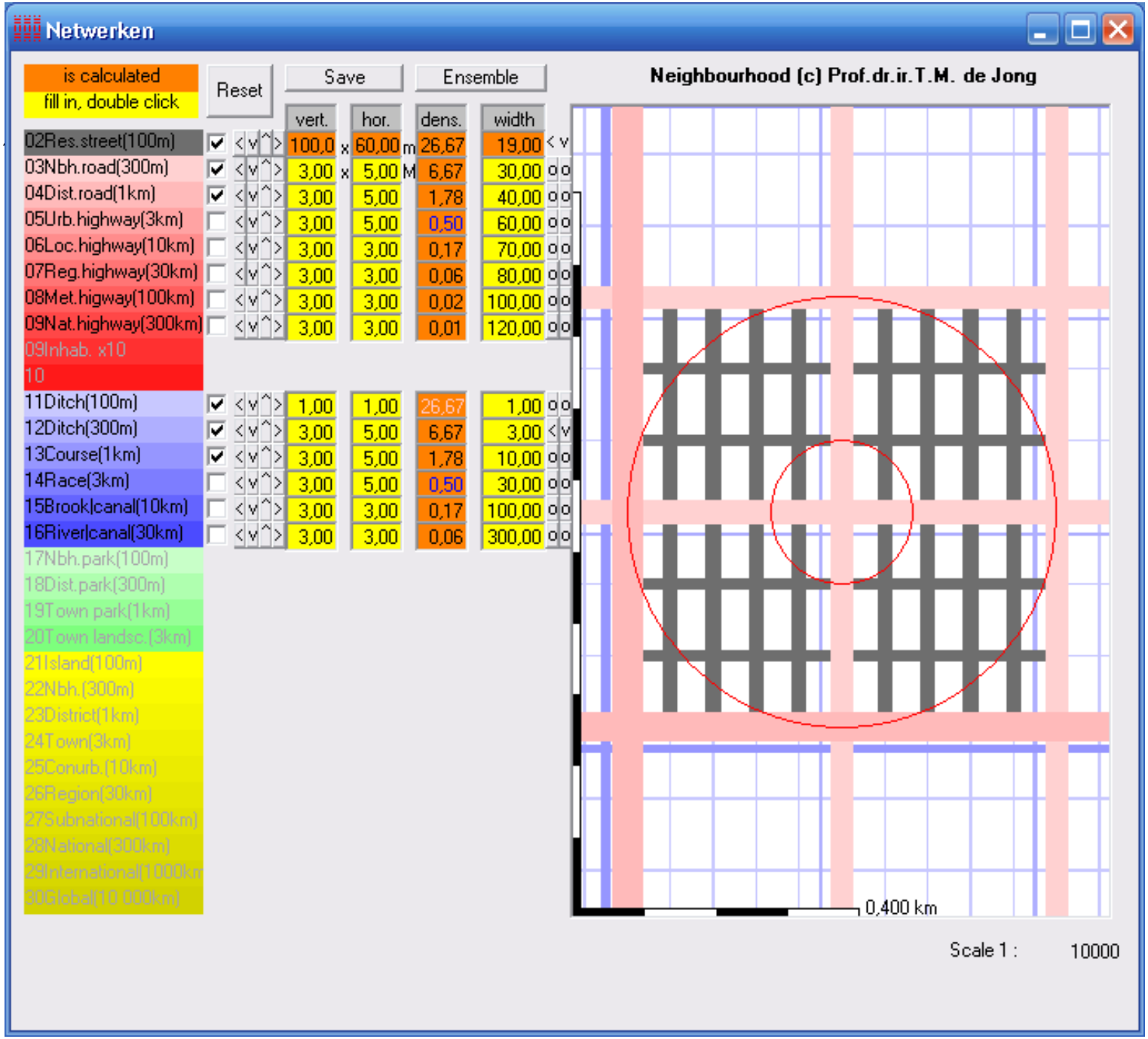
Ensemble (c) Prof.dr.ir.T.M. de Jong

	left	above	right	below
01 Plot surface (m2)	100,00	90,00	100,00	110,00
02 G.floor surface (m2)	50,00	50,00	50,00	50,00
03 Number of storeys	2,00	2,00	2,00	2,00
04 Roof height (m)	3,00	3,00	3,00	3,00
05 House width(m)	5,00	5,00	5,00	5,00
06 Number of plots/block	9,00	8,00	9,00	8,00
07 Width garden aside(m)	0,00	0,50	0,00	0,50
08 Length block + gard.(m)	45,00	41,00	45,00	41,00
09 House depth(m)	10,00	10,00	10,00	10,00
10 House volume (m3)	345,00	345,00	345,00	345,00
11 Floor space (m2)	120,00	120,00	120,00	120,00
12 Plot length(m)	20,00	17,56	20,00	21,46
13 Tot. length garden (m)	10,00	7,56	10,00	11,46
14 Rear garden(m)	9,00	7,56	9,00	11,46
15 Front garden(m)	1,00	0,00	1,00	0,00
16 Width ped.pavement (m)	2,00	1,49	2,00	1,49
17 Width green verge(m2)	2,00	0,00	2,00	0,00
18 Width parking space (m)	2,50	2,50	2,50	2,50
19 Width street (m)	6,00	6,00	6,00	6,00
20 Path round the back (m)	1,00	1,00	1,00	1,00
21 Plot depth (m)	30,00	25,05	30,00	28,95
22 Total surface (ha)	0,14	0,15	0,14	0,17
23 Density(houses/ha)	65,22	53,22	65,22	46,05
24 Common green fields(m2)	98,01	87,20	98,01	102,81
25 Paved area(m2)	345,00	1115,2	345,00	1173,7
26 C.green per house(m2)	10,89	10,90	10,89	12,85
27 Paved per house (m2)	38,33	139,41	38,33	146,72
28 Floor density(m2/m2)	0,78	0,64	0,78	0,55
29 Number of houses	9,00	8,00	9,00	8,00
30 N. of parking spaces	16,00	8,00	16,00	8,00

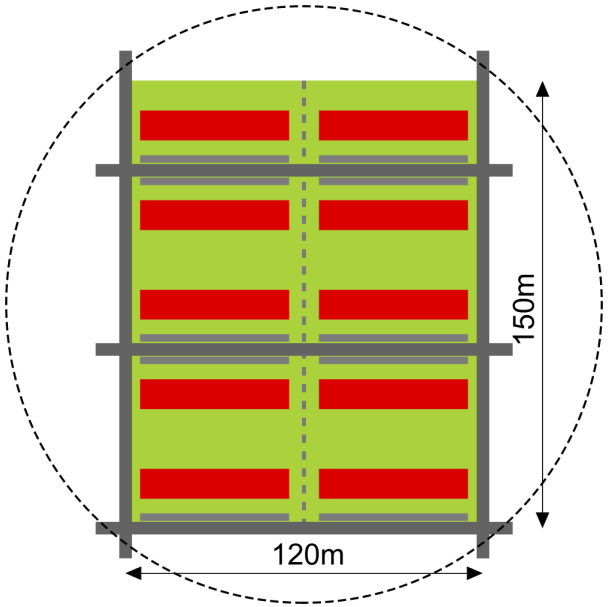


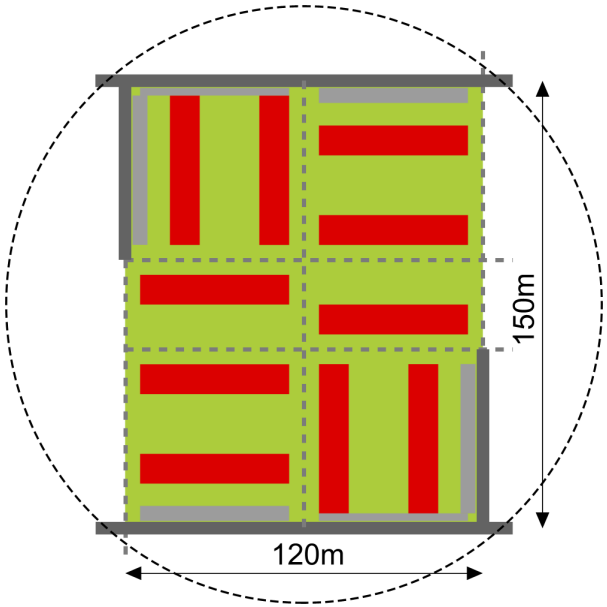
Number of houses 34 Density 56,66 houses/ha. FSI 0,68 Surface: 100,00m x 60,00 m = 0,60 ha. Scale1 : 1000

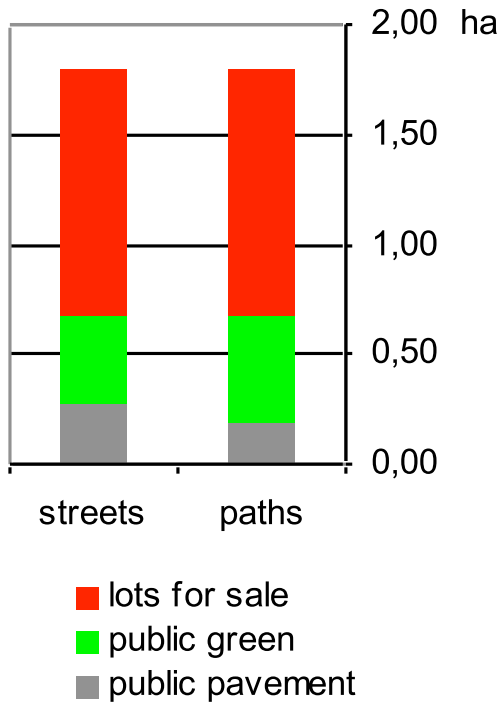
PER HOUSE 1,41 parking spaces; 100,00 m2 for sale; 11,35 m2 green; 87,62 m2 paved area; i.e. resp. 50 ; 6 and 44 %.


Netwerken
is calculated
fill in, double click
Reset
Save
Ensemble
Neighbourhood (c) Prof.dr.ir.T.M. de Jong
vert.
hor.
dens.
width
02Res.street(100m) 100,0 x 60,00 m 26,67 19,00
03Nbh.road(300m) 3,00 x 5,00 M 6,67 30,00
04Dist.road(1km) 3,00 5,00 1,78 40,00
05Urb.highway(3km) 3,00 5,00 0,50 60,00
06Loc.highway(10km) 3,00 3,00 0,17 70,00
07Reg.highway(30km) 3,00 3,00 0,06 80,00
08Met.higway(100km) 3,00 3,00 0,02 100,00
09Nat.highway(300km) 3,00 3,00 0,01 120,00
09Inhab. x10
10
11Ditch(100m) 1,00 1,00 26,67 1,00
12Ditch(300m) 3,00 5,00 6,67 3,00
13Course(1km) 3,00 5,00 1,78 10,00
14Race(3km) 3,00 5,00 0,50 30,00
15Brook|canal(10km) 3,00 3,00 0,17 100,00
16River|canal(30km) 3,00 3,00 0,06 300,00
17Nbh.park(100m)
18Dist.park(300m)
19Town park(1km)
20Town landsc.(3km)
21Island(100m)
22Nbh.(300m)
23District(1km)
24Town(3km)
25Conurb.(10km)
26Region(30km)
27Subnational(100km)
28National(300km)
29International(1000km
30Global(10.000km)
0,400 km
Scale 1 : 10000

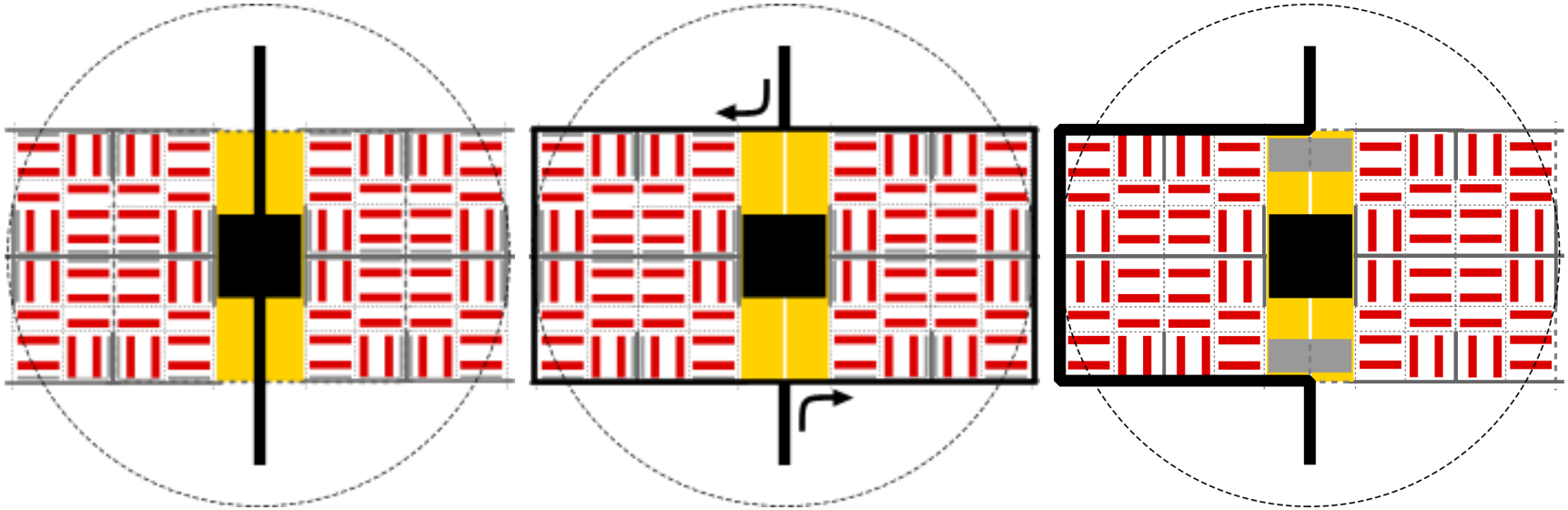
Saving pavement ensemble



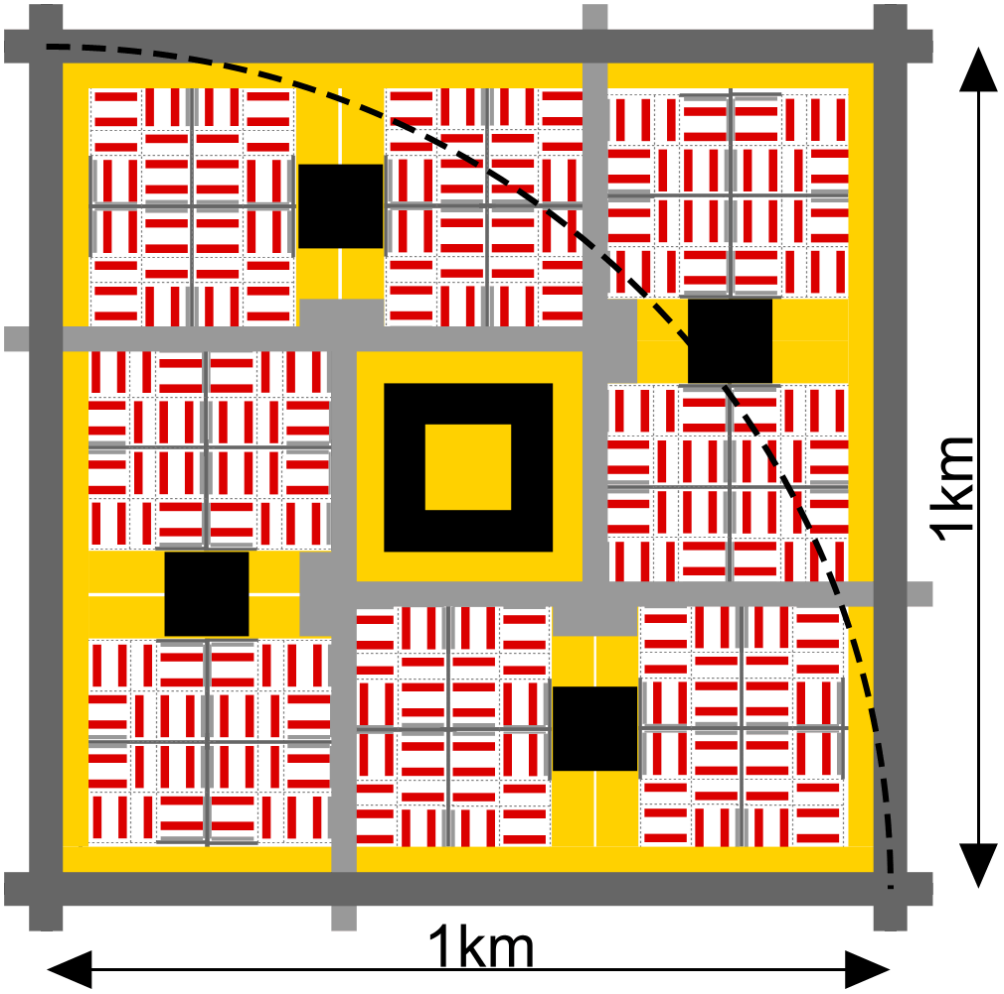


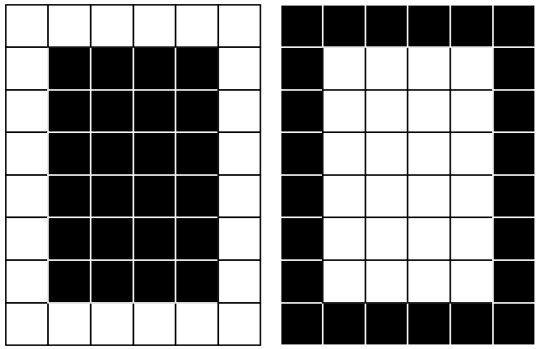


Saving pavement neighbourhood

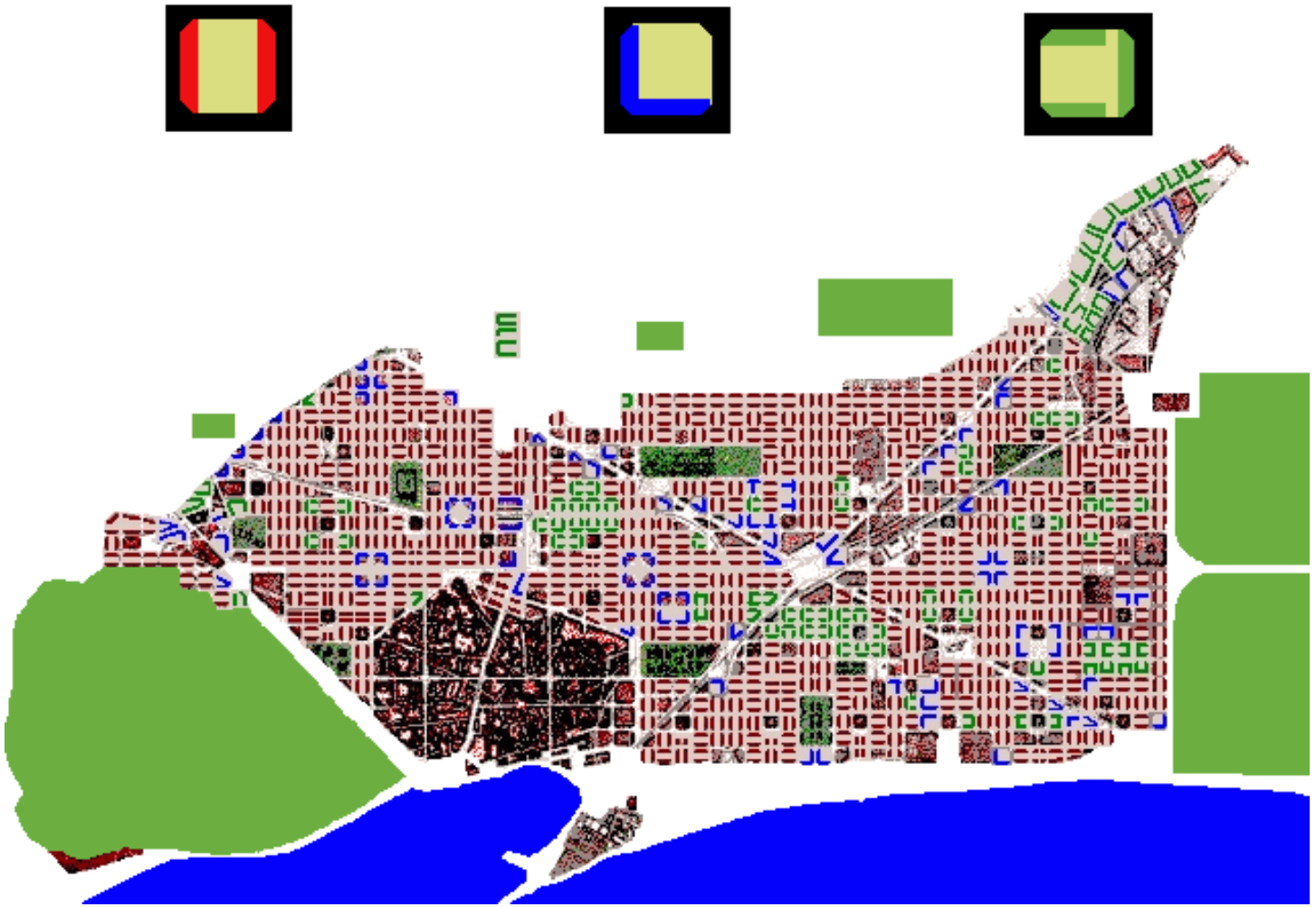


Saving pavement district

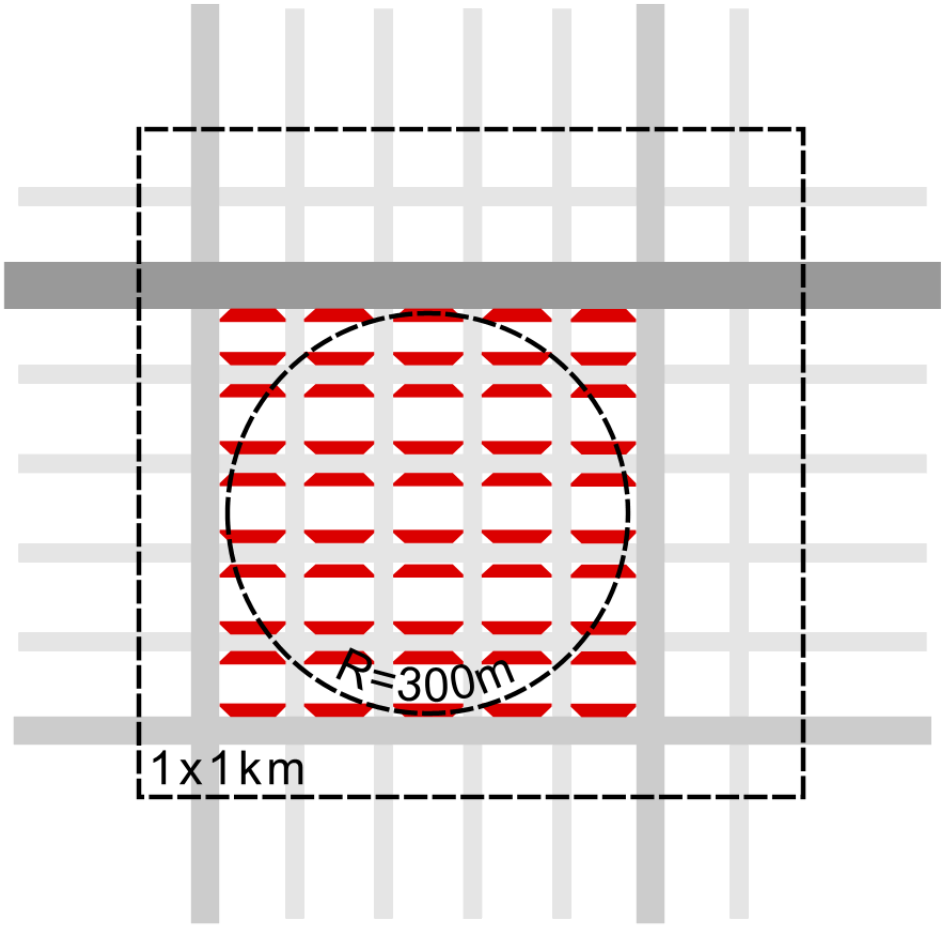




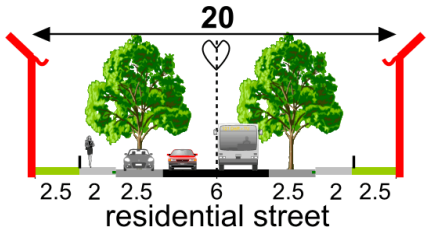
District grids

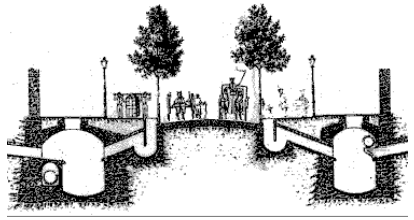


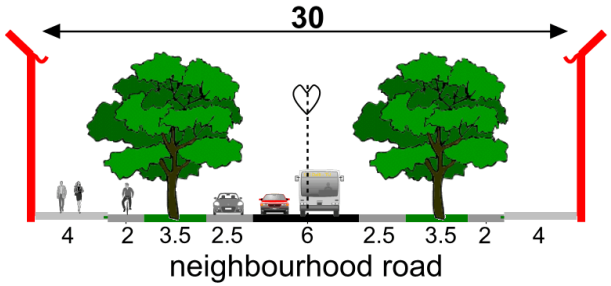
Cerda

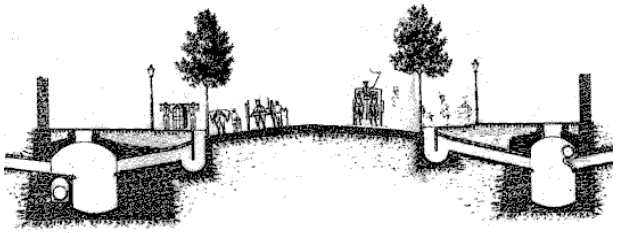


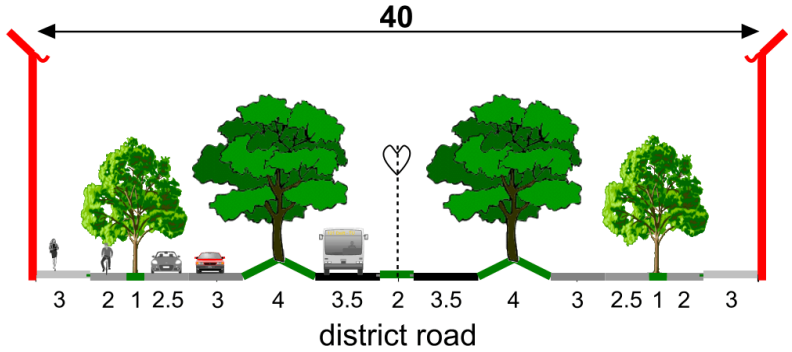
20, 30, 40, 50m

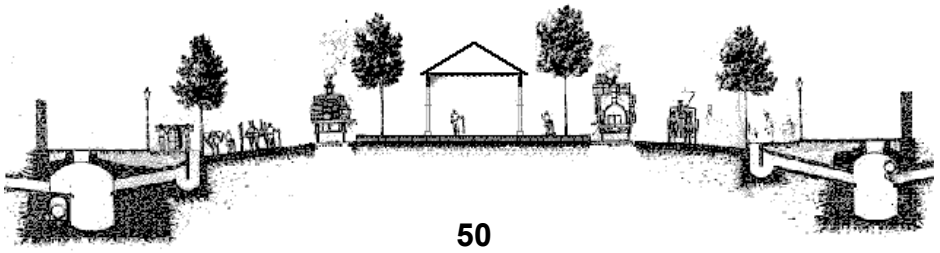

20
2.5 2 2.5 6 2.5 2 2.5
residential street



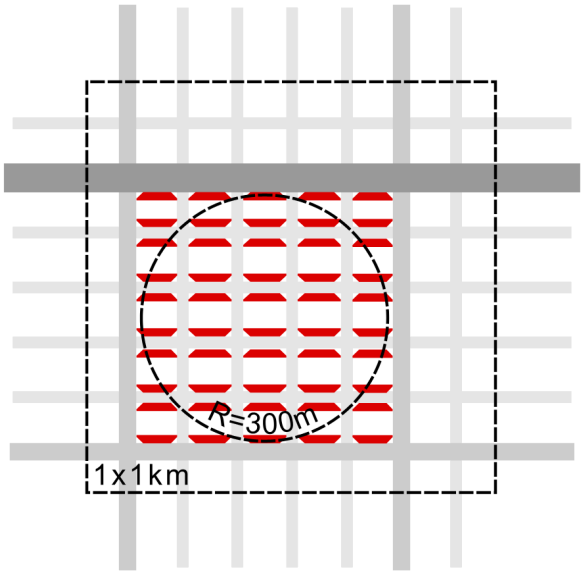

30
4 2 3.5 2.5 6 2.5 3.5 2 4
neighbourhood road

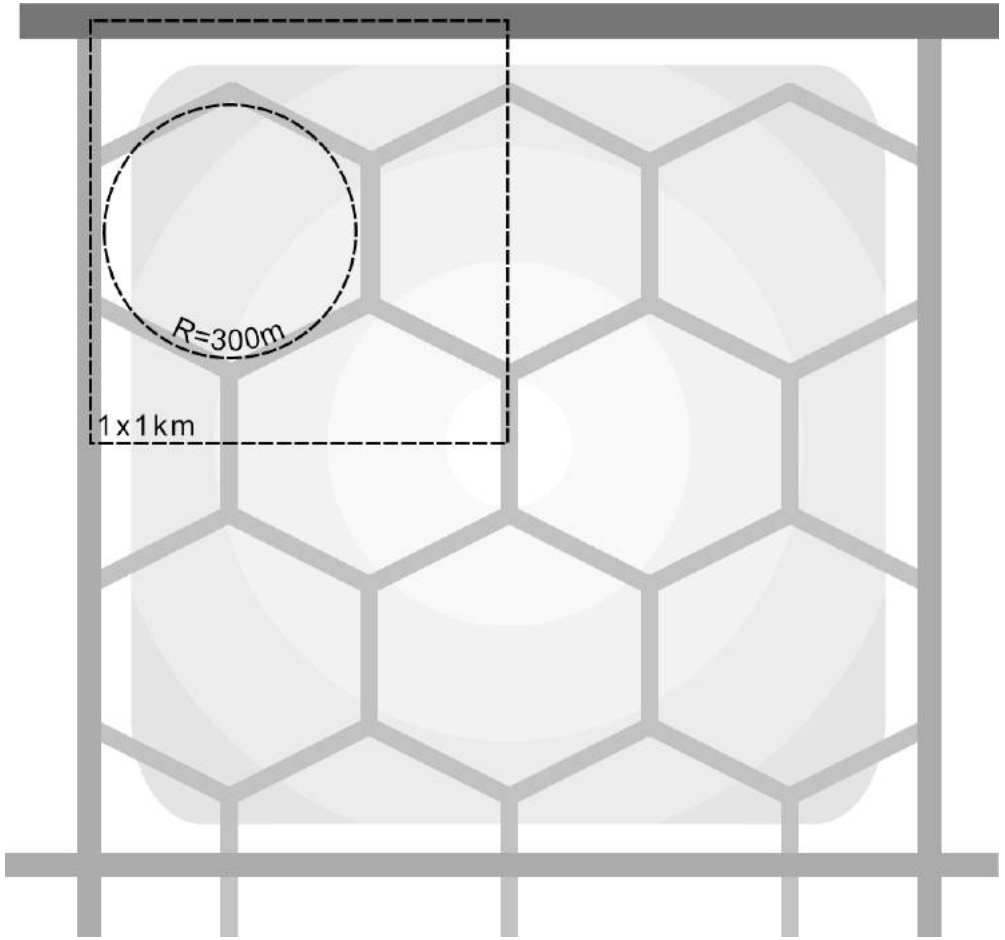



40
3 2 1 2.5 3 4 3.5 2 3.5 4 3 2.5 1 2 3
district road


50

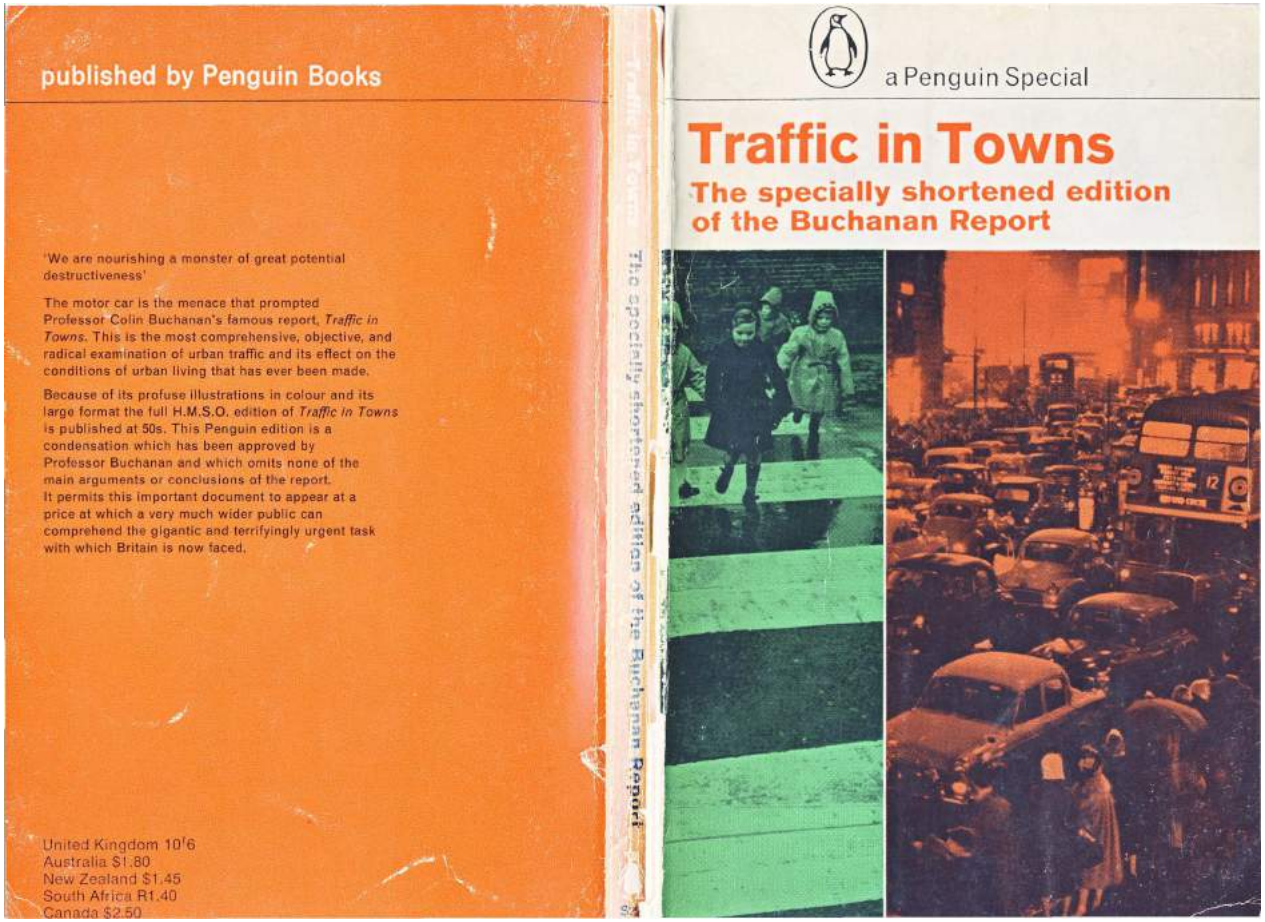
Cerda (1867) and Buchanon (1963)



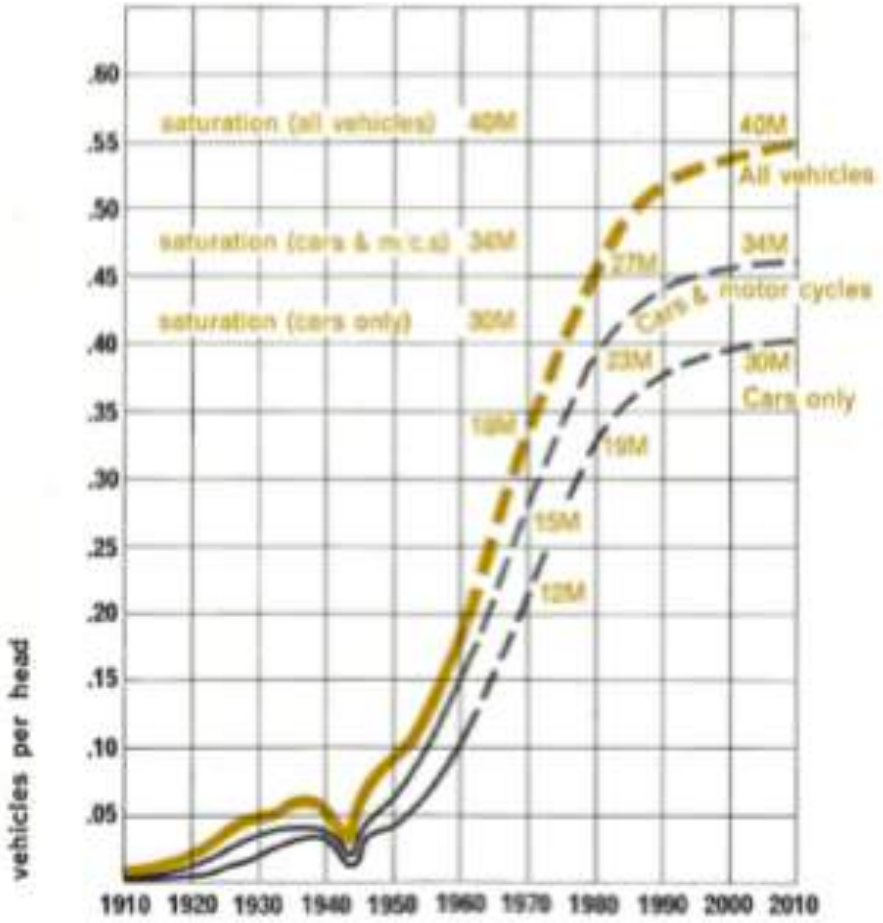


The same
neigbourhood size

Buchanan (1963)



Buchanan (1963)



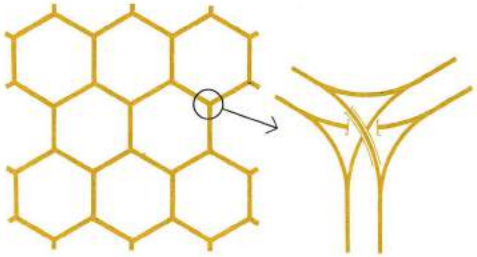
Buchanan (1963)

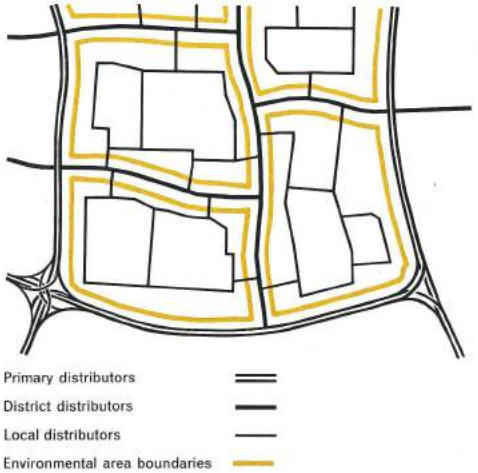
flow. But if a wider view is taken the actual contribution to relieving the centre is extremely uncertain.

It is not inferred here that a ring road is in no circumstances likely to form part of an urban network. The objection is against the slavish adoption of the ring as a standardized pattern. If the problem is considered in terms of a network serving environmental areas (a corridor serving rooms, to use the analogy with buildings) it will be seen at once that the pattern of the network must depend on the disposition of the areas, the kinds and quantities of traffic they generate, the associations that exist between one area and another, or between areas and the outside world. The pattern may eventually comprise a ring, but it must be allowed to work itself out. In designing the network it is unnecessary, and indeed inadvisable, to start with any preconceived intuitive ideas for relief roads, internal by-passes, spine roads, and the like. All these notions confuse the essential technical issue, which is simply the distribution of traffic to areas of buildings.

The only circumstances in which a distributory network might take on a regular geometrical form would be in the case of an extensive area with a uniform spread of development. In such a case the network would be superimposed like a 'grid' with a definite pattern and 'module'. A hexagonal pattern (Figure 12) is very efficient, with economical three-way intersections, but other polygonal patterns are possible. A rectangular pattern requires very complex intersections. The basic dimension or 'module' of the distributory system

12. The hexagonal network pattern which gives a good distribution with comparatively simple intersections.





13. The principle of the hierarchy of distributors. Access roads are not shown.

in such circumstances will broadly depend upon the kinds and intensities of land uses within the enclosed areas: the more intense the activities the more traffic will be generated, and so the greater the need to insert distributors and thus the closer the mesh of the distributory system will need to be. Unfortunately the more intense the activities are the more intense the development is, and the more difficult it becomes to insert a proper distributory system.

The function of the distributory network is to canalize the longer movements from locality to locality. The links of the network should therefore be designed for swift, efficient movement. This means that they cannot also be used for giving direct access to buildings, or even to minor roads serving the buildings, because the consequent frequent junctions would be dangerous and make the road inefficient. It is therefore necessary to introduce the idea of a 'hierarchy' of distributors, whereby important distributors feed down

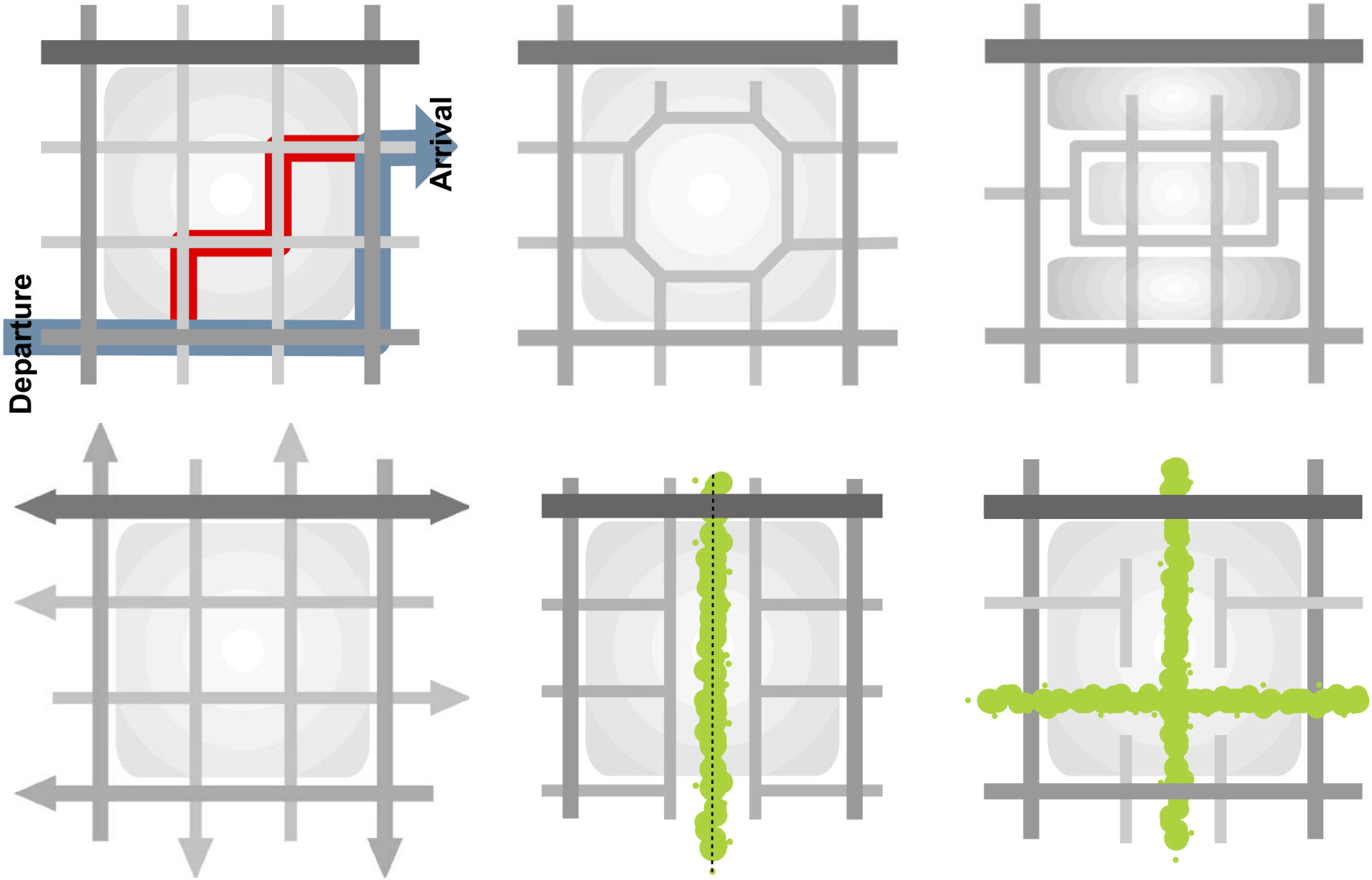
Buchanan (1963)

A hexagonal pattern (Figure 12) is very efficient, with economical three-way intersections, but other polygonal patterns are possible. A rectangular pattern requires very complex intersections.
…
The function of the distributory network is to canalize the longer movements from locality to locality.
…
This means that they cannot also be used for giving direct access to buildings, or even to minor roads serving the buildings, because the consequent frequent junctions would be dangerous and make the road inefficient.

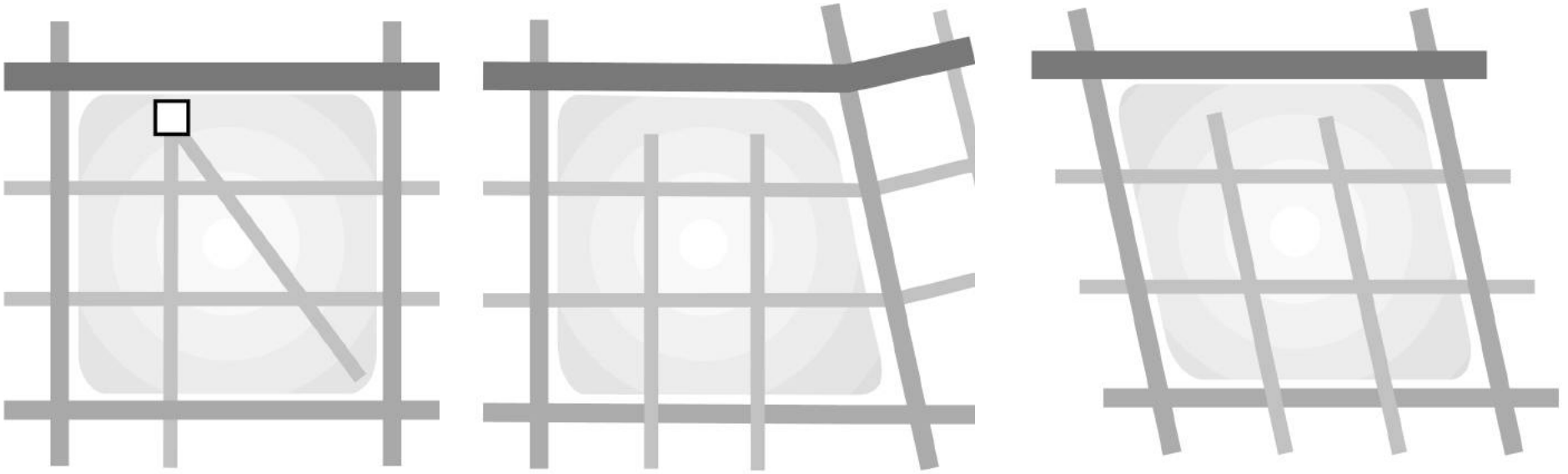
It is therefore necessary to introduce the idea of a 'hierarchy' of distributors, whereby important distributors feed down through distributors of lesser category to the minor roads which give access to the buildings [13].

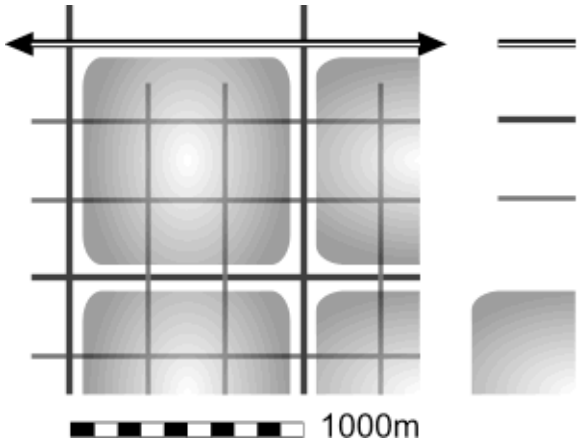
The system may be likened to the trunk, limbs, branches, and finally the twigs (corresponding to the access roads) of a tree. Basically, however, there are only two kinds of road - *distributors* designed for movement, and *access roads* to serve the buildings.

Grid flexibility (Bach)



Grid flexibility (Bach)





Stroomweg 70 km/u met vrijliggend locaal verkeer ook op kruisingen

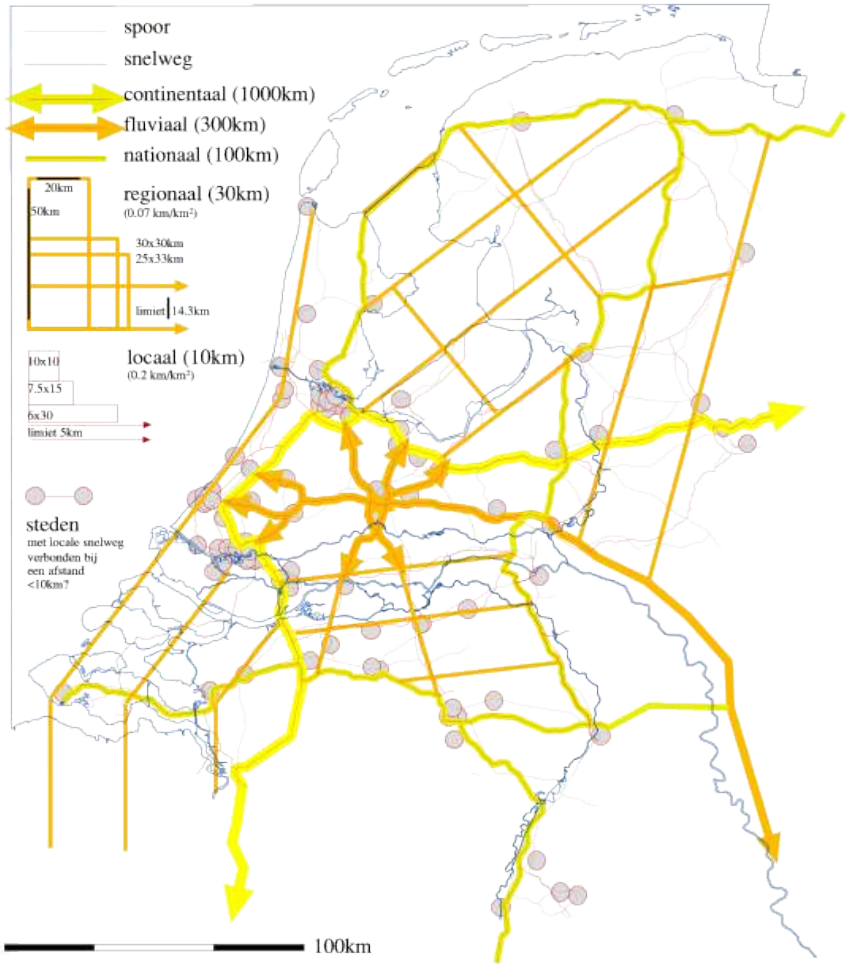
Gebiedsontsluitingsweg (GOW) 50km/u, met vrijliggend langzaam verkeer langs de weg

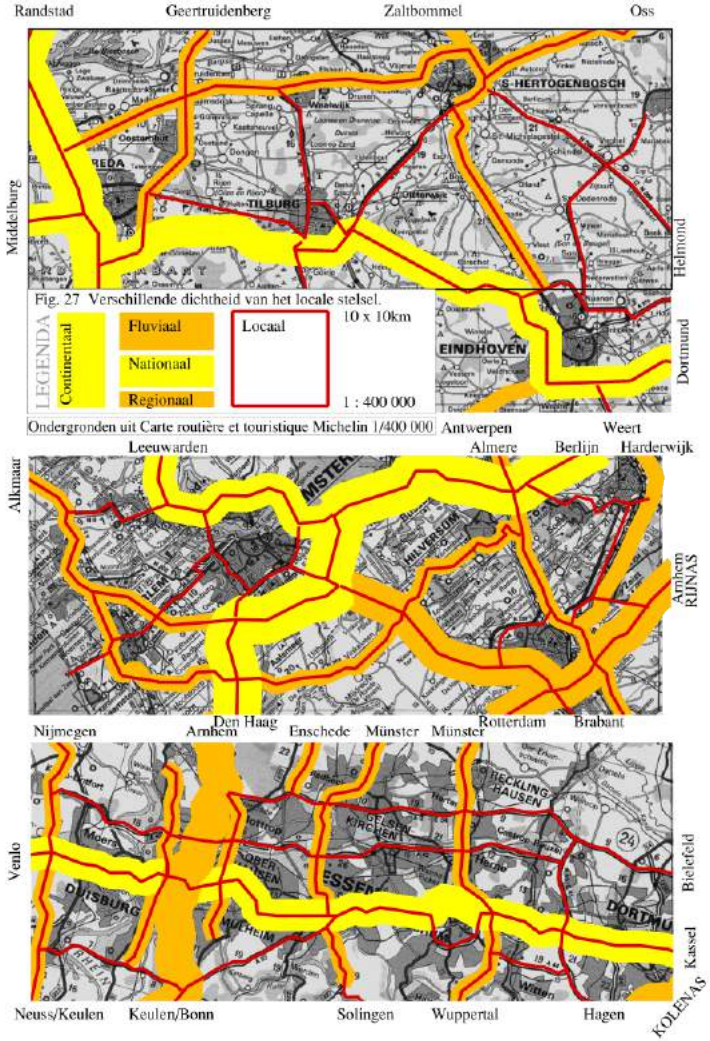
Erftoegangsweg, 30km/u zone

Verbijfsgebied

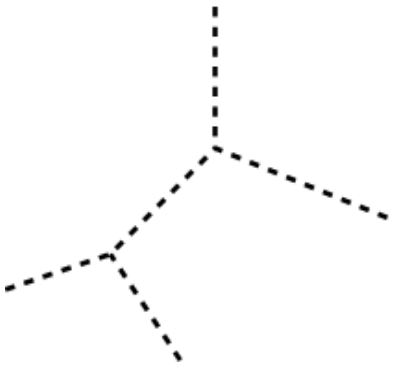
Dutch appointments ‘Duurzaam Veilig’

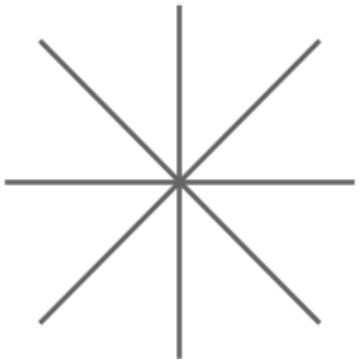
Regional networks

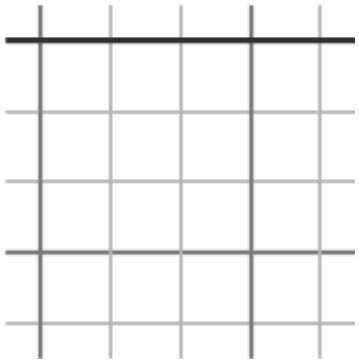


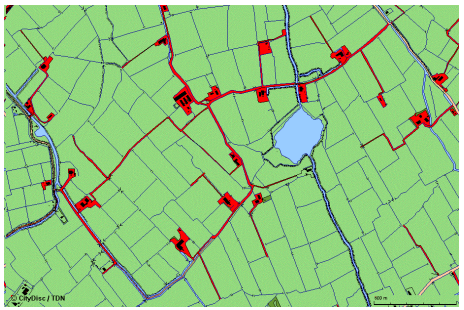


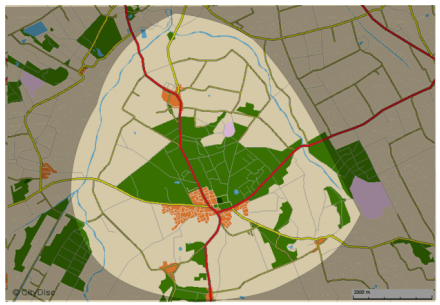
Network types

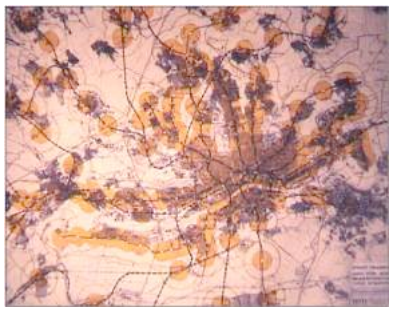












1km

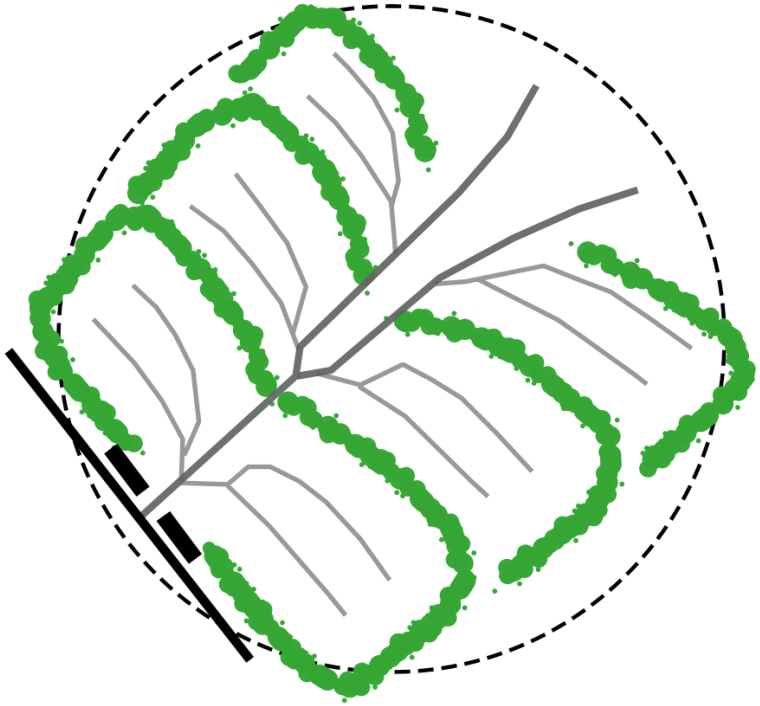
3km

10km

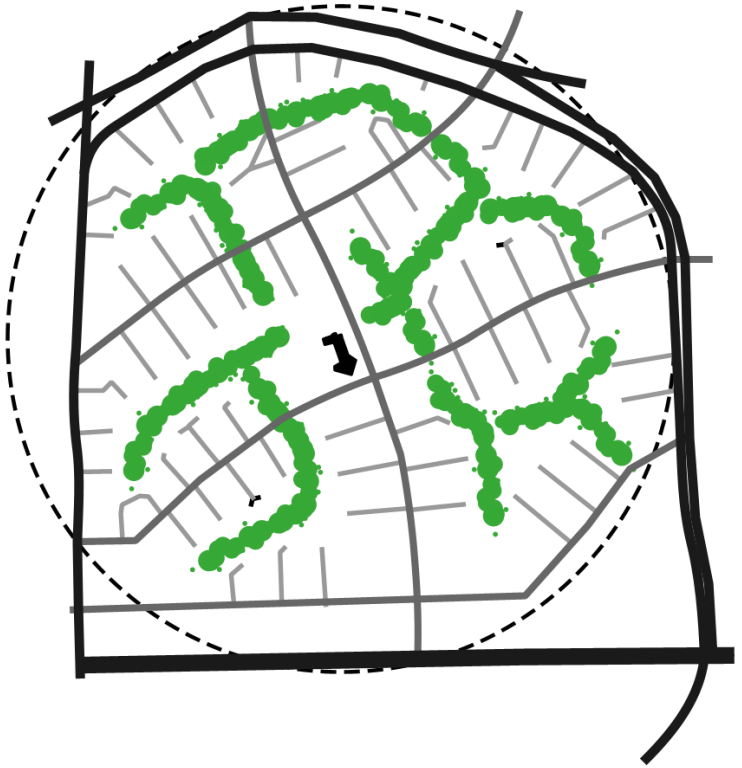
300m-10km

Care for pedestrians is the core of urban design

Pedestrians

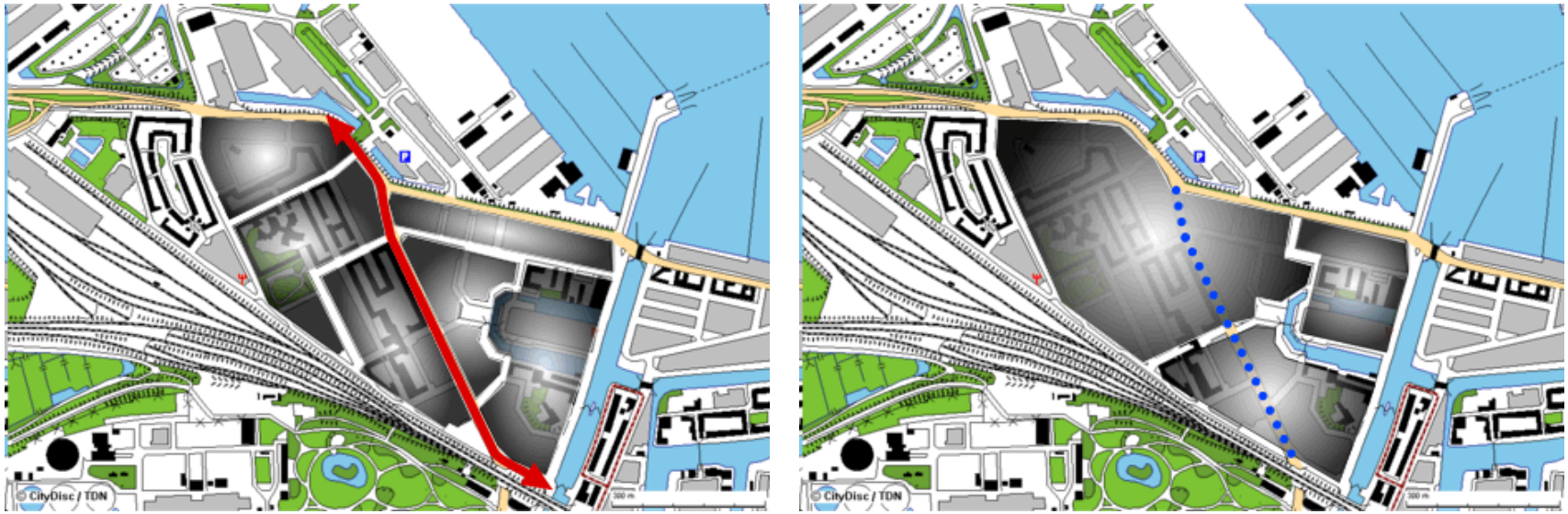


Reichow: car first

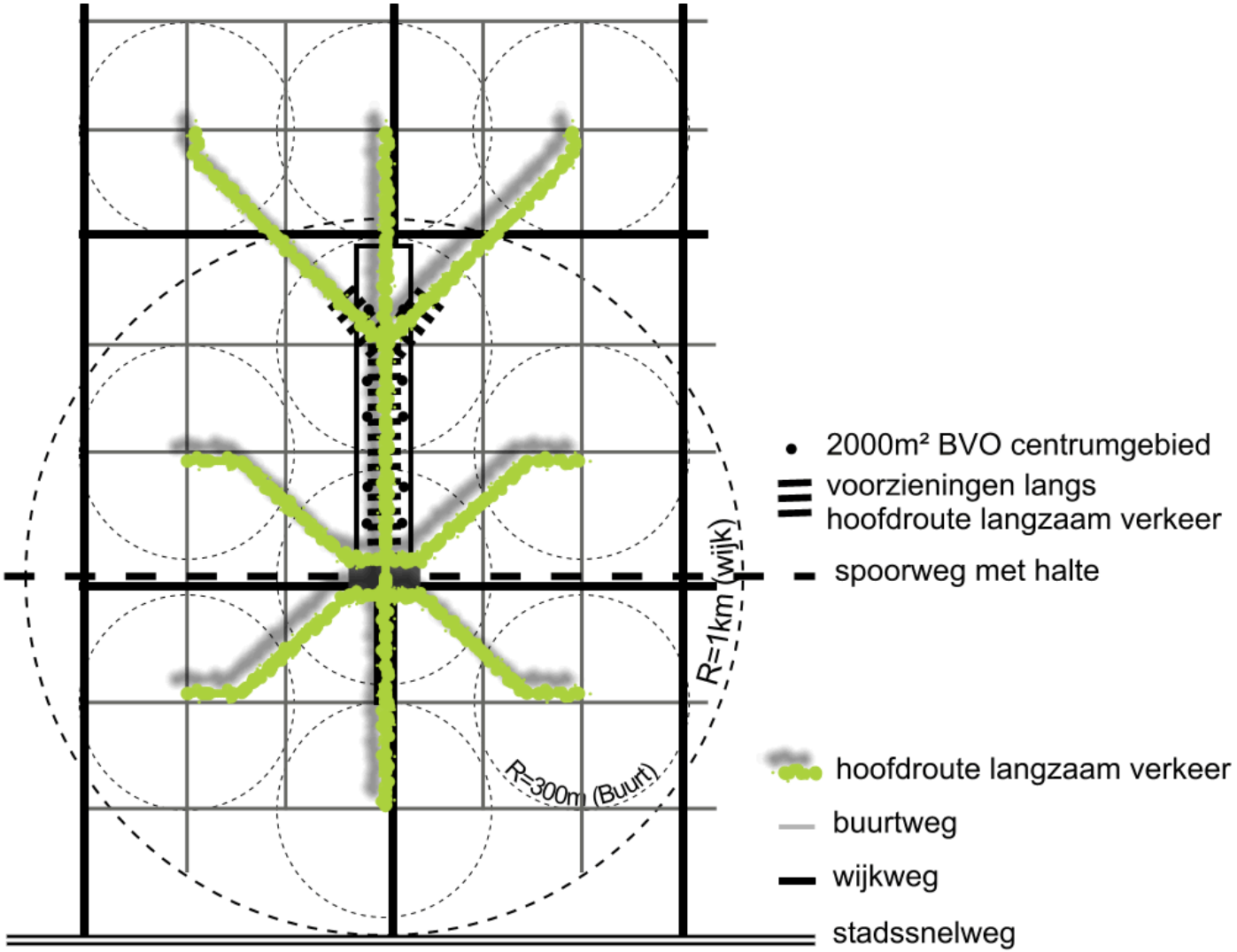


Runcorn: Pedestrian first

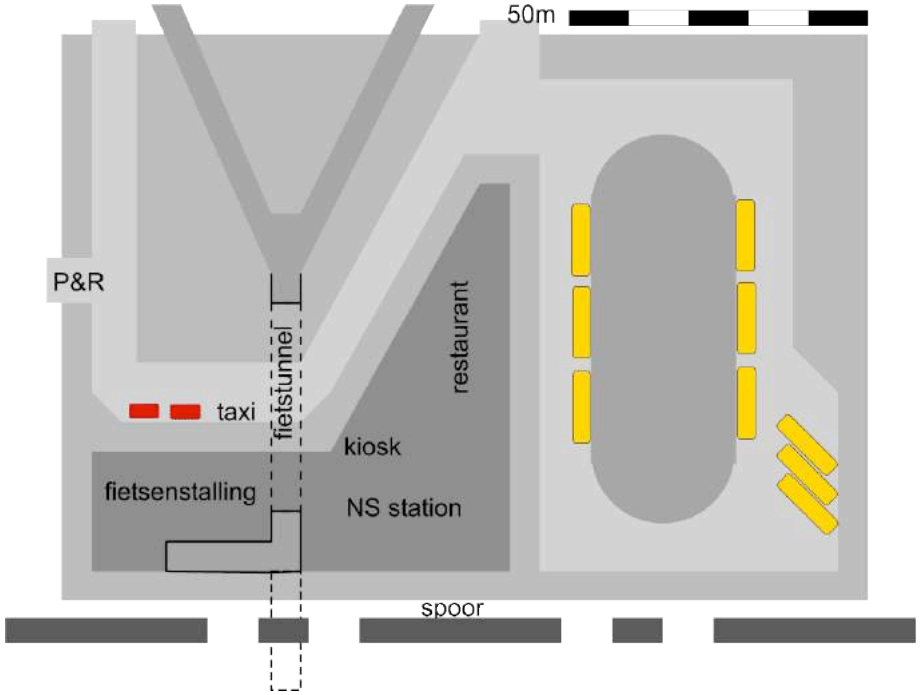
Pedestrians in residential area

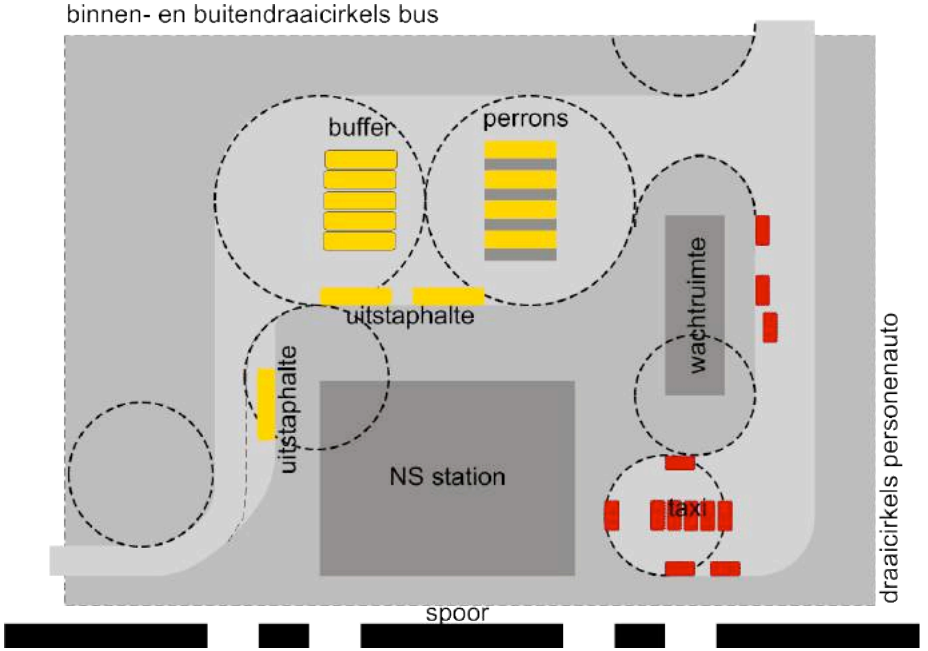


Radials for pedestrians and cyclists

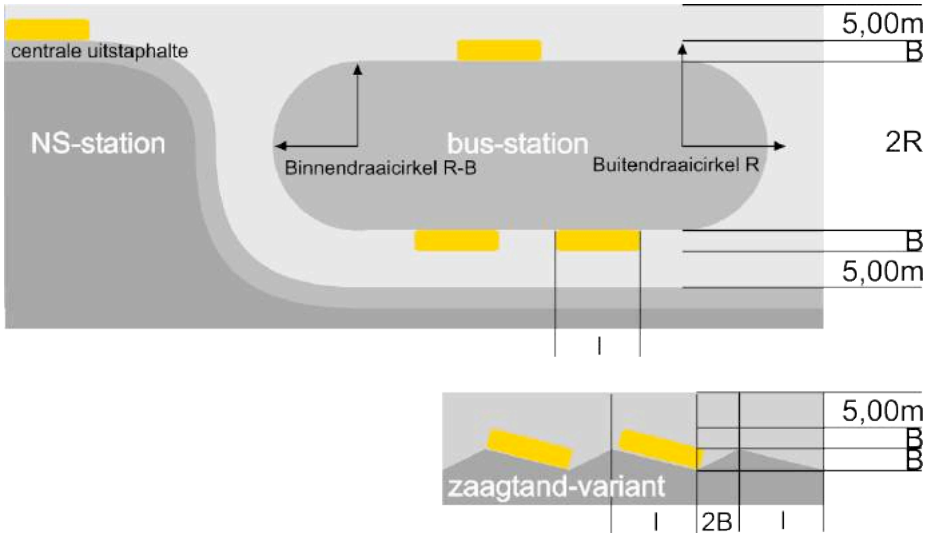


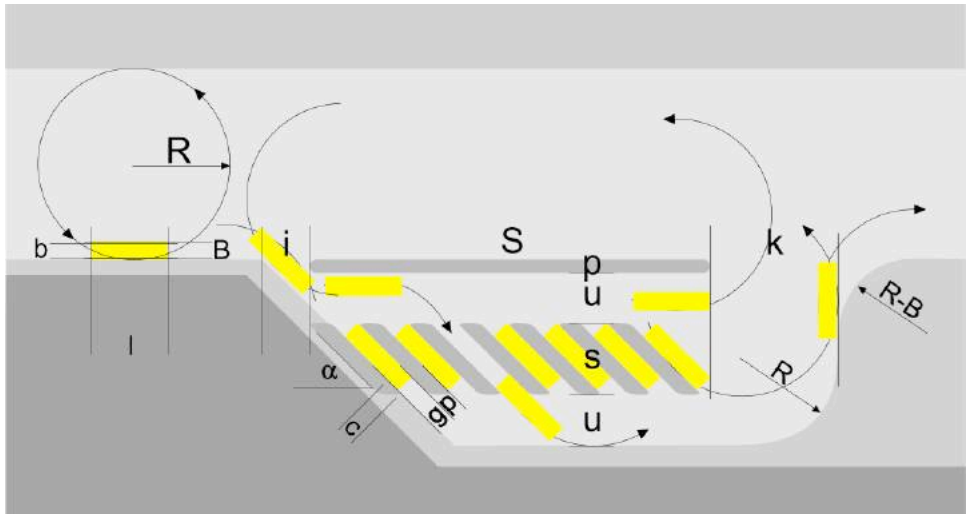
Railway stations



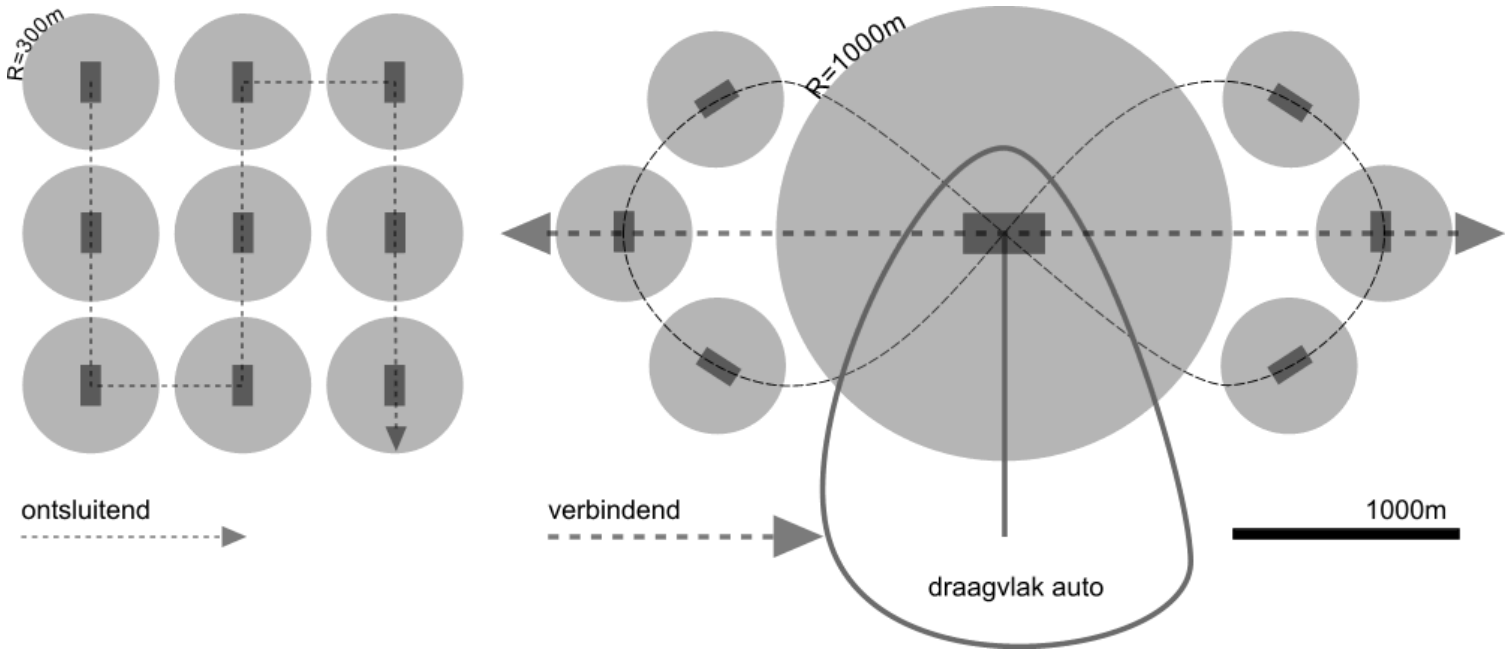


Bus stations

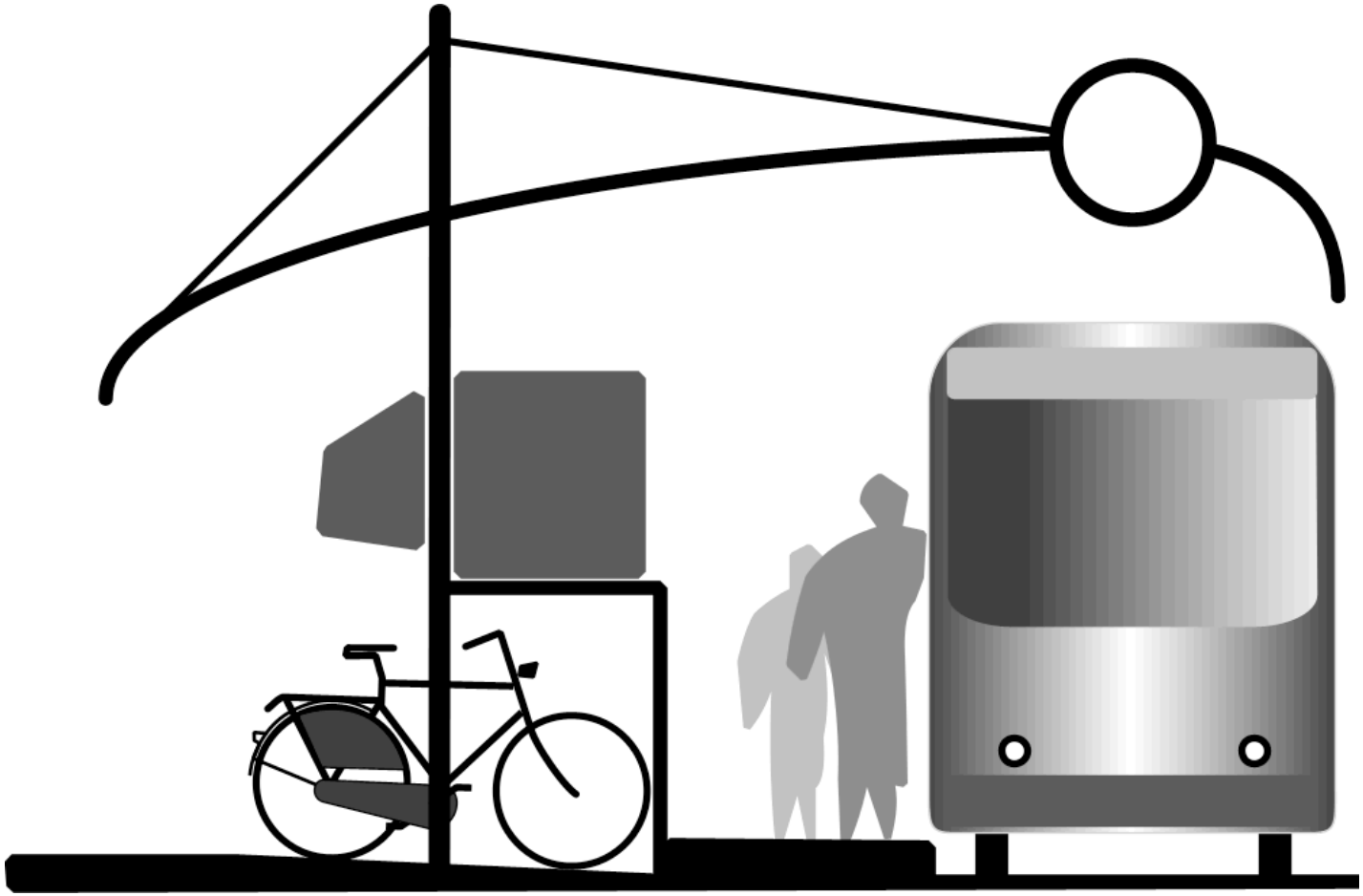




Bus routes


R=300m
R=1000m
ontsluitend
verbindend
1000m
draagvlak auto

Bach’s bus stop



Bus stops