

The Safety of Roundabouts in Belgium

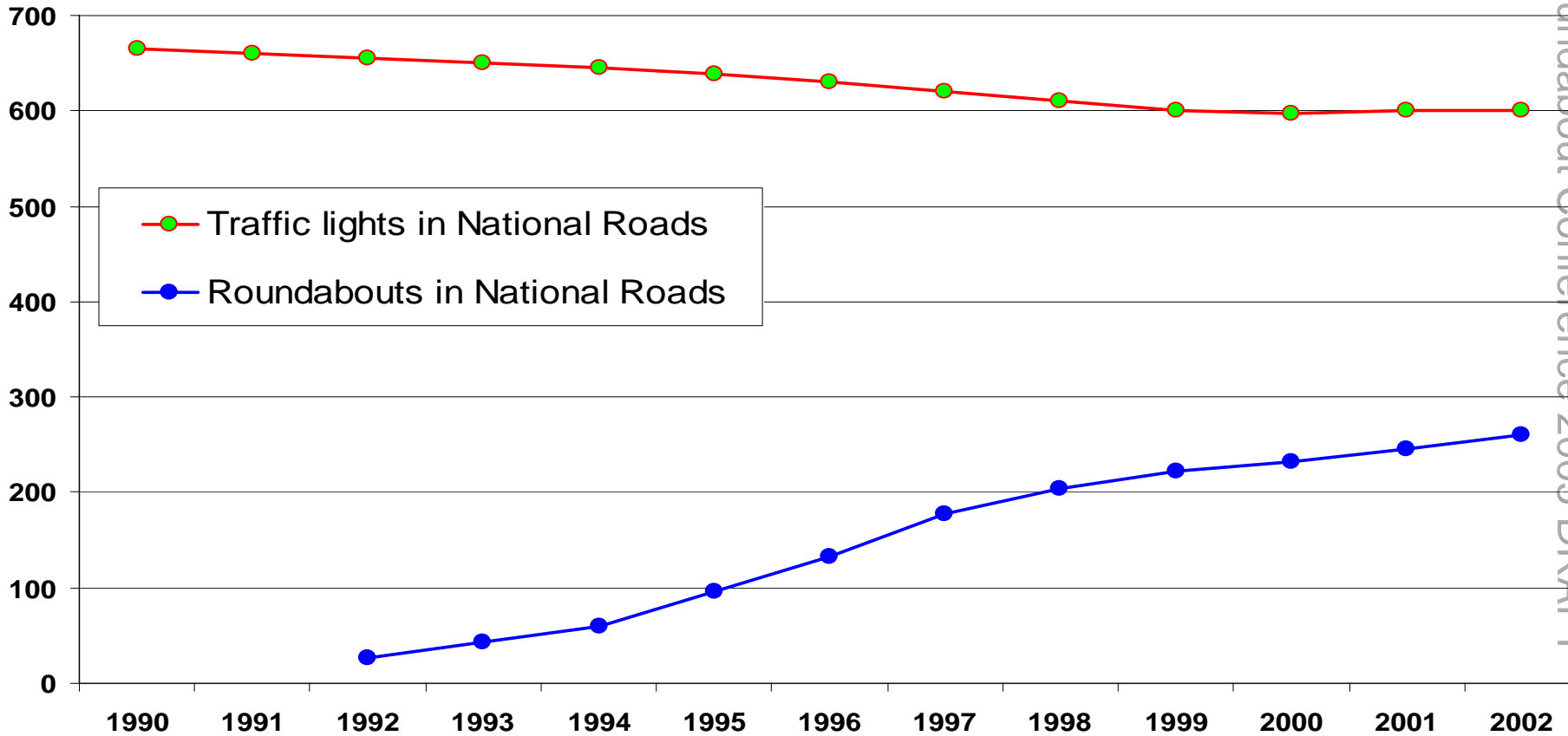
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RÉGION WALLONNE

Roundabouts and Traffic Lights : Evolution

Number of traffic lights and roundabouts in Wallonia



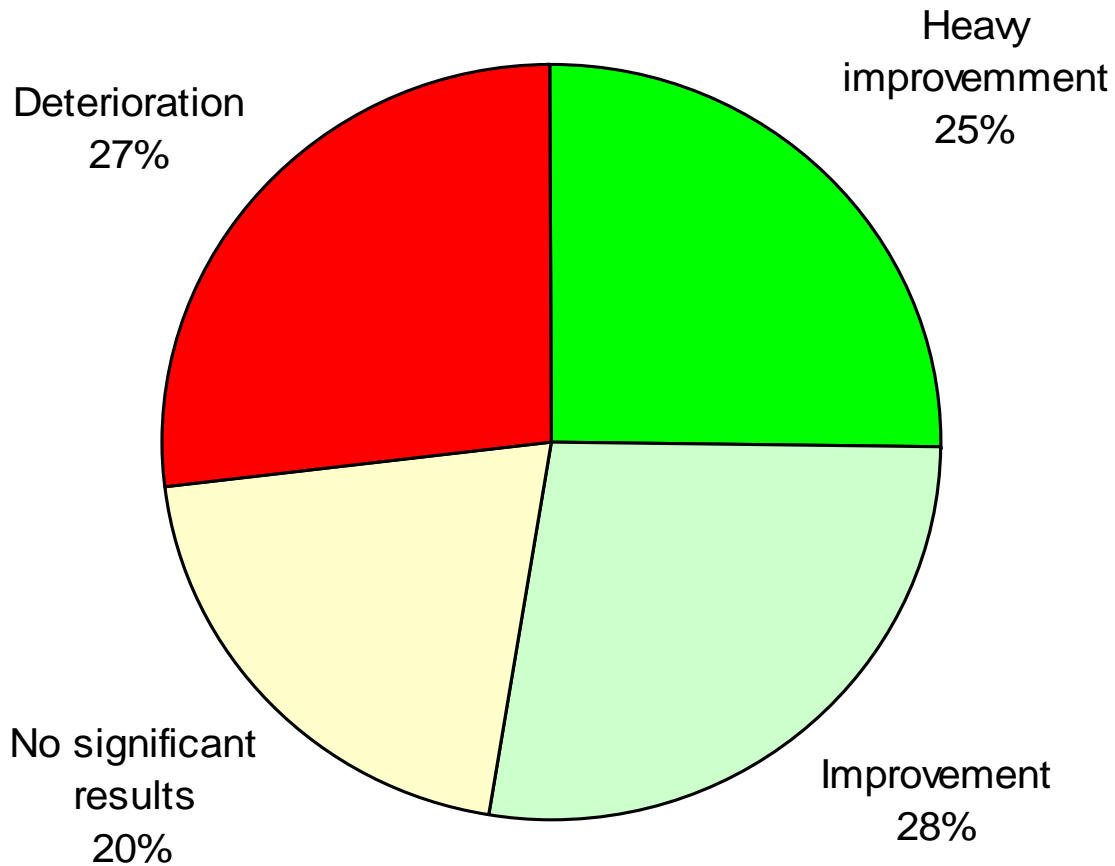
Evaluation of roundabouts

3 Evaluations

- 1) Before - After
- 2) Accidents Frequency
- 3) Comparisons : Roundabouts - Traffic lights;
Belgium (Wallonia) - France

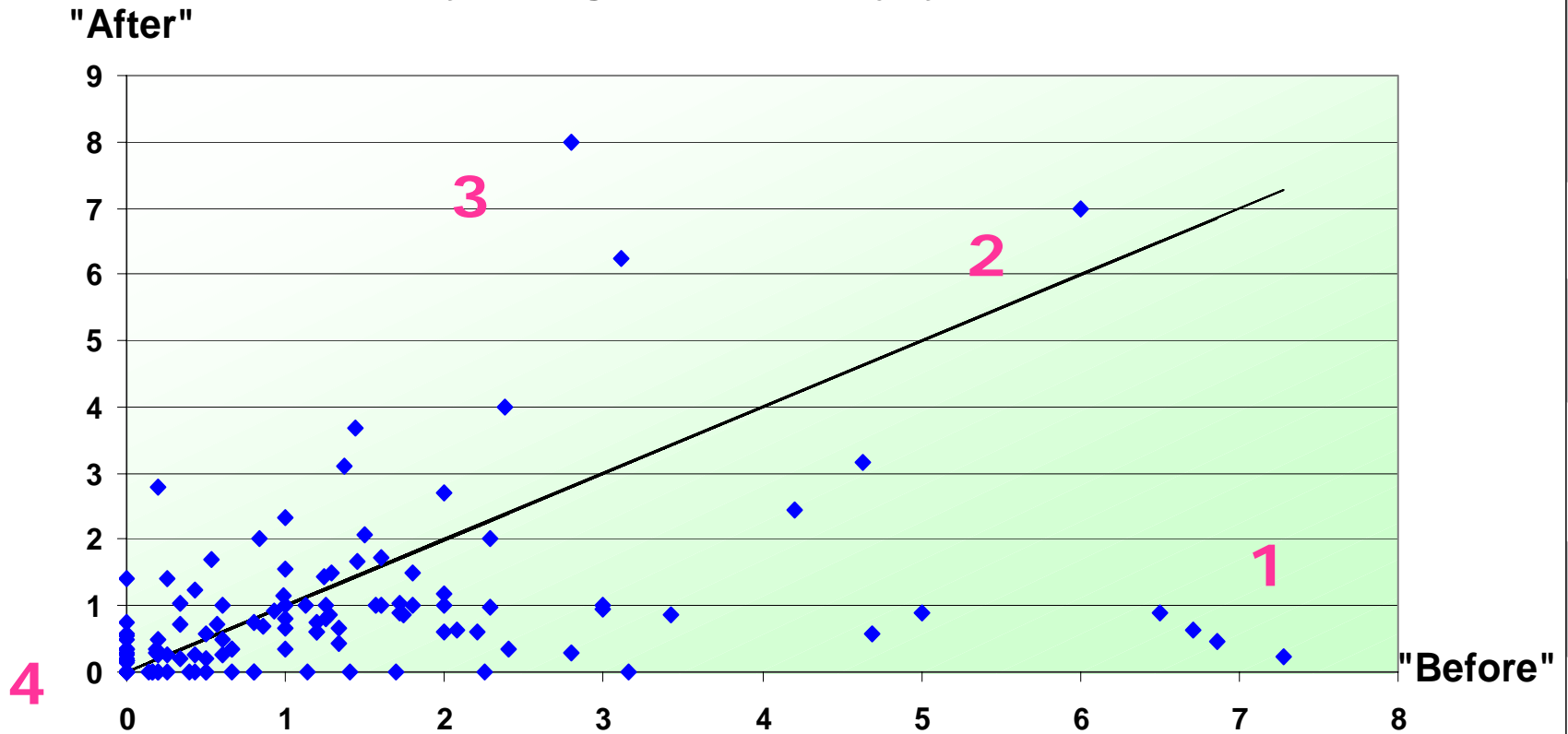
Before - After

Assessment of the changing into roundabouts



Before - After

Yearly average number of injury accidents



Before - After

122 crossroads (1992-2000)

Before

736 accidents

544 years

After

411 accidents

520 years

reduction of 42 %

Before - After

Open country : - 50 %

Semi-urban : - 46 %

Urban : - 15 %

But on the same period,

- 15 % of accidents in other crossroads

Before - After : Comparison

France : - 60 % of accidents (100 R., Haute-Garonne)
- 66 % of accidents (SETRA, CETE de l'Ouest, ...)
- 88 % (55 R., Loire Atlantique 1979-2000)

Denmark : - 53 % (urban), -84 % (open country)

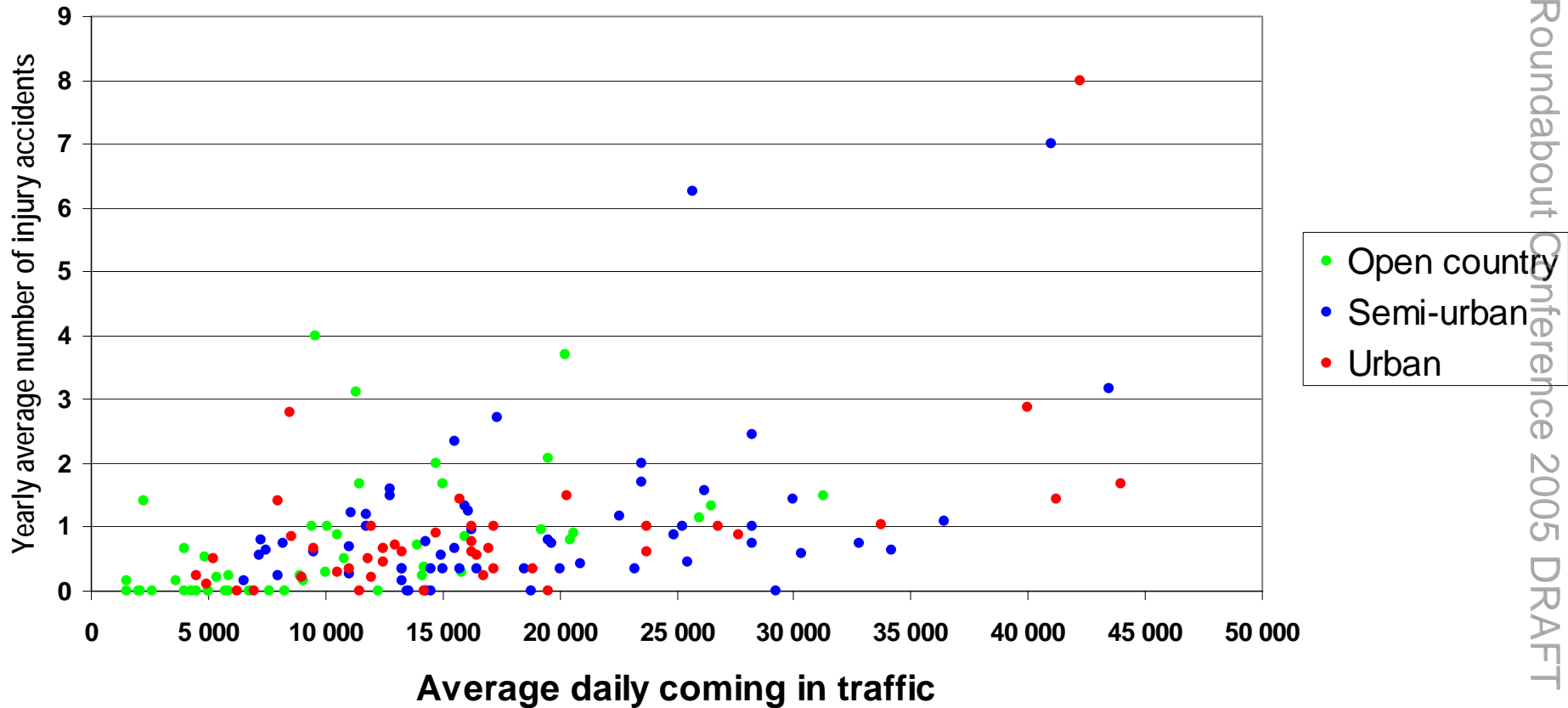
The Netherlands : - 71 % (181 roundabouts)

Australia : - 71 % (13 roundabouts)

USA : - 76 % (24 roundabouts, Maine)
- 88 % (8 roundabouts, Maryland)

Roundabouts : Acci. Frequency

Injury accidents frequency in roundabouts



Roundabouts : Acci. Frequency

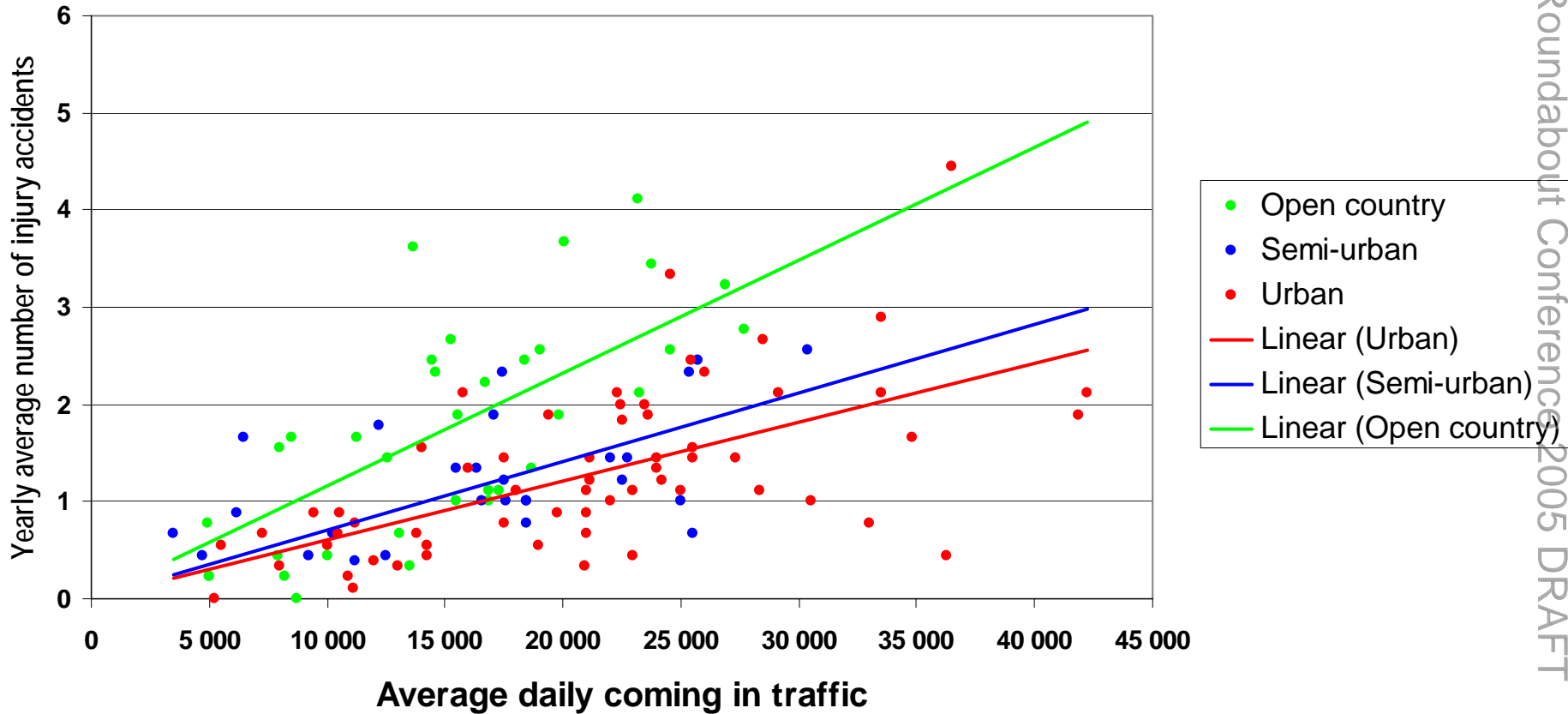
151 Roundabouts (1992-2000) - 736 years

for an AADT = 10 000

	Accidents	Serious Acci.
Open country :	0,527	0,169
Semi-urban :	0,488	0,115
Urban :	0,502	0,082
	~ 0,5	simple to double

Traffic lights : Acci. Frequency

Injury accidents frequency in traffic lights



Traffic lights : Acci. Frequency

122 Traffic lights (1992-2000) - 1098 years

for an AADT = 10 000

	Accidents	Serious Acci.
Open country :	1,139	0,280
Semi-urban :	0,743	0,146
Urban :	0,609	0,098
	simple	simple
	to double	to threefold

Comparison: Traffic lights - Roundabouts

Traffic lights / Roundabouts

	Accidents	Serious Acci.
Open country :	+ 116 %	+ 66 %
Semi-urban :	+ 52 %	+ 24 %
Urban :	+ 21 %	+ 25 %

Comparison: Traffic lights - Roundabouts

Traffic lights / Roundabouts

	Accidents
France :	+ 100 %
Norway :	+ 60 à + 100 %
The Netherlands :	+ 30 %
Australia :	+ 100 %

Roundabouts : France - Belgium

Injury Accidents / year

Belgium (Wallonia)

~ 0,5

France

~ 0,25

for an AADT = 10 000

Roundabouts: Belgium - France

Explanations :

- general over-proportioned
- direct way of turn-to-right
- frequent entries of two lanes
- two-lanes rings
- few reductions of the profile in upstream of the roundabout

Types of accidents in roundabouts

Open country

- > rain - no influence
- > 59 % - collisions against an obstacle
- > two-wheels veh. are implicated in 13 % of acci.
- > alcohol ... 21 % of accidents
- > Recommendations


Types of accidents in roundabouts

Built-up area

- > rain - no influence
- > 39 % - lateral collisions
- > 31 % - collisions against an obstacle
- > two-wheels veh. are implicated in 26 % of acci.
- > Recommendations

Types of accidents in traffic lights

Open country

- > rain - great influence
 - > 49 % lateral collision
 - > 24 % frontal collision
 - > 20 % from behind collision
 - > turn-to-left - 56 % of acci.
 - > red light crossing - 29 % of acci.
- 
- 2 veh.

Built-up area

- > idem excepted pedestrians = 12 % of acci.

Principal planning elements

- > prefer a simple installation
- > rule out any aggressive obstacle
- > a good view when approaching the roundabout
- > avoid too big planning elements
- > not hesitate to make the central island rather small in urban environment

Choice of types of crossroads

Motorways and Express ways

- > uneven crossroads
- > semi-crossroads (way in, way out)
- > sometimes roundabouts on express ways

Choice of types of crossroads

Ordinary Roads : Open country

Basic crossroad = simple crossroads (stop, yield, priority of right)

When turn-to-left more important > a turning left way

When side-traffic rather important or safety problems
> roundabout

Choice of types of crossroads

Urban ou Semi-urban Environment

Several kinds of crossroads are often compatible.

Defining the installation aims and their priorities in act will help to choose the most appropriate type of crossroads.

Choice of types of crossroads

Basic crossroad = simple carrefour (stop, yield)

Roundabout :

- safety problem, speed moderation
- complicated crossroads (numerous islands)

Traffic lights :

- manage and control the traffic in regulated zone
- priority of public transport
- control the queues
- pedestrians crossing too difficult