

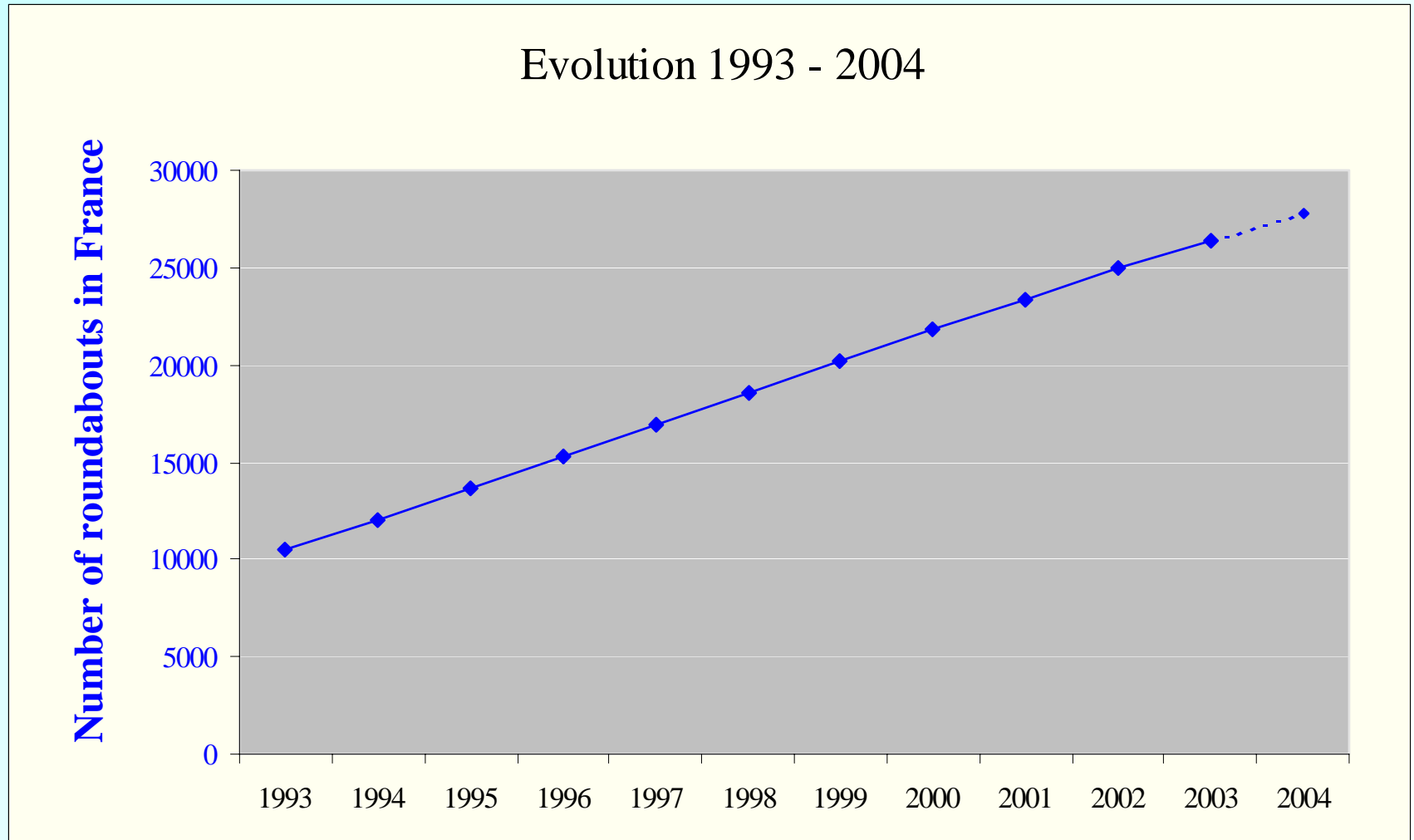
ROUNDBABOUTS IN FRANCE

Safety and New Uses



Bernard GUICHET
24/05/2005

Every year, more than 1000 new roundabouts in FRANCE













National Roundabout Conference 2005 DRAFT











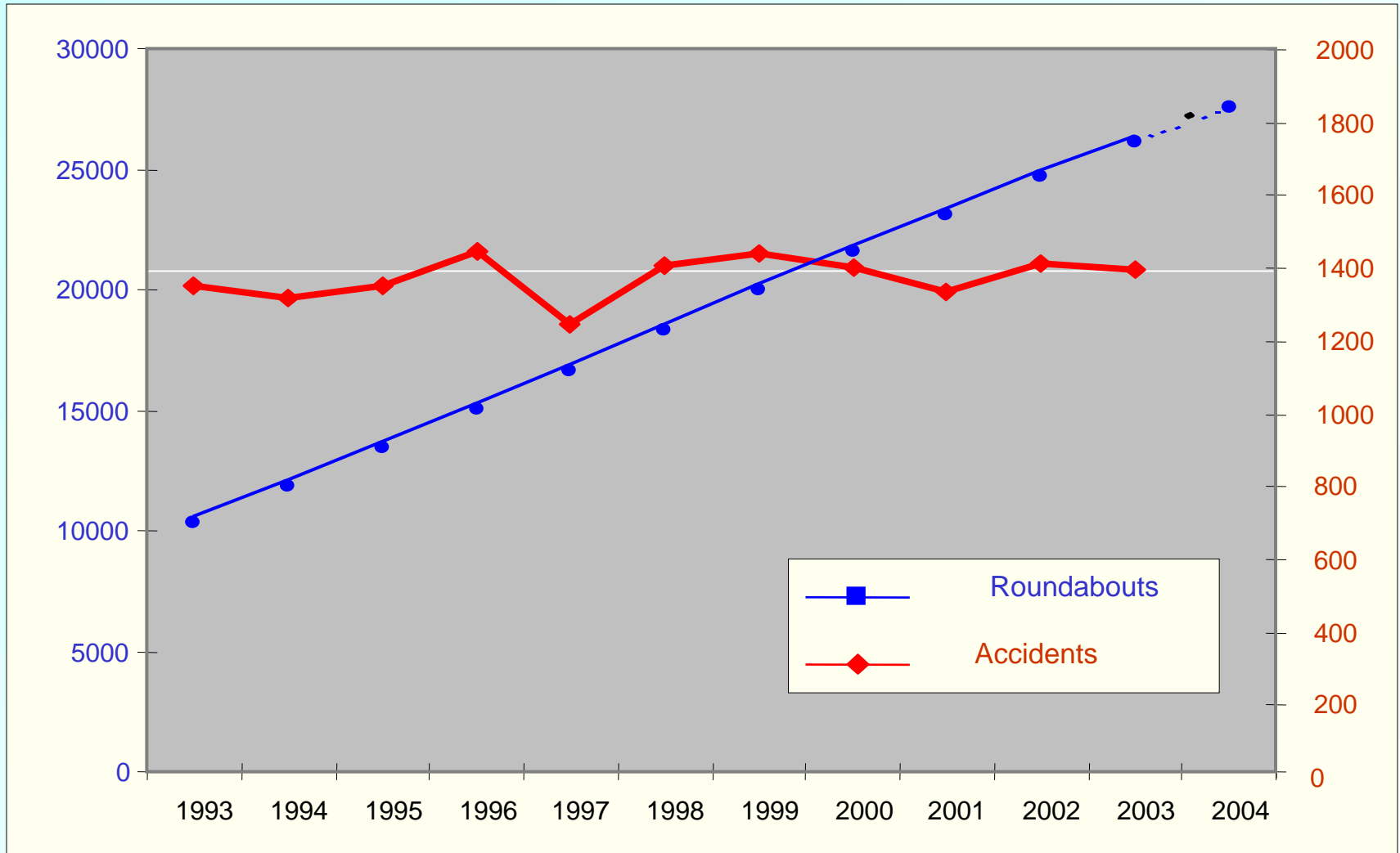






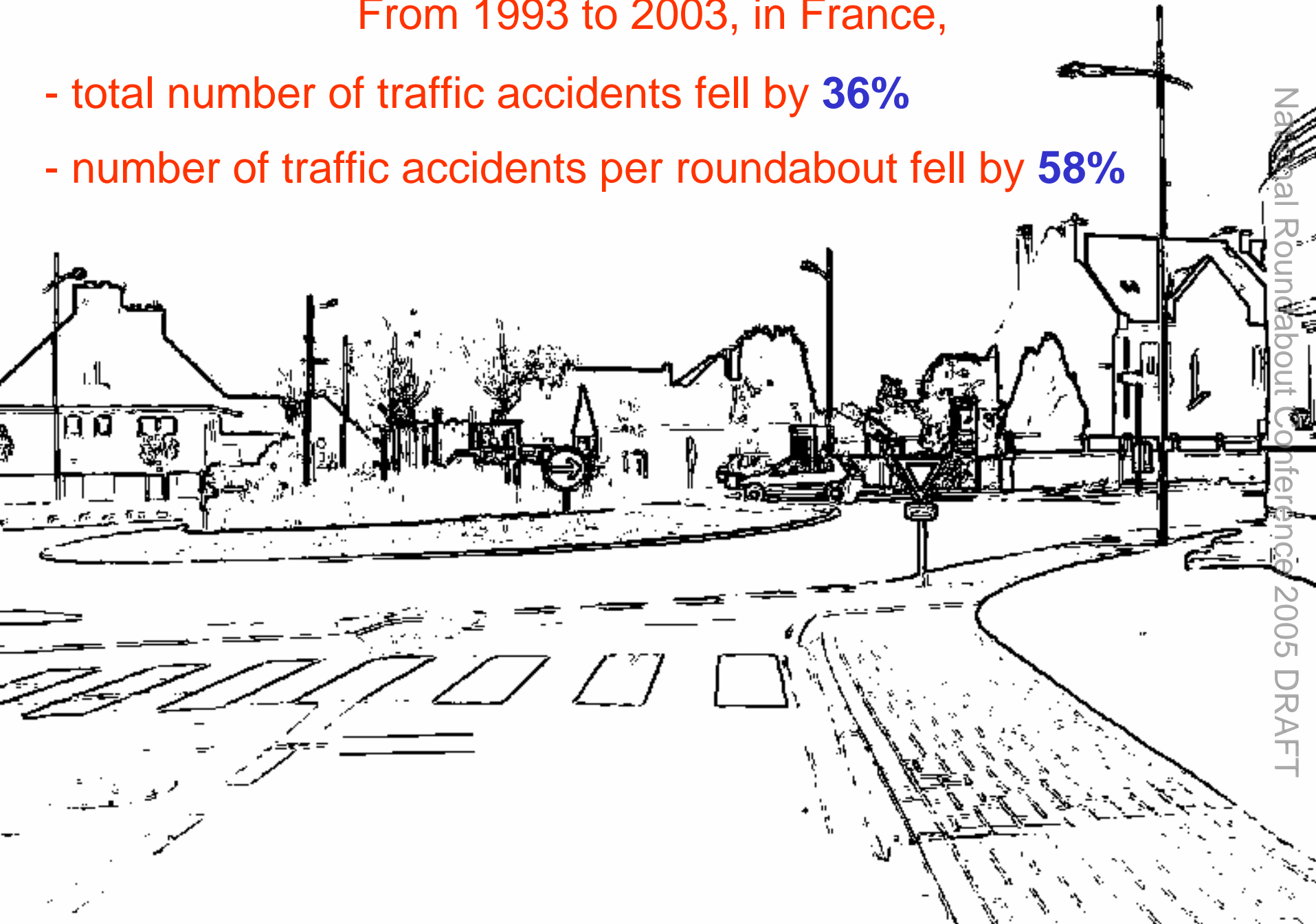
More roundabouts, but less accidents per roundabout

Evolution 1993 - 2003

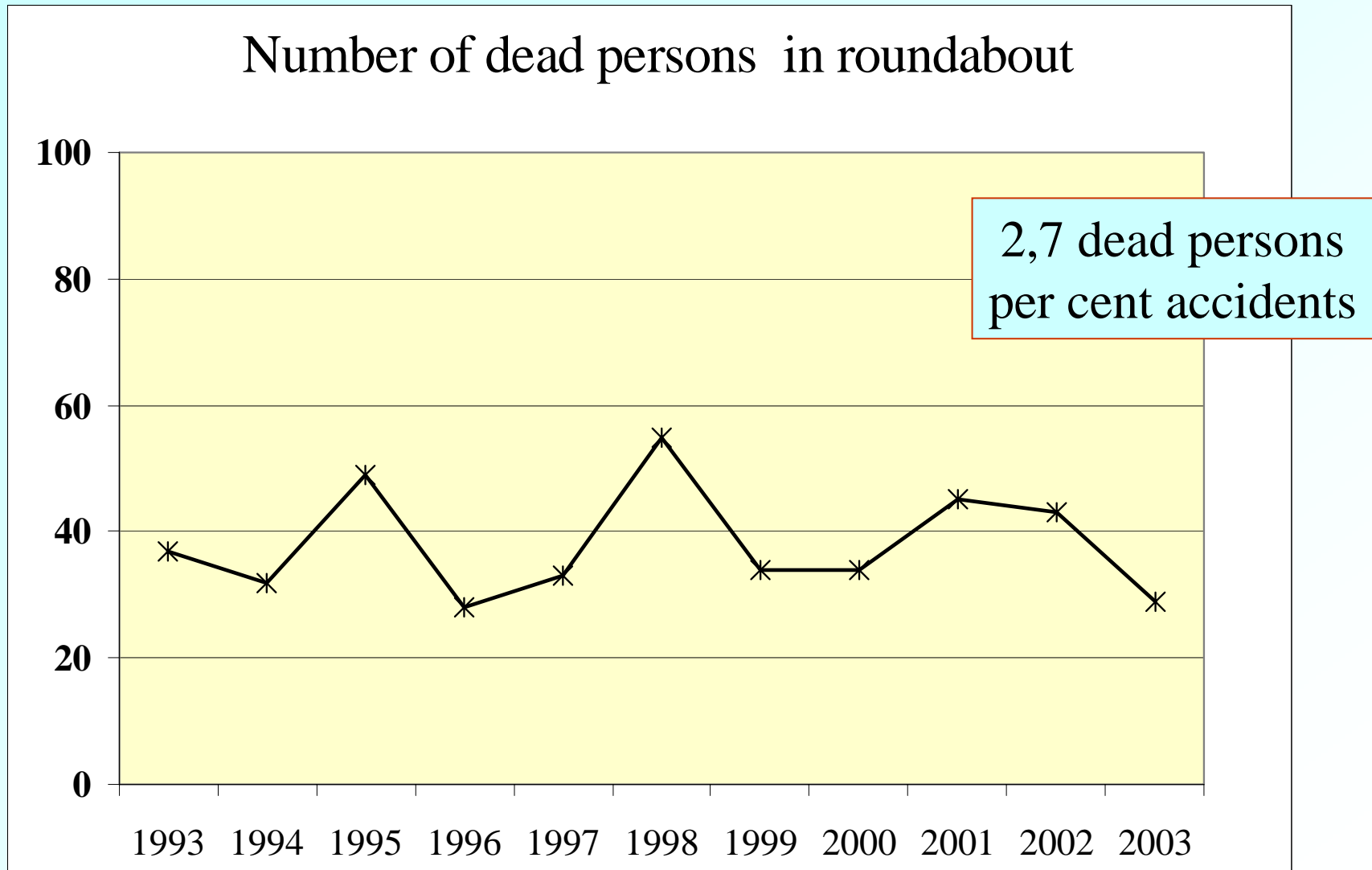


From 1993 to 2003, in France,

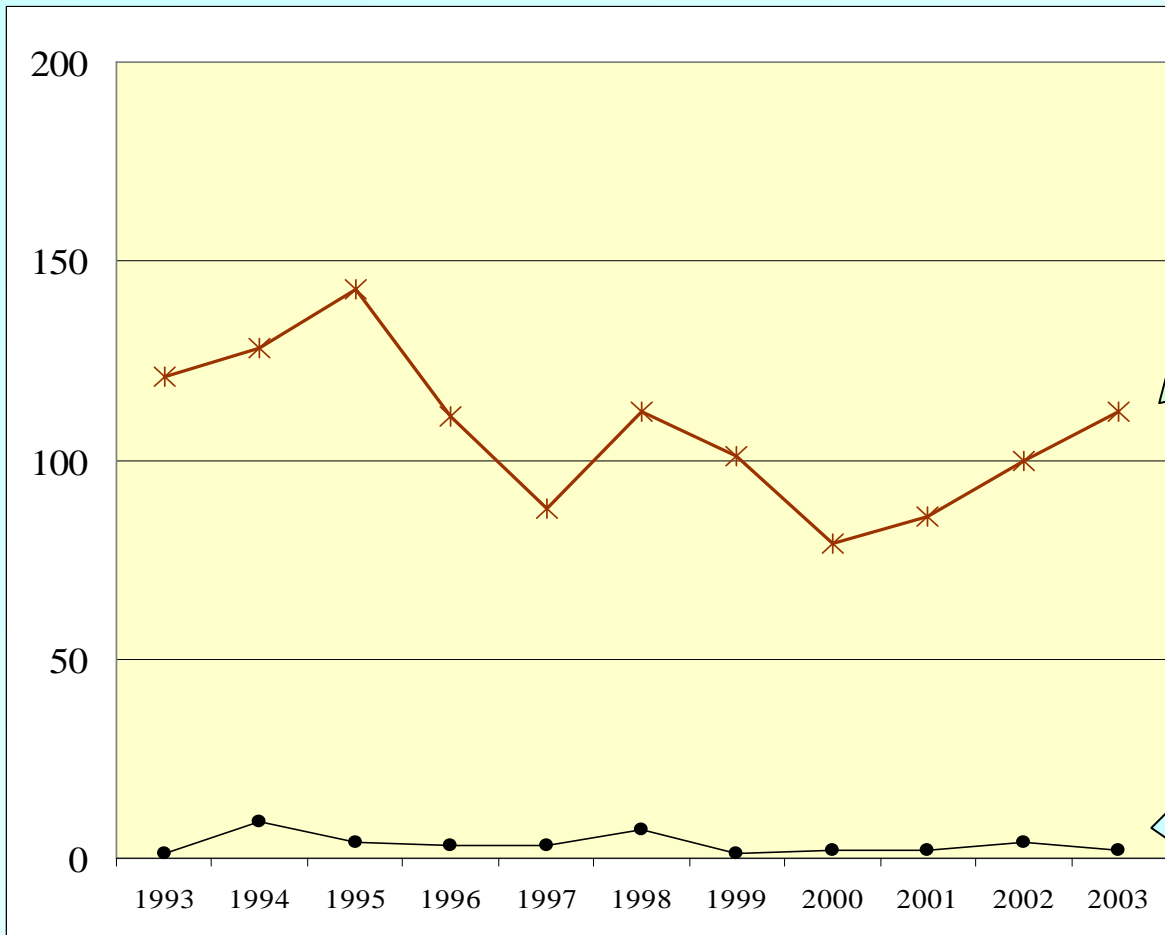
- total number of traffic accidents fell by **36%**
- number of traffic accidents per roundabout fell by **58%**



FATAL ACCIDENTS



PEDESTRIAN ACCIDENTS



Year 2003
112 pedestrians
for 1406 accidents

Year 2003
2 killed pedestrians
for 1406 accidents

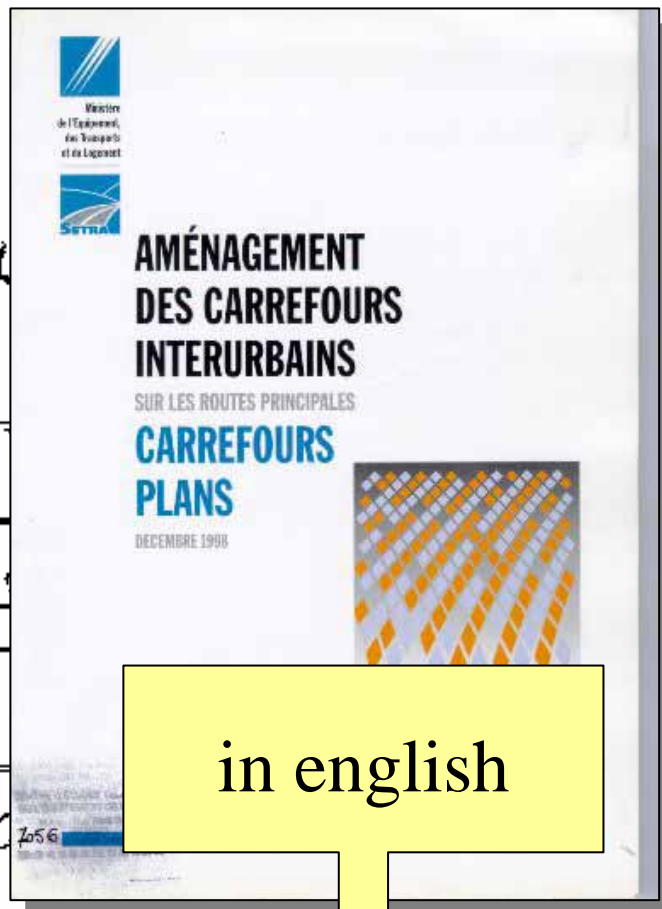
Roundabouts and elderly drivers

Part of elderly drivers in accidents

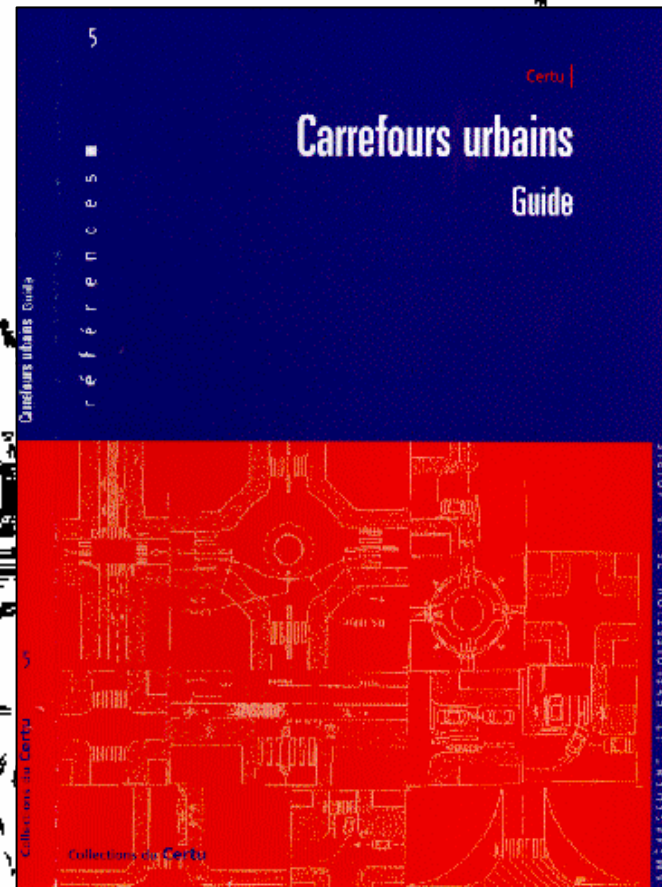
age	Roundabouts	Other intersections
66-75 years	5,46%	7,74%
> 75 years	4,14%	5,71%
For a total of drivers	1209	14337

Ref. 1999-2003 – Bretagne + Pays de la Loire

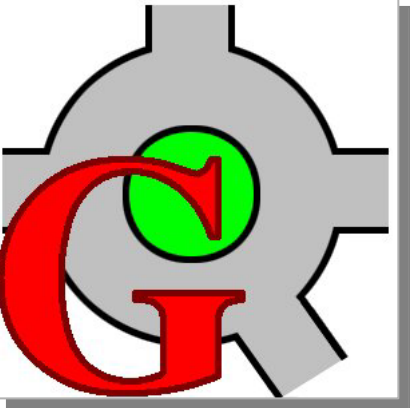
New guidelines has been published
in 1998 and 1999



in english



http://catalogue.setra.equipement.gouv.fr/2_prod/telechargement.shtml



Software

Girabase

**Calculation of
Roundabout Capacity**



This product is
an English language
adaptation of
a French product



Sales Office <http://www.certu.fr>

Girabase

Calculation of Roundabout Capacity

MENU

INSTALL

BROWSE CD CONTENTS



Mon

Monum

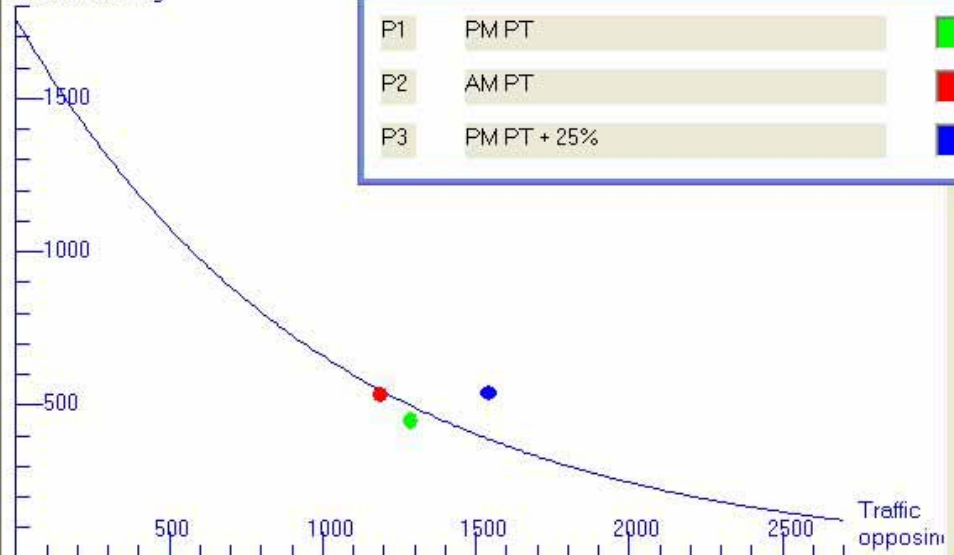
AM PT

Comments

Saturate arm

Close

Traffic Entering



Capacity curve options

- P1 PM PT ■
- P2 AM PT ■
- P3 PM PT + 25% ■

Reserve Capacity		Queue length		Waiting time	
in pcu/h	in %	average	maximum	average	total

1	Arches NP	-20	-3%	23vh	69vh	129s	23.5h
2	Island in the Sky	-75	-15%	38vh	105vh	277s	43.4h
3	Monument Valley	311	46%	1vh	4vh	8s	0.8h
4	Grand Canyon	670	42%	0vh	3vh	2s	0.4h
5	Mesa Verde	13	2%	14vh	44vh	95s	14.1h

New use of roundabouts and studies :

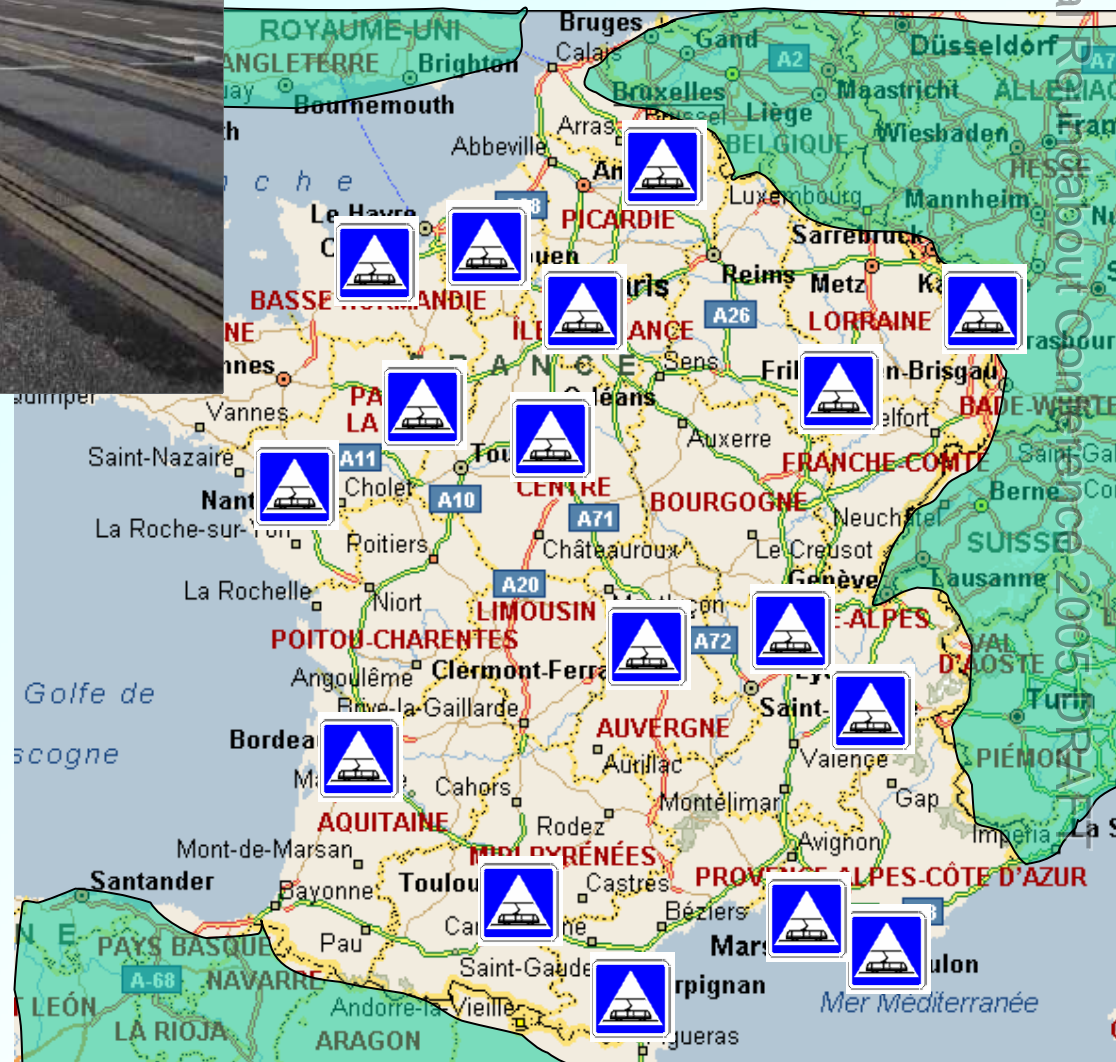
- intersection with tram
- near railway level crossing
- with traffic signals





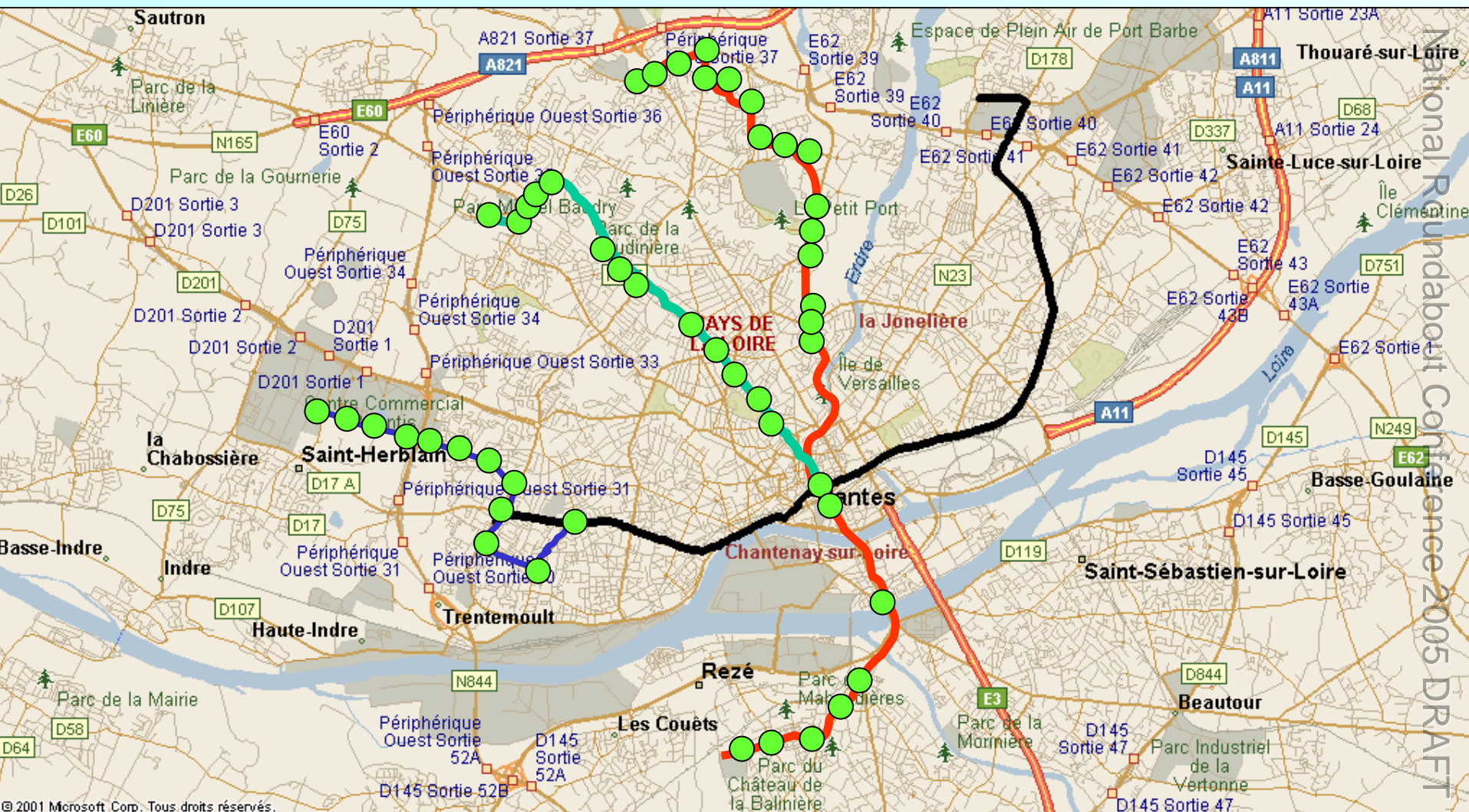
Intersection with tram

For 10 years, modern tram
has made a broad rise
in large French cities



NANTES

Line 3 – 1999-2004



● Roundabout

They are modern roundabouts
with yield to the entries



Advantages of roundabouts for tramway intersections :

- better safety
- possibility of U-turn
- easier management of traffic lights

When a tram arrive,
traffic is stopped by red lights
and priority is given to the tram



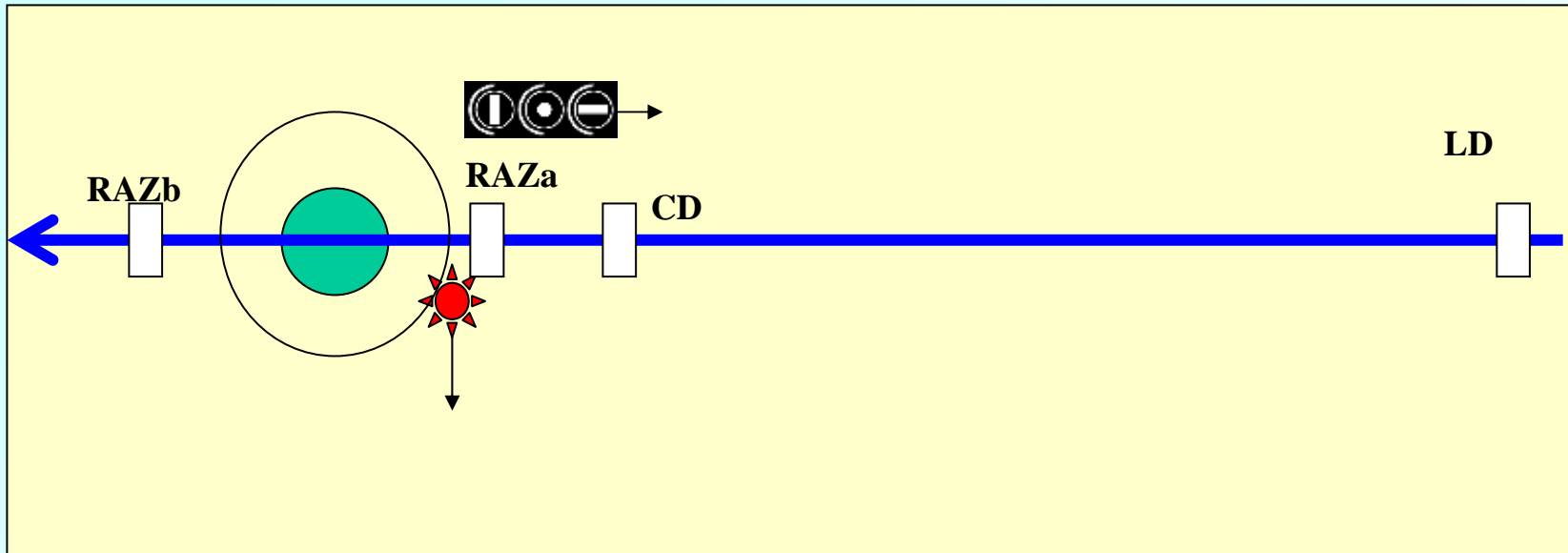
Flashing red signal are used
on the ring to stop cars

This specific signal
is used for trams





4 detections order the signals



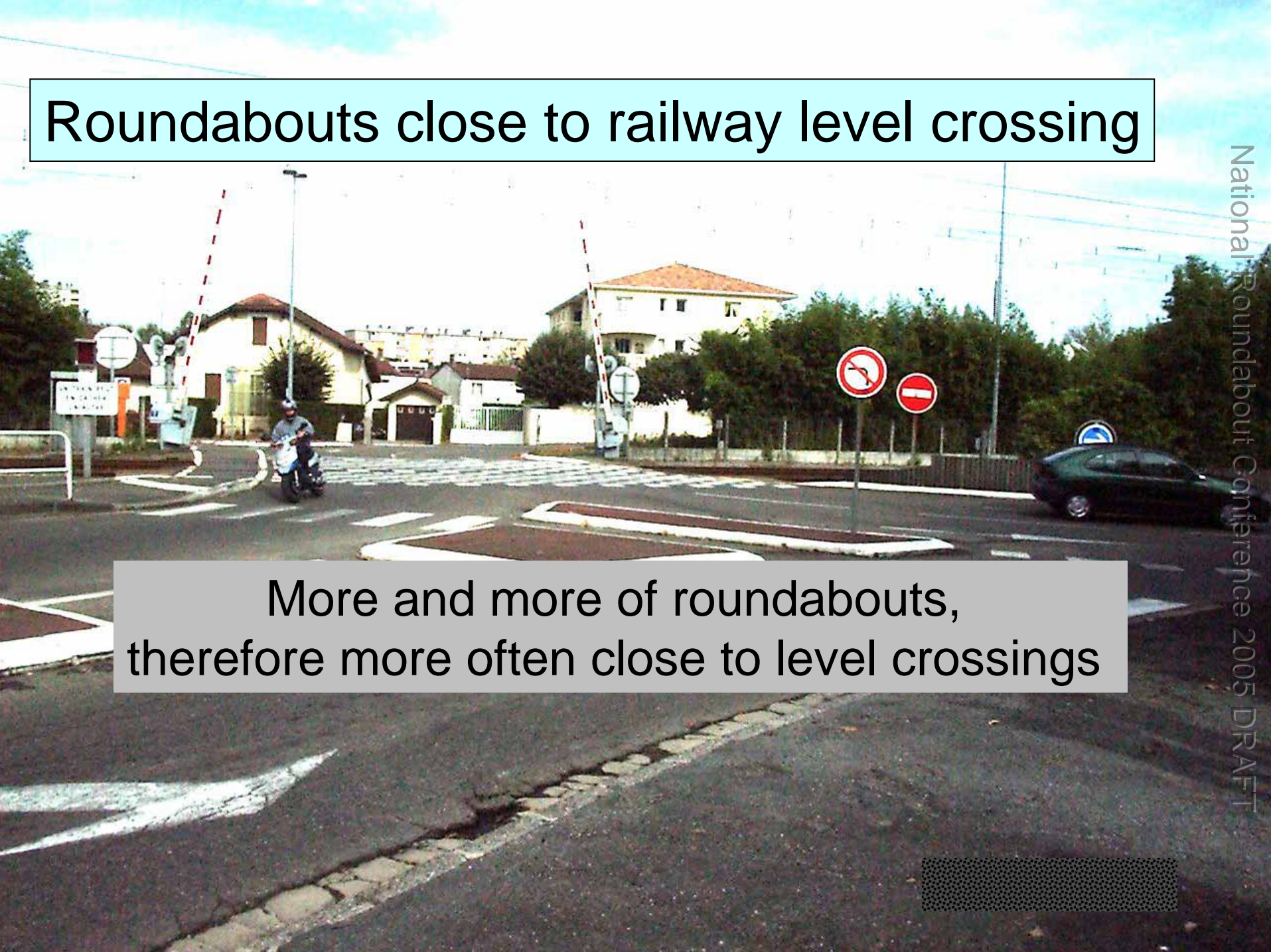
LD : (80 - 140m) = red for cars and “green” for tram

CD : (5 - 10m) = confirmation and safety

RAZa : (5m after) = red for tram

RAZb : (after roundabout) = black for car

Roundabouts close to railway level crossing



More and more of roundabouts,
therefore more often close to level crossings

The French National Railway Company is anxious



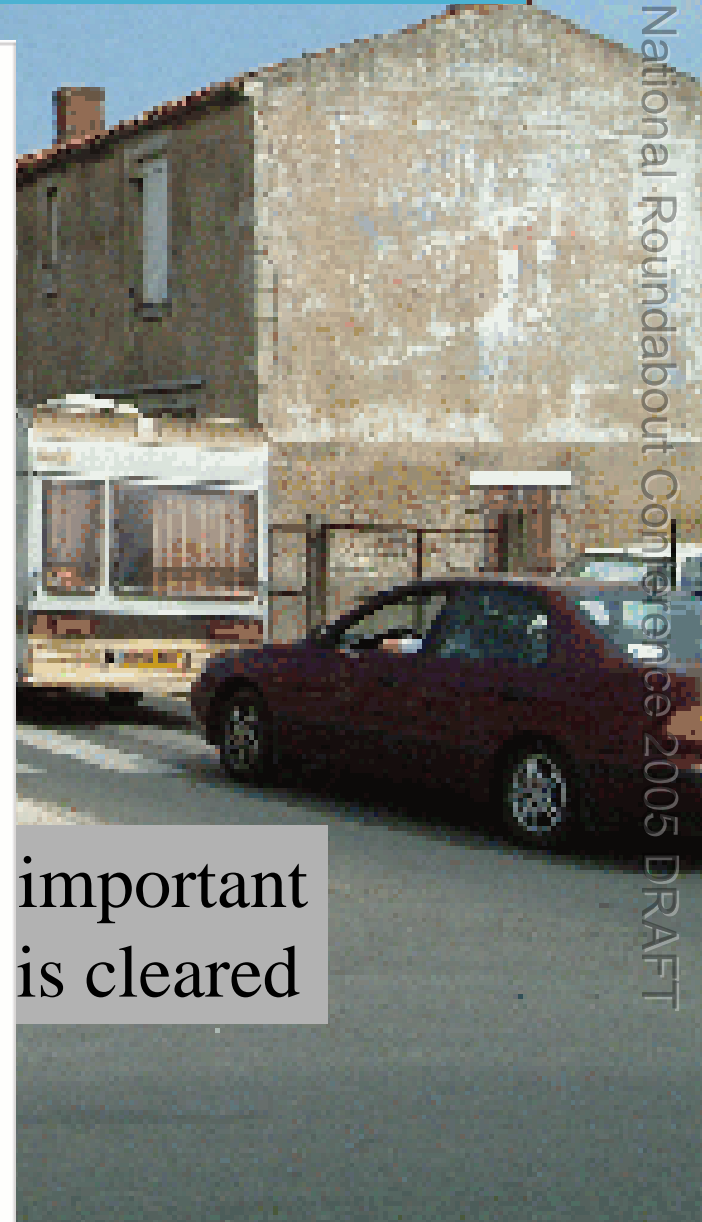
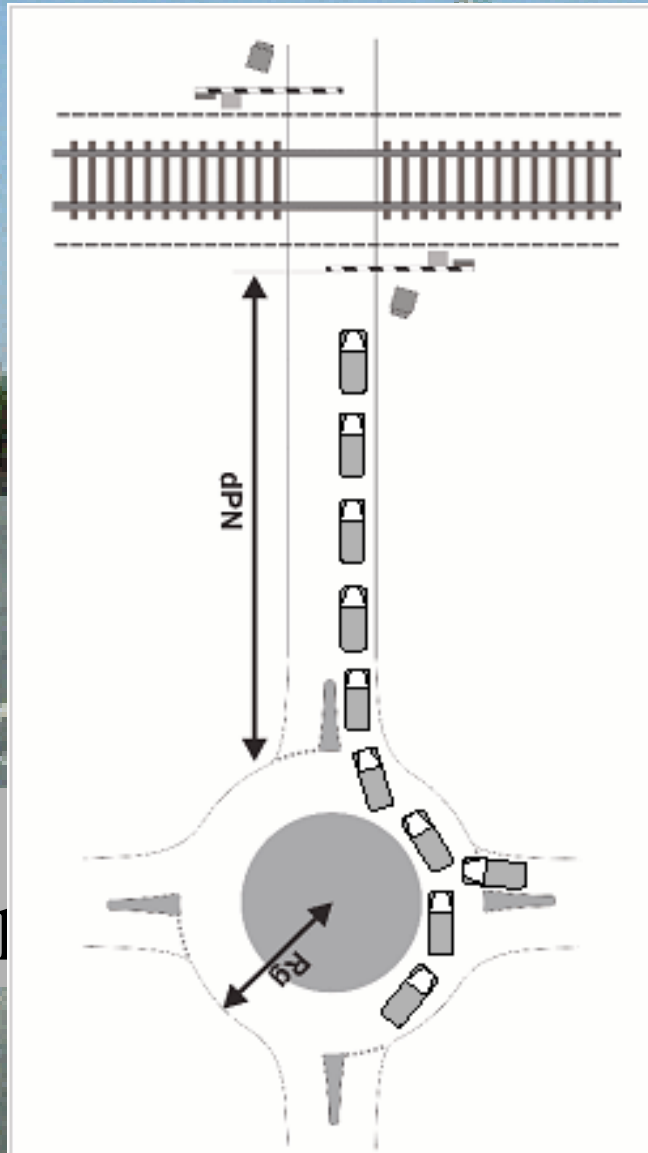
Road Directory and Railway Company
manage a working group
to plan a guideline with solutions

Two various problems are studied ...

First problem: the queue of the level crossing goes up in the roundabout



Not a
In a sl

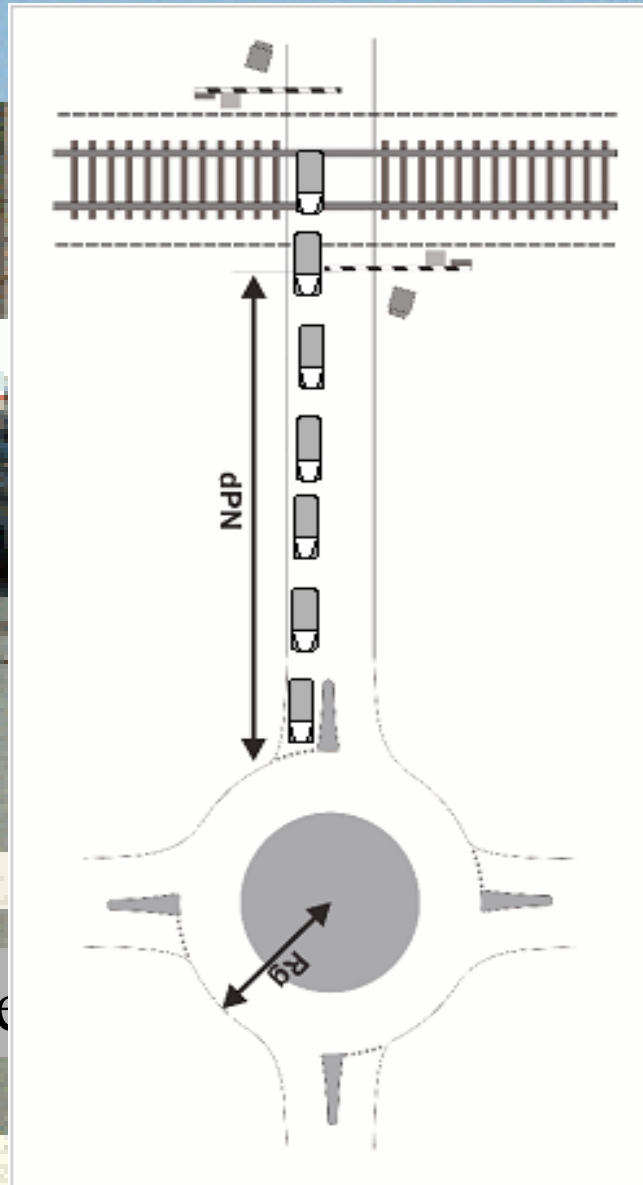


important
is cleared

Second problem: the queue of the roundabout goes up on the level crossing



A train can arrive



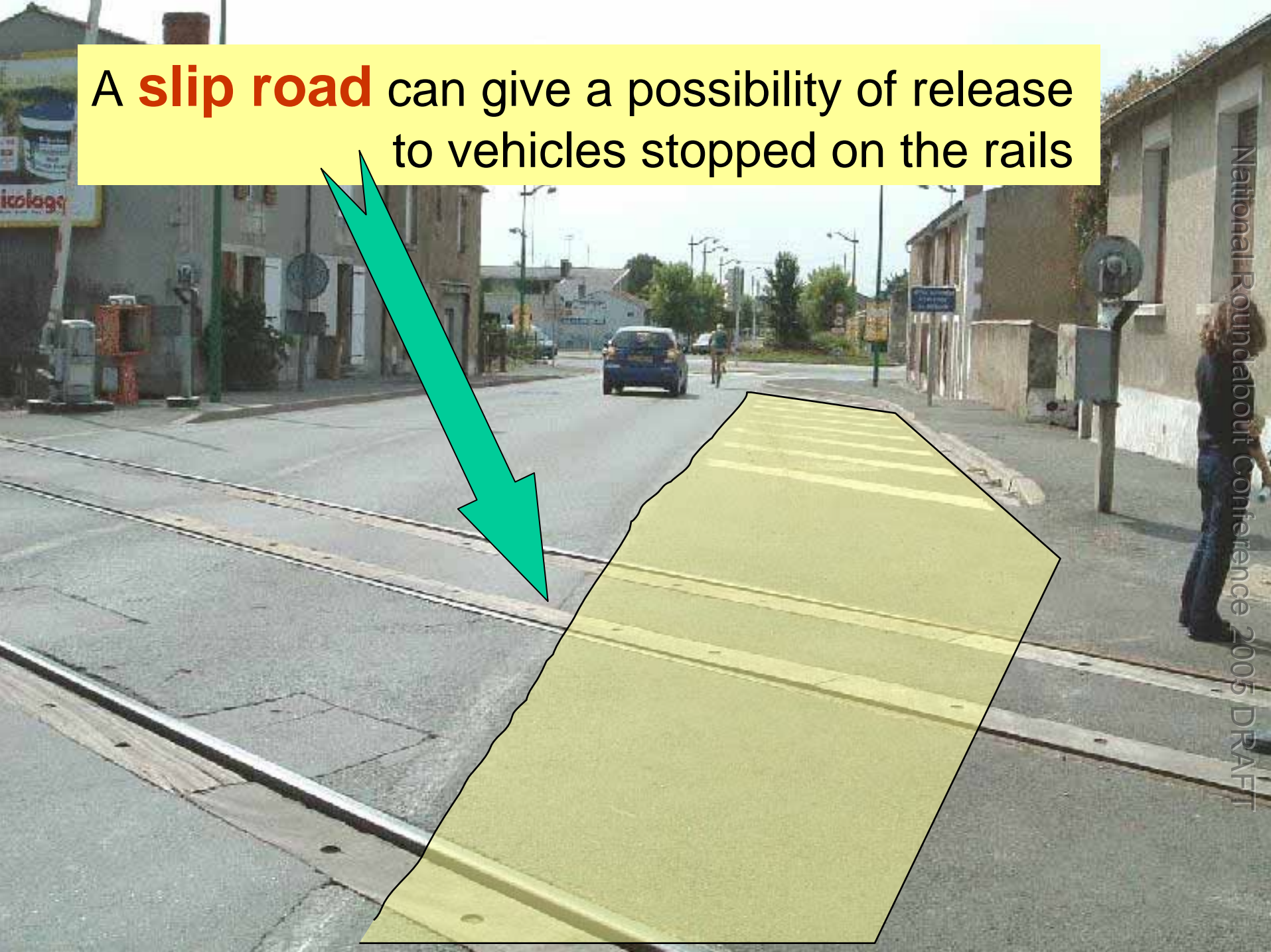
of fatal accident

Solutions are either preventive, or curative,
static or dynamic

Various complementary signals
are tested to avoid the stop on railways



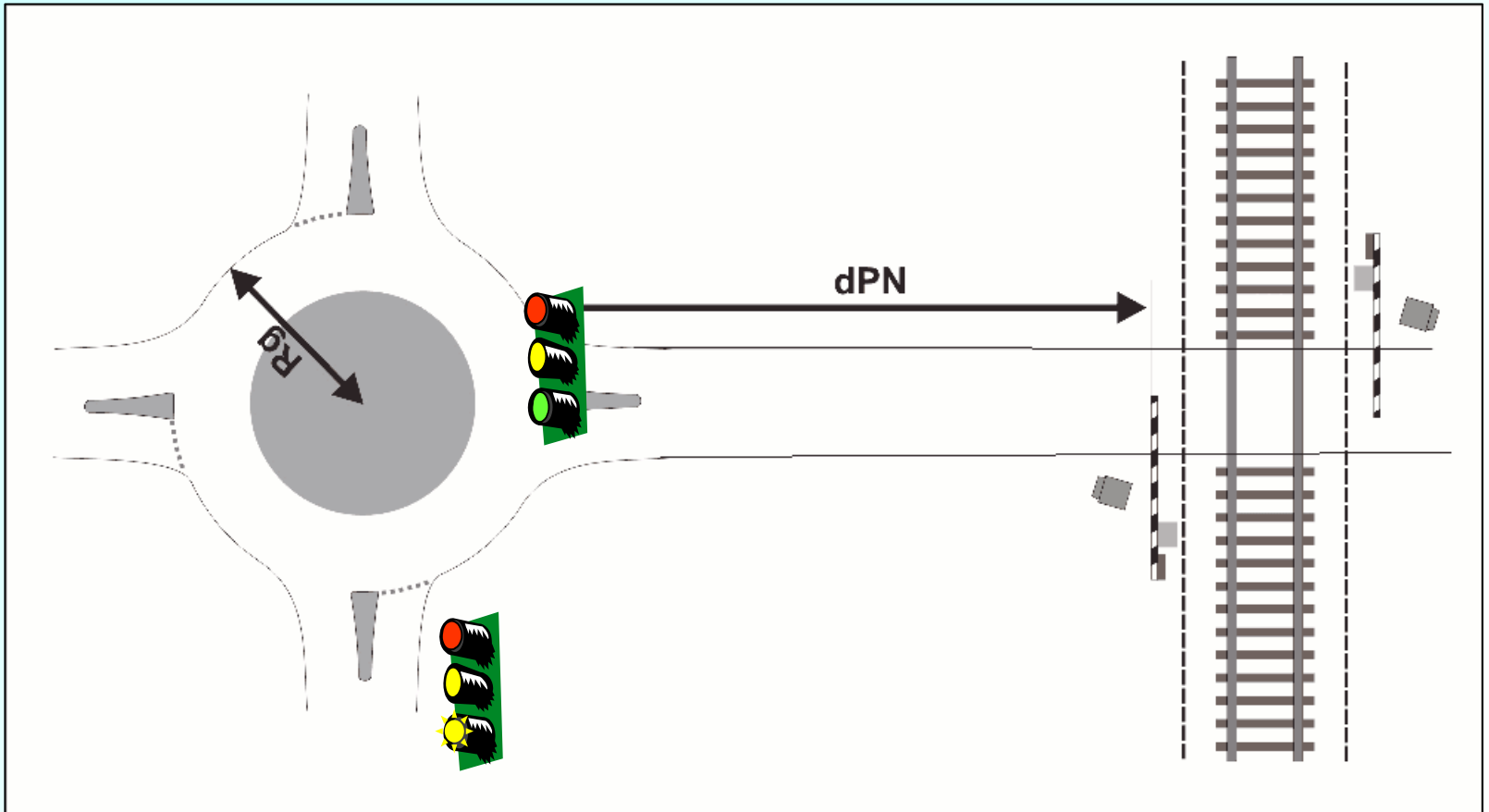
A **slip road** can give a possibility of release to vehicles stopped on the rails



Other curatives solutions used traffic signal

At entry of roundabout

Or in the ring of (large) roundabout



We propose a formula to calculate
the time of release of the level crossing

$$t(s)=7 + \pi \cdot (Rg-La/2)/20 + dPN/4,05 + lPN/2,78$$

To validate the various parameters,
the reaction times were timed on a lot of roundabouts

Publication of a guideline in 2005

A other subject of research :
roundabouts with permanent traffic signals



Guideline for area of utilization, design,
planning, road signs ...

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