

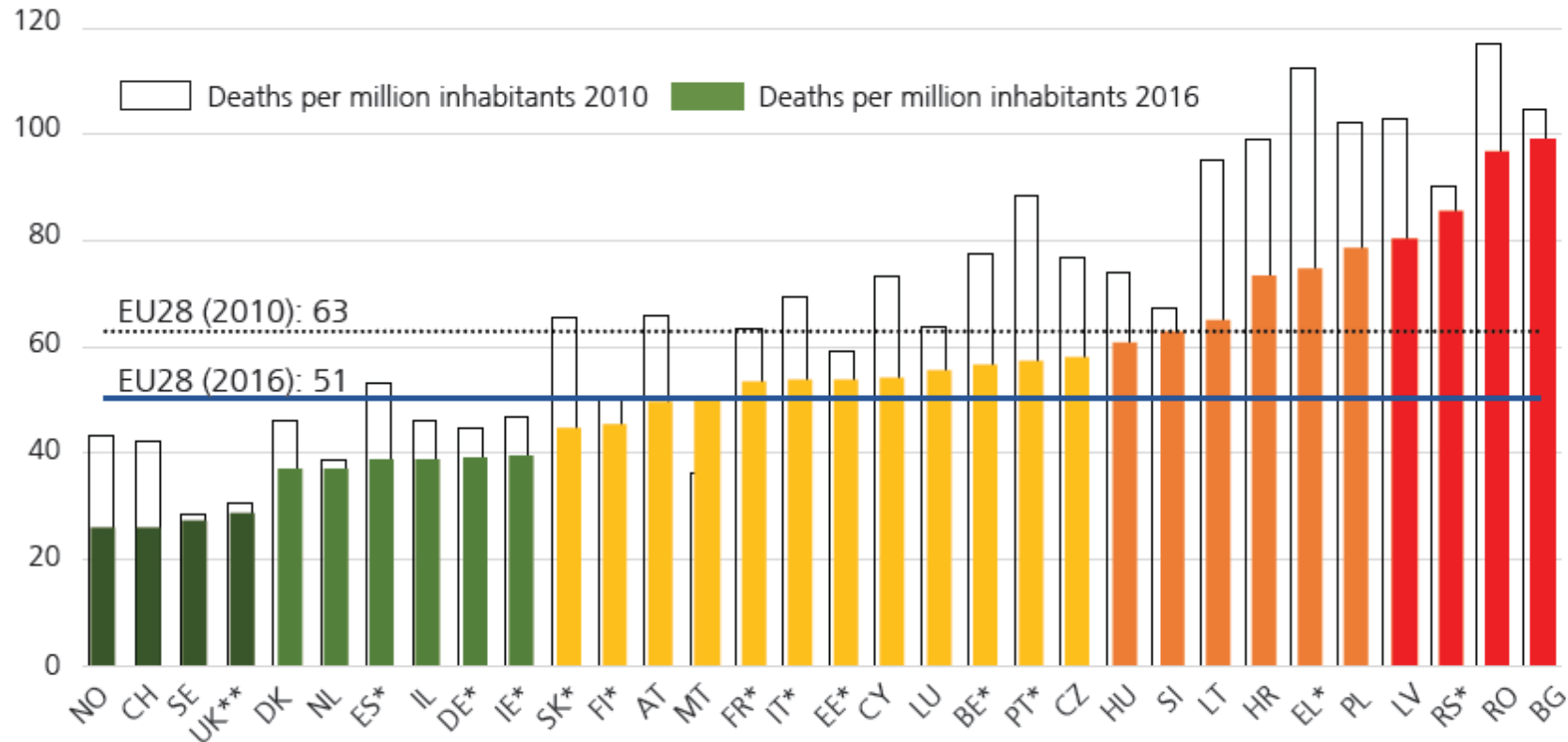
PIN Talk in Romania

Speed enforcement: Roads and users

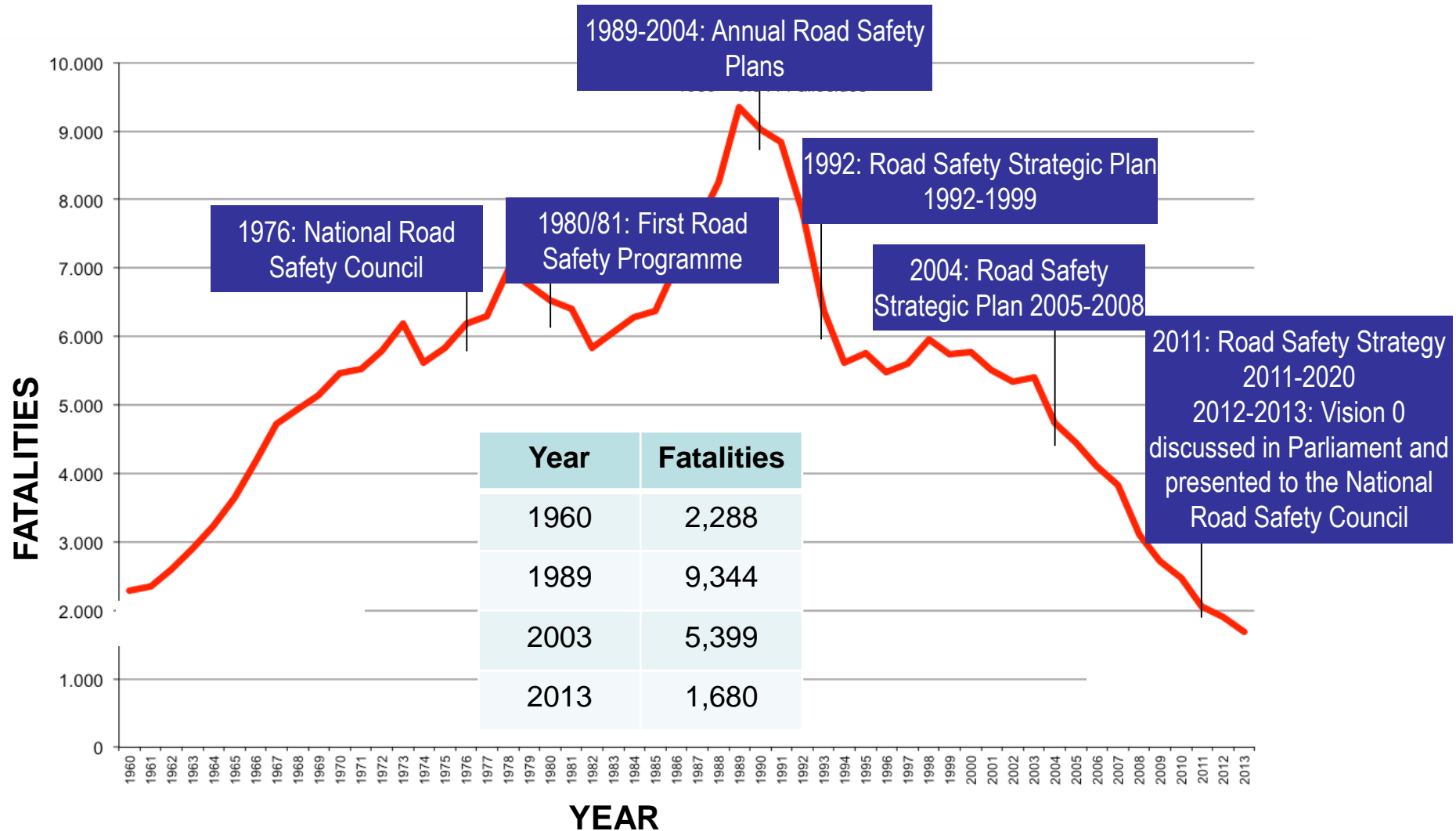
Pedro Tomás Martínez

Mobility Management Area Chief

EU Fatalities/million population classification



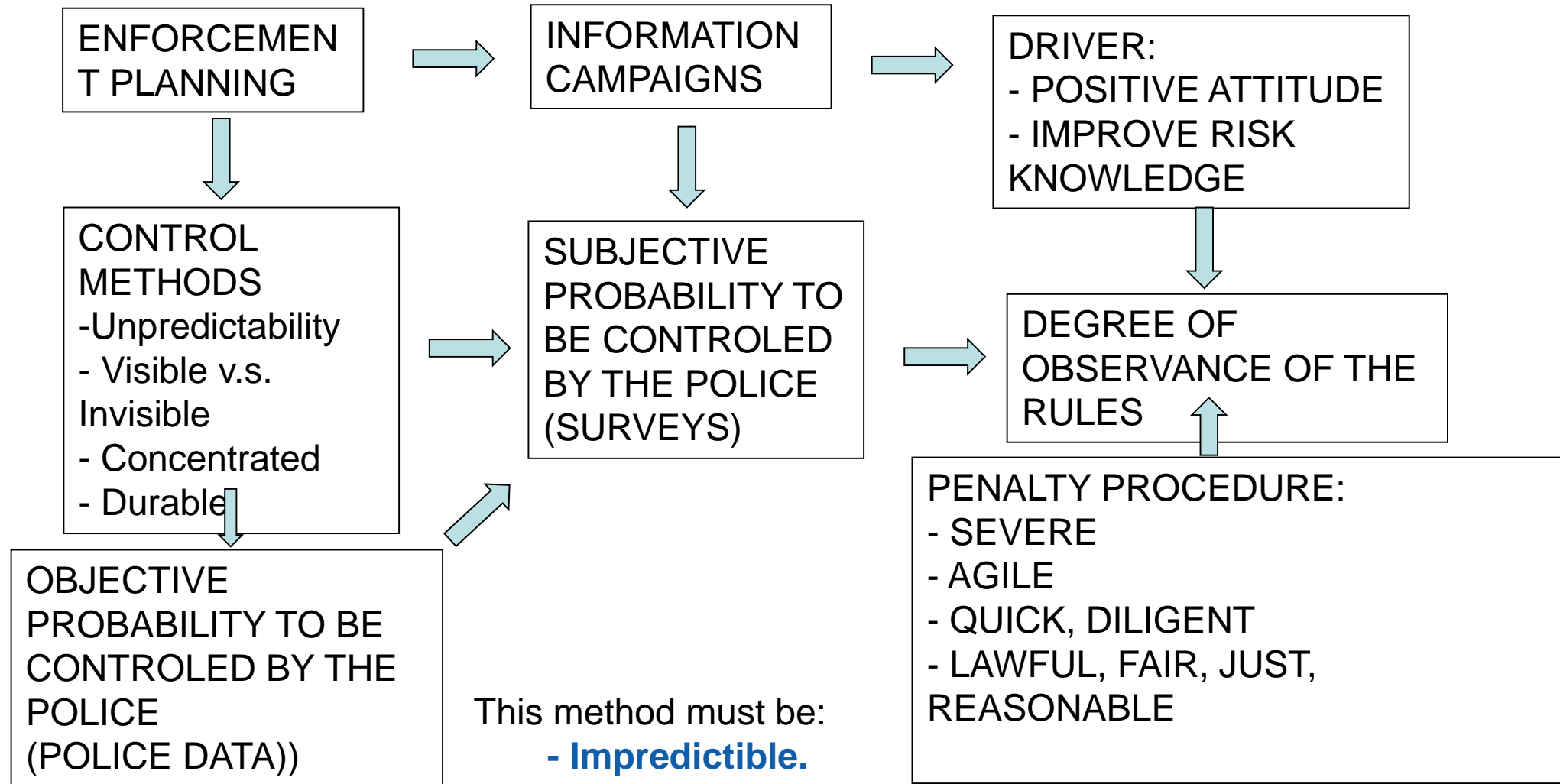
Mortality (road deaths per million inhabitants) in 2016 (with mortality in 2010 for comparison). *National provisional estimates used for 2016, as the final figures for 2016 are not yet available at the time of going to print. **UK data for 2016 are the provisional total for Great Britain for the year ending September 2016 combined with the total for Northern Ireland for the calendar year 2016. Numbers of deaths in LU and MT are particularly small and are therefore particularly subject to substantial annual fluctuation. Annual numbers of deaths in CY and EE are also relatively small and therefore may be subject to annual fluctuation



SARTRE (*Social Attitudes to Road Traffic Risk in Europe*)

- SARTRE 1 (1991-1992)
- SARTRE 2 (1996-1997)
- SARTRE 3 (2002-2003)

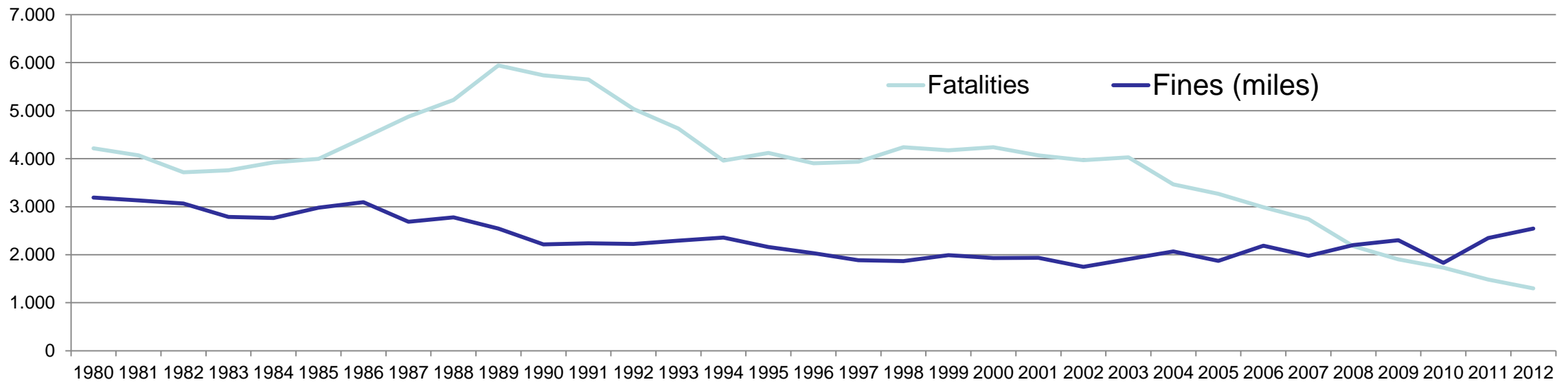
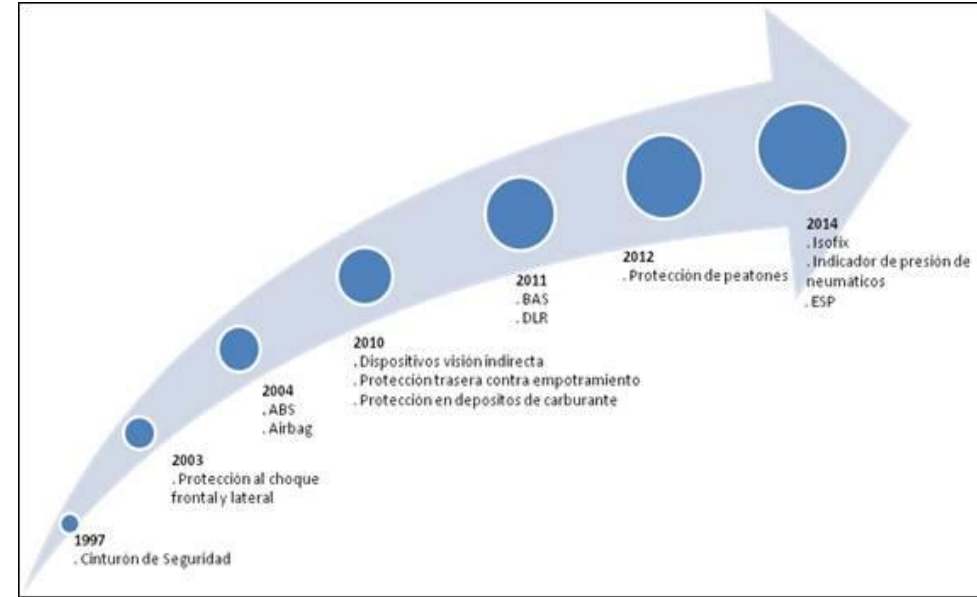
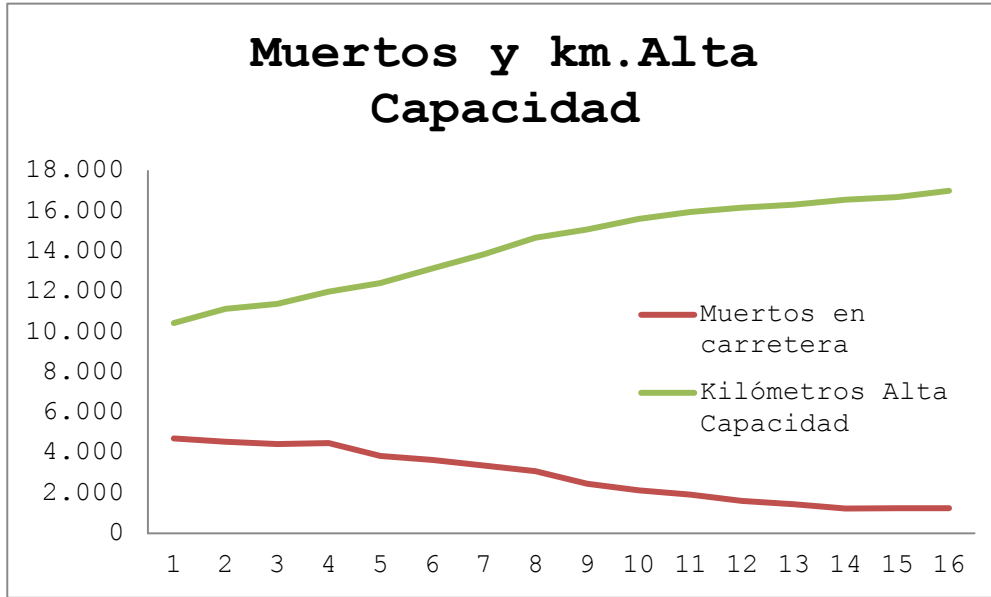
	Alcohol	Speed	Seat belts
Risk behavior	Weekly violators 7.2% (4/23)	21 % feel themselves law breakers (7/23)	82 % uses in motorways (10/23)
Risk knowledge	83 % consider alcohol cause of accidents (2/23)	80 % consider speed cause of accidents(5/23)	24 % do not consider necessary should you drive carefully (9/23)



This method must be:

- **Impredictible.**
- **Visible and invisible speed controls.**
- **Constant along time.**
- **Disseminated and concentrated.**
- **Credible speed limits!!**

Fines/Roads/Vehicles v.s. Fatalities



Individual risk perception is very low
We think we are not to die on a traffic accident.
Mortality index measures this risk:

- Motorways: 0,29
- Rural roads: 1,27

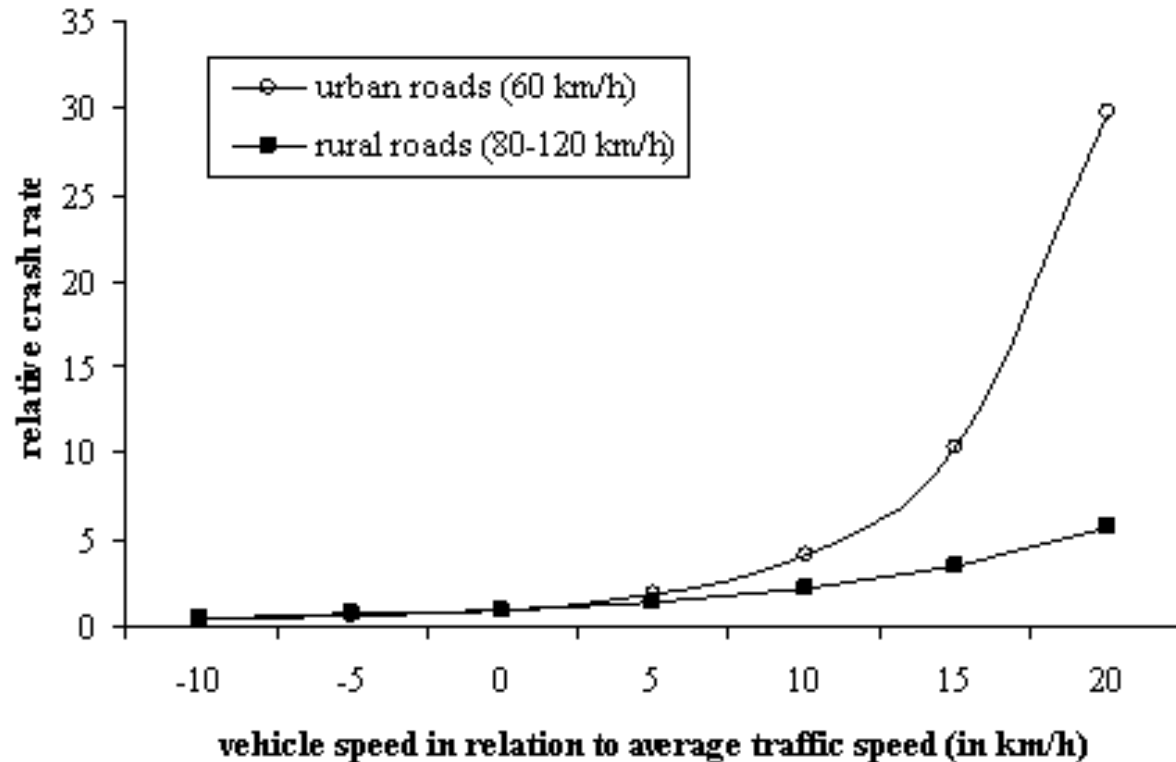
This means that, for every million of 500km trips, the following figures result:

- Motorways: 1,45 fatalities
- Rural roads: 6,35 fatalities

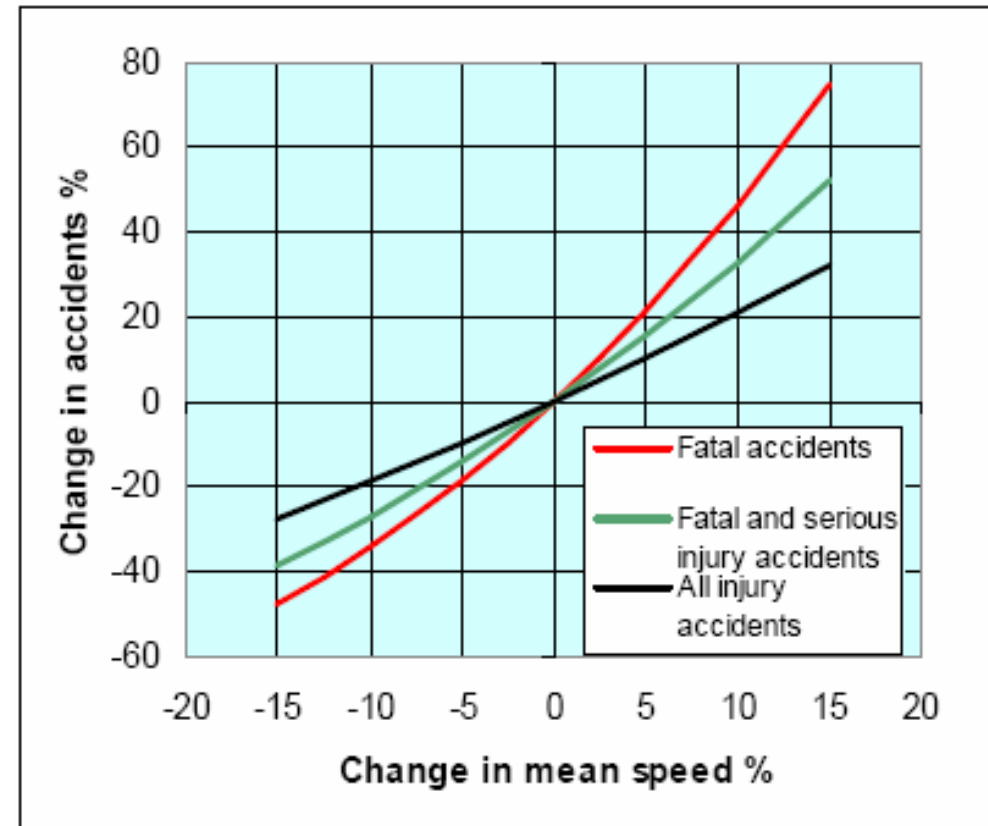
IN SHORT:

- To fulfill this, each person has to travel 500km daily during 2 full lifes.
... and so... **INDIVIDUAL RISK PERCEPTION IS EXTREMELY LOW!!!!**

Driving faster than the rest increases individual risks.
(Kloeden, Ponte y McLean, 2002)



1% mean speed increases result in a 4% fatal accidents increase.
(Nilson, 2004)



641 speed camera boxes

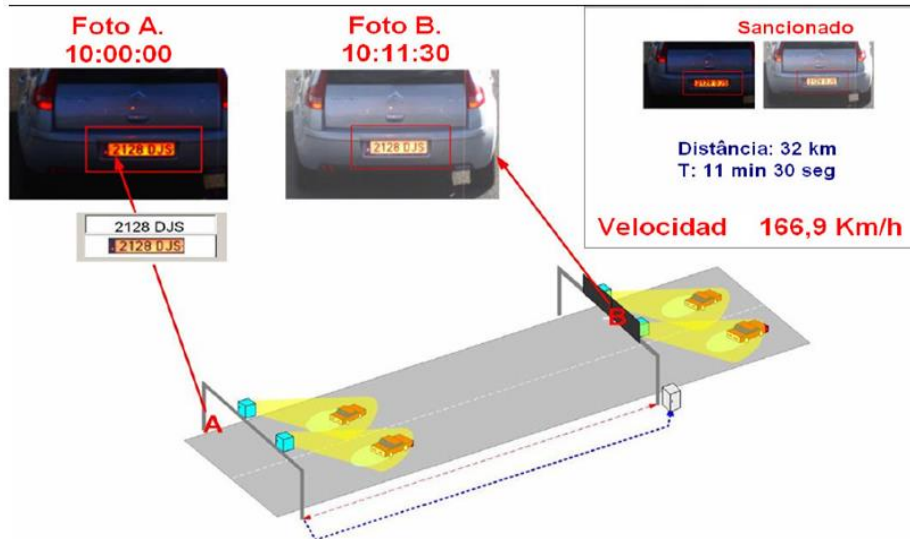


374 fixed speed cameras

390 portable speed cameras



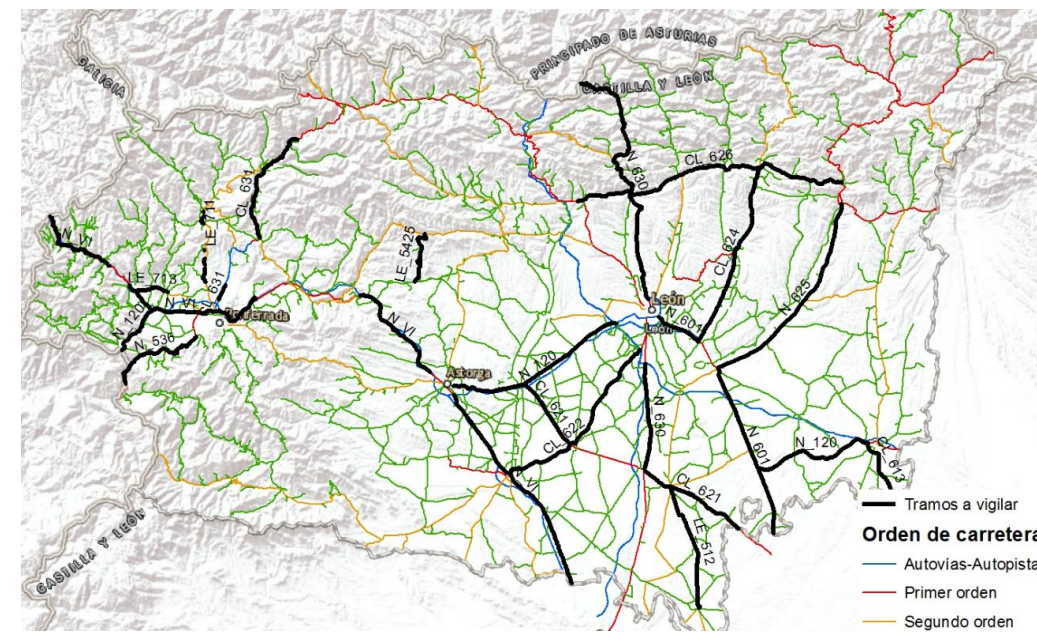
25 mean speed radars



13 helicopter speed cameras



- Concentrated... **where?**
 - EX-POST: Speed excess related traffic accidents.
 - EX-ANTE: High mean speeds profile and high speeds dispersion + Road Design risks factors (FCD + GIS).
- **Local factors** (“black spot management”)
 - Black Spots (new methodology!)
 - T.C.A (Accident concentration stretch – European Directive).
- Global Factors (“network management”)
 - INVIVE
 - EuroRAP
 - Critical areas and risk factors (ie. Overtaking management, rumble strip, etc)
 - Focus on causes VS Focus on statistics
- Big Data and Floating Car Data have allowed for a breakthrough.



Speed excess

\sum Accidents +
 \sum Serious injuries +
 $3 \cdot \sum$ Deaths

Length of stretch

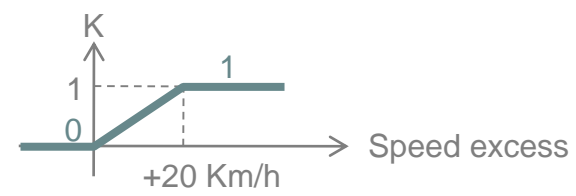
$$INVIVE = \frac{\log_2(1 + C_{VEL}) + \log_3(1 + C_{ACC}) + \log_{20}(1 + C_{Long})}{1 + 0,2 \cdot (J - K)}$$

Road hierarchy

- 0: Motorways
- 1: Basic dual carriageways.
- 2: Connectors carriageways.
- 3: Local carriageways.

INVIVE grows as hierarchy road is higher.

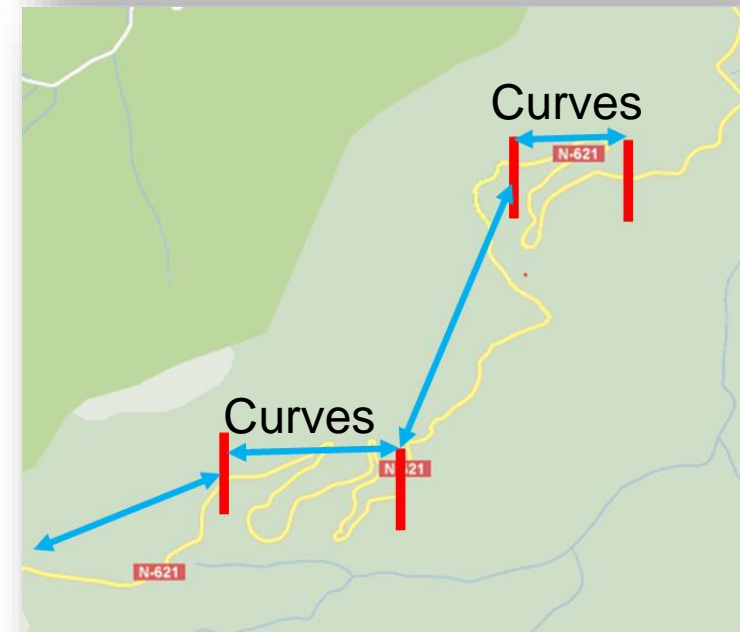
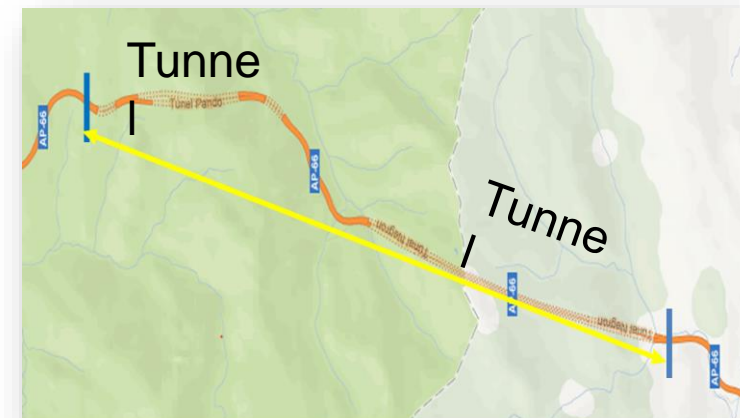
Hierarchy speed excess calculation



Split a stretch in terms of consistency and homogeneity:

① **Túneles:** Tunnels series or >2km. Tunnel.

② Curves layout and straight alignments.



Speed management: Case studies.

120 > 110

Speed limit temporary modification due to national energy shortage risk.

110km/h on all motorways

Information infrastructure: VMS

Enforcement methodology: Fixed speed cameras+ Police speed cameras

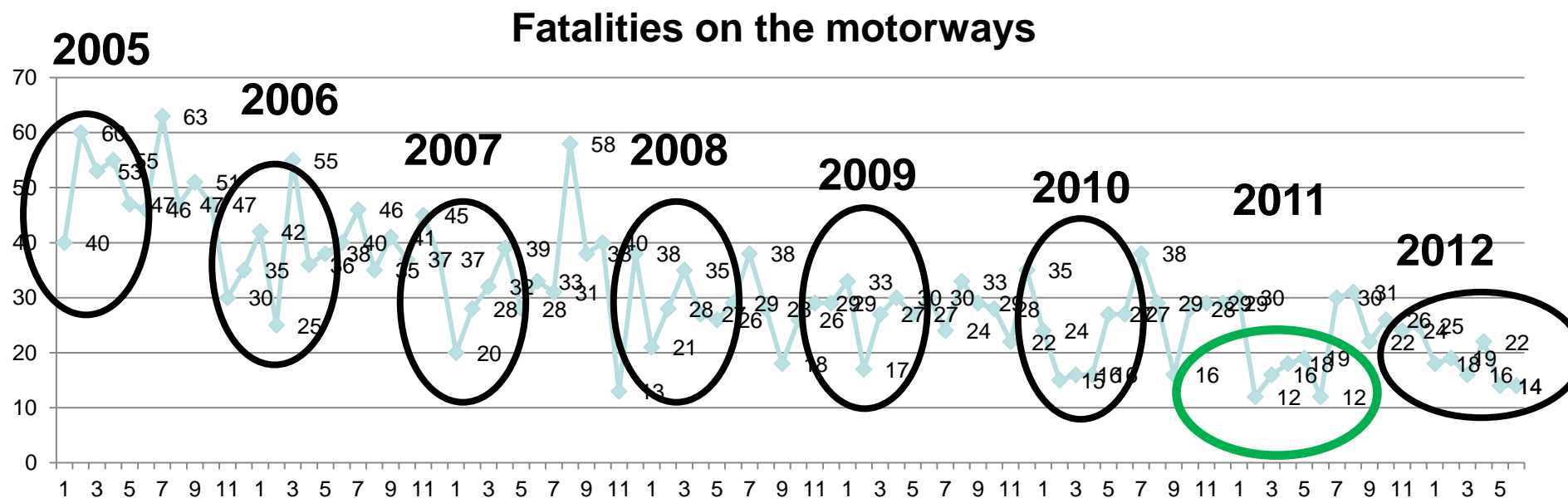


	RADARS DATA							LOOP DETECTORS DATA		
	2006	2007	2008	2009	2010	2011	2010-2011 Variation	2010	2011	2010-2011 Variation
January	111,08	106,19	102,49	103,24	101,67	101,56	-0,11%	105,6	106,94	1,27%
February	109,05	106,13	102,61	103,02	101,98	100,99	-0,97%	105,98	107,36	1,30%
March	109,39	106,14	103,97	104,48	101,85	95,64	-6,10%	106,76	101,31	-5,10%
April	109,64	105,22	102,4	106,13	103,06	96,23	-6,63%	107,36	102,32	-4,69%
May	108,75	106,65	103,91	105,18	102,99	97,36	-5,47%	106,87	101,98	-4,58%
June	107,16	103,42	103,6	103,74	102,62	96,19	-6,27%	106,89	100,82	-5,68%



400M€ energy consumption savings!!

$$\text{Nilson : Number of fatal accidents} = Y_1 = \left(\frac{V_1}{V_0} \right)^4 Y_0$$



120 → 110 km/h (march-june2011)

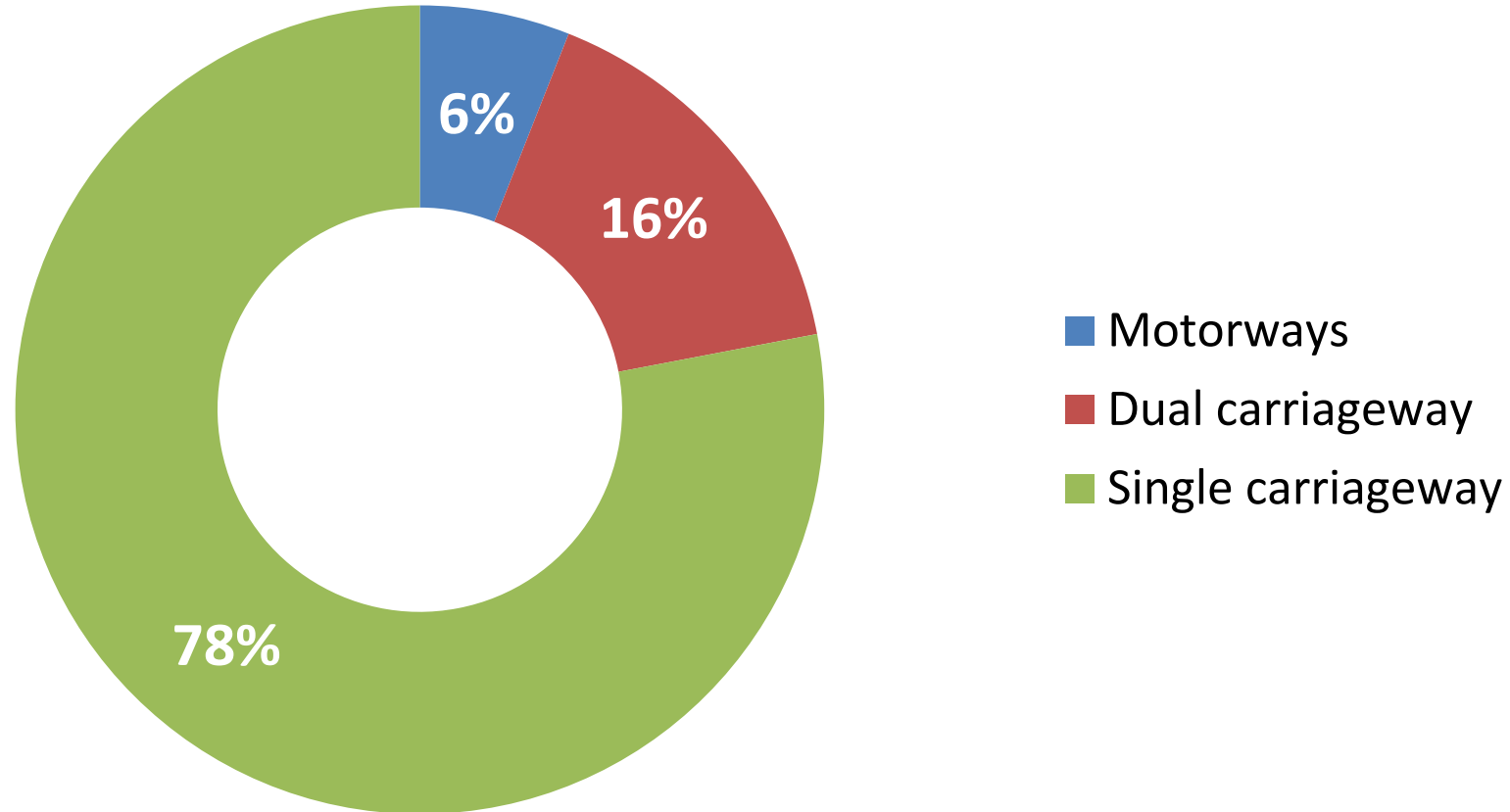
Amplifying effects of massive VMS signals of SPEED CONTROLS (disperse)



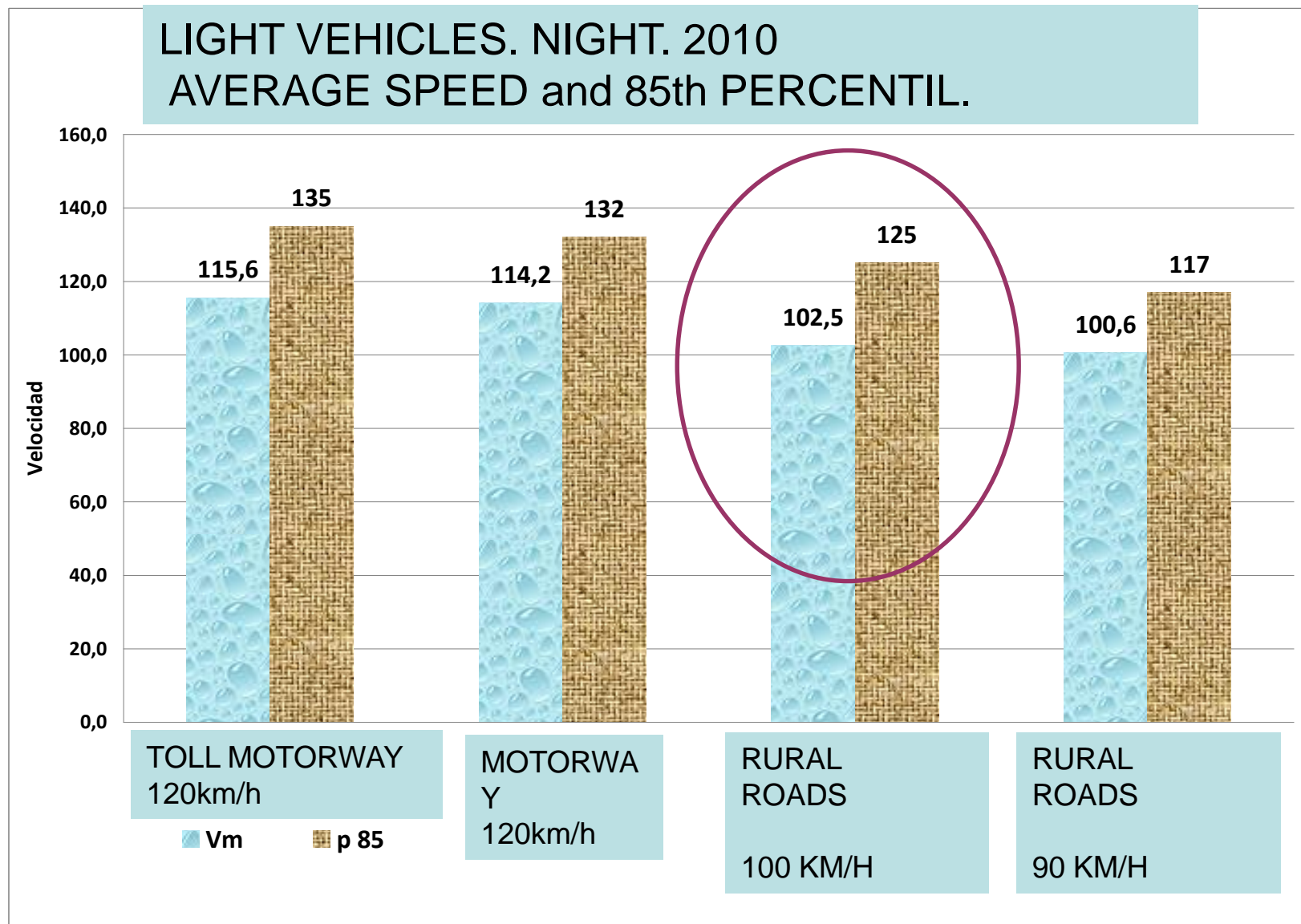
Slight intensification of speed controls on motorways >> Big increase of subjective speed control.

Periodo	Velocidad media	Reducción ACV
2ªq DIC 2013	102,03	408
2ªq DIC 2014	100,92	328
Diferencia	-1,09%	-19,61%
Resto 2013		7484
Resto 2014		7174
Diferencia		-4,14%

WHY RURAL ROADS?



WHY RURAL ROADS?



Where?

Speed excess + Fatalities Or Speed excess + Real risks

After other traffic calming countermeasures were tested

Credible speed limits

Visible speed limits

Geometric Design Inconsistency (Alfredo García et.al RUTAS Journal 160)





Where?

Speed excess + Fatalities Or Speed excess + Real risks
Associated with interurban traffic calming methods.

Credible speed limits.

Visible speed limits.

Wild fauna.

Intersections.

Vulnerable users (pedestrians and cyclists).

Direct accesses.



Evidencias: DIRECCIÓN GENERAL DE TRÁFICO
Operador DGT

Ya filtradas por: OMNIVISION

Salir

Tipo: Stop Control
Ubicación: Puerto de los Leones

Matrícula: 6057CPN

Fecha y hora: 08/05/2015 16:43:42
Población: GUADARRAMA
Calle: PUERTO DE LOS LEONES ALTO DEL LEÓN

Id. Punto de infracción: PUERTO LEONES
ID instalación: PUERTO LEONES
Modelo Equipo: SICAM-SC
Nº de Serie: 11-0051
Sentido/Orientación: Alejándose
Tiempo rojo infracción:

Desde: 04/05/2015 00:00:00
Hasta: 06/05/2015 23:59:59

Date/Time	Plate	T
08/05/2015 22:03:32	1969FRV	+
08/05/2015 20:31:15	1742CZM	+
08/05/2015 19:51:01	6887CDS	+
08/05/2015 16:43:42	6057CPN	+
08/05/2015 16:04:31	6420BPL	+
08/05/2015 14:38:53	4474FGV	+
08/05/2015 14:15:57	1905GBR	+
08/05/2015 13:46:27	7871Bfy	+
08/05/2015 13:36:04	0232CMX	+
08/05/2015 12:27:24	5887CFP	+
08/05/2015 9:28:26	6198HJG	+
08/05/2015 9:14:05	5756GXR	+
08/05/2015 0:07:40	5678CSR	+
07/05/2015 22:38:17	8688GWX	+
07/05/2015 22:24:11	1592FBN	+

Frame 1
Frame 2
Frame 3
Frame 4
Frame 5

TIMESTAMP: 0
TIMESTAMP: .933
TIMESTAMP: 1.866
TIMESTAMP: 2.798
TIMESTAMP: 3.731

Nº carril: 0

6057 CPN

0:06

CSV PDF TAR Sel. Todo Desel. Todo

Where?

Non-lights regulated intersections.
Speed excess associated on main road.
Existing or potential risk.
Deficient geometric design.
Portable.

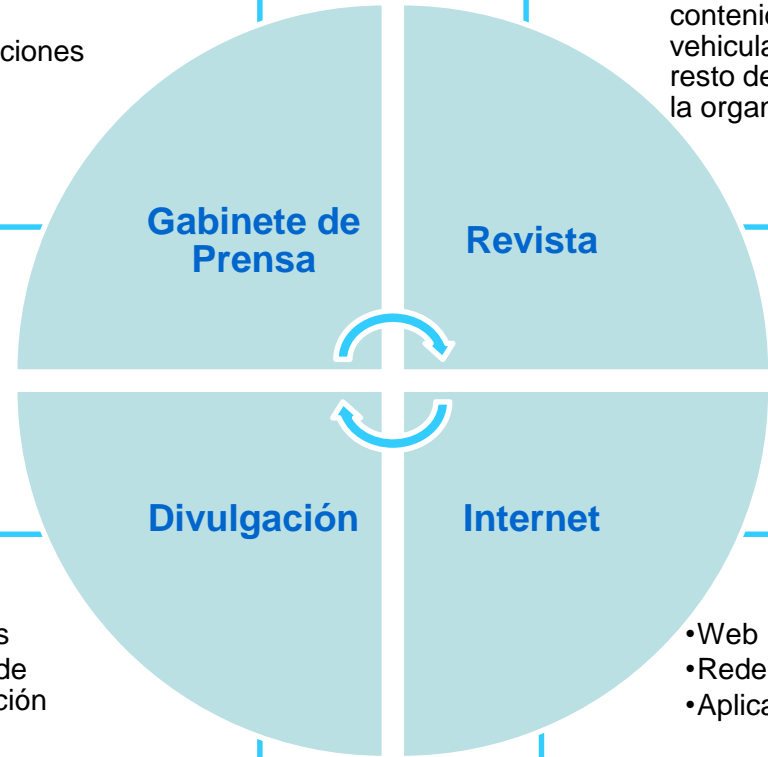


Where?

Non-separated dual carriageways.
Mean-speed cameras.
Real risks.

- Relación con los medios
- Comunicaciones oficiales

- Dotación de contenidos para vehicularlos en el resto de canales de la organización

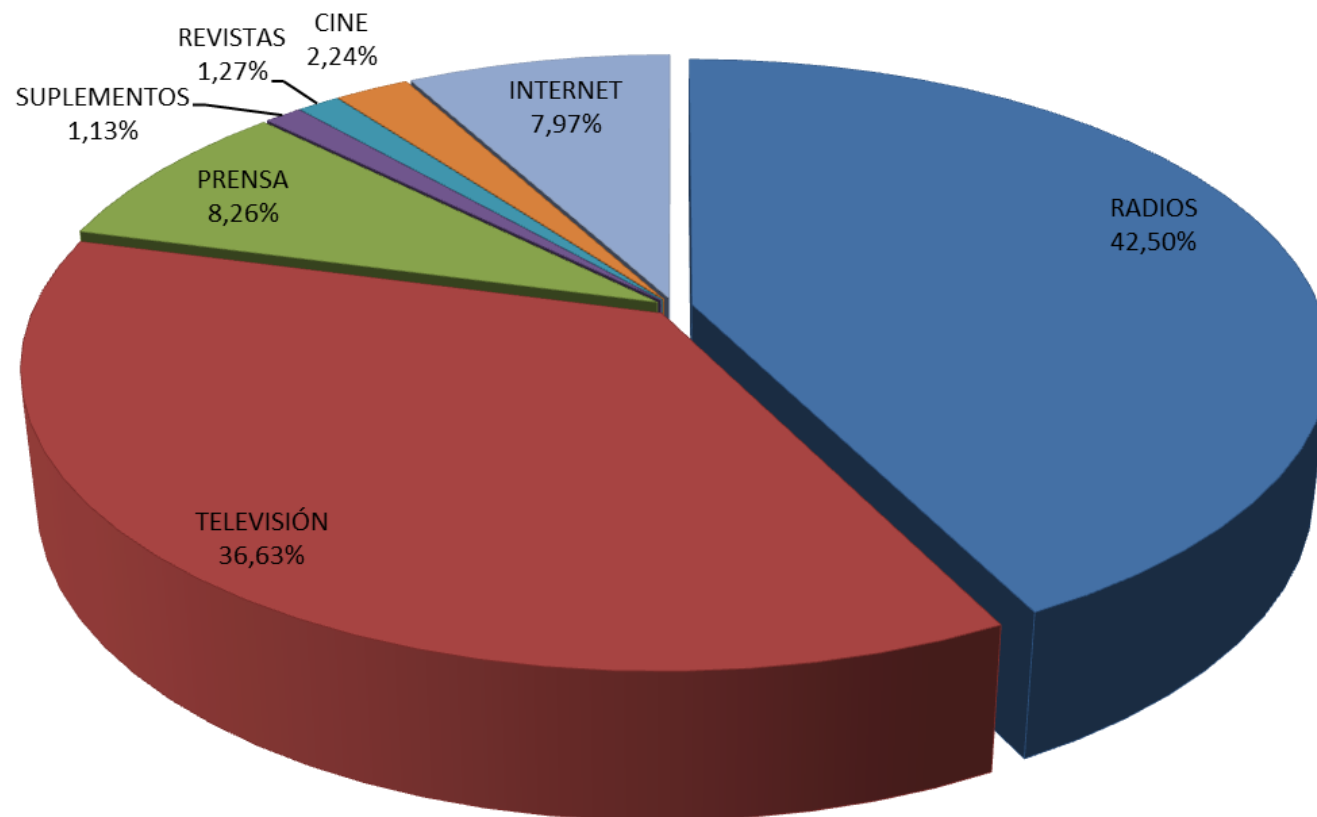


- Campañas
- Acciones de comunicación

- Web
- Redes Sociales
- Aplicación Móvil



Distribución por medios 2016

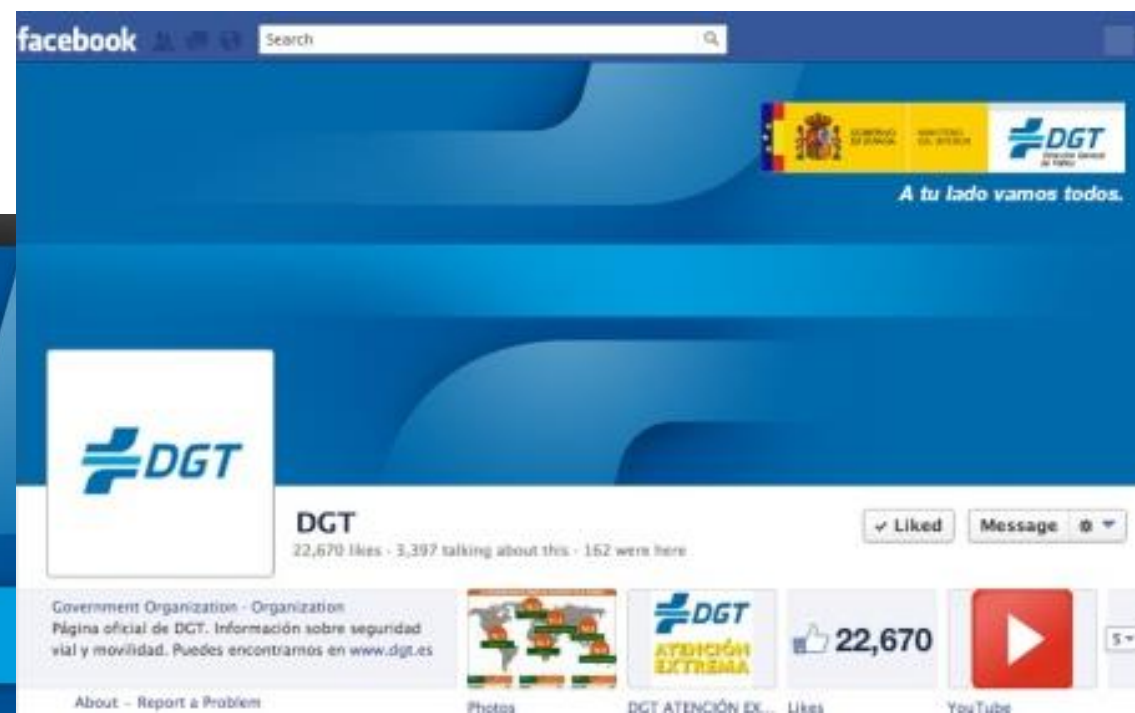


Facebook 235.000 followers.

Twitter 142.000 followers.



The image shows the Twitter profile page for the Dirección General de Tráfico (DGT). The profile name is "Dir. Gral. Tráfico" with the handle "@DGTeS". The bio states: "Canal oficial de DGT. Te damos información útil sobre seguridad vial y movilidad. Otras consultas en www.dgt.es. Incidencias de tráfico: @InformaciónDGT". The statistics show 13,732 tweets, 0 following, and 943 followers. The "Tweets" section is visible, showing several tweets with text and images. The left sidebar includes navigation options like "Inicio", "Conecta", "Descubre", and "Cuenta", along with a search bar. There are also sections for "A quién seguir" (listing Rolling Stone (ES), Radio Segovia, and Policía Nacional) and "Tendencias" (listing #PostureoBar, #110ANIVERSARIO, #SiFueraRajoy, #Faltamos, #FDBack, EPA, España, Sábado 27, Iron Man 3, and BBVA).



The image shows the Facebook profile page for the Dirección General de Tráfico (DGT). The profile name is "DGT" and the bio states: "Página oficial de DGT. Información sobre seguridad vial y movilidad. Puedes encontrarlos en www.dgt.es". The statistics show 22,670 likes and 3,397 people talking about this. The "Tweets" section is visible, showing several tweets with text and images. The left sidebar includes navigation options like "Inicio", "Conecta", "Descubre", and "Cuenta", along with a search bar. There are also sections for "A quién seguir" (listing Rolling Stone (ES), Radio Segovia, and Policía Nacional) and "Tendencias" (listing #PostureoBar, #110ANIVERSARIO, #SiFueraRajoy, #Faltamos, #FDBack, EPA, España, Sábado 27, Iron Man 3, and BBVA).

Thank you for your attention

ptomas@dgt.es