

Measuring infrastructure safety



Ferry Smith, Director Public Affairs

Royal Dutch Touring Club ANWB

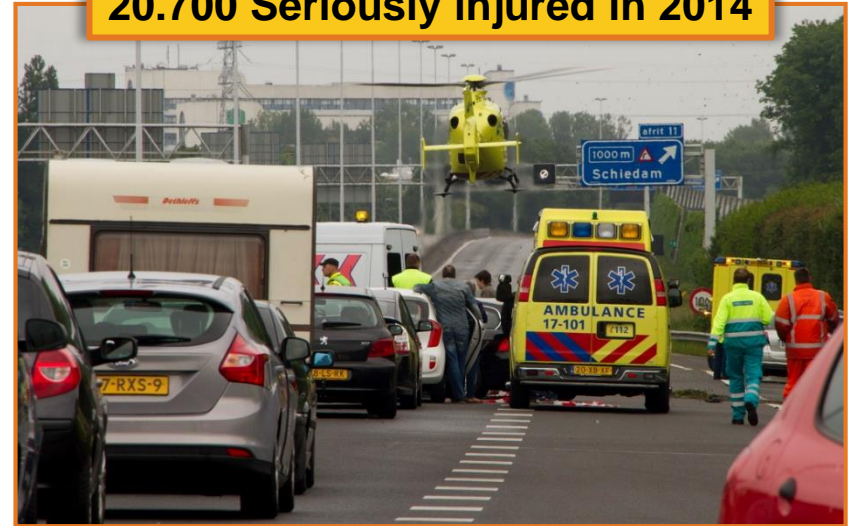


Road casualties in The Netherlands

621 Fatal accidents in 2015

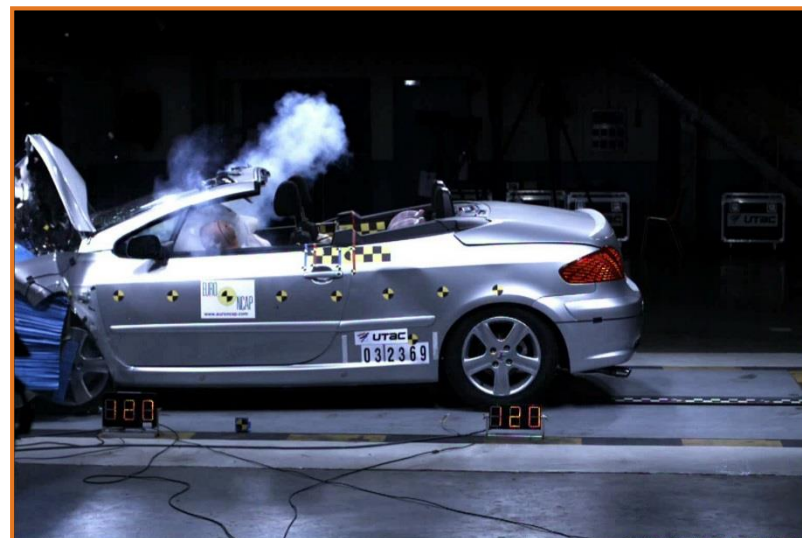


20.700 Seriously injured in 2014



Improving Road Safety

- **Safe drivers**
- **Safe cars**
 - European New Car Assessment (EuroNCAP)
- **Safe roads**
 - European Road Assessment Programme (EuroRAP)



European Road Assessment Programme



Unsafe



Safe



ViDA Database (1)

ViDA BETA Dashboard Reports Admin Support Upload Roxy Tacq Language

Maps Tables Charts Downloads

Filters Search

- Detailed Conditions
- Star Ratings
- Star Ratings (Smoothed)
- RAPs
- Safer Roads Investment Plan
- Projects
- Strip Plan
- Datasets
- Detailed Conditions (After)
- Roads
- Star Ratings (After)
- Section
- Star Ratings (After, Smoothed)

Netherlands 2014 Provincial Roads

Total length: 7,322km [Show](#)

Detailed Road Conditions

Vehicle flow (AADT)	km	%
0 - 1000	21.4	0
1000 - 5000	1,954.9	27
10000 - 15000	1,327.5	18
100000 +	4.5	0
15000 - 20000	565.6	8
20000 - 40000	633.5	9
40000 - 60000	91.3	1
5000 - 10000	2,680.1	37
60000 - 80000	43.4	1

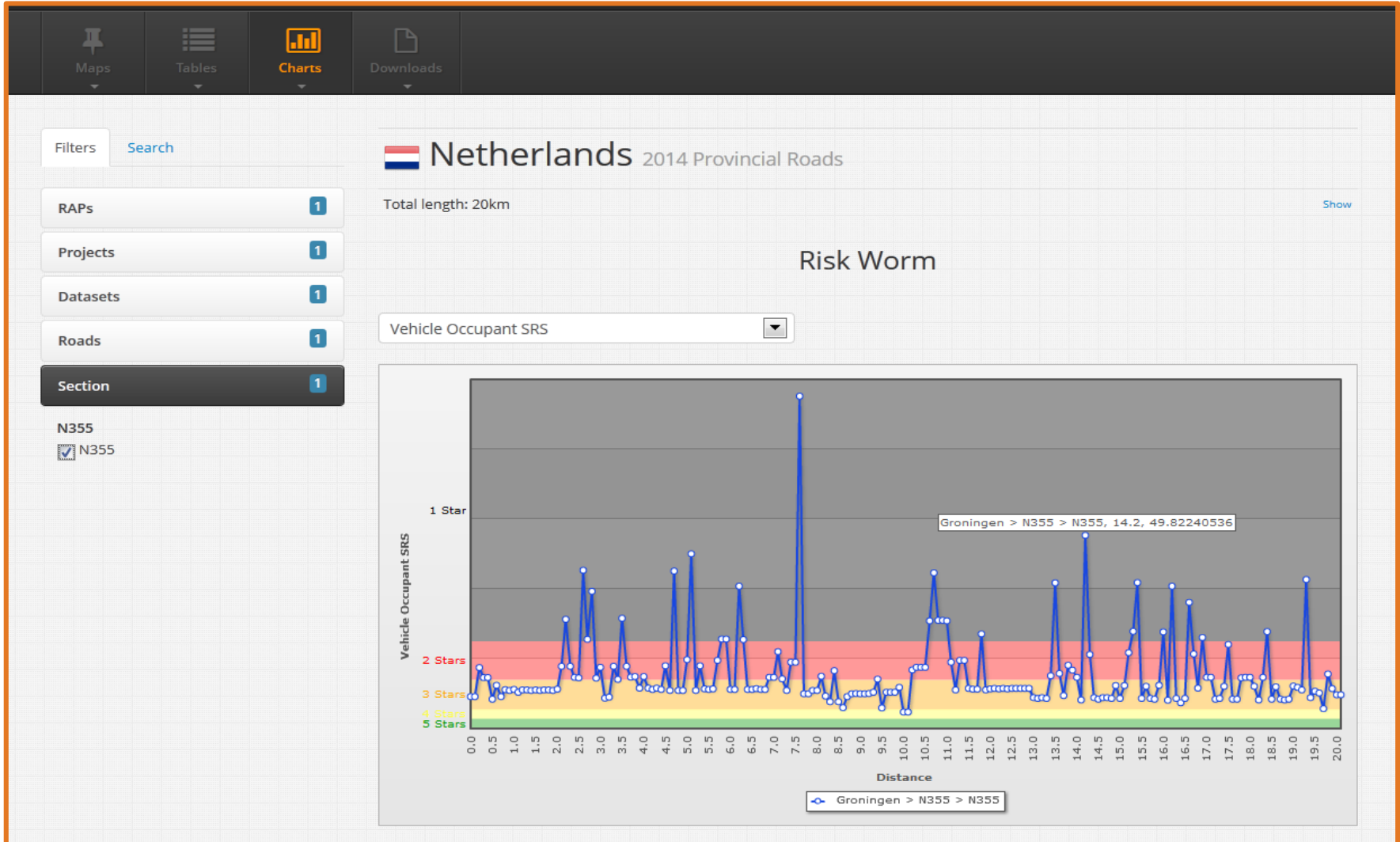
Area type	km	%
Rural / open area	6,899.1	94
Urban / rural town or village	423.1	6

Bicycle observed flow	km	%
None	6,688.2	91
1 bicycle observed	357.1	5

Bicycle peak hour flow	km	%
None	3,023.7	41
1 to 5	4,017.5	55

s/tables/detailed_conditions

ViDA Database (2)



Example

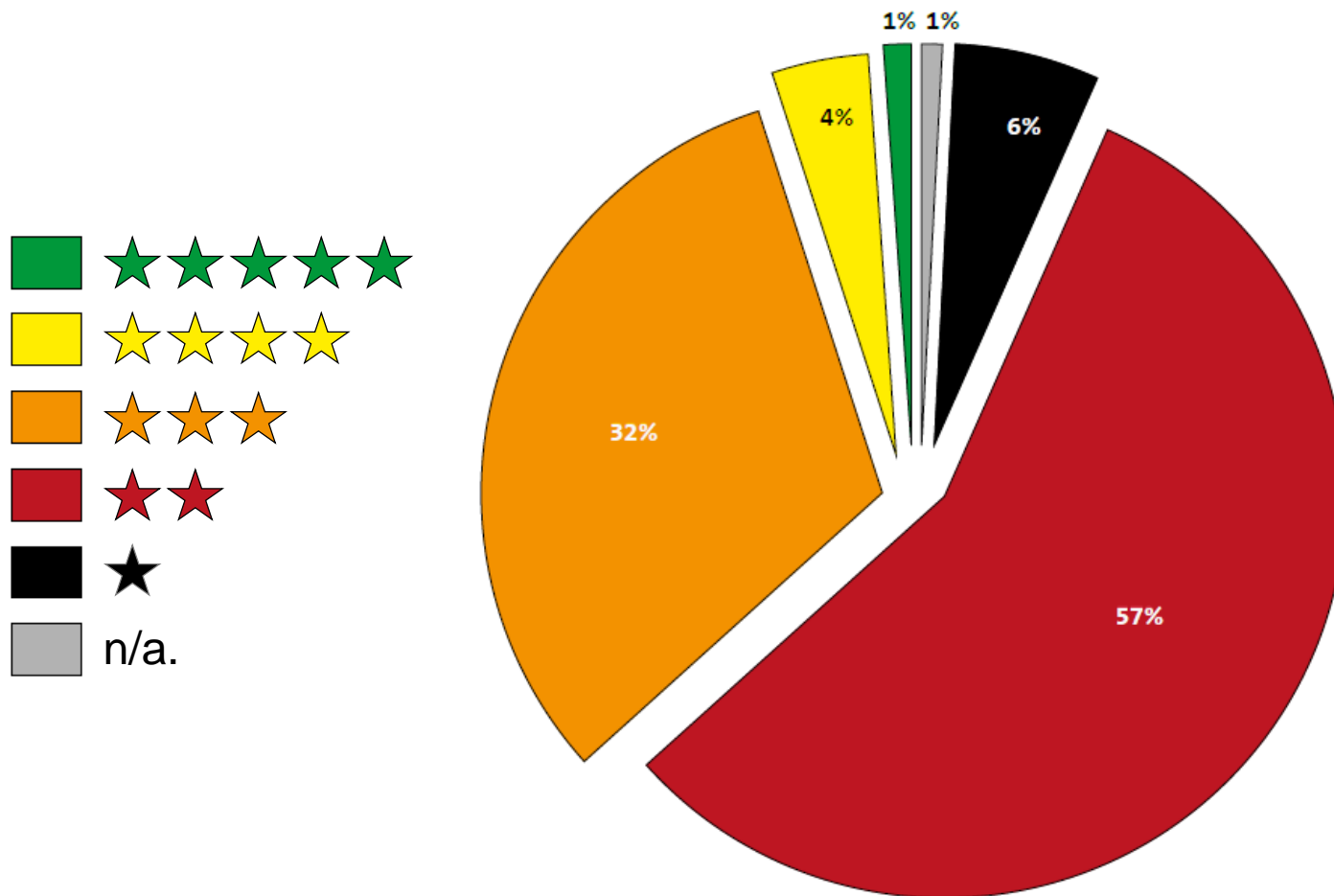


Road Assessment in NL to date

- **Assessment of state roads (app. 5,200 km)**
 - 2009: Commitment minister of Transport: all state roads must be rated at at least 3 stars in 2020 (RPS 1.0)
 - Currently on schedule, apart from app. 20 km
- **Assessment of provincial roads (app. 7,700 km)**
 - 2014: Analyses presented to provinces
 - 2015: Provincial elections
 - Safe infrastructure in coalition agreements



Looking closer: star ratings of provincial roads 2013



Safer road investment plan

- Total reduction in number of road casualties: 13,500
- Total cost: € 1,9 billion
- Total benefit: € 4,1 billion

Measure	Length/number	FSI Reduction X 1000	Benefits €	Costs €	Benefits-Costs Ratio
Verge guard rails	5625 km	5.7	1.805.480.985	763.878.000	2,4
Extra lane	378 km	2.5	772.400.921	509.902.500	2
Rumble strips	4231km	1,3	407.294.457	50.669.700	8
Hard strips/shoulders	2467km	1,1	292.203.646	218.824.200	1,3
Guard rails (central axis)	499km	0,7	196.238.602	90.530.000	2
Streaming area (turning traffic at T-crossing)	455 locations	0,6	192.855.993	60.853.100	3
Double middle barrier	26km	0,6	191.780.850	145.620.000	1
Streaming area (turning traffic)	95 locations	0,4	96.666.625	17.013.800	6
Middle barrier	156 km	0,3	85.232.698	19.632.700	4
Lighting at intersections	250 locations	0,0	92.373.429	9.028.000	10
TOTALS		13,5	€ 4.132.528.206,00	€ 1.885.952.000	2,2

Return on investments



Good practice: province of Friesland

- Investment of €30 million in safe infrastructure (2015-2019)
- EuroRAP analysis important basis for setting priorities



New development: CycleRAP

- Developing a method to assess cycling infrastructure
- ‘Extended Star Rating for Bicyclist’ in EuroRAP



Why CycleRAP?

- Number of road victims among cyclists no longer decreasing (+/- 180)
- Over 50% of the total number of seriously injured in traffic are cyclists
- Mostly one-bicycle accidents
- Infrastructure often part of the problem; also in the future!



ANWB initiative

Develop an integral mobility approach for city centres...



...taking into account all interests (no 'one-issue solution')

Robust Municipal Route Network

- Design method for public space,
- Involving road authorities and road users
- Matching:
 - Infrastructure types
 - Various means of transport
- Link with road safety
 - EuroRAP, CycleRAP
- Link with Smart Cities



'EuroRAP for cyclists'

Aims ANWB:

- Contribute to safe cycling
- Contribute to reducing the number of road victims with 50%



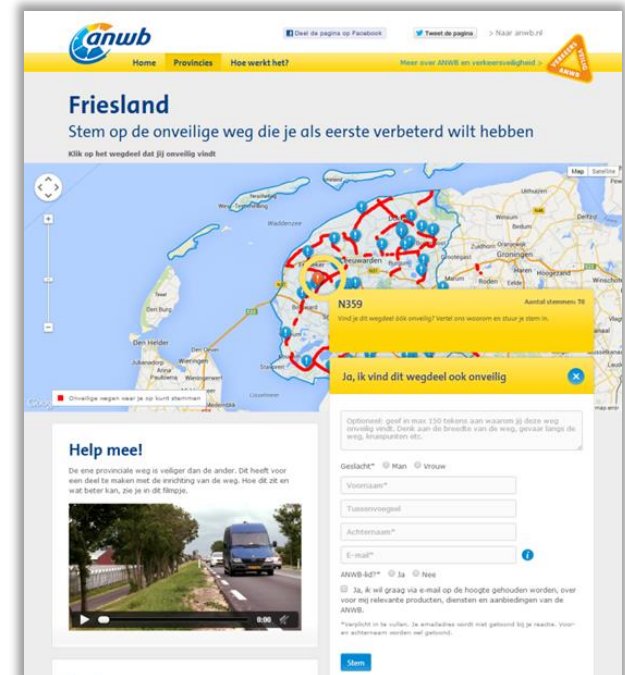
Star rating

- Developed by SWOV, commissioned by ANWB
- Safety score for cycling infrastructure
- Building on EuroRAP method
- Looking at risk prevention
- Based on 23 road characteristics + amount of traffic



Next steps

- First version CycleRAP method ready in summer 2016
- Pilots carried out in Friesland, Amsterdam, Rotterdam/The Hague
- Many road authorities are interested
- Ambition is to involve members
 - Regional level
 - Local level



CycleRAP in practice

- Scientifically based method
- Execution in steps:
 - Collecting images
 - Coding
 - Calculation of scores
 - Reporting



Collecting images



Coding road characteristics

Inventarisatie

ID: URL:

Straatnaam: Lengte:

Straatnaam Van: Xvan: Y van:

Straatnaam Tot: Xtot: Y tot:

VsGs/DV **Fietspad**

	Heen	Terug		Heen	Terug
Intensiteit	<input type="text"/>	<input type="text"/>	Versmalling	<input type="text"/>	<input type="text"/>
Soort Kruising	<input type="text"/>	<input type="text"/>	Hoogteprofiel	<input type="text"/>	<input type="text"/>
Rijrichtingen	<input type="text"/>	<input type="text"/>	Overgang - Kwaliteit	<input type="text"/>	<input type="text"/>
Voorziening	<input type="text"/>	<input type="text"/>	Overgang - Type	<input type="text"/>	<input type="text"/>
Ligging	<input type="text"/>	<input type="text"/>	Straatverlichting	<input type="text"/>	<input type="text"/>
Verhardingsbreedte	<input type="text"/>	<input type="text"/>	Markering	<input type="text"/>	<input type="text"/>
Verharding - Type	<input type="text"/>	<input type="text"/>	Paal in pad	<input type="text"/>	<input type="text"/>
Verharding - Kwaliteit	<input type="text"/>	<input type="text"/>	Paal - Zicht	<input type="text"/>	<input type="text"/>
Uitritten	<input type="text"/>	<input type="text"/>	Middeneiland - Aanwezig	<input type="text"/>	<input type="text"/>
Bocht - Scherp	<input type="text"/>	<input type="text"/>	Middeneiland - Zicht	<input type="text"/>	<input type="text"/>
Bocht - Zicht	<input type="text"/>	<input type="text"/>	Berm - Kwaliteit	<input type="text"/>	<input type="text"/>
Snelheidslimiet	<input type="text"/>	<input type="text"/>	Berm - type	<input type="text"/>	<input type="text"/>
			Obstakel - Afstand	<input type="text"/>	<input type="text"/>

Calculating the score

The screenshot displays the iRAP web application interface. At the top, the navigation bar includes 'Dashboard / Results / Star Rating / Map', 'Support', 'Roxy Tacq', and 'Language'. Below this is a menu with 'Road Data', 'Star Rating' (highlighted with a star icon), 'Investment Plans', and 'Downloads'. A 'Project filters' section is visible, followed by 'Reporting options' with a 'Show' button and a 'Total length: 1,673km' indicator. The 'Report options' section includes 'Star rating type' (Smoothed selected, Raw), 'Star Rating user group' (Vehicle Occupant selected, Motorcyclist, Pedestrian, Bicyclist), and 'SRIP implementation' (Before selected, After). The main content area is titled 'Star Rating' with a help icon and a subtitle 'Vehicle Occupant Star Rating Smoothed Star - Before countermeasure implementation'. A legend at the top right of the map area shows color-coded star ratings: 5 Stars (green), 4 Stars (yellow), 3 Stars (orange), 2 Stars (red), 1 Star (dark red), and Not applicable (black). The map itself shows a network of roads in the Netherlands, with colors corresponding to the star ratings. Major cities like Amsterdam, The Hague, and Rotterdam are labeled. The map includes a 'Map/Satellite' toggle, a Google logo, and map data attribution to GeoBasis-DE/BKG (©2009), Google.

‘From data to action’...

- All state roads assessed with RPS 3.0 in 2020; min. 3 star
- All provincial roads rated at min.3 stars in max. 20 years
- Major municipal roads assessed with EuroRAP
- CycleRAP: assessment of major bicycle infrastructure (rural and urban area)
- Work towards 1 assessment method for infrastructure!



