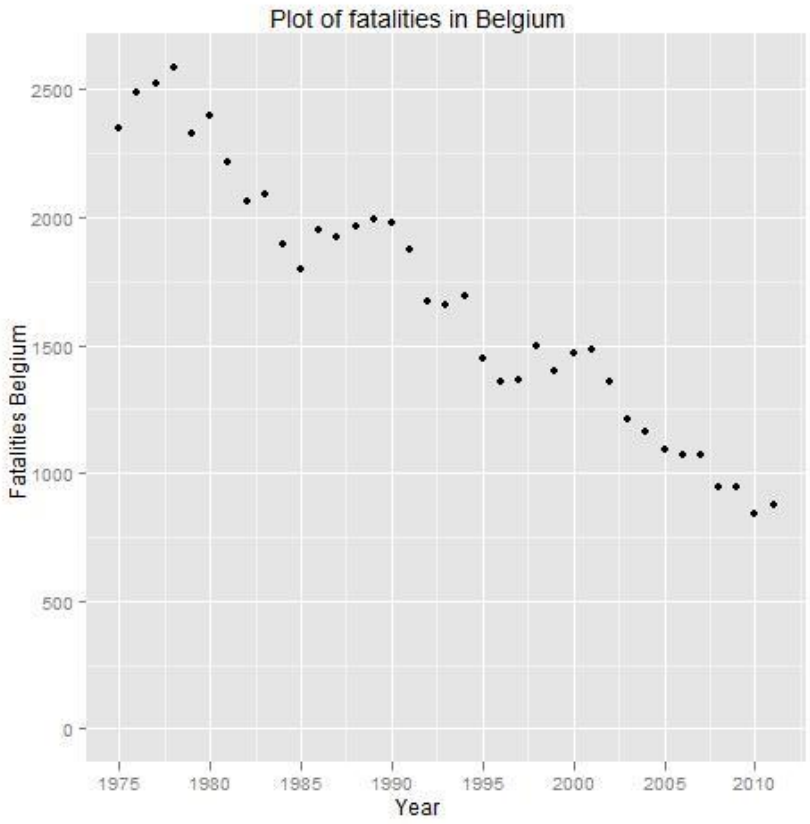
Belgium

Fatalities



In 2011 the fatality number increased for the first time in a decade

- The fatalities have shown a decrease which got stronger over the years
- In 2011 numbers had increased for the first time in a decade.

Registration of fatalities

- In 1991, 2001, and 2002 there were changes in the registration of fatalities.
  - In 1991, the registration form was changed, while the procedure remained the same.
  - In 2001 a number of changes were implemented.
    - A computerized version of the registration form is used since then (probably making a difference in terms of "lost forms").
    - The whole Belgian police system was reformed at that time, and this may temporarily have given accident registration a lower priority.
    - The statistical office paid more attention to the issue of missing accident forms for fatal victims (as registered by the hospitals), resulting in a strong decrease in the number of non-registered fatal victims.
  - From 2002 on, the fatal victims for whom there was no accident form were included in the fatality counts.

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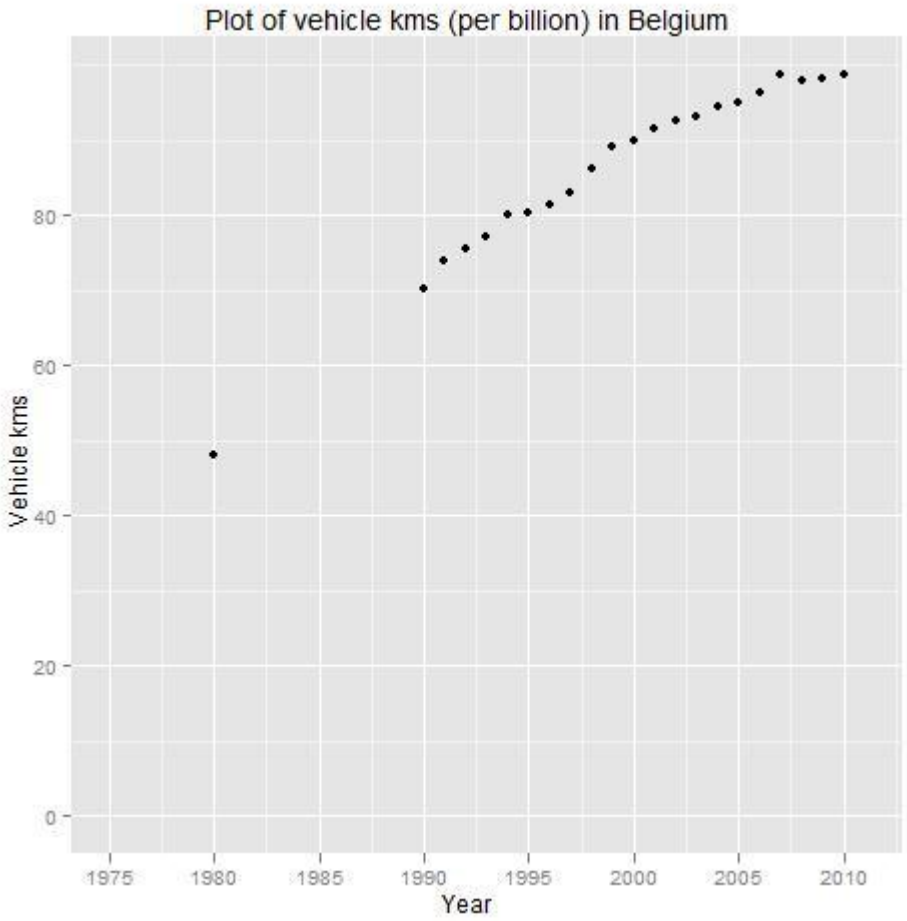
Traffic Volume



The number of vehicle kms is increasing – albeit more slowly since 2007

- The number of fatalities depends strongly on the amount of traffic. To forecast the fatalities, the traffic volume (measured in vehicle kilometres) has to be forecasted first.
- The selected measure for traffic volume is the vehicle kilometres (in billions) per annum.
- Although available from 1970 onwards.
  - Between 1970 and 1980: constant increase of 18.6 billion per year.
  - Between 1980 and 1990: constant increase of 22.3 billion per year.
  - The strictly linear pattern suggests that the vehicle kilometres were actually measured in 1970, 1980, while being interpolated for the years in between.
  - From 1990 on: the rate of increase varies from one year to the next suggesting that measurements took place each year.
- The interpolated data (1975-1979, 1981-1989) have not been considered for the forecasts presented below.

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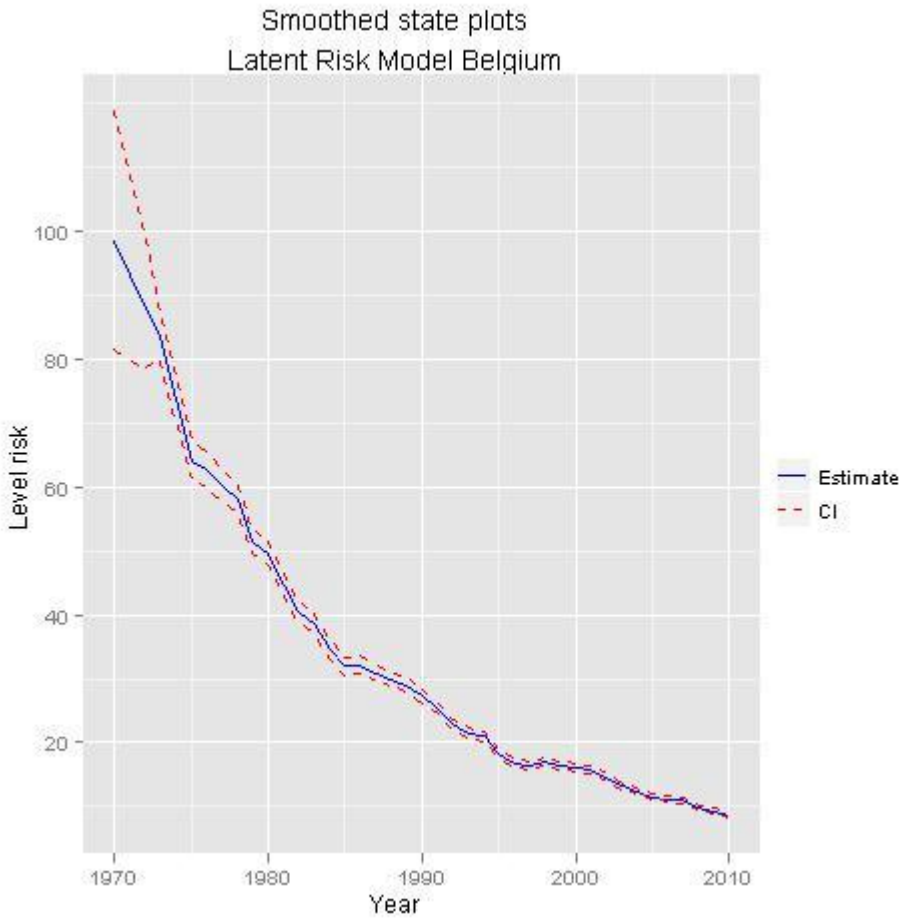
Fatality Risk

- The fatality risk is the number of fatalities per billion (10^9) vehicle kilometres.
- Estimation model: Latent Risk fixed level exposure fixed slope risk [1,2]
- CI: 68% confidence interval (+/- 1 standard deviation)



- The risk for fatalities in Belgium has reduced from almost 60 per billion vehicle kilometres in the mid 70s to less than 10 per billion vehicle kilometres in the most recent years.
- This amounts to a mean decrease of 5.3% per year.

The fatality risk has been decreasing by 5.3% yearly

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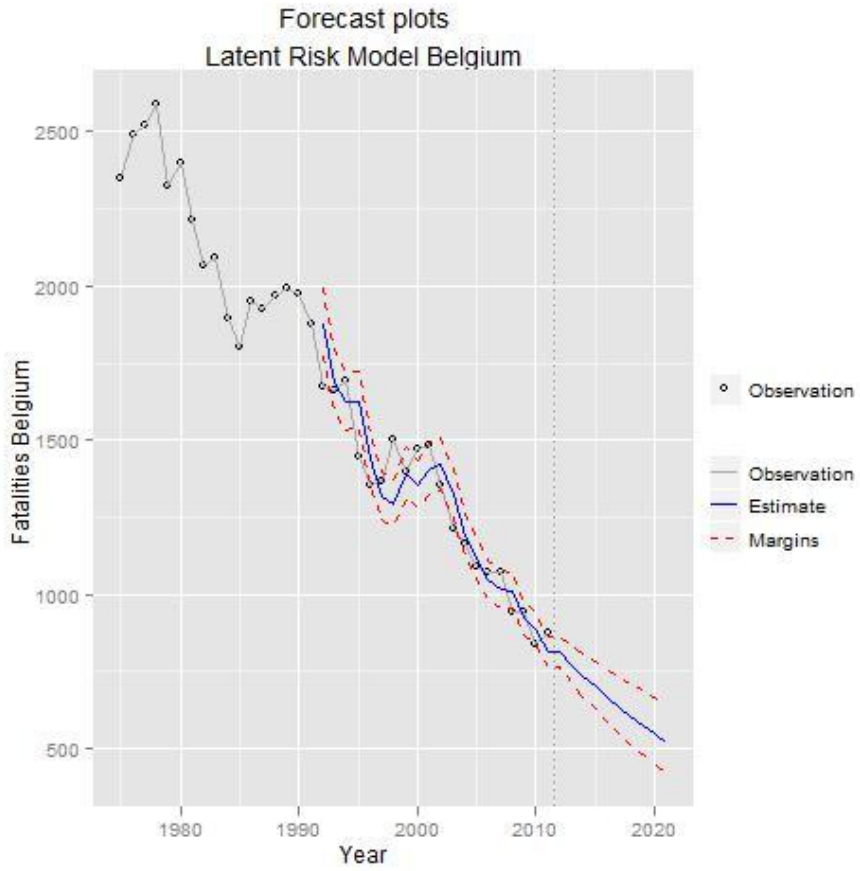
Forecasts to 2020

– If road safety is improved at the same rate as previously and the past development of mobility continues, the following forecasts can be made for the number of fatalities in 2020:

If RS efforts continue at the same level, the expected number of fatalities in 2020 is 548.



Forecast of road-traffic fatalities in Belgium up to 2020

Year	**Prediction**	Lower CI	Upper CI
2012	**813**	766	863
2013	**774**	716	837
2014	**737**	670	810
2015	**701**	627	784
2016	**667**	587	758
2017	**635**	550	734
2018	**605**	514	711
2019	**575**	481	689
2020	**548**	449	668

Disclaimer

– Statistical forecasting does not offer a definite prediction of what is *actually* going to happen in the future.
– The estimates are based on the "business as usual" assumption: no *principal* changes between past and future development.
– Even in these conditions future outcomes are uncertain. This uncertainty is represented in the confidence intervals (plotted in the red margins: 66%; printed in table: 95%).

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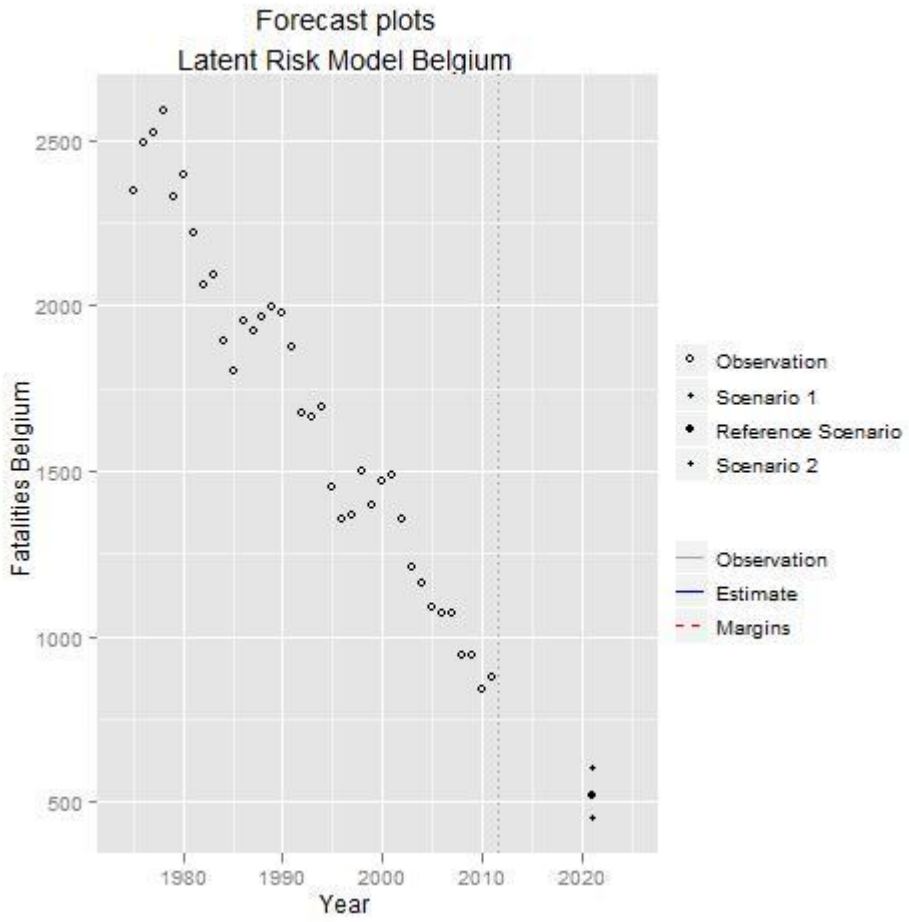
Scenarios

- The strong uncertainty about the development of the fatalities in Belgium is for a good part due the development in traffic volume.
- To illustrate that, three point-estimates for fatalities in Belgium 2021 are plotted assuming three different scenarios for traffic volume.
  - Reference: continuation of development (forecasted value)
  - Scenario 1: strong growth (forecasted value +1 stand. deviation)
  - Scenario 2: decrease (forecasted value -1 stand. deviation)



Scenarios for Traffic Volume

	Vehicle kilometers (billions)	*Road traffic fatalities*
Situation 2010:	98.7	840
Prediction 2021 according to mobility scenarios:		
- Continuation of development (increase)	105	521
- Stronger increase than predicted	121	602
- Less increase than predicted	90	451

References

|1] Dupont & Martensen (Eds.) 2012. Forecasting road traffic fatalities in European countries. Deliverable 4.4 of the EC FP7 project DaCoTA.

|2] Bijleveld F., Commandeur J., Gould P., Koopman S. J. (2008). Model-based measurement of latent risk in time series with applications. Journal of the Royal Statistical Society, Series A, 2008.

[3] EC National Expert for road accident statistics and road safety performance indicators.

[4] Martensen & Dupont (Eds.) 2010. Forecasting road traffic fatalities in European countries: model and first results. Deliverable 4.2 of the EC FP7 project DaCoTA.

[5] Commandeur, J. & Koopman, S.J. (2007). An Introduction to State Space Time Series Analysis. Oxford University Press.