Monetary Valuation of EU-wide road safety developments in 2011

Based on the relevant figures presented in the 5th PIN report, ETSC decided to estimate the monetary valuation of the road safety developments observed in 2011. However, the monetary valuation of preventing one road death (VPF) presented in the 5th PIN report was estimated at 2009 factor prices and in 2009 euro to be 1.70 million EUR[1]. For the purpose of the 6th PIN Report, this value needs to be updated to reflect the economic conditions for the relevant year, in this case 2011.

There are two components that need to be taken into account in the updating of the VPF value: the change in GDP per head and the conversion from 2009 euro to 2011 euro. The latter will be done by taking into account the year-to-year inflation rate for the EU27 as a whole between 2009 and 2011. The former will be done by considering the corresponding change in the real GDP for the EU27 as a whole and adjusting by the increase in the EU population between 2009 and 2011.[2]

Consequently, having regard to the fact that all the percentage changes are small, the formula used to update the VPF figure is the following:

VPF(2011)=VPF(2009)*(GDP_growth(2010)-POP_growth(2010))*inflation(2010)*
(GDP_growth(2011)-POP_growth(2011))*inflation(2011).

By plugging in the respective numbers we obtain the following calculation

VPF(2011)=1,700,000*(1.02-0.0028)*1.021*(1.015-0.0027)*1.031=1,842,536.65 EUR

There were 944 fewer road deaths in 2011 compared to 2010 for the entire EU, thus the benefit for society gained through the prevention of those deaths is valued at 944*1,845,536.56= 1,738,507,030 EUR.

However, these developments have to be seen against the progress towards the EU road safety target of halving road deaths by 2020 compared with 2010 levels. According to the target, in 2020 there should be at most 15,526 road deaths given that 31,052 were recorded in 2010.

ETSC argues that the aim should be for progress towards the EU road safety target to be made uniformly, i.e. through reductions each year amounting to the same year-to-year percentage decrease.

Let x be the annual percentage decrease required to reach the EU 2020 target. Mathematically this means that:

RD(2011)=RD(2010)*(1-x)

[1] For the full VPF calculation method, please read the 2011 PIN report methodological note at http://www.etsc.eu/documents/Methodological_Note_PINReport2011.pdf

[2] The economic and population data was retrieved from EuroStat on 18.04.2012

RD(2012)=RD(2011)*(1-x)=RD(2010)*(1-x) *(1-x)=RD(2010)*$(1-x)^2$

RD(2013)=RD(2012)*(1-x)=RD(2010)*(1-x) *$(1-x)^2$=RD(2010)*$(1-x)^3$

And so on until we reach

RD(2020)=RD(2010)*$(1-x)^{10}$

However, we know that RD(2020)=0.5*RD(2010) in order to reach the EU target, hence:

0.5*RD(2010)=RD(2010)*$(1-x)^{10}$ <=>0.5=$(1-x)^{10}$ <=> 1-x=$\sqrt[10]{0.5}$ <=> $x = 1 - \sqrt[10]{0.5}$ = 6.7%

By plugging in the obtained yearly required percentage reduction in road deaths into the time series for the 2010-2020 period we obtain the following predicted numbers:

2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
31,052	28,973	27,032	25,222	23,533	21,957	20,487	19,115	17,835	16,640	15,526

Thus, if the EU progress in 2011 had been consistent with a uniform progress towards the road safety target, an additional (31,052-28,973)-944=1,136 road deaths could have been prevented in 2011.

Using the VPF value above we obtain 1,136*1,842,536.65 = 2,092,973,396 EUR as the value of social benefit that could have been achieved by preventing these extra road deaths.