

Data on fires in Europe

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A Dutch study published in 2016 found the following data on fires in selected countries in Europe, it seems mainly in the period 2002-2012. Whereas the data for the large fires seems correct, the data for smaller fires should probably only be taken as an indication. The numbers vary so much from country to country that it seems probable that the collection method is not comparable. But the conclusion is clear: Small fires occur quite frequently.

Overview of fires in European tunnels in the registered period 2000-2010

Tunnel	Length tunnel [km]	Cum. Number vehkm ⁴ [mln vehkm]	Number of fires (<15 MW) [-]	Period [year]
Belgium	5,4	891	2	varying
Germany ⁵	41,1	9900	103	6
Norway	778,5	18470	160	10
Sweden	1,6	193	0	6
Denmark	5,3	388	1	varying
France	60,5	2886	47	6
Austria	348	10454	63	6
United Kingdom ⁶	5,7	144	1	2
Total	1246,1	43.326	377	varying

4) The cumulative number of vehkm is calculated as $\Sigma(\text{AADT} * \text{\#days per year} * \text{cum. tunnel length} * \text{period}/1000000)$, where the AADT can be found in the references.

5) In a period of two years (2008 and 2009), 3300 mln vehkm have been travelled. It is assumed that in a six year period, three times this number is travelled.

6) AADT from [48], except for the Pen-Y-Cliptunnel, which has been estimated on the basis of the average AADT of the Conwy and Penmaenbach tunnels, since they are in the same highway.

Source: Mirjam Nelisse & Ton Vrouwenvelder from the TNO Netherlands Organization for Applied Scientific Research, Delft, The Netherlands

Article "Probability of a Large fire in a Road Tunnel – a Bayesian Approach" in the Proceedings Report of the "Seventh International Symposium on Tunnel Safety and Security, Montreal, Canada, March 16-18, 2016"

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Large fires in European tunnels in the non-registered period

Tunnel	Age [yr]	Length tunnel [km]	Cum. nr. veh. since opening	Cum. Mln. vehkm	Number of fires	HRR [MW]
Mont Blanc tunnel ⁷	44	12	62.213.509	722	1	300
Tauern	37	6	214.729.500 ⁸	1374	1	200
Hovden	20	1	13.870.000	18	1	150
Ekeberg	17	2	291.635.000	456	1	35
Mt Blanc	44	12	62.213.509	722	1	30
Pfänder	32	7	205.568.000	1381	1	20
L`Arme	33	1	100.322.805	110	1	20
Castellar	43	1	221.613.400	126	1	20
Hitra	18	6	8.081.100	46	1	20
Felbertauern	45	5	50.000.000	264	1	15
Frejus	32	13	32.000.000	412	1	15
Porte d`Italie	42	0	1.533.000.000	652	1	15
Moorfleet	49	0	733.285.000	178	1	15
Røldal	48	5	17.520.000	82	1	15
Kingsway	41	2	493.845.000	988	1	15
Total					15	

7) All numbers in the columns "Age" and "Cum. Nr. Veh. Since opening", except the shaded ones, are based on facts.

8) Shaded cells: numbers are based on estimations.

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