Cerema

# Lowering the speed limit to 80 km/h

Assessment - 12-month items

July 2019

Delegation for road safety

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## Assessment - 12-month items


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# Summary

The decision was made to lower the speed limit from 90 to 80 km h on two-way roads without a central delineator as of July 1, 2018. This decision was accompanied by the desire to carry out an objective assessment after two years. To do this, the Interministerial Delegation for Road Safety sent an engagement letter to the Centre for Studies and Expertise on Risks, Environment, Mobility and Land Planning (Cerema) on April 27, 2018.

Cerema, in agreement with the Delegation for Road Safety, drew up an assessment methodology that had to meet certain conditions. The data used must be available "before" and "after" implementation of the measure in order to be comparable. The assessment must follow the principles of proportionality and progressiveness, as prescribed in the 2014 Government Instructions. It is not possible to reconstitute certain data which did not exist before the measure was implemented over the entire network affected, for reasons of cost and time. A suitable acquisition system had therefore to be defined depending on the data concerned.

While the 2-year period chosen may seem very long in view of the public decision, it is as short as possible in scientific terms for consolidating the recovered data and smoothing out one-off and seasonal phenomena, thereby identifying the real, stable impacts of the measure.

As the purpose of this measure is to reduce the number of deaths by reducing speeds on two-way roads without a central delineator, the methodology chosen is based on two main areas:

- an analysis of the changing accident rate and speeds at which people drive "before" and "after" the measure was implemented;
- a detailed analysis to understand the effects of the measure with regard to four topics: speeds, accident rate, acceptability and effects on society.

This document presents the informations available twelve months after the measure was implemented. This can in no way be considered as the results of the assessment, which will require a longer data period and a more detailed analysis of these.

**The speed observatory** set up for this assessment allows the changing behaviour of drivers in terms of speeds travelled on two-way roads without a central delineator to be monitored on a monthly basis.

The results are available over the period from June 2018 to April 2019. They highlight a break in the changes in speed on the network concerned as soon as the measure was implemented (between June and July 2018).

Then the monthly evolution shows a slight increase in the speeds practised. Between June 2018 and April 2019, the average speed difference for light vehicles is -3.0 km/h. While this decrease is in line with the results of the international litterature, it is lower than the assumptions made by the National Road Safety Concil to estimate the gains of the measure.

Indeed, 59% of light vehicle drivers drive over 80 km/h, 35% of them between 80 and 90 km/h and 24% at over 90 km/h. There is therefore a margin for progress in compliance with the measure.

**In terms of accident rates,** the network studied is defined according to the location criteria available in the Road traffic accident and injury report (*Bulletin d'analyse des accidents corporels* - BAAC), which is the network excluding urban areas and motorways. Historical data are available over long series (since 2010). On the other hand, acquisition of data "after" the measure was implemented is subject to the data being validated. 2018 data are consolidated since May 2019. 2019 data come from rapid feedback not yet validated and preBAAC. They are to be considered with caution.

After a stagnation or even a slight increase in the number of deaths on the network impacted by the measure between 2014 and 2017, the year 2018 shows an unquestionable drop. This decrease is mainly due to the second half of 2018, after the measure was implemented.

Over the 12-month after the implementation of the measure (July 2019 to June 2019), the number of deaths on the network considerated is 206 lower than the average for the reference period (2013-2017). A opposite phenomenon is observed on the rest of the French road network, with a slight increase in the number of people killed.

**Regarding effects on society,** an estimate of changing travel times was made from the Google Maps API on nearly 300 routes affected by the measure, spread over all departments of mainland France and representing a cumulative linear distance of 7,551 kilometres. It appears that on average, the increase in travel time from July 1, 2018 is of the order of one second per kilometre on a daily journey between work and home. However, there are disparities between routes, with 34% of routes where users gain up to 5 seconds per kilometre between June and September 2018, and 37% of routes with an increase in travel time of less than 1 second per kilometre.

This average increase in travel time of one second per kilometre is observed twelve months after the implementation of the measure, by comparing the same routes between June 2018 and June 2019.

**Concerning the feelings of users,** two waves of surveys before (April 2018) and after (March 2019) the implementation of the measure were conducted. The sample of respondents was chosen to be representative of the French population and to be comparable between the two surveys.

Public opinion is evolving positively and shows a better acceptance of the measure, with an increase of 10 points in respondents in favour of the measure. This acceptability seems to be increasing among the most opposed persons to the measure, with a 15 points drop between the two surveys (25% of respondents in March 2019 against 40% in April 2018).

76% of respondents said they would respect most often or systematically the measure. This is in contrast to the 80 km/h overtaking rate of 59% and the proportion of drivers travelling between 80 and 90 km/h (35%), mesured by the speed observatory.

Some studies[1] have shown that users do not consider speeding over 10% to be dangerous or reprehensible. Although the scientific literature[2] has confirmed that speed plays an important role in road safety, both in terms of the number and severity of accidents, users underestimate the danger posed by speed.

Between the two waves of the survey, the loss of time perceived by users as a result of lower speed has decreased, even among those most opposed to the measure, but it is still higher than reality.

Moreover, the more respondents are in favour of the measure, the more they think that the measure will have an impact on reducing the number of injuries, the number of material accidents and the risk of collisions, through the reduction of the speeds practised. Road safety is an important argument for adherence to the measure.

[1]Corbett, C. (2001). Explanations for understating in self-reported speeding behaviour. Transport. Res. Part F 4, 133–150

Goldenberg et Van Schagen, I. (2007). The credibility of speed limits on 80 km/h rural roads:The effects of road and person(ality) characteristics. Accident Analysis and Prevention, 37, 1121-1130

[2]Elvik, E., Vadeby, A., Hels, T., Van Schagen, I. (2019) Updated estimates of the relationship between speed and road safety at the aggregate and individual levels. Accident Analysis and Prevention, 123, pp. 141-122.

# Contents

# 1 - Context and purpose of the mission

## 1.1 - History of the measure

In November 2012, the Minister of the Interior announced a goal for France to reduce the number of deaths to fewer than 2000 by 2020, or a 50% decrease.

In November 2013, the Committee of Experts issued a report of proposals to halve the number of people killed or seriously injured in road accidents by 2020[3]. This report proposes four measures to achieve this goal, one of which is to reduce the speed limit from 90 to 80 km/h on two-way roads. A saving of 350 to 400 lives per year was estimated if the measure was applied to the entire two-way network limited to 90 km/h and if the average speed were effectively reduced by 5 km/h.

At the plenary session of the French National Road Safety Council (CNSR) of 11 June 2014, the Minister of the Interior announced his intention to begin an experiment in this area. The selected routes were officially presented to the plenary session of the CNSR on May 11, 2015. These were three national road routes (RN 57 Vesoul - Rioz, RN 151 Auxerre - La Charité-sur-Loire and RN7 Crozes-Hermitage - Valence). The experiment took place from July 2015 to July 2017.

The assessment report[4] showed that lowering the speed limit from 90 km/h to 80 km/h led to an average decrease in speeds of 4.7 km/h, all vehicles combined, of 5.1 km/h for light vehicles and 2.7 km / h for heavy goods vehicles. This drop affects all categories of vehicles and all users, regardless of their driving habits. The highest speeds also fell compared to the initial situation. This decrease is also reflected in a decrease in the inconvenience caused by HGVs driving during the experiment with a lower speed difference as compared with light vehicles. No significant shift of traffic onto bypass routes was observed. However this experiment had nothing to say about changes in the accident rate. This was because the limited number of kilometres concerned made satisfactory statistical analysis impossible[5].

The French Interministerial committee for road safety of 9 January 2018 proposed 18 measures to combat road safety issues. The fifth measure involves reducing the speed limit by 10 km/h on two-way rural roads with no central delineator. The decision was taken to make this measure effective on July 1, 2018.

The measure targets the two-way network in the open countryside because this is the one with the greatest impact on road deaths. In 2017, it represented 1,915 deaths or 56% of all road deaths[6]. It was decided to apply the measure to the entire network because the roads where most of the traffic flows are those where the majority of the people killed are concentrated. Indeed, it has been shown that at national level, 20% of the road network in the open countryside accounts for 55% of deaths[7] and that the departmental main road network accounts for 67% of deaths outside urban areas[8].

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[3]Conseil National de la Sécurité Routière, Comité des Experts (2013) Proposition d'une stratégie pour diviser par deux le nombre des personnes tuées ou blessées gravement d'ici 2020. Volume 1, 25 p. It is available at https://conseilnational-securiteroutiere.fr/les-travaux/#les-rapports-dexperts

[4]CCerema (2017) Expérimentation de l'abaissement de la vitesse limite autorisée à 80 km/h. Bilan des observations des vitesses pratiquées. Rapport de décembre 2017, 25 p. available at https://www.cerema.fr/fr/centre-ressources/boutique/experimentation-abaissement-vitesse-limite-autorisee-80-kmh

[5]ONISR (2018) Expérimentation de la baisse de la VMA à 80 km/h : Bilan de l'accidentalité. Rapport de février 2018, 15 p.

[6]ONISR (2018) La sécurité routière en France. Bilan de l'accidentalité de l'année 2017. 142 p.

[7]ONISR (2018) Accidentalité sur les routes bidirectionnelles hors agglomération : Enjeux relatifs au réseau principal sur 100 départements.

## 1.2 - Litterature on the links between speed and road safety

For many years, international scientific research has linked the decline in traffic speeds to the decline in accidents and fatalities.

The most obvious link is the impact of speed on the severity of the accident. The higher the impact speed, the more serious the consequences in terms of injuries and material damage. This is related to the dissipation of kinetic energy from the vehicle or vehicles just before impact. This depends on the mass of the vehicles and the square of their speed. Collisions at higher speeds and with a heavier vehicle can therefore have more serious consequences.

The recent OECD report explains why it is that the higher the speed, the higher the risk of accidents[9]. A driver needs a constant time to react at unexpected events and the higher the speed, the greater the distance covered during this time. In addition, at high speeds, speed differences between users are detrimental because they increase potential conflict situations (for example, the risk of rear-end collisions between a slower and faster vehicle).

Nilsson's "Power Model" showed that a 10% increase in average speed results in an increase of about 20% in the frequency of accidents with injuries, of 30% in serious accidents and of 40% in fatal accidents[10]. These results mainly concern rural roads and motorways. In early 2019, a research confirmed these results based on more recent data[11].

Scientific litterature shows that speed practised is a significant factor in road safety, both in terms of the number of accidents and their severity.

## 1.3 - Litterature on the links between the maximum authorised speed and the speeds practised

In several countries, the decision to reduce the maximum authorised speed (MAS) was taken for road safety reasons because of the proven link between speeds and accidents. A synthesis[12] of recent case studies shows that a 10 km/h decrease in maximum authorised speed results in a 3 km/h reduction in mean speed, with potentially significant variability.

In France, the experiment[13] of reducing the maximum authorised speed from 90 to 80 km/h, driving on three two-way roads outside urban areas between 2015 and 2017, showed a reduction in the average speed of 5.1 km/h for light vehicles.

## 1.4 - Purpose of the mission

In order to ensure careful follow-up, this decision was accompanied by the desire to make an in-depth assessment after two years. This assessment was entrusted to the *Centre d'études et d'expertise sur les risques, l'environnement, la mobilité et l'aménagement* (Centre for Studies and Expertise on Risks,

[8]Cerema (2014) 70 km/h : étude de l'abaissement de la vitesse sur les réseaux locaux interurbains – Etude d'enjeux.

[9]OECD / International Transport Forum (2018) Speed and crash risk. Report, 76 p.

[10]Nilsson, G. (2004) Traffic safety dimensions and the power model to describe the effect of speed on safety, bulletin 221, Lund Institute of Technology.

[11]Elvik, E., Vadeby, A., Hels, T., Van Schagen, I. (2019) Updated estimates of the relationship between speed and road safety at the aggregate and individual levels. Accident Analysis and Prevention, 123, pp. 141-122.

[12]OECD / International Transport Forum (2018) Speed and crash risk. Report, 76 p.

[13]Cerema (2017) Expérimentation de l'abaissement de la vitesse limite autorisée à 80 km/h. Bilan des observations des vitesses pratiquées. Rapport de décembre 2017, 25 p.

Environment, Mobility and Land Planning (Cerema)) which received a letter of engagement from the Interministerial Delegation for Road Safety on April 27, 2018.

This letter details the general purpose of the mission, namely "the assessment of the interdepartmental measure to reduce the speed limit to 80 km/h on two-way roads without central delineator", hereinafter referred to as **VMA80**, along with four "special topics" that will be addressed therein: changes in speed, changes in bodily injury rate and in particular road deaths, the acceptability of the measure and the cultural change that it will induce, and qualitative and quantitative analyses of its effects on society.

The letter gives the overall deadline, indicating that the assessment of the measure "will be published two years after its implementation, i.e. July 1, 2020". In addition, it is stated that a first interim report is to be provided for the anniversary of the measure, i.e. July 1, 2019.

# 2 - Assessment methodology

## 2.1 - The general principles of the methodology

The assessment methodology must take into account various imperatives:

- The results must be provided within two years after the implementation of the measure, i.e. July 1, 2020.
- The measure applies to the entire two-way road network without central delineator. It therefore concerns a type of network in its entirety and makes it difficult to compare with control sites not directly impacted by the measure. This is because the rest of the network (roads with delineators, urban roads and motorways) differs too greatly from the network concerned in terms of types of accident, users involved and severity, to allow a comparison[14]. The principle of a comparative assessment "before" and "after" implementation of the measure on the network concerned was therefore adopted.
- The network affected by the measurement is very large (over 400,000 kilometres). The assessment must follow the principles of proportionality and progressiveness, as prescribed in the 2014 government instructions[15]. It is not possible to reconstitute certain data, which did not exist before the measure was implemented, over the entire network for reasons of cost and time. A suitable acquisition system had therefore to be defined depending on the data concerned.
- The measure was implemented quickly (July 1, 2018) after the decision was made (January 9, 2018), i.e. less than 6 months later. This must be taken into account in the choices for the acquisition of data that did not exist “before” the measure was implemented.
- Implementation was highly publicized, which must be taken into account in the analysis of data from the “before” period.

The methodology is based on two main areas:

- an analysis of the changing accident rate and speeds at which people drive "before" and "after" the measure was implemented;
- a detailed analysis to understand the effects of the measure with regard to four topics: speeds, accident rate, acceptability and effects on society.

[14]ONISR (2018) La sécurité routière en France. Bilan de l’accidentalité de l’année 2017. 142 p.

[15]DGITM (2014) Government instructions of 16 June 2014 on the assessment of transport projects. 5 p.

A main indicator for the assessment was developed. This is the comparison of the number of deaths on roads excluding urban areas and motorways between the "before" period (2013-2017) and the "after" period (July 2018-June 2019). .

## 2.2 - The methodology deployed for each section

### 2.2.1 - Speeds Section

There were no long-standing data on speeds in France to make a satisfactory reference for carrying out the assessment. This is because ONISR's national speed observatory delivers aggregated indicators with a six-month time resolution which does not allow break-up phenomenon to be highlighted or monthly monitoring of site-by-site indicators. Similarly, access to historical speed measurements delivered by traffic data acquisition systems did not appear to be suitable for several reasons: many people were involved, making it difficult to aggregate data, lack of a quality procedure, difficulty in qualifying suitable measurement sites, and a time constraint incompatible with the implementation of the VMA80 measure.

Cerema therefore set up a speed observatory to assess the impact of reducing the speed limit to 80 km/h on the speeds that drivers drive at (hereinafter the VMA80 observatory).

This VMA80 observatory had to meet different criteria:

- allow indicators to be monitored over time (at least 2 years),
- be able to distinguish between types of vehicles and road categories concerned,
- master the data acquisition chain to ensure the nature and quality of the data.

It comprises about forty measurement sites on two-way roads with two road lanes, spread over mainland France. They were selected for their neutrality in terms of infrastructure, i.e. so that users can travel at the speed they want to.

The methodology adopted by Cerema should make it possible to study changes in driver behaviour.

Indicators monitored over time (at least 2 years) are:

- average speed
- the distribution of individual speeds and percentiles (V15, V50, V85),
- the exceeding of speed thresholds with respect to the speed limit.

This observatory was started in June 2018 and provides continuous data acquisition. The data obtained in June 2018 represents the period "before" the measure was implemented. Those from July 2018 refer to the "after" period.

It should be noted that observatory data are available only 2 months after acquisition. So in January 2019, the data available for the "after" period are those from July to November 2018.

### 2.2.2 - Accident rate section

The accident data come from the Road traffic accident and injury report (*Bulletin d'Analyses d'Accidents Corporels de la Circulation* - BAAC). These files are entered by the police for any traffic accident occurring on a road open to public traffic, involving at least one vehicle and resulting in at least one injured person. The consolidation of the file is carried out by the local road safety observatories and ONISR with the support of Cerema.

Assessment of accident rate concerns the network affected by the measure in mainland France. This is defined according to the location characteristics in the BAAC, i.e. “outside urban areas” and “outside motorways”. These criteria select accidents outside urban areas where at least one of the lanes is not a motorway. Thus, a motorway ramp may be retained within the scope of the assessment if an accident occurs at its outlet on a two-way lane outside urban areas affected by the maximum authorised speed reduction measure. This definition differs slightly from the sometimes adopted definition of "off-road", which consists in excluding any accident where one of the lanes is a motorway. It is more in line with the object under study.

The network thus defined will later be referred to as **the studied network**, as opposed to **the rest of the network.**

The network under consideration is slightly wider than the network concerned by the measure, because it includes road sections whose limitation is either more restrictive following a specific order - crossing places known as outside urban areas, dangerous bends, approaches to urban areas at 70km/h or roundabouts - or higher given cross profile characteristics - 110 km/h for non-highway sections with 2x2 lanes with separate carriageways or 90 km/h for overtaking slots of 3 lane sections not affected by the decree. The share of such sections is estimated at 10% of the observed total network mortality.

The definition of the network concerned by the measurement could not be more precise. Indeed, it is not possible to reliably distinguish the lane traffic regime (one-way or two-way) or the number of lanes. The information in these fields in the BAAC has undergone a significant evolution leading to a very significant improvement from 2017 onwards but not allowing comparison with previous years.

The main indicator of the assessment is the number of people killed on the studied network.

Additional indicators were defined:

- the number of accidents, fatalities and serious accidents (i.e. ones involving at least one killed or injured person hospitalized for more than 24 hours),
- the death rate, i.e. the number of deaths per 100 accidents,
- the severity rate, i.e. the number of people killed and injured hospitalized for more than 24 hours per 100 accidents,
- the number of injured people hospitalized for more than 24 hours,
- the ratio of the number of people killed per 100 injured hospitalized for more than 24 hours.

Historical accident data are available. The period "before" the measure can therefore be represented over long periods (from 2010 until 2017).

On the other hand, the "after" period is subject to the constraint of the officialization of accident data, preceded by the necessary time limit for their validation. Thus, in general, data on personal injuries are only available within three to four months, which is necessary for them to be validated, and are only officialized annually.

### 2.2.3 - Acceptability section

The purpose of this section is to analyse users' feelings about the measure according to different dimensions examined and according to the characteristics of the respondents: main means of transport, age classes, socio-professional categories, residence (urban, rural or semi-urban). It also involved examining changes in this feeling during the two years of the assessment.

To do this, a questionnaire is distributed by a survey institute to a large sample of drivers representative of the French people. It includes the different dimensions of the acceptability of the measure, in particular

its perceived effectiveness and usefulness, its fairness, its impact on the behaviour and the general attitude of the respondents.

Several survey waves are planned over a period of 2 years, from April 2018 to April 2020. The survey wave conducted in April 2018 represents the feeling "before" implementation of the measure. The next ones relate to the "after" period.

### 2.2.4 - Effects on society section

The purpose of this section is to understand the effects on society related to the measure of lowering the speed limit to 80 km/h on two-way roads without a central delineator.

It is based on the Transport assessment repository approach, as presented in the Government instructions of June 16, 2014. In this sense, the principles of progressiveness and proportionality will guide this assessment.

It is based on qualitative and quantitative analyses of the previous sections, bibliographic analyses and the definition of a simplified methodology for the monetary valuation of advantages.

The indicators examined are:

- the study of travel times and traffic flow conditions;
- shifts of traffic in qualitative terms;
- the analysis of accident rates on selected routes;
- analysis of environmental and noise pollution;
- a simplified socio-economic calculation;
- user perception of the effects of the measure.

The results of this section will be mainly available for the final report after the two years of assessment.

# 3 - Conclusions available 12 months after implementation of the measure

Assessment of the VMA80 measure is planned over two years to allow consolidated data and sufficiently long series to avoid one-off or seasonal effects. **The purpose of this document is to present information available 12 months after implementation to follow the trend, but this can in no way constitute the results of the evaluation.**

## 3.1 - Changes in the main indicators

This involves looking at the changes "before" and "after" the measure was implemented for the speeds at which drivers travelled and the accident rate, considering the data available over the period June 2018 – June 2019.

### 3.1.1 - Speeds

The results presented in this document concern the two-way, two-lane roads of the VMA80 observatory. They are drawn up from 81 million passing vehicles measured from June 1, 2018 to April 30, 2019.

The monthly figures of the VMA80 observatory are detailed in Table 1.

*Table 1: Number of passing vehicles recorded on the 2-lane sites of the VMA80 observatory*

| | All vehicles | Average daily traffic per site | Light vehicles | Heavy goods vehicle |
|---|---|---|---|---|
| June 2018 | 8300118 | 7700 | 7347665 | 456311 |
| July 2018 | 7188789 | 7200 | 6281882 | 422024 |
| August 2018 | 6776699 | 6300 | 5981608 | 344045 |
| September 2018 | 7424276 | 7000 | 6495520 | 406871 |
| October 2018 | 7539610 | 7100 | 6585632 | 446936 |
| November 2018 | 7437101 | 6900 | 6422630 | 463163 |
| December 018 | 7265888 | 6400 | 6462494 | 349409 |
| January 2019 | 6679732 | 6200 | 5995123 | 333646 |
| February 2019 | 6693449 | 6800 | 5931996 | 368231 |
| March 2019 | 7729870 | 7000 | 6832505 | 415929 |
| April 2019 | 7705088 | 7300 | 6808880 | 421909 |

*The evolution of speeds applied to light vehicles*

The results show, **as from Sunday 1 July 2018, a break in the evolution of speeds on the two-lane bidirectional roads of the VMA80 observatory**, as shown by the evolution of the average daily speeds of light vehicles (Figure 1).

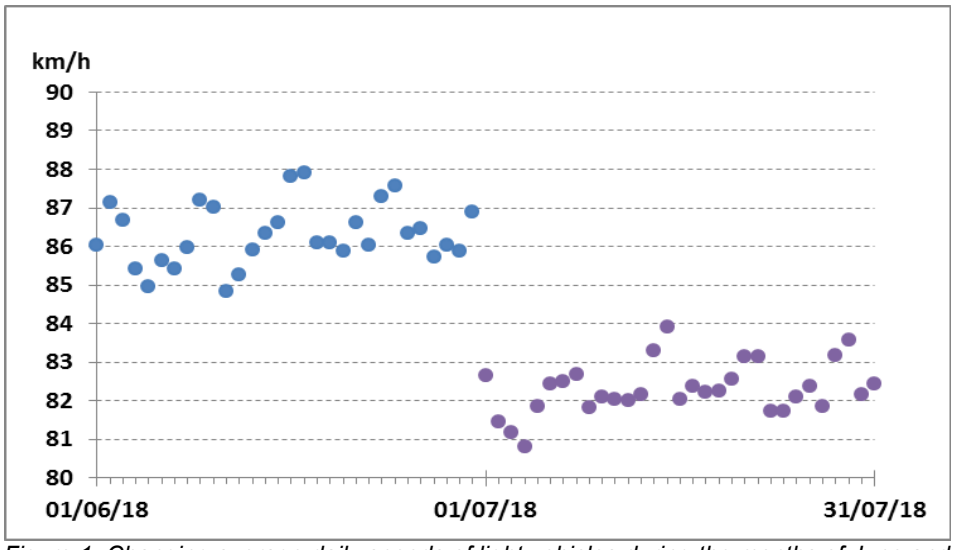


*Figure 1: Changing average daily speeds of light vehicles during the months of June and July 2018; data collected by the VMA80 observatory (Source: Cerema)*

By analysing the average speeds expressed on a monthly basis (Figure 2), the reduction in speeds appears in July as soon as the measure was implemented (-4.3 km/h for light vehicles). Then, the monthly evolution shows a slight increase in speeds until April 2019. This trend was observed in the experiment conducted between 2015 and 2017[16], where the observed speeds decreased significantly immediately after the maximum authorized speed was lowered and then increased slightly before stabilizing within two years of the implementation of the lowering.

**In April 2019, the decrease in average speeds for light vehicles was -3.0 km/h compared to June 2018.**

[16]Cerema (2017) Expérimentation de l'abaissement de la vitesse limite autorisée à 80 km/h. Bilan des observations des vitesses pratiquées. Rapport de décembre 2017, 25 p.

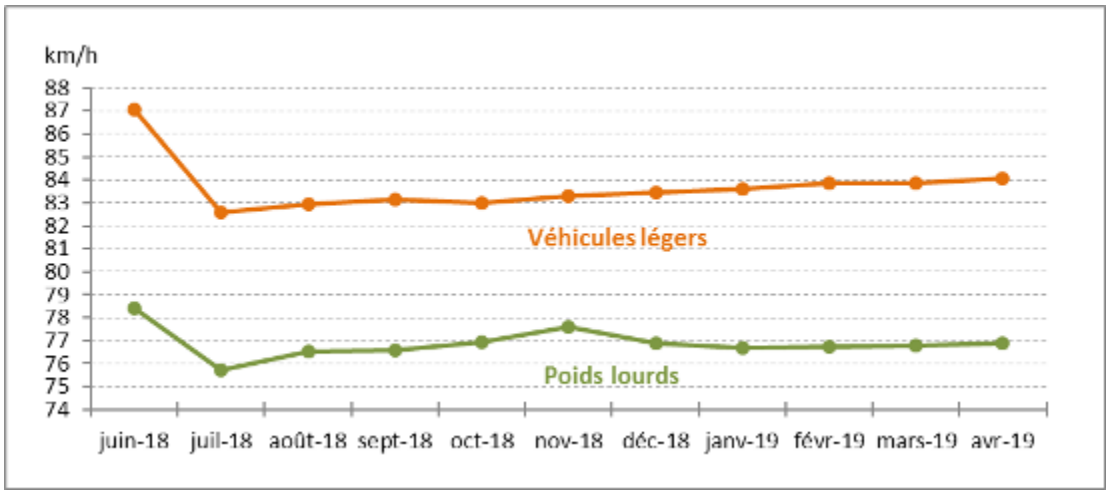


*Figure 2: Average monthly speeds collected by the VMA80 observatory for all vehicles from June 2018 to April 2019 (Source: Cerema)*

As further information, the average speed difference for free light vehicles[17] is -3.1 km/h between June 2018 and April 2019. The result of this indicator, which is less sensitive to the effects of traffic, shows a change in the behaviour of light vehicle drivers.

The drop in speeds corresponds globally to the expected effect if we refer to the international literature[18] (-3 km/h). However, it is less pronounced than those put forward in hypotheses by the CNSR committee of experts[19] (-4 km/h or even -5 km/h, as part of an effective sanction control) and the results of the experiment conducted in France from 2015 to 20174[20] (-5.1 km/h for light vehicles).

[17]Vehicles are said to be "free" when their speed is not impacted by the vehicle in front. The time between vehicles is greater than 5 seconds (Aron, M., Durrande, F. (2000) Temps Intervéhiculaires sur Route Nationale - Étude en un point - Time between vehicles on main roads - One-point study).

[18]OECD / International Transport Forum (2018) Speed and crash risk. Report, 76 p.

[19]Conseil National de la Sécurité Routière, Comité des Experts (2013) Proposition d'une stratégie pour diviser par deux le nombre des personnes tuées ou blessées gravement d'ici 2020. Volume 1, 25 p.

[20]Cerema (2017) Expérimentation de l'abaissement de la vitesse limite autorisée à 80 km/h. Bilan des observations des vitesses pratiquées. Rapport de décembre 2017, 25 p.

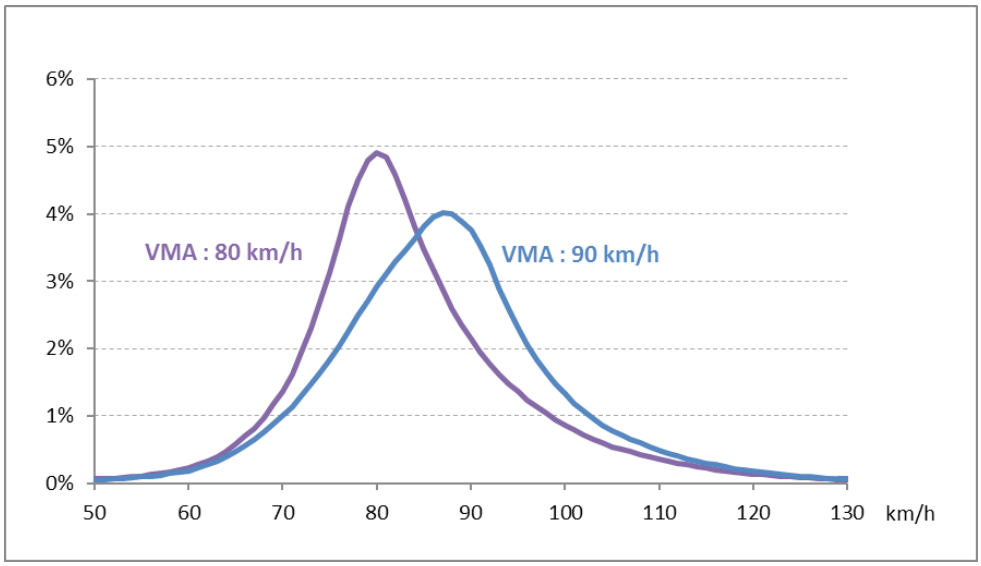


*Figure 3: Distribution of light vehicle speeds between the period July 2018-April 2019 (VMA : 80 km/h) compared to June 2018 (VMA : 90 km/h), according to data collected by the VMA80 observatory (Source : Cerema)*

Figure 3 shows the evolution of speed distribution on two-lane bi-directional roads. It appears that after the implementation of the measurement, the velocity distribution was completely shifted to lower velocities. The decrease therefore concerns the entire speed distribution of light vehicles.

**However, 59% of drivers still travel above 80 km/h**, 35% of drivers travelling between 80 and 90 km/h and 24% travelling at more than 90 km/h. The share of vehicles exceeding 80 km/h increased by 7 points between July 2018 (52%) and April 2019.

This high proportion of light vehicles travelling at a higher speed than the maximum authorised speed can have an influence on the impact of the measure in terms of accidents, as research[21] has shown that drivers driving faster than the average speed have a higher risk of being involved in an accident.

**Similarly, the impact of the maximum authorised speed reduction on drivers of light vehicles travelling at speeds above 100 km/h remains limited.** In April 2019, 9% of light vehicle drivers travelled at more than 100 km/h, compared with 13% before the authorised speed was lowered to 80 km/h (June 2018). The share of vehicles exceeding 100 km/h increased by 1 point between July 2018 and April 2019.

[21]Kloeden, C. N., McLean, A. J. & Glonek, G. (2002). Reanalysis of travelling speed and the rate of crash involvement in Adelaide South Australia. Report No. CR 207. Australian Transport Safety Bureau ATSB, Civic Square, ACT.

Taylor, M. C., Lynam, D. A. & Baruya, A. (2000). The effects of drivers' speed on the frequency of road accidents. TRL Report, No. 421. Transport Research Laboratory TRL, Crowthorne, Berkshire.

***The evolution of the speeds used for heavy goods vehicles***

The VMA80 reduction measure does not apply to heavy goods vehicles (excluding coaches). **However, there is an impact on the speed practiced by HGV drivers** (-1.5 km/h between June 2018 and April 2019). Their average speed remains below 80 km/h (illustration 2).

38% of heavy goods vehicle drivers still drive above 80 km/h: 34% of drivers driving between 80 and 90 km/h and 4% driving at more than 90 km/h. They were 49% before the measure was implemented. In particular, **the number of heavy goods vehicles exceeding 90 km/h has been halved.**

***Time between vehicles***

In addition, **times between vehicles remain stable**. Indeed, inter-vehicular times of less than 2 seconds and less than 1 second did not change during the period from June 2018 to April 2019. This is the case for both light vehicles[22] and heavy trucks[23]. This means that vehicles, and in particular heavy goods vehicles, do not travel any closer to the vehicle in front.

### 3.1.2 - Accident rate

As stated in the methodology, accident data require a validation process to be usable. The validated data for 2018 are official since the May 29, 2019. However, in order to quickly obtain data for the first months of 2019 and to be able to have an initial idea of the trend, the method led to two sources being used:

- the official bases for consolidated bodily injuries, i.e. prior to the year 2018 inclusive,
- for 2019, the most recent data available, including both BAAC and PREBAAC (rapid feedback). These data have been supplemented by accidents reported by rapid feedback from prefectures (data provided by ONISR).

The figures for the number of deaths are probably the closest to reality, although remaining subject to uncertainty before verification and increasing the reliability of the base. On the other hand, it is not yet possible to make more detailed use (types of collision, for example).

Processing was done using TRAxy, the new ONISR information system, and its analysis tool under SAP-BI.

***Analysis of the global trend in final data***

The first analysis focused on aggregate data from 2010 to 2018 (see figure 4).

[22] 5% for the inter-vehicular times (IVT) of less than 2 secondsand 7% for the ITV less than 1 second

[23] 6% for the inter-vehicular times (IVT) of less than 2 secondsand 1% for the ITV less than 1 second

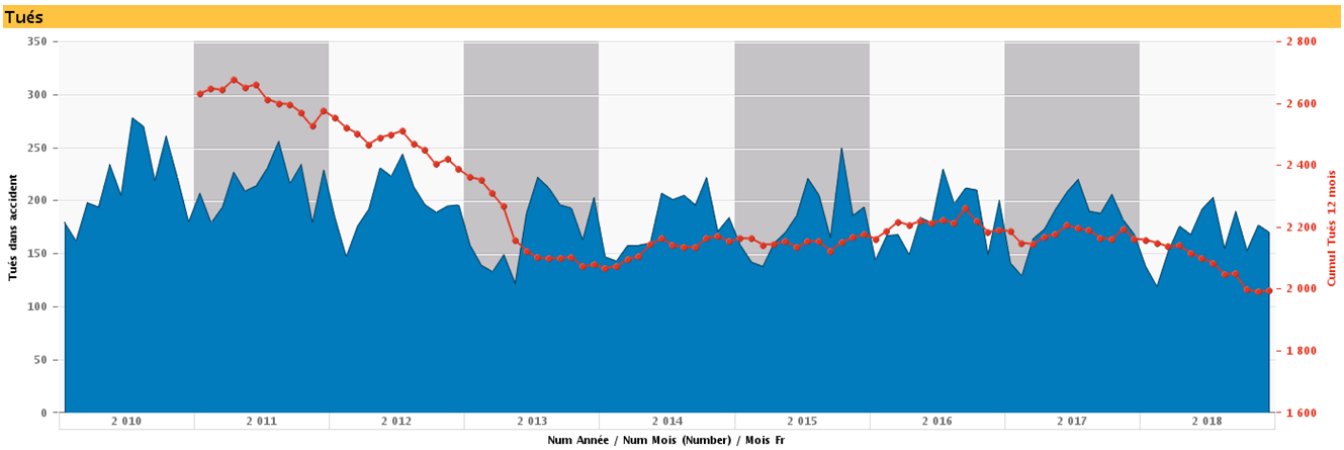


*Figure 4: Monthly data on the number of deaths - 2010-2018*
*Raw values (in blue) and cumulative over 12 months (in red) - (Source of data: BAAC official until 2017 and provisional ONISR data at 24/01/2019 for the year 2018)*

The annual changes in the number of deaths on the network excluding urban areas and motorways show a decrease from 2010 to 2013, followed by stagnation and even a slight increase until 2017.

Analysis of the raw data shows that as of July 2018, the number of road deaths is, for each month, systematically below the average for the years 2010-2018.

In cumulative data over a rolling year over twelve months, it appears that the year 2018, with 2025 deaths (provisional data) on the network excluding urban areas and motorways, is at a level never before reached. Until then, the best year was 2013 with 2078 deaths, and in 2017 there were still 2161 deaths.

It was confirmed that this downward trend for 2018 was not due to seasonal factors. Using a seasonal adjustment method, it has been verified that the variations observed do not result from the influence of particular seasonal factors.

After this general observation, a specific analysis was carried out for the year 2018.

### *Impact of the measure on the 2018 annual report*

First of all, let us remember that a period of 5 years is the duration used in accident research for assessments. In addition, 2013 clearly shows a break in the trend curve (Figure 4), and therefore the period 2013-2017 can be chosen as the reference for the analyses.

In 2018, 132 fewer people were killed than the average number of people killed per year between 2013 and 2017.

As the measure was only applied from July 2018, a focus was placed on the second half of the year compared to the first half, taking 2013-2017 as the reference period.

| | BAAC | | | | | | BAAC | |
|---|---|---|---|---|---|---|---|---|
| | 2013 | 2014 | 2015 | 2016 | 2017 | moyenne 2013-2017 | 2018 | Ecart 2018 à la moyenne |
| Janvier | 158 | 147 | 158 | 144 | 141 | 150 | 138 | -12 |
| Février | 139 | 143 | 142 | 167 | 129 | 144 | 121 | -23 |
| Mars | 133 | 158 | 138 | 168 | 164 | 152 | 156 | 4 |
| Avril | 149 | 158 | 160 | 149 | 173 | 158 | 178 | 20 |
| Mai | 122 | 160 | 170 | 184 | 192 | 166 | 170 | 4 |
| Juin | 188 | 207 | 186 | 179 | 208 | 194 | 193 | -1 |
| Total premier semestre | 889 | 973 | 954 | 991 | 1007 | 963 | 956 | -7 |
| Juillet | 222 | 201 | 221 | 230 | 220 | 219 | 202 | -17 |
| Août | 212 | 205 | 205 | 197 | 190 | 202 | 159 | -43 |
| Septembre | 196 | 196 | 165 | 212 | 188 | 191 | 194 | 3 |
| Octobre | 193 | 222 | 250 | 210 | 206 | 216 | 155 | -61 |
| Novembre | 163 | 171 | 186 | 149 | 182 | 170 | 176 | 6 |
| Décembre | 203 | 184 | 194 | 200 | 168 | 190 | 177 | -13 |
| Total second semestre | 1189 | 1179 | 1221 | 1198 | 1154 | 1188 | 1063 | -125 |
| TOTAL ANNUEL | 2078 | 2152 | 2175 | 2189 | 2161 | 2151 | 2019 | -132 |

*Table 2: Number of deaths on the studied network, by half-year from 2013 to 2018 (Source: BAAC official)*

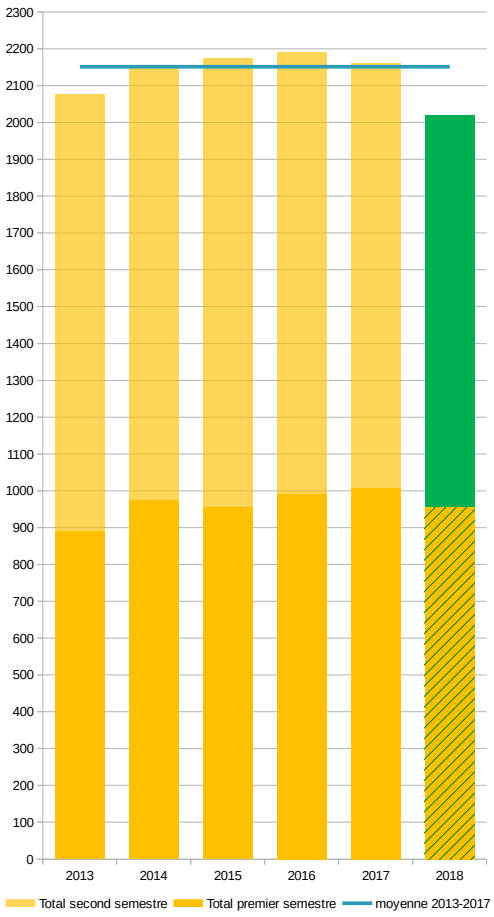


*Figure 5: Comparison of the number of deaths on the studied network, by year, from 2013 to 2018 (Source: BAAC official)*

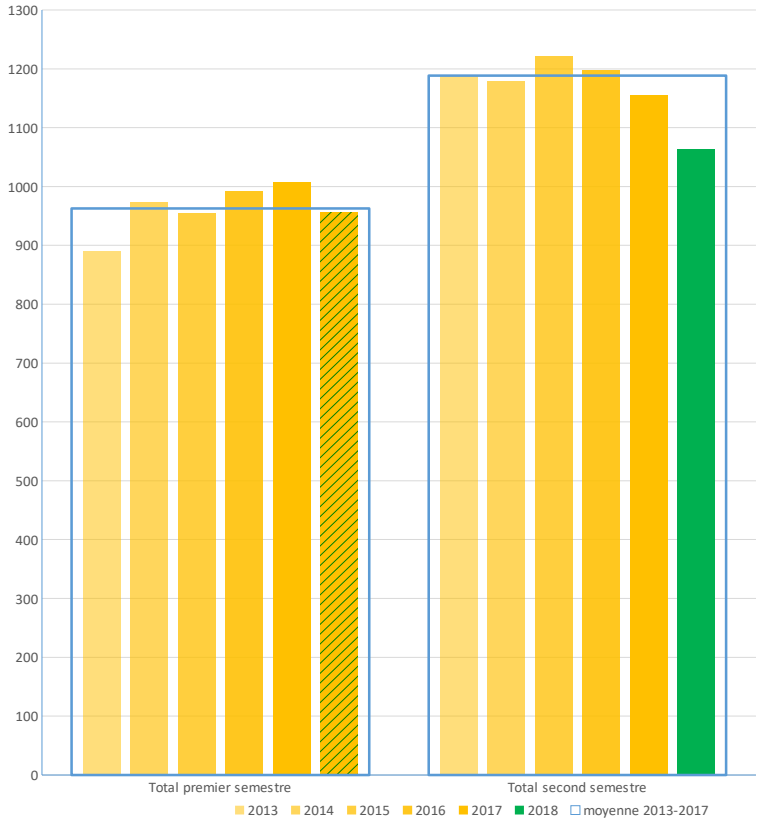


*Figure 6: Comparison of the number of deaths on the studied network, by half-year, from 2013 to 2018 (Source: BAAC official)*

Although it is likely, as has been observed for other measures, that the mere announcement of the VMA80 had a partial effect before it was officially implemented on July 1, if only concerning better observance of speed limits, the study of the comparative change by semester provides useful insights into the percentage of improvement observed in 2018 that could potentially be attributed, in the current state of the data, to the measure (table 2 and figure 6).

It turns out that in 2018 the second half of the year, like the first, has a number of deaths that is down compared to 2017 as well as compared to the average of the reference years (period 2013-2017). However, this drop is much clearer for the second half of 2018 with:

- 91 fewer deaths in the second half of 2018 compared to the second half of 2017, compared to 51 fewer deaths in the first half of 2018 versus 2017,
- 125 fewer deaths in the second half of 2018 compared to the average of the second semesters over the entire reference period, 2013-2017, compared to 7 fewer deaths in the first half of 2018 versus to 2013-2017.

**After a stagnation or even a slight increase in the number of people killed on the network excluding motorways and urban areas between 2014 and 2017, the year 2018 marks a non-debatable drop. This decrease is mainly due to the second half of 2018, after the measure was implemented.**

In order to assess whether there might be a link between this decrease and the introduction of the measure, it is useful to compare, over the same periods, what has happened on the rest of the French network.

Table 3 and figure 7 show that in **the rest of the network**, the number of deaths in 2018 is in line with those observed in previous years: **there is no deviation from the average, as is the case for the network outside urban areas and outside motorways.**

| | BAAC | | | | | | BAAC | |
|---|---|---|---|---|---|---|---|---|
| | 2013 | 2014 | 2015 | 2016 | 2017 | moyenne 2013-2017 | 2018 | Ecart 2018 à la moyenne |
| Janvier | 85 | 88 | 104 | 92 | 114 | 97 | 91 | -6 |
| Février | 82 | 82 | 93 | 96 | 75 | 86 | 97 | 11 |
| Mars | 67 | 103 | 81 | 87 | 103 | 88 | 79 | -9 |
| Avril | 87 | 96 | 98 | 94 | 108 | 97 | 106 | 9 |
| Mai | 102 | 100 | 97 | 110 | 105 | 103 | 98 | -5 |
| Juin | 105 | 104 | 113 | 106 | 116 | 109 | 97 | -12 |
| Total premier semestre | 528 | 573 | 586 | 585 | 621 | 579 | 568 | -11 |
| Juillet | 122 | 101 | 132 | 126 | 123 | 121 | 126 | 5 |
| Août | 110 | 101 | 127 | 104 | 107 | 110 | 87 | -23 |
| Septembre | 116 | 121 | 92 | 122 | 109 | 112 | 128 | 16 |
| Octobre | 115 | 125 | 128 | 105 | 113 | 117 | 119 | 2 |
| Novembre | 89 | 109 | 110 | 109 | 90 | 101 | 92 | -9 |
| Décembre | 110 | 102 | 111 | 137 | 124 | 117 | 109 | -8 |
| Total second semestre | 662 | 659 | 700 | 703 | 666 | 678 | 661 | -17 |
| TOTAL ANNUEL | 1190 | 1232 | 1286 | 1288 | 1287 | 1257 | 1229 | -28 |

*Table 3: Number of deaths on the rest of the network, per semester from 2013 to 2018 (Source: BAAC official)*

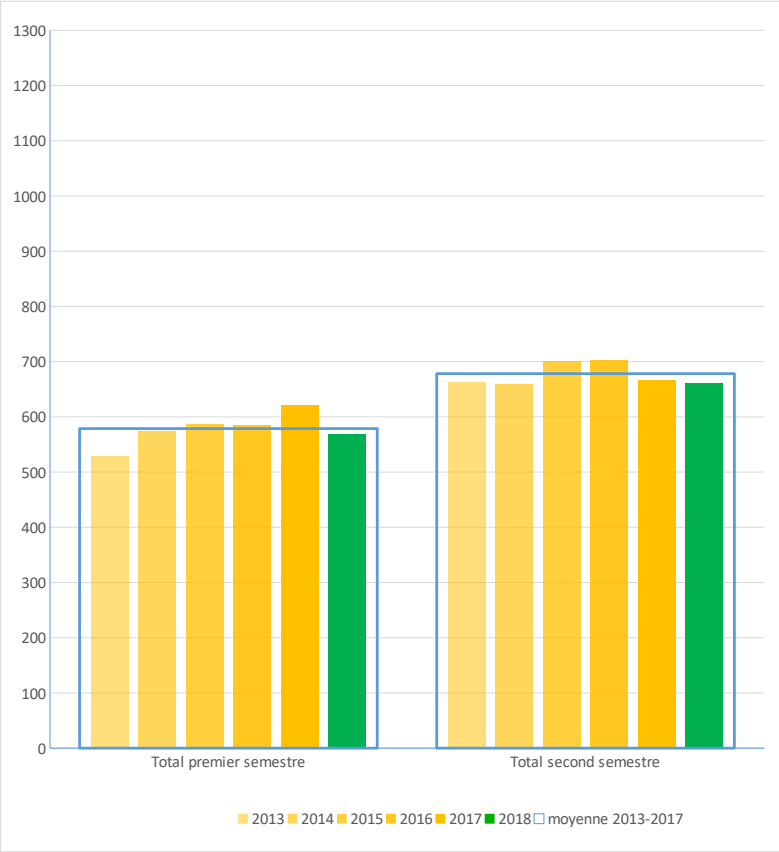


*Figure 7: Comparison of the number of deaths on the rest of the network, by semester from 2013 to 2018 (Source: BAAC official)*

***Impact of the measure 12 months after its implementation (July 2018-June 2019)***

Thanks to BAACs, preBAACs and rapid returns from prefectures, ONISR already has data on fatalities for the first half of 2019. These data are not yet final. Nevertheless, especially for the "Killed" data, they are a good estimator. Thus, the final 2018 data differed by only 6 units, compared to the provisional data, over a volume of 2019 deceased persons.

For the 12 months after the implementation of the measure (July 2018 to June 2019), on the netwrok outside urban areas and outside motorways, the number of people killed is 206 lower than the reference period (average of the years over 2013-2017).

This result is not found in the rest of the network, where on the contrary, an opposite phenomenon is observed with a slight increase in the number of people killed.

However, these trends should be considered with caution and should be verified when the data are validated and available for the entire period "after" implementation of the measure.

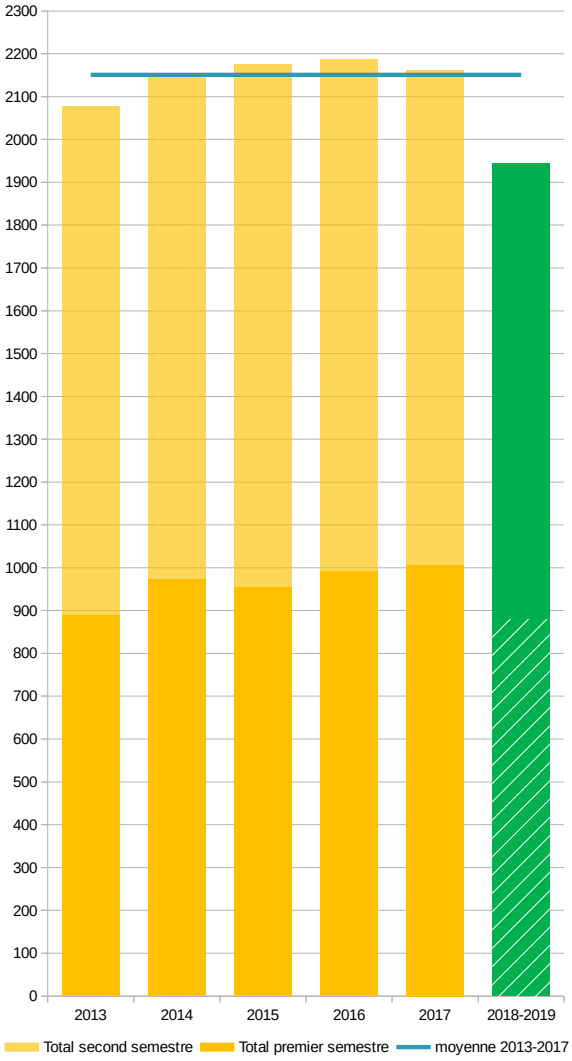


*Figure 8 : Comparison of the number of deaths on the studied network between the "before" period (2013-2017) and the "after" period available (July 2018-June 2019)*

*Sources : 2013 à 2018 (BAAC officiel), 2019 (données ONISR)*

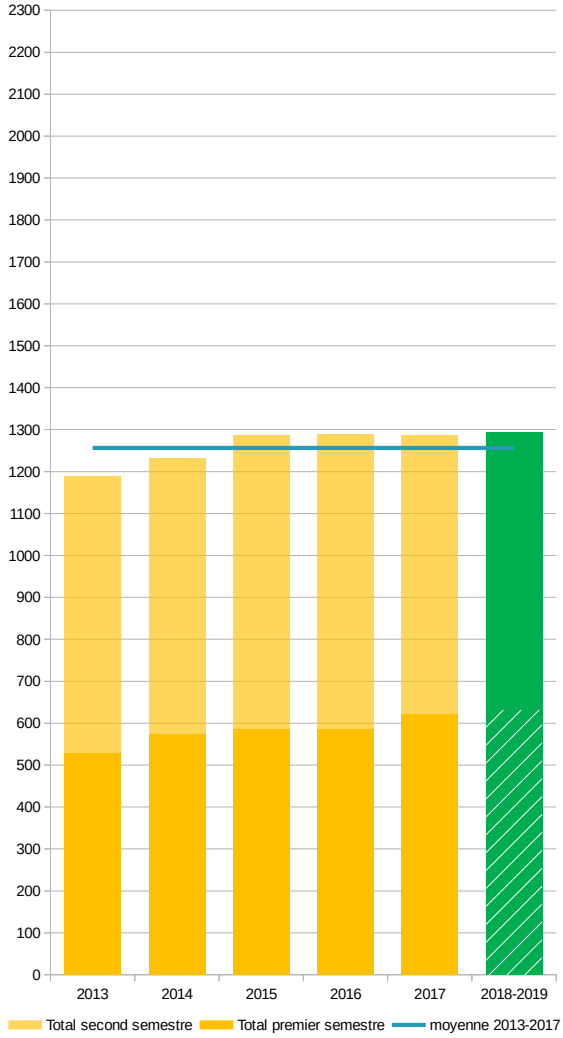


*Figure 9 :Comparison of the number of deaths on the rest of the network between the "before" period (2013-2017) and the "after" period available (July 2018-June 2019)*

*Sources : 2013 à 2018 (BAAC officiel), 2019 (données ONISR)*

| | BAAC | | | | | | | BAAC 2018 et données ONISR 2019 | |
|---|---|---|---|---|---|---|---|---|---|
| | 2013 | 2014 | 2015 | 2016 | 2017 | moyenne 2013-2017 | | 2018-2019 | Ecart à la moyenne |
| Janvier | 158 | 147 | 158 | 144 | 141 | 150 | premier semestre 2019 | *131* | -19 |
| Février | 139 | 143 | 142 | 167 | 129 | 144 | | *143* | -1 |
| Mars | 133 | 158 | 138 | 168 | 164 | 152 | | *157* | 5 |
| Avril | 149 | 158 | 160 | 149 | 173 | 158 | | *134* | -24 |
| Mai | 122 | 160 | 170 | 184 | 192 | 166 | | *146* | -20 |
| Juin | 188 | 207 | 186 | 179 | 208 | 194 | | *171* | -23 |
| Total premier semestre | 889 | 973 | 954 | 991 | 1007 | 963 | | 882 | -81 |
| Juillet | 222 | 201 | 221 | 230 | 220 | 219 | second semestre 2018 | 202 | -17 |
| Août | 212 | 205 | 205 | 197 | 190 | 202 | | 159 | -43 |
| Septembre | 196 | 196 | 165 | 212 | 188 | 191 | | 194 | 3 |
| Octobre | 193 | 222 | 250 | 210 | 206 | 216 | | 155 | -61 |
| Novembre | 163 | 171 | 186 | 149 | 182 | 170 | | 176 | 6 |
| Décembre | 203 | 184 | 194 | 200 | 168 | 190 | | 177 | -13 |
| Total second semestre | 1189 | 1179 | 1221 | 1198 | 1154 | 1188 | | 1063 | -125 |
| TOTAL ANNUEL | 2078 | 2152 | 2175 | 2189 | 2161 | 2151 | | 1945 | -206 |

*Table 4 : Number of deaths on the studied network, spread over 12 months, between the "before" period (2013-2017) and the "after" period available (July 2018-June 2019)*

*Sources : 2013 à 2018 (BAAC officiel), 2019 (données ONISR)*

| | BAAC | | | | | | | BAAC 2018 et données ONISR 2019 | |
|---|---|---|---|---|---|---|---|---|---|
| | 2013 | 2014 | 2015 | 2016 | 2017 | moyenne 2013-2017 | | 2018-2019 | Ecart à la moyenne |
| Janvier | 85 | 88 | 104 | 92 | 114 | 97 | premier semestre 2019 | *105* | 8 |
| Février | 82 | 82 | 93 | 96 | 75 | 86 | | *111* | 25 |
| Mars | 67 | 103 | 81 | 87 | 103 | 88 | | *96* | 8 |
| Avril | 87 | 96 | 98 | 94 | 108 | 97 | | *100* | 3 |
| Mai | 102 | 100 | 97 | 110 | 105 | 103 | | *102* | -1 |
| Juin | 105 | 104 | 113 | 106 | 116 | 109 | | *119* | 10 |
| Total premier semestre | 528 | 573 | 586 | 585 | 621 | 579 | | 633 | 54 |
| Juillet | 122 | 101 | 132 | 126 | 123 | 121 | second semestre 2018 | 126 | 5 |
| Août | 110 | 101 | 127 | 104 | 107 | 110 | | 87 | -23 |
| Septembre | 116 | 121 | 92 | 122 | 109 | 112 | | 128 | 16 |
| Octobre | 115 | 125 | 128 | 105 | 113 | 117 | | 119 | 2 |
| Novembre | 89 | 109 | 110 | 109 | 90 | 101 | | 92 | -9 |
| Décembre | 110 | 102 | 111 | 137 | 124 | 117 | | 109 | -8 |
| Total second semestre | 662 | 659 | 700 | 703 | 666 | 678 | | 661 | -17 |
| TOTAL ANNUEL | 1190 | 1232 | 1286 | 1288 | 1287 | 1257 | | 1294 | 37 |

*Table 5 : Number of deaths on the rest of the network, spread over 12 months, between the "before" period (2013-2017) and the "after" period available (July 2018-June 2019)*

*Sources : 2013 à 2018 (BAAC officiel), 2019 (données ONISR)*

## 3.2 - Available informations as to the effects of the measure

At this stage of the study, only two aspects have been examined: an estimate of travel times before and after the measure was implemented, and an analysis of the users' feelings between April 2018 (before the implementation of the measure) and March 2019 (after).

### 3.2.1 - Travel times

An estimate of the impact of the measure on travel times has been made. The characterization of the time lost per user is expressed in seconds per kilometre.

To do this, Cerema took a reading of journey times from the Google Maps API algorithm "before" and "after" the measure to reduce the speed limit to 80 km/h was implemented . Using the Google Maps API makes it possible to automatically start collecting data at the same time on all selected routes.
The surveys covered 298 routes of between 25 and 30 kilometres in length, spread over all the departments of mainland France. They total a cumulative length of 7,551 kilometres.

The routes chosen favour commuting (i.e. daily trips between home and work). They include a minimum of 70% of two-way roads outside urban areas where speeds are restricted to 80 km/h. Potential exclusion criteria were taken into account, such as weather conditions or road works. The routes selected in mainland France are shown in the following figure.

*Figure 10: Representation of the routes analysed for travel times before and after implementation of the VMA80 measure in mainland France (Source: Cerema)*

Travel time readings using Google Maps were made:

- in the week before the measure, or June 25 to 30, 2018,
- in the week after implementation of the measure, or from July 4 to 9, 2018,
- in the second week of September, or September 10 to 15, 2018.

The times of the readings are as follows:

- at 8 am for morning commutes,
- at 5 pm for evening commutes,
- at 10 am and 3 pm for trips other than commuting,
- on Saturdays at 3 pm.

The first three readings illustrate an average daily travel time during the week.

The Google Maps database constituted in this way is not intended to cover the entire French road network affected by the decision to reduce the speed limit to 80 km/h. In addition, Google Maps data are not Floating Car Data (FCD) traces of vehicles. They represent the travel time estimated by the Google algorithm at a time "t".

Nevertheless, the methodology adopted makes it possible to examine how travel times changed "before" and "after" the measure, and to make an overall estimate the time lost with a large range of routes affected by the measure and distributed throughout France.

**On average, over all 298 routes, the results show a loss of travel time from 1 July 2018 of roughly one second per kilometre on a commuting trip (average daily time lost on weekdays).**

This order of magnitude reflects disparities according to the routes. Tables 6 and 7 below show the distribution of routes according to gains in, or losses of travel time before and after the measure was implemented on routes in mainland France.

*Table 6: Breakdown of routes according to **gains in average daily travel time**, on weekdays, from June to September 2018 (All vehicles)*

| Gain in travel time (second/km) | June/July 2018 | *( % of the total)* | June/September 2018 | *( % of the total)* |
|---|---|---|---|---|
| Less than 1 s/km | 55 | *18 %* | 62 | *21 %* |
| Between 1 and 2 s/km | 9 | *3 %* | 24 | *8 %* |
| Between 2 and 3 s/km | 2 | *1 %* | 7 | *2 %* |
| Greater than 3 s/km | - | - | 8 | *3%* |
| | **66** | ***22 %*** | **101** | ***34 %*** |

Table 7: Breakdown of routes according to **losses in average daily travel time**, on weekdays, from June to September 2018 (All vehicles)

| Loss of travel time (second/km) | June/July 2018 | *( % du total)* | June/September 2018 | *( % of the total)* |
|---|---|---|---|---|
| Less than 1 s/km | 140 | ***47 %*** | 110 | *37 %* |
| Between 1 and 2 s/km | 70 | *23 %* | 52 | *17 %* |
| Between 2 and 3 s/km | 16 | *5 %* | 15 | *5 %* |
| Greater than 3 s/km | 6 | *2%* | 20 | *7%* |
| | **232** | ***78 %*** | **197** | ***66 %*** |
| **Total routes** | **298** | ***100%*** | **298** | ***100%*** |

Between June 2018 and July 2018:

- 78% of the itineraries show a loss of average daily journey time, of which almost half (47%) concern lost time of less than 1 second per kilometre.
- For 22% of routes, a gain in travel time of mostly less than 1 second was measured.

Note that July, corresponding to the summer school holidays, may be different from June in terms of traffic profile.

As a result, the comparison was made between June 2018 and September 2018. It turns out that:

- 66% of the total routes show a loss of average daily journey time, of which over a third (37% of the total) concern lost time of less than 1 second per kilometre.
- The gain in average daily journey time affects 34% of routes.

The number of routes with gains in average daily travel times of more than 1 second per kilometre is generally higher in September 2018 than in July 2018, although it remains very limited (13% of routes). Very few routes have longer travel times above 2 seconds per kilometre (12% of the total).

This analysis gives an estimate. A Google Maps collection is underway for June and July 2019, based on the same methodology. The first exploitations of the surveys show on average on all 298 routes, an increase in travel time between June 2018 and June 2019 of about one second per kilometre on a commuting trip (average daily lost time during the week).

It should be noted that it is planned to extend the duration of the survey period for the regulatory change, both for the "before" and the "after" period. Indeed, this will make it possible to smooth out specific factors (works, accidents, weather) or seasonal factors (tourist traffic) likely to significantly vary the travel times of the various selected routes.

### 3.2.2 - Users' feelings concerning the measure

Before presenting the results of the surveys carried out, it is important to review the lessons from the international literature in terms of the acceptance and acceptability of a speed limit.

According to a Dutch study, on a road limited to 80 km/h[24], drivers report driving 8 km/h above the speed limit. Such exceeding of the speed limit is in line with other research showing that respondents tend to drive 10% above the speed limit, whether it is 60 km/h or 100 km/h[25].

Exceeding the speed limit by around 10% is not considered a risk behaviour by many users. Thus, several studies show that as long as drivers feel comfortable and confident in their vehicle, they do not consider exceeding the speed limit to be dangerous or morally reprehensible[26].

Different elements have an impact on the acceptability of speed limits. First, the characteristics of drivers influence: those with a high score on the "sensation seeking" scale[27] are those with a strong appetite for

[24]Goldenberg et Van Schagen, I. (2007). The credibility of speed limits on 80 km/h rural roads:The effects of road and person(ality) characteristics. Accident Analysis and Prevention, 37, 1121-1130.

[25]Fleiter, J., Watson, B. (2005). The speed paradox: the misalignment between driver attitudes and speeding behaviour. In: Proceedings of the Australasian Road Safety Research, Policing and Education Conference,Wellington, New Zealand.

[26]Corbett, C. (2001). Explanations for understating in self-reported speeding behaviour. Transport. Res. Part F 4, 133–150.

[27]Zuckerman, M. (1979). Sensation seeking and risk taking. In C. E. Izard (Ed.), Emotions in personality and psychopathology. New York: Plenum Press

speed[28]. This intra-individual characteristic is related to the age of the respondents. For example, young drivers tend to be more interested in thrills at the wheel[29].

Standards (including descriptive standards) also seem to play a role in the speeds used, more specifically the speeds used by other drivers. Thus, a driver who thinks that the drivers he observes on the road do not respect the speed limit will be more likely not to respect such a speed limit himself[30]. Similarly, Swedish drivers say that it is more important to drive like others than to respect the speed limit[31].

However, other motivations are highlighted such as saving time and therefore arriving earlier at the destination (for 32% of drivers[32]) or at least not arriving late (57% of research respondents[33]).

On the other hand, a positive impact in terms of reducing the number of accidents but also their severity seems to be a convincing argument for respecting the limitation[34].

Finally, according to a literature review12[35], if drivers believe that speed can generate noise pollution and have a negative impact on the environment, these elements have very little impact on their decision to drive at a higher or lower speed.

Concerning the lowering of the maximum authorised speed from 90 to 80 km/h in France, two waves of investigations were carried out:

- from April 24 to May 2, 2018, i. e. "before" the implementation of the measure, among 5,310 respondents aged 18 and over,
- from March 7 to 14, 2019, i. e. "after" the implementation of the measure, among 3,800 respondents aged 18 and over.

The panel of respondents was chosen to be representative of the French population and to be comparable between the two surveys. It is composed of 47% men, with an average age of 47 years. The main mode of travel used by respondents on the network in the last 6 months was by car. Almost a quarter of the sample resides in a rural area (23%) and 18% in a city with a population of less than 20,000.

The results presented below have all been statistically tested to verify the significance of the statements made.

First of all, between the two waves of surveys, **there was a positive change in the acceptability of the measure,** with a 10 point increase in respondents in favour of the measure (30% in wave 1 and 40% in wave 2). This acceptability seems to be increasing among those most opposed to the measure, with a 15 point drop in the representation of those "totally opposed" to the measure (25% of respondents in wave 2

[28]SARTRE, 2004b. European drivers and road risk. Part 2. Report on in-depth analyses. INRETS, Arcueil Cedex.

[29]Delhomme, P., Chaurand, N. et Paran, F. (2012). Personality predictors of speeding in young drivers : anger vs sensation seeking. Transportation Research Part F , 15, 654-656.

[30]Haglund, M., Aberg, L. (2000). Speed choice in relation to speed limit and influences from other drivers. Transport. Res. Part F 3, 39–51.

[31]Åberg, L., Larsen, L., Glad, A., & Beilinsson, L. (1997). Observed vehicle speed and drivers' perceived speed of others. Applied Psychology: An International Review, 46(3), 287–302

[32]Rowland, T and D McLeod (2017) Travel time savings and speed: actual and perceived. NZ Transport Agency research report 568. 97pp.

[33]Transport Canada (2007). Driver attitudes to speeding and speed management : a quantitative and qualitative study. Final report.

[34]Mc Guffie, J. et Span,D. (2009). Community attitudes to speed limit. Report, AMR Interactive

[35]Elvik, R. (2010)A restatement of the case for speed limits. Transport Policy 17.

versus 40% in wave 1). This positive trend is particularly marked among respondents living in rural areas and in cities with less than 20,000 inhabitants.

Prior to implementation, 77% of respondents indicated that they intended to comply most often or consistently with the measure. 76% say they do so after implementation.

This result is inconsistent with the available speed data, which shows an 80 km/h overrun rate of 59% for car drivers. This may come from the threshold of acceptable respect for users, as seen in the literature. Thus, people travelling between 80 and 90 km/h can consider that they are respecting the speed limit. However, the literature review in Part 1.2 clearly showed the difference in impact on accidentality between a driving speed of 80 km/h and a speed of 90 km/h. **Users underestimate the danger of speed.**

This is confirmed by the main arguments given by users who state that they have little intention of complying with the measure. For them, the road allows them to go fast and there is little risk because they control their vehicle.

Between the two waves of the survey, the estimated lost time decreased. Respondents "opposed" to the measure estimate on average that the measure causes them to lose at best less than 2 minutes, at worst between 2 and 5 minutes on their usual journey. Before the implementation of the measure, they estimated that they would lose at best less than 5 minutes, at worst between 5 and 10 minutes.

**However, the estimated lost time is still higher than reality.** Indeed, nearly 80% of users, reporting that they lose more than 2 minutes of travel time, travel daily distances of less than 50 kilometres. Considering the estimated average evolution through travel time records of 1 second per kilometre, travel times should be increased by a maximum of 50 seconds.

Users who are not in favour of the measure have little regard for speed as a factor in accidents, unlike other factors such as alcohol.

Moreover, the more respondents are in favour of the measure, the more they think that the measure will have an impact on reducing the number of injuries, the number of material accidents, the risk of collisions and the speeds at which they occur.

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