Cerema

Lowering the speed limit to 80 km/h

Assessment - 18-month items

January 2020

Delegation for road safety

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Summary

Context

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.

The purpose of this measure is to reduce the total number of road deaths by reducing the speeds at which people drive. The effect of speed on overall road deaths has been widely documented in the international literature.

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 on Risks, Environment, Mobility and Urban Planning (Cerema) on April 27, 2018.

Since the assessment of a public policy “aims to assess the effectiveness of this policy by comparing its results with the objectives set and the means implemented”, the methodology is based on two main areas:

- an analysis of changes in drivers’ speeds and the accident rate “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.

The methodology used had to take into account the imperatives associated with the measure: its scale (400,000 kilometres of road network), its speed of implementation, some data not available before implementation, and the 2-year reporting deadline. That assessment is only carried out in mainland France. Based on scientific approaches, it has been presented in various international congresses.

A speed observatory dedicated to this assessment has been set up to monitor the monthly changes in driver behaviour in terms of speeds on two-way roads without a central delineator.

In terms of accident rates, the network studied is defined according to the location criteria of the Road traffic accident and injury report (Bulletin d’analyse des accidents corporels – BAAC) labelled by the official statistics authority, which is the network excluding urban areas and motorways. For the analysis periods, 5 years, a period commonly used in road safety, was chosen. The reference period “before” the measure is 2013-2017. The "after" period is restricted to the data available after the measure was implemented, bearing in mind that a period of data validation is also necessary to arrive at the final figures.

An initial estimate of changing travel times was made from the Google Maps application on nearly 300 routes affected by the measure, spread over all departments of mainland France and representing a cumulative linear distance of 7,550 kilometres.

Finally, in terms of user perceptions, three waves of surveys “before” (wave 1 in April 2018) and “after” (wave 2 in March and wave 3 in October 2019) implementation of the measure were carried out. The panel of interviewees was chosen to be representative of French people and to be comparable between surveys.

This document is an interim report. The final report will be produced 2 years after implementation of the measure, i.e. in July 2020. In addition to the longer period of available data, it will further develop some of the operational feedback, including an analysis of societal effects.

Results

Over the twelve months following implementation of the measure (July 2018 - June 2019), there was a reduction in speeds of -3.4 km/h, a 13% drop in road deaths, an average increase in journey times of around 1 second per kilometre and a 10-point drop in the number of unfavourable users. Observations in the second half of 2019 confirm these trends.

More precisely, the **speed** observatory shows a break in the changes of speeds on the network in question as soon as the measure was implemented (i.e. between June and July 2018).

The monthly change then shows a slight increase in speed before stabilising. From June 2018 to June 2019, the decrease in speed is on average -3.4 km/h for all vehicles. This trend remains stable until November 2019.

While this decrease is in keeping with the results of the international literature, it is lower than the assumptions made by the French National Road Safety Council (Conseil National de la Sécurité Routière - CNSR) to estimate the gains obtained through the measure.

This is because 58% of drivers of light vehicles still drive above 80 km/h, 35% of them between 80 and 90 km/h. The literature indicates that speeding below 10 km/h is mainly perceived by road users as not very dangerous and reprehensible, even though it plays a significant role in French road deaths.

For the 12 months after implementation of the measure (July 2018 to June 2019), **the number of people killed** on the network in question is 209 fewer than the average for the reference period (2013-2017). The opposite phenomenon is to be observed on the rest of the French road network with a slight increase in the number of people killed. This corresponds to a 13% decrease in road deaths on the network under consideration compared to the rest of the French road network (with an estimated error of 4%).

Accident rate data for the second half of 2019 appear stable compared to the second half of 2018, both on the network under consideration and on the rest of the network (i.e., compared to the average for the reference period 2013-2017, 127 fewer fatalities on the network in question and 13 fewer fatalities on the rest of the network).

On all the routes studied in France, one year after the measure was implemented, an average travel time increase of the order of one second per kilometre was observed on trips between home and work.

The surveys show that the perception of this increase is overestimated by users compared to reality, but that this gap has narrowed after the measure was implemented.

It also appears that the number of people opposed to the measure decreased after its effective implementation, with a 10 point drop between April 2018 and March 2019 (70% of respondents in wave 1 and 60% in wave 2). This trend is confirmed in October 2019 (58% of respondents).

The decline is greater among those most opposed to the measure, with a 15-point drop (40% of respondents in wave 1 and 25% in wave 2). It is particularly pronounced among respondents living in rural areas and in towns with populations of less than 20,000. This trend was confirmed in the October 2019 survey wave, with 23% “strongly opposed” to the measure.

In the light of the international literature and the initial results of the assessment, it appears that, although a break in speeds from July 2018 onwards has been observed, there is still room for improvement in terms of speed enforcement, particularly with regard to speeding below 10 km/h, which plays a significant role in road deaths.

Sommaire

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[1]. 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 of the Cerema[2] 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[3].

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 outside urban areas 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[4]. 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. It has been shown that at national level, 20% of

[1]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. Tome 1, 25 p. disponible sous https://www.conseil-national-securite-routiere.fr/les-rapports-dexperts/

[2]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. disponible sous https://www.cerema.fr/fr/centre-ressources/boutique/experimentation-abaissement-vitesse-limite-autorisee-80-kmh

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

ONISR (2019) La sécurité routière en France. Bilan de l'accidentalité de l'année 2018.

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

the road network outside urban areas accounts for 55% of deaths[5] and that the departmental main road network accounts for 67% of deaths outside urban areas[6].

1.2 - Purpose of the measure

The measure to lower the maximum permitted speed by 10 km/h on the two-way network without a central delineator is therefore part of a national policy to reduce the total number of people killed in road accidents, a policy which was reasserted in 2012 by the Minister of the Interior.

The measure aims to reduce the total number of deaths in France by reducing the speeds at which people drive.

1.3 - 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, 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.

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

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

2 - Scientific literature related to the measure

The aim of the measure is to reduce the total number of deaths in France by reducing the speeds at which people drive.

In this section, the scientific references related to this objective and its implementation are presented, i.e.:

- fatal accidents and their relationship to speed,
- the relationship between maximum permitted speed and the speed at which people drive,
- the principles of acceptance and acceptability of speed limits.

2.1 - Fatal accidents: the impact of speed

An analysis of fatal accidents for the year 2015 was carried out by Cerema.

It was carried out using the sequential accident analysis method[7] defined by INRETS, which, based on the reading of accident reports, makes it possible to retrace the history of the accident, identify malfunctions in the traffic system and define accident factors.

The accident factor is a state of a component of the human/vehicle/infrastructure-environment system that was necessary (but not sufficient on its own) for the accident to occur (if this factor had not been present, the accident would not have occurred) and on which action might be possible. It therefore directly intervenes in the occurrence of the accident.

Excessive or inappropriate speed appears to be the first factor (37%) causing fatal accidents in 2015, involving at least one road user travelling on a two-way road limited to 90 km/h. The second is alcohol consumption (32%), followed by drug use (16%), fatigue (13%), lack of opportunity for recovery (12%) and refusing to give way (11%), to cite only the main ones. Accident factors can combine to cause an accident to occur.

Furthermore, **speed plays an important part in the severity of accidents**. 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 biomechanical tolerance of the human body also plays an important part.

Figure 1 shows the risk of being killed depending on the speed of impact. For example, in the case of head-on impacts of vehicles, the risk for the user to be killed in the accident is 80% at 90 km/h and 10% at 70 km/h.

The recent Organisation for Economic Co-operation and Development (OECD) report explains why the higher the speed, the greater the risk of an accident[8]. A driver needs a constant time to react to unexpected events. The higher the speed, the greater the distance covered during this time and so the speed on impact will be high. Moreover, at high speeds, speed differentials between users are detrimental as they increase potential conflict situations. For example, the risk of rear-end collisions between slower and faster vehicles is higher.

[7]Brenac (1997) L'analyse séquentielle de l'accident de la route. Rapport INRETS Outils et méthodes n°3

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

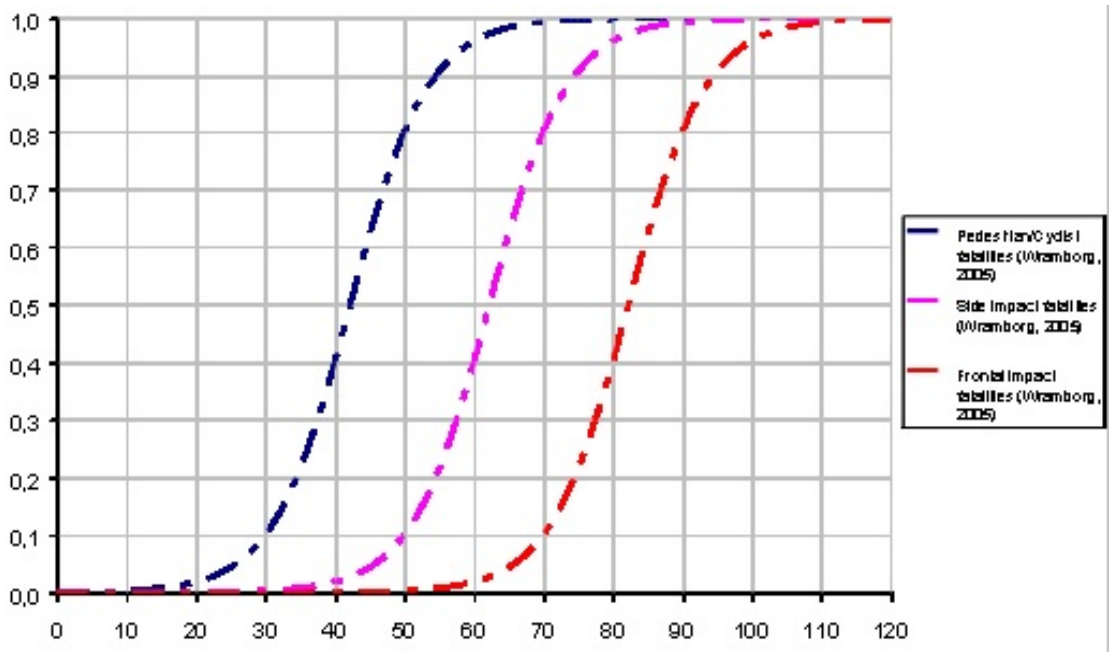

Figure 1: Relationship between risk of death (in %) and speed at collision (in km/h) by Wramborg, P. (2005)

Speed therefore plays a part in all accidents, whatever their causes.

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 that of serious accidents and of 40% in that of fatal accidents[9]. These results mainly concern rural roads and motorways. In early 2019, these results were reconfirmed based on more recent international data[10].

In France, a large number of speed cameras have been deployed since 2003. Various studies[11] have shown that these systems have reduced “large-scale” speeding. However, speeding below 10 km/h remains significant and accounted for almost half of all fatal accidents in 2010.

International scientific work has established a strong correlation between traffic speeds and the number of accidents and deaths.

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

[10]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.

[11]CARNIS L., BLAIS E., An assessment of the safety effects of the French speed camera program, Accident Analysis and Prevention, no 51, 2013 pp. 301-309.

VIALLON V., LAUMON B., Fractions of fatal crashes attributable to speeding: Evolution for the period 2001-2010 in France, Accident Analysis and Prevention, no 52, 2013 pp. 250-256.

2.2 - Relationship between the maximum permitted speed and the speeds at which people drive

In several countries, the decision to reduce the maximum permitted speed (MPS) has been taken for road safety reasons because of the proven link between speeds and accidents. A summary[12] of recent case studies shows that a 10 km/h drop in MPS leads to a 3 km/h reduction in average speed, but with a variability that can be significant.

In Sweden, a review of speed limits has been carried out since 2008 on the national rural road network. The review concerned, in particular, a decrease on low-safety roads (17,800 kilometres impacted). On the rural network, which was reduced from 90 to 80 km/h, the assessment showed a 3.1 km/h decrease in speed and drop in the number of deaths per year of 14 (representing a 41% decrease)[13].

In France, experimentation[14] with reducing the MPS from 90 to 80 km/h, on three two-way roads outside urban areas between 2015 and 2017 showed a drop in average speed of 5.1 km/h for light vehicles and 2.7 km/h for heavy goods vehicles. This drop affected all categories of vehicles and all users, regardless of their driving habits. The highest speeds also fell compared to the initial situation. This decrease in the maximum permitted speed is also reflected in a decrease in the inconvenience caused by HGVs who were driving during the experiment with a lower speed difference as compared with light vehicles. No significant shift of traffic onto bypass routes was observed.

2.3 - Acceptance and acceptability of a speed limit

Scientific literature shows that speed plays a key role in road safety, both in terms of the number of accidents and their severity. This paragraph looks at the literature on the perception of this correlation and the acceptance of a speed limit.

According to a Dutch study[15], on a road with a speed limit of 80 km/h, drivers reported driving 8 km/h above the speed limit. Such speeding is consistent with other research showing that **respondents tend to drive 10% over the speed limit,** whether the limit is 60 km/h or 100 km/h[16].

Exceeding the speed limit by 10% is not considered risky behaviour by many road users. Several studies show that as long as drivers feel comfortable and in control of their vehicle, they do not consider exceeding the speed limit to be dangerous or morally reprehensible[17].

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

[13]Vadeby, A., Forsman, A. (2018) Traffic safety effects of new speed limits in Sweden. Accident Analysis and Prevntion, 114, pp. 34-39

[14]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.

[15]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.

[16]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.

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

Different factors have an impact on the acceptability of speed limits. Firstly, the characteristics of the drivers have an influence: those with a high score on the “thrill-seeking”[18] scale are those with a strong appetite for speed[19]. This intra-individual characteristic is related to the age of the respondents. Young drivers tend to be more thrill-seeking at the wheel[20].

Standards (especially descriptive standards) also appear to play a role in determining the speeds at which people drive, more specifically the speeds at which other drivers drive. A driver who thinks that the drivers he sees on the road are not respecting the speed limit will be more likely not to respect the speed limit himself[21]. In the same vein, Swedish drivers say it is more important to drive like everyone else than to respect the speed limit[22].

However, other motivations are put forward, such as saving time and therefore arriving earlier at one’s destination (for 32% of drivers[23]) or at least not arriving late (57% of respondents[24]).

On the other hand, a positive impact in terms of reducing the number of accidents and their severity seems to be a convincing argument for complying with the speed limit[25].

Finally, according to a review of the literature[26], although drivers believe that speed can cause noise pollution and have a negative impact on the environment, these factors have very little impact on their decision to drive faster or slower.

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

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

[20]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.

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

[22]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

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

[24]Transport Canada (2007). Driver attitudes to speeding and speed management : a quantitative and quaitative stydy. Final report.

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

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

3 - Assessment methodology

3.1 - The general principles of the methodology

The purpose of assessing a public policy, according to French decree No. 98-1048 of 18 November 1998, is “to assess the effectiveness of this policy by comparing its results with the objectives assigned and the means used”[27].

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.

It has been presented in various international scientific congresses, such as the International Transport and Air Pollution Conference in May 2019, the World Road Congress in October 2019, and the Transportation Research Board in January 2020[28].

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. 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[29]. 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.

[27]Blanchard, G. et Carnis, L. (2015) Evaluation des politiques publiques de sécurité routière. Méthodes, outils et limites. Edition L’Harmattan (sous la coordination scientifique). 272 p.

[28]Long M., Buttignol V., Eyssartier C. (2019) Vehicle velocity and air pollution : challenges on the speed limit reduction to 80 km/h in France. Proceedings of the 23rd Transport and Air Pollution Conference, Thessalonik, May 2019.

Eyssartier, C., Chastenet, L., Granier, M-A. (2019) Abaissement de la vitesse de 90 km/h à 80 km/h sur les routes françaises : acceptabilité de la mesure. Proceedings of the 26th World Road Congress, Abu Dhabi, October 2019.

Buttignol, V., Long, M., Troullioud, O. (2019) Réduction de vitesse de 90 à 80 km/h en France : quelle approche pour évaluer les effets socio-économiques ? Proceedings of the 26th World Road Congress, Abu Dhabi, October 2019.

Millot M., Le Lez C., Violette E., Duchamp G., Mompart N., Eyssartier C., Buttignol V., Chaumontet R. (2019) How can the reduction in speed from 90 km/h to 80 km/h on French roads be assessed ? Proceedings of the 26th World Road Congress, Abu Dhabi, Oct 2019.

Millot M., Le Lez C., Violette E., Duchamp G., Mompart N., Eyssartier C., Buttignol V., Ledoux V. (2020) Impacts on the reduction of speed limits on speed practiced, accident rates, variations in travel time, effects on the environment. TRB 99th Annual Meeting, Washington, January 12–16

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

- 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.

3.2 - The methodology deployed for each section

3.2.1 - 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 site-by-site indicators to be monitored on a monthly basis. 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 has 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 road users can travel at the speed they want to.

The methodology adopted by Cerema aims to make it possible to study changes in driver behaviour. The observatory used does not claim to be representative of the speed at which people drive on all French roads with a speed limit of 80 km/h. However, the technical choices made and the way the observatory is managed guarantee the quality of the measurements collected and the robustness of the indicators.

The observatory continuously collects speed data from all road users driving on the sites concerned. It does not use sampling. Regular checks are made to ensure the quality and continuity of the data collection. Because of this the measurement uncertainty of the average speed at each point is less than 1 %.

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 up in June 2018. 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.

3.2.2 - 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 file is consolidated 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. The scope of study is defined according to the location characteristics in the BAAC. This does not include the maximum authorised speeds of the roads on which road users were travelling. It is not possible to reconstitute them given the mass of accidents involved (1915 deaths for the year 2017, for example).

The scope of the study was defined on the basis of the variables "excluding urban areas" and "excluding motorways". These criteria select accidents outside urban areas where at least one of the lanes is not a motorway. For example, a motorway slip road may be included in the scope of the assessment if an accident occurs as it opens onto a two-way lane outside an urban area affected by the speed limit lowering measure. This definition differs slightly from the definition sometimes used for "excluding motorways", which excludes any accident where one of the lanes is a motorway.

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

The studied network is slightly wider than the network affected by the measure, because it includes road sections where the speed limit is either more restrictive as a result of a particular decree - crossing places said to be outside urban areas, dangerous bends, approaches to urban areas at 70km/h or roundabouts - or higher, given cross-section characteristics - 110 km/h for non-motorway sections with 2x2 lanes and separate carriageways, or 90km/h for three-lane sections not affected by the decree. Such sections are estimated to account for 10% of deaths on the total observed network.

The definition of the network affected by the measure could not be more precise. This is because it is not possible to reliably distinguish the traffic flow (one-way or two-way) or the number of lanes. Completion of these fields in the BAAC underwent a substantial change leading to a very significant improvement as of 2017 but not allowing comparison with previous years.

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

Additional indicators were defined:

- the number of accidents, deaths 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. A period of 5 years, commonly used in road safety, was chosen. The reference period "before" the measure is 2013-2017.

The "after" period is limited to data available two years after implementation of the measure, a deadline imposed by the context of the assessment. This availability is limited by the formalization of accident data, preceded by the necessary time required to validate them. Bodily injury data are generally only

available within a period of three to four months, which is the time needed for them to be validated, and they are made official only once a year.

3.2.3 - 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.

3.2.4 - 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.

The Council of State noted that the 80 km/h measure could be seen as a modification of part of the existing network by lowering the speed and that, as such, the Transport assessment repository, as presented in the government instruction of 16 June 2014, should be used for this purpose. 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;
- user perception of the effects of the measure.

A simplified socio-economic calculation will be proposed. The results of this section will be mainly available for the final report after the two years of assessment.

4 - Conclusions available 18 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 evidence available 18 months after its implementation in order to monitor the trend, but this does not constitute the final results of the assessment.

Trends are given for the changes of speeds, accident rates, travel times and road user experience.

For this section, the change is compared over the first year of implementation of the measure (July 2018 - June 2019). The trends are then analysed, when the data are available, to see if they continue over time.

4.1 - Speeds

The results presented in this document concern the two-way, two-lane roads of the VMA80 observatory. They are based on 135 million passing vehicles measured from 1 June 2018 to 30 November 2019. Detailed figures are presented in the appendix.

4.1.1 - Changes in speeds for light vehicles

The results show, **as of Sunday 1 July 2018, a break in speed trends on the VMA80 observatory's two-lane two-way roads,** as shown average daily speed trend of light vehicles (figure 2).

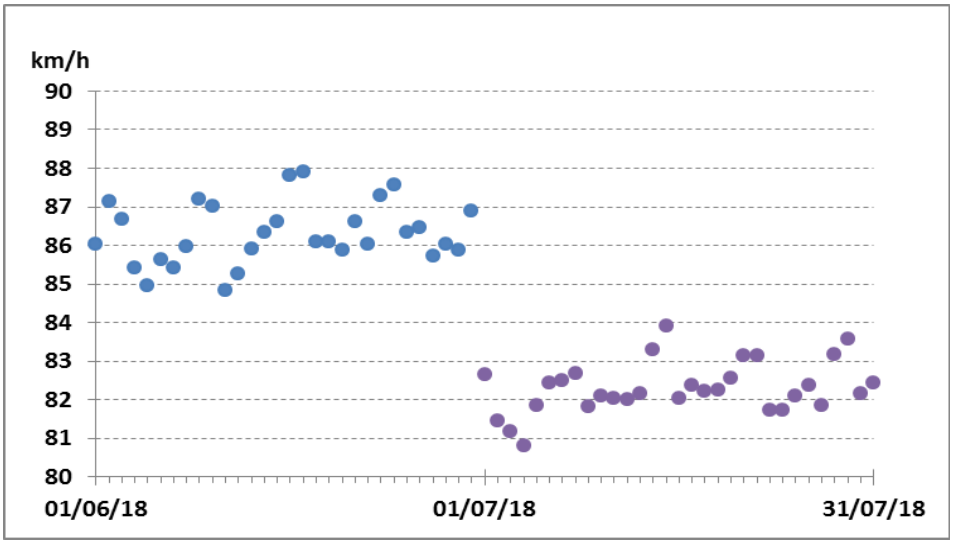

Figure 2: Changing average daily speeds of light vehicles during the months of June and July 2018; data collected by the VMA80 observatory (Source: Cerema)

Analysing the average speeds expressed on a monthly basis (figure 3), the reduction in speeds appeared in July 2018 as soon as the measure was implemented (-4.3 km/h for light vehicles).

The monthly trend then shows a slight increase in speed until June 2019 before stabilizing. This trend had been observed in the experiment conducted between 2015 and 2017[30].

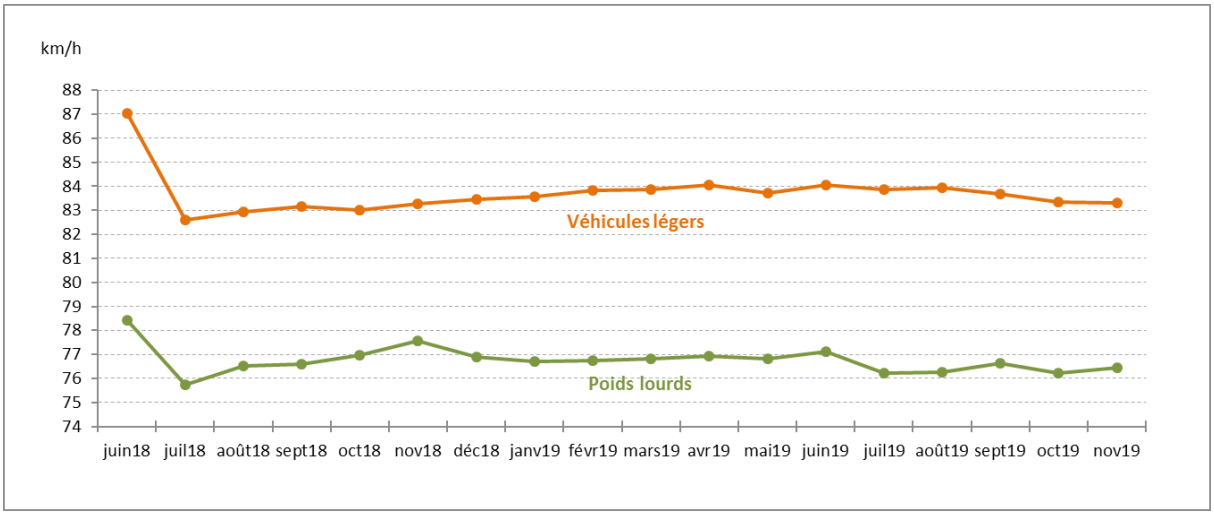

Figure 3: Average monthly speeds collected by the VMA80 observatory for all vehicles from June 2018 to November 2019 (Source: Cerema)

For light vehicles, the decrease in speeds averaged -3.5 km/h between June 2018 and June 2019. This trend remained stable until November 2019.

Further, the average speed difference for free light vehicles[31] was -3.6 km/h between June 2018 and November 2019. The result of this indicator, less sensitive to the effects of traffic, shows a change in the behaviour of light vehicle drivers.

The decrease in speeds corresponds overall to the effect expected if we refer to the international literature[32] (-3 km/h). It is, however, less pronounced than the hypotheses put forward by the CNSR committee of experts[33] (-4 km/h or even -5 km/h, in the context of efficient traffic regulation enforcement) and the results of the experiment conducted in France from 2015 to 2017[34] (-5.1 km/h for light vehicles).

[30]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.

[31]Les véhicules sont dits "libres" lorsque leur vitesse n'est pas contrainte par le véhicule précédent. Le temps inter-véhiculaire est supérieur à 5 secondes (Aron, M., Durrande, F. (2000) Temps Intervéhiculaires sur Route Nationale - Étude en un point).

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

[33]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. Tome 1, 25 p.

[34]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.

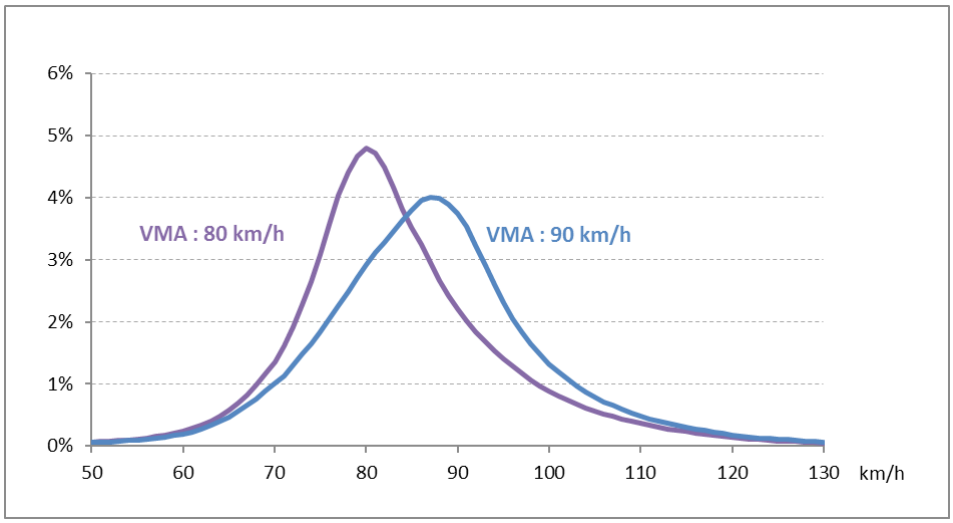

Figure 4: Distribution of light vehicle speeds between the period July 2018-November 2019 (VMA: 80 km/h) compared to June 2018 (VMA: 90 km/h), according to data collected by the VMA80 observatory (Source: Cerema)

Figure 4 shows the changing speed distribution on two-way, two-lane roads. It can be seen that after the measure was implemented speed distribution was completely translated to lower speeds. The drop therefore concerns the entire distribution of light vehicle speeds.

However, in November 2019, 58% of drivers still drive at over 80 km/h, with 35% driving between 80 and 90 km/h and 23 % at over 90 km/h.

This high proportion of light vehicles travelling at speeds higher than the maximum permitted speed may have an affect on the impact of the measure in terms of accidents, as research[35] has shown that drivers travelling faster than the average speed had a greater risk of being involved in an accident and that speeding below 10 km/h plays an important role in road deaths[36].

Insufficiently changing behaviour of some drivers means that the measure cannot reach its full potential. If all the vehicles recorded by the VMA80 observatory were to travel at a speed of 80 km/h or less, the drop in average speed would be three times greater in November 2019, i.e. -9.7 km/h instead of -3.5 km/h.

Similarly, the impact of the reduction in the maximum permitted speed on drivers of light vehicles travelling at over 100 km/h remains limited, although their proportion is stabilising. 9% of drivers of light vehicles still drive at over 100 km/h in November 2019 (the same proportion was observed in April 2019), compared to 13% before the maximum permitted speed was lowered to 80 km/h (June 2018).

[35]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.

[36]Viallon V., Laumon B., Fractions of fatal crashes attributable to speeding: Evolution for the period 2001-2010 in France, Accident Analysis and Prevention, no 52, 2013 pp. 250-256.

4.1.2 - Changes in speeds for heavy goods vehicles

The reduced speed limit measure does not concern heavy goods vehicles (excluding coaches). **However, there appears to be an impact on the average speed of HGV drivers (-1.6 km/h** between June 2018 and June 2019, with a stabilising trend until November 2019). Their average speed remains below 80 km/h (figure 3).

37% of heavy goods vehicle drivers were still driving above 80 km/h in November 2019: 33% drive between 80 and 90 km/h and 4 % drive at over 90 km/h. There were 49% of them before the measure was put in place. In particular, **the number of heavy goods vehicles exceeding 90 km/h has been halved**.

4.1.3 - Changes in speeds for all road users

From June 2018 to June 2019, the decrease in speed is on average -3.4 km/h for all vehicles. This trend continues until November 2019.

4.1.4 - Times between vehicles

In addition, **times between vehicles remain stable**. Times between vehicles of less than 2 seconds and less than 1 second did not change during the period from June 2018 to November 2019. This observation is true for both light vehicles[37] and heavy goods vehicles[38]. This means that, proportionately, **vehicles, and in particular heavy goods vehicles, do not drive closer to the vehicle in front.**

4.2 - Accident rate

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

- on the one hand, the official bases of consolidated accidents causing bodily injury, i.e. prior to 2018 inclusive, indicators in final version labelled by the Public Statistics Authority (*Autorité de la Statistique Publique* - ASP),
- on the other hand, for 2019, the quasi-definitive data published by the ONISR in January 2019 (indicators labelled by the ASP), which are estimated from the BAACs, preBAACs (BAAC files currently being entered), and accidents reported by the prefectures' rapid ascents.

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 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.

[37] 25% for times between vehicles (TBV) of less than 2 seconds, and 7% for TBVs of less than 1 second

[38] 6% for TBVs of less than 2 seconds and 1% for TBVs less than 1 second

4.2.1 - Analysis of the global trend in definitive data

The first analysis focused on aggregate data from 2010 to 2018 (see figure 5). The 2019 data are not yet validated and therefore cannot be considered definitive.

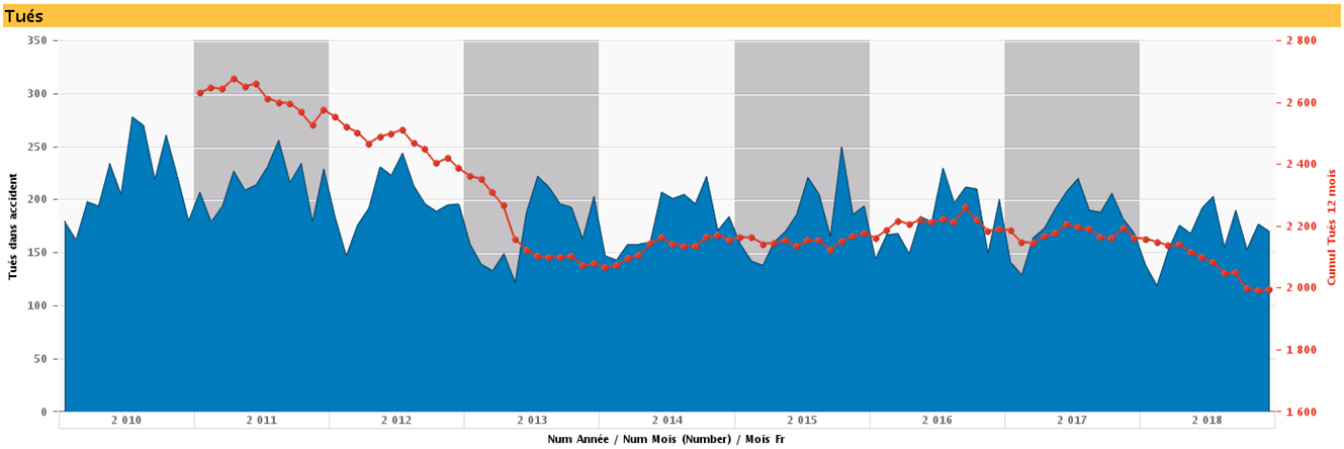

Figure 5: Monthly data on the number of deaths - 2010-2018
Raw values (in blue) and cumulative over 12 months (in red) - (Source of data: BAAC official until 2017 and provisional ONISR data at 24/01/2019 for the year 2018)

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.

From July 2018 onwards, analysis of the raw data shows that the number of road deaths for each month is 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 2,019 deaths on the network (excluding urban areas and motorways), is at a level never reached since 2010. Until then, the best year was 2013 with 2,078 deaths, and in 2017 there were still 2,161 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.

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

Thanks to the BAACs, preBAACs and rapid feedback from prefectures, ONISR has data on deaths for the first half of 2019. These data are not yet definitive. Nevertheless, especially for the “Killed” data, they are a good estimator. The final 2018 data differed by only 6 units from the provisional data, out of a volume of 2,019 deaths.

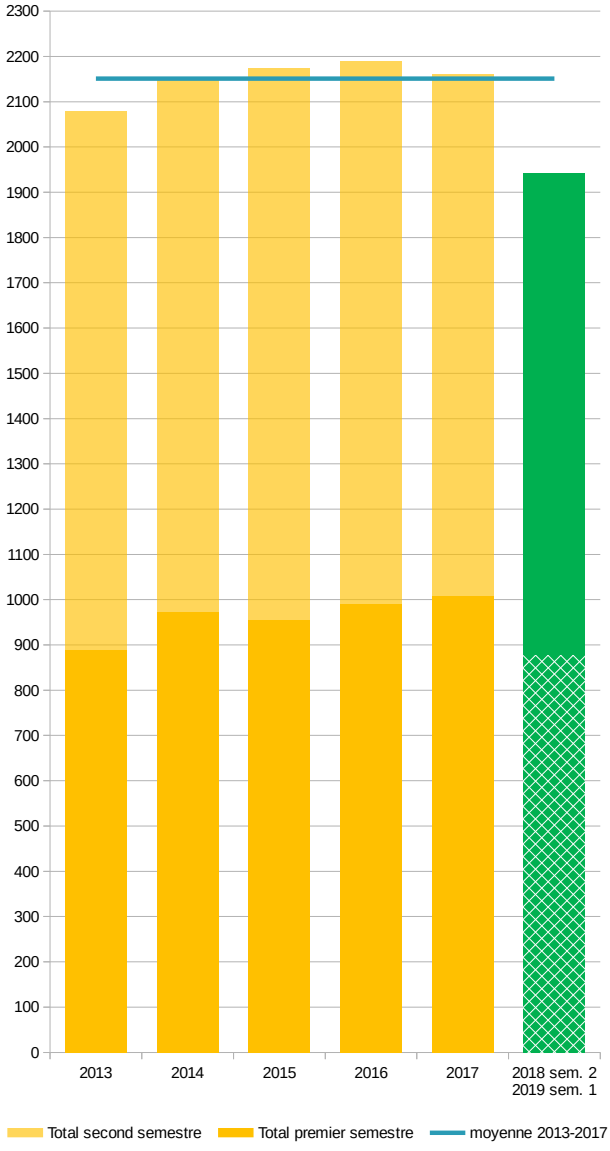

Figure 6: Comparison of the number of deaths on the studied network between the “before” period (2013-2017) and the “after” period available (July 2018-June 2019)

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

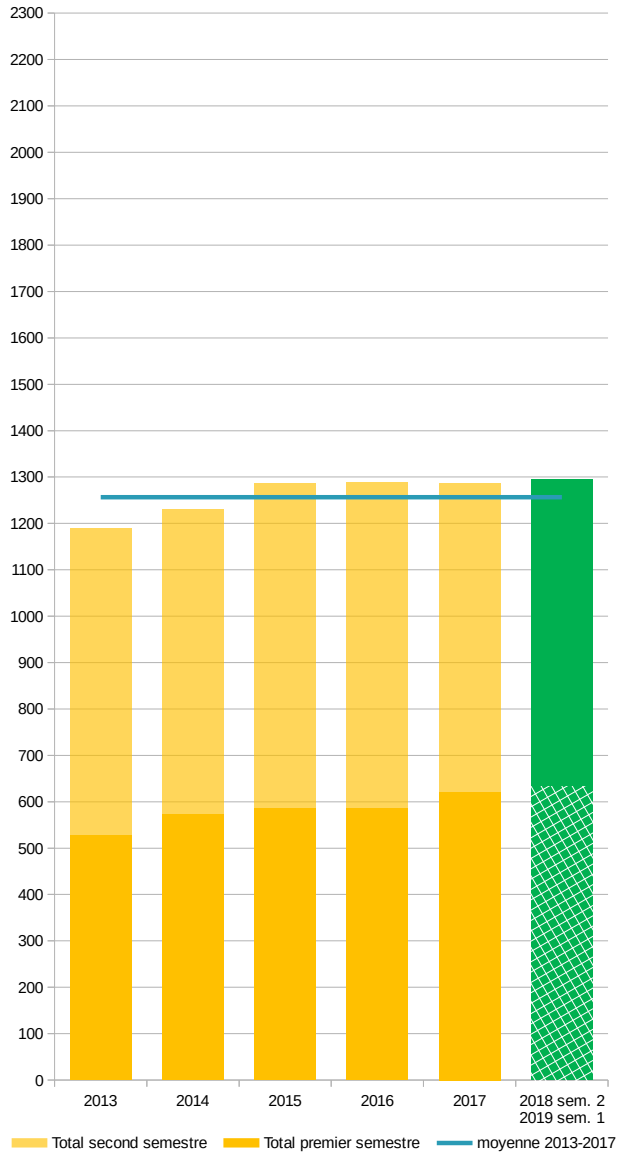

Figure 7:Comparison of the number of deaths on the rest of the network between the “before” period (2013-2017) and the “after” period available (July 2018-June 2019)

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

For the 12 months after the implementation of the measure (July 2018 to June 2019), on the non-motorway network and outside urban areas, the number of people killed is 209 fewer[39] than in the reference period (average for the years 2013-2017).

[39]In the previous Cerema report of July 2019, a decrease of 206 deaths was reported. This is due to the fact that the 2019 data are not yet consolidated. They are likely to vary by a few units more (e.g. death occurring after an accident and not yet recorded; accident not yet recorded) or less (e.g. an accident downgraded following an investigation that had arrived at a conclusion of suicide; an accident on a road that finally turned out not to be open to traffic).

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

However, these trends should be considered with caution and will need to be verified when the data are validated and are available for the entire period “after” the measure was implemented.

	BAAC							BAAC 2018 et données provisoires 2019	
	2013	2014	2015	2016	2017	moyenne 2013-2017		2018 sem. 2 2019 sem. 1	Ecart à la moyenne
Janvier	158	147	158	144	141	150	premier semestre 2019	*131*	*-19*
Février	139	143	142	167	129	144		*141*	*-3*
Mars	133	158	138	168	164	152		*158*	*6*
Avril	149	158	160	149	173	158		*131*	*-27*
Mai	122	160	170	184	192	166		*145*	*-21*
Juin	188	207	186	179	208	194		*173*	*-21*
Total premier semestre	889	973	954	991	1007	963		*879*	*-84*
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		1942	-209

Table 1: 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 provisoires 2019	
	2013	2014	2015	2016	2017	moyenne 2013-2017		2018 sem. 2 2019 sem. 1	Ecart à la moyenne
Janvier	85	88	104	92	114	97	premier semestre 2019	*106*	*9*
Février	82	82	93	96	75	86		*113*	*27*
Mars	67	103	81	87	103	88		*97*	*9*
Avril	87	96	98	94	108	97		*102*	*5*
Mai	102	100	97	110	105	103		*97*	*-6*
Juin	105	104	113	106	116	109		*119*	*10*
Total premier semestre	528	573	586	585	621	579		*634*	*55*
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		1295	38

Table 2: 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)

4.2.3 - Estimate of the effect of the measure, 12 months after its implementation

To estimate the number of lives saves that can be assigned to the measure, this comparison must take into account various factors including regression to the mean, long-term trends and exogenous changes such as traffic trends. Calculating the odds ratio allows these factors to be taken into account.[40].

A control group must first be defined. In the case of lowering the maximum permitted speed from 90 to 80 km/h, the measure applies to the entire network of two-way roads without a central delineator. It therefore concerns a type of network in its entirety and makes it difficult to compare with control groups not directly impacted by the measure.

Moreover, it is not possible to have detailed knowledge of the traffic on the network impacted by the measure. The data does not exist in a complete and reliable manner. Permanent counts exist on some networks. However they are not exhaustive and as they are managed by different authorities (State, departmental councils, etc.), the data collection systems are different, making them impossible to aggregate. In addition, given the size of the network in question (over 400,000 km), it is not possible to carry out occasional counts to reconstruct the data.

It was therefore decided to use the "Mainland France except the studied network" as a control group. This principle has already been used in before-and-after project comparisons to estimate the impact on road safety[41].

With regard to traffic trends, the experiment report on three national road routes from July 2015 to July 2017 did not show any shift of traffic from the network affected by the measure to a competing network[42]. The detailed analysis of the impacts of the measure will seek to verify that this does not occur in the case of general implementation of the measure. It will be carried out on a sample of routes spread over the whole of France because the existing data do not allow an assessment of the trend over the entire network in question. These elements will be presented in the final assessment report.

The comparison between the studied network and the control group can be made using the following formula, which provides an approach to the estimated impact of the measure.

Given that[43] :

K = number of deaths before the measure on the studied network

L = number of deaths after the measure on the studied network

M = number of deaths before the measure on the control group

N = number of deaths after the measure on the control group

w = (N/M) x K

Odds ratio (OR) =[(L/K)/(N/M)] / (1 + 1/K + 1/M+ 1/N)

[40]Hauer, E. (1997) Observational Before-after Studies in Road Safety. Pergamon Press, Elsevier Science Ltd, Oxford, United Kingdom.

[41]Elvik, R., Ulstein, H., Wifstad, K., and al. (2017) An Empirical Bayes before-after evaluation of road safety effects of a new motorway in Norway. Accident Analysis and Prevention, 108, pp. 285-296.

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

[43]Hauer, E. (1997) Observational Before-after Studies in Road Safety. Pergamon Press, Elsevier Science Ltd, Oxford, United Kingdom.

Elvik, R., Ulstein, H., Wifstad, K., and al. (2017) An Empirical Bayes before-after evaluation of road safety effects of a new motorway in Norway. Accident Analysis and Prevention, 108, pp. 285-296.

And the estimated error = (OR) x $\sqrt{(\frac{1}{K}+\frac{1}{w}+\frac{1}{M}+\frac{1}{N})/(1+\frac{1}{w})}$

This calculation is carried out over a complete annual period in order to avoid seasonal phenomena.

For the 12 months after implementation of the measure:

Odds ratio (OR) = 0,87

Estimated error: 0,04

12 months after the implementation of the measure, a decrease of around 13% in road deaths is observed on the network in question, compared to the rest of the French road network (with an estimated error of 4%).

4.2.4 - Trend in accident rate in the second half of the years from 2013 to 2019

In order to be able to estimate whether there is a trend in accident rates over the most recent periods known, even as provisional data, it seemed worthwhile examining the trends, taking into account provisional data for the second half of 2019.

A trend comparison was therefore made between:

- the second half of the years 2013 to 2017, as the reference period before the measure,
- the second half of 2018 and 2019, after the implementation of the measure.

Both on the network in question and on the rest of the network, the situation is very stable between the second halves of 2018 and 2019.

On the studied network, the difference in deaths observed in the second half of 2018 compared to the reference period 2013-2017 seems to persist in the second half of 2019. This is because there was a discrepancy of 125 deaths between the second half of 2018 and the average for the second half of the reference period. For the second half of 2019, **the discrepancy is 127**.

On the rest of the French road network, the 2018 trend is similar in 2019 with a discrepancy of 17 deaths between the second half of 2018 and the reference period, and **a discrepancy of 13 deaths** between the second half of 2019 and the reference period.

This analysis will be completed in the final report in July 2020.

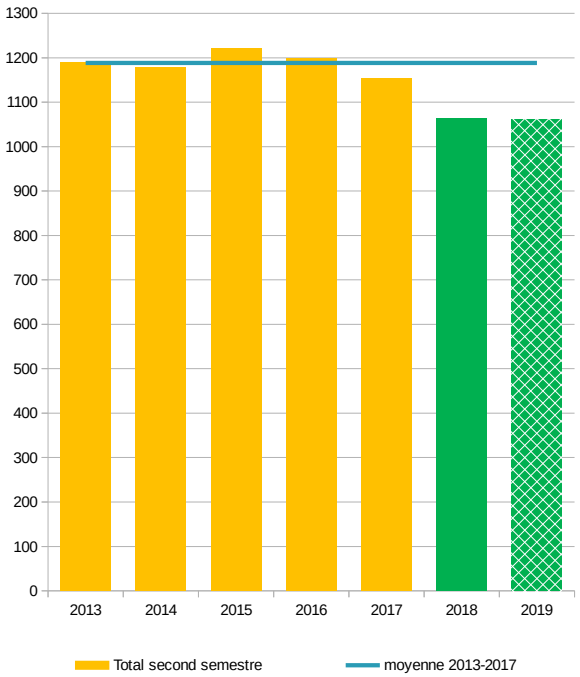

Figure 8: Comparison of the number of deaths on the studied network, spread over the second semester, between the "before" period (2013-2017) and the "after" period available (2018-2019) Sources : 2013 à 2018 (BAAC officiel), 2019 (données ONISR)

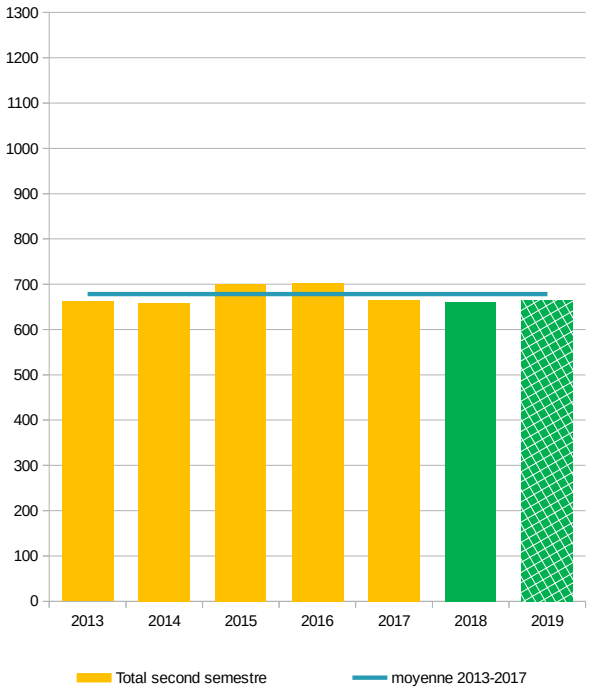

Figure 9: Comparison of the number of deaths on the rest of the network, spread over the second semester, between the "before" period (2013-2017) and the "after" period available (2018-2019) Sources : 2013 à 2018 (BAAC officiel), 2019 (données ONISR)

	BAAC						BAAC 2018 et données provisoires 2019	
	2013	2014	2015	2016	2017	moyenne 2013-2017	2018	2019
Juillet	222	201	221	230	220	219	202	*207*
Août	212	205	205	197	190	202	159	*175*
Septembre	196	196	165	212	188	191	194	*190*
Octobre	193	222	250	210	206	216	155	*166*
Novembre	163	171	186	149	182	170	176	*163*
Décembre	203	184	194	200	168	190	177	*160*
Total second semestre	1189	1179	1221	1198	1154	1188	1063	*1061*

Table 3: Number of deaths on the studied network, spread over the second semester, between the "before" period (2013-2017) and the "after" period available (2018-2019) Sources : 2013 à 2018 (BAAC officiel), 2019 (données ONISR)

	BAAC						BAAC 2018 et données provisoires 2019	
	2013	2014	2015	2016	2017	moyenne 2013-2017	2018	2019
Juillet	122	101	132	126	123	121	126	*120*
Août	110	101	127	104	107	110	87	*116*
Septembre	116	121	92	122	109	112	128	*121*
Octobre	115	125	128	105	113	117	119	*91*
Novembre	89	109	110	109	90	101	92	*94*
Décembre	110	102	111	137	124	117	109	*123*
Total second semestre	662	659	700	703	666	678	661	*665*

Table 4: Number of deaths on the rest of the network, spread over the second semester, between the "before" period (2013-2017) and the "after" period available (2018-2019) Sources : 2013 à 2018 (BAAC officiel), 2019 (données ONISR)

4.3 - Travel time

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 second week of September, or September 10 to 15, 2018.
- one year after setting up the measure, i.e. from June 24 to 30, 2019, excluding the summer period.

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 an increase in 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 5 and 6 below show the distribution of routes according to gains or increases in travel time before and after the measure was implemented on routes in mainland France.

Table 5. Breakdown of routes according to gains in average daily travel time, on weekdays, from June 2018 to June 2019 (All vehicles)

Gain in travel time (second/km)	June/September 2018	*(% of the total)*	*June 2018/ June 2019*	*(% of the total)*
Less than 1 s/km	62	*21 %*	32	*11 %*
Between 1 and 2 s/km	24	*8 %*	9	*3 %*
Between 2 and 3 s/km	7	*2 %*	6	*2 %*
Greater than 3 s/km	8	*3%*	5	*2%*
	101	***34 %***	**56**	***19 %***

Table 6. 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/September 2018	*(% of the total)*	*June 2018/ June 2019*	*(% of the total)*
Less than 1 s/km	110	*37 %*	72	*24 %*
Between 1 and 2 s/km	52	*17 %*	83	***28 %***
Between 2 and 3 s/km	15	*5 %*	40	*14 %*
Greater than 3 s/km	20	*7%*	46	*15%*
	197	***66 %***	**241**	***81%***
Total routes	**298**	***100%***	**297**	***100%***

Between June 2018 and June 2019[44], it turns out that:

- 81% of the routes show an increase in average daily travel time, of which 24% are less than 1 second and 28% between 1 and 2 seconds per kilometre.
- For 19% of the routes, a gain in travel time was measured. This is mainly of less than 1 second.

It should be noted that it is planned to extend the length of the period when readings are taken, both for the period “before” and the period “after” the measure was implemented. This will help to smooth out specific factors such as roadworks, accidents and the weather, or seasonal factors (tourist traffic) likely to significantly impact travel times on the various selected routes.

4.4 - Road users' feelings about the measure

Concerning the lowering of maximum permitted speed from 90 to 80 km/h in France, three waves of surveys were carried out among respondents aged 18 and over:

- from April 24 to May 2, 2018, i.e. “before” implementation of the measure, with 5,310 respondents (wave 1),
- “after” implementation of the measure:
  - from March 7 to 14, 2019, with 3,800 respondents (wave 2),
  - from October 10 to 17, 2019, with 3,884 respondents (wave 3).

The panel of interviewees was chosen to be representative of French people and to be comparable between surveys. It is 47% male, with an average age of 47 for the first two waves and 49 for the third. The main means of transport used by respondents on the network in question in the last 6 months is the car. Nearly a quarter of the sample lives in a rural area (23%) and 18 % in a town with less than 20,000 inhabitants.

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

4.4.1 - Changes in acceptability of the measure

After implementation of the measure, a positive change in its acceptability has been noted.

Between March 2019 and April 2018, this corresponds to a 10-point increase in respondents in favour of the measure (30% of respondents in wave 1 and 40% in wave 2). The third wave of surveys carried out in October 2019 confirms this first trend with 42% of people in favour of the measure.

It concerns in particular those most opposed to the measure, with a 15-point drop in the representation of those “totally opposed” to the measure (40% of respondents in wave 1, 25 % in wave 2, 23 % in wave 3). This positive development is particularly marked among respondents living in rural areas and in towns with fewer than 20,000 inhabitants (from 50% in wave 1 to 30% in wave 2 in these both residential areas).

[44]The July 2019 interim report presented only data collected in September 2018, as data from June 2019 were not yet available. For this report, data for June 2019 are mainly used because they are based on the same seasonal phenomena as June 2018.

4.4.2 - Compliance with the measure

After implementation of the measure, the proportion of respondents reporting that they usually or consistently comply with the measure is similar to the period before implementation (77% in March 2019 versus 76% in April 2018).

Between March 2019 and October 2019, declarations of the speeds at which people drive remain similar. This is in line with the change observed by Cerema's VMA80 observatory.

However, these results underline that part of the population does not intend to comply with the measure, including exceeding the limit by only a small amount. This refers to the literature review in Part 2, which pointed out that driving 10% over the speed limit was considered by users as not very dangerous and not very reprehensible. However, the literature has clearly shown the difference in the impact on accident rates between driving at 80 km/h and driving at 90 km/h, and the effect of exceeding the limit by 10 km/h on French road deaths. **Road 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, roads allow them to go fast and there is little risk because they are in control of their vehicle.

4.4.3 - Estimation of time lost

After implementation of the measure, for all types of respondents, the estimated time lost decreased.

The more respondents are in favour of the measure, the less they think the measure makes them lose time.

Respondents “opposed” to the measure estimate on average that the measure causes them to lose at best less than 2 minutes, and at worst between 2 and 5 minutes on their usual journey. Before the measure was implemented, they estimated that they would lose at best less than 5 minutes, and at worst between 5 and 10 minutes.

However, the estimated lost time is still higher than the reality. The majority of users, reporting a loss of more than 2 minutes of travel time, make daily trips of less than 50 kilometres. Considering the average change estimated through travel time readings of 1 second per kilometre, travel times should be increased by about 50 seconds, which is much less than the more « than 2 minutes » reported.

4.4.4 - Perception of accident factors

Users who are opposed to the measure do not consider speed as a factor causing accidents, unlike other factors such as alcohol.

On the other hand, the more respondents are in favour of the measure, the more they think that it will have an impact on reducing the number of injuries, the number of material accidents, the risk of collision, and the speeds at which people drive.

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Annexe : Data from the VMA80 Cerema observatory

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

	All vehicles	Average daily traffic per site	Light vehicles	HGVs
June-2018	8.300.118	7.700	7.347.665	456.311
July-2018	7.188.789	7.200	6.281.882	422.024
August-2018	6.776.699	6.300	5.981.608	344.045
Sept-2018	7.424.276	7.000	6.495.520	406.871
Oct-2018	7.539.610	7.100	6.585.632	446.936
Nov-2018	7.437.101	6.900	6.422.630	463.163
Dec-2018	7.265.888	6.400	6.462.494	349.409
Jan-2019	6.679.732	6.200	5.995.123	333.646
Feb-2019	6.693.449	6.800	5.931.996	368.231
March-2019	7.729.870	7.000	6.832.505	415.929
April-2019	7.705.088	7.300	6.808.880	421.909
May-2019	7.727.557	7.400	6.886.489	410.370
June-2019	7.399.878	7.600	6.586.598	380.004
July-2019	8.033.209	7.300	6.999.235	490.239
August-2019	7.276.919	6.900	6.423.547	393.541
Sept-2019	8.085.551	7.600	7.113.318	447.371
Oct-2019	8.110.433	7.300	7.170.478	463.157
Nov-2019	7.724.903	7.100	6.878.286	422.937

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