Asociatia Drum Sigur

No. 7 Date: 16.01.2024

To: **United Nations Economic Commission for Europe (UNECE)**

Federal Highway Administration (FHWA)

American Association of State Highway and Transportation Officials (AASHTO)

European Transport Safety Council (ETSC)

World Bank / Global Road Safety Facility (GRSF)

World Road Association (PIARC)

Subject: **Erroneous design and use of road signs giving priority at intersections (GIVE WAY and STOP signs)**

Dear Madam / Dear Sir,

With this letter, we bring to your attention a subject that affects traffic safety in most countries around the world and for which urgent actions are needed to remedy this situation.

Thus, in the following we will refer to the incorrect design and use of road signs for yielding priority at intersections and, more precisely, to how the design prescriptions related to the road signs GIVE WAY and STOP negatively affect road safety.

Introduction

The classification of road accidents and the identification of the causes that led to their occurrence is done almost exclusively by referring to the drivers' maneuvers, completely excluding the traffic conditions resulting from the design and construction of the road.

We insist on this aspect, because the technical solutions adopted within a road project or the quality of the execution of the works represent in many cases the decisive element that leads to the occurrence of road accidents.

Despite the fact that during the implementation of a road project, several parties responsible for ensuring the quality and safe traffic conditions are involved, in reality countless errors can be identified that manage to go unnoticed within this complex process of designing and construction of a road.

These errors vary from Designer to Designer, from Builder to Builder or from Beneficiary to Beneficiary, so that one of the main causes that generate these errors or these incorrect solutions results from the level of training and experience of the personnel involved.

Another cause of these mistakes is generated by the existing errors within the applicable norms and standards or by the way the information within them is presented and transmitted to the engineers, so that they, through the adopted technical solutions, to ensure the highest level of road quality and safety.

Regarding the occurrence of road accidents influenced by road signs, first of all, it must be taken into account that the signs and road markings comply with the design principles, provide the correct

information to the traffic participants and do not create situations of confusion for drivers who could favor the occurrence of road accidents.

Thus, the correct use of the type of road sign on a road, when priority must be given, is of major importance for traffic safety, and an error in its design can lead to road accidents.

T or Cross type intersections

In many T- or Cross-type intersection, there are road signs for yielding priority, and one of the big errors encountered is their incorrect design and use, and more specifically is the use of the road sign GIVE WAY instead of the STOP sign and **vice versa** .

The types of road signs found in the countries around the Globe are established, mainly, by the Vienna Convention on Road Signs and Signals, the Manual on Uniform Traffic Control Devices and derivative versions of the two.

With regard to road signs for yielding priority in intersections, GIVE WAY and STOP, the way to choose which type of sign is the right one to use, involves a series of quite complex and resource-consuming analyzes and measurements, quite significant compared to other signs.

Thus, with regard to these design rules and use of the two signs of giving priority, according to the two standardizations mentioned above, we mainly identified the following situations:

1. The Vienna Convention on Road Signs and Signals provides more general information on how to design and use road signs, so that the countries that have adopted this convention have developed, respecting the information in the convention, their own rules and prescriptions that are the basis of the design and use of the two signs. These rules differ from country to country, so that although these countries have adopted the same Convention, the rules for applying the two signs may be different for each country.

   Regarding the design error, we mention that in the countries where the Vienna Convention is adopted, there is **an excessive use of the GIVE WAY Sign,** with the violation of design principles and rules. Thus, despite the design rules, that in many situations clearly establish that the STOP sign must be used, we find instead the GIVE WAY sign used. The error is so frequent that it can be identified in extremely many intersections and even in situations with very low visibility.

   See the example below:

Such an error has implications especially on traffic safety, considering that it transmits erroneous information to drivers, regarding the traffic conditions and the maneuvers they can perform to cross the intersection safely.

2. The Manual on Uniform Traffic Control Devices provides quite a lot of information regarding the rules for the design and use of the two signs, and together with the information published by AASHTO regarding the visibility distance, basically covers all the range of necessary information.

   However, in the countries where the Manual on Uniform Traffic Control Devices or its derivative variants have been adopted, there is **an excessive use of the STOP Sign,** with the violation of design principles and rules.

   Even if such an error does not affect traffic safety, as in the above situation, in this case there is an efficiency problem, with a negative impact on fuel consumption, travel times, pollution and level of service of the intersection.

Thus, regardless of the country on the Globe in which we are, in the T- and Cross-type intersections, we can identify many errors in the design and use of the road signs for yielding priority in the intersections, by using the GIVE WAY Sign when it is required to use the STOP Sign sign and vice versa.

Roundabouts

At roundabouts the situation is different than at T or Cross type intersections, because in the guidelines and signaling standards of all the countries on the Globe, regardless of the applicable standardization, there are layout models by which the use of the GIVE WAY Sign at the entrance in the roundabout is predetermined, imposed, regardless of visibility.

The example below shows an access in a roundabout with low visibility. In the localities, the error is more common, considering that the visibility conditions are much lower than outside the localities.

We underline the fact that choosing the type of sign for yielding priority in intersections must take into account the visibility conditions for all types of intersections, including roundabouts, considering that the design and use rules of the two signs depend entirely on the conditions of visibility.

Thus, in all the countries on the Globe, there is an error in the design rules by which, erroneously, the GIVE WAY Sign is imposed at the entrance of the roundabouts, regardless of the visibility distance.

This error has implications for traffic safety, considering that it transmits erroneous information to drivers regarding the traffic conditions and the maneuvers they can perform to cross the intersection safely.

The impossibility of using the GIVE WAY Sign.

With regard to the design and use of the road sign "GIVE WAY" depending on the visibility distance, this situation depends on ensuring these visibility conditions **permanently**.

Even if visibility is ensured at the time of design and construction of the intersection, during its exploitation, situations may arise in which the visibility in the intersection is affected by factors independent of the traffic/design engineer.

Thus, the following situations may occur that affect visibility at the intersection:

- certain vehicles park in the area of the visibility triangle or are forced to stop as a result of a breakdown;
- vegetation can grow in the area of the visibility triangle, large enough to affect visibility;
- fences, buildings, parking lots or billboards may appear in the area of the visibility triangle.

Even if some of these situations are prohibited, this does not mean that these cases do not happen.

In cases where visibility at the intersection is affected, and the conditions underlying the use of the GIVE WAY Sign are no longer met, normally the GIVE WAY Sign should be replaced by the STOP Sign for the period that visibility is affected, which is practically impossible to achieve .

Thus, we can say that it is impossible to use the GIVE WAY Sign when applying the principles regarding the visibility distance, considering that these visibility conditions cannot be fulfilled **permanently**.

Minimum visibility conditions

In addition to the visibility conditions for the design and use of the GIVE WAY Sign, there are minimum visibility conditions for the STOP Sign as well.

Situations in which these minimum visibility conditions for the STOP Sign are not respected are encountered, in particular:

- in very old cities with a very congested architecture and narrow streets or in very congested cities where vehicles are parked even on the corners of intersections.
- outside the localities in intersections where the main road is in a rather tight curve with reduced visibility or in areas where vegetation has entered in the road area.

In these intersections, in order to be able to observe the vehicles traveling on the main road, the driver is forced to enter slowly with the front part of the vehicle on the road side of the main road, being practically exposed to a possible accident, regardless of the safe maneuvers he would do.

Thus, although the minimum conditions for crossing the intersection safely are not met for these intersections, traffic directed by road signs is still allowed, and the number of these intersections is impressively high at the global level.

Below an extreme example from Naples (Italy, Europe):

In such situations, it is clear that crossing the intersection safely no longer depends on the driver who has to give way, considering that the design solution of the intersection and the elements that block visibility do not allow a safe crossing. However, the road legislation, in case of an accident, establishes that the entire responsibility belongs to the driver.

We highlight, that even at the roundabouts there are situations where the crossing of the intersection in safe conditions cannot be achieved by the driver who has to give way.

The difficulty of designing and using the road signs for yielding priority

Regarding the design and use of the GIVE WAY and STOP signs, the traffic/design engineer has an important role, and his experience and ability to understand these design principles are essential to the result.

Thus, in practice, for the same situation, two traffic/design engineers can use different signs for yielding priority.

In the view of the Asociatia Drum Sigur (Safe Road Association), this is totally wrong, because the way you drive on a road should not depend on the way an engineer understands the design principles. We believe that design solutions must be supported exclusively by studies, analyzes or measurements.

Another aspect that affects the design and use of these signs is the fact that, compared to other road signs, the calculations and measurements that must be performed to determine which type of sign for give priority can be used are complex and consume significant resources.

Thus, to the extent that the choice of the type of road signs for yielding is at the discretion of the traffic/design engineer and at the same time there is no responsibility for him, the need for calculations and measurements becomes a decision at his discretion.

The application of the provisions of some standards implies quite significant intellectual work from the engineer, and the more detailed the information, the more his ability to design correctly decreases.

Although it is understandable for a person to make a mistake, when we talk about traffic safety, the error is not accepted.

That is precisely why we consider that for the GIVE WAY and STOP signs, simpler methods of design and use of the two signs must be identified and developed, so that they are respected by traffic/design engineers regardless of their experience or available resources.

Different meanings for drivers

Totally different from what happens with the other road signs, in the case of the GIVE WAY and STOP signs, the meaning resulting from the design principles and rules differs from the meaning addressed to drivers.

More precisely, for the design and use of the GIVE WAY sign, a series of parameters are taken into account, such as: the design speed on the main road, the speed with which the vehicle approaches on the secondary road, the size of the intersection (number of lanes), the crossing time of the intersection, visibility distance, type of turn, parameters that drivers do not know.

Based on these parameters, the traffic/design engineer analyzes whether a vehicle coming from the secondary road can cross the intersection without having to stop for a specific situation.

Even if these calculations are made, this does not mean that in reality the vehicle coming on the secondary road can truly safely cross the intersection, and this is because some of the above parameters are estimated and are not real for all cases, as follows:

- the speed of the vehicle traveling on the main road may be higher than the design speed of the main road, as calculated,
- the speed of the vehicle coming from the secondary road varies from case to case and may be higher or lower than the calculated one.

Thus, despite the fact that these extremely laborious calculations and measurements are made by the traffic/design engineer and it is analyzed whether a vehicle can cross the intersection according to certain parameters, they have no importance for the driver, because he still has to ensures and at the same time bears full responsibility for the way he crosses the intersection.

Also, for the design and use of the STOP sign, all categories of vehicles traveling on that road are taken into account, but there are many situations in which certain categories of vehicles meet the conditions for the use of the GIVE WAY sign, so the obligation to stop for these drivers is an excessive measure.

The meaning must be changed

From the point of view of road legislation, the two signs have basically the same meaning, that of giving priority to vehicles on the main road. Even if they indicate different ways of crossing the intersection, in essence, the two signs have the same meaning, to give up priority, and the driver is entirely responsible.

What's more, the meaning of the STOP sign can be found entirely in the meaning of the GIVE WAY sign.

In addition to the meaning given by the design principles and the one given by the road legislation addressed to drivers, it is important to analyze their meaning in practice and which the drivers apply.

Although there are countless studies and measurements related to how drivers react at the obligation to stop when they meet the STOP sign, it can be observed with naked eye that most drivers who cross such an intersection usually do not stop at the STOP sign, unless they have to.

The Association appreciates that this happens especially because:

- the meaning of the GIVE WAY sign also fully includes the meaning of the STOP sign;
- the driver is entirely responsible for crossing the intersection, as he is taking the decision;
- drivers perceive that the two signs are placed erroneously in many cases or that the use of an sign depended on the engineer's random decision;
- drivers do not consider that stopping the vehicle ensures a safer crossing of the intersection in most situations, rather it is a measure to be sanctioned;
- the experience of the driver or the frequency of crossings of an intersection by the same driver influences greatly the way the vehicle crosses the intersection. On average, the percentage of drivers who cross the intersection for the first time is small compared to those who cross at least the second time.

In this context, we consider that one of the solutions would be to analyze whether the meaning of the two signs should be changed.

One approach would be to remove the obligation to stop at the STOP sign for all vehicles.

Another approach would be for the two signs to have the meaning exactly as they are perceived by drivers:

- follows an intersection with low visibility in the case of the STOP sign
- follows an intersection with increased visibility in the case of the GIVE WAY sign.

Also, the visibility distance could be calculated by much simpler methods and for the most favorable cases, not for the worst.

Legal and financial responsibility

As we mentioned at the beginning of the letter, the technical solutions adopted within a road project or the quality of the works are in many cases the decisive element that leads to the occurrence of road accidents.

Despite the fact that the road legislation establishes that in the event of an accident due to failure to give priority, the entire responsibility is beared by the driver, for certain cases it can be demonstrated that the technical solutions, the design errors of the engineer or the errors in the technical rules are the determining factors for the occurrence of certain road accidents.

Therefore, it is important to remember that each error can lead to legal and financial liability for all parties involved (Designer, Builder, Beneficiary), both in the case of a road accident, and in the event that the error must be corrected.

However, the goal should not be to look for methods by which this responsibility can be canceled as a result of errors, but rather to find viable solutions to eliminate errors and create roads that are easy to understand and travel by all drivers.

Conclusions

The subject of yielding priority in intersections and regulatory signs is extremely complex and for sure many researches and debates are needed to reach a clear and final conclusion.

However, in order to remain with a more concise picture of what was presented above, we will further summarize the main ideas:

- the technical solutions adopted within a road project or the quality of the execution of the works represent in many cases the decisive element that leads to the occurrence of road accidents and thus it is necessary to pay more attention to the design;
- for T and Cross type intersections:
  - in the countries where the Vienna Convention was adopted, **there is an excessive use of the GIVE WAY sign,** with the violation of design principles and rules and having negative effects on traffic safety;
  - in the countries where the Manual on Uniform Traffic Control Devices or its derivative variants have been adopted, **there is an excessive use of the STOP sign,** with the violation of design principles and rules, depending on the traffic engineer's experience and ability to perceive the design prescriptions regarding the two signs, having a negative impact on fuel consumption, travel times, pollution and level of service of the intersection.
- for roundabouts: in all countries, in the guidelines and standards for signaling and markings, the design models are presented by which the use of the GIVE WAY sign at the entrance of the roundabout is pre-set, regardless of visibility, which is totally wrong;
- it is impossible to use the GIVE WAY sign when the principles regarding the visibility distance are applied, considering that these visibility conditions cannot be fulfilled **permanently**.
- Although the minimum conditions for safely crossing the intersection are not met, traffic directed by road signs is still allowed in countless intersections. Such cases are found at intersections in congested areas and even at roundabouts;
- for the GIVE WAY and STOP signs, simpler methods of designing and using the two signs must be identified and developed, so that they are respected by traffic/design engineers regardless of their experience or available resources;
- the meaning of the two signs resulting from the design principles and rules differs from the meaning addressed to drivers, something that does not happen with other signs. Thus, despite the fact that these extremely laborious calculations and measurements are made by the traffic/design engineer and it is analyzed whether a vehicle can cross the intersection according to certain parameters, they have no importance for the driver, because he still has to ensure for the crossing and at the same time bears full responsibility for the way he crosses the intersection;
- the principles underlying the use of the STOP sign are too general, thus resulting in countless situations in which, at least for cars, which are the predominant vehicles on the roads, it is not necessary to stop;
- From the point of view of road legislation, the two signs have basically the same meaning, that of giving priority to vehicles on the main road. Even if they indicate different ways of crossing the intersection, in essence, the two signs have the same meaning, to give up priority, and the driver is entirely responsible;

  What's more, the meaning of the STOP sign can be found entirely in the meaning of the GIVE WAY sign.
- most drivers who cross an intersection do not stop at the STOP sign, unless they have to. Those who stop have in mind the avoidance of fines and not the fact that stopping the vehicle will help them with the maneuvers they are about to perform;

- the experience of the driver or the frequency of crossings of an intersection by the same driver greatly influences the way he crosses the intersection;
- an analysis is necessary regarding the modification of the meaning of the two signs, as follows:
  - One approach would be to remove the obligation to stop at the STOP sign for all vehicles.
  - Another approach would be for the two signs to have the meaning exactly as they are perceived by drivers:
    - follows an intersection with low visibility in the case of the STOP sign
    - follows an intersection with increased visibility in the case of the GIVE WAY sign.
- Despite the fact that the road legislation establishes that in the event of an accident due to failure to give priority, the entire responsibility is beared by the driver, for certain cases it can be demonstrated that the technical solutions, the design errors of the engineer or the errors in the technical rules are the determining factors for the occurrence of these accidents road;
- road signs must be uniform in all countries of the world and must not differ from country to country.

There are many analyzes to be performed and many questions to be answered.

However, any change related to road signs can only be made with the involvement of the responsible international bodies.

Thus, through this letter, the members of the Asociatia Drum Sigur (Road Sigur Association), invite you to act together and collaborate to clarify the ideas and analysis presented above regarding the GIVE WAY and STOP signs and the establishment of measures that would clarify the inconsistencies regarding the giving of priority in intersection.

We would like to clarify the fact that the Asociatia Drum Sigur (Safe Road Association) is an association, a non-governmental organization from Romania (Bucharest), interested in solving traffic safety problems, having in its composition members and engineers capable of participating in collaborations aimed at solving traffic safety problems.

Your answer will be highly appreciated.

Regards,

Asociatia Drum Sigur (Safe Road Association)
President
Florin Claudiu Nicolae