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**TINTING OF CAR GLASS: ANALYSIS OF THE CURRENT SITUATION  
IN UKRAINE AND THE EXPERIENCE OF OTHER COUNTRIES**  
**ТОНУВАННЯ АВТОМОБІЛЬНОГО СКЛА: АНАЛІЗ СУЧАСНОГО СТАНУ В  
УКРАЇНІ ТА ДОСВІД ІНШИХ КРАЇН**

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**Abstract.** *The paper considers the issues of tinting of car glass, the allowed degree of tinting of glass, determines the percentage of drivers - violators of regulations and the causes of this phenomenon. Proposals to reduce the number of violations by drivers of private vehicles are also being considered.*

**Key words:** *tinting of car glass, road users, traffic safety, statistics of road accidents.*

### **Introduction**

Nowadays, more and more drivers are tinting the glass of their vehicle. This makes the interior of the car protected from the outside world, somewhat blocks ultraviolet and infrared radiation and makes the vehicle itself visually appealing. But not all drivers follow the rules and regulations of tinting, and this often leads to unpleasant situations: fines, problems with the police or even traffic accidents.

### **Objective of the research**

The experience of leading countries and the study of the state of compliance of drivers of vehicles with individual use of the requirements for standards for tinting car glass is of interest to determine the factor influencing the state of accidents on the roads of Ukraine.

### **Statement of the main material of the research**

Car glass tinting is a change in the color and reflective properties of car windows. Typically, tinting is used to obtain a sunscreen effect and to save fuel for the operation of the air conditioner, as it consumes much less energy to maintain comfortable conditions in the cabin [1].

Tinting glass also gives a presentable appearance of the car, emphasizes its



beauty and individuality, makes it more attractive. Tinting also protects the driver and passengers from too bright sun, hides from prying eyes the interior of the car, prevents burnout of interior parts and reduces the heating of the cabin on a hot day [2].

Let's try to understand what degree of darkening of car glass is considered admissible according to the Ukrainian norms.

To begin with, let's turn to the Rules of the Road (SDA) of Ukraine [3]. The note to sub-clause 31.4.7 reads as follows:

“Transparent colored films can be attached to the top of the windshield of cars and buses. It is allowed to use tinted glass (except mirror), the light transmission of which meets the requirements of GOST 5727-88 [4]. It is allowed to use curtains on the side windows of buses.

According to this GOST, the light transmission of glass, which provides visibility for the driver, must be at least:

- 75% - for windshield (this is the glass used for glazing the front section of vehicles);
- 70% - for non-windscreen glass included in the driver's field of vision, which determines the front visibility;
- Mirror film must not be applied to the rear window;
- on a windshield it is possible to glue a sun protection strip (to 14 cm);
- light transmission of other glass, which is not wind, is not normalized (Fig. 1) [1; 4; 6].



**Fig. 1 - Permitted degree of light transmission**

Source: [1]

There are several types of tinting films:

- metallized (with a thin coating of aluminum - does not burn out for a long time, protects from the sun, but negatively affects the work of mobile communications in the cabin);



- color (creates the effect of staining the glass, it is important that the driver does not distort the colors of the cabin);
- with the transition of color (glass seems multicolored, helps from glare, retains visibility);
- removable film (you can remove and glue back yourself);
- athermal (always passes compliance checks, protects from the sun);
- carbon [7; 8].

What dangers does the driver of the car expose himself to in the case of unregulated tinting of the glass? Many drivers, when ordering a tinting service, make serious mistakes, because if you do not follow GOST, the following tinting:

1. Will impair visibility in the dark and in bad weather;
2. Complicate the inspection for drivers of neighboring cars in corners and pedestrian crossings;
3. Coatings with a mirror effect, especially at night, can blind drivers [5].

With "double" toning, internal reflections are not excluded, when, for example, in the left side window you can see the reflection of the car ahead of you on the right.

There are also purely technical problems associated with tinting. For example, metallized film degrades mobile and GPS signals. Particular attention should also be paid to light and rain sensors, which are installed at the top of the windshield. In order for them to work correctly, they cannot be tinted [9].

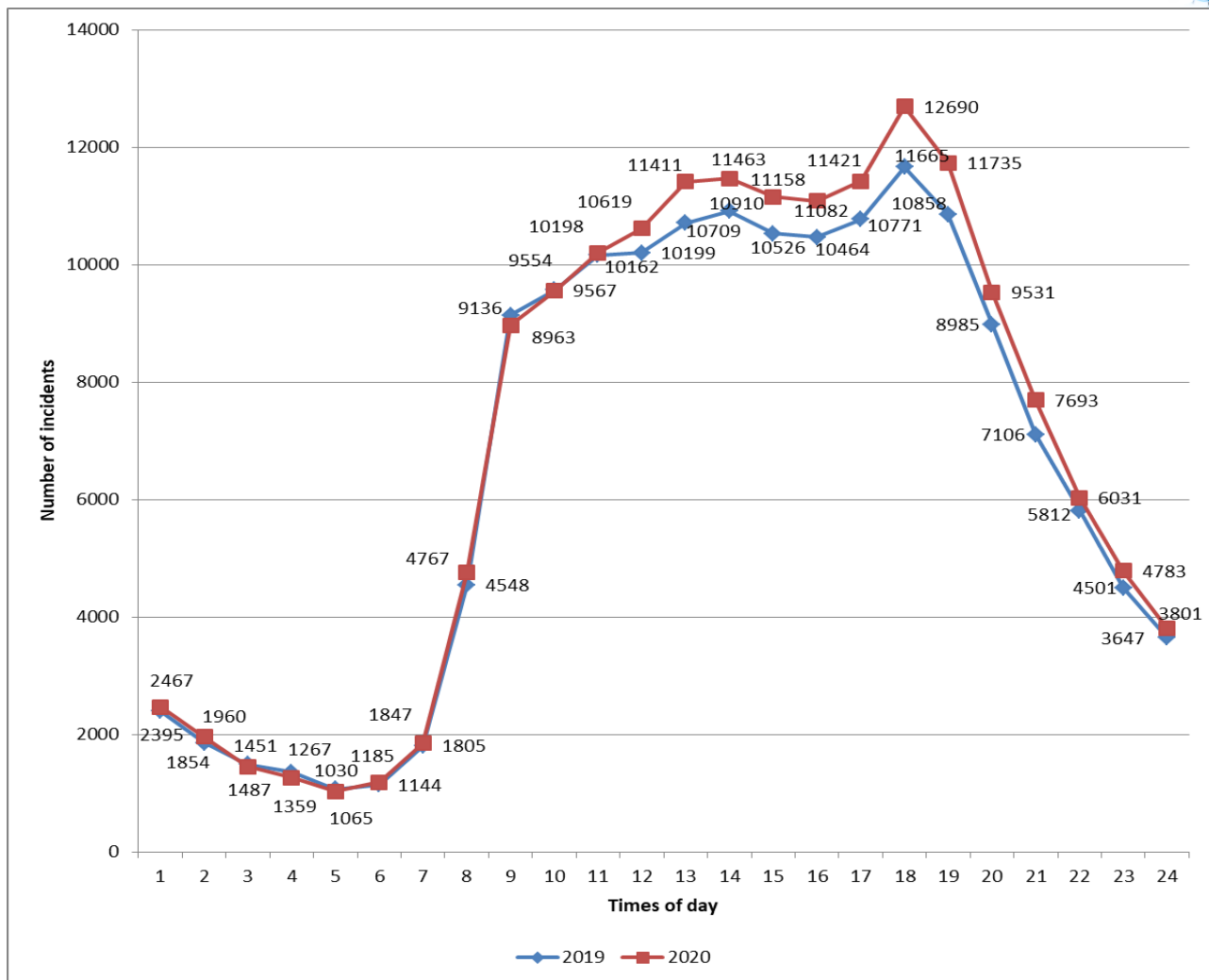
### **Results and discussion**

The authors conducted a study on the number of drivers of vehicles that operate their vehicles with tinted glass that exceed regulatory parameters. The observations took place in Zaporizhia on Soborny Avenue on weekdays from 10 a.m. to 11 a.m. in the direction of the central part of the city. According to the results of observations, 26.45% of cars are operated in violation of paragraph 31.4.7 of the Traffic Code of Ukraine.

Moreover, deep tinting of the windshield or windshield of cars dangerously affects the visibility of the driver of potential obstacles to the movement of the vehicle, such as pedestrians, cyclists, small vehicles, especially at dusk, cloudy weather during the autumn - winter period.

Study of statistics of road accidents on the roads of Ukraine by time of day for 2019-2020 [10] shows an increase in the number of accidents compared to the previous period, especially at dusk, when the visibility of vehicles, pedestrians and other road users is deteriorating (Fig. 2). Analyzing the statistics on the time of commission, we conclude that most accidents occur in the evening, during the evening twilight, which accounts for the second "peak" of traffic intensity.

Undisciplined drivers are not deterred by the growing level of danger for road users while driving a tinted car at dusk or gloomy weather, or the threat of fines. They are not constrained by the fact that according to the Code of Ukraine on Administrative Offenses, a fine of UAH 340 is provided for violation of the norms of tinting of automobile glass (Article 121, part 1). Repeated during the year the commission of any of the violations provided for in Part 1-3 of this article is punishable by deprivation of the right to drive a vehicle for a period of 3 to 6 months or administrative arrest for a period of 5 to 10 days (Article 121, Part 4) [11].



**Fig. 2 - Comparison of the number of incidents by time of day**

Source: [10]

Checking the level of tinting of car glass is performed using a light transmittance meter (taumera). However, according to sub-item “b” of item 2.4 of the Traffic Regulations of Ukraine, police officers do not have the right to inspect the technical condition of vehicles that are not subject to mandatory technical control in accordance with the law (changes in the Traffic Regulations of January 23, 2019). Resolution № 46 of the Cabinet of Ministers of Ukraine amended the Rules of the Road, which do not allow traffic police officers to check the technical condition of vehicles for individual use [12].

Interestingly, analyzing the experience of other countries, we observe the mandatory implementation of current regulations regarding the tinting of car glass. For example, in the United States, the requirements for tinting the glass of private vehicles vary depending on the specific state (Fig. 3) [13]. The general requirements are as follows: at least 70% light transmission (30% tint) for windshield and front side windows, the rest of the glass can be tinted without restriction in the presence of two side mirrors [14].

In the UK, 25% tinting is allowed for the windscreen (75% light transmission) and 30% tinting for the front side (70% light transmission). The rear windows can be tinted without restrictions [15]. Similar restrictions apply to drivers in Poland and

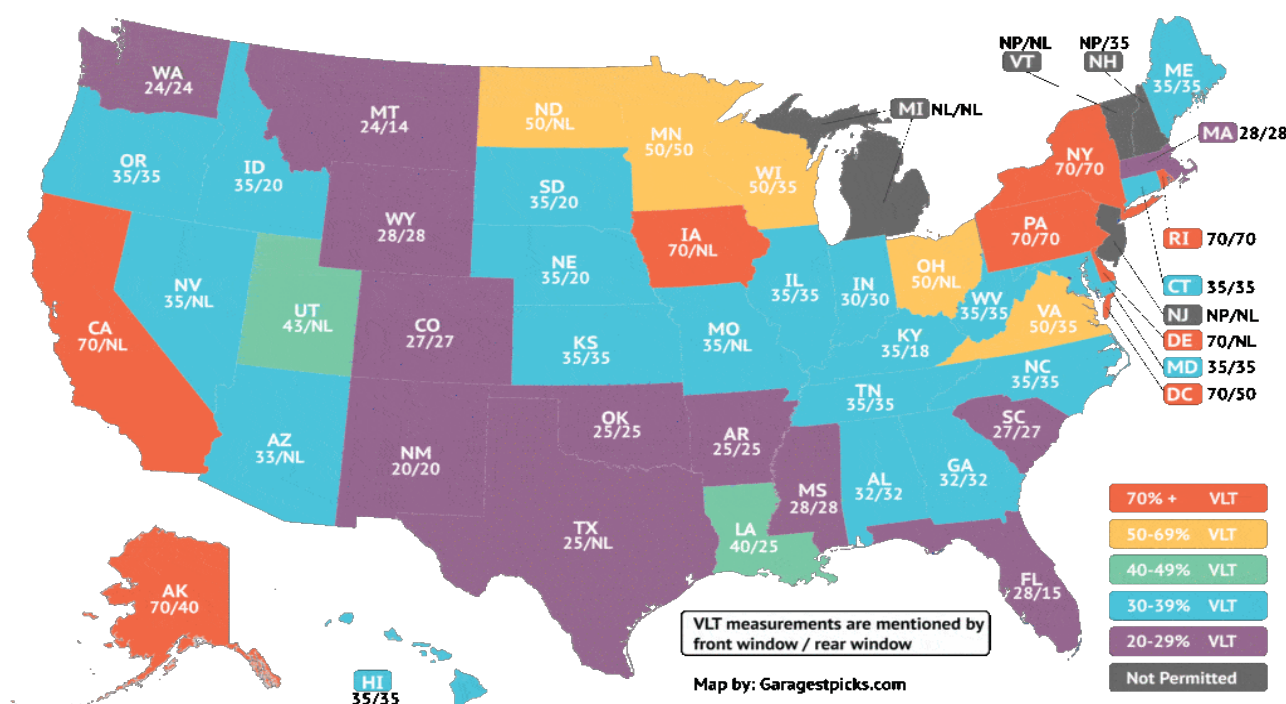


Sweden.

In Australia, there are other permissible toning standards for cars: windshield 70% light transmission, side and rear - at least 35% [16].

For example, in France, tinting of the windshield is prohibited, except for a 10 cm strip at the top for sun protection. The front side windows, in accordance with the requirements of UNECE Regulation №43 [17], must have a degree of light transmission of at least 70%. Tinted rear windows are allowed, provided that the car is equipped with 2 side mirrors [18].

Interesting experience of glass tinting in Central Asian countries, such as Uzbekistan, Kyrgyzstan and Tajikistan. There, drivers pay annually for a permit to tint the glass of their car in accordance with regulations. Moreover, the cost of the permit for tinting is a significant amount [19; 20; 21]. And fines for excessive tinting of car warehouses are the same as in other countries.



**Fig. 3 - Car glass tinting standards in the United States**

Source: [13]

In Ukraine, unfortunately, the police currently do not have the opportunity to check the level of light transmission of tinted car glass, which is not used for commercial purposes.

In such limited working conditions of traffic police officers, it does not make sense to point out the lack of a sufficient number of facilities for monitoring the technical condition of vehicles, stationary or mobile traffic police posts equipped with devices for monitoring the technical condition of cars. Because commercial vehicles usually have tinted glass that meets current standards. As a rule, only undisciplined drivers of private vehicles violate traffic rules.

**Conclusions**

As noted above, the inability of traffic police to check the technical condition of private vehicles leads to a large number of offending drivers who ignore the



requirements of paragraph 31.4.7 of the Traffic Code of Ukraine, which significantly affects the state of accidents on roads and streets of settlements. It is established that 25% of drivers of private cars violate the requirements of the Traffic Rules. Such actions of undisciplined drivers have a negative impact on the state of accidents on the roads of Ukraine, especially at dusk and cloudy weather, autumn-winter period.

It is expected that the introduction in September 2022 of mandatory technical control of personal transport, which has been discussed for many years, will control the technical condition of vehicles, and especially - tinting of car windows. However, there is a possibility for undisciplined drivers to use actions when removing the tinting film before passing the technical inspection, and after passing the inspection procedure to tint the oversized glass again and drive for the next 2 years before the next inspection. To counteract such actions of drivers, it is proposed to introduce the practice of mass inspection of technical condition of vehicles on the roads, which, as mentioned above, is currently absent in Ukraine, and personal cars are not allowed to check according to changes in traffic rules!

In order to increase the level of road safety and reduce the state of accidents on the roads of Ukraine, without waiting for the introduction of mandatory technical control of personal transport, it is proposed:

1. Amend sub-item “b” of item 2.4 regarding the right of police officers to inspect the technical condition of all vehicles, not only those that are subject to mandatory technical control in accordance with the law (changes in the traffic regulations of January 23, 2019). To rectify a legal case where police officers do not officially have the right to check the technical condition of private transport.

2. To propose to the leadership of the National Police of Ukraine to increase the number of personnel of the Traffic Police for more intensive control of drivers violating the requirements of the Traffic Code of Ukraine on the roads of the country. Introduce the practice of mass inspection of technical condition of vehicles, especially tinting of windshields and front side windows that affect road safety, especially at dusk or in cloudy weather, autumn-winter period.

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**Анотація.** В роботі розглядаються питання тонування автомобільного скла, дозволена ступінь тонування скла, визначається відсоток водіїв – порушників вимог нормативів та причини такого явища. Також розглядаються пропозиції щодо зниження кількості порушень з боку водіїв приватних транспортних засобів.

**Ключові слова:** тонування автомобільного скла, учасники дорожнього руху, безпека дорожнього руху, статистика дорожньо-транспортних пригод.

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