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Are Drivers Ready for the Winter? A Driver Behavior Analysis

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Abstract: ***It can be difficult to adjust rapidly to winter circumstances, especially in nations with short winters and several seasons throughout the year. In the winter, especially in urban areas, traffic becomes one of the most significant challenges in everyday life, and even fundamental services such as schooling might be halted due to the inclement weather. The behavior of drivers in inclement weather is investigated in this study.The goal is to establish if drivers are prepared for winter circumstances, to review survey data, to disclose how much the driver's conduct contributes to the discomforts encountered, and to make recommendations for what measures should be done and what course to pursue. According to the findings of the survey, the majority of drivers who have been engaged in traffic accidents are under the age of 40. Furthermore, winter tires alone are insufficient.***

Keywords: Winter tire, Adverse weather, Transportation, Driver behavior

1. Introduction

The transport sector affects the environment, and the environment also affects transport in some cases. According to Akin et al. (2011) weather conditions may have a big impact on travel demand, driving habits, and traffic flow patterns.It is sometimes difficult to adapt quickly to winter conditions, especially in countries that do not experience long winter time and have different seasons in a year. In winter conditions, especially in metropolitans, traffic becomes one of the biggest problems in daily life, and just because of the adverse weather condition, even the basic services such as education can be suspended. Problems are experienced not only in the city but also in highways and the roads connect the cities, and the transportation network of the region.
In this study, the behavior of the drivers in adverse weather conditions are analyzed. The aim is to determine whether the drivers are ready for the winter conditions, to evaluate the results obtained from the surveys, to reveal how much the driver's behavior contributes to the discomforts experienced, and to develop suggestions on what precautions should be taken and what is the appropriate path to follow.

In the following part of the study, the background is given, and then the study area is described. Afterward, the analysis of the surveys conducted in the selected cities is given and the results are presented. Then, the results are evaluated and the study is concluded in the final part.

2. Related Studies

Inclement weather conditions also increase the risk of traffic accidents for instance, the slippery roads in rainy weather, the slipping of vehicles on snowy roads and the possibility of getting off the road.Caia et al. (2013) investigated which condition significantly impacts on traffic safety under rainy weather conditionsin a negative way and proposed a quantitative model for analyzing driving dangers in wet weather.Adverse weather also impacts traffic. In a study conducted by Kockelman (1998) it was looked at how weather conditions, as well as driver and vehicle population characteristics, influence the flow-versus-density relationship on a homogenous highway segment. As a result of the study, road users, their cars, and weather conditions can all have an impact on the flow-density curve. Hanabali and Kuemmel (1992), on the other hand, state that when road users encounter risky driving conditions, they are less inclined to travel. There is a slowdown in transportation flow as a result of snow and ice conditions.Snow and ice storms disrupt typical activity in every city throughout the winter months. Minor interruptions to severe disasters that shut down the industry, impair electricity and communication lines, and render streets, roads, and highways inaccessible are all possible outcomes.

3. Study Area

In winter season, the east part of the Turkey face with the adverse weather conditions. Not only the east, but also highest settlements of the country struggle with the inclement weather. According to the cases of being stranded on the road because of the snow, the 5 cities in Turkey are selected to conduct the survey in winter season in 2015 with the drivers in order to catch the behavioral traits of the drivers. These cities are Afyon, Balikesir, Bolu, Erzurum, and Kayseri.

Bolu is famous with its ski resort named as Kartalkaya. The city is very close to Istanbul and especially on weekends people who are willing to have fun with the snow choose Kartalkaya for a short trip. On the other hand, because of the rugged topography of the city, road goes around the mountain and buses, trucks, and other types of vehicle stuck in snow in winter time.

Kayseri is also one of the famous ski resort in Turkey and the name of the mountain is well known which is Erciyes. Its ski

resort is high quality and the winter condition in the city is rough.

Erzurum is very famous with its mountain, Palandoken. It also hosted the 2011 Universiade Winter Olympic games. The winter is quite harsh in this city. Erzurum is also well known by the ski-lovers from all over the world. The winter takes almost 6 months in this city and it is located at an altitude of 1,890 meters.

Afyon is located at the intersection of the main roads connect the big cities such as Ankara, Antalya, Izmir and Istanbul. These main arterials are very important for passenger and freight transport in the country.

Balikesir is located at the seaside, but in the winter season, weather conditions are challenging. In the time this study is planned, some cases were experienced in the city as a result of the adverse winter conditions.

4. Survey Study and Results

The number of surveys conducted in the above-mentioned provinces is 3,349 in total, with 1076 in Afyon, 501 in Balikesir, 498 in Bolu, 523 in Erzurum and 751 in Kayseri.

Looking at the results of the survey, it is seen that they are distributed as 32% cars, 23% trucks, 13% buses, 13% pickup trucks, 12% trucks and 7% minibuses. 60% of the vehicles included in the study are commercial vehicles.

Only 5% of vehicle drivers are women, and the average age of the drivers is 39.5 years. 40% of the vehicles surveyed are commercial. In the questionnaire, the tire condition is also evaluated and according to the observation, 90% of the vehicles have winter tires and it has been determined that the condition of the tires is medium (somewhere between bad and good condition) in 17%. In terms of tire condition of non-commercial pickup trucks and minibuses, 40% of pickup trucks and 50% of minibuses have moderately good tires. 79% of vehicles also have chains. Some vehicles with winter tires do not have a chain attached to avoid being stuck on the road in winter condition. This is the idea that the chain will not be needed when drivers use winter tires. In addition, 12% of these vehicles are people who have been involved in traffic accidents before. Moreover, 11% of drivers involved in fatal or injury accidents are under the age of 30, while 29% are between the ages of 31-40. This indicates that young people are at greater risk of traffic accident. In the statistics of the World Health Organization, it is stated that the greatest risk group is people between the ages of 5-29 (WHO, 2021). Finally, the survey results show that 24% of the vehicles have had previous experience of staying on the road due to snow.

5. Conclusion

As a result, adverse weather conditions negatively affect the traffic in urban and intercity transportation. Measures taken by governments can be effective to a certain level. However, the most important precaution must be taken and implemented by the drivers. Looking at the results of the survey, it is seen that the majority of drivers who have been involved in traffic accidents before are drivers under the age of 40. In addition, winter tires alone are not enough. All kinds of equipment should be kept in the vehicles in order not to stay on the road in such a bad weather. Furthermore, driving in winter can be taught to the drivers before obtaining the license.

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