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ABSTRACT

In the face of the rapidly developing economic situation, the demand for travel by urban residents is increasing, and the demand for traffic is also gradually increasing, which undoubtedly increases the number of traffic accidents, especially during peak hours. However, electric two-wheelers are at a disadvantage among many traffic participants, so electric two-wheelers are more likely to be injured in traffic accidents. How to solve the occurrence of electric two-wheeled vehicle traffic accidents has been related to people's livelihood issues. This paper analyzes the causes of electric two-wheeled vehicle traffic accidents on urban roads, and provides help for electric two-wheeled vehicle traffic management on urban roads, so as to reduce the occurrence of electric two-wheeled vehicle traffic accidents.

Keywords: *electric two-wheeled vehicle accident, accident cause, traffic accident countermeasures.*

1. INTRODUCTION

Traffic accidents have become the top disaster among many disasters, and traffic accidents have caused a great casualty rate. How to reduce traffic accidents has become the focus of many scholars' research. Xinyu Zhu et al. analyzed the regional characteristics, temporal characteristics, casualty characteristics, road space characteristics and illegal behaviors related to electric bicycle accidents. And from the production and sales of electric bicycles, road infrastructure construction, traffic violation management and other aspects, put forward corresponding solutions. [1] Dan Zhang et al. formulated a safety checklist for electric bicycle accident-prone scenarios to prevent and analyze traffic accidents. [2] Shengbo Wu found that the reasons for the traffic accident of electric bicycles are: weak legal awareness of electric bicycles, problems with road infrastructure, electric bicycles exceeding the standard, not meeting production requirements, and many illegal electric bicycles. [3]

Through simulation research, Xueqing Zhu found that among the types of collisions between cars and electric two-wheelers, side collisions have the most serious impact on the injury degree of electric two-wheelers, and frontal collisions and rear-end collisions are less. [4] Junren Luo et al. obtained five dangerous scenarios of electric two-wheeled vehicles and automobile accidents through cluster analysis and research on indicators such as vehicle type, vehicle speed, number of vehicle lanes, two-wheeled vehicle type, and two-wheeled vehicle movement mode. [5]

Yingshuai Li et al. used the random forest model to find that the main factors affecting the injury degree of electric bicycle drivers are: "accident type", "injured part", "road physical isolation type" and so on. [6] Wenlong Jiang et al. found factors such as "ramp or curve", "collision with moving vehicle", "other single-vehicle accident", "motor vehicle fails to yield as required" and "electric bicycle fails to yield as specified" through logistic regression model Significant effect on injury severity of electric bicycle drivers. [7] Using the decision tree method, Xiangliang Xiao et al. found that the factors affecting the severity of accidents include: on roads without non-motorized vehicle lanes, non-motorized vehicles do not drive on the right side of the roadway, non-motorized vehicles drive in the opposite direction, non-motorized vehicles speeding, etc. [8] According to the marginal effect, Tong Zhu and others found that the factors that have a significant impact on the degree of injury of electric two-wheeler drivers during peak hours are: "the gender of the electric two-wheeler driver", "the type of motor vehicle

involved", "the vehicle before the collision" Direction of motor vehicle movement" and "road environment". [9] In a word, the cause analysis of electric two-wheeled vehicle traffic accidents will help to reduce the occurrence of traffic accidents. This paper analyzes the main reasons of electric two-wheeled vehicle traffic accidents on urban roads in detail, and proposes corresponding solutions.

2. ANALYSIS OF THE CAUSES OF TRAFFIC ACCIDENTS OF ELECTRIC TWO-WHEELED VEHICLES

In urban roads, there are many reasons for electric two-wheeled vehicles to cause traffic accidents. The more important reasons are: motor vehicles speeding, electric two-wheeled vehicles do not pass according to the traffic signal regulations, electric two-wheeled vehicles do not drive in the specified lanes, Turning motor vehicles do not let the straight-running electric two-wheeled vehicle go first, or the electric two-wheeled vehicle drives in the opposite direction, etc. The following is a detailed analysis of the above reasons:

Motor vehicle speeding

The speed of motor vehicles on the main road is very fast, and individual electric two-wheelers may suddenly appear on the branch road connecting the main road. Due to the high speed of the motor vehicle, it is still unable to stop the vehicle safely after slamming on the brakes. So in the panic and fright, the two cars collided, resulting in an irreversible situation. Therefore, motor vehicles should also pay attention to observation during the driving process of the road section, identify the meaning of traffic signs, and pass strictly according to the traffic signs and markings, and should not be careless. In addition, in the spring, because the trees become lush, the sight of motor vehicles may be blocked, and the side roads cannot be seen in time. In order to avoid collision with vehicles on the side roads, motor vehicles should pay attention to observation during the driving process, and should slow down or stop to look out when passing through some places that may have potential safety hazards.

Electric two-wheeled vehicles do not pass according to traffic signal regulations

Electric two-wheeler drivers have some uncivilized driving behaviors in the process of road traffic. In particular, electric two-wheeled vehicles do not pass according to traffic signal regulations, which undoubtedly increases the risk of traffic accidents. Many electric two-wheeler drivers do not drive according to traffic lights, but make judgments by observing the driving behavior of other drivers. Therefore, at the intersection of urban roads, a group of electric two-wheeled vehicles often run through the red light or the yellow light. This may also cause the electric two-wheeled driver to not pay attention to the vehicle when passing the intersection and pass directly, resulting in a great risk of accident.

Electric bicycles do not drive in the specified lanes

On urban roads, some electric bicycles do not run on non-motorized lanes, and do not follow the traffic rules of their own lanes. Motor vehicles travel very fast in the lane and may scratch with electric bicycles, causing damage. Electric bicycles should be driven in the specified lanes. In addition, there are also individual electric bicycles that are randomly worn between motor vehicles. This uncivilized driving behavior not only causes traffic chaos, traffic congestion, etc., but also increases the risk of accidents. On the road sections without non-motorized vehicle lanes, electric bicycle drivers are not allowed to follow other motor vehicles, but drive aside on the motor vehicle lanes, and also avoid the risk of driving. Since electric bicycles have no hard shell protection, drivers are more injured after a traffic accident, so it is better to pay attention to driving safety during driving.

The turning motor vehicle does not let the straight-running electric two-wheeled vehicle go first

In order to reduce the waiting time, the motor vehicle driver who is turning at the intersection wants to pass the intersection quickly. For example, a vehicle turning right does not give way to an electric two-wheeled vehicle that is going straight normally, so it is very likely to collide with an electric two-wheeled vehicle that is going straight normally. According to the relevant provisions of the Road Traffic Safety Law, motor vehicles turning right should give way to electric two-wheeled vehicles that normally go straight ahead. Therefore, motor vehicles should slow down or stop to give way when passing the intersection, so as to avoid the occurrence of traffic accidents. Urban road traffic civilization requires the joint efforts of all drivers. Motor vehicles need to slow down when passing intersections, so as to provide convenience for vulnerable groups such as electric two-wheelers or pedestrians.

Electric two-wheeled vehicle driving in reverse

The Road Traffic Safety Law stipulates that electric two-wheeled vehicles are not allowed to drive in the opposite direction. However, many drivers prefer to drive in the opposite direction on the road considering detours or other inconvenient travel behaviors. Electric two-wheelers may encounter a large number of forward-running electric two-wheelers during the retrograde process. Since both vehicles are blocked in the process of driving, not only the speed of the electric two-wheeled vehicle is slowed down, the traffic congestion index is increased, but also the collision risk coefficient of the electric two-wheeled vehicle is increased. In short, electric two-wheeler drivers should abide by the traffic rules, respect the legal provisions of road traffic safety, and do not go wrong, not only to protect themselves, but also to facilitate others.

3. METHODS TO REDUCE TRAFFIC ACCIDENTS OF ELECTRIC TWO-WHEELERS**Increase infrastructure construction**

Due to the lack of road infrastructure, and the lack of repair and maintenance of existing road facilities, it is likely that some road traffic safety problems will arise. First of all, non-motor vehicle lanes should be added to the sections without non-motor vehicle lanes, and the worn or unclear traffic signs and markings at the intersection should be re-planned, and the intersections without sidewalk lines should be reset. Set the lane and phase according to the traffic volume of the intersection, reduce the average queue length and driving delay time, and set the full red time in the signal timing, so as to clear the vehicles that did not pass in time and ensure the driving safety of the vehicles. Some high-end information collection equipment, such as millimeter wave radar and video fusion, can be used to measure traffic information parameters such as traffic volume and driving speed in real time. Therefore, the traffic signal control scheme can be changed in real time, and different signal schemes can be used to control different traffic volumes during peak or flat peak hours, reducing the delay time of vehicles. High-definition video equipment can also capture uncivilized driving behavior, and can also contribute to the detection of difficult traffic accidents. Many motor vehicles are unwilling to take the corresponding responsibility after colliding with the electric two-wheeled vehicle, and the phenomenon of driving and escaping occurs. The monitoring equipment will better record this uncivilized behavior that violates the traffic laws.

Publicize traffic laws and regulations

Most of the electric two-wheeler drivers have uncivilized driving behaviors such as not passing according to the traffic signal regulations and driving in the opposite direction due to their weak legal awareness. Regularly go to various communities to carry out activities such as traffic laws and regulations popularization and education publicity, and can carry out legal publicity by distributing leaflets, giving speeches, rewarding quizzes, etc. Only when every citizen knows the law and understands the law, to be able to restrain their driving behavior in accordance with the relevant provisions of the traffic laws. At present, the more popular methods are live webcasts or small videos. In order to jointly maintain road traffic safety and resist uncivilized driving behaviors, all enthusiasts are encouraged to ask electric two-wheeler drivers about legal knowledge at the intersection. Answering inquiries, small videos can be produced in the later stage to affect more people, and jointly create a harmonious and civilized driving environment as well as comfortable and safe passage conditions. At present, the traffic control departments of many cities have installed video capture equipment and large-screen monitors at intersections. When the electric two-wheeled vehicle passes through the intersection, it can be clearly seen on the display screen, which can be used by everyone to supervise each other and jointly maintain civilized driving behavior. Joint supervision with the media is more conducive to electric two-wheeled vehicle drivers to regulate their own driving behavior, and is conducive to urging electric two-wheeled vehicle drivers to abide by traffic rules.

Incentive system

It is recommended that the education department take necessary reward and punishment measures for some uncivilized driving behaviors. Only when rewards and punishments are clearly defined can they play a normative role. For example, fines are imposed on drivers of electric two-wheelers who do not wear helmets and electric two-wheeled vehicles are driving in the wrong direction, and praise is given for civilized driving behaviors that comply with traffic order and do not violate traffic laws, etc. Establish and improve traffic management methods for electric two-wheeled vehicles, so as to realize the principle of vehicles going their own way, Every electric two-wheeler driver can obey the rules and drive in a civilized manner, which is bound to reduce road traffic accidents and ensure road safety and smoothness.

4. CONCLUSION

This article discusses the causes of traffic accidents on electric two-wheelers. Such as motor vehicles speeding, electric two-wheeled vehicles do not pass according to traffic signal regulations, electric two-wheeled vehicles do not drive in the prescribed lanes, turning motor vehicles do not let straight-going electric two-wheeled vehicles go first, and electric two-wheeled vehicles drive in the opposite direction. Corresponding suggestions and countermeasures are also put forward to provide strategies for the traffic management of electric two-wheelers, which is conducive to reducing the occurrence of traffic accidents of electric two-wheelers and ensuring driving safety.

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