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Contents

American Road Intersections and Traffic Control	
<i>Kelly TOM</i>	(1)
Analysis of Early Damage of Asphalt Pavement	
<i>Xinyu WANG</i>	(5)
Research on the Current Situation of Road Traffic Safety in the United States	
<i>John Davis</i>	(12)
Deducing Formula of Critical Load of Thin Wall Hollow Pier In Construction Stage	
<i>Qiang YU</i>	(15)
Study of The Section Width To Thickness Ratio of Cross Section Thin-walled Hollow Pier	
<i>Chengjun YAN</i>	(18)
Technical Study for Subgrade and Pavement of Highway in Southwest China	
<i>Jianguo YANG</i>	(23)
The Structure Analysis To Retaining Wall Of High Fill Embankment Over V-Shaped Gully	
<i>Yijun XIAO</i>	(27)
Analysis Prestressed Anchor Cable Reinforcement Tech-nique And Prestressed Detection Method	
<i>Qi-wen LIU</i>	(32)
Studying on Deposit Dynamic Characteristics and Pre-venting Measures of Debris Flow Along Highway in Western Mountain	
<i>Xiwang WEI, Jingsheng DING</i>	(35)
Experimental Research on PTC Control Technology of Widening Subgrade Differential Settlement	
<i>Pan TONG</i>	(41)
Elastic Wave Method to Detect the Prestressed Anchor cable Anchoring Force	
<i>Weiya Fu</i>	(46)

American Road Intersections and Traffic Control

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Abstract: Based on the latest technical specifications and practical engineering the paper briefly described the development and application of American road intersections and traffic control , introduced its basic principles and effective methods etc. for reference.

Keywords: Road; Intersection; Traffic; Signal light; Ring regulations

1. Introduction

Road intersection is the intersection of several roads, but also the conflict point of human planning. Intersection is the basic and important part of the road, which plays an important and decisive role in the road operation efficiency and traffic safety. The complexity of Road intersection design is not only to consider the number of vehicles and pedestrians, but also to meet their different requirements. Such as straight line, turn right, turn left and turn around. Road intersection design not only to consider the geometry of the intersection, the intersection number, but also consider the operation and maintenance requirements, etc.. When the road intersection appears not to comply with traffic regulations, such as speeding and running red light, its operations and traffic safety situation becomes more complex and grim. Therefore, how to apply the geometric characteristics and traffic characteristics of Road intersection, and with the aid of the intersection operation method is an important guarantee to ensure the smooth and safe intersection traffic.

However, due to the complexity of the road intersection, the traffic safety is still a huge challenge. According to the statistic result of road traffic accidents in the United States in 2010, the total number of traffic accidents in the United States is about 9567000, of which 59.8% of the accidents are directly and indirectly related to the intersection. The total number of deaths from traffic accidents is about 44713, of which 35.4% are directly and indirectly related to the intersection. Cause many road intersection accidents, such as roads, vehicles, people, climate, etc.. Among them, the human factors, especially the great danger of running a red light. Only in 2008, the road crossing the red light caused the accident caused 165000 people were injured, 762 people were killed.

Therefore, the road intersection traffic safety is not only the main task of the U.S. federal government departments, but also the state and local government

departments in the primary task. In addition, many non-governmental organizations in the United States also promote the improvement of traffic safety in the road intersection in various ways. Over the years, the United States government and many professional departments such as the federal highway administration, the national highway traffic safety administration, the American Association of state highway and transportation officials, U.S. transportation engineers have devoted enormous resources to research and solve the traffic intersection and safety problems. Take the federal highway administration as an example, the sources of funding for the road intersection include highway safety improvement projects HSIP and 402nd highway safety funds, etc.. HSIP funds accounted for the entire ground transportation project STP 10% of the budget, while the 402nd highway safety funds is based on twenty-third of the U.S. Code "highway" 402nd provisions enacted in 1966, which requires States to make the highway safety planning, to solve the traffic safety problem for people and road environment, and states have set up the governors highway safety representative. In addition, the United States Federal Highway Administration also allows private donations and kind donations, and to improve road traffic safety. The main purpose of this paper is to introduce the basic principles and effective methods of American Road intersection and traffic control in the United States, based on the latest technical specifications of the United States. In addition, this article also from the perspective of Engineering Technology for domestic counterparts in the United States Road intersection traffic regulations and its reasonable implementation and application. Hope for the construction and development of road traffic in China, in order to improve the road traffic safety.

2. Road Intersection Traffic Control Mode

In the United States, the road intersection traffic control method and its facilities are based on the United States Federal Highway Administration's "traffic control unified facility manual". In fact, the Federal Highway Administration of the MUTCD is the United States federal regulations twenty-third, 655th specified traffic control methods and facilities of the technical standards, which has a federal legal effect. The main purpose of MUTCD is to establish uniform standards for traffic control facilities and their use on public roads in the United States. Different traffic control methods of Road intersection, the traffic operation characteristics of different. The choice of intersection traffic control mode should be based on the detailed analysis of traffic operation. This paper mainly introduces the intersection traffic control of the 3 main ways, including the signal light control, stop control and traffic control.

2.1. Signal lamp control mode

Road intersection general signal lamp control. The main advantage of the traffic control signal lamp is to ensure the traffic order, improve the traffic capacity of the intersection, and reduce the vehicle right angle collision accident. In addition, for a number of signal lights on the road control situation, we can make all the intersection of the signal lights made linkage system, so that the vehicle can be continuous, uniform and through. However, traffic control signal lamp is not a panacea. Its successful application depends on reliable traffic data. Any errors in design, construction, operation and maintenance are likely to cause traffic accidents, etc..

If a road intersection can not meet any of the above criteria, it means that the signal lamp control mode is not suitable for the intersection. That is, to set up a control signal lamp at a road intersection, at least to meet any one or more of the above. However, to meet any one or more of the basis does not indicate the most reasonable way to control the signal lamp. The basis of the above analysis is only a part of the whole work, but also on the various factors and control methods for analysis. Once determined to set up a control signal lights, it should be based on the specific traffic volume, pedestrian traffic, whether there is a turn lane and other reasonable determination of the signal lamp.

2.2. Prohibition of access control

Prohibition of traffic is one of the main ways of intersection traffic control, and it is also the most common type of intersection in the United States. In fact, the prohibition of traffic is not only low cost, but also for the traffic signal is not suitable for intersection is also very effective. To set up the intersection according to the traffic control mode if the ban will

help reduce traffic delays and some types such as rear end accidents. However, the prohibition of the passage of the requirements of each vehicle must be completely stopped, which will not only cause inconvenience to the vehicle, but also increase the vehicle brake and exhaust emissions.

2.3. Licensing control mode

In many low traffic intersection, the suspension control is more common. However, when traffic is too low, it will not only cause unnecessary parking, but also is not conducive to traffic and environmental protection. If the use of licensing control may be more effective. In the circular intersection, all should be set up to allow the brand to enter the road crossing.

3. Road Intersection Traffic Regulations

Research on traffic safety of America Road intersection shows that the main types of intersection traffic accident is the side collision, collision and crash. Among them, the intersection parking accident accounts for about 25% of the number of traffic accidents at the intersection. The primary reason caused by traffic accidents is the intersection of red light, failed to stop or fail to make, the secondary reason is unable to see the traffic control equipment and instructions. Running a red light is the most serious traffic violation of the intersection of the signal light. Estimated that nearly 100000 traffic accidents and 1000 deaths each year. Nearly 56% of the drivers had a red light experience. Therefore, to improve traffic safety is a system engineering, which requires not only the road intersection with excellent infrastructure, but also for public education, so that drivers are familiar with the road intersection, traffic control facilities should be taken to correct the command and response and action. The state should enforce laws and regulations to enforce all users to comply with traffic regulations, to remind people to drive carefully.

3.1. Rules for the control of a signal lamp

As mentioned earlier, the traffic signal lamp control mainly by 3 kinds of red yellow and green light and shape traffic. Therefore, first of all, we should understand the basic meaning of the color of traffic control lights. American road traffic law enforcement power is exercised by the state or city police department. Driving people to the red, yellow, green traffic lights to comply with the rules and regulations in the driver's manual are clearly specified. The rules of the traffic lights, readers are very familiar with. There may be some differences in the understanding of the traffic rules of the yellow light. Basically it can be seen that the United States did not put the so-called "into the yellow light" as a violation of traffic rules. There are

two main reasons for it. First, the purpose of the yellow light is to remind the driver to slow down ready to stop, and to provide sufficient time for the vehicle to stop the car through the intersection. Second, as is known to all, the vehicle's safe stopping distance is related to the speed of the vehicle, the driver's reaction time, the friction coefficient of the vehicle and the road surface. According to the relevant research results in Shanxi, China, when the vehicle speed is 30 km/h and 50 km/h, the minimum safe stopping distance is about 30 m and 60 M. When the traffic lights change from green to yellow when the emergency brake, if the parking distance is not enough, it is possible to stop line passing vehicles and road lane intersection occupancy and cause rectangular collision; if the back with the car too close, may cause the accident. That is to say, if the "into the yellow light" as a violation of traffic rules, may bring new traffic safety issues.

In fact, the intersection of signal light control, the key is to determine the safety of red, yellow, green three lights, and the time of traffic law enforcement against the red light". For China's recent controversial "rush yellow light" traffic safety issues, the author believes that should be in the intersection design signal lamp. Careful readers may notice that many Chinese urban planning and construction of the main street is very wide, so that the size of the intersection of the road is very large, the vehicle through the intersection of the time required for a long time. Therefore, the United States when the signal light design experience may not be suitable for China's intersection of the truth.

3.2. Control traffic rules

At the intersection, the vehicle must be completely stopped. No matter whether there is other vehicles through the intersection, vehicles will be parked in the parking line or the sidewalk before lateral markings, which can be clearly see other vehicles on the road. Until the other first to have been parked in front of the car through the car, after the side can be carefully and safely through. When and other vehicles at the same time to reach the intersection, should be in accordance with the general "give way" principle of operation. Such as turning the vehicle so that the straight ahead of the vehicle, the left hand side of the vehicle to make the right hand side of the vehicle first, motor vehicles

to allow pedestrians or non motor vehicle first. In the United States, primary and secondary schools are also equipped with both sides of the left side of the car before and after the same suspension, when the bus pulled up in the next student, the suspension will automatically open. At this point, the rear of the school bus and the vehicle must be stopped, waiting for the school bus start stop after the suspension, before you can be careful to start running. In addition, in the sight of bad road intersection in front of the suspension, usually with red flashing lights, alerting the driver in front of the suspension control intersection, to slow down and be prepared to stop.

4. Concluding Remarks

Based traffic control and the new rules in the United States, through field investigation and combined with the actual work experience to introduce the concise and to the point of intersection of road traffic control and main traffic rules.

The relevant departments in the implementation of recommendations China based on school bus vehicle equipment regulations on the implementation of the primary and secondary schools, study the rules of the road, around the campus and the school bus driver and the road at the traffic rules, in order to further improve and enhance the school and school bus traffic safety.

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