Research on Intelligent Traffic Model Based on Neural Network Algorithm

Yi Qin¹,*
¹Jincheng Campus, Taiyuan University of Science and Technology, China
*Corresponding author e-mail: qinyi@tyust.edu.cn

Abstract. For the national economic construction and social development, intelligent traffic safety design has a very important role. In addition, cars have entered thousands of households in recent years, and the flow of intelligent traffic has increased significantly. The transformation and design of intelligent traffic safety facilities is an important work related to people's life safety. Building with GIS technology as the core, the computer interlocking simulation system and join the safety of the application of computer technology, network communication technology, the grading management mode, the implementation of traffic safety monitoring and management of the whole process of engineering construction in the true sense realize the standardization and systematization of safety information construction process management, so that they can master the traffic engineering construction all aspects of the data and safety information, guarantee the quality of project construction.

Keywords: Highway Reconstruction, Traffic Safety, Safety Facilities, Design Survey

1. Introduction
The standardized management of road marking is an important part of intelligent transportation, and the project department is the core department of transportation. To ensure the completion of the project on time, we must first establish a sound management system and effective leadership. Carry out overall planning and scientific arrangement for the whole project in the traffic flow, properly coordinate each work content, and promote the traffic project of the construction project in an orderly way. In addition, work responsibilities should be clearly divided, should be divided into the responsibility of each project leader, the unsafe factors in the process of traffic should be studied in depth, and a scientific and reasonable safety production management system should be established corresponding to ensure the completion of the total construction period on time.

2. Site investigation and design ideas for the transformation of intelligent traffic safety facilities

2.1. Road marking investigation and design ideas
Before the road marking design, the implementation of the project should be planned and arranged according to the actual work situation and project design requirements. The project leader and supervisor should comprehensively evaluate the scientific nature and rationality of the planned project, and screen...
its potential risks or problems, as shown in Figure 1 below, which is a common map of urban rail transit station:

![Figure 1. Basic planning of urban intelligent transportation stations](image)

The project transporter shall take the overall traffic plan and plan of the construction project as the overall starting point and arrange the transportation project on a monthly basis. Focus on solving the key problems in traffic engineering, flexible allocation, dynamic management and optimization of each traffic elements, to ensure the overall planning on time and quality completion.

2.2. Research and design ideas for road signs

The site safety of intelligent transportation needs to start from the road signs, but often many intelligent traffic signs are ambiguous; Some security measures in the form of intelligent traffic signs are not in place as a whole; At the same time, the team inspection and project inspection defects, resulting in a relatively weak road safety system, the daily operation of intelligent traffic there are greater potential dangers.

The flexible design of road signs includes two aspects: on the one hand, the configuration of traffic equipment and construction consumables; On the other hand, arrange and dispatch traffic technicians, managers, third-party supervisors and traffic personnel. When the project deadline is relatively tight, the transport party should organize personnel to allocate materials to ensure the continuous operation of the transport project. If the traffic plan cannot be completed on schedule in the process of implementation, the problem should be investigated in time, the problem should be solved in time, and the traffic plan should be adjusted. At present, there are still many problems in traffic process simulation management, which need to be solved pertinently.

2.3. Investigation and design ideas of road guardrail

The guardrail design in the intelligent transportation is often ignored, in the specific project of the traffic road, the general beautiful guardrail can not meet the actual needs of the project. The overall function of most road guardrail is poor, and the understanding of enterprise simulation management is vague, and it is difficult to perform their duties.

It is one of the effective ways to promote the intelligent transportation simulation management to study the demand of different roads for guardrail. But with the continuous development of intelligent transportation safety design, the existing guardrail is often difficult to meet the needs of the traffic, in
the process of intelligent transportation is gradually introduced more "reflection" and "led guardrail, barrier to add this part on the one hand, traffic great vigor and vitality, but because of its potential danger road protection does not reach the designated position, factors such as safety index is not up to standard, also become intelligent transportation substandard risk.

3. Improvement and design of intelligent traffic safety facilities

3.1. Analysis of the main contents of the transformation design of intelligent traffic safety facilities
For traffic units, internal causes change external causes, and external causes determine behavior. Therefore, quality assurance systems at all levels should be established, and quality checks should be carried out regularly for each traffic operation team. In order to ensure the coordination and efficiency of traffic roads, the traffic quality inspection needs the participation of multiple parties. The main participants include leaders of traffic units, direct persons in charge of roads, owners, and relevant staff of government quality supervision departments and traffic supervision departments. The main contents of inspection include measurement and inspection inside and outside the industry. During the on-site inspection, the inspectors shall conduct on-site measurement and comprehensive inspection of the middle line and level of the traffic construction road and the detailed scale of the project. During the internal inspection, the authenticity and accuracy of all kinds of materials shall be evaluated, and the inspection standards shall be based on the rules and regulations of the construction company and the industry standards.

3.2. Intelligent traffic safety sign transformation design scheme
In a considerable part of the process of intelligent transportation, the safety education of traffic signs is not timely, and the quality of travel personnel is difficult to meet the specific needs of traffic. Establish a sound traffic safety sign training system, and regularly learn all kinds of knowledge, including traffic operation norms, inspection standards and working procedures. Objective To ensure that all traffic participants understand the basic characteristics of road projects. For key technical personnel in special positions, pre-job qualification verification and pre-job training should be carried out to ensure the recognition of intelligent traffic safety signs.

3.3. Intelligent traffic sign transformation design scheme
The design of signs is closely related to traffic accidents. Traffic accident control is a two-stage process. Eliminate the hidden danger before the traffic accident, reduce the occurrence of traffic accident; Reduce human and economic losses after traffic accidents. Therefore, before the occurrence of traffic accidents, the parties of intelligent transportation should regulate and control all kinds of traffic roads according to the specific characteristics of the construction roads and the actual situation of the building location, and establish the corresponding simulation management system. Including line safety system, traffic operation safety system, intelligent traffic safety system, intelligent traffic fire prevention and typhoon safety system and other safety systems. After the traffic accident, to reduce the loss as far as possible, but also to establish traffic safety traffic accident report system, which is of great practical significance to the control of traffic safety. For example, after a major intelligent traffic accident, the person in charge of the road should report the accident to the enterprise leaders and relevant government departments quickly, with a delay of no more than 24 hours.

3.4. Technical requirements for intelligent transportation transformation
First of all, the safety training of the traffic contingent should focus on the simulation management of the traffic personnel, and enhance the overall safety awareness of the traffic contingent from the perspective of safety education training. At the same time, it is also necessary to take effective measures to regulate the daily operation of traffic personnel, so that traffic personnel form procedural and standardized work habits, and further realize the current "safety production law", the use of modern media and modern other communication channels, a wide range of intelligent traffic safety production
management knowledge. Through strengthening the safety production laws and regulations and safety technical standards, improve the safety quality of traffic personnel, according to the Ministry of Construction of the "construction workers safety training and education system" to carry out targeted training, timely and efficient safety technical training of transport personnel, strengthen the safety protection of workers.

![Figure 2. An urban traffic map designed by computer simulation](image)

3.4.1. Pay attention to the safety training of employees. The training of traffic personnel should focus on the key points and carry out safety operation training for employees. We can start with the backbone personnel of transportation in the enterprise, to carry out systematic training on safety technology, team leaders and safety management personnel, to strengthen the whole stage of production operation and seize the opportunity for the general public to promote safety skills training.

3.4.2. Pay attention to the safety education of special types of work and temporary workers. On the traffic roads, those who need special jobs shall receive systematic pre-job training and can enter the intelligent transportation system only after passing the assessment training. Enterprises should pay attention to the safety education of special types of work and temporary workers.

3.4.3. Take various ways to improve the safety technical literacy of employees. For example, internal safety knowledge competition is held to enhance employees' awareness of safe operation in a more flexible way.

3.4.4 Strive to create a rich and colorful safety culture. Enterprises can carry out a variety of safety culture activities, take active safety courses training and other characteristics of simulation management activities, effectively strengthen the sense of safety responsibility.

4. Design overview of security computer interlocking simulation system

The simulation system is a comprehensive system, which is a computer simulation system for the whole process of traffic engineering construction. The system design mainly includes the following aspects: construction schedule information management, construction safety comprehensive information management, risk monitoring information management, completion data management, design data.
management before construction, construction process data change management. The system shown in Figure 3 needs to collect and mine comprehensive data from the above aspects, process and analyze the data through software, and give timely feedback.

Figure 3. Computer interlocking simulation of urban rail transit stations

The logic framework of traffic engineering construction safety monitoring system is based on the whole process of construction and involves the simulation management information of each level of construction. It is a comprehensive management system of traffic engineering construction. The system adopts hierarchical structure. The advantages of the hierarchical structure system itself not only keep each other independent, and can support each other, such as safety information collection, information input, storage, processing, analysis, and then turn to the deep foundation pit and display. The comprehensive display of the whole process of traffic engineering construction depends on the mutual support of each structural layer.

5. Conclusion
Before traffic accidents occur, various preventive measures should be taken to eliminate or reduce to a large extent the factors that may cause traffic accidents, such as setting up increasingly obvious signs of danger zones and marking lines. In addition, traffic units should also bring the training of traffic safety signs into technical training. Transportation technicians shall, before entering their posts, strictly examine relevant qualifications and professional skills, and conduct technical training and safety education. In the formal start and the development of traffic task plan, technical explanation should also be carried out to confirm and implement the detailed safety operation system and rules in written form. Traffic engineering construction design and development of the computer interlocking simulation system is necessary, through this system, the effective implementation of the safety accident warning, realize the unified management of construction site monitoring, information documents, etc, still exist, but the simulation system of a single function, and the low level of integration defects as a result, the computer simulation system of simulation is widely used in rail transit construction, must be improved in the above several aspects.
References

[1] Fei X, Tian G, Lima S, et al. Research on data mining algorithm based on neural network and particle swarm optimization [J]. Journal of Intelligent & Fuzzy Systems, 2018, 35(3):2921-2926.

[2] Guo Y ,Lu L. Application of a Traffic Flow Prediction Model Based on Neural Network in Intelligent Vehicle Management [J]. International Journal of Pattern Recognition & Artificial Intelligence, 2018,33 (3): 1959009.1 to 1959009.18.

[3] Liu L, Ma C Q. Research on Intelligent Monitoring System on Tunnel Based on Neural Network [J]. Advanced Materials Research, 2014, 1044-1045:846-849.

[4] Ping X, Liu Y, Liu H. Research on books intelligent distributing based on BP neural network [J]. IEEE, 2012.

[5] Shen G, Chen C, Pan Q, et al. Research on Traffic Speed Prediction by Temporal Clustering Analysis and Convolutional Neural Network with Deformable Kernels (May, 2018) [J]. IEEE Access,2018, PP:1-1.

[6] Wang W P, Zhou L. Research on Intelligent Control Technology with Building Energy Control Model Based on Intelligent Control Algorithm [J]. Advanced Materials Research, 2014, 1014:329-332.

[7] Wang Y, Feng Y, Sun H. Research on vehicle intelligent wireless location algorithm based on convolutional neural network [J]. Neural Computing and Applications, 2020(3).

[8] Xiong S, Yi Z. Research on Urban Traffic Flow Intelligent Prediction Based on Improved BP Artificial Neural Network [J]. Journal of Chongqing University of Posts & Telecommunications, 2005.

[9] Yang S, Lin J. Research on Urban Public Traffic Satisfaction Evaluation Model Based on BP Neural Network Algorithm [J]. 2009.

[10] Zhou X Z, Zhang Q, Wang T. Model and Algorithm Research on High-speed Railway Intelligent Traffic Dispatching [J]. Iop Conference, 2018, 392.