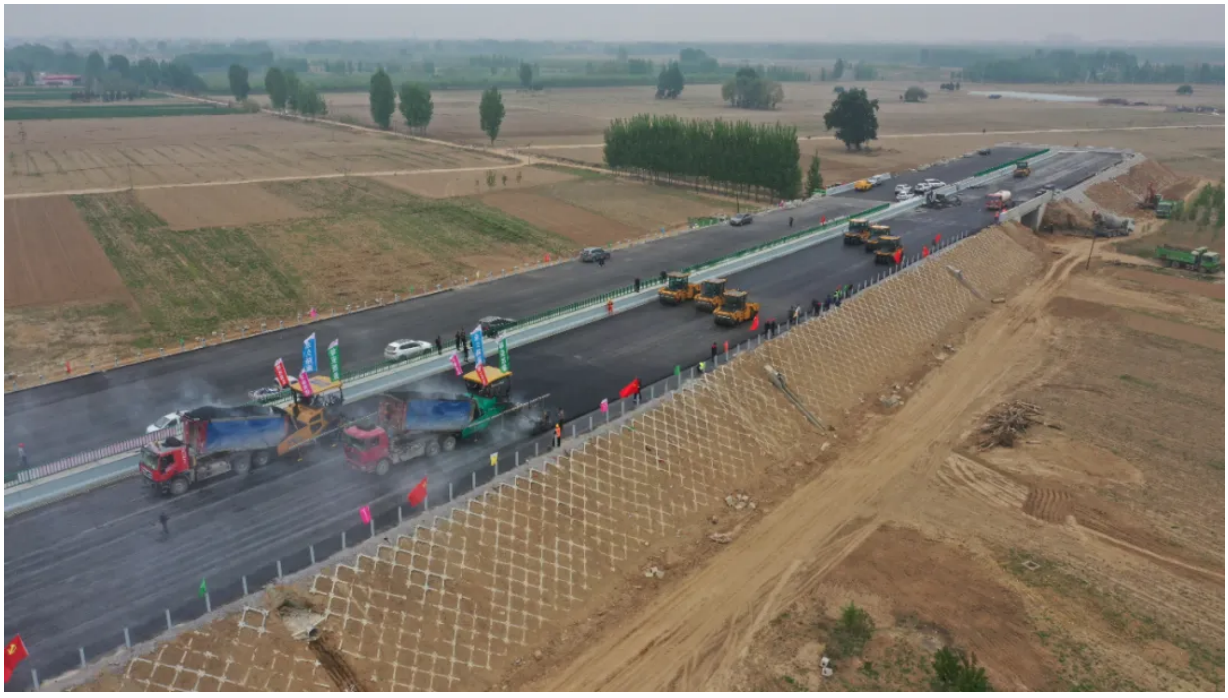
Jingde Expressway: The country's largest "unmanned driving cluster intelligent construction" was first applied in the construction of the asphalt surface of the external backbone road network in Xiong'an New District

Jingde Preparatory Office Yesterday

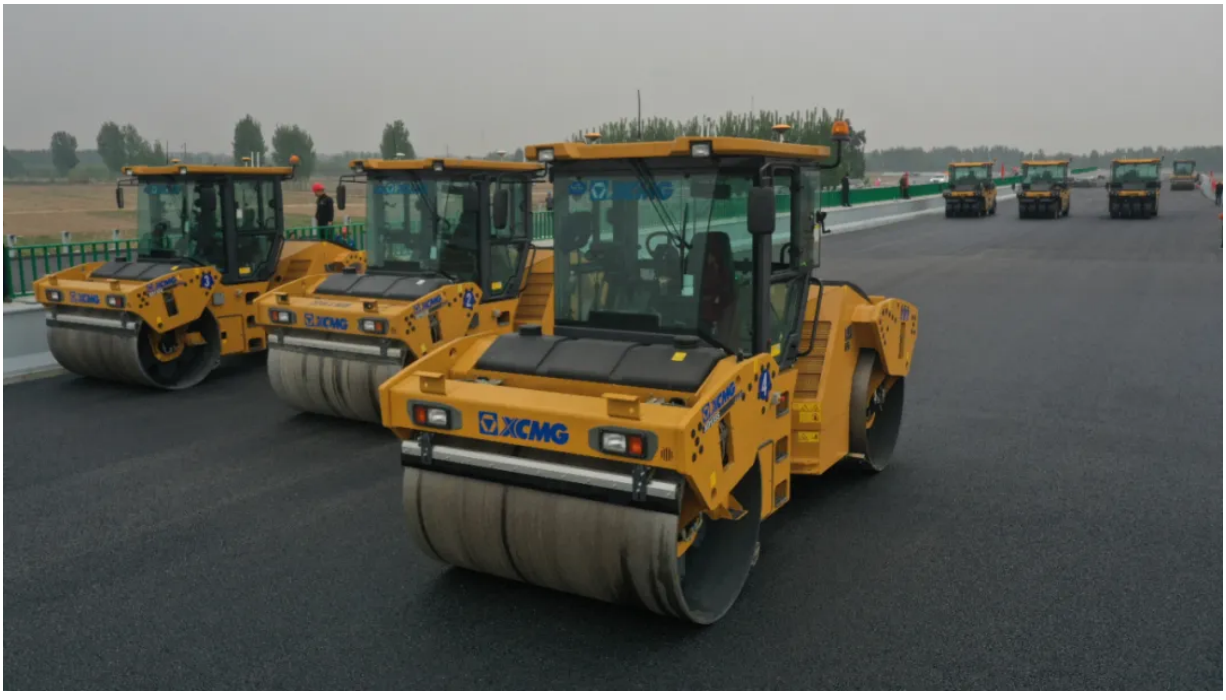
On April 24, 2021, Jingde Expressway and XCMG Group used the "unmanned cluster intelligent construction" technology for the first time in the construction of the asphalt middle surface of the ZT11 standard Tengda Construction Group. The front 2 pavers are combined and 7 People driving road rollers followed closely behind, and the scene was spectacular. This technology is also the first to be applied in the construction of the asphalt surface of the external backbone road network in Xiongan New District, and is currently the largest in the country.



The test section of this paving is the right section of the main line K97+692.848~K98+095.5, 402 meters long, and designed to use 8 cm thick ARHM-20 asphalt mixture. The "unmanned cluster intelligent construction" technology saves costs and works efficiently. While achieving intelligent obstacle avoidance, it can track the rolling trajectory of the fleet and roller compaction data in real time, and the application of the drone cluster reduces the number of on-site personnel by two-

application of the drone cluster reduces the number of on-site personnel by two-thirds At the same time, it effectively reduces various inputs such as quality cost, inspection cost, post-maintenance cost and ecological cost. This technology is an innovative attempt by Jingde Expressway to help "Xiongan Quality" and build "Smart Expressway".

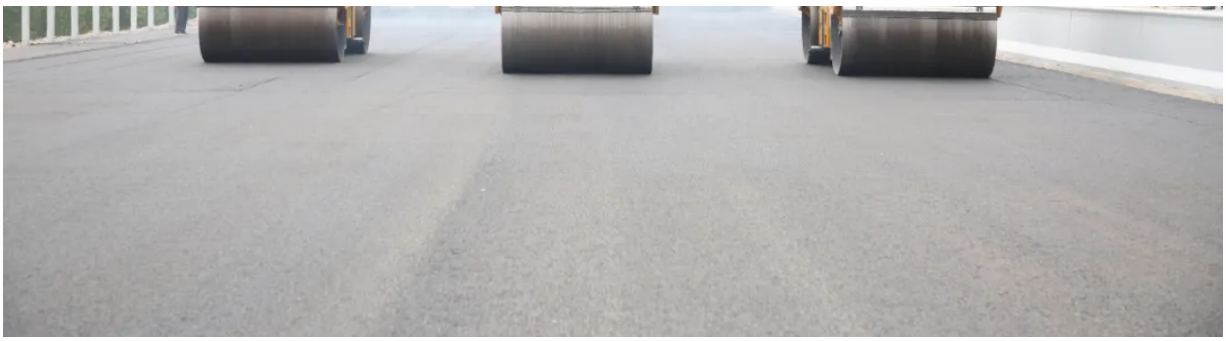
The unmanned driving cluster system is mainly composed of five parts: perception module, path planning and decision-making module, local area network communication module, control execution module, and background monitoring module. Comprehensive use of high-precision Beidou positioning technology, inertial navigation technology, and obstacle recognition technology to provide the equipment with driving route guidance and control signals, control the actions of the equipment's various working systems, and complete established tasks such as driving, steering, and working device operations. At the same time, the use of industrial Internet of Things and other technical means to return data to the service platform in real time, using big data analysis, combined with operations, to provide real-time monitoring, data display, remote control, compaction management, statistical reports and other functions. This is the second generation of unmanned technology. It is the intelligent cooperation of the optimal construction technology and the optimal construction equipment. It adopts the combination of environment and construction strategy, and matches the construction materials and construction methods. The construction process is intelligently adjusted according to the changes of the scene and changes according to the environment. The transformation, temperature, wind speed and other changing conditions of the construction technology have realized the efficient completion of the construction with the best construction technology.



The machinery cluster adopts echelon operation, and is divided into a paving echelon and three rolling echelons of initial pressure, recompression and final pressure according to the operation process. The overall configuration of machinery and equipment is 2 pavers, 3 double-drum rollers (initial pressure, vibration pressure 3 times), 3 rubber-wheeled rollers (recompression, static pressure 8 times), 1 double-drum roller (final pressure) , Vibration pressure 1 time).

According to the road paving width, the width of the roller body, the reserved safety distance, the staggered distance of the body, the number of rolling passes and other parameters during construction, the optimal planning path is generated through the pre-set algorithm program and control strategy, so as to realize the vehicle trajectory and Accurate monitoring of the operating status, and output control instructions to the on-board control system, autonomously control the roller, and realize unmanned operation of the entire fleet. The application of this technology has successfully realized unmanned operation of equipment under complex working conditions. The construction trajectory is accurately controlled at 2 to 3 cm, which is 50% higher than manual operation, which greatly improves the construction quality and greatly saves operating costs.

In this construction, safety has always been a focus of attention. The UAV group is equipped with multi-level safety precautions. For the first time, dynamic space electronic space fencing, intelligent analysis and fault diagnosis, multiple types of radar integrated safety monitoring, electronic tag management interaction, and remote Multiple safety measures such as remote control and physical braking ensure the safety of the construction area, so that the equipment can ensure that the equipment is in a controllable state under any circumstances, while avoiding safety accidents, and escorting the safe construction of the road.



The 5G era has come, and the intelligent, unmanned, and standardization of mechanical construction has become the development trend of the industry. The successful application of the "unmanned cluster intelligent construction" of the Jingde Expressway asphalt pavement is not only the largest in the country, but also the first use in the Xiongan New Area. At the same time, it is promoting the industrialization of unmanned technology and accelerating the integrated development of intelligent transportation construction. Played a guiding role. In the future, Jingde Expressway will continue to use scientific and technological innovation to generate new development momentum, transform scientific and technological achievements into actual productivity, create Xiongan standards, create Xiongan quality, and provide an effective guarantee for the realization of high-quality development in the construction of a strong transportation country!

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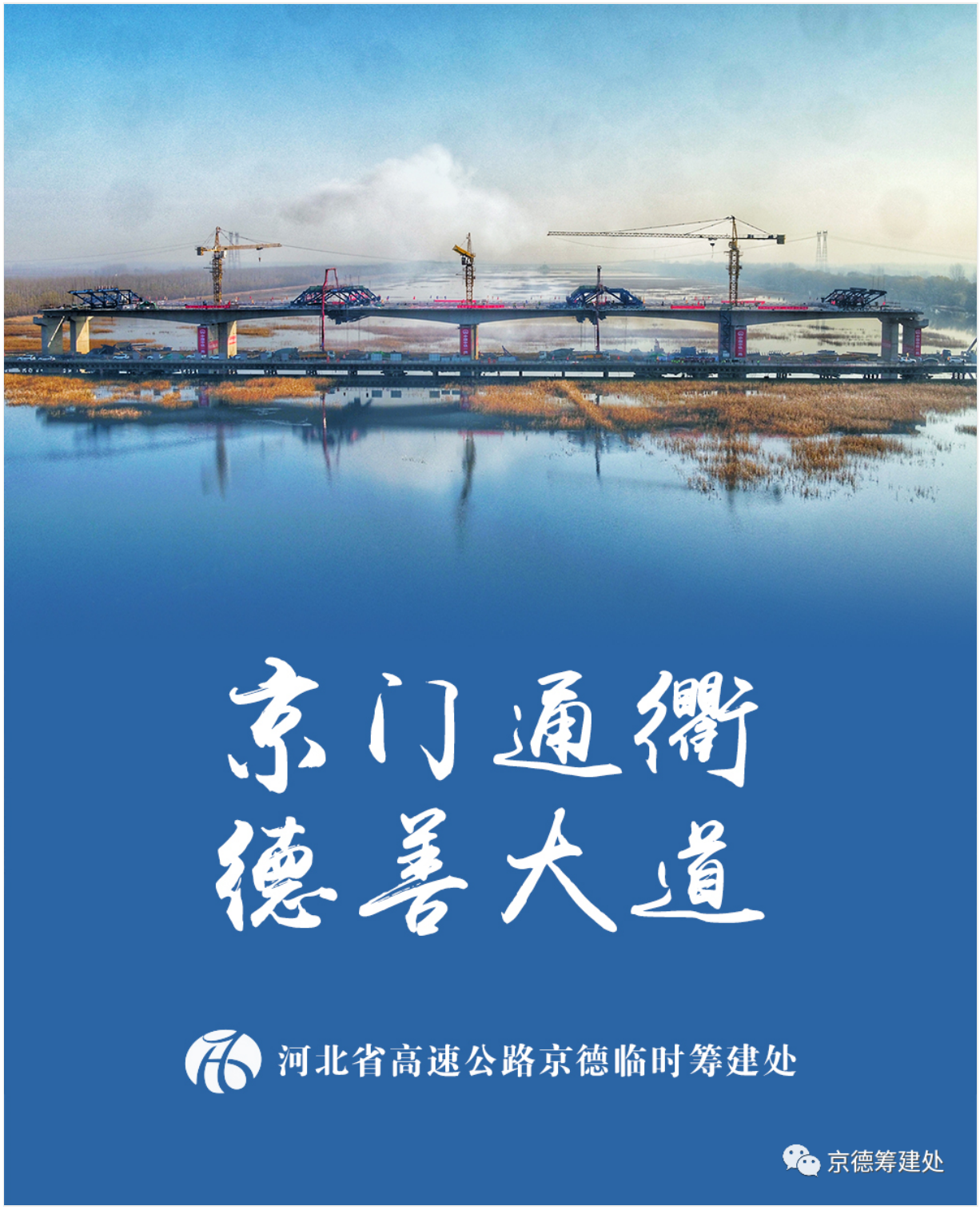

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