World Bank Loan Project

Newly Built Railway
Shijiazhuang-Zhengzhou Passenger Dedicated Line

Summary of Environmental Impact Assessment Report

The Third Railway Survey & Design Institute
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World Bank Loan Project

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Plane Sketch of newly built railway of Shijiazhuang-Zhengzhou Passenger Dedicated Line
1. **Profile of the project**

1.1 **Geographic location and line direction**
Shijiazhuang-Zhengzhou passenger dedicated line starts from Shijiazhuang City, capital of Hebei Province in the north to Extra Large bridge of Yellow River, Zhengzhou (excluding) in the south. Full length of the line is 355.17km. The lines pass Shijiazhuang, Hebei, Xingtai, Handan, Anyang, Hebi and Xinxiang, Henan.
Shijiazhuang-Zhengzhou passenger dedicated line starts from southern Shijiazhuang, passes Shijiazhuang Ring Road, Qing-Yin Expressway, by east of Yuanshi Military Airport, Beijing-Guangzhou Railway, Gaoyi West, Lindong East, Beijing-Guangzhou Railway again, Jingzhu Expressway, Xingtai East, Handan East, Anyang East, Hebi East, Xinxiang East to north bank of Yellow River Bridge at the destination (Starting design points for Zhengzhou River Railway and Highway). Six stations are set for the project, New Gaoyi, New Xingtai, New Handan, New Anyang, New Hebi and New Xinxiang.

1.2 **Main technical standards**
1. Railway grade: passenger dedicated line;
2. Number of the main line: two;
3. Designed speed: 200km/h and higher, infrastructure: 350km/h;
4. Distance between the two lines: 5.0m;
5. Radium of minimum curve: normally 9000m, 7000m under difficult situations;
6. Maximum slop: normally 12%, no more than 20% in some sections;
7. Effective lengths of receiving-departure track: 700m;
8. Traction category: electric power;
9. Operation mode of the train: automatic control;

1.3 Main project quantity and investment

Main project quantity and investment amount are shown in Table 1-1.

Table 1-1  Main project quantity and investment amount

<table>
<thead>
<tr>
<th>Project</th>
<th>Unit</th>
<th>Length</th>
<th>New Shijiazhuang (excluding)</th>
<th>Provincial boundary -Yellow River Bridge (excluding)</th>
<th>Summary of the line</th>
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<tbody>
<tr>
<td>Length of the line</td>
<td>Main line km</td>
<td>204.62</td>
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<td>Length of roadbed</td>
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<td>Land</td>
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<td>454.6</td>
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<tr>
<td>Land</td>
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<td>420.3</td>
<td>1040.7</td>
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<td>House removal</td>
<td>10⁴m²</td>
<td>22.3</td>
<td>19.3</td>
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<tr>
<td>Interval earth</td>
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<td>389.1</td>
<td>1597.1</td>
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<tr>
<td>Station earth</td>
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<td>201.3</td>
<td>246.7</td>
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<tr>
<td>Grout and masonry</td>
<td>10⁴m³</td>
<td>60.7</td>
<td>25.7</td>
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<td>Earth rack</td>
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<td>Spraying grass planting</td>
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<td>496.9</td>
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<td>Bush</td>
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<td>Extra large bridge</td>
<td>Double lines</td>
<td>122647.9/21</td>
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<td>Middle bridge</td>
<td>Single line</td>
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<td>Ordinary middle bridge</td>
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<td>Frame bridge</td>
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<td>1925/1</td>
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<td>4140.6/134</td>
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<td>6</td>
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<td></td>
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<td>2.9</td>
<td>6.1</td>
<td></td>
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<td>-------</td>
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<tr>
<td>Houses</td>
<td>$10^6$m²</td>
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<td>Tract welding plant</td>
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<td></td>
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<tr>
<td>Pavement</td>
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<td></td>
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<tr>
<td>Built</td>
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<td>Reconstructed</td>
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<td>65.0</td>
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<td>Mixing station</td>
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Total investment estimation of the project is 35068654000 Yuan
2. Assessment of current state of environment

2.1 Assessment of current state of bio-environment
Assessment scope is urban eco-system and agriculture-eco system centered with human activities. Natural vegetation and species and quantity of large ferae naturae are small. Existing animals and plants are those that are reserved and growth to meet needs of human beings. Being diversity is relatively simple. Since regional greening is relatively improved, crops and manual forests are developed, with good vegetation and slight water and soil loss. Within the assessment scope, agricultural production is developed and land use rate in the region is high. Within the assessment scope, the system is relatively stable and has complete functions. Due to effective management and energy replenishment by human beings, the system can be maintained and developed stably and has certain anti-interference ability.

2.2 Assessment of current state of sound environment
Along Shijiazhuang-Zhengzhou Passenger Dedicated Line, the social living noises is the main noise source except that some sensitive points are affected by noise of Beijing-Guangzhou Railway and existing Beijing-Zhuhai Expressway.

2.3 Assessment of current state of vibration environment
Railway vibration in some sensitive parts 30m from Beijing-Guangzhou Railway exceeds standards of “Both Sides of Railway Trunk” of GB10070-88 Environment Vibration Standards
in Urban Regions.
Other regions along the line are rural areas, where there is no obvious vibration sources and current vibration approaches to background vibration. VLz10 values at each point are 55db or so and lower than 60db. With reference to standards of “residents and cultural and education regions” in GB10070-88 Environment Vibration Standards in Urban Regions, environment vibration can meet the requirements for 70db at daytimes and 67db at night.

2.4 Assessment of current state of water environment
Main drainage channel near New Gaoyi Station is agricultural irrigation channel. Niuwei River near new Xingtai Station is drainage river with bad V category water and V category water under planning. Chapodian Channel near New Anyang River is Anyang Drainage river with bad V category water and V category water under planning.

2.5 Assessment of current state of environment air quality
The line mainly passes wide and open rural areas with fewer air pollution sources and good regional air environment quality.

2.6 Assessment of current state of quality of electromagnetic environment
Among 12 monitoring points along the line, field intensity of signals of 70 channels of 102 TV channels received with antennas can reach nominal usable field intensity in the service region specified by The State Administration of Radio, Film and Television. Total of 92 channels have 35db noise-signal ratio required by normal reception, accounting for 90% of total channels. Generally speaking, villages along the line has very low TV popularization,
but TV signal has very good coverage with better receiving quality.

3. Assessment of environment impact

3.1 Assessment of bio-environment impact

(1) Along Shijiazhuang-Zhengzhou Passenger Dedicated Line, the landform is plain region flushed by flood with flat and wide landform and is urban eco-system and agriculture eco-system centered by human activities.

(2) Railway construction will cover permanent land use of 1174.5hm², of which is 931.7hm² (basic agriculture field of 911.3 hm²) of cultivated land and 63.1 hm² of construction land. Use of large quantity of cultivated land will produce adverse impact on use layout and agriculture production along the line, and results in reduction of grain yield of 12.862 million kg every year. By taking measures of economic compensation for land creation and recovery, the impact can be alleviated.

(3) For the project construction, 171300 trees in the construction scope will be cut, resulting in destruction to vegetation along the line. In the project design, reasonable compensation will be provided for tree cutting. At the same time, arbors, bushes and grasses are planted on the sides of the line and roadbed slop to protect the slopes and beautifying and improving eco-environment. 292840 arbors and 144,090 bushes will be planted to greatly compensate for destruction to vegetation by the project construction.

(4) In the design of bridges and culverts, requirements for flood discharge, irrigation, surface runoff, person traveling and
animal passages have been taken into account. Bridges and culverts are all designed for water level of 1/100, producing slight impact on rivers, flood discharge, flood detention, irrigation and overland runoff and animal passages.

(5) Filling for roadbed and station site of the project is 1980.2×104m3, and cutting is 1163.0×104m3 (including bridge foundation cut of 1092.5×104m3). The project has provided related project protection and greening prevention measures for earth site, roadbed slope, spoil of bridge and culvert foundation, construction site and passage. Fulfillment of these measures will help to reduce impact of earth and rock works on eco-environment and reduce water and soil loss.

(6) The project has 19 earth sites which can provide 1995×104m3 of earth and covers earth site of 540hm2 consisted of hills and barren and dry land, producing slight impact on agricultural production and vegetation. There are 16 spoil sites, which are all soil pits produced by the project. Spoil will be treated and recovered with the earth sites.

(7) There are no environment-sensitive areas such as natural reservation area, water source protection area and cultural relic reservation units in the assessment scope of the project.

3.2 Assessment of sound environment impact

According to environment noise predication results, the noise equivalent sound level 30 meters from center line of outside railway to residences is 64.5~74.4dBA at daytime and 62.2~72.3dBA at night, 0.2~4.4dBA higher and 0.1~2.3dBA higher than standards at daytime and night respectively; the noise equivalent sound level 30~60(75) meters from center line of outside railway to residences
is 63.4~73.4dBA at daytime and 60.8~71.3dBA at night, 0.1~3.4dBA higher and 5.8~16.3dBA higher than standards at daytime and night respectively; the noise equivalent sound level 30 meters in Grade 2 residence is 54.8~70.2dBA at daytime and 51.1~67.9dBA at night, 0.2~10.2dBA higher and 1.1~17.9dBA higher than standards at daytime and night respectively; and the noise equivalent sound level in special sensitive points such as schools and kindergartens is 62.4~73.3dBA at daytime and 59.3~69.2dBA at night, 2.4~13.3dBA higher and 9.3~19.2dBA higher than standards at daytime and night respectively.

### 3.3 Assessment of environment vibration impact

1. Average speed in the entrance and exit station sections in the passenger dedicated line during operation period is relatively high and only some trains will stop in the station to avoid high grade trains. Expected vibration value is high. Most of outdoors ground Z vibration grades 30 meters from external tract from road bank and bridges and section can’t meet standards of 80dB.

2. Evaluation of outdoors ground Z vibration grades 30 meters from external tract from road bank and bridges and section is as high as 84.5~86.5dB. Internal and external vibration of the buildings can’t meet standards.

3. Schools and nursery schools on the sides of the line are far from the line. Indoors and outdoors noises can meet 80dB standards. Outdoor vibration of No. 60 Zhangzhuang Primary School (35m) and No. 111 Shizhai No. 1 Middle School (18m) exceeds 80dB.

4. Points more than 80 meters from the roadbed and non-residue
roadbed along the flood plain/flushing plain of Shijiazhuang-Zhengzhou Passenger Dedicated Line can meet vibration standards on the sides of the railway trunk. After using vibration reduction roadbed, the vibration standard distance is about 51m. 60 meters from the bridge impact scope can meet standards, after vibration reduction, distance of 38 meters can meet standards. Taking damping role of the buildings, vibration 33 meters from road banks and 24 meters from bridges lines after vibration reduction measures can be lower than 80dB.

3.4 Assessment of water environment impact

(1) After implementation of the project, increased wastewater in new Handan Station, New Hebi and New Xinxiang is all domestic wastewater, which is discharged into existing pipelines and then to municipal discharge system and finally to municipal wastewater treatment plant after treatment in the septic tank. Each index can meet Grade III standards of Wastewater Comprehensive Discharge Standards (GB8978-1996). The treatment process designed is feasible.

(2) Wastewater in new Gaoyi Station is, after oxidation treatment, discharged into main drainage channel near the station. Outgoing water quality can meet Grade II standards of Wastewater Comprehensive Discharge Standards (GB8978-1996). The treatment process designed is feasible.

(3) Wastewater in new Xingtai Station is, after oxidation treatment, discharged into Niuwei River. Outgoing water quality can meet Grade II standards of Wastewater Comprehensive Discharge Standards (GB8978-1996). The treatment process designed is
feasible.

(4) Wastewater in new Anyang Station is, after oxidation treatment, discharged into Chapodian channel near the station. Outgoing water quality can meet Grade II standards of Wastewater Comprehensive Discharge Standards (GB8978-1996). The treatment process designed is feasible.

3.5 Assessment of atmosphere environment impact

(1) New Gaoyi, New Xingtai, New Handan, New Anyang, New Hebi and New Xinxiang are heated with terrestrial heat, producing no adverse impact to the air environment. Maintenance regions in New Gaoyi, New Handan, New Hebi and New Xinxiang are heated by oil boiler. Soot, concentration of SO2 and NOX, after measurement, can meet standards of Category II Section II of GB13271-2001 Discharge Standards of Boiler Air Pollutants.

(2) Heating mode in maintenance regions in New Gaoyi, New Handan, New Hebi and New Xinxiang is the same as the station. Oil-fuel boilers are changed into terrestrial heat pumps.

3.6 Assessment of electromagnetic environment impact

After operation of the project, electromagnetic radiation produced by operation of trains greatly reduces noise-signal ratio of channels along the line. Among 102 TV channels received with antennas at 12 monitor points, the first 92 channels of the project can meet 35dB of noise-signal ratio required by normal receiving. After completing the project, remaining 59 channels can meet noise-signal ratio requirements according to operation speeds of trains, 64% of those before the project. After considering radiation and sheltering influence of the trestles and train bodies, high-speed
moving of the train results in rapid drop of wireless channels, each sensitive points are seriously affected by interference and noise-signal ratio is dropped. Since cable TV popularization along Shijiazhuang-Zhengzhou passenger dedicated line is low, generally speaking, the project produces very obvious impact on the TV receiving of the residents along the line.

Working frequency electric fields and magnetic fields produced by enclosure of the traction transformer station is far lower than national standards, producing no adverse impact on health of residents outside the enclosure of the transformer station.

3.7 Analysis of solid waste environment impact
The project mainly produces the following types of solid waste: living waste produced by the construction site, construction waste from removal, living waste from passenger waiting room, domestic waste of train passengers and domestic waste of working personnel of stations along the line.

Waste generation from project removal is expected to be 308,700 m3. Waste generation from passenger waiting room of the stations is about 122t/year. Input of passenger train waste is 153.3t/a and discharge of domestic waste of staff of stations and sections is 148.9t/a.

3.8 Substitute options
1. Highway Substitute options
Compared with highway substitute options, option for railway passenger dedicated line, is better than higher substitute options in terms of impact on eco-environment, social economic profit and transportation safety, and materials guarantee. The highway substitute options is the best option.
2. Local comparison and selection options

(1) Option for Shijiazhuang to Xingtai Section

Option I recommended for the project is environmentally reasonable featured by fewer residents affected, small quantity of earth and rock works and small project investment.

(2) Option for Xingtai Station

Option I recommended for the project is option for east station along Xingtai Beijing-Zhuhai Expressway, which is environmentally reasonable featured by small project investment and high safety.

(3) Option for Handan Station

Option I recommended for the project is environmentally reasonable featured by fewer distributed sensitive points, short line, small quantity of earth and rock works, mall project investment and convenient traveling by passengers.

(4) Option for Anyang Station

Two line plans of Anyang Station is located at the plain. The landform along the line is similar and noises and vibration sensitive points are distributed with small difference. Planning and project investment of the different lines are taken into account. Option I recommended for the project is environmentally reasonable featured by short line, small quantity of earth and rock works, small project investment and convenient traveling by passengers.

(5) Option for Hebi Station

Option 1 is featured by scare distribution of noise and vibration sensitive points, meets urban planning requirements of Hebi City. Option I is environmentally reasonable and featured by
small quantity of bridges and small project investment.

(6) Option for Xinxiang Station

Two line options of Xinxiang Station is located in wash land of Yellow river. The project landform is similar and small difference in distribution of noises and vibration sensitive points. Different line options take planning and passenger traveling into account. Option I recommended for the project is environmentally reasonable featured by short line, small quantity of earth and rock works, and convenient traveling by passengers.

4. Environment protection measures

4.1 Eco-environment protection measures

(1) Protection measures on land and basic agriculture land

Cut of road moat and bridges and culverts is filled to the roadbed and station site to reduce quantity of earth and discharged earth.

Project earth is under unified planning and centrally getting. Earth pit is selected so as to avoid occupation of water irrigation land and vegetable land. The land should be prepared, protected and recovered for cultivation after earth getting. After construction, temporarily used land should be recovered for original functions as soon as possible. For the project that can’t be recovered such as construction passenger to the slop earth pit shall be under local management and maintenance and for local residents to cultivate land.

(2) Soil and vegetation protection measures
Construction vehicles try to use the existing road and strictly drive on the designed construction pavement to avoid grinding of crops and surface vegetation.

During construction, should strengthen management, protect crops and vegetation around the construction site. Temporary facilities should be arranged on an overall basis and shall not be built at will. After construction, remove temporary building, clear up sites and recover for cultivation land.

When transporting building materials producing flying dusts such as sands, soil and ashes, transporting vehicles, should take measures by covering tarpaulins to prevent generation of flying dust. Strengthen management and maintenance of construction road, keep road leveling up. The sand roads should be sprayed with water often to prevent adverse impact of transporting dust on vegetation and crops.

(3) Bridge works protection measures
Mud and sediment and spoil produced from drilling and digging of bridges and culverts should be used as road filling. If they can’t be used, choose sinkage location for unified piling and protection. During infrastructure foundation of crossing-river bridges where there is water throughout a year, transport mud form digging to the bank and use it after shining. After the construction, salvage and clear earth and enclosure, avoid river block and pollution of water body.

(4) Protection measures for farm drainage and irrigation facilities
When the line crosses flood discharge channels and agriculture irrigation channels, set appropriate drainage and irrigation bridges and culvert. When the work covers the above facilities,
remove and construct projects to avoid impact on the functions of existing facilities.

(5) Protection measures for cultural relics
   In the project assessment scope, there are no cultural relics found. The construction unit should report to local cultural relics management department in time to joint find out solutions if cultural relics are found.

(6) Greening measures
   Plant appropriate arbor, bushes and greensward on sides of the line, around the roadbed slope and stations to create better eco-environment.

(7) Protection measures for water and soil loss
   Road banks and slopes are protected by spraying cement grout arch form skeleton + spaying plants and grasses.
   Moat slope is protected by net hanging spraying concrete or cement mortar protection wall, protection slope or arch form frame + hexagon concrete air core blocks + spraying plants and grasses.
   Beach land and shore bank: slope protection under the protection elevation uses cement grout masonry protection slope.
   Main line of passenger dedicated line is set with discharge channels outside the natural protection wall. Exit of the drainage channel is discharged outside the roadbed.
   Cone slope of the bridges is protected by dry masonry blocks or mortar blocks to avoid river water and flood washing.

4.2 Sound environment protection measures
(1) There are total 95 sound barrier along the line, with total length
of 56970m;
(2) There are 151 sound isolation and ventilation windows along the line with total areas of 29535m$^2$;
(3) Reasonably arrange construction site so as to try to be far away from sensitive points such as residential areas; reasonably arrange construction machines in the construction site. Construction machines with larger noises should be as far as one side of sensitive point such as residential areas.
(4) Reasonably and scientifically arrange construction site, measure or estimate noise in the site according to layout of the site, especially noise on the side of sensitive point.
(5) Reasonably arrange working period. Operation with larger noises should be arranged at daytime. If continuous operation is required by protection process or specially required working during 22 hours to 6 hours next day, the employer and construction unit should submit application to the construction administrative department of the jurisdiction before construction and report to local environment protection departments and night construction should be conducted after approval. The employer should arrange resident work with construction unit and announce to the residents and units nearby on the construction period.

4.3 Environment vibration protection measures
(1) Vibration measures should be taken at the sensitive points where vibration nearest to the external tracks exceeds 80dB. No-sediment line is taken with measures of overall vibration-reduction roadbed. There are 83 sections of vibration-reduction roadbed and 45690 double meters.
(2) After using vibration-reduction roadbed, the no-sediment line, if vibration of sensitive points on the sides of the railway trunk exceeds standards, should be removed until indoors vibration reaches standards. Total of 31300m² of houses should be removed along the line.

(3) Based on vibration environment requirements, local government and related departments at different levels are suggested to stop building residence, schools and hospitals within vibration standards distance along Shijiazhuang-Zhengzhou Passenger Dedicated Line.

4.4 Water environment protection measures

(1) Indexes of wastewater from New Handan, New Hebi and New Xinxiang, after treatment in septic tanks, can meet Grade III standards of Wastewater Comprehensive Discharge Standards (GB8978-1996) and the wastewater is discharged into municipal wastewater treatment plant.

(2) Domestic wastewater from New Gaoyi, New Xingtai and New Anyang, after treatment in adjusting sedimentation tank and secondary bio-contact oxidation tank, can meet Grade II standards of Wastewater Comprehensive Discharge Standards (GB8978-1996) and is discharged into channels nearby.

4.5 Air environment protection measures

(1) Special persons should be arranged at the construction site responsible for cleaning, equipped with water spraying equipment to reduce flying dust pollution;

(2) Office area and living area at the construction site should be greened and beautified Hot water boilers and cooking boilers
should use cleaner fuel;

(3) Establish water cleaning system at the construction and removal site, appoint special persons for spraying and cleaning. At the construction, harden the site. Once being dried, should spray water to keep wet and organize force to clean the mud on the construction site and road.

(4) Railway employer should arrange transportation according to regulations on construction pavement designed. Construction pavement should be mud debris road. Trucks transporting building materials should be been overloaded. If required, dedicated seal device or other dust prevention facilities should be used.

(5) Rubbish storage points should be set at the construction site. Temporary piling site, and site of bulk building materials should be compacted and covered and project rubbish and spoil should be cleaned.

(6) Enclosure of the removal and construction site should be complete and perfect to reduce construction flying dust scope. Concrete should be mixed in the shed. When being mixed, spraying and dust reduction measures should be taken to reduce dust pollution.

(7) Along the line, terrestrial heat pump should be used for heating. Only 4 maintenance regions are set fuel boiler for heating. To meet environment protection requirements, heating facilities along the line should be unified for convenient management. It is recommended that oil-fuel boiler in the maintenance areas in New Gaoyi, New Handan, New Hebi and New Xinxiang should be changed into terrestrial heating pumps.
4.6 Electromagnetic environment protection measures

(1) After completing construction of Shijiazhuang-Zhengzhou Passenger Dedicated Line, impact of electromagnetic radiation produced by the trains on receiving TV of residents along the line can be eliminated by cable wire TV network. At the same time, radiation and sheltering impact can be completely eliminated. Compensation principle will be that compensation will be given to the sensitive points where receiving quality is greatly reduced after construction of the project. Compensation expenses are 500 Yuan per family. Reserve amount for the compensation is 5.59 million Yuan.

(2) Though working frequency electric field and magnetic field produced by the built traction transformer station outside the enclosure is much lower than standards recommended by the state, transformer station is suggested to be at least 30 meters from sensitive targets such as residence, nursery schools and hospitals to further reduce electromagnetic impact and eliminate fear of residents.

4.7 Preventive measures for solid waste pollution

(1) Domestic waste produced at the construction site should be collected by a special person and is treated centrally in environment protection departments. Completely remove construction waste produced from removal from the construction site and transport it to the specified site for disposal.

(2) According to requirements of T.J.W [1995] No.178 of Ministry of Railway of Circular on Issuing Supervision and Management Regulations on Comprehensive Treatment of
Waste along the Line, all the train wastes should be sealed in a container and are placed in a fixed location. At the platform of the stations for waste storage, there are waste collection and transportation devices. Waste, after being collected should be transported to environment and health department for unified treatment.

(3) Waste collection device is set along the line. Waste, after being collected should be transported to environment and health department for unified treatment.

(4) Propaganda environment protection to passengers at stations, increase environment protection consciousness of passengers and try to reduce waste casting at anywhere to reduce environment impact.

4.8 Estimation of environment protection project investment

Environment protection works include roadbed and slope protection works, spoil and earth getting protection and treatment works, greening works, waste treatment works, noise and vibration treatment works, and electric and magnetic radiation works, etc. Total investment estimated is 340,427,700 Yuan, accounting for 0.97% of the total project investment.

5 Environment management and environment monitoring program

5.1 Environment management program

To protect environment along the line, and ensure to effectively control and alleviate adverse environment impacts, strict and
scientific environment management should be conducted to implementation of the project, mainly including environment management in the early period of the construction, environment management during the construction period and environment management during operation period. management and supervision organizations of environment protection and related duties are shown in following Table.
5.2 Environment monitoring program

Environment monitoring during project construction period is implemented by the employer and construction unit and supervised by local environment protection and water administrative department. Control project includes pollution impact of water and soil loss, dust and construction wastewater, noises and vibration caused by earth project.

Environment monitoring during the operation period is implemented by Environment Monitoring Station of Shijiazhuang-Zhengzhou Passenger Dedicated Line Co., Ltd. Control project includes supervision and inspection of perfect rate of the stations and environment protection facilities, operation and execution of national and local environment protection laws and regulations, mainly noises, vibration and electromagnetic indexes up to standards.

Environment monitoring during operation period should be conducted by Shijiazhuang-Zhengzhou Passenger Dedicated Line. A Environment monitoring program is formulated according to features of the project by construction period and operation period as shown in following Table.
## Environmental monitoring program in the construction period and operation period

<table>
<thead>
<tr>
<th>Monitoring factor</th>
<th>Phase</th>
<th>Monitoring point</th>
<th>Monitoring parameter</th>
<th>Monitoring method</th>
<th>Monitoring frequency</th>
<th>Standard</th>
<th>Executive unit</th>
<th>Responsible unit</th>
<th>Supervisory agency</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ambient noise</strong></td>
<td>Construction period</td>
<td>Sensitive points of Jiuzhou and Zhanghuo Village, etc.</td>
<td>Equivalent A sound level</td>
<td>GB12524-90 “Method of noise measurement in building and construction site”</td>
<td>Twice/year</td>
<td>GB12523-90 “Noise standard in building and construction site”</td>
<td>Entrusted by the construction unit</td>
<td>Employer</td>
<td>Local competent department for environmental protection</td>
</tr>
<tr>
<td><strong>Vibration environment</strong></td>
<td>Construction period</td>
<td>Sensitive points of Jiuzhou and Zhanghuo Village, etc.</td>
<td>VLZ&lt;sub&gt;10&lt;/sub&gt;</td>
<td>Measuring method in GB10071-88 “Measuring method of ambient vibration in urban area”</td>
<td>Twice/year</td>
<td>GB10070-88 “Standard of ambient vibration in urban area”</td>
<td>Entrusted by the construction unit</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Operation period</td>
<td>Sensitive points of Jiuzhou and Zhanghuo Village, etc.</td>
<td>VLZ&lt;sub&gt;max&lt;/sub&gt;</td>
<td>Measuring method in GB10071-88 “Measuring method of ambient vibration in urban area”</td>
<td>Twice/year</td>
<td>The standard at both sides of “main railway line” in GB10070-88 “Standard of ambient vibration in urban area”</td>
<td>Entrusted by the operation unit</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Air quality</strong></td>
<td>Construction period</td>
<td>Main construction points along the line</td>
<td>Construction dust, tail gas discharge of lorry and construction machinery</td>
<td>Onsite inspection</td>
<td>4 times/year</td>
<td>GB13271-2001 “Emission Standard of Air Pollutants for Coal-burning Oil-burning Gas-fired Boiler”</td>
<td>Construction unit, operation unit or entrusted monitoring unit with relevant qualifications</td>
<td>Employer</td>
<td>Local competent department for environmental protection</td>
</tr>
<tr>
<td></td>
<td>Operation period</td>
<td>Concentration of chimney opening</td>
<td>Smoke and dust, NO&lt;sub&gt;x&lt;/sub&gt;</td>
<td>Monitoring according to “Technical specifications for environmental monitoring discharge of waste gas”</td>
<td>Once/year</td>
<td>GB12526-90 “Noise standard in railway boundary area”</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Water environment</strong></td>
<td>Construction period</td>
<td>Construction campsite</td>
<td>Ph, SS, COD, BOD&lt;sub&gt;5&lt;/sub&gt;, animal and vegetable oil</td>
<td>Monitoring according to “Technical specifications for environmental monitoring waste water”</td>
<td>Once/year</td>
<td>GB8978-1996 “Integrated Discharge Standard of Sewage”</td>
<td>Entrusted by the construction unit</td>
<td>Employer</td>
<td>Local competent department for environmental protection</td>
</tr>
<tr>
<td></td>
<td>Operation period</td>
<td>New Gaoyi, New Handan, etc.</td>
<td>Ph, SS, COD, BOD&lt;sub&gt;5&lt;/sub&gt;</td>
<td>Monitoring according to “Technical specifications for environmental monitoring waste water”</td>
<td>Once/year</td>
<td>GB8978-1996 “Integrated Discharge Standard of Sewage”</td>
<td>Entrusted by the operation unit</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Electromagnetic radiation</strong></td>
<td>Operation period</td>
<td>The communities affected by electromagnetic field, especially the sensitive points to which protective measure is to be taken</td>
<td>TV signal field intensity, field intensity of background radio noise</td>
<td>Guideline on Management of Radioactive Environmental Protection Electromagnetic Radiation Monitoring Instruments and Methods</td>
<td>Monitoring once after normal operation</td>
<td>Normal TV receiving and watch can be available when signal-to-noise ratio reaches 35 dB, and the menu quality adopts 5-level grading standard of damage system as recommended by International Radio Consultative Committee</td>
<td>Entrusted by the operation unit</td>
<td>Employer</td>
<td>Local competent department for environmental protection</td>
</tr>
</tbody>
</table>
5.3 Environment monitoring program during construction period

Environment monitoring during construction period is conducted by qualified supervision unit trusted by the employer. The qualified supervision unit will supervise execution of environment protection measures during construction period.

5.4 Personnel training

To ensure construction environment supervision to be fair and standardized, training should be provided to related supervisors before commencement so as to know environment supervision business and related environment protection laws and regulations.

6. Public participation

Public participation can make assessment unit know lots of public information on related project construction and plays positive role on direction of project construction and environment protection and coordination, strengthen understanding and support of public on the project and lay solid foundation for smooth implementation of the project.

There are three rounds of public participation in the environment impact assessment of the project:

(1) Public participation at the stage of field survey and monitoring
(2) Newspaper and network announcement
(3) Environment assessment announcement

Public participation mode:

(1) Media news release

Before submitting the report to the competent environment protection departments, the assessment unit publishes announcement on environment impact assessment of Shijiazhuang-Zhengzhou Passenger Dedicated Line

(2) Public participation questionnaire

The assessment unit makes survey on public participation in different sectors and classes along the line at the stage of material collection, field survey and report drafting. The public participation in the environment impact assessment mainly includes survey, visit by the assessment personnel, listening to opinions of the publics along the line and asking the interviewees to fill in Public Participation Sampling Questionnaire of the project.

(3) Exchange and consultation at the site

(4) Soliciting for opinions of the management department and experts

The People along the railway show support to the project and considers the project will benefit the local economic development. Almost all the investigators realize importance of environment. Noises and vibration is the major environment problem. Most of people cooperate with the removal for land use involved and wish to get reasonable economic compensation.

The assessment suggests the employer places priority to environment protection spiritually and fulfill environment protection treatment measures in action to minimize environment impact during the construction period and operation period of the railway and fulfill due economic profit and social profit of the project while guaranteeing public interests.

7. Assessment conclusions
According to the assessment, construction of Shijiazhuang-Zhengzhou Passenger Dedicated Line conforms to national energy structure policies and technical policies in railway sector and is of great importance to economic development and improvement of traffic situations along the line. Though the project will produce more or less negative impact on eco-environment, sound environment, vibration environment, water environment, air environment, and electromagnetic environment in the construction region, effective preventive measures are taken after realizing the importance of the impact. The report also provides preventive measures and suggestions addressing local environment features. Only when the environment protection measures and main construction project are completely implemented according to requirements of “three simultaneous”, adverse impact of the project on environment can be reduced or eliminated. Implementation of the project will not produce serious impact or destruction to the environment along the line. The project construction is environmentally feasible.