

## RESEARCH ARTICLE

# Study of owner management on the common provincial trunk highway upgrading

Feng An Ning\*

Xingyi Highway Administration of Guizhou Province, Xingyi, Guizhou 562400, China

**Abstract:** This study reviewed a comprehensive discussion on the owner management of the upgrading and reconstruction project of the common national trunk highway in Guizhou province. Established the Construction Project Management Measures and formulated the measures for the administration of construction projects. From the aspects of project owner management, credit evaluation, main procedures, daily delivery of information, property management fees, the implementation of construction projects, project completion audit, working methods and other aspects to research.

**Keywords:** trunk highway, upgrading project, management

\*Correspondence to: Feng An Ning, Xingyi Highway Administration of Guizhou Province, Xingyi, Guizhou 562400, China; E-mail: [3519478180@qq.com](mailto:3519478180@qq.com)

**Received:** December 18, 2017; **Accepted:** December 29, 2017; **Published Online:** January 8, 2018

**Citation:** Ning F A, 2018, Study of owner management on the common provincial trunk highway upgrading. *World Construction*, vol.7(1):1-6. <http://doi.org/10.26789/JWC.2018.01.001>.

**Copyright:** Study of owner management on the common provincial trunk highway upgrading © 2018 Feng An Ning. This is an Open Access article distributed under the terms of the ([Creative Commons Attribution-NonCommercial 4.0 International License](https://creativecommons.org/licenses/by-nc/4.0/)), permitting all non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

## 1 Introduction

With the development of the national economy, the ministry of transportation has given a strong support policy to help the highway in Guizhou province during the Twelfth Five-Year Plan. The highway of the general state has been upgraded, the National secondary road has reached 50%, and the Provincial secondary road has reached 8.7%. During this period, the reconstruction construction of secondary road in the whole province raised the climax. In the thirteenth Five-Year Plan, the state requires that the National secondary road of Guizhou province reach 90%, and the tertiary road and above reaches 50%. Based on the characteristics of guizhou mountainous area and inform, combined with the implementation of management of project owner, this article provides specific opinions and practice, for everyone in the road or promotions in the transformation of the construction of the project owner management study for discussion and get the application together.

## 2 Establishment of the management institution for project owners

The general requirements of the project management agency: total investment of 200 million yuan or within 30 kilometers of the project; the total number of managers is not less than seven; for each additional investment of 150 million yuan or 20 kilometers of additional miles, one engineering technical manager shall be added; engineering technicians are not less than 65% of the total number of managers and the professional technical titles of intermediate and above shall account for more than 50% of the total number

of engineering technicians. Personnel qualification: have the corresponding engineering organization management ability; good command of relevant regulations and professional knowledge; experience in construction management of more than 1 highway project; professional skills and qualifications for corresponding positions.

Staff settings: One office director of owner management: previously worked as a unit leader or department head or senior professional technical position.

One deputy office director of owner management (technical director): have the technical position of middle and senior engineering.

One head of program: have the technical position of middle engineering.

One project director: have the technical position of middle engineering.

One safety director: must hold the highway engineering security personnel post card.

Finance director: must hold professional technical positions in accounting or economic series intermediate and above.

Other staffs (technical, comprehensive, pilot): must hold the corresponding position qualification certificate.

## 3 Established the Construction Project Management Measures

### 3.1 The basis of the Construction Project Management Measures

Tendering documents, special terms of contract, general terms of contract, technical standards of contract agreement

t, technical specifications of construction, design drawings, related management methods of units, etc.

## 3.2 Contents of the Construction Project Management Measures

### 3.2.1 First section: General rules, organization and job responsibilities

The main targets are the quality objectives, project target, security objectives and construction of a clean and honest administration, etc.

The institutions and job responsibilities are as follows: job responsibilities of the project owner, job responsibilities of the planning (measurement) department, job responsibilities of the engineering (quality) department, job responsibilities of the safety production department, job responsibilities of the finance department, job responsibilities of the integrated department, duty of the office director of owner management, duty of the deputy office director of owner management, job responsibilities of technical director, responsibility of project manager, responsibility of project manager, responsibility of chief security officer, responsibility of chief financial officer, responsibilities of chief executive officer of comprehensive office, responsibilities of other staff members, labor discipline and work Reception management methods.

### 3.2.2 Second section: Methods and management system

Main management system as follows: contract management of project schedule, project quality management, construction schedule management, measurement implementation rules, design change management, safe production (accident emergency rescue plan, construction safety and security) management, environmental protection management, standardized construction and civilized construction management, project financial management, central laboratory management, construction supervision and management, construction of a clean and honest administration management, engineering archive management.

### 3.2.3 Third section: Check the evaluation method and the corresponding form

The main assessment methods are engineering quality inspection evaluation methods, production safety inspection evaluation methods, construction schedule inspection evaluation methods, Construction safety and security checks evaluation methods, etc., and the form for the corresponding inspection and evaluation methods<sup>[1]</sup>.

## 4 Safe production management

Project owners do have to conscientiously implement the requirements on work safety, and make sure safety product, there are leadership, measures, inspection, implementation.

To form a security organization that unified leadership, hierarchical management. The project owner shall do a good job of daily safety precautions and safety supervision inspection, regular or irregular inspection. Combine regular checks with key spot checks, pay close attention to the accident hidden danger management and strictly implement the safety accident reporting system. Sign the safety responsibility of one by one, decompose the security responsibilities and implemented, define responsibility, rights and interests of production safety, the responsibility falls to the individual. When preparing the overall construction organization design and construction organization design of the sub-project, the project shall formulate targeted safety technical measures in accordance with the characteristics of the construction project and establish the safety production rules and regulations and operation regulations. Prepare a special construction plan for the more dangerous works, prepare emergency and safety drills in advance according to the regulations.

## 5 Safe production management

The project will implement the project quality responsibility life-long system within the design service life. The heads of all participating units shall take the lead responsibility for the project's quality management of the unit. The technical director (chief engineer) of each unit shall be responsible for the leadership of the project's engineering quality and technology. The project quality inspection leader of each unit shall be responsible for engineering and technical aspects. The project leaders of each unit shall be directly responsible for the quality of the project site. The project chief engineer of each unit is directly responsible for the quality technology of the project site. The responsible person of the engineering quality inspection of each unit project site shall take the responsibility of the engineering quality of the unit project site on the engineering technology. Site engineering and technical personnel are directly responsible persons.

## 6 Project scheduling management

Prior to the commencement of the project, the project proprietor shall conscientiously review whether the construction unit construction has operability overall construction organization design plan (meeting the requirements of the project duration); supervise the supervising engineer to carefully examine whether the project is reasonable, whether it meets the requirements, and whether the construction measures are proper, quality and safety assurance measures are perfect; supervise the supervision engineer to examine in detail whether it is reasonable, whether it meets the rules and regulations, whether the construction measures are proper, and whether the quality and safety guarantee measures are improved.

The owner convenes a project schedule meeting on schedule every month to make arrangements for the overall

l progress of the project. The progress of the actual construction of the project should be compared with that of the planned schedule. If lagging behind, the project should be adjusted in time to strengthen the construction power and increase the input of resources so as to ensure the planned duration achieve<sup>[2]</sup>.

## 7 Design change management

Design changes are divided into major design changes, larger design changes and general design changes. General design changes approved by the project legal person and be submitted to the provincial bureau for the record. Major design changes and larger design changes are approved by the provincial bureau. After major design changes approval, submitted to the Provincial Department for the record. Owners should strictly control larger or major design changes, strict implementation of the approval authority, dealing with general design changes. Strictly implement the design change site signing system, the general design change plan has been checked and signed by the owner, construction, supervision and design representatives. Major changes and larger changes shall be implemented in accordance with the design change management procedures of the Ministry of Transport and Provincial Department to ensure the rationality and accuracy of the design changes. Engineering change must be based on sufficient. When the supervision engineer signs the change design, it is required to verify the accuracy, the expression is clear, and no vague words should be used. The assessment of engineering changes and changes shall be in conformity with the provisions of the contract and related measures. In the process of engineering construction, the original design unit shall be responsible for the modification of the project design documents due to the design defects, and no other units or individuals may modify it without authorization. For larger and more changes, the approval of the relevant units should be submitted to the original examination and approval unit for approval.

## 8 Engineering measurement and payment

The quality of engineering measurement project must meet the technical specification and design drawing requirements. All kinds of inspection and acceptance procedures are complete. The measurement specification, content, method, measurement unit and the unit price engineering project of the engineering project must be in conformity with the terms of the contract, bill of quantities, the requirements of technical specification and related documents, and the project owner shall uniformly use the measurement payment format or the measurement payment software. After the first trial approved the owners do strict review, send to the project management department sign, and then send to branch project leader for examination and approval, by the project finance department to pay for the metering project.

## 9 Credit evaluation

Credit evaluation is the evaluation that construction unit evaluate the survey and design unit and the construction unit about the design, construction quality, later service quality in the implementation of the project. Support material collection and collation work should be done well. Set up the account in quarterly basis, give construction unit and survey and design unit a fair and impartial evaluation, recommend outstanding enterprises for the transportation industry. The credit evaluation of the supervision unit and the central laboratory is evaluated by the government supervision agency. The owner of the project should do a good job in the related assessment and evaluation for the central testing room and the supervising unit, and provide some basic materials for the evaluation of the supervision institution, provide some basic materials for monitoring evaluation.

## 10 The main formalities settlement related to the project

### 10.1 Highway construction project management agencies for the record

To collect the documents that established by the legal person, documents of the legal representative, the document of the project feasibility study report, enterprise legal person business license or institution legal person certificate, the construction of information about funding sources, profession title certificate of the head of institution, technical director, financial administrator, personnel in key position (security department head, planning department head, engineering department head), the head of the organization and the technical director of the previous project management work performance and related supporting documents, Construction Project Management Method of project owner. Go to the preliminary design document or construction drawing design document approval of the competent department for the record<sup>[3]</sup>.

### 10.2 Highway engineering quality and safety supervision application and highway engineering quality registration

According to the project (self-managed, escrow) management mode, collect the following documents: relevant documents and basis of the engineering project; contract documents of design, construction and supervision; project supervision outline (or supervision plan); construction organization plan; qualification data of the supervision units, central laboratories, survey units, design units and construction units (business license, qualification certificate, safety production license, organization agency code and bank card, etc.); relevant personnel information (Id card, graduation certificate, professional title certificate, professional

technical certificates); bridges, tunnels, high slopes, high-fillings, main structures of large-scale support projects, etc.; submit to the supervision department for approval.

### **10.3 Highway engineering quality and safety supervision application and highway engineering quality registration**

According to the project (self-managed, escrow) management mode, collect the following documents: relevant documents and basis of the engineering project; contract documents of design, construction and supervision; project supervision outline (or supervision plan); construction organization plan; qualification data of the supervision units, central laboratories, survey units, design units and construction units (business license, qualification certificate, safety production license, organization agency code and bank card, etc.); relevant personnel information (ID card, graduation certificate, professional title certificate, professional technical certificates); bridges, tunnels, high slopes, high-fillings, main structures of large-scale support projects, etc.; submit to the supervision department for approval<sup>[4]</sup>.

### **10.4 Highway construction project started permit**

Collect the following documents: approval documents of construction drawing design; the audit opinion of the transportation authority on the implementation of construction funds; the approval of land and resources departments concerning land expropriation or the approval of controlled land; list and contract price situation of construction units and supervision units; prepared prequalification report, bidding documents and bid evaluation report; handling material of quality supervision procedures; materials of ensure project quality and safety measures; submit to State (City) transportation department to approval.

### **10.5 Road property rights**

Collecting land acquisition and demolition generated land housing measurement, payment, contractual basis for the agreement, to the county land and resources management department to handle the highway land property right certificate.

## **11 Daily submission of project owners**

- Project progress report: reflect all aspects of the project.
- Weekly report: know about the land expropriation and demolition of local government for government supervision.
- Engineering quality report: quality supervision bureau should know about the quality of project construction.

- Geological hazards and safety production reports of construction: know about the safety aspects of the geological and construction production.
- Highway construction market order report: know about whether the highway construction market has violated the basic construction procedures, appoint the construction team and construction material and other behaviors.
- Propaganda and reporting: carry forward highway culture, report on the construction of the project, encourage all participating units complete the objectives ensuring the quality.
- Temporary information: to submit the information of the project according to the temporary arrangement of the superior timely. The focus should be on the project quality safety self-inspection project promotion work report.

## **12 Construction fund management**

Project construction funds to implement account management, earmarking. The project owner urges the construction unit to set up a project capital account at a designated bank and strictly enforce the accounting standards for business enterprises. No transfer, diversion or occupation of the construction funds shall occur, nor any occurrence of false invoices, payment of white batches, discrepancies in cost and expense, etc. , to pay all taxes and fees in time. Project owners do to urge the construction unit shall sign tripartite funding management agreement with the landlord bank, abide by all provisions of the terms of the contract about money use, consciously accept the owner and the bank supervision management of project construction funds and check, accept the auditing department audit of project fund, and strictly carry out the audit opinion. Construction project owner management fee refers to the construction project preparation, construction, construction, completion work, acceptance, summary and other work costs. The costs include staff salaries, wage subsidies, allowances, office expenses, conference fees, travel expenses, vehicle costs, project bidding costs, resident construction costs, business entertainment and other expenses. In particular, the business entertainment expenses shall not exceed 10% of construction project owners management fees, financial management shall be set up by category, in accordance with the provisions of the financial system, strict control.

## **13 Implementation of construction projects**

### **13.1 Project implementation adhere to the principle**

When implemented, the design shall be carried out in accordance with the construction drawing design. Local design changes can be made, but the following points should

be made: first, make the design drawing perfect principle: re-check and joint trial the design drawing and the actual topography and landform when entering the construction site, perfect the drawings. Second, make good use of the old road principle: make full use of the old road as an emergency parking zone or a climbing lane or a village fair or landscape resting place. Third, local adjustment principle: For the past villages of the line, subject to house demolition, cultural relics protection, drainage and other effects, may be appropriate to adjust the line plane, vertical<sup>[5]</sup>.

### 13.2 To supervise the key parts of the project

- Bridge foundation, hole pile, beam plate, arch ring.
- High slope cut slope  $\geq 20$  m.
- High fill fill  $\geq 5$  m. It is mainly stratified compaction.
- Large-scale support engineering structure: large retaining wall  $\geq 1200$  m<sup>2</sup> or the height of the retaining wall  $\geq 8.0$  m. Base bearing capacity, strength of concrete and mortar.
- Roadbed inspection: plane position, longitudinal surface elevation, ratio of slope, groove depth.
- Pavement: the pavement thickness, compaction degree and asphalt dosage of each structure layer.

Implement The First Project Acceptance System, implementation of Four New Technologies application.

## 14 Project completion audit

Basis of audit: bidding documents and contracts, Related documents and systems, key auditing design changes and exceed the total contract part of the project. In daily work, do the original records, pictures, video data collection and finishing, provide truthful and valid data and information, accept social supervision and government audit, to achieve the reasonable compliance expenses of project funds.

## 15 Theme of project owner management

### 15.1 Contract management

Project owner management should be based on consultant signed the project consulting contract, bidding documents signed survey and design contracts, construction contracts, construction supervision contracts (including the central laboratory) as a basis.

### 15.2 Safety production management

Based on the State Safety Production Law, the Technical Specifications for Road Construction Safety, the Road Safety Guide and the Original Road Safety Maintenance and Management, Supervision and management of safety funds, construction safety, construction insurance, safety drills,

safety and security, and prevention of potential safety hazards.

### 15.3 Safety production management

The establishment of four systems of quality management that is Government Supervision, Corporate Management, Social Supervision, Self-inspection. Strengthen the contractor's raw materials, mining materials, construction mix, construction techniques and processes, construction self-assessment and data recording supervision and check the quality of the project and accept the quality supervision and inspection of provincial highway bureau.

### 15.4 Construction schedule management

According to the characteristics of highway reconstruction, combined with the project of the requisition, funds in place, to determine the optimum construction plan, the reasonable allocation of personnel, engineering machinery and equipment, progress plan, do demolition and construction, to supervise and urge the construction progress.

### 15.5 Investment control

The bid of the construction unit is the bid of the quantity list price, that is, the design quantity, the price quoted price as the quotation, is the unit price management is not the general price contract. In the management of construction drawings based design, strict control of the number of projects and the imbalance of quotations, to ensure that do not break the approved construction drawings budget.

### 15.6 Design change control

Design changes are divided into major design changes, larger design changes and general design changes, one of the following situations is a larger design change:

- Continuous length of more than 2.0 km route plan adjustment.
- The type, width and thickness of pavement structure change.
- The number or structure of large and medium-sized bridge changes.
- The number of tunnels change or programs change.
- Other individual project costs change more than 500 million.
- Exceed construction design approval budget.

In accordance with the above requirements, owner management shall strictly control major or larger design changes, master the approval authority of project owners, and deal with general design changes. Design changes to have supporting information, the number of projects to seek truth from facts, the unit price in accordance with the list, similar to the list of negotiated prices, construction plans under the float unit price management, in line with the design change procedures, stand the audit.

### 15.7 Raise awareness of environmental protection

Strengthen the awareness of environmental protection, with the concept of green engineering throughout the entire construction, prohibit indiscriminate chaos, destroying the ecological balance of behavior, make full use of the old road, build Guizhou Smooth and Beautiful Highway.

### 15.8 Information and archive management

Familiar with construction drawing design, budget, quantity of design of the list of sources clear, classification establishment of engineering measurement, design change, safety production, project quality, land property rights, financial special, credit rating, clean government and meeting documents and other accounts. The focus is design change, land property accounting. The Implementation Rules for Acceptance and Acceptance of Highway Engineering (Handover), Regulations on File Filing and File Filing of Major National Construction Projects, Measures for Traffic Archives Management, Measures for Registration of Archives of Traffic Construction Projects, Traffic Construction Project File Special Acceptance as the basis for guidance, improve file management.

### 15.9 Clean government construction management

Take Guizhou Province's Ten Prohibitions and Five No Provisions in the field of management of transport system as well as the requirement of cleanliness at this stage as the guideline, not less than one meeting and daily education should be conducted every month to strengthen the management of clean government.

## 16 The work of the project owner

- Coordinate the land acquisition and demolition work of local governments. Pay more respect, negotiate more, communicate first, then do, master the technique of work.
- The service of the designer: Provide flat, vertical, to the acres, wire control points, pile-by-pile coordinates of the electronic version, and sent design representative resident, guide the design in the construction of a reasonable application.

- The problem of construction: Provide the support basis for the problem, submit the supervision review, initial opinion, and finally the owner to approve.
- Correctly handle the relationship between owner, construction and supervisor. Strictly speaking, the relationship of the contract (entrusted) is equal. In the project construction is to help each other, to communicate with each other, support each other, mutual understanding and common development, work together to complete the project.

## 17 Conclusion

This is our actual practice in the management of project owners. We have obtained some experience and achievements. Certainly, there are still some shortcomings. We will continue to improve our work and hope that comrades will study and give criticism and rectification. For ordinary the provincial trunk highways and other upgrade project owners management provide a scientific and useful guidance.

## Conflict of Interest Declaration

No conflict of interest was reported by the author.

## References

- [1] Zhang X J, 2011, Low grade highway along the river line promotion transformation design. *Urban Roads Bridges & Flood Control*, vol (5): 35-40,238.  
<http://doi.org/10.16799/j.cnki.csdqyfh.2011.05.011>
- [2] Su Y Q, Dong Y and Zhang H J, 2012, Network promotion renovation project design speed of. *Traffic standardization*,vol (17): 20-23.  
<http://doi.org/10.16503/j.cnki.2095-9931.2012.17.015>
- [3] Rodrigues A and Bowers J, 1996, The role of system dynamics in project management. *International Journal of Project Management*, vol.14(4): 213-220.  
[http://doi.org/10.1016/0263-7863\(95\)00075-5](http://doi.org/10.1016/0263-7863(95)00075-5)
- [4] Ismail D, Majid T A, Roosli R, et al. 2014, Project management success for post-disaster reconstruction projects: international NGOs perspectives. *Procedia Economics and Finance*, vol.18: 120-127.  
[http://doi.org/10.1016/S2212-5671\(14\)00921-6](http://doi.org/10.1016/S2212-5671(14)00921-6)
- [5] Battikha M G, 2003, Quality management practice in highway construction. *International Journal of Quality & Reliability Management*, 5.vol.20(5): 532-550.  
<http://doi.org/10.1108/02656710310476516>