

# Exploration of Management Methods for Improving the Quality of Statistical Data of Transportation Enterprises in Hangzhou City

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**Abstract:** In order to improve the authenticity of statistical data, prevent the falsification of statistical data, further improve the quality of statistical data, better play the advisory role of statistical data in decision-making, and enhance the credibility of government statistical work, based on the direct reporting data of Hangzhou's transportation enterprises, this study analyzes the problems in data management of Hangzhou's transportation enterprises from the current quality management situation of transportation statistical data in Zhejiang Province, and proposes improvement plans that adapt to the data quality control of Hangzhou's transportation enterprises before, during, and after the work.

**Keywords:** transportation enterprises, data quality, management improvement

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## 1. Quality Management of Current Transportation Statistics Data in Zhejiang Province

### 1.1. Establishment of Traffic Statistics Institutions

Enterprise statistical data is subject to enterprise reporting and hierarchical review management. At the ministerial level, it is managed by the Comprehensive Planning Department of the Ministry of Transport. At the provincial level, it is managed by the Planning Department of the Provincial Department. The Provincial Highway Transport Center and the Port and Shipping Management Center are responsible for managing statistical data in their respective fields according to their respective responsibilities. At the city and county levels, it is managed by the Transportation Bureau, and each center is responsible for managing statistical data in their respective fields according to their respective responsibilities are shown in Figure2.

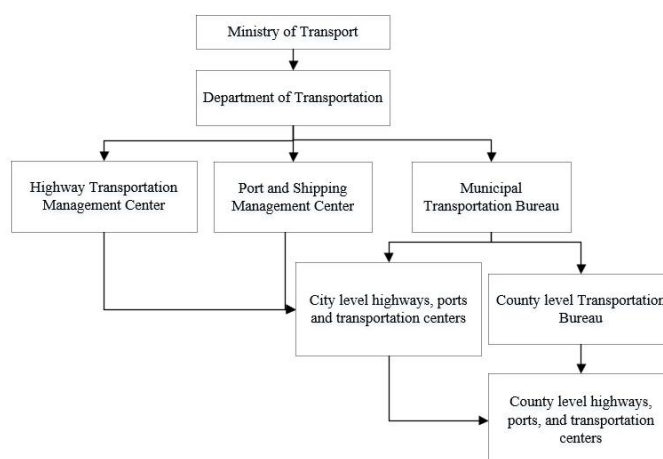


Figure 1 Current Setting of Traffic Statistics Institutions

### 1.2. Statistical Data Quality Management System

(1) At the national level: firstly, the State Council has issued the "Statistics Law of the People's Republic of China" and the "Implementation Regulations of the Statistics Law of the People's Republic of China" laws and regulations, which apply to statistical activities organized and implemented by people's governments at all levels, statistical agencies of people's governments at or above the county level, and relevant departments; The second is that the Ministry of Transport has

issued the "Regulations on the Management of Transport Statistics" and the "Implementation Opinions of the General Office of the Ministry of Transport on More Effective Play of the Supervision Function of Transport Statistics", which are applicable to the transport authorities conducting transport statistics activities within the territory of the People's Republic of China.

(2) At the provincial level: firstly, the Zhejiang Provincial Bureau of Statistics has issued the "Regulations on the Supervision and Management of Statistical Work in Zhejiang Province", which applies to all units and individuals within the administrative region of Zhejiang Province; Secondly, the Zhejiang Provincial Department of Transportation has issued the "Zhejiang Provincial Transportation Statistics Management Measures" and the "Zhejiang Provincial Transportation Statistics Data Quality Responsibility Division and List"; Thirdly, the Provincial Highway and Transportation Management Center has issued the "Zhejiang Province Highway and Transportation Industry Statistical Data Quality Control Measures (Trial)" and the "Classification and List of Statistical Data Quality Responsibilities".

(3) At the municipal level: Firstly, the Hangzhou Municipal People's Government has issued the "Opinions of the Hangzhou Municipal People's Government Office on Further Strengthening Statistical Infrastructure Construction and Improving the Quality of Statistical Data"; Secondly, the Hangzhou Municipal Bureau of Statistics has issued the "Opinions on Establishing a Statistical Data Quality Monitoring and Evaluation System to Further Improve Statistical Data (Trial)"; Thirdly, the Hangzhou Transportation Bureau has formulated and issued the "Hangzhou Transportation Statistics Management System" and the "Hangzhou Transportation Statistics Data Quality Responsibility Division and List".

### 1.3. Approval process for direct reporting data of transportation enterprises

The data submitted by transportation enterprises is subject to a hierarchical review and approval process based on the principle of hierarchical reporting. The specific process is: initial review - re review - final review. The enterprise reports to the county-level management unit for county-level management review and reporting to the municipal management unit. The municipal management unit reviews and reports to the provincial management unit, and the provincial management unit reviews and reports to the Ministry of Transport. If any level is found to have failed the review during the review process, it will be rejected until it is approved by the Ministry of Transport.

### 1.4. Approval Rules for Monthly Data Reporting by Transportation Enterprises

The direct reporting data approval of transportation enterprises mainly includes the monthly production situation approval of highway and waterway transportation, as shown in Figure 2.

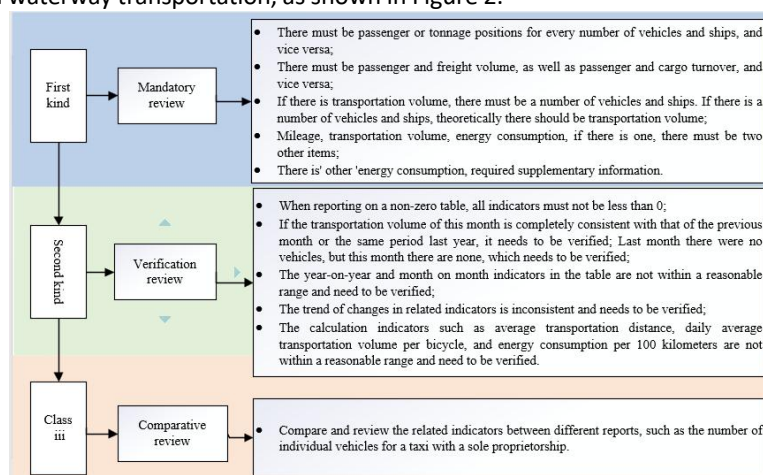


Figure 2 Classification of Monthly Data Audit for Direct Reporting by Transportation Enterprises

### 1.5. Quality Management System for Transportation Statistical Data

At present, the statistical data quality management system established from top to bottom in transportation statistics strictly controls the data quality process through process control, evaluation system, and verification mechanism. The data quality system governance thinking is applied, and "based on institutional guarantees, process control as the starting point, evaluation system as the core, and verification mechanism as the promotion" is used to achieve data quality management without blind spots.

## 2. There are problems in the management of direct reporting data for Hangzhou enterprises

### 2.1. Limited binding force in terms of legal system

At present, although China has been improving and revising statistical laws and regulations such as the Statistics Law, there are still certain limitations that cannot meet the practical needs of statistical work. Among them, the degree of refinement in the punishment for statistical violations is insufficient, the focus is limited, and the operability is poor. The Statistics Law only briefly mentions that "the people's government at or above the county level shall order correction, give a warning, and may issue a notice", and the statistical work of departments and industries cannot fundamentally improve their statistical law enforcement and supervision capabilities.

### 2.2. Weak grassroots statistical strength

One reason is that there is a shortage of grassroots statistical personnel, many part-time jobs, and some staff members do not attach enough importance to statistical work, which makes it difficult to carry out the work and leads to insufficient quality control of source data; Secondly, full-time statistical staff hold multiple positions, with one person corresponding to multiple departments, resulting in relatively weak business capabilities and greater difficulty in carrying out their work; Thirdly, there is a high turnover of statistical personnel, frequent changes, loose connections, and a gap in understanding the statistical criteria and corresponding indicators due to personnel changes. This results in insufficient understanding of statistical indicators and criteria, and the control of data quality at the source cannot be effectively improved.

### 2.3. The existing statistical management mechanism is not perfect

One reason is that the importance of statistical work has not been fully recognized. Management departments and enterprises often place more emphasis on improving economic efficiency and business models, neglecting the importance of statistical work, resulting in a lack of scientific data support for government decision-making; Secondly, there is a lack of effective mechanisms for pre -, during -, and post data quality control, resulting in some industry managers and enterprises lagging behind in obtaining important information such as statistical methods, statistical audit rules, and data quality control, which cannot meet the high requirements of current statistical work; The third issue is the lack of a clear data quality verification mechanism, which leads to management departments being unable to efficiently verify the data reported by enterprises within the effective time frame.

## 3. Methods for improving data quality management

Based on the existing transportation statistical data quality control system, combined with the problems in Hangzhou enterprise direct reporting and data quality control, the following detailed improvement plan is proposed:

### 3.1 Pre control measures

#### 3.1.1 Improve the communication and training mechanism for statistical work

Improve the communication and training mechanism for statistical work at the provincial, municipal, and county levels, ensure familiarity with statistical systems and requirements, enhance the effectiveness of statistical work training, and form a communication and training loop of "participation in training - business familiarity - enterprise communication - effective reporting". Specifically, as follows:

(1) Training mechanism for statistical personnel in the management department. Firstly, industry management departments at all levels regularly hold training sessions for statistical personnel on statistical business. Develop a training manual for statistical personnel in the management department and prepare training materials to facilitate their learning and improvement. The training targets include statistical personnel from various levels of management departments; Secondly, actively participate in provincial-level training sessions to understand the latest trends and changes in statistics, and enhance the professional level and management ability of municipal level statistical management personnel; The third is to hold city level training sessions for relevant business statisticians in each county (district, city) within the jurisdiction of the city.

(2) A training mechanism for enterprise statisticians. Firstly, industry management departments at the city and county (district, city) levels regularly conduct training sessions for statistical personnel of enterprises within their jurisdiction. At the municipal level, a set of guidance manuals for enterprise statisticians can be developed, which can be divided into guidance manuals for highway transportation enterprises, waterway transportation enterprises, and port transportation enterprises according to industries; Secondly, county (district, city) level can further optimize and improve the formation of enterprise guidance manuals with local characteristics based on the different characteristics of local enterprises. The training targets all statistical personnel of a set of table enterprises in the local area.

(3) Establish a mechanism for interconnectivity between the management department and a set of enterprises. Firstly, the statistical personnel of the management department establish a bridge for long-term communication and exchange with a set of enterprises within their jurisdiction. Industry management personnel ensure familiarity with the business situation of each enterprise, and guide enterprises to establish or improve statistical ledgers based on their operational characteristics; The second is to strictly control the entry of new enterprises into the warehouse, ensuring that each new enterprise has a sound statistical foundation and effective communication in statistical work; The third is to establish a mechanism for interconnection and intercommunication, which will be established through online WeChat groups and offline field visits and research. The interconnection and intercommunication content includes conveying the requirements of higher-level statistical work, enterprise operation situation, business type, business characteristics, statistical data sources, statistical data processing methods, data reporting situation, statistical ledger situation, and problems encountered in the process of enterprise statistical work.

### **3.1.2. Improve the responsibility and assessment mechanism for statistical objectives**

(1) Establish job responsibility objectives for data quality. Firstly, according to the various stages of data production in different professional fields, personnel, positions, responsibilities, and quality are determined, and the goals of data quality control are decomposed and implemented from top to bottom, clarifying tasks, responsibilities, standards, and requirements, ensuring that there are clear quality control standards for every stage from data collection to data review and analysis, and ensuring that work is carried out according to their respective target responsibilities; The second is to tighten and compact the target responsibility assessment at all levels, form a target responsibility management system where everyone strengthens their sense of responsibility, participates in data quality control, and implements it layer by layer to ensure that every aspect of statistical data production is under supervision and effectively guarantees the quality foundation of statistical data.

(2) Establish a method for evaluating the professional competence of statistical personnel. The industry management department shall formulate evaluation methods for statistical personnel to ensure the professional competence and work effectiveness of statistical personnel in various fields. The evaluation targets include statistical personnel from various levels of management departments and related businesses, including highway, waterway, port businesses, etc. The evaluation content includes participation in statistical training, visiting and researching enterprises, interconnection with enterprises, training effectiveness (including mastery of statistical systems, etc.), implementation of key points for report data review, and return of reports by superiors. The evaluation frequency can be conducted quarterly or annually. For statistical personnel with poor evaluation results, timely feedback and active communication of difficulties in the statistical process should be provided, and efforts should be made to improve deficiencies.

## **3.2. In process control**

### **3.2.1. Establish an enterprise data quality verification mechanism**

Regularly verify the statistical data of enterprises. The first verification object includes: survey objects specified in a set of statistical system for transportation enterprises, involving road transportation, waterway transportation enterprises, urban passenger transportation, port business operators, and enterprises with monthly transportation volume audits exceeding [-50%, 50%]. The second is the verification method: based on the relevant requirements of the statistical investigation system and the characteristics of the verification objects, on-site verification, telephone verification, problem clue verification and other methods are used to focus on verifying the source data quality of newly added or changed survey objects, as well as survey objects with large total volume and abnormal data fluctuations. The third is the verification process: mainly divided into extracting verification objects, issuing verification notices, on-site verification procedures, and off-site verification procedures. The fourth is the verification results: using the source data reporting errors

found during the verification, feedback will be provided to the investigation object step by step, and the city and county management departments will be responsible for supervising their verification, modification, and reporting, and keeping records.

### 3.2.2. Develop incentive mechanisms for enterprise statistical work

One is to solve the problems of enterprises not attaching importance to statistical work and insufficient statistical funds, and continuously consolidate the statistical foundation of enterprises; The second is to promote enterprises to establish complete statistical ledgers and related filing materials, establish corresponding indicator calculation supporting evidence, do a good job in collecting and organizing basic data, and improve the quality of statistical data from the source of data production; The third is to effectively promote the standardized construction of grassroots statistical foundations, boost the work spirit of enterprise statisticians, and stimulate their enthusiasm for work. The scope object is a set of networked direct reporting enterprise statisticians. The main content includes comprehensive management, basic ledger, data quality, support and cooperation, compliance with management, legal publicity, and other aspects.

### 3.3.3. Establish a mechanism for verifying enterprise statistical data

According to a set of table data approval requirements, combined with the actual situation of this city, industry management departments should verify the authenticity of data from multiple sources. For enterprises with transportation volume exceeding [-100%, 100%], they should continuously expand the evaluation dimensions of management department data through operational truck transportation system data, electronic waybill data, GPS data, highway toll station data, and strengthen data evaluation methods. Establish a closed-loop process of "enterprise data reporting management department data verification enterprise review feedback". The enterprise data verification process includes exporting enterprise data, collecting industry data, providing feedback on verification results, and providing feedback on enterprise review.

### 3.3.4. Improve the data audit management system

Based on the existing higher-level audit rules and requirements, city and county-level management departments can further develop reasonable audit rules for their own level according to communication with enterprises, clarifying the basic regulations, audit responsibilities, audit processes, and audit points of data audit. The basic regulations for auditing must be carried out by relevant management departments or personnel with relevant responsibilities, and auditors should carry out their work in accordance with the corresponding auditing rules and requirements; During the review process, it is necessary to comply with laws, regulations, and organizational standards. Enterprises must not be required to tamper with, fabricate, or delete data, and data leakage is strictly prohibited.

## 3.3 Post control measures

Establish a full process evaluation and feedback mechanism for control measures. Regularly evaluate and provide feedback on each link and control measure, including communication and training evaluations, assessment results evaluations, data quality verification evaluations, incentive mechanism evaluations, data verification and audit evaluations. Feedback the evaluation results of various links and control measures to the statistical personnel of industry management departments and enterprise statistical personnel at all levels, forming a circular work mechanism of "implementation evaluation feedback correction implementation".

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