White Paper on Smart Safety of Road Freight Industry in China
## Content

**Executive summary**  4

**Insight into freight safety trends and impact analysis of economic benefits**  5

General trends of road freight safety in China  6

Distribution characteristics of road freight accidents  7

Impact analysis of economic benefits from freight safety risk  9

**Cause analysis of road freight safety risk**  10

Direct cause: Correlation analysis of accident attribution  12

Cause of management: Lack of lean operation  13

**Industry advice**  15

Short-term development: Leveraging digital technology to improve freight smart safety management  16

Medium and long-term development: Apply lean operation and implement risk management  19

Industry value chain: Accelerate upstream and downstream ecological collaboration and jointly build an industry safety management system  21
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Executive summary

In the past decade, the scale of China’s road freight industry has risen rapidly, driven by the rapid growth of Chinese residents' consumption expenditure and the rapid development of digital e-commerce. As the most important way of goods transportation, as of 2019, China’s road freight volume exceeded 41.6 billion tons, cargo turnover was close to 8 trillion tons kilometers, and the number of freight trucks exceeded 13 million, which has developed into the world's largest market. However, with the rapid expansion of the market, safety risks remain high, which has always been a pain point for development of the industry. The fragmented structure of China’s road freight market, the low level of digitalization, and the uneven capabilities of lean operation lead to a lack of comprehensive and systematic data statistics and analysis of safety risks. It has become a long-term "inevitable" and "invisible" chronic illness in the industry and will prevent overall operational efficiency improvement of China's road freight transportation.

With the advent of the 5G era, it will greatly accelerate the development of Internet of Things and the improvement of basic computing power, thereby promoting the visualization and transparency of risk behaviors, making it possible for freight companies to use digital technology to achieve smart safety management. In order to truly and comprehensively analyze the overall trend of China's road freight safety, PwC strategy consulting business Strategy&, together with the Internet of Things technology company G7 and China Transportation News, jointly issued the "White Paper on Smart Safety of Road Freight Industry in China". Based on PwC’s long-term insight into transportation industry, G7’s accumulated road freight big data and the analysis of more than 4,000 accident samples in 2019, we conducted a systematic study of China’s road freight safety trends, causes, economic benefits, and solutions. Through this report, PwC Strategy&, G7 and China Transportation News will explain the current status of road freight safety and the causes of accidents to upstream and downstream companies in the industry, and focus on how to reduce safety risks, improve work and life of truck drivers, improve lean operation of freight companies and improve the level of operation and provide effective advice to the industry.
General trends of road freight safety in China

Under the background of continuous improvement of regulatory standards and safety regulations and policies, the number of road freight accidents in China has been effectively controlled in recent years, but the overall accident risk is still high. The G7 big data platform shows that as of 2019, the number of million-km accidents in China is 3.7; however, the number of million-km accidents of US is around 1.3 (Figure 1). At the same time, according to industry expert interviews, the mortality rate of truck drivers in China is around 1‰. Compared with developed countries, the safety management of China’s road freight industry still has a long way to go.

Figure 1: Comparison of accidents per million kilometers between China and the US (by unit)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>China</td>
<td>US</td>
</tr>
<tr>
<td>3.7</td>
<td>1.3</td>
</tr>
</tbody>
</table>

Information Sources:
G7 big data platform, desktop research, NHTSA, PwC Strategy& analysis
Distribution characteristics of road freight accidents

Based on the sample analysis of the G7 big data platform, we further analyzed the freight accident and found the following distribution characteristics:

- **Compared to night, accidents occur more frequently at 7-9 a.m.**
  
  The data shows that the number of accidents between 7-9 a.m. million kilometers is as high as 4.7 (Figure 2), which is peak during the day. According to survey, most freight drivers usually finish loading and start driving at midnight. They have been working for about 8 hours at 7-9 a.m. and are in a tired state. Morning peak in this time period result in sharp increase in road vehicle density. Therefore, multiple reasons result in a high incidence of accidents.

- **The number of national and provincial road accidents is significantly higher than that of highway, but the latter has more serious accidents**
  
  Due to more standardized governance and better road conditions, driving behavior is more standardized, so the number of highway accidents is significantly lower than that of national roads and provincial roads. The number of highway accidents per million kilometers is 1.9, while national roads have as many as 11.4. The provincial roads at 9.3 (Figure 3). Although the overall number of highway accidents is low, the compensation for accidents is 70% higher than that of national and provincial roads, and the degree of accidents is more serious. Therefore, the control of highway accidents is still the focus of monitoring for various fleets and freight companies.
• The risk of accidents varies widely, with 70% of the compensation being caused by 10% of accidents

We found that the 80-20 rule also applies in the field of road freight safety. Sorting the accidents according to the amount of compensation, it can be found that the risk of freight accidents varies. The top 10% of accidents contributed 70% of the amount of compensation (Figure 4), which means that there is a high degree of leverage in safety risks. Serious accidents are the top priority for fleet / freight companies to prevent.

• The smaller the fleet size, the higher the risk of accidents

China’s road capacity structure is relatively fragmented, with more than 65% of the vehicles operated by individuals. As the market base, the number of risks of small and medium-sized fleets1 per thousand kilometer2 is about three times higher than that of large fleets (Figure 5), reflecting the current situation of large differences in the safety management level among China's freight companies. Due to the lack of safety management processes, tools and methods, small and medium-sized fleets have maintained a low driving safety factor for a long time.

Note 1: The super-large fleet refers to the fleet with more than 1000 vehicles; the large fleet refers to the fleet with 100-1000 vehicles, and the small to medium-sized fleet refers to the vehicle with 100 vehicles or individuals

Note 2: The number of risks per thousand kilometers = the number of high-risk behaviors (such as aggressive driving, fatigue driving, etc.) / thousand kilometers
Impact analysis of economic benefits from freight safety risk

Under the background of continuous compression of shipping prices and companies facing greater cost pressures (Figure 6), safety risks will further aggravate the cost-side challenges. In China, road freight companies have an average annual accident insurance compensation of about RMB30,000 per car; for serious truck accidents, the one-time loss is as high as several hundred thousand yuan, and the losses include vehicle damage, personnel compensation, cargo compensation, etc. In addition, an average single truck accident will result in a 6-7 day outage, resulting in an average loss of revenue of approximately RMB 35,000 per trip (Figure 7).

Accident risk will also affect the economic benefits of the upstream and downstream industries, especially insurance companies. Due to the high accident rate, the road freight industry also presents a high insurance compensation rate. The premium for heavy-duty trucks in China is above 100 billion. In addition to the increase in premiums for freight companies, insurance companies usually pay 80% of the losses. Proper safety management can reduce the overall accident compensation rate by 10% to 15%, and well-managed fleet compensation can even drop by 35%. The upstream freight company's risk management level has a significant impact on the insurance company's profit.
Cause analysis of road freight safety risk
Road cargo transportation is usually affected by drivers' driving behavior, devices, external environment, emergencies and other factors, so the factors that cause accidents are complex and diverse. However, in addition to the direct causes, behind the accident, the lack of safety management system is a systematic cause that has been lurking "under the iceberg" for a long time.

Factors of Safety Risks: Direct Causes of Accidents and Systematic Causes “Under The Iceberg”

**Direct Causes of Accidents**: including driver driving behavior, vehicle devices, road conditions and emergencies

**Management Systematic Causes**: lack of lean operation system, lack of on-site management tools and processes, etc.

**Information Sources**: G7 big data platform, expert interviews, PwC Strategy& analysis
Direct cause: Correlation analysis of accident attribution

From the perspective of direct causes, drivers’ improper driving behavior and devices blind spots are the main factors leading to accidents. Based on the big data analysis of G7 platform, 37% of road freight accidents is caused by drivers’ behavior, 35% are caused by devices blind spots. These two causes are main factors that lead to accidents (Figure 8).

Within driving behaviors, most accidents are caused by aggressive driving behavior: among the accidents caused by drivers, aggressive driving behavior accounts for nearly 80%, including intersection speeding, speeding too fast, turning too fast, overtaking, and unsafe distance. In addition, fatigue driving is the second largest factor, resulting in 15% of accidents (Figure 9).

Equipped with blind spots is second largest cause of accidents: most fleets have low loading rates of assisted driving devices, so blind spots will also cause high incidence of accidents (Figure 10), among which are mainly right blind spots (accounting for 42%) and reversing blind spots (32%).

Information Sources:
G7 big data platform, PwC Strategy& analysis
Figure 9: Breakdown of drivers’ driving behavior factors (unit: %)

- **Aggressive driving** 77%
  - Including intersection speeding, speeding too fast, turning too fast, overtaking, and unsafe distance
- **Fatigue driving** 15%
  - Including long-term driving without adequate rest, poor physical condition, etc.
- **Distractions** 4%
  - Including making phone calls, watching cell phones, smoking, etc.
- **Dangerous driving** 4%
  - Including retrograde, rolling, etc.

**Information Sources:**
G7 big data platform, PwC Strategy& analysis

Figure 10: Breakdown of devices blind spots factors (unit: %)

- **Right blind spots** 46%
- **Reversing blind spots** 32%
- **Left blind spots** 19%
- **Blind spot ahead** 1%
- **Others** 2%

**Information Sources:**
G7 big data platform, PwC Strategy& analysis

**Cause of management: Lack of lean operation**

From the perspective of management system, the lack of lean operation system is the root cause of safety risks of China's road freight industry, which is mainly determined by China's unique transportation capacity structure. Compared with the United States, Japan and the European Union, China's road freight transportation capacity structure is "big and scattered". Although the overall market size is already in the first echelon, the market share of large freight companies is relatively low (Figure 11), which means the industry is far from entering the stage of economic of scale and intensive operation. A large number of small and medium-sized fleets have been in the dilemma of low-profit and low-efficiency operations for a long time, and they lack a sophisticated management system. Although the industry's capacity structure is gradually concentrating on large freight companies, the "big and scattered" feature will still exist in the short term.

Figure 11: China's unique capacity structure leads to a low level of lean operation management system

<table>
<thead>
<tr>
<th>Number of trucks (2018, '000 units)</th>
<th>Market share of top ten enterprises (unit: %)</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>~13,600</td>
</tr>
<tr>
<td></td>
<td>~5%</td>
</tr>
<tr>
<td>US</td>
<td>~15,500</td>
</tr>
<tr>
<td></td>
<td>~13%</td>
</tr>
<tr>
<td>EU</td>
<td>~6,600</td>
</tr>
<tr>
<td></td>
<td>~10%</td>
</tr>
<tr>
<td>Japan</td>
<td>~5,000</td>
</tr>
<tr>
<td></td>
<td>~15%</td>
</tr>
</tbody>
</table>

**Information Sources:**
CEIC, desktop research, PwC Strategy& analysis
Under such a capacity structure, the safety management of China's overall freight industry is in a relatively extensive stage, mainly reflected in lack of data-driven management tools and methods, and lack of safety culture and management processes.

The first is the lack of data management methods and tools, resulting in processes that are difficult to trace and problems difficult to identify.

• The data collection method is relatively extensive, the installation and utilization of digital tools (such as digital devices) is low, and the operation process is opaque: excessive relying on the driver’s own experience, the truck is a “black box” during the journey, and it is difficult for the company or fleet level to effectively trace the driving behavior, resulting in inaccurate risk identification or liability attribution.

• Lack of immediate intervention, passive and lagging safety management actions: for aggressive driving, fatigue driving behavior, and driving blind spots, there is no real-time monitoring and assisted intervention devices, and accidents usually occur in milliseconds.

• Lack of operational analysis awareness or ability, and the value of data is not fully utilized: even if data is collected, most fleets face the dilemma of inefficient management. They have not precipitated and effectively interpreted the data or applied it to aspects such as predictive warning, route scheduling, and driver assessment.

Secondly, freight companies lack safety awareness, safety culture, and fail to effectively implement control measures into daily operations.

• There is a huge gap in the safety management system between different fleets, which is reflected in a series of management steps such as driver recruitment, training, performance evaluation: according to expert interviews, large fleets with strong safety awareness usually strictly control the driver admission rate within 1% ~ 3%, while small and medium fleets usually have the admission rate around 20% to 30%. Despite the current challenge of a large driver gap, weak job training and poor employment environment lead the industry to enter a vicious circle. Meanwhile, large enterprises conduct hierarchical management of drivers based on historical driving behavior analysis, cooperate with incentive mechanisms and auxiliary training, enhance driver safety awareness and related skills, and greatly reduce the risk of accidents from the source.

• Irregular use of vehicle space, unqualified vehicle exit inspections, and improper vehicle maintenance have also led to a high incidence of safety accidents: some fleets continue to expand the warehouse space within the truck and occupy the cockpit space to increase the single cargo volume, resulting in insufficient buffering at the time of accident. Secondly, many small fleets did not strictly implement the standard “six steps of inspection” process, and trucks that did not meet the standard were still running on busy route. Vehicles were not maintained regularly, which is also an important reason for accident.

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Lack of Lean Operation System Is The Root Cause For Road Freight Safety Problems in China

<table>
<thead>
<tr>
<th>Cause</th>
<th>Description</th>
<th>Potential consequences</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of data-driven management tools and methods</td>
<td>Extensive data collection methods and low credibility</td>
<td>Difficult to identify risks</td>
</tr>
<tr>
<td>Lack of active safety management</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lack of data-driven operational analysis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lack of safety culture and management process</td>
<td>Weak awareness of safety management</td>
<td>Difficult to solve problems effectively</td>
</tr>
<tr>
<td></td>
<td>Lack of control and execution process</td>
<td></td>
</tr>
</tbody>
</table>

Information Sources: G7 big data platform, PwC Strategy\& analysis
Industry advice
The effective control of safety risks is one of the signs that the road freight industry has entered maturity. It is also a starting point for freight companies to reduce costs and increase efficiency and create positive social benefits. Based on the data insights and analysis of the causes, and advanced industry experience, we recommend that companies can reduce risk of accidents and improve safety management from the following three aspects.

### Short-term development: Leveraging digital technology to improve freight smart safety management

In the short term, it will fully leverage the development of digital technologies, such as Internet of Things based devices, big data, and AI algorithm, to strengthen active safety management capabilities, and apply data-driven management methods to make long-term operation optimization.

With the rapid improvement of connected devices and computing power brought by 5G, freight companies can effectively reduce accidents through data-driven management, and establish smart safety management system. For example, smart devices and digital technologies can provide value through predictive warning, intervening and long-term intervention. Before leaving the car, the company improves the risk assessment with historical data, grades with digital safety devices, and strengthens safety training for drivers to ensure devices utilization and health rate. During the transportation, the company can use monitoring devices and driving assistance systems to accurately identify blind spots and high-risk driving behaviors, so as to achieve immediate intervention and predictive warning, and minimize human factors during transportation. Throughout daily operations, the company can check and adjust based on big data analysis, improve operational processes and optimize safety management effectiveness.

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### Predictive Prevention

- **Risk Assessment and Prediction**
  - Identification of potential factors (driving records, road conditions, devices health, etc.)
  - Risk classification
  - Advance risk planning such as routes / shifting

- **Smart Device Deployment**
  - Vehicle condition monitoring
  - Driver status monitoring
  - Driver assistance devices

- **Driver Safety Education**
  - Guarantee devices health rate
  - Behavior under control for full process

- **Vehicle Status and Environment Recognition**
  - Location, route, temperature (such as cold-chain conditions), etc.
  - Engine, brakes, fuel conditions, etc.
  - Vehicle blind spots

- **Immediate Intervention**
  - Smart device real-time warning + manual intervention
  - Driver assistance system intervention (eg ADAS)

### Active Safety Management During Transportation

- **Driver Status and Driving Behavior Recognition**
  - Physical fatigue
  - Aggressive driving behavior
  - Dangerous driving behavior (such as using mobile phones, etc.)

### Daily Operation Optimization

- **Data-driven Operation Optimization**
  - Comprehensive, true and real-time data collection, master transportation status of the whole network
  - Full process transparency and visualization, efficient data management
  - Accident and risk attribution and review
  - Division of responsibilities and identification of high-risk groups (such as driver classification)
  - Targeted management measures (such as rewards and punishments, training optimization, etc.)

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*Information Sources:*
Expert interviews, PwC Strategy& analysis
Case: By using smart devices and advanced algorithms to reduce the risk of accidents, the Internet of Things technology industry in China has made some progress.

A leading domestic logistics IoT platform service provider accumulates data by the digital devices, conducts safety risk algorithm modeling, carries out hierarchical management of different levels of risk, and provides targeted operation services to the high-risk driver group, thereby effectively reducing accident rate.

- With the help of this solution, the rate of accidents per million kilometers of a certain express delivery company has dropped from 2.9 to about 1.9, and the number of high-risk accidents per thousand kilometers has fallen below 50% of the industry average, realizing a shift from passive accident management to active accident prevention.

- In the case of a tripartite cooperation with an insurance company and a fleet, the digital solution provider and the insurance company jointly developed a safety data control model, which can more accurately output risk warning and accident liability attribution, helping the freight company to optimize future premium expenditures. By ensuring device health, the insurance company reduce the accident compensation rate from the initial 90% to 60%.

Case: A leading domestic logistics IoT service provider, through algorithm modeling and technical services, reduces the accident rate of freight companies and helps insurance companies reduce compensation rate

<table>
<thead>
<tr>
<th>Environment Data</th>
<th>Travel Data</th>
<th>Risk Level Data</th>
<th>Accident Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vehicle Device Data</td>
<td>Driving Behavior Data</td>
<td>High-risk Driving Behavior Classification Algorithm Modeling</td>
<td>Device and Management Service Matching</td>
</tr>
</tbody>
</table>

- Real-time Risk Intervention
  - AI Reminder on Vehicle
    - Algorithms to Identify Risks And Report to Platform
      - Manually Intervene in High-risk Behavior Until the Risk is Lifted

- Safety Management Operational Optimization
  - High-risk Driver Identification, One-on-one Management
    - Fleet Safety Operation Data Report
      - Safety Service Report

Indemnification Optimization: Based on the analysis of big safety data, the premium expenses of high-quality fleets are reduced, and the reduction in accident rates helps to optimize the compensation level of insurance companies

Information Sources:
Expert interviews, desktop research, PwC Strategy\& analysis

Industry Advice
Case: Data-driven safety optimization is already the main direction of international IoT platforms

A digital platform for the fleet of a leading commercial vehicle OEM, equipped with GPS, cameras, vehicle sensors, DriverCard identity authentication and other smart devices, comprehensively records driving time, driving behavior, and vehicle performance data for risk warning and diagnosis to reduce accidents and risks. The fleet apply the output data report to the driver deployment, maintenance plan and order optimization process to support the long-term safe operation of the fleet.

Case: A global leading commercial vehicle OEM digital application solution, through data recording and analysis reports, optimized support for drivers, devices and operations management

- **Driver management**
  - **Time management**: record continuous driving, work and rest time, including compressing the number of rest periods and extending driving periods, and deploy drivers reasonably
  - **Driving behavior**: through driving behavior rating, record and analyze bad driving behavior, reward good driving habits

- **Safety management**
  - **Risk assessment and prediction**: output vehicle condition and performance assessment reports, carry out malfunction prediction and remote diagnosis
  - **Preventive driving mode**: Based on the analysis report, design preventive driving mode to reduce accidents

- **Operation management**
  - **Fleet management optimization**: record fuel consumption, brake wear, tire wear and other data, provide predictive maintenance suggestions; improve vehicle conditions and vehicle utilization; based on fleet management and traffic data analysis, carry out order planning and process optimization

**Information Sources:**
Desktop Research, PwC Strategy& analysis
Medium and long-term development: Apply lean operation and implement risk management

In the long run, fleet / freight companies should consolidate the construction of safety culture, further improve lean management system, and achieve overall cost reduction and efficiency gains including risk reduction. They could further apply online operation, visualization, and transparency of the entire operation process, with strict implementation of various means such as access standards, training, assessment, and incentives, to cultivate a "bottom line culture", so as to penetrate safety awareness in every step of operation and realize a comprehensive cost reduction and efficiency increase.

Case: A leading domestic super large logistics company. Through the establishment of a "cultural leadership, technology-driven, organizational safety and process optimization" safety management system, the company built an intelligent safety monitoring platform Marvin, combined with big data and algorithm analysis to provide management basis and optimization suggestions. It established a three-level safety responsibility system, while supplemented with risk control and accident review processes, which allows effective implementation of management and control measures.

Information Sources:
Expert interviews, desktop research, PwC Strategy& analysis
Case: The management experience of the hazardous chemicals industry with a high level of safety is also worthy of reference. Take a leading domestic manufacturer of hazardous chemicals as an example. Transportation safety risk has always been the pain point of the chemical industry. The hazardous chemical cargo owner enterprise cooperated with technology companies to develop the ADAS risk index model, accurately identified the cause of the accident and risk responsibility, and applied compulsory training to establish high-risk drivers blacklist and the “bottom line thinking” of the team. This could promote safety culture of the transport company and the driver side.

Case: In addition to accident control, lean operation system of the fleet can also effectively achieve cost reduction and efficiency enhancement, taking a leading global commercial vehicle engine manufacturer as an example. Its fleet management platform built a complete operation management system of vehicle files, operation status, line information and working conditions based on connected vehicle devices and enterprise operating data. By mean such as improving drivers’ driving behavior, smart dispatch management, and vehicle and working condition matching, it have reduced the insurance and other costs, while improving the effective utilization rate and turnover rate of the devices.

**Fleet operation center: digitalization, transparency and lean operation**

<table>
<thead>
<tr>
<th>Route</th>
<th>Condition</th>
<th>Vehicle</th>
<th>Operation</th>
</tr>
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<tbody>
<tr>
<td>• Operating network</td>
<td>• Speed</td>
<td>• Shape</td>
<td>• Attendance / Working Rate</td>
</tr>
<tr>
<td>• Geomorphic features</td>
<td>• Mileage</td>
<td>• Parameter</td>
<td>• Freight turnover</td>
</tr>
<tr>
<td>• Province area</td>
<td>• Fuel consumption</td>
<td>• Goods</td>
<td>• Freight efficiency</td>
</tr>
<tr>
<td>• High-speed route</td>
<td>• Safe driving</td>
<td>• Warehouse</td>
<td>• Aging index</td>
</tr>
<tr>
<td></td>
<td>• Fuel-efficient driving</td>
<td></td>
<td>• Car purchase cost</td>
</tr>
<tr>
<td></td>
<td>• Number, type, location of malfunction, etc.</td>
<td></td>
<td>• Operating expenses</td>
</tr>
</tbody>
</table>

**Cost reduction**
- Insurance expenditure: Through safety incentive system and driving behavior analysis, customized insurance items can reduce the insurance expenditure by 0.5% to 2.0%.
- Tolls: Big data analyzes load and toll, matches the most economical path, and saves about 1.0% to 2.0%.
- Maintenance cost: To extend the warranty period and oil change period.
- Fuel cost: Through measures such as optimal matching of vehicle and vehicle transportation conditions, optimization of power system, online driving behavior monitoring and offline one-on-one targeted training, and improvement of fuel-saving skills of the fleet, measures to achieve fuel-saving 1.0% ~ 3.5%.

**Efficiency improvement**
- Fleet management: Establish data management systems such as vehicle file management, maintenance data management, transportation indicators (such as operating lines, speed, fuel consumption, etc.), build a safety incentive system, and reduce the probability of accidents by 5% ~ 20%.
- Operation management: T-box monitors repair, parking, and fault duration, quantifies attendance TCO, through DVIR departure inspection, custom maintenance, OTA remote fault support and other measures to reduce the fault rate by 5% ~ 10%, and save 5% ~ 15% for repair time.

**Information Sources**: Expert interviews, desktop research, PwC Strategy& analysis.
Industry value chain: Accelerate upstream and downstream ecological collaboration and jointly build an industry safety management system

Learning from the development experience of the leading markets such as the United States and the European Union, the overall safety level of the road freight industry has improved. In addition to the refined operations of the fleet / freight companies themselves, it is also inseparable from the comprehensive cooperation and support, it is recommended that all stakeholders in the ecology work together with an open mind to build a safe and efficient government and enterprise data sharing mechanism, continuously improve safety supervision standards, strengthen upstream and downstream incentives and mutual assistance, and work together to promote lean operation management and efficiency improvement within the industry.

### Ecological Stakeholders

#### Government Department / Industry Association
- **United States**: increase the assembly rate of vehicle safety devices and establish an information sharing mechanism
  - Mandatory installation of ELDs (electronic card and devices), relevant departments directly monitor the driving time of drivers
  - ESC (vehicle stability control system) is mandatory for heavy trucks of level 7 and above, and the unified assembly of truck AEB (automatic emergency braking system) will be fully realized by 2025 to improve safety devices standards
  - Establish electronic files of vehicles and drivers, and eliminate the accidental consciousness of enterprises and individuals evading supervision
- **EU**: The International Federation of Road Transport (IRU) regularly conducts "European Truck Accident Cause (ETAC) Research" and regularly releases relevant statistics and reference recommendations
  - Strengthen the construction of road transportation management information platform, promote government-enterprise real-time data sharing, promote transparency of law enforcement process and unification of supervision standards
  - Establish a big data index to guide the development of the industry, and establish a safe credit file to increase the cost of violations
  - Strengthen accident risk data accumulation and research analysis with ecological stakeholders to provide relevant policy and regulatory guidance for the industry

#### Cargo Owner
- A leading hazardous chemical company in China: Incentive and control
  - In the fleet supplier management system, safety decentralization accounts for more than 50%
  - Provide 50% financial subsidy to help fleet service providers install Mobileye and other smart devices
  - Jointly develop risk behavior scoring models with technical vendors, take 7-day outage mandatory measures for drivers below safety standards, and provide targeted training support
  - Based on driving data, establish driver archives and "blacklists", and never hire drivers who have repeatedly violated regulations and have high-risk driving records

#### Technology Service Provider
- A leading American car networking company: Establishing accident risk prediction and smart recruitment models
  - Predict the highest risk factors based on data, and make recommendations for safe operation based on market segment characteristics
  - Through big data analysis, summarize the common characteristics of excellent drivers and provide driver recruitment insights and suggestions
- A leading Israeli car networking company: provides insurance forecast and premium optimization solutions based on driving behavior data
  - Improve the depth of service and data mining accuracy of long-term safe operations, meanwhile enhance the compatibility of devices and systems and reduce the repeated construction of enterprises
  - Open up upstream and downstream data nodes, expand application scenarios, and enhance data utilization value

### Leading Use Case

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### Information Sources:
Expert interviews, desktop research, PwC Strategy& analysis
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About G7
G7 is China’s leading IoT freight service platform. Through a unique Internet of Things technology platform, software service platform and payment settlement system, G7 connects various production factors of China's highway logistics industry, and provide a full range of integrated services covering network freight, safety insurance, intelligent equipment and fleet management to more than 500 of China's largest cargo owners and logistics companies, more than 70,000 growing fleets and more than 1 million drivers. As of the end of April 2020, there were more than 1.5 million freight trucks connected to the G7 IoT platform. For more information, please visit www.g7.com.cn.

About China Transportation News
Founded in 1984, China Transportation News is the main channel for the national transportation industry news promotion in charge of the Ministry of Transport, and was selected as the "Top 100 Newspapers" and "China Post Top 100 Newspapers". China Transportation News adheres to the purposes of rooting industry, serving industry, and promoting industry development, based on the concept of "professional, authoritative, leading, and service", tells a good story of traffic, conveys a good voice of traffic, and promotes positive energy of traffic.