

Analysis of Transportation Cost Reduction by Drop-and-pull Transport

Yao Liu

School of Logistics and Trade, Wuhan Business University, Wuhan 430056, China

liuyao1323@foxmail.com

Abstract

At present, the road freight transportation in our country is in the stage of transition from traditional transportation to modern logistics. Fuel, vehicle parts, labor and other costs rise, leading to the ordinary single vehicle transportation mode is increasingly difficult to resist the impact of market volatility in traditional logistics enterprises. As a kind of advanced transportation organization mode, the Drop-and-pull Transport is not only conducive to the development of low-carbon economy, but also will promote the development of logistics enterprises in our country, it is one of the most important measures for the implementation of low-carbon transportation in China. Based on the principles and organizational models of Drop-and-pull Transport, this paper puts L logistics enterprise as a research subject, and then comparatively analyzing the economic benefits between the two modes of transport. The results shows that the Drop-and-pull Transport mode has a greater effect on transportation efficiency improvements and transportation costs decline.

Keywords

Drop-and-pull Transport; Logistics Enterprise; Cost Reduction; Economic Benefits.

1. Introduction

With the gradual improvement of the national highway network, China's road transport industry has been an unprecedented rapid development, but also faced with how to improve transport efficiency, reduce the cost of logistics enormous pressure. In 2014 the ratio of total logistics costs to GDP 16.6%, not only much higher than the developed countries such as the United States and Germany (the United States is about 8%), but with the economic development level is approximately equal to the BRIC countries compared to high, such as India (13%), Brazil (11.6%). How to better meet the needs of the construction of a resource-saving and environment-friendly society, the development of advanced mode of transport, improve the logistics rationalization and organization level of road transport, reduce supply chain cost, improve the efficiency of transportation, the transport sector become a major issue facing the development needs of transport came into being. In 2010, the national development and Reform Commission and the Ministry of transportation jointly issued the notice on printing and distributing the implementation plan for the pilot work of rejection and transportation. Since then, the development of the transportation has risen to the strategic level of national development.

2. The basic principle of Drop-and-pull Transport

The definition of truck trailer is towing a trailer to the destination, the trailers unloaded, put on a new trailer to another destination mode of transport. Compared with the traditional transport mode, this mode of transport is conducive to reducing the waiting time of loading and unloading, accelerate the tractor turnover, improve transport efficiency and labor productivity; to reduce the vacancy rate and inefficient transportation, reduce energy consumption and emissions, save goods storage facilities; to reduce the loss and reduce road traffic accidents; organization for water roll transport, railway transport hump multimodal transport, and promote the comprehensive transportation construction.

3. Operational organization model of Drop-and-pull Transport

In this mode of transport, the organization of the vehicles will be affected by factors such as the distribution of stations, the organization of supply, and so on, thus forming a variety of organizational models, such as Both ends of the transport, Circulation transport, Other connections transport.

3.1 Both ends of the transport

That is, the two nodes in the line used in the rejection mode. As shown in Figure 1, set a tractor from the A station to the B station site, the specific steps are as follows: (1) A station reserved for the two semi-hanging (S1, S3), S1 pre-installed in B (2) tractor from the A station hang heavy hanging S1 to B station; (3) to reach the B station, remove the heavy hanging S1, loaded with the completion of the heavy hanging S2, return to the A Station; (4) tractor arrived, remove the S2, hang up the finished product hanging S3, repeat step 1, the cycle.

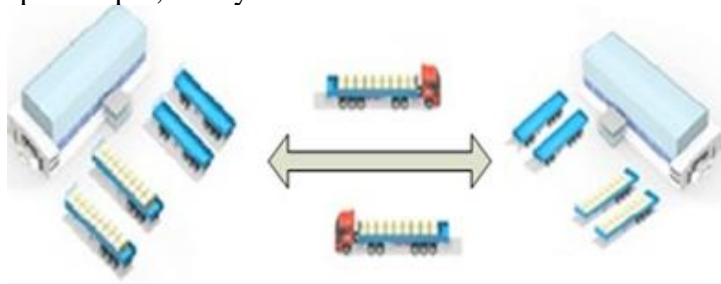


Figure 1 Both ends of the transport mode diagram

3.2 Circulation transport

"Circulation transport" is carried out in three (or more) area of rejection operation, and the formation of closed loop back and forth the job path, shown in Figure 2. And "both ends of the rejection," only need to reserve a station in a heavy hanging, the rest of the same steps, it is not tired.

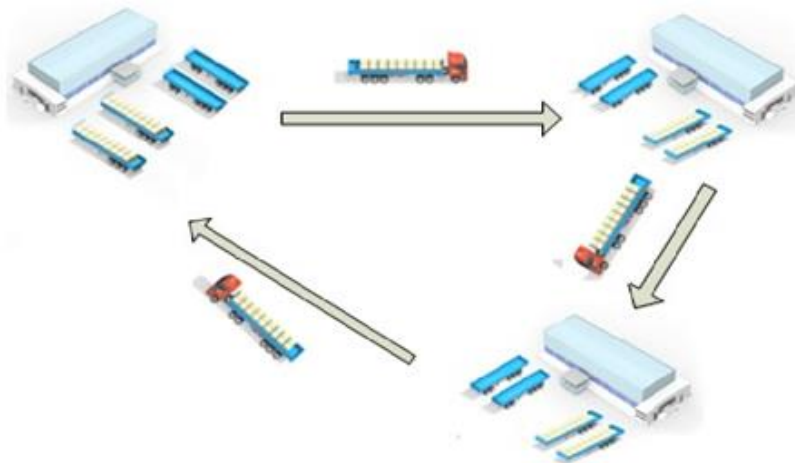


Figure 2 Circulation transport mode diagram

3.3 Other connections transport

As shown in Fig. 3, it is assumed that the tractor is connected between stations A, B, and C, and B is the middle connection. In Fig. 3, there are three links in the pilot line. Tractor T1, in the A, B between the rejection, tractor T2 in the B, C between the rejection, the specific steps of the model are as follows:

- A to B Station:

(1) Two semi-trays (S1, S3) are reserved in station A, S1 is pre-loaded and B is reserved for semi-trailer S2; (2) Tractor T1 is linked from station A according to the system instruction (3) Tractor to B station, remove S1, install S2 return to A station; (4) Repeat step (1).

- B to C Station:

(2) Tractor T2 installs S1 from station B to C station according to the system instruction; (3)) Tractor T2 arrives at station C, unloading S1, reloading S5 and returning to B station; (4) Repeat step (1). As shown in Figure 3.

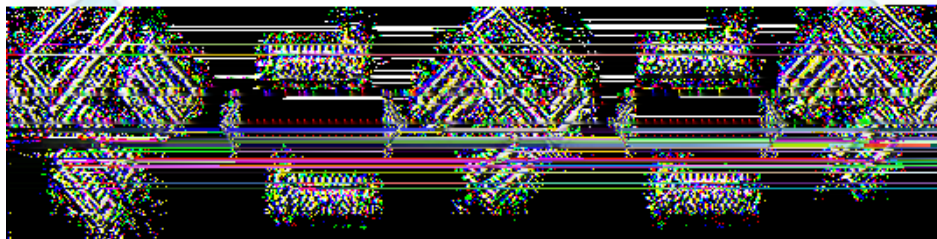


Figure 3 Other connections transport mode diagram

4. Analysis of Economic Benefit

4.1 Comparison of transport efficiency

The improvement of the transport efficiency after the rejection is mainly due to the reduction of the loading and unloading waiting time of the tractor, which will effectively reduce the number of tractors, increase the mileage of the truck and the total turnover. Take a L enterprise hanging transport line as an example, the line for the "line two, both ends of the rejection linked" mode of transport, running 25 days per month, from the traditional mode of transport into the transport mode, the tractor loading and unloading Waiting time is reduced, making the number of cycling trips per month and mileage have increased the utilization rate,

4.2 Comparison of average transportation cost

Transportation costs include fixed costs and variable costs, including fixed costs of vehicle depreciation, repair costs, insurance, other costs and taxes, variable costs generally include fuel costs, tolls and driver wages and so on. This line is still used as an example to analyze the changes in average transport costs.

By calculation can be seen that, the cost of the traditional mode of transportation is 0.358 yuan / ton, transport cost is 0.303 yuan / ton, transport way cost savings of 0.056 yuan / ton, down 15.51%.

5. Conclusion

According to the comparison between the traditional mode and the economic efficiency in the rejection mode, the towing vehicle can reduce the waiting time of the tractor, which makes the annual total stroke increased by about 80% and the bicycle turnover by 125%. In addition, the rejection of transport is also more able to reduce vehicle load-free behavior, which to some extent, improve the vehicle load factor. It is estimated that compared with the traditional mode of transport, throwing the cost of transport savings of 0.056 yuan / ton km, transportation costs fell 15.51%.

At present, China's road freight is in the traditional transport to the modern logistics transformation stage, although the ordinary single truck is still the majority of logistics enterprises is the main mode of transport, however, due to fuel, vehicle parts prices, labor costs, Traditional logistics and transportation is difficult to resist the impact of market volatility. To carry out transport rejection, not only conducive to the development of China's low-carbon economy, but also to promote China's logistics enterprises to achieve efficient and healthy development.

Acknowledgements

This work was supported by Fund Project: University subject 《Study on economic benefit and energy saving and emission reduction of swing and transportation in logistics enterprises》 (2016KY018)

References

- [1] SONG Dian hui. China's logistics cost is higher than the BRICS countries [J]. Foreign Trade Practice, 2015 (11): 90 -92.

- [2] Ouyang Bin, Guo Jie, Li Zhongkui, Chu Chunchao.Strategic conception of low - carbon transportation development in China [J]. Population, Resources and Environment in China (3): 1 - [3] YANG Chang, DAI Da-zhi, LU Shao-ping. Study on the Law of Drop Operation and Its Implementation Strategy [J]. Logistics Technology, 2010 (7): 69 - 70.
- [3] WU Yu, ZENG Chuan - hua, YANG Wei.Study on the transporting strategy of road transportation organization [J]. Logistics Engineering and Management, 2010 (8): 83 - 85.
- [4] Lianjun zhang, Peihua zong. Port competitiveness evaluation index system research. China Water Transport, 2003(8).
- [5] CEVERO R, LANDISJ. Twenty Years of the Bay Area Rapid Transit System: Land-Use and Development Impacts [J]. Transportation Research Part A, 1997, 31(4): 309- 333.