

Transportation and Differentiation on Rhythmicity of Road Traffic Activities Between Urban and Rural Areas

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Abstract Transport and rhythm in transport activities are considered as a mirror reflecting socio-economic activities. In addition to studying secondary sources, the article mainly uses field methods and counts the number of vehicles circulating on 12 main urban routes and 12 inter-district routes along with the interviews of random 200 workers in the transport sector, traders, and sales staff in Thanh Hoa province. The data sources are synthesized, processed and compared to see the differentiation in the number of means of transport in urban areas, revealing it is 2.0 times higher than that in rural areas. The rhythm in transport activities in urban areas is also often more concentrated than in rural areas. In addition, during production and business seasons such as tourist season, agricultural harvest season, and holidays, the volume of transport, turnover and transport revenue is always 3 - 5 times higher than normal. The results of the study contribute to orienting transport operation plans to avoid the consequences of traffic congestion during peak times of the year.

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1. Introduction

Transportation is a service sector and has an important position. The operation of the transportation industry is to create momentum for socio-economic development. Therefore, at each development stage of history, in each production situation, and in each certain space, the transportation industry always has its own characteristics. The rhythmicity of transport activities reflects the transport demand and level of people and goods that often follow a certain cycle and relate to many socio-economic activities. In addition, this rhythmicity shows the close connection between the transportation industry and socio-economic production activities in each region and region. In fact, the rhythmicity of transport activities is strongly influenced by the seasonal rhythm, associated with the rhythmicity of socio-economic activities in many areas such as agriculture, industry, trade, and tourism; it also based on the needs and mobility of people and other socio-cultural activities, including holidays, New Year, and festivals... Transportation will be rational when it is based on the needs of society and is demonstrated by transportation work. The more rational the transportation is, the higher the value of the transportation industry [I.Tarski, 1985]. Rationality in transportation depends on many factors such as goods distribution plan, arrangement of production and business establishments, choices of appropriate means of transportation, or choices of reasonable routes... [I.Tarski, 1985].

Moreover, Jonathan Cowie (2010), by "The Economics of Transport", helped readers better understand the important elements of the transportation system and the transportation market. This is done through the interaction between the behavior of the customer, the transportation provider, and the actions of the transport authority through the implementation

of the traffic policy. The author also examined the ongoing reforms in the organization of all aspects of the demand and supply of transport services, the market structure and the basic economic characteristics of the transport market, the economic transportation and environment, transportation subsidies and regulation, and traffic forecasting and assessment.

In "The Geography of Urban Transportation Geography, urban studies", Susan Hanson and Genevieve Giuliano (2004) outlined the basic concepts, tools, and methods that readers need to engage with then urgent urban traffic policy issues such as the driving force for transporting passengers and goods in urban areas, local and regional transportation planning processes, and questions regarding public transport.

Jean-Paul Rodrigue, Claude Comtois, Brian Slack (2009) in his study "The Geography of Transport System", argued that transportation exists only when it carries people and goods and information around. Otherwise, it has no purpose. Therefore, as the economy - society develops, the progress of transportation is more important than ever to best meet the needs. His analysis shows that in the 9th century, transportation was mainly via rail and sea in order to expand the scope of markets and strengthen national relations. In the twentieth century, the focus had shifted to choosing routes, prioritizing modes of transport, enhancing the capacity of existing transport networks, and meeting travel demand on a global scale. In the twenty-first century, transportation must respond to the global economic system in a timely and cost-effective manner.

In general, most studies emphasized the importance of the transportation industry in many perspectives and the driving factors for the development of itself.

In order to obtain an insight into the rhythmicity of transport activities in the studied area, the author collect data

on the number and flow of different transport types by making various surveys and accessing sources from the Department of Transport of Thanh Hoa province. Transportation in the most typical places in the province and the most considerable times or seasons of a year are concerned. The research content are presented in the next part including literature review, methodology and approach, experiment, results and discussions that are followed by the extraction of a conclusion.

2. Methods

From the viewpoint of the transportation industry in terms of socio-economic geography, the author has used the method of collecting, synthesizing, and processing secondary and primary sources of documents to approach the problem.

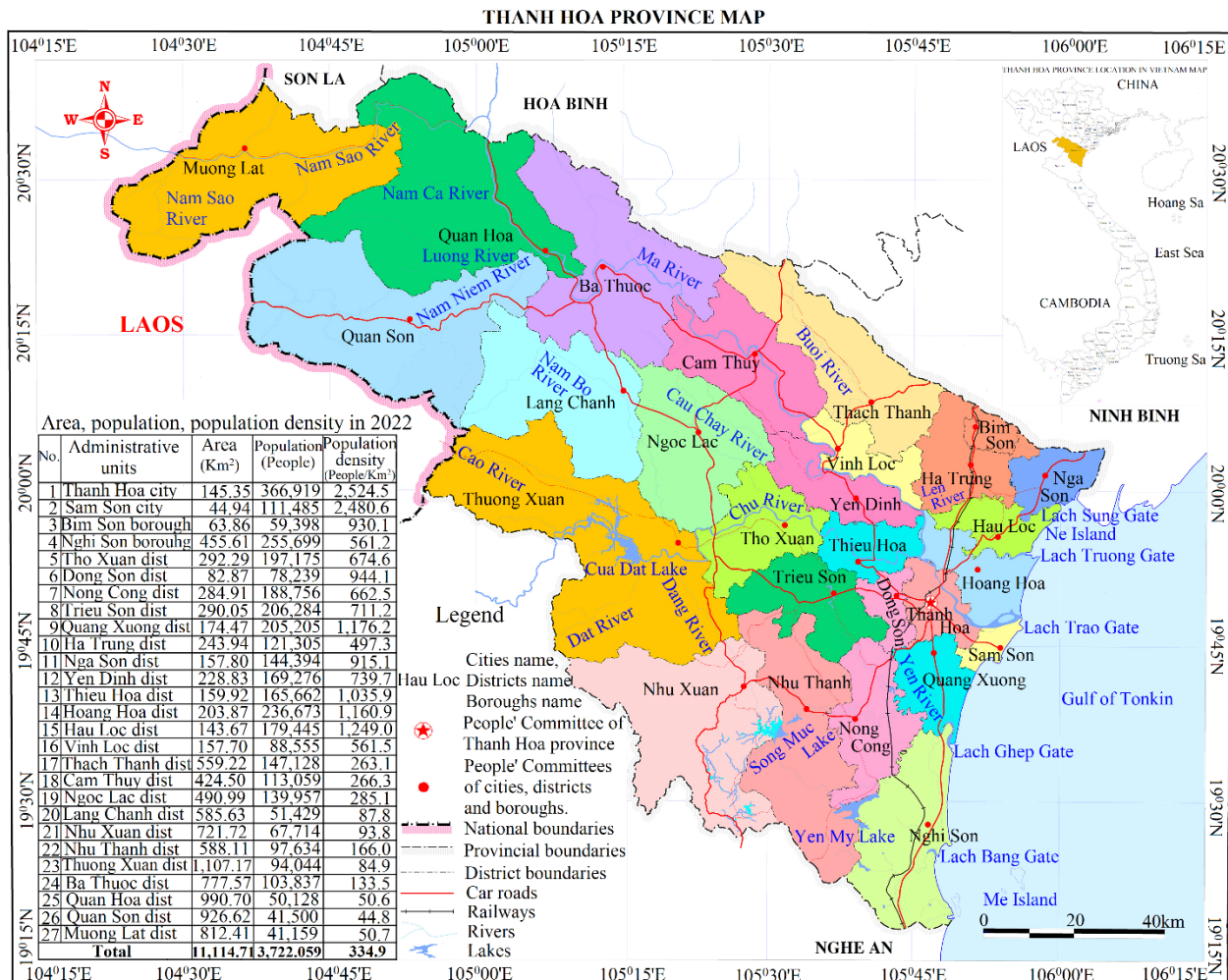
Secondary documents: To have a theoretical basis for the transportation industry and analyze the rhythmic differentiation in transport activities between rural and urban areas, in addition to approaching the research works of Jean-Paul Rodrigue, Claude Comtois, Brian Slack (2009), I. Tarski (1985), Jonathan Cowie (2010), Susan Hanson, Genevieve Giuliano (2004), Doan Pham Dai (2012),... the author also used some material sources from the study area such as Statistical Yearbook of Viet Nam [General Statistics Office of Vietnam (2015, 2022)], Statistical Yearbook of Thanh Hoa province [Thanh Hoa Statistical Office (2015, 2022)], Geography of Thanh Hoa province [Thanh Hoa Provincial People's Committee (2000)];...

The primary data are the results obtained from field surveys, traffic surveys and interviews with workers during the months of January, March, May, August, and November 2022. The main locations are Thanh Hoa city, Sam Son city, Nghi Son town, Tho Xuan district, Thuong Xuan district, Thieu Hoa district, Hau Loc district, Vinh Loc, Yen Dinh (Thanh Hoa province, Vietnam). The specific details are as follows.

- Traffic survey: Traffic volume counts were conducted on 12 main urban roads in Thanh Hoa city, Sam Son city, and Nghi Son town and 12 inter-district roads in the districts of Tho Xuan, Thuong Xuan, Thieu Hoa, Hau Loc, Vinh Loc, and Yen Dinh. All vehicles on the road are counted through a common cross-section of the route at 1-hour intervals in 1 day (equivalent to 24 intervals) and then aggregated into the traffic volume of 1 day. Similarly, the system of vehicles on the road is counted separately by type and then converted into the designed traffic volume (the number of cars converted from other types of vehicles, the unit of measurement is CPU) [Ministry of Science and Technology of Vietnam, 2005]. The purpose of this survey is to clarify the picture of traffic volume differentiation in various time and space intervals.

Directly surveying traffic volume will ensure observation and handling of specific field situations on the surveyed route.

- Interviewing workers: The content of the questions in the interview form is designed to ensure suitability for the interview subjects: 40 transport staff of freight transport companies, 40 transport staff of passenger transport companies, 20 traders



(Source: Department of Natural Resources and Environment of Thanh Hoa province)

Fig. 1. Thanh Hoa province map in 2022

and 100 sales staff in markets (Dien Bien, Tay Thanh, Vuon Hoa and district markets), supermarkets (Coopmart, BigC) and some stores (Mediamart, Winmart). The results from the interview forms were compiled and processed to clarify the picture of purchasing power, consumption of goods as well as some issues related to transport activities such as frequency of operation, transport volume, turnover and revenue.

- Field survey: Recorded issues related to the research work during the process of surveying traffic volume and interviewing workers. The field survey provides the most general and basic view of the problem.

The survey and field sites are likened to a miniature picture of the natural and socio-economic conditions of Thanh Hoa province. In there:

In terms of nature: Thanh Hoa province has an area of 11,114.71 km², ranked 5th out of 64 provinces in Vietnam. This is a rather large province having an allocation from east to west with two main terrain types: plains and midlands-mountains [Thanh Hoa Provincial People's Committee, 2020], including two cities, two boroughs, 23 districts (Fig1), 31 towns, 60 wards and 467 communes. This has created a clear territorial division.

In terms of population: Thanh Hoa is a densely populated province. In 2022, with a population of 3,722,059 people [Thanh Hoa Statistical Office, 2022], Thanh Hoa ranks third in terms of population of Vietnam. Together with two types of population, rural and urban, there is a clear territorial division with an urban population of 994,907 people (accounting for 26.73%) and a rural population of 2,727,152 people (accounting for 73.27%) [Thanh Hoa Statistical Office, 2022]. People's living standards are quite high, especially those in urban areas, which tends to make a difference in the mobility needs of people between urban and rural areas.

Thanh Hoa is an area with a stable and positive socio-economic development rate. In recent years, the process of

industrialization and modernization has taken place strongly; therefore, the "seasonal" nature of economic activities is increasingly evident.

3. Result and Discussion

3.1. Some characteristics of urban and rural areas related to transport activities

Urban areas are places with high population density. According to data from the General Statistics Office of Vietnam (2015, 2022), the urban population in Vietnam increased continuously in the period 2010 – 2022. The population growth rate of rural areas ascended insignificantly. In fact, the population fraction of rural areas decreased from 69.6% in 2010 to 62.4% in 2022; whereas, the population fraction of urban areas in Vietnam climbed from 30.4% in 2010 to 37.6% in 2022. Also in this trend, the urban population growth rate in Thanh Hoa province increased continuously for many years. In contrast, the rural population growth rate was negative or decreased significantly. According to data from the Thanh Hoa Provincial Statistics Office (2015, 2022), the urban population of Thanh Hoa province in 2010 increased by 3.93%, and the rural population increased by only 0.12%. In 2015, the urban population rose sharply by 8.33% while the rural population changed by negative 0.83%. In 2022, the urban population went up by 3.67% whilst the rural population altered by negative 1.13%. In period from 2010 to 2022, the urban population fraction in Thanh Hoa province grew from 10.79% to 27.67% and the rural population reduced from 89.21% to 72.33%. These two progresses are majorly due to the process of increasing mechanization and urbanization as the birth rate in urban areas is not as high as in rural areas. Population growth in urban centers is inevitable due to economic development [Ernie Renita and Iswari Nur Hidayati, 2024].

In urban areas, the productive forces develop, which are highly concentrated and mainly operate in non-agricultural

Table 1. Comparison of basic criteria between urban and rural areas

Criteria	Urban	Rural
Location, role	This is the political, administrative, economic, cultural, scientific, and technological center of a locality, region, territory, or the whole country; as a driving force for the development of that locality, region, territory, or country.	That has not yet developed strongly in terms of economy, science and technology and is often influenced by neighboring urban areas.
Population	Being a densely populated place, consisting of many intertwined living groups with different lifestyles, participating in diverse socio-economic activities. Urban development is evident through growth and increase in population density [Ernie Renita and Iswari Nur Hidayati, 2024].	People living in the countryside are mostly farmers [Ministry of Construction, 2021] with the characteristic of living in small-scale communities in villages, communes, and hamlets.
Socio-economic status	The constant growth of the cities surges negative pressure due to the increasing demand for space for the benefit of socio-economic activities [Ernie Renita and Iswari Nur Hidayati, 2024]. The economy in urban areas is mainly non-agricultural, multi-industry, and multi-sectorial; it also has a high growth rate; the urban areas are operating places of all kinds of markets and places of convergence and information exchange.	Rural environment is agricultural environment [Ministry of Construction, 2021] so this in rural areas is mainly based on agriculture and handicrafts, while industry, commerce, services and information have not developed strongly.
Infrastructure	Having a unified, interconnected, and complex system, forming non-synchronous networks and systems throughout the area regardless of administrative boundaries, requiring centralized and consistent management mostly by field and industry.	This in rural areas is simple, non-continuous and asynchronous, requiring mainly territorial management, not having a central function and high concentration like that in cities.

economic sectors. Urban areas are also general, regional or specialized centers, at national, inter-provincial, provincial, or district levels, which have a role in promoting the socio-economic development of the whole country or a certain territory. There, the proportion of non-agricultural labor usually reach at least 65% of the total labor force, and the system of technical infrastructure and social infrastructure in urban areas is developed in a connected and synchronous manner [Decree of the Government No. 42/2009/ND-CP, 2009]. They are also places with an urban lifestyle and culture associated with very specific living and communication characteristics, different from the countryside.

Meanwhile, rural areas have a low population density with an economy that mostly consist of agriculture and handicrafts, food processing, and small-scale household trading. According to Man Phan Si (2010), in rural areas, in addition to basic agricultural production, in the traditional socio-economic system, small-scale industries and commerce also appeared very early, associated with agricultural activities and supporting and supplementing agriculture. Access to science and technology in rural areas is still not high and not uniform (refer to Table 1).

3.2. Transportation activities

3.2.1. Transportation activities between two areas: urban and rural

The disparity in investment between urban and rural areas [Ministry of Construction, 2021] as well as the differences in economic, social, population and infrastructure conditions between urban and rural areas will lead to quite clear differences in transport demand. This makes the high density and traffic volume in large towns and cities face persistent transport challenges such as traffic congestion along with high transportation costs [Amin T. Kiggundu and Stephen Mukiibi, 2012] (see Table 2).

The convenience in the concentration of transport types and the relatively large travel needs of people as well as the high economic development speed in urban areas have created in this area a transport picture that is much more vibrant and bustling than that in rural areas.

In Thanh Hoa province, through the survey of vehicle traffic in Thanh Hoa city, Sam Son city, and Nghi So town, the average traffic volume varies from 5500 - 7000 PCU (Passenger Car Unit); while in the districts of Tho Xuan, Thuong Xuan,

Table 2. Comparison of some transport criteria between urban and rural areas

Criteria	Urban	Rural
Operating speed	Transport infrastructure is developed, so urban areas are capable of high operating speeds. However, urban areas are also densely populated areas, so at different urban levels, the operating speed is often limited variously by the provisions of traffic laws.	Traffic infrastructure conditions are not well developed, so the operating speed of means of transport is often limited by the quality of the roadbed, width, topography and discontinuity of the roads and routes.
Operating frequency	Urban areas are often economic, political, and social centers. The concentration of economy and population requires a large and relatively continuous operating frequency of the transport industry to meet a large amount of demand for transportation of people and goods. Therefore, transportation activities take place regularly and continuously. Additionally, high density and traffic often lead to traffic congestion.	Due to the main characteristic of agricultural economy, rural areas often have spatial and population differentiations, so the demand for transportation is not as high as in urban areas. Accordingly, the operating frequency in the transportation is usually low, so transport activities have a lot of free time.
Means of transport	Due to the high and diverse transportation needs, means of transport in urban areas are diverse, modern and large in number. In particular, for freight transport, trucks over 7 tons transport are the majority; for passenger transport, personal cars, family cars with less than 10 seats account for a large proportion.	The number of means of transport is quite low. In particular, the means of transporting goods are mainly vehicles with a load capacity of less than 7 tons. In addition, there is also a common appearance of a system of three-wheeled vehicles and rudimentary vehicles. In passenger transport, in addition to personal cars, service cars from 20 to 40 seats account for a considerable proportion, and the number of motorbikes and mopeds is large.
Transportation performance results	<ul style="list-style-type: none"> - High volume of transportation due to the large movement of people and diverse transportation items. Compared with rural areas, urban areas have four to five times higher transport volume. - Due to the high volume of transport, the volume of rotation is large. - Due to the increasingly reasonable and progressive division of labor by territory and in production planning in urban areas, the average transportation distance here tends to decrease. - Revenue in the transportation industry is quite high and plays an important role in the total GDP of urban areas. 	<ul style="list-style-type: none"> - The demand for transportation of people and goods is not large; thus, transport performance results are much lower than in urban areas. - Turnover volume is one-fifth compared to urban areas - The average transport distance in rural areas is bigger than in urban areas and tends to decrease. - Revenue from the transport industry is inferior to that in urban areas and accounts for a negligible proportion of the total GDP of rural areas.

(Source: Field Results)

Thieu Hoa, and Hau Loc, the traffic volume is only under 700 PCU.

Besides, the means of transport also have a very clear division in terms of quantity and type as exhibited in Fig. 2.

Compared to rural areas, the number of means of transport in urban areas is two times higher. In which, the number of passenger vehicles is 2.2 times higher and the number of freight vehicles is 1.7 times higher.

For passenger vehicles, vehicles with less than 10 seats account for a high proportion in both areas (over 40%), of which more than 70% are family cars and nearly 30% are service taxis. Vehicles with more than 10 seats are mainly passenger transport service ones, of which vehicles with 10-40 seats in rural areas account for 43.1%, which is 8.9% higher than that in urban areas; whereas, the number of vehicles with more than 40 seats in rural areas are 0.8% lower than that in urban areas (refer to Table 3).

Compared with the means of passenger transport, the means of transport of goods have a rather large division in the categories in the study areas. Especially, vehicles with a tonnage of less than 2 tons (only 4.5% in urban areas but 32.3% in rural areas) and vehicles with a tonnage of more than 20 tons (urban areas accounts for 41.5% while rural areas accounts for only 3.1%) (see Table 4).

In urban areas, nearly 80.0% of shopping and trading centers are located, which is also an area that accounts for over 75% of purchasing power compared to rural areas. Accordingly, the differentiation of means of transport will play

an important role in meeting the demand for supply of goods in the locality.

3.2.2. Rhythmicity of transport activities

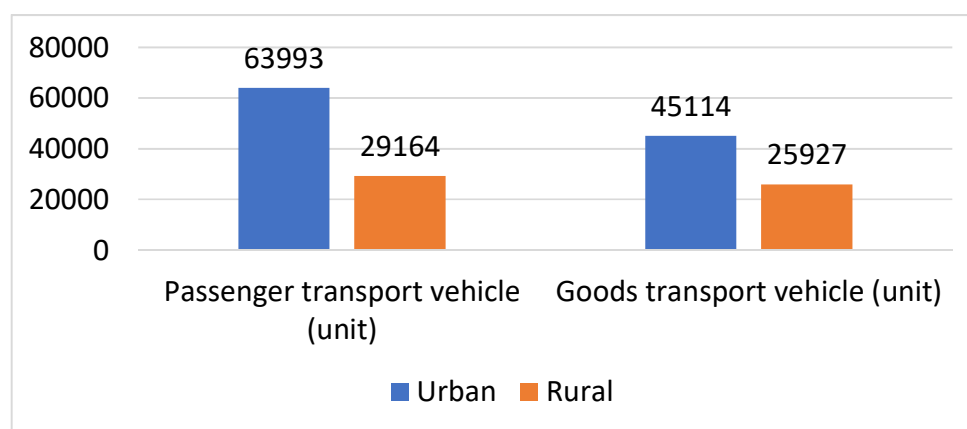
Transportation is a need that arises from people's desire to participate in various activities in tourism, settlement as well as production [Amin T. Kiggundu and Stephen Mukiibi, 2012]. In freight transport, rhythm is mainly associated with seasonal rhythms in commercial and agricultural service activities.

a) For commercial services, urban areas have more developed commercial activities than

rural areas because there are often differences in ecology and commodity economy between the areas [Doan Pham Dai, 2012]. The rhythm in commercial activities of both areas is quite similar in time, but there are differences in level.

New Year and Spring Festival is the time when consumers spend heavily on shopping and spending, so the commercial atmosphere on this occasion is quite vibrant. Enterprises, producers, and business establishments step up production and exploit sources of goods with many varieties to serve the people's consumption needs: from victuals, food, clothing, shoes, confectionery, fresh flowers, and ornamental plants to electronic and electrical goods.

Most of the commercial centers, supermarkets, and big markets are concentrated in urban areas. Therefore, on New Year and other festive occasions, the exchange and purchase of goods is very large



(Source: Section of Transport, Department of Transport of Thanh Hoa province)

Fig. 2. Number of means of transport by urban and rural areas in Thanh Hoa province, Vietnam in 2022.

Table 3. Structure of passenger transport vehicles by urban and rural areas in Thanh Hoa province in 2022 (Unit: %)

Area	Less than 10 seats	From 10 - 24 seats	From 25 - 40 seats	More than 40 seats
Urban	49.1	18.3	15.9	16.7
Rural	41.1	24.5	18.6	15.9

(Source: Section of Transport, Department of Transport of Thanh Hoa province)

Table 4. Structure of means of transport of goods by urban and rural areas in Thanh Hoa province in 2022 (Unit: %)

Vehicle type	Less than 2 tons	From 2 to 7 tons	From 7 to 20 tons	Over 20 tons
Urban	4.5	23.9	30.1	41.5
Rural	32.3	53.8	10.8	3.1

(Source: Section of Transport, Department of Transport of Thanh Hoa province)

According to the survey results: it showed that every year on New Year and spring festivals, the number of customers shopping for food items and foodstuffs increased by 2.5 - 3 times; also, the number of customers entering the supermarket to survey and choose to buy electronic and refrigeration products increased by 3 - 4 times compared to normal days. Therefore, the supply of goods must increase highly to meet the demand for production and consumption of people in the province.

Consequently, usually around the middle of January every year (from the 12th lunar month) in Thanh Hoa province, many enterprises and businesses actively import and supply goods to serve New Year. As of mid-January 2022, in the province, there are more than 30 enterprises and businesses participating in the supply of goods with a total value of goods up to nearly 4.0 billion VND (increasing 3 - 3.5 times compared to the normal) (Thanh Hoa Provincial People's Committee, 2022).

The bustle of the commercial market has led to the development of freight transport activities in Thanh province. According to the actual survey results, every year, immediately prior to the traditional New Year holiday of the nation, the volume of freight transport increases by 3 - 4 times, the volume of rotation increases by 4 - 4.5 times, the revenue of the transportation industry increases by 4 - 5 times compared to normal. Besides, due to the rich source of goods and the wide market, the average distance in freight transport is also rather high.

In rural areas, commercial activities are quite isolated; they are usually concentrated at rural markets or retail stalls. On the occasion of New Year holiday, although people's purchasing power is higher, the supply of goods as well as the activities of the transport industry ascend but not significantly.

According to the survey results, the quantity of goods supplied during New Year holiday in rural areas is mainly consumer goods (accounting for over 80%) with an increase of 1.5 - 2 times compared to normal. In view of that, the activity of the transportation industry on this occasion also doubled in terms of operating frequency, volume of transportation, rotation and revenue (see Table 5).

One reason is that rural people are attracted to neighboring cities, and another reason is that the living standards are lower than urban areas, so transportation activities and operation in there are lower and shorter in New Year and other holidays.

Right after New Year holiday, freight activities subside. The frequency of operations, the volume of rotation and shipping as well as the revenue decrease sharply. After the holidays and New Year about a month, these activities return to normal.

b) In agriculture: Agricultural activities have created the "seasonal" nature of transportation activities. This is shown mainly in rural areas, while almost negligibly in urban areas.

In rural areas, the formation of specialized agricultural areas in the direction of commodity production has had a strong impact on agricultural product transport flows and freight transport activities for agricultural development. In Thanh Hoa province, the rhythmicity here is clearly exposed in the sharp increase in agricultural product transport activities in the months after the harvest of the crop and fifth-month crop in the districts of Dong Son, Tho Xuan, Thieu Hoa, Vinh Loc, Yen Dinh, Nong Cong, Trieu Son; the late autumn and early winter months - the time to harvest chili peppers, baby melons, sweet corn, tomatoes in Hoang Hoa, Hau Loc,...; the last days of the year and spring months - the time to harvest flowers and ornamental plants concentrated in the suburbs of Thanh Hoa city, Quang Xuong district,...

If explosive and vibrant freight transport in the commercial industry takes place all year round and increases sharply at the end of the year, agricultural transport activities in Thanh Hoa province are mostly busy in harvest season of agricultural products with short transport routes, medium volume of transportation, rotation and revenue.

In passenger transport, the rhythmicity is most evident at two times, the tourist season and the holiday season of the year, with the sudden increase in travel demand of the people.

c) Tourist season:

Tourism in relation to transport activities is reflected in people's participation in tourism activities and the way these activities are carried out [OSOB, Samson Babatunde, 2015]. Therefore, there is no big difference in the seasonality of the tourist season between urban and rural areas. However, in urban areas, due to higher conditions, needs and mobility of people are bigger than those than in rural areas, so the frequency of activities in passenger transport is also much higher than that in rural areas.

In the process of surveying the number of visitors travel to Sam Son beach in Thanh Hoa province in the summer of 2022, 72.5% of visitors come from urban areas, of which nearly 50% of visitors come from out of province. Out of 27.5% of tourists coming from rural areas, over 80% are visitors from the province.

d) During the holidays, the volume of passenger transport also fluctuates sharply. The flow of travel is mainly from urban areas. Before the holidays, there is a flow of

Table 5. Comparison of freight transport activities during the public holidays and New Year in Thanh Hoa province between urban and rural areas

Criteria	Urban	Rural
Supply/ demand	Diverse and large	Mainly consumer products
Amount of goods transported and rotated	- Three to four times bigger than normal days - Six times bigger than rural area	- One and a half to two times bigger than normal days - Only one-sixth of urban area
Duration	45 days	20 days

(Source: Survey results)

Table 6. Comparison of passenger transport activities during the public holidays and New Year in Thanh Hoa province between urban and rural areas

Criteria	Urban	Rural
Number of passengers transported and rotated	- Three to four times bigger than normal days - Six times bigger than rural area	- One and a half to two times bigger than normal days - Only one-sixth of urban area
Duration	45 days	20 days

(Source: Survey results)

movement from urban areas to rural areas; after the New Year, the flow moves back from rural areas to urban areas. Because urban areas, especially big cities, are often more crowded than rural areas, passenger flows and rhythmicity of passenger transport are often shown more clearly. .

In the tourist season, the time in the rhythmicity of passenger transport activities is often contrarily long or short in different locations, depending on the characteristics of the tourist route; whereas, in the holidays, the time is quite uniform and usually happens in 2 weeks before New Year and lasts for about 1 - 1.5 months after New Year (see Table 6).

In general, during the tourist season or holidays, the number of passengers of the transport industry increases the most, in particular the route Ha Hoi - Thanh Hoa, the other Northern provinces - Thanh Hoa, and the Central coastal provinces - Thanh Hoa. For the number of visitors from the South to Thanh Hoa, most choose the form of rail transport (and a very small part by air). Therefore, on routes such as National Highway 1A, Ho Chi Minh road... or at transport hubs such as Thanh Hoa city, Nghi Son economic zone, and Lam Son - Sao Vang, transport activities increased sharply. However, the volume of passenger transportation during the holidays is highly concentrated in a short time, so it often encounters many inadequacies in transportation activities such as increased transport service prices, high traffic congestion and accidents, and heavily polluted traffic environment.

4. Conclusion

Transport helps to ensure the circulation and is an indispensable step in the process of socio-economic development. As society develops, transportation becomes more important than ever. Especially in developing countries, transportation is a very important component of urban life because it is an absolutely necessary means to achieve the ultimate goal (OSOBA, Samson Babatunde, 2015). Furthermore, the circulation of goods and passengers always has a close correlation between the demand and supply of the society and the production characteristics of the economic sectors. Accordingly, in transportation activities, there is always a differentiation in time and space. The cyclical and "seasonal" differentiation of socio-economic production activities will largely create seasonal rhythmicity of transportation. The spatial differentiation between urban and rural areas is strongly influenced by development, living standards, and needs in each region. Urban areas have higher transportation needs than rural areas, which also means that the risk of traffic pollution will be higher. The problems of air pollution, traffic congestion, traffic accidents, and psychological stress of traffic participants in urban areas, especially in big cities are important issues to be concerned.

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