

# Tourist Behavior and Multi-Attractions in Khon Kaen Province

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## Abstract

The purposes of this study were to examine the behavior of tourists who have traveled to Khon Kaen province and to study multi-attraction visits in Khon Kaen Province, which is currently ranked second in the Northeastern region for visitor numbers and tourism income. The study population consisted of tourists who have traveled to Khon Kaen province. This research identified the most popular attractions taken by tourists from one attraction to another. Using primary data collection methods, the study found that the five most popular tourist attractions were Central Plaza Khon Kaen, Wat Nong Wang, Ubolratana Dam, Ton Taan Market, and Khon Kaen Zoo. The data was analyzed using descriptive statistics for general information and tourist behavior, and inferential statistics for tourist attraction sequences through Social Network Analysis (SNA) using the UCINET program to demonstrate the travel network within Khon Kaen Province. The study revealed that Central Plaza Khon Kaen was the central tourism attraction, with tourists typically traveling from there to Ton Taan Market, Ubolratana Dam, Wat Nong Wang, and Khon Kaen Zoo. The findings regarding tourist travel patterns can inform policy planning for tourism supply and development, including linking tourism programs, integrating attractions, clearly defining tourist areas, planning transportation systems, developing travel infrastructure, and maintaining roads and traffic connections between attractions, all to further develop Khon Kaen's tourism potential.

**Keywords:** Tourist Behavior; Social Network Analysis; Khon Kaen Tourism: Multi-Attractions

## 1. Introduction

Tourism is a service industry that plays an important role in the Thai economy, accounting for the majority of all trade services. It generates continuing businesses such as hotels, lodgings, restaurants, souvenir stores, and local goods, leading to investment, employment, and income distribution to locals while bringing in hundreds of billions of baht in foreign currency. Contributing 4.8% to the gross domestic product, the tourism sector provides significant economic value. Tourism is considered the primary source of income for the Thai economy (Department of industrial promotion, 2004). In 2019, tourism accounted for 16% of GDP, with income from foreign tourists representing 10% of GDP and 61% of all tourism revenue. However, in 2020, foreign tourists were unable to enter Thailand due to the COVID-19 pandemic. The number of foreign tourists contracted by 80% to 8.1 million people compared to 2019, prompting the government to stimulate domestic tourism to compensate for the decrease in foreign visitors (Rueanthip and Laosamrit, 2020).

Khon Kaen province has experienced continuous population growth and territorial expansion. With Khon Kaen University located in the middle of the northeast, the province has become a regional educational and technological hub. The Mueang district offers numerous services, natural resources, public facilities, and varied accommodation options at different price points to serve tourists. The strategically located airport provides convenient and time-saving travel options. These factors, combined with the province's long history, contribute to its tourism potential. Consequently, Khon Kaen has emerged as a significant tourist destination in modern Thailand.

According to the Ministry of Tourism & Sports (2023), Khon Kaen ranks second in tourist arrivals in the northeastern region. The province welcomed 4,556,656 Thai tourists in 2018 and 5,583,809 in 2019. However, due to the COVID-19 pandemic in 2020, the number of Thai tourists declined to 2,920,357. The downward trend continued into 2021, with tourist numbers further decreasing to 1,387,695 as most visitors remained concerned about travel during the pandemic. In 2023, as COVID-19 cases decreased, tourist numbers recovered to 3,512,879 visitors. The pandemic caused major disruption to the tourism industry during 2020-2021, with many businesses losing revenue and struggling to recover. While tourist numbers decreased significantly during the height of the pandemic due to safety concerns, tourism began returning to normal levels in 2022 as the pandemic subsided.

Khon Kaen features several significant tourist attractions that should be preserved, including Phra Mahathat Kaen Nakhon, Khon Kaen Zoo (Khao Suan Kwang), and Ubolratana Dam. Given their importance, studying multi-attraction travel patterns in Khon Kaen presents an interesting research opportunity to identify the most popular travel routes. By examining tourist behavior, travel routes, and planning patterns, this research aims to provide guidelines for developing tourism areas in Khon Kaen. This study implements multi-attraction research

to examine the connections between various tourist attractions. According to Tansiri and Srikeaw (2021), who studied tourist behavior and tourism network connections, key factors influencing tourist decisions included income levels, average accommodation costs, choice of transportation, frequency of visits, and time spent at different attractions. Their research found that these factors had similar impacts on tourist decision-making.

## 2. Research Objectives

- 2.1 To examine the behavior of tourists who have traveled to Khon Kaen Province.
- 2.2 To study the pattern of multi-attraction visits in Khon Kaen Province.

## 3. Research Methodology

### 3.1 Population and Sample size

The population in this study consists of tourists who have traveled to Khon Kaen. The sample size is 207, determined using the G\*Power program. The calculation method, developed by Cohen (1977), is specifically designed for estimating sample sizes when the exact population size is unknown.

### 3.2 Data collection

3.2.1 The scope of data collection focuses on gathering accurate information to avoid distortion. This is achieved by distributing a quantitative primary data questionnaire to residents of Khon Kaen and tourists who have visited the city.

3.2.2 The data collection method involves developing a quantitative data collection tool using Google Forms. This tool is used because it enables convenient and efficient data collection while allowing for data interpretation in various formats. There are two steps to collect primary data:

1) Step 1: Identifies the top five attractions in Khon Kaen that people want to visit. This questionnaire uses multiple-choice questions and serves as a basis for creating a questionnaire for step 2.

2) Step 2: Gathers general information and data on tourist behavior.

### 3.3 Data Analysis

#### 3.3.1 Descriptive Statistics

Descriptive statistics are used to present the collected data on general information and tourist behavior of the respondents. These statistics describe the characteristics of the data using frequency to calculate percentages, central tendency to determine the mean, median, and mode, and measures of variation, including the standard deviation.

#### 3.3.2 Social Network Analysis (SNA)

Social Network Analysis (SNA) is used to analyze data characterized by networks of associations that represent relationships within a dataset. SNA involves examining social structures using networks and graph theory. It describes networked structures through nodes, which represent individual actors, people, or entities within the network, and ties, edges, or links, which signify the relationships or interactions connecting them (Wikipedia, 2024). The primary goal of SNA is to identify central points in social networks, known as centrality. SNA is widely utilized in research and development to study diverse and extensive social networks. Additionally, the UCINET program was employed for tools used in Social Network Analysis.

Degree centrality refers to the tourist attractions that are most frequently connected to other tourist centers. A tourist attraction with high centrality is regarded as a central hub within the network. Such a destination is a central location or major channel with the most connections to other tourist destinations. This means that a destination serves as a hub or gateway to other destinations, and the destination is well-connected in terms of travel routes. The degree centrality can be calculated using the following mathematical equation (1) (Wasserman and Faust, 1994)

$$C_D(n_i) = \sum_j x_{ij}$$

(1) where  $C_D(n_i)$  is the degree of centrality index for destination  $i$ , and  $x_{ij}$  represents the connection (number of tourist flows) between destination  $i$  and destination  $j$ .

#### 4. Research Findings Summary

The results of the study are divided into two parts: 4.1 The results of descriptive statistics on general information and tourist behavior. 4.2 The results of social network analysis for multi-attraction tourist visits.

##### 4.1 The Results of Descriptive Statistics on General Information and Tourist Behavior

Table 1 presents the findings on the general information of tourists. The study included 207 tourists who visited Khon Kaen Province. The majority were female (61.2%), followed by male (32.5%), and unspecified gender (6.3%). Most tourists were aged 20–29 years (82.6%), followed by those under 20 years of age (7.2%). The next largest groups were tourists aged 50–59 years (6.3%), 30–39 years (2.9%), and 40–49 years (1%). In terms of income, the majority earned less than 15,000 baht (64.7%), followed by those earning more than 30,000 baht (13%). Other income brackets included 15,001–20,000 baht (11.6%) and 20,001–30,000 baht (10.6%). Regarding education, most tourists held a bachelor's degree (87.4%), followed by those with a high school diploma (8.7%), a master's degree (2.9%), and a doctorate degree (1%).

	Percentage
<b>Gender</b>	
Male	32.5
Female	61.2
Unspecified	6.3
<b>Age</b>	
Under 20 years	7.2
20-29 years	82.6
30-39 years	2.9
40-49 years	1
50-59 years	6.3
<b>Income</b>	
Less than 15,000 THB	64.7
15,001-20,000 THB	11.6
20,001-30,000 THB	10.6
More than 30,000 THB	13
<b>Education</b>	
High school diploma	8.7
Bachelor degree	87.4
Master degree	2.9
Doctoral degree	1

**Table 2** Behavior of tourists traveling in Khon Kaen Province

Table 2 presents the results of the study on the behavior of tourists traveling in Khon Kaen Province. The study included 207 tourists, with the majority traveling for relaxation (83.6%), followed by visiting friends or relatives (37.2%) and attending meetings or seminars (20.8%). Most tourists traveled from other provinces (66.2%), followed by those from other districts within Khon Kaen Province (31.9%) and from abroad (1.9%). In terms of transportation, the majority traveled by private car (66%), followed by public buses (24.8%) and airplanes (9.2%). Regarding group size, most tourists traveled in pairs (25.2%), followed by those traveling alone (23.8%) and groups of four (17.5%). The people accompanying the tourists were primarily family members (42%), followed by friends (34.5%) and partners (9.2%).

Most tourists visited Khon Kaen more than five times (71.5%), followed by 3–4 visits (12.1%) and 1–2 visits (11.6%). The duration of stay was typically 1–2 days per trip (51.2%), followed by single-day trips (16.9%) and 3–4-day trips (14.7%). In terms of travel timing, the majority visited on weekdays (35.5%), followed by holidays (23.7%) and weekends (14.1%).

When choosing Khon Kaen as a destination, most tourists cited convenient transportation (75.8%), followed by its reputation (59.9%) and beauty (52.7%). While in Khon Kaen, the majority of tourists traveled by private car (69.6%), followed by private motorcycles (26%) and hired vehicles (19.3%). In terms of spending, most tourists spent over 5,000 baht (33%), followed by 2,001–3,000 baht (22.9%) and 1,001–2,000 baht (17.1%). Tourists found traveling within Khon Kaen convenient due to the ease of transportation (66.7%) and the availability of hired buses (14%). However, some found it inconvenient because locations were far apart (10.1%). The majority of tourists (91.3%) would recommend Khon Kaen to others, while 8.7% would not.

		Percentage
Purpose of travel		
	Relaxation	83.6
	Business	12.6
	Government work	3.4
	Visiting friends/Visiting relatives	37.2
	Meeting/Seminar	20.8
	Study/Work	3.4
Where did you come from?		
	Other provinces	66.4
	Lives in Khon Kaen	31.7
	Abroad	1.9
How did you travel to Khon Kaen Province?		
	Public bus	24.8
	Private car	66
	Airplane	9.2
How many people are joining this trip?		
	1 person	23.8
	2 people	25.2
	3 people	16
	4 people	17.5
	5 people	2.9
	More than 5 people	14.6

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If there are people traveling with you How are those people related to you?

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Family	42
Friend	34.8
Sweetheart	9.2
Relative	6.3
Colleague	5.7
None	1.1
All of the above	0.6

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How many times have you traveled to Khon Kaen?

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1 time	4.8
1-2 times	11.6
3-4 times	12.1
5 or more times	71.5

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Length of stay per trip

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1 day	16.9
1-2 days	51.2
3.4 days	14.7
More than 5 days	14.5

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Characteristics of the date you travel to Khon Kaen Province

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Weekday	35.5
Holiday	23.7
Weekend	14.1

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Deciding on a tourist destination

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Beauty	52.7
Convenient to travel	75.8
Cheap products	42.5
Reputable	59.9

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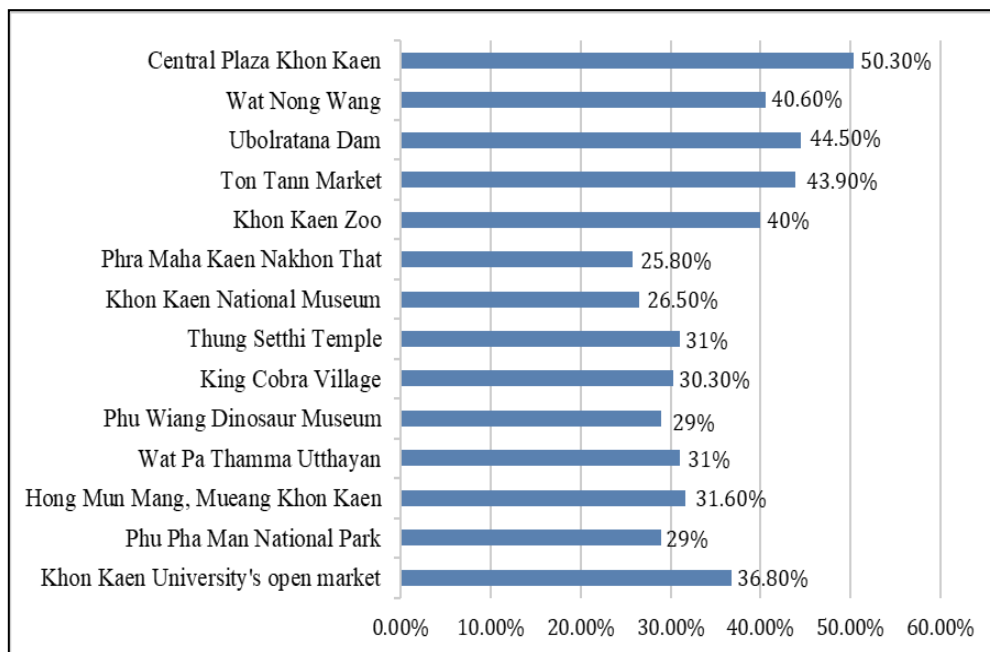
How to travel to other attractions in Khon Kaen?		
	Personal motorcycle	26.1
	Private car	69.6
	Motorcycle for hire	9.2
	Taxi	13.5
	Car for hire	19.3
	Public shuttle	4.3
How much money do you spend on traveling in Khon Kaen Province?		
	500-1,000 THB	10.5
	1,001-2,000 THB	17.1
	2,001-3,000 THB	22.9
	3,001-4,000 THB	11.9
	4,001-5,000 THB	4.3
	More than 5,000 THB	33.3
Is it convenient for you to travel within Khon Kaen Province from one place to another?		
	Convenient because there are buses for hire.	14
	Convenient because it is easy to travel	66.7
	Convenient because there are cheap rental cars.	4.8
	Inconvenient because the number of rental cars is not enough.	3.9
	Inconvenient because each location is far apart.	10.1
	Inconvenient because rental cars are expensive.	0.5
If someone you know asks you about Khon Kaen Province, Would you recommend that those people visit or not?		
	Recommend	91.3
	Not Recommended	8.7

**Table 2** Behavior of tourists traveling in Khon Kaen Province

## 4.2 The Results of Social Network Analysis for Multi-attraction tourist visits

### 4.2.1 Results from the questionnaire on the top five of Khon Kaen attractions

The tourist attractions that people want to visit in Khon Kaen Province were assessed using a multiple-choice format in step 1. The findings reveal that Central Khon Kaen received the highest preference at 50.3%, followed by Ubolratana Dam at 44.5%, Ton Taan Market at 43.9%, Wat Nong Wang at 40.6%, and Khon Kaen Zoo at 40%, as shown in Figure 1. This information about the five most popular tourist attractions was used to design the questionnaire in step 2



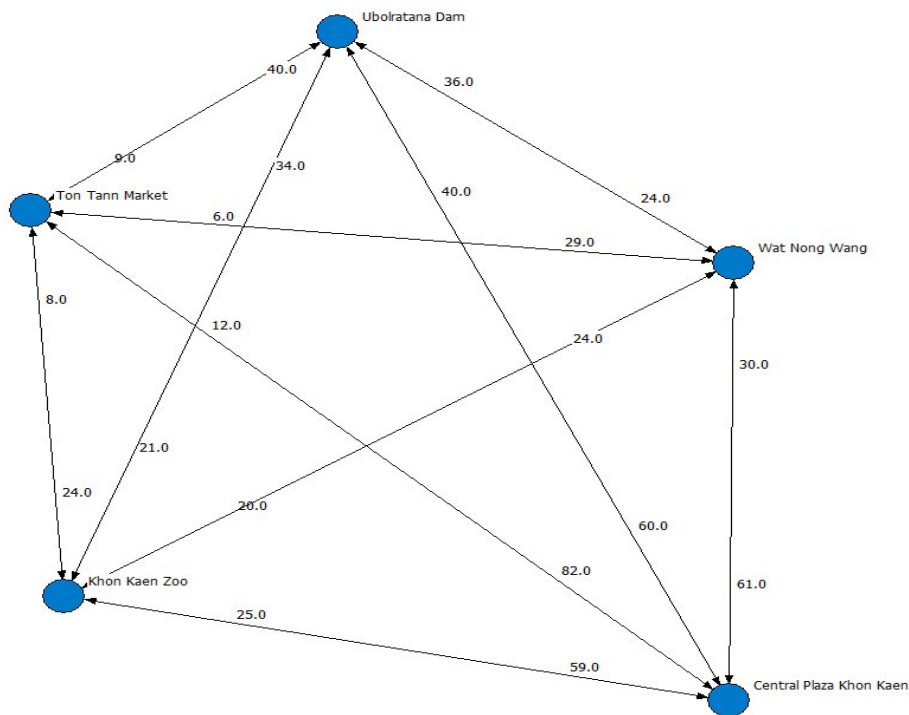
**Figure 1** The top five of Khon Kaen attractions that people want to visit Khon Kaen province

### 4.2.2 Results of Social Network Analysis

From the five most popular tourist attractions, the travel patterns of tourists visiting Khon Kaen Province were analyzed using social network analysis. Based on the degree centrality results of the social network analysis in Table 3, it was found that Central Khon Kaen had the highest degree centrality value at 262. This was followed by Ton Taan Market with a value of 175, Ubolratana Dam at 170, Wat Nong Wang at 150, and Khon Kaen Zoo at 141. These results indicate that tourists tend to travel to key attractions of interest, with Central Khon Kaen being the most visited location, as it has the highest Degree Centrality value. This is followed by Ton Taan Market, Ubolratana Dam, Wat Nong Wang, and Khon Kaen Zoo, in descending order of their Centrality values. Figure 2 illustrates the travel patterns of multi-attraction tourism in Khon Kaen, constructed based on the degree of centrality using the UCINET program.

Attractions	Degree centrality
Central Plaza Khon Kaen	262
Ton Tann Market	175
Ubolratana Dam	170
Wat Nong Wang	150
Khon Kaen Zoo	141

**Table 3** The results of the social network analysis of travel to tourist destinations.



**Figure 2** Travel Pattern Network of Khon Kaen Based on Degree Centrality Values

Source: Calculated by UCINET program

## 5. Discussion of Research Findings

The findings of this study provide valuable insights into tourist behavior and multi-attraction visits within Khon Kaen Province, a key tourism hub in Northeastern Thailand. As the province ranks second in the region in terms of visitor numbers and tourism income (Tourism Authority of Thailand, 2023) understanding how tourists navigate its attractions is crucial for strategic tourism planning and development. The study identified Central Plaza Khon Kaen as the primary tourism hub, serving as a focal point from which visitors traveled to other key attractions, including Ton Tann Market, Ubolratana Dam, Wat Nong Wang, and Khon Kaen Zoo.

This aligns with previous research indicating that commercial and urban centers often serve as anchor destinations, influencing tourist movement within a region (Chhetri et al., 2020) The application of Social Network Analysis (SNA) using UCINET provided a deeper understanding of these travel sequences, revealing the connectivity between various attractions and the extent to which certain sites act as pivotal nodes in the province's tourism network (Freeman, 2004) These findings have important implications for tourism management and policy. By recognizing the centrality of key attractions, policymakers and stakeholders can better design tourism routes, integrate attractions more effectively, and enhance visitor experiences through improved transportation systems and infrastructure (Hall, 2019) Strengthening road networks and optimizing traffic flow between major tourist sites can enhance accessibility and convenience, making Khon Kaen a more attractive destination for both domestic and international visitors (UNWTO, 2022). Furthermore, the insights gained from this study can contribute to more sustainable tourism development by promoting balanced visitation across attractions, reducing congestion at popular sites, and encouraging exploration of lesser-known destinations (Weaver, 2021) By strategically linking attractions and developing well-defined tourism circuits, Khon Kaen can further enhance its reputation as a dynamic and interconnected tourism destination, maximizing its economic potential while ensuring a positive visitor experience.

## 6. Knowledge from Research

This study contributes new insights into tourist behavior and multi-attraction visits within Khon Kaen Province, offering both theoretical and practical implications for tourism development.

**1. Identification of a Tourism Hub** The study confirms that Central Plaza Khon Kaen functions as the primary tourism hub, influencing tourist movement across the province. This highlights the role of commercial centers in shaping travel patterns, which can be applied to other urban destinations.

**2. Tourism Flow and Connectivity** Using Social Network Analysis (SNA), the research provides a novel perspective on how attractions are interconnected. The findings demonstrate that tourists follow specific travel sequences, with strong linkages between Central Plaza, Ton Taan Market, Ubolratana Dam, Wat Nong Wang, and Khon Kaen Zoo. This knowledge helps in optimizing travel routes and integrating attractions.

**3. Policy and Infrastructure Development** The study offers practical recommendations for tourism planning, emphasizing the need to improve transportation infrastructure and road connectivity between key attractions. This supports sustainable tourism growth by enhancing accessibility and visitor experience.

**4. Balanced Tourism Distribution** The research suggests strategies to distribute tourist flow more evenly across attractions, reducing congestion at popular sites and promoting lesser-known destinations. This contributes to long-term sustainable tourism management.

**5. Application of SNA in Tourism Studies** By utilizing UCINET for network analysis, this study demonstrates the effectiveness of Social Network Analysis in understanding tourist behavior. This methodological approach can be adapted for future tourism research in other destinations.

Overall, this study advances knowledge on destination management and provides valuable data for policymakers, tourism operators, and urban planners to enhance Khon Kaen's tourism potential.

## 7. Recommendation

### Policy recommendations

The results of the Descriptive Statistics study reveal the travel behavior of tourists visiting Khon Kaen Province. Most tourists travel for relaxation or to visit friends or relatives, typically arriving from other provinces by private car, traveling in pairs, staying for 1–2 days, and spending over 5,000 baht during their trip. Analysis of travel patterns to and from five main tourist attractions shows that Central Plaza Khon Kaen is the most visited origin point (46.86%), followed by Ubolratana Dam (19.81%), Wat Nong Wang (15.46%), Khon Kaen Zoo (12.08%), and Ton Taan Market (5.78%). The most common next destinations from these locations vary, with Central Plaza Khon Kaen most frequently leading to Ton Taan Market (48.68%) and Wat Nong Wang (16.40%), while Khon Kaen Zoo primarily connects to Central Plaza Khon Kaen (31.40%) and Ubolratana Dam (26.45%). Ton Taan Market directs most tourists to Khon Kaen Zoo (27.27%) and Wat Nong Wang (25%), and Ubolratana Dam commonly leads to Khon Kaen Zoo (24.81%), Ton Taan Market (21.80%), and Wat Nong Wang (21.05%). Wat Nong Wang primarily connects to Central Plaza Khon Kaen (33.94%) and Ubolratana Dam (28.44%).

The results of the Social Network Analysis show that Central Khon Kaen holds the highest Degree Centrality value (262), followed by Ton Taan Market (175), Ubolratana Dam (170), Wat Nong Wang (150), and Khon Kaen Zoo (141), highlighting their significance as tourist hubs. These findings provide essential insights for developing tourism policies, such as linking attractions, enhancing transportation systems, and maintaining infrastructure to support connectivity and improve the tourist experience.

For the policy recommendations: 1) A policy should be proposed to increase the number of public shuttle service points in the province. According to the data collected, only 4.3% of tourists use the public shuttle service provided by the province, while the use of taxis,

motorcycles for hire, and rental cars is more than double this figure. Additionally, some respondents mentioned in the questionnaire that they were unaware of the availability of public shuttle services in Khon Kaen. 2) Renovations or promotional activities should be undertaken to attract more visitors to Wat Nong Wang and Khon Kaen Zoo, as their Degree Centrality values are relatively low compared to Central Plaza Khon Kaen, Ton Taan Market, and Ubolratana Dam.

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