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## Conference Paper

# The Effect of Accessibility Improvement on Tourist Excursion Behaviors: Empirical Case Studies in Japan

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**The Effect of Accessibility Improvement on Tourist Excursion Behaviors:  
An Empirical Case Study in Japan**

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**ABSTRACTS:**

One of the most important issues in a current situation in tourism in Japan is to identify how attractive cities or towns we can provide visiting tourists as a tourism product satisfying their needs and wants. It is therefore necessary to grasp what kind of needs and wants potential tourists can obtain from their experience of visiting cities. For this purpose, an area marketing and management approach (AMMA) is expected to be effective one. In this paper a basic framework of our AMMA will be introduced. In addition, a practical procedure for quantitatively measuring the effect of accessibility improvement on tourist travel demand and activity patterns will be proposed. This paper discusses a practical method for measuring accessibility improvement effect focusing on the increase of the number of visitors to the tourism areas where the level of service in accessing transport facilities is planning to be improved. An empirical case study in Japan will be presented in this paper.

## **1. Introduction**

In 2007, Basic Act on Promotion of Tourism Nation (in December 2006, to wholly revise former Tourism Basic Act) was established to enforce the Basic Plan for realizing Japan as a tourism nation. The Basic Plan intends to promote various measures in a comprehensive and systematic manner. The main objectives include development of attractive, internationally competitive tourist destinations, enhancement of the international competitiveness of the tourism industry and nurturing of human resources, promotion of international travel and improvement of an environment to promote sightseeing. The Basic Plan also set five fundamental targets, whose substances are, respectively, to increase the number of nights for stay in accommodations per one Japanese during domestic tours, foreign tourists to visit Japan, Japanese tourists to overseas, expenditure in Japan on sightseeing tours, and international meetings held in Japan.

Under the current circumstances of tourism of Japan, one of the most important issues is to identify how attractive cities or towns we can provide visiting tourists as a tourism product satisfying their needs and wants. It is therefore necessary to grasp what kind of needs and wants potential tourists can obtain from their experience of visiting cities. For this purpose, an area marketing and management approach (AMMA) is expected to be effective one. It is because this approach can examine the derived nature of tourist travel demand explicitly. It is here needed to identify strategies and measures for less forecasting than creating and managing more attractive tourism destinations and also to evaluate their effect and impact on endogenous development. In the following section of this paper a basic framework of our AMMA will be introduced.

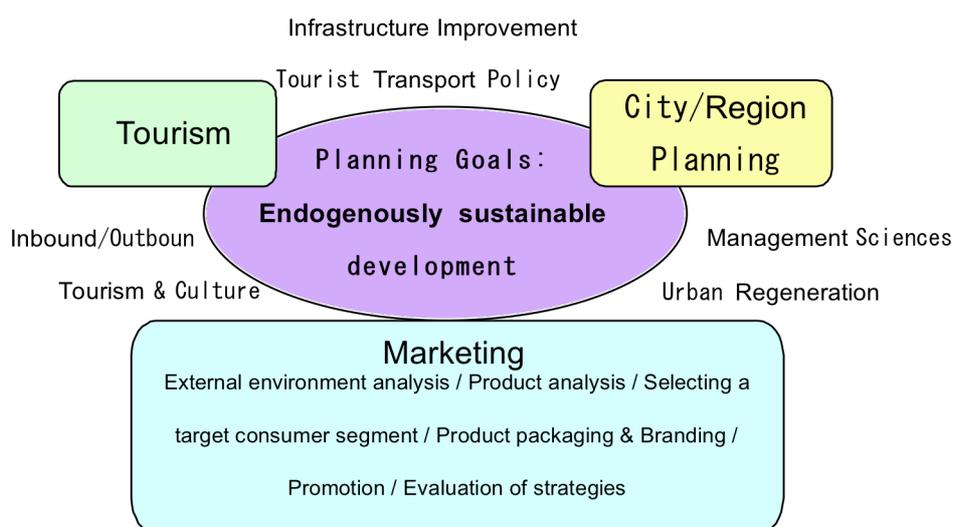
This paper also discusses a practical method for measuring accessibility improvement effect focusing on the increase of the number of visitors to the tourism areas where the level of service in accessing transport facilities be planned. An empirical case study in Japan will be presented in this paper. This case is concerned with an improvement of road network service in the provinces in Wakayama prefecture. The case is featured with the procedure for measuring both direct and indirect effects; increase of the number of visitors and increase of their region economic impact. As this case study is implemented using the existing survey data like a standard road census data-set and available demographic and socio-economic indices data, it is expected to be more effective method to make decision how we should improve network services as a supporting tourism product to contribute the formation of more attractive tourism areas.

Finally, we will discuss the future direction of the proposed AMMA researches and show conclusive remarks on accessibility analysis relating to measurement of its effect on regional tourism development.

## 2. A framework of Area Marketing and Management Approach (AMMA)

As local authorities and stakeholders have previously played a role in making decision of tourism and its related transportation planning in the area, a choice-based survey method have often been used to identify the behavioral properties of the tourists who visit the corresponding area. On the other hand, Japanese government (2007) has recently proclaimed its new policy of tourism, that is to say, the one for nation's an economic powerhouse. They have started to discuss issues on how the size of a tourism area should be denoted as a spatial range of a tour & stay and on how to promote the attractiveness of such an excursion behavior. It has therefore become important to establish a comprehensive method of surveying, analyzing, forecasting and evaluating for tourists' wide-area excursion behaviors cooperating related authorities with each other. It is however evident that there are only a few experiences to conduct such a wide-area survey in Japan.

Nishii, et. al (2008 and 2009) discussed on some challenging subjects of urban tourism marketing and their prospects. As shown in **Figure 1**, a strategic framework of tourism is here proposed and it aims to reach the region regeneration and the sustainable development of a planned region. The figure also indicates that this framework consists of three key components as follows; tourism, city & regional planning, and marketing approaches and that they have to keep in consistency with each other for achievement of the planning goals. This implies that a strategic urban tourism marketing approach is regarded as a comprehensive one and includes not only the increase of attractiveness of urban tourism but also the endogenously sustainable development of the tourist areas. The framework is therefore called Area Marketing and Management Approach, denoted below as AMMA.



**Figure 1 A Framework of Strategic Urban Tourism Marketing**

One of the most important issues in tourism marketing is to identify how attractive cities or towns we can provide visiting tourists as a tourism product satisfying their needs and wants. It is therefore necessary to grasp what kind of needs and wants potential tourists can obtain from their experience of visiting cities. For this purpose, a standard marketing research procedure is here applied to as follows: First of all, this procedure starts with an analysis of external environments from both macroscopic and microscopic aspects. The former is concerned with trends in socio-economic and demographic circumstances surrounding the studied areas. The latter is on tourist's decision making and taste in destination choices and tour patterns. According to the definition of area marketing, it can be defined as the process of planning and executing the conception, pricing, promotion, and distribution of ideas, goods, and services to create exchanges that satisfy individual and organizational goals. Kolb (2007) emphasizes that this definition describes marketing as an exchange that satisfies both the visitor and the city and its citizens. She also suggests that marketing cities is providing a product that meets the needs of visitors while improving the quality of life for the city's citizens-the primary mission of the city. In the second stage, a thorough and objective product analysis of the city's Strengths, Weaknesses, Opportunities and Threats, that is denoted as SWOT analysis, has to be undertaken because the city as a product can be more fully developed to meet the needs of tourists. After analyzing the city, the procedure will move the third stage. The stage is concerned with the target market segmentation, where a group of potential tourists may be chosen as a specific target that is expected to visit the city. The fourth and fifth stages are followed: to product packaging and branding, and to develop the message and promotion. These stages are not always carried out in sequence, that is to say, the third stage is regarded as one part of the promotion process. Finally, after the tourism strategy has been implemented, the results are evaluated to assess if the plan has been successful or if adjustments need to be made.

Let us here discuss on the basic concept of tourism area management. It is clear that tourism researches have come to a turning point against the background of the advent of newly challenging subjects in tourism related transportation planning. It is due to the fact that these subjects have emerged from the recent socio-economic changes such as a declining in birth rate, aging society, throttle-down economy, environmentally sustainability, globalization, and innovation of information technology obviously make individuals' needs and sense of value diverse. It is therefore necessary for us to address a few fundamental issues for future innovation and redevelopment in tourism researches as follows:

- To redevelop a systematic planning method of surveying, behavioral analysis, forecasting, and policy evaluation for tourism & travels, which is featured with its comprehensiveness and accountability,
- To innovate a methodology for the pragmatic pursuit of more attractive formation of tourism areas,
- To redevelop a strategic AMMA for quantitatively evaluating how the improvement of transportation infrastructures can contribute to the endogenous development of tourism areas, and
- To correspond to globalization of tourism such as the improvement of inbound / outbound tourists statistics, surveying, and analytical modeling.

Among the above issues, the second may be argued separately depending how spatial expanse of tourist's behaviors can be defined. **Table 1** shows five levels of spatial expanses of tourism-planned areas. The table also indicates that the expected effects of road network improvement in each level of planned areas are different. In the level-I, denoted as a nation wide planned area, the increase of inbound tourism may be mainly expected by either the improvement of airline accessibility or the development of multiple gate system. On the other hand, in the level-V, as the spatial expanse is the smallest scale, it is expected that, the walk trail improvement in a tourist spot may make the excursion more attractive. This means that all of the above issues must be discussed according to the level of spatial expanse of tourism areas.

**Table 1 The Classification of Tourism Planned Areas**

<b>Level</b>	<b>Spatial expanses of planned area</b>	<b>Name of plans</b>	<b>The expected effects of road network improvement</b>
<b>I</b>	Nation-wide unit	Nation-wide plan	Improvement of airline access and multiple gate system may cause increase of potential of inbound tourism.
<b>II</b>	Regional block	Wide area tourism excursion plan	Gaining the ascendancy over wide area tourism excursion may lead up to the formation of an attractive route and a scenic byway as one of tourist resources.
<b>III</b>	Tourism region	Tourism region formation plan	Formation of the tourism region stretching over more than one prefecture is expected to promote the endogenous development with involving the increase of both LOS in transportation services and tourism demand and with activating the regional economy.
<b>IV</b>	Tourism area	Tourism area plan	Smoothing mobility in the tourism area may give tourists satisfaction.
<b>V</b>	Tourist spot	Tourist spot plan	Walk trail improvement in a tourist spot may make the excursion more attractive.

### **3. A method for measuring accessibility improvement effect**

#### 3-1. The basic concept

Basically, road construction and/or improvement projects aim to develop a network for increasing level of services in nation wide and region traffics and finally to achieve the goal such as balanced land-development in nation level, correction of a gap among regions, and sustainable and autonomic development in the area. Also, we have often discussed what road construction and/or improvement is truly necessary for the targeted area. While a viewpoint of economic efficiency, for example, whether the value of benefit cost ratio amounts to more than 1.0, has been often paid to attention reflecting on the criticism of public works, more essential subjects should be discussed: Especially, we need to identify the roles and planning goals of the projects under consideration and also to improve their accountability through evaluating the overall effect of those projects.

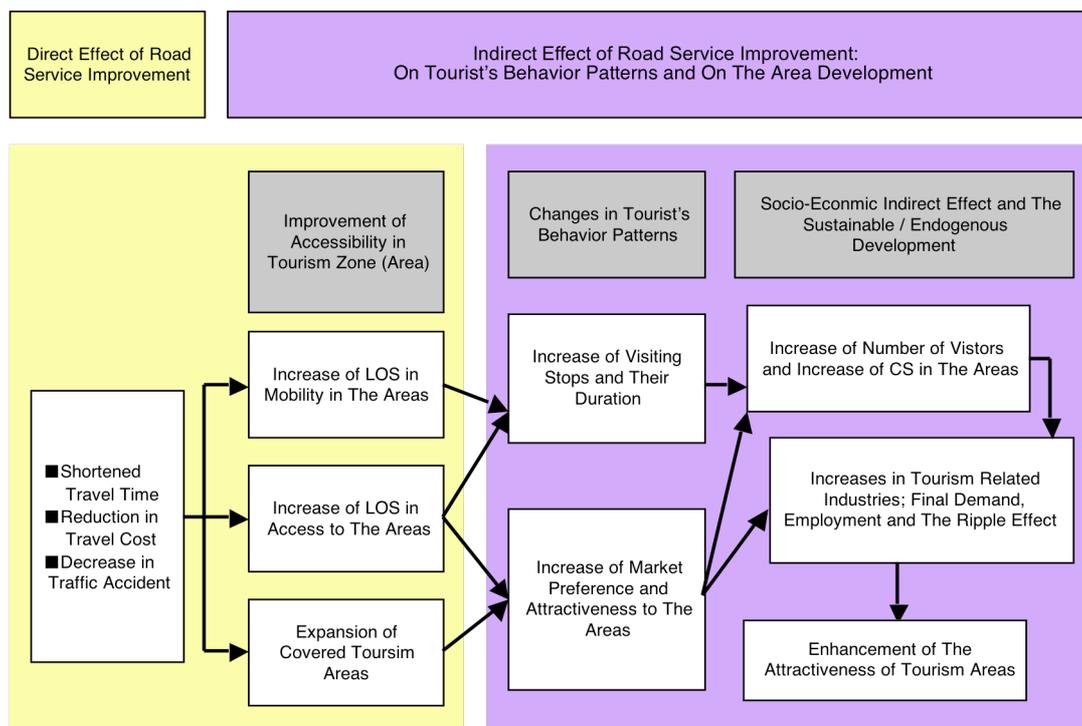
In the middle range of spatial area-levels between level II and level IV as shown in Table 1, it become an important subject to identify how we should progress a desirable area formation linking it with road construction and improvement projects in the corresponding areas. In other words, it is more strongly required for planners to explore how effectively these projects can contribute the area formation. For example, when focusing on level II as shown in Table 1, the road network improvement in a region block is expected to contribute the ascendancy over wide area tourism excursion and it may lead up to the formation of an attractive route and a scenic byway as one of tourist resources. Also, in the level III, such a project has an increasing effect on LOS in mobility in the tourism region stretching over more than one prefecture, and furthermore it is expected to promote the endogenous development cooperating with activation policies of the region economy.

In 2008, Japan Tourism Agency started to discuss on development of 'tourism areas' based on enactment of Tourism Zone Development Act. A tourism zone is here denoted as an area consisting of tourism sites that are closely linked in terms of nature, history, culture or otherwise. The Minister of Land, Infrastructure, Transport and Tourism (denoted as MLIT) has approved tourism zone plans in 30 regions of Japan and supported for the Tourism Areas development. In these plans, a tourism zone is designed to enable longer-stay travel of more than 2 nights and 3 days through cooperation among its tourism sites, with a larger goal of enhancing the attractiveness of these sites. It is quite clear that enhancement of comfort and convenience of transfers and mobility among these sites play an important role for achieving the goal.

Under the above background, this study focuses on the effect of accessibility improvement on the tourism areas development. The objective of this study is to propose a method of quantitatively measuring the effect based on the framework of an evaluation method of road improvement projects as shown in **Figure 2**.

According to the current manual of B/C by MLIT, the amount of benefit is calculated only focusing on the direct effect induced by shortened travel time, reduction in travel cost, and decrease of the number of traffic accidents. Such direct effect may be remarkable in the case of an urban area because the amount is in proportion to the traffic volume. On the other hand, the effect in a rural tourism area results in being underestimated. As this study basically makes a point of measuring the whole effect of road improvement

projects, the indirect effect is incorporated into the benefit evaluation process through focusing on not only the tourist's behavior but also the area development.



**Figure - 2 An Analytical Framework of The Accessibility Improvement Effect**

### 3-2. The method

In this study, the following three viewpoints are taken into consideration: Increase of LOS in accessibility to a tourism area, Increase of LOS in mobility in the area, and Influence on the region economy. While these three points of view are concerned with respective items of the direct effect of improvement of accessibility in tourism area as in **Figure 2**, they have their own indicators as shown in **Table 2**. These indicators are applied to a case study in the next section in order to quantitatively evaluate the amount of the indirect accessibility improvement effect. It is noted that the definition is limited under the condition that all of explanatory variable data can be available or already prepared and that there remains the problem to be solved in data-collection procedure.

As shown in **Table 2**, it is evident that the first indicator is directly concerned with the accessibility improvement effect. When focusing on the changes in accessibility to a tourism area caused by the increase of LOS in the road network, it is needed to evaluate how they impact on the increase of the total number of visitors to the areas and how they result in changes in the area tourism market such as the expansion of covered area, the variations in tourist's preference and behavioral decision making on travel & expenditure. In the next section, an empirical case study will be introduced to discuss validity of the proposed method.

Table 2 Indicators for evaluating the accessibility improvement effect

viewpoints	Indicators	Definition
Increase of LOS in accessibility to a tourism area	The increased amount of tourist's expenditure	$\sum_k (V_{kj}^{after} - V_{kj}^{before}) \cdot TE_{kj}$ , where $(V_{kj}^{after} - V_{kj}^{before})$ : Increased number of visitors from k-th zone to j-th zone, $TE_{kj}$ : Tourist's expenditure
Increase of LOS in mobility in a tourism area	Increased ratio of density of road length per area	$(D_j^{after} - D_j^{before})/D_j^{before}$ , where $D_j^{after}$ : road density (after)(km/km <sup>2</sup> ), $D_j^{before}$ : road density (before)(km/km <sup>2</sup> )
Influence on the region economy	The amount of induced product	Based on Input-Output Table in the areas, the amount of product induced by tourism related industries is calculated.
	The number of induced employment	The calculated amount of induced product is converted to the number of induced employment .

### 3-3. The case study

Let us introduce a case study on the analysis of accessibility improvement effect in a rural tourism area. The studied tourism area, called Nanki-area, is located in the south of Wakayama prefecture in Kinki region of Japan. The area is one of typical tourism areas, featured with abundant natural beauty and hot springs. On the other hand, it has the geographical disadvantage, that the time traveling from Osaka is long for the distance because of a low level of service in road network. They have had high expectation of the accessibility improvement project contributing the area development.

In this case, a road-improvement project is focused on, in which an expressway is planned to be about 24 km length between Shirahama and Susami with the designed speed of 80 km/h. A regression analysis is applied to estimating the number of visitors to 14 tourism sites in the studied prefecture using the following 4 kinds of explanatory variables; the accessibility to each of tourism sites from the surrounding zones, tourism resource potential, the ratio of day trips to the total, and the dummy for a specific site. The estimated equation is expressed as follows:

$$V_k^{before} = a_1 \cdot AC_k^{before} + a_2 \cdot RP_k + a_3 \cdot DT_k + a_4 \cdot \delta_k + a_5$$

$$V_k^{after} = a_1 \cdot AC_k^{after} + a_2 \cdot RP_k + a_3 \cdot DT_k + a_4 \cdot \delta_k + a_5$$

where  $V_k^{before}$ ,  $V_k^{after}$  : The number of visitors to k-th zone (before/after),

$AC_k^{before}$ ,  $AC_k^{after}$  : The value of accessibility in k-th zone (before/after),

$RP_k$  : Tourism resources potential in k-th zone (The number of tourism resources),

$DT_k$  : The ratio of day trips to the total in k-th zone,

$\delta_k$  : Dummy variable,  $\delta_k=1$ , when  $k=k'$ (Shirahama zone), otherwise  $\delta_k=0$ , and  
 $a_1, a_2, a_3, a_4$ , and  $a_5$  : parameter estimates.

**Table 3** shows the result of estimated parameters of a multiple regression model, in which the number of visitors to a tourism zone denoted as a dependent variable is expressed as a function of four independent variables. While the estimated regression model has a dummy variable as one of independent variables, it implies that this dummy variable is concerned with one of specific zone-attributes. It is because Shirahama zone is featured with its unique location and transportation conditions: The zone is located at the site that is the nearest from Osaka and has a local domestic airport. The result shows that the model fits the data well as a whole judging from the value of a multiple coefficient of determination ( $R^2 = 0.7697$ ) and the value of the adjusted  $R^2$  (=0.6929). It is also found that, as shown in the value of the t-statistics of accessibility variable (AC), it strongly determines the number of visitors comparing with the other independent variables.

Table 3 Estimated parameters of a regression model

Variable	Estimated value	t-statistics	regression statistics	
AC: Accessibility	$a_1$	1368663	3.221	R 0.8773
RP: Tourism resources	$a_2$	27518	1.997	$R^2$ 0.7697
DT: Day trip ratio	$a_3$	4895746	1.699	modified $R^2$ 0.6929
$\delta$ :Dummy	$a_4$	3816464	-	Standard Deviation 7.04E+05
Constant	$a_5$	-4060500	-1.458	

**Table 4 Summary of The Accessibility Improvement Effect**

Indicator	Effect	The amount of the effect	Note
The increased amount of tourist's expenditure	Increase of the number of visitors to the area (Case 1: The shortened travel time in L=24 km is 15min.)	120,000 tourists	Based on the result of a regression analysis (Tab 3)
	Increase of the amount of tourist' expenditure (Case 1)	1.595 billion Yen	
The amount of induced product	Increase of the amount of tourist' direct expenditure in the area (Wakayama prefecture) (Case 1)	1.394 billion Yen	The estimated number of tourists is converted to the amount of direct expenditure
	Induced ripple production effect	2.162 billion Yen	
	The sum of direct expenditure and ripple production effect over 20 years	Approx. 17.1 billion Yen	Using Input-Output Table in Wakayama prefecture
The number of induced employment	Increase of the number of employees	250 employees	Using the coefficient of induced employees

Finally, let us introduce the summary of the accessibility improvement effect. **Table 4** shows the estimated amount of the effects corresponding the indicators proposed in this paper. In the first indicator, that is to say, while the increased tourist' expenditure is focused on, the number of increased visitors accounts for 120,000 tourists, and this effect brings in the increase of the total amount of tourist's expenditure, that is equal to about 1.6 billion Yen. On the other hand, the second and third indicators are used to estimate the indirect effect of accessibility improvement. The sum of the amount of direct tourist's expenditure and the ripple production effect over 20 years is calculated based on the input-output table in Wakayama prefecture and it is found that the amount approximately accounts for 17.1 billion Yen. Also, using the coefficient of induced employees in the area, we can find that the increase of the number of employees is expected to be 250 employees.

#### **4. Conclusions**

Under the dramatic changes in tourism of Japan in this decade, it is required to identify how attractive cities and towns we can provide visitors with satisfying their needs and wants and to identify how these tourism areas we can develop with the sustainable and endogenous matter for the inhabitants in the region. Reacting to the request, AMMA has been introduced in this paper because this kind of approach has advantage in examining both the derived nature of tourist's travel & activity demand and the induced effect of the area-management policy.

While a general framework of AMMA in tourism areas has been presented in chapter 2, the authors have emphasized the importance of the concept of tourism area management. It is because we have recognized that the subjects emerged their form by the current socio-economic changes in the tourism areas clearly give us new challenges in the area planning and management fields. Especially, among four of the issues addressed in the section, we have challenged the third issue: That was to redevelop a strategic AMMA for quantitatively evaluating how the improvement of transportation infrastructures can contribute to the endogenous development of tourism areas.

In chapter 3, the effect of accessibility improvement on the tourism areas development has been focused on. The aim was to propose a method of quantitatively evaluating the indirect effect of increase of LOS in road network project. Based on the analytical framework as shown in Figure 2, a practical method of the accessibility improvement effect has been introduced including the development of some of quantitative indicators as shown in Table 2, and a case study has been conducted to estimate the amount of the accessibility improvement effect of the road network project in Wakayama prefecture.

It is evident that we remain a lot of subjects to be solved for developing more sophisticated framework of the AMMA proposed in this paper. Especially, the framework of AMMA should contain the viewpoint of interaction between tourist's decision making and the related LOS in transportation & facility in the area. Also, more systematic method of evaluating a variety of the effect of area-infrastructure improvement should be researched focusing on not only the accessibility effect but also the entire of the area development.

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