A Study On The Evaluation Of Inland Container Depot In The South Of Vietnam

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Abstract : *Inland Container Depot is regarded as an important link in the multimodal transport, contributing to reduce transportation costs, reduce the time saved at the port, with the main function of clearing domestic goods, empty containers and refrigerated containers, super cargo. Inland Container Depot has just used in the South of Vietnam in recent years which are starting in the business. In this paper, i want to research on the potential of dry ports including the development and effective for economic of Vietnam.*

Key word : *ICD, Location, Potential, South of Vietnam, AHP Method.*
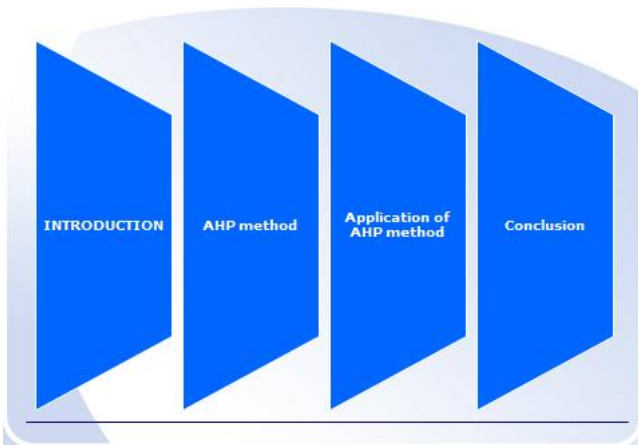
1. Introduction

1.2 ICD

- Inland Container Depot is one of the types of infrastructure for logistics operations. It has been around for decades, but was only used properly in the early 1970s and then became more and more popular around the world.
- Main services include clearance of domestic cargo, containerized cargo yards, empty containers and refrigerated containers, container handling services, overweight cargo

1. Introduction

1.1 The South of Vietnam

- The Southeast has a height of 0 - 986m, the geological structure mainly red basaltic soil and ancient alluvial soil. The plain area occupies an area of about 6.130.000 hectares and over 4,000 canals with a total length of up to 5,700 km.
- The southwest has an average elevation of nearly 2m, with some low mountains in the area adjacent to the Central Highlands and Cambodia

Figure 1. The South of Vietnam

1. Introduction

1.3 Situation of ICD

- Inland Container Depots the South of Vietnam were born in 1998 but from 2009 to present, the rate of development and expansion of ICD has increased rapidly.
- ICD born in recent years have large scale, modern technology, advanced management level. It is also possible to integrate a full range of logistics services, initially taking the form of logistics centers.

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1. Introduction

1.3 Situation of ICD

- ICD Tan Cang - Long Binh (2009), is is not only the clearance point but also the type of warehouse outside the control of customs such as domestic warehouse; warehouse for distribution; cold storage; storage of dangerous goods, provision of logistics-related services, and supply chain management. The goal is to become a largest model center in Vietnam of logistics providing comprehensive business solutions, professional logistics management and supply chain quality.

2. AHP Methodology

- **Calculating Priority vector (x)**
- **Calculate Adjusted weight**
- **Calculating Consistency index(CI) and Consistency ratio (CR)**

$$CI = (\lambda_{max} - n)/(n-1)$$

λ_{max} is Eigen value

n is the number of evaluations

Table 2. Random Consitsency Index

n	1	2	3	4	5	6	7	8	9	10
RI	0	0	0.58	0.9	1.12	1.24	1.32	1.41	1.45	1.49

$$Consistency\ Ratio = \frac{Consistency\ Index}{Random\ Consistency\ Index}$$

2. AHP Methodology

Analytic Hierarchy Process (AHP) is one of Multi Criteria decision making method that was originally developed by Prof. Thomas L. Saaty. It is a method to derive ratio scales from paired comparisons. The input can be obtained from actual measurement

Table 1: Number of comparisons

Number of things	1	2	3	4	5	6	7	n
Number of comparisons	0	1	3	6	10	15	21	$\frac{n(n-1)}{2}$

3. Application of AHP method

- **Information of ICD in the South of Vietnam**

		An Son ICD	Long Binh ICD	New Long Binh ICD	ICD Sotrans	Song Than ICD
Location		Thuận An, Binh Duong Province.	District 7, Bien Hoa City, Dong Nai Province.	Long Binh road, District 9, Ho Chi Minh city.	Thủ Đức District, Ho Chi Minh City	Thuan An, Binh Duong Province
Total area	2020	200,000 m²	500,000 m²	500,000 m²	100,000 m²	
	2030	330,000 m²	1,500,000 m²	1,500,000 m²	150,000 m²	500,000 m²
Expected productivity	2020	300,000 TEU	750,000 TEU	750,000 TEU	160,000 TEU	
	2030	500,000 TEU	2,500,000 TEU	2,500,000 TEU	450,000 TEU	1,000,000 TEU
Multimodal transaportation system	Road	Route 13, the belt 3, Ho Chi Minh City	The belt 2 and 3, Ho Chi Minh City	Route 51, Highway Bien Hoa- Vung Tau	Route 52 Ha Noi- Ho Chi Minh	Route 13, The belt 2 and 3 Ho Chi Minh city
	Inland waterways	An Son Port (Sai Gon river)	Long Binh Port (Dong Nai river)		Phuoc Long 2 port (Sai Gon river)	

2. AHP Methodology

Steps of using AHP

- **Survey collection**

$$a = (a_1 * a_2 * a_3 * \cdots * a_i * \cdots * a_n)^{\frac{1}{n}}$$

a is the sum of values for comparison pairs,

a_1 is the single evaluation of comparable couples,

n is the number of evaluations

- **Making Comparison matrix**

$$\begin{array}{c|ccccc} & A1 & A2 & A3 & \cdots & An \\ \hline A1 & 1 & a_{12} & a_{13} & \cdots & a_{1n} \\ A2 & a_{21} & 1 & a_{23} & \cdots & a_{2n} \\ A3 & a_{31} & a_{32} & 1 & \cdots & a_{3n} \\ \vdots & \vdots & \vdots & \vdots & \ddots & \vdots \\ An & a_{n1} & a_{n2} & a_{n3} & \cdots & 1 \end{array}$$

Figure 3. Comparision matrix

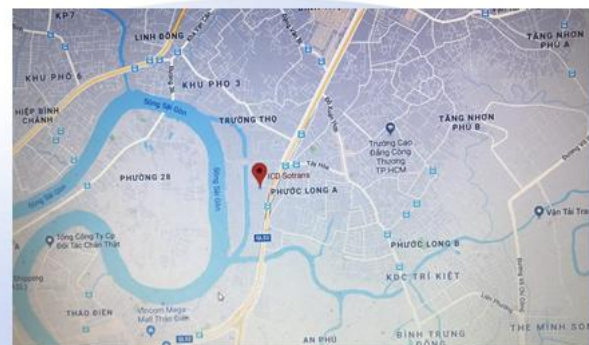# 3. Application of AHP method

Figure 4. Location of Sotrans ICD

3. Application of AHP method

Investment and operating cost	Ability of multimodal transporation	Potential of area
• The cost of buying land • The cost of Building • Transport costs	• The distance to the route • The distance to the railway • the distance to the Inland waterways	• Industrial area • Customer • Regional economic sacle

3. Application of AHP method

■ *138 questionnaires in the pairwise comparisons of the first and second level criteria were sent to 15 experts who were local government officials, maritime ports, logistics companies and customers.*

$$\begin{vmatrix} 1 & 10/13 & 1/2 \\ 1.3 & 1 & 10/14 \\ 2 & 1.4 & 1 \end{vmatrix}$$

Figure 5. Level 1 comparision matrix