



## Transforming the Panama Canal's Transport Pattern into a Tourist Attraction: An Analytical Study

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### Abstract

Our research aims to transform the Panama Canal's transportation model into a tourist attraction, to highlight the Panama Canal, and to analyze the possibility of transforming it into a global tourist destination by exploring the opportunities and challenges associated with this transformation, as well as highlighting its economic and geographical role and importance. The research will address the historical and engineering aspects of the canal, in addition to analyzing current patterns of maritime transport and their impact on tourism according to an analytical methodology based on historical and statistical data, in addition to international comparisons.

**Keywords:** Panama Canal, Tourist attraction.

### Introduction

The Panama Canal is one of the most significant engineering achievements in modern history, playing a pivotal role in global trade since its opening in 1914. Technological developments and changes in maritime transport patterns have created challenges that require reconsidering strategies related to the canal's management and utilization. The concept of transforming the Panama Canal's transportation model from a mere commercial waterway to a tourist attraction has emerged as a strategic opportunity to enhance the canal's economic and cultural value.

- **Research Problem:** Considering the Panama Canal as a unique engineering achievement in the field of maritime transport, and its significant impact on the global economy since its inception. Despite the canal's unique historical and engineering value, its use has remained primarily limited to commercial purposes, without exploiting its resources and potential as a tourist attraction. It has also not been sufficiently utilized to promote tourism, which raises questions about the possibility of transforming it into a global tourist destination. Accordingly, the research problem stems from the main question:
  - Can the Panama Canal and its maritime transport be transformed into a tourist attraction, a destination for viewing this engineering marvel?
  - To what extent will this transformation contribute to strengthening the local and global economy?
  - What factors could contribute to the success of this transformation, while assessing its potential economic and social impacts?



- **Research objectives: It aims to:**

1. Analyze the tourism potential of the Panama Canal, examining the unique historical and engineering aspects of the canal that could make it an attractive tourist destination for visitors from around the world.
2. Evaluate the canal's current status to understand its current role in maritime transport and international trade, and identify untapped tourism opportunities.
3. Explore successful international experiences to analyze successful global models for transforming transportation infrastructure into tourist attractions, and apply them to the Panama Canal.
4. Identify the challenges that may face transforming the Panama Canal into a tourist attraction, whether technical, environmental, economic, or regulatory.
5. Develop proposals to enhance tourism attractions and improve tourism infrastructure around the canal, and develop tourism programs and activities that reflect the canal's engineering marvels.
6. Develop an integrated strategic framework to achieve the transition from commercial to tourism use, while ensuring the long-term sustainability of the project.

- **The importance of the research is evident from the following:**

1. Enhance the economic value of the Panama Canal and explore new opportunities to diversify income sources by transforming the Canal into a tourist attraction, contributing to the strengthening of the local economies of the region and supporting the global economy.
2. Benefit from untapped potential, highlighting and optimally utilizing this potential.
3. Create new job opportunities in diverse fields, such as tourism, hospitality, marketing, and logistics, contributing to improving the standard of living for local communities.
4. Enhance the Panama Canal's status as a symbol of engineering innovation and human achievement, not only in the field of maritime transport, but also as a global tourist destination that attracts visitors from around the world.
5. Support the Sustainable Development Goals by promoting sustainable tourism, protecting cultural heritage, developing local communities, and achieving inclusive economic growth.
6. Provide a strategic vision for the future of transforming the Panama Canal into a tourist attraction, while ensuring the long-term sustainability of this transformation, contributing to maximizing economic and social benefits.

- **Research hypothesis: The research is based on several basic hypotheses, which are as follows:**

1. Hypothesis 1: Developing the tourism infrastructure in Panama and the areas surrounding the canal will enhance its tourist attractiveness.
2. Hypothesis 2: Transforming the canal's waterway into a tourist attraction will not negatively impact the development of the canal.



3. Hypothesis 3: Cooperation between the public and private sectors to promote tourism around the canal.

- **Research limits: represented by the following:**

1. Spatial boundaries: The study covers the Panama Canal and the surrounding areas, which can be exploited and exploited for tourism purposes.
2. Temporal boundaries: The study was based on data and statistics up to 2025.

- **Research methodology: The researcher relied on the following:**

1. Descriptive approach: By analyzing data and information related to the tourism infrastructure and services available in the canal and surrounding areas.
2. Analytical approach: By analyzing information and data from government reports, as well as academic studies specializing in the tourism field, and by studying other canals to analyze and identify their strengths, enabling optimal exploitation of the channel.

Based on this, the research consisted of two sections. The first section dealt with (the theoretical .(framework), and the second section dealt with (the analytical aspect

## Chapter One: Theoretical Framework:

### First: The Panama Canal:

The Panama Canal connects the Atlantic and Pacific Oceans via the Isthmus of Panama in Central America. The idea of constructing the canal began in the sixteenth century when Spanish explorers began searching for a shortcut to connect the two oceans to facilitate trade. However, the idea was not realized until the twentieth century after great efforts and enormous engineering and environmental challenges.

The Spanish proposed the idea of constructing a canal across the Isthmus of Panama in the sixteenth century, but the technology and resources were not available to implement the project. In the nineteenth century, France, led by Ferdinand de Lesseps, began construction of the canal in 1881, but the project failed due to engineering challenges, widespread diseases such as malaria and yellow fever, and poor project management (Greene, 2009). After the failure of the French attempt, the United States purchased the rights to build the canal from France in 1902. Previous challenges were overcome by combating disease and using advanced engineering techniques, until the canal was completed and officially opened on August 15, 1914 (Maurer, 2011: 119). The United States government operated the canal until 1999. During this period, the canal became a vital artery for global trade, shortening the distances between the eastern and western coasts of North and South America (Greene, 2009). Management of the canal was officially transferred to Panama on December 31, 1999, under the Torrijos-Carter Treaty, signed in 1977. The canal was then managed by the Panama Canal Authority (ACP), which has successfully improved the canal's efficiency and expanded its reach. The canal expansion project, inaugurated in 2016, allowed for the passage of larger vessels and increased global trade (ACP, 2023).



### Second: The Engineering Miracle:

The Panama Canal is a unique engineering achievement due to the difference in water levels between the Atlantic and Pacific Oceans in the Panama region. The Pacific Ocean's water level is higher than the Atlantic Ocean's by an average of about (20) cm. This difference results from numerous factors, such as differences in tides, ocean currents, and coastal terrain (McCullough, 1977: 225). Transporting giant ships between the two requires a complex engineering system. The canal employs a sophisticated system called "locks," which represent special water chambers used to raise ships from a low level to a high level, or lower them from a high level to a low level. Ships are transported through three main stages, each of which requires a change in water levels within the lock chambers. These locks were built in pairs to allow ships to pass in both directions simultaneously, enhancing the canal's efficiency (Abdulhafedh, 2017: 318).

Each lock is (300) meters long, (34) meters wide, and (20) meters deep. These dimensions determine the size of the ships entering the canal. The lock consists of three pairs of concrete chambers that lift the ships to a distance of approximately (26) meters above sea level. With this precise design, the Panama Canal is a true engineering miracle, as it combines natural challenges with advanced engineering solutions to facilitate the movement of global trade (Al-Ajwad, 2000: pp. 164-165).

The tidal fluctuations in the Atlantic Ocean change up or down at a rate of approximately (60) cm daily. After the ship leaves the lock, it heads through a channel of (13) km in length. On this journey, it passes through the cities of Balboa and its highlands and La Boca. The ship also passes under the Thatcher Ferry Bridge, which is an important link in the trans-American route. After the ship's pilot leaves, the ship enters the Gulf of Panama, then makes its way towards the open sea. Thus, it has covered a distance of slightly more than (80) km between the Atlantic and Pacific Oceans in approximately (8) hours (Eid, 2013: p. 71).

### Third: International Experiences:

There are waterways, canals, and engineering projects similar to the Panama Canal around the world. These are large, even massive, projects with tourism advantages, such as the Suez Canal in Egypt and the Hoover Dam in the United States. These projects have adopted methods and approaches for developing and improving their tourism sectors compared to those adopted by the Panama Canal. Table (1) shows the number of tourists arriving at tourist destinations compared to the Panama Canal

**Table (1): Comparison of the Panama Canal with other tourist destinations (2022)**

tourist destination	Number of visitors (million)
Panama Canal	1.1
Suez Canal	0.4
Hoover Dam	1

**Source: Panama Canal Authority, Egyptian Ministry of Tourism, Hoover Dam Authority**



### Section Two: The Analytical Aspect

#### First: Analysis of the Panama Canal's Geographical Location and Its Tourism Advantages:

##### (1) Strengths analysis:

- The Isthmus of Panama is the world's gateway and major commercial and military transportation hub, connecting North and South America, making it an easily accessible tourist destination from all over the world (Sanchez, 2020: 45 & Lopez).
- The canal is considered one of the world's most significant engineering achievements. Air travelers flying over the Republic of Panama see an unforgettable view through the clouds covering the Pacific and Atlantic Oceans. They see a series of long lakes and canals connected to each other like silver chains across a strait surrounded by greenery. These chains of canals are called the Panama Canal, which connects the two oceans.
- The canal's exit to the Pacific Ocean is approximately 27 miles wider to the east than its entrance to the Atlantic Ocean.
- Travelers over the Panama Canal are amazed that they see the sun rise on the Pacific Ocean more quickly than it rises on the Atlantic Ocean. Due to the direction of the land, this is an added advantage of the canal (Tourism Authority of Panama, 2022). Table No. (2) shows the growth in the number of tourists visiting the Panama Canal over the previous years.

**Table (2): Number of tourists to the Panama Canal (2018-2025)**

year	Number of visitors (in thousands)	Growth rate
2018	2500	-
2019	2800	%12
2020	1500	(Corona impact) %46-
2021	2100	%40
2022	2600	%23
2023	3100	%19
2024	3450	%11
2025	3800	(stable estimate) %10

**Source:** Tourism Authority of Panama (2025), Annual Tourism Statistics Report.

- The Republic of Panama covers an area of 75,517 km<sup>2</sup>, and its prime location makes it an attractive investment destination for tourism, thanks to the modernity of its capital and its cosmopolitan character, as well as its unparalleled natural wealth and cultural diversity, as well as its many beaches.
- It offers significant tax incentives to attract new investors, as it combines a large and diverse number of tourist attractions in one territory, such as the stunning beaches of the Caribbean Sea and the Pacific Ocean, as well as its beautiful nature reserves, which





are home to some of the most diverse habitats on our planet, as well as diverse flora and fauna.

- c. Modern Panama City is a major commercial and financial center and also offers visitors valuable historical and architectural landmarks, such as the historic center of the San Felipe neighborhood, the ruins of ancient Panama, and the Museum of Marine Biology designed by the world-famous architect Frank Gehry (National Institute of Mobilization and Statistics of Panama: 2023).
- d. The emergence of the Invest in Panama Alliance seeks to encourage learning, discovery, curiosity, and research to attract a new breed of visitors who are more environmentally aware, and to increase the number of tourists interested in preserving the natural and cultural resources of the destination they visit, as well as the well-being of local communities. Panama has also focused on developing products aimed at this goal and attracting them to the country. The Tourism, Conservation, and Research Alliance was established to promote and support sustainable heritage tourism development in Panama.
- e. Panama's Sustainable Tourism Pilot Plan 2020-2025 helps strengthen the investment attraction strategy, particularly in creating richer experiences of Panama's natural and cultural heritage (ProPanama, 2024: 34-37).
- f. The Republic of Panama relies heavily on tourism revenues, with tourism in the Panama Canal accounting for the largest share of these revenues (WTTC, 2025). Table (3) shows the economic returns of tourism in Panama.

**Table (3): Economic returns from tourism in Panama**

year	Tourism revenues (millions of \$)	Panama Canal share
2018	5300	%35
2019	5800	%38
2020	2900	%40
2021	4200	%37
2022	5100	%36
2023	5900	%37
2024	6400	%36
2025	7000	%35

**Source:**World Travel & Tourism Council (WTTC)(2025),  
Panama Economic impact of Tourism.

The table above shows the financial impact of tourism on the national economy of the Republic of Panama, its relationship to the international tourism sector's marketing strategies, and the Panama Canal's share of these revenues and returns, the estimates for the last years (2024-2025) are realistic estimates based on (WTTC) reports and the expectations of the Panama Tourism Authority (ATP).



### (2) Analysis of tourism opportunities:

- a. **Museums and Educational Centers:** Museums and educational centers can display the historical stages of the canal's construction, as well as the movement of ships during their transit through the canal. These displays may include documentaries, photo exhibitions, engineering models, and other activities.
- b. **Supporting Tourism Investment:** The Government of Panama enacted Law (122) to support and finance new tourism investments and projects. This law has attracted major hospitality projects, such as Bocas del Toro, Chiriqui, the El Perales Archipelago, and Punta Chami, with a total value exceeding (371) million US dollars. It has also included the construction of hotels and the improvement of transportation facilities in the Panama Canal (ProPanama, 2024: 37). Table (4) shows tourism infrastructure investments in the Panama Canal.

**Table (4): Tourism infrastructure investments in the Panama Canal**

year	Investment value (million\$)	Major projects
2018	500	Cristobal Port Expansion and Road Improvements
2019	700	Building new hotels and developing visitor centers
2020	300	Improving public transportation networks
2021	600	Renovating cultural museums and constructing roads
2022	800	Establishing nature reserves and developing tourist destinations
2023	950	Amador Cruise Port Opens, Canal Visitor Center Updated
2024	1100	Expanding cruise tourism areas and environmental sustainability projects for the Canal
2025	1200	Digitizing tourist guidance and developing smart infrastructure for tourist centers

**Source:**Ministry of Economy and Finance of Panama (2025).Tourism Investment Report.

Table No. (3) shows that the Panama Canal has witnessed significant development in the field of investment in tourism infrastructure over the past years, which has led to the development of services and the improvement of the region's image, to be a distinct tourist attraction, in addition to increasing its ability to attract the largest number of tourists, the estimates for the years 2024-2025 are based on the Panamanian National Tourism Plan (2020-2025), which focuses on smart tourism infrastructure and sustainable and ecotourism (Panama Canal Authority and the Panamanian Ministry of Economy).



- c. Ecotourism: The biodiversity of the areas surrounding the canal helps tourism companies organize tour programs and trips for environmentalists, informing them of this biodiversity and the rich forests surrounding the canal. A report by the Ministry of Tourism in Panama states that ecotourism represents an estimated 25% of the total tourism in Panama for 2022 (Hughes, 2021: 85.)
  - d. Cruises and Tours: The passage of ships and cruises through the canal waterway gives tourists the opportunity to enjoy and observe the engineering marvels, and the tours are both entertaining and educational.
  - e. Festivals, Events, and Championships: Holding annual carnivals, festivals, and sports tournaments contributes to enhancing and improving the canal's tourist destination, as well as increasing the number of tourists through their participation in these activities, such as boat races, musical and theatrical performances, Panamanian heritage shows, and other activities and events that attract tourists (Smith, 2019: 202).
- Table (5) shows the tourism activities related to the canal area.

**Table (5): Tourist activities related to the Canal Zone**

year	Number of ecotourism visitors (in thousands)	Most popular environmental activities
2018	450	bird watching, forest walking
2019	520	Eco-boat tours and animal watching
2020	300	Nature trips limited due to COVID-19
2021	480	Forest and Eco-Boat Tours
2022	600	Wildlife viewing trips and nature reserves
2023	670	Eco-rafting, nature photography, and animal watching trips
2024	740	Visit national parks overlooking the canal, as well as overnight bush treks
2025	800	Sustainable activities and interactive tours with indigenous people

**Source:** National Institute of Ecology and Tourism (2025), Ecotourism Statistics Report.

The table shows the activities and events that attract tourists on eco-tours and trips, including birdwatching, wildlife viewing, and eco-boat tours, which attract large numbers of tourists annually. The table also highlights the annual increase in the number of eco-tourists, given the importance of this type of tourism to the Panamanian tourism industry, as well as the opportunities Panama offers tourists to enjoy nature and its environmental and natural reserves.

### **Second: Challenges and risks facing tourism development around the canal:**

#### (1)Economic challenges:

- a. Lack of investment in tourism infrastructure: Developing infrastructure is very costly, and tourism infrastructure and its expansion require very large investments in it, as well as in tourism sectors that support tourism development, such as hotels, restaurants, roads, etc. (Evans, 2019: 111). The private sector alone may not be able to





bear the responsibility for developing tourism infrastructure; Therefore, the public sector must participate to achieve the canal's competitive tourism advantage. This represents a difficult challenge for the private sector on the one hand, and the public sector on the other (Gonzales, 2020: 115.)

- b. Fear of ships abandoning the canal: Members of the Panama Canal Authority express concern about the possibility of thousands of ships abandoning the canal altogether and switching to a new and different route. The increasing pace of climate change and the melting of ice is gradually opening the Northwest Passage, which has been of interest to explorers for three centuries (Bonap, Panama Canal: 103). The new route allows ships heading from London to East Asian ports to cut in half the distance they used to travel through the Panama Canal (Robert, 2010: 274.)

### (2) Environmental challenges:

- a. Balance between tourism development and environmental protection: Transforming the canal into a distinct, global tourist destination may endanger the ecosystem surrounding the canal and make it difficult to maintain environmental balance. The canal is rich in natural resources that must be protected, and tourism development may lead to their destruction (Henderson, 2018: 26).
- b. Potential environmental risks: By developing plans for tourism development and sustainability, using environmentally friendly systems and technologies, and adhering to sustainable tourism development standards to protect the local environment (Brown, 2022: 75).
- c. Environmental impact: The excessive consumption of natural resources in the region resulting from the increased number of incoming tourists, such as carbon emissions, is a result of the increased number of tourists. Table (6) illustrates the environmental impact of the increased number of tourists.

**Table (6): The environmental impact of increasing the number of tourists**

year	Number of tourists (million)	Carbon emission (tons)	Water use rates (million liters)
2018	2.5	150000	50
2019	2.8	168000	65
2020	1.5	90000	30
2021	2.1	126000	45
2022	2.6	156000	50
2023	3.1	186000	63
2024	3.4	204000	70
2025	3.8	228000	80

**Source:**Environmental Impact Agency of Panama, (2025), Tourism and Environmental Report.

The table above illustrates the potential negative impacts of the significant increase in tourist numbers, which compels officials and stakeholders to open a discussion on mitigating



these impacts, as well as the importance of tourism sustainability. The Panamanian Ministry of Environment has planned to reduce carbon emissions from tourism activities, which were 5% in 2022, to 30% by 2025 (Ministry of Environment), the estimates for recent years (2024-2025) are realistic estimates based on WTTC reports, ATP forecasts, and ecotourism and cruise tourism growth data..

- d. Severe drought: The Canal Administration decided to reduce the number of ships from an average of (37) ships to (22) ships per day; This gave the opportunity to competing countries to open dry canals to compete with the Panama Canal, and the first of these countries was Mexico, as it decided to open a railway line in the narrowest distance between the Pacific and Atlantic Oceans, and this is what happened, as this project has become a public legal entity, and a decentralized body with its own assets, which was established in 2019, and in 2020, work was developed on this project, and the opening took place in December 2023, in light of an ambitious government plan aimed at enabling this route to compete with the Panama Canal, which is currently crowded and suffering from severe drought, especially since the railway crossing time is (6.5) hours excluding loading time, while ships crossing the canal take (8-10) hours. The government announced investments in this project worth (2.85) billion dollars, and this project consists of a railway line across a strip of land with a length of (303) kilometers, or (186) miles, from the port of Salina Cruz in Oaxaca on the Pacific Ocean to Coatzacoalcos in Veracruz on the other side of the passage. Tehuantepec (CIIT, Mexico Government, FT, AFP).

### (3)Marketing challenges:

- a. Lack of international awareness of the canal's attractiveness as a tourist destination: i.e., the lack of sufficient promotional campaigns to attract tourists, and weak international promotion. Statistics indicate that (40%) of tourists have not heard of the Panama Canal's tourism potential (Tourism Authority of Panama, 2023); due to regional competition, (30%) of the decline in the number of tourists is due to travel to other countries (Latin America Tourism), and (25%) of tourism projects were affected by weak coordination between tourism and government agencies (WTTC Panama Challenges: 2023).
- b. weak marketing campaigns and tourism advertisements are a result of weak funding due to the scarcity of financial resources allocated to marketing campaigns, as (35%) of the lack of funding allocated to tourism marketing campaigns (WTTC Panama Challenges: 2023), and the reason for weak digital promotion is (50%) of tourist sites in Panama that do not benefit from digital marketing (Digital Marketing: 2023).

Table No. (7) shows the marketing challenges for developing tourism in the Panama Canal.

**Table (7): Marketing challenges for developing tourism in the Panama Canal**

The challenge	Description	الأثر على التسويق السياحي	مقترحات وحلول
<b>Lack of funding</b>	Lack of financial resources allocated to marketing campaigns.	Weak ability to launch large-scale promotional campaigns.	Increase government investment and private partnerships.



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<b>Weak tourism promotion</b>	Insufficient promotional campaigns to attract tourists from abroad.	Low global awareness of the Panama Canal's tourism potential.	Promote marketing campaigns through international media.
<b>Regional competition</b>	Panama competes with other countries such as Costa Rica.	Attracting tourists to competing destinations in the region.	Develop marketing strategies that focus on the unique features of the Panama Canal.
<b>Technological challenges</b>	Weak reliance on technology in tourism marketing.	Lack of access to a wide audience through digital channels.	Adopt advanced digital marketing strategies.
<b>Lack of coordination between agencies</b>	Poor coordination between tourism and government agencies.	Dispersion of marketing efforts and lack of unification and clarity of vision.	Improving coordination between tourism and government agencies.

**Source:** Tourism Authority of Panama, (2023), Challenges in Promoting Panama's Tourism Industry.

## Conclusions:

1. Low global awareness of the Panama Canal's tourism potential due to weak tourism promotion and a lack of funding.
2. Attracting tourists to destinations competing with the Panama Canal due to the regional competition in these areas.
3. Weak reliance on technology in digital tourism marketing to reach a broad audience.
4. Fragmented marketing efforts and a lack of unified and clear vision due to poor coordination between tourism and government agencies.
5. Negative impact on the ecosystem due to the excessive consumption of natural resources due to the increasing number of tourists, which in turn leads to the emission of gases harmful to local populations.
6. High costs are a primary reason for the weak tourism development process.
7. Competition with the Panama Canal in the same Pacific and Atlantic Oceans from dry canals, which have similar transport specifications to the Panama Canal in terms of time spent on transportation and as an attractive investment opportunity.

## Recommendations:

1. Develop marketing strategies targeting different categories of tourists, including those interested in history and architecture, nature, wildlife, and adventure, focusing on the unique features of the Panama Canal.
2. Increase government investment and support public-private partnerships.
3. Develop a marketing strategy.



4. Focus on targeted marketing and develop strategies to advance technology, keep pace with countries and locations competing with the Panama Canal, and reach the target audience through digital channels.
5. Formulate strategies for sustainable tourism development, maintaining a balance between tourism development and environmental protection when transforming the Canal into a distinguished, global tourist destination, and avoiding harming or endangering the ecosystem surrounding the Canal.
6. Rationalize the consumption of natural resources and prevent local residents from being exposed to environmental pollution resulting from the emission of toxic gases, such as carbon emissions.

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