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"Warning in Spaces: Blending Heritage, Nature and Design"

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Organizer:

Bachelor of Landscape Architecture (Hons.)
Programme of Landscape Architecture, Department of Built Environment & Technology,
Faculty of Built Environment, UiTM Perak Branch, Seri Iskandar Campus



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"Harmony in Spaces : Blending Heritage, Nature and Design"

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Local Community Perception on the Preservation of Victoria Bridge as a Heritage Tourism Attraction in Karai, Perak

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Abstract

One of Malaysia's most recognizable examples of colonial industrial history is Victoria Bridge in Karai, Perak, which represents the engineering prowess and infrastructure aspirations of the British colonial era (Museum Volunteers Malaysia, 2021). The bridge, which was built in 1900 at the height of Perak's tin mining boom, was formerly an essential connection between the export hubs along the west coast and the tin-producing centres in the Kinta Valley (Free Malaysia Today, 2024). Beyond its aesthetic value, the bridge serves as a physical link to the socioeconomic changes that influenced Perak's industrial identity and regional growth (Atlas Obscura, 2025). Today, preserving Victoria Bridge goes beyond simple conservation; it is an endeavour to bring Perak's colonial industrial past back to life and incorporate it into modern heritage and industrial tourist plans. Perak wants to use its railway, mining, and industrial heritage assets to draw specialized tourism markets and empower local communities, as stated in recent state initiatives (Peira et al., 2022; Mohd-Isa, 2011). An example of sustainable heritage management is the bridge's adaptive reuse as a cultural and tourism landmark, which supports economic diversification in Karai and Kuala Kangsar while fostering a sense of pride and identity among the local population (Idrus et al., 2010; Bhati, 2014). Three primary approaches will be used in the research: a review of the literature to look at earlier studies and historical records; site surveys and in-person observations to evaluate the physical state and interactions with visitors; and a questionnaire survey to look at public perception, awareness, and involvement in the conservation process (IRAJ, 2016). By using these strategies, the project hopes to demonstrate how Victoria Bridge's preservation might function as a template for incorporating colonial industrial heritage into Perak's modern industrial tourism framework, promoting long-term cultural and economic renewal.

Keywords: Heritage, Residents, Kuala Kangsar, History, Victoria Bridge, Railway

INTRODUCTION

Particularly during the colonial era, when the tin-mining industry in the Kinta Valley flourished and changed the region's topography, Perak has long been a pillar of Malaysia's industrial and economic history (Museum Volunteers Malaysia, 2021). In order to serve this rapidly expanding industry, the British government built a vast network of infrastructure, one of which was the railway system, which was essential in linking coastal ports for export with inland mining regions.

The railway was significant because it transformed industrial transportation, substituting quicker, more dependable ways to move goods and materials for sluggish water methods. Along the railway route, this

promoted the development of mining towns and communities, in addition to increasing Perak's productivity (Free Malaysia Today, 2024). As a crucial component of this network, the 1900 completion of Karai's Victoria Bridge connected tin-producing areas and represented the pinnacle of colonial engineering prowess (Atlas Obscura, 2025; Idrus et al., 2010).

Victoria Bridge is a well-known representation of Malaysia's colonial industrial past and one of the country's oldest surviving railway bridges. The state government of Perak has identified these locations as resources for industrial heritage tourism in recent years, connecting them to sites such as the Kinta Tin Mining Museum and Tanjung Tualang Tin Dredge (Bhati, 2014; Peira et al., 2022). This program seeks to support community-based development, tourism, and education while protecting the state's industrial heritage.

PROBLEM STATEMENT

Growing obstacles to Victoria Bridge's preservation in Karai jeopardize its historical and cultural integrity. The bridge's historic environment that formerly connected it to Perak's tin-mining sector may be disrupted by urbanization pressures and new infrastructure developments in the surrounding area, thereby overshadowing its heritage significance (Mohd-Isa, 2011; Idrus et al., 2010).

Local ties to the bridge's historical significance have also been undermined by a lack of community awareness and involvement. Its significance in Perak's industrial past is not well known to many younger locals, which is indicative of a larger problem in Malaysia: a decline in public involvement in heritage conservation (Sodangi et al., 2014; Museum Volunteers Malaysia, 2021). Long-term stewardship and cultural continuity are threatened by this lack of participation.

Financial constraints and the requirement for specific technical knowledge to preserve iron-truss structures continue to be conservation challenges. Parts of the bridge are susceptible to deterioration due to inadequate maintenance funding, which is indicative of larger challenges in maintaining historic infrastructure (IRAJ, 2016; Mohd-Isa, 2011). Lastly, even though Victoria Bridge has seen some tourists, its potential for industrial heritage tourism is still untapped. The location is still not completely incorporated into Perak's industrial tourist circuit, which also includes famous sites like the Kinta Tin Mining Museum and Tanjung Tualang Tin Dredge (Bhati, 2014; Peira et al., 2022). Opportunities for sustainable tourism, education, and economic revitalization have thus not been completely realized (Liu et al., 2024).

LITERATURE REVIEW

Industrial heritage encompasses the physical remains and cultural landscapes associated with past industrial activities, including factories, mines, transport infrastructure, and workers' settlements, which collectively illustrate historical patterns of economic and technological development (Liu et al., 2024). In recent decades, the preservation of industrial heritage has expanded beyond mere conservation to include adaptive reuse and tourism development, positioning heritage sites as assets for sustainable regional growth. Railway infrastructure is widely recognized as a critical component of industrial heritage, as it enabled the large-scale movement of raw materials, labour, and goods during the industrial era (Bhati, 2014).

In the Malaysian context, **Perak** plays a central role in the nation's industrial history due to its dominance in the **tin-mining industry** during the late nineteenth and early twentieth centuries. British colonial administration invested heavily in railway construction to support the extraction and export of tin, transforming Perak into a key economic hub (Mohd-Isa, 2011). Railways not only facilitated industrial efficiency but also influenced settlement patterns, urban growth, and socio-economic structures across the state. As a result, railway-related structures such as bridges, stations, and maintenance facilities are considered significant industrial heritage assets.

The **Victoria Bridge in Karai**, completed in 1900, is one of the earliest steel railway bridges in Malaysia and represents an important technological achievement of the colonial period (Museum Volunteers Malaysia, 2021). Its iron-truss design reflects British engineering practices adapted to tropical conditions and heavy industrial loads associated with tin transport. Scholars emphasize that such infrastructure holds high heritage value due to its rarity, authenticity, and strong association with industrial history (Mohd-Isa, 2011). Despite its designation as a heritage landmark, studies note that Victoria Bridge remains underutilized in heritage planning and tourism promotion compared to other industrial sites in Perak.

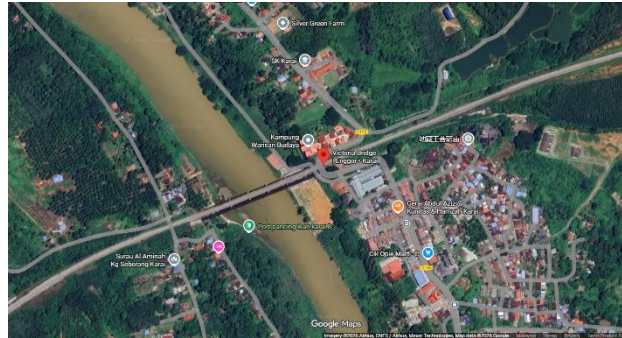
Research on **industrial heritage tourism** highlights its potential to generate economic benefits while preserving historical identity. Bhati (2014) argues that industrial heritage attractions can diversify tourism products, particularly in regions seeking alternatives to mass tourism. In Perak, sites such as the **Tanjung Tualang Tin Dredge** and the **Kinta Tin Mining Museum** demonstrate how former industrial assets can be successfully transformed into educational and tourism-oriented destinations (Peira et al., 2022). These examples indicate that industrial heritage, when properly interpreted and managed, can enhance visitor understanding of historical industrial processes and local culture.

However, several scholars identify persistent challenges in industrial heritage conservation in Malaysia. Limited funding, lack of technical expertise, and insufficient coordination between heritage authorities and tourism agencies often hinder effective preservation (Sodangi et al., 2014). Railway heritage structures, in particular, require specialized maintenance due to aging materials and structural complexity, making long-term conservation costly and technically demanding. Without sustained intervention, such structures face gradual deterioration and loss of historical integrity (IRAJ, 2016).

Community awareness and participation are also identified as key determinants of successful heritage conservation. Sodangi et al. (2014) emphasize that local communities play a crucial role in safeguarding heritage values, as public engagement fosters a sense of ownership and responsibility. In the case of Victoria Bridge, limited awareness among younger generations has weakened its cultural continuity, reducing its visibility as an industrial heritage tourism asset (Museum Volunteers Malaysia, 2021).

Overall, existing literature highlights a gap in research focusing specifically on **railway heritage as a driver of industrial tourism in Perak**. While industrial heritage tourism has been widely discussed, the role of railway infrastructure such as Victoria Bridge remains underexplored. This study addresses this gap by examining how preservation efforts can strengthen Victoria Bridge's contribution to Perak's industrial tourism strategy while ensuring sustainable heritage management.

SCOPE OF STUDY



The study was conducted at Victoria bridge Located in Karai, Perak. The target respondent was the local community that live nearby the bridge and aged 18 years old and above. The focus of the research was to study the opinion of the local community towards the Preservation of Victoria Bridge as a Heritage Tourism Attraction. An observation also conducted along the bridge from one end to the other to identify the conditions of the bridge and any historical values in the area.

AIM AND OBJECTIVES

Aim

The aim of this study is to examine the impact of preserving Victoria Bridge and its railway heritage in Karai, Perak, on residents, with a focus on its role in supporting industrial tourism in Perak.

Objectives

1. To analyse the historical and cultural significance of Victoria Bridge in relation to Perak's tin-mining and railway heritage through a literature review that compiles archival records, scholarly studies, and policy documents on colonial industrial infrastructure.
2. To assess the current physical condition and tourism potential of Victoria Bridge using site surveys and direct observations to evaluate conservation status, visitor accessibility, and interpretive facilities that support heritage tourism.
3. To investigate community perception and engagement towards the bridge's role in industrial tourism development through a questionnaire survey, identifying public awareness, attitudes, and expectations for sustainable heritage tourism in Karai and surrounding areas.

METHODOLOGY

This study adopts a mixed-methods approach to ensure comprehensive analysis of both tangible and intangible impacts of heritage preservation.

Literature And Archival Review

- Collect secondary data on railway heritage, industrial heritage conservation, and case studies of preserved railway bridges globally and regionally.
- Review archival documents, historical maps, photographs, and government reports on Victoria Bridge.

Site Survey And Observation

- Conduct physical observation of the bridge and surrounding railway heritage.
- Use photography and condition assessments to document structural and spatial characteristics.

Questionnaire Surveys

- Distribute structured questionnaires to local residents
- Gather data on perceptions, cultural values, tourism impacts, and willingness to support preservation.

LIMITATION STUDY

The two-week research period for this study limits the scope of data collecting and analysis. While site surveys are limited to quick observations of the bridge's physical and tourism characteristics, the literature study might not include all previous research. A modest sample size will be used for the questionnaire survey, which will restrict wider representation. Notwithstanding these limitations, the study offers helpful initial insights on the contribution of Victoria Bridge to the growth of industrial tourism in Perak.

EXPECTED OUTCOMES

This research is expected to demonstrate that the preservation of Victoria Bridge plays a significant role in strengthening Perak's industrial heritage identity by reinforcing the historical connection between the colonial railway system and the tin-mining industry. The study will clarify how the bridge functions not only as an engineering landmark but also as tangible evidence of the infrastructure that enabled Perak's economic growth during the colonial period. By documenting its historical value and current condition, the research will contribute to a clearer understanding of its importance within Malaysia's industrial heritage narrative.

Secondly, the findings are anticipated to reveal the level of public awareness, perception, and community attachment towards Victoria Bridge as a heritage tourism asset. Through questionnaire surveys and site observations, the study is expected to identify gaps in interpretation, accessibility, and visitor facilities that currently limit its tourism potential. These insights will help explain why, despite its uniqueness, the bridge remains underutilized compared to other industrial heritage attractions in Perak such as former tin-mining sites and museums.

Finally, the research is expected to provide practical recommendations for integrating Victoria Bridge into Perak's industrial tourism strategy. These may include improved conservation planning, heritage interpretation, and community involvement initiatives that support sustainable tourism development. Overall, the outcomes will assist local authorities, planners, and heritage agencies in formulating strategies

that balance preservation, education, and economic benefits.

FINDINGS AND DISCUSSIONS

a) Qualitative Data (Objective 2)

The observation data acquired on the site, also known as the qualitative method, is required to reach to the site, identify all of the essential information, and evaluate the data in accordance with certain requirements to obtain sufficient information. Some necessary facts include the bridge's physical condition, tourist and community activity, heritage protection and management, tourism, and site development.

a (1) Physical Condition of the Bridge and Surroundings

No.	Observation Item	Description / Indicators	Remarks
1	Structural condition of bridge (steel frame, beams, flooring)	- Most of the bridge's beams are covered in mildew and overgrown vegetation. - The flooring may deteriorate owing to rust, but the steel frame is generally in decent shape.	 
2	Cleanliness of site	Site cleanliness is considerably clean, but most of the area are dominate by overgrown plant	 
3	Signage and information boards	The signage is preferably to change due to some of text are hard to read	  
4	Accessibility and safety features	- Overall, there is a risk to the site's safety, particularly near the railway. - Users of the railroad near the bridge are at	 

		risk because some of it is damaged.	
5	Vegetation and landscape condition	Lack of maintenance of overgrowth and less attractive landscape	

Figure a (1)

Overall, the bridge is in poor condition due to the greenery and overgrowth of plants, making it uncomfortable to stay for an extended period of time. The signage on the site is prominent and easy to detect because it is strategically placed. It is concerned for the bridge's safety because some of the netting is broken, potentially increasing the risk of people going off.

a (2) Visitor and Community Activity

No.	Observation Item	Description / Indicators	Remarks
1	Presence of visitors	Local and tourist numbers are influenced to time of the day and weekends	
2	Visitor behaviour	Visitor came and taking picture of the bridge as a memory	
3	Community involvement	Vendors and local residents are located near the bridge	
4	Interpretation and learning	Visitors interact with the signage and display within the bridge	

Figure a (2)

According to the observations, visitors are more likely to come on weekends in the evenings, and the majority of them are captivated by the bridge and other components of the site, such as the pillbox and the railway. Furthermore, local vendors play a significant role in supplying any condiments required by tourists. The prepared information board also assists visitors in understanding the history of the bridge.

a (3). Heritage Conservation and Management

No.	Observation Item	Description / Indicators	Remarks
1	Maintenance frequency	The maintenance is rarely achieved as the area are rarely being manage by observing the overgrown wild plants	 
2	Heritage protection measures	Most of the area are freely accessible for tourist as it still used as a connecting bridge to cross the river	 
3	Collaboration with authorities	There are some organizations in the area that upkeep Victoria bridge as a tourist attraction	 

Figure a (3)

Based on the observations, the bridge's maintenance frequency is quite low because many sections provide a high danger of injury to visitors and local residents. There are also organizations in the area that provide information of Victoria bridge.

a (4) Tourism and Site Development

No.	Observation Item	Description / Indicators	Remarks
1	Facilities for visitors	Facilities are provided for visitors. For example, shops, parking and toilet.	 
2	Accessibility	The accessibility in the area is understandable and easy to maneuver	 

		around		
3	Tourism promotion	The organizations supply some brochure and books for easy understanding of the bridge promoting tourism.		

Figure a (4)

For the tourism sector, visitor facilities are reasonably sufficient, with several rest spots, bathrooms, and shops for both visitors and local populations. The hotel adjacent also has a promotional leaflet to boost bridge tourism.

In conclusion, the bridge's current physical state is quite decent, despite some carelessness, particularly in terms of maintenance and safety elements. These aspects may have an impact on Victoria Bridge's tourism potential since they put the community and visitors at danger of injury. In terms of tourism potential, surrounding organizations such as *Kampung Warisan Budaya* and *D'Village Hotel & Villas* contribute significantly to bridge tourism.

b) QUANTITATIVE DATA (Objective 3)

Quantitative data is collected from local inhabitants and the community of Victoria Bridge, where respondents are asked several inquiries on their view of Victoria Bridge as a Heritage Tourism Attraction using an online Google Form. The collected data will be evaluated to determine the notion and acceptance of the bridge throughout history.

b(a) Demographic information

Gender	male	26	54.2
	Female	22	45.8
	Total	48	100
Age Group	18-20	1	2.1
	21-30	30	62.5
	31-40	9	18.8
	41-50	6	12.5
	Above 51	2	4.2
	Total	48	100
Occupation	Student	25	52.1
	Government Employee	9	18.8
	Private Sector Employee	3	6.3
	Business Owner	11	22.9
	Total	48	100

Figure b(a)

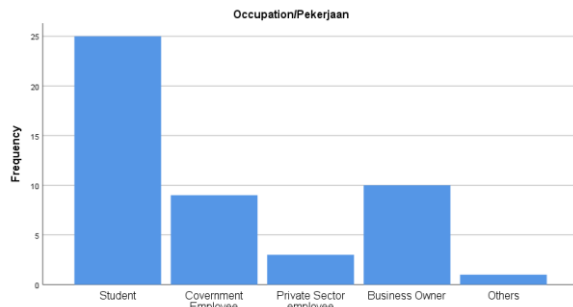


Figure b(a)1

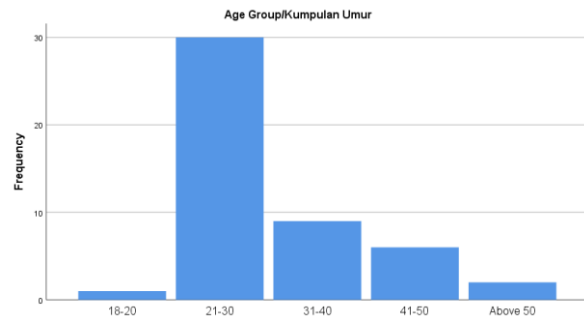


Figure b(a)2

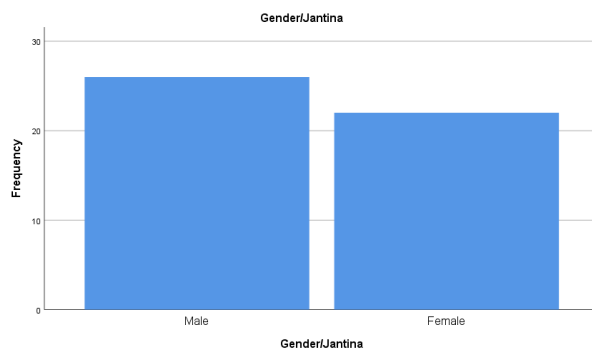


Figure b(a)3

The survey gathered data from 48 respondents, showing a relatively balanced gender distribution with a slight male majority at 54.2%. The age profile is heavily concentrated among young adults, with those aged 21–30 making up the vast majority at 62.5%. This aligns with the occupational data, which shows that students are the primary participants at 52.1%, followed by business owners at 22.9% and government employees at 18.8%. Overall, the results primarily reflect the perspectives of a younger, student-based demographic.

b(b) Perception of Heritage Preservation

Question	N	Me an	Std. Deviation
Preserving Victoria Bridge is important to maintain Perak's cultural identity.	4 8	4.69	.468
The bridge represents an important link between Perak's tin-mining and railway history.	4 8	4.46	.651
The government should prioritize funding for the preservation of Victoria Bridge.	4 8	4.13	.815
Local communities should play an active role in protecting the bridge's heritage value.	4 8	4.56	.580
Current conservation efforts are sufficient to maintain the bridge's condition.	4 8	3.62	1.104
Heritage education programs can increase public appreciation of the bridge.	4 8	4.44	.681

Figure b(b)

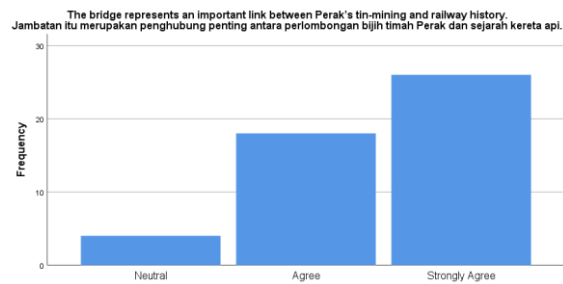
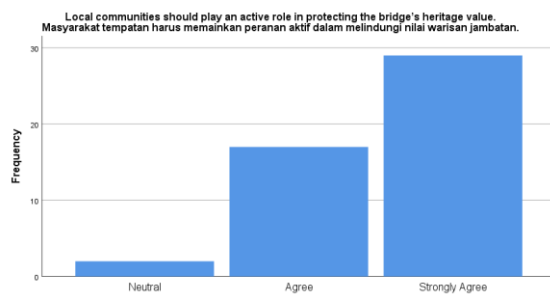


Figure b(b)1

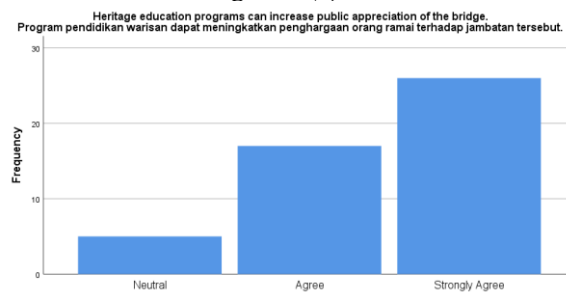


Figure b(b)2

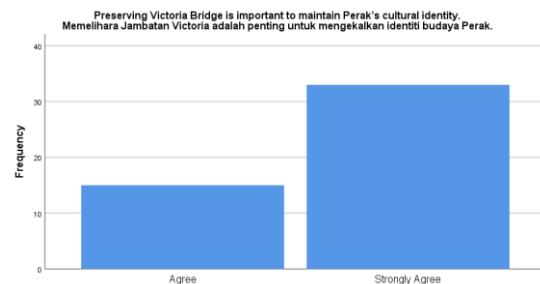


Figure b(b)3

Figure b(b)4

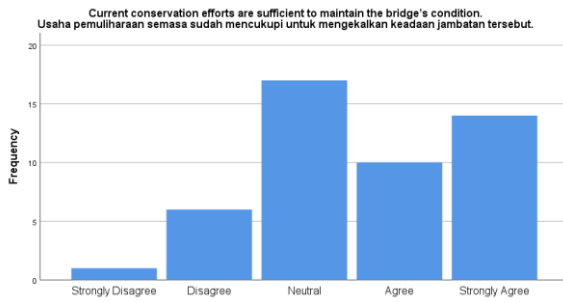


Figure b(b)5

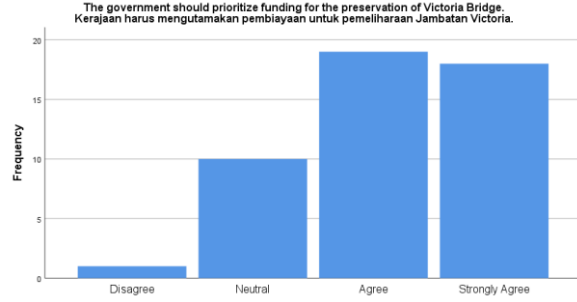


Figure b(b)6

Regarding heritage preservation, there is a very high level of agreement that Victoria Bridge is essential to Perak's cultural identity (**mean: 4.69**) and represents a vital link to tin-mining history (**mean: 4.46**). While respondents strongly support active community roles (**mean: 4.56**) and increased heritage education (**mean: 4.44**), they expressed the lowest confidence in current conservation efforts (**mean: 3.62**), indicating a perceived need for improved maintenance and government funding.

b(c) Heritage Tourism and Community Impact

Question	N	Mean	Std. Deviation
Victoria Bridge has strong potential as an industrial heritage tourism attraction.	48	4.56	.616
Preserving the bridge can create new job opportunities for the local community.	48	4.17	.724
Tourism development around Victoria Bridge should include local participation.	48	4.35	.758
Improved accessibility and interpretation would enhance visitor experience.	48	4.54	.544
Integrating Victoria Bridge into Perak's heritage tourism route will increase tourist interest.	48	4.52	.545

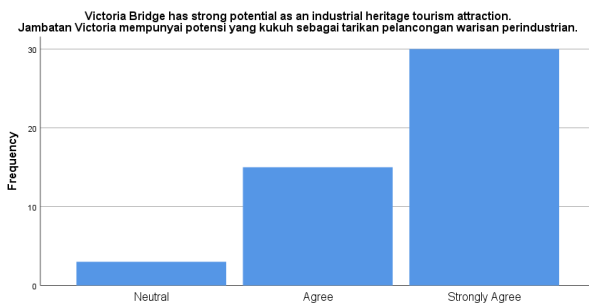


Figure b(c)1

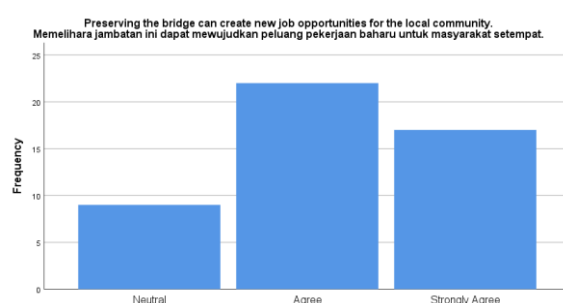


Figure b(c)2

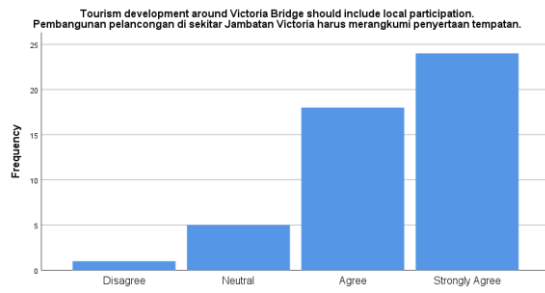


Figure b(cb)3

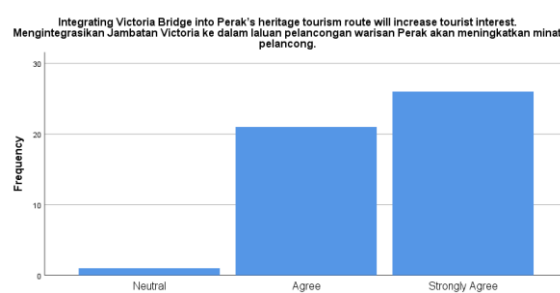


Figure b(c)4

The survey of 48 respondents reveals a demographic dominated by young adults, with **62.5%** aged 21–30 and **52.1%** identifying as students. Public sentiment strongly supports the bridge as essential to **Perak's cultural identity** (mean: **4.69**) and a vital link to tin-mining history (mean: **4.46**). While respondents advocate for community involvement (mean: **4.56**) and better heritage education (mean: **4.44**), they expressed the lowest confidence in current conservation efforts (mean: **3.62**), indicating a need for improved maintenance.

Throughout the questionnaire distribution, it is clear that respondents of all ages accept the preservation of Victoria Bridge as a heritage tourism attraction. Analysing the collected data reveals that the bridge has a significant impact on the history of tin mining in Perak and its timeframe. The facts from the table and chart show that it is not necessary to be a veteran or a small child to comprehend the relevance of history in human life; it is sufficient to be an understanding generation in order to preserve the remains for future lessons.

CONCLUSION

This study looked at the importance of maintaining the Victoria Bridge and its accompanying railway heritage as a key component of Perak's colonial industrial environment and a possible stimulus for industrial heritage tourism. The findings show that the bridge is more than just an engineering construction; it is also a historical icon of the tin-mining industry that formerly shaped Perak's socioeconomic development. As one of Malaysia's first steel railway bridges, it represents technological achievement, historical continuity, and cultural identity, connecting previous industrial progress with contemporary heritage values. The study also shows that preserving railway heritage may contribute significantly to Perak's industrial tourism strategy by improving place identity, enriching visitor experiences, and promoting local economic development. However, obstacles such as urbanization pressure, low public awareness, finance limits, and technical conservation issues continue to jeopardize the bridge's long-term viability. These limits have limited the bridge's inclusion into mainstream tourism circuits when compared to other industrial heritage attractions in Perak. The study emphasizes the need of coordinated heritage management, effective interpretation, and community involvement through a literature analysis, site observations, and community-based survey methods. The Victoria Bridge has the potential to serve as an educational resource, a tourism landmark, and a cultural anchor for Karai, if preservation efforts are coordinated with sustainable tourism planning. Finally, preserving this railway legacy not only saves a significant historical asset but also strengthens Perak's position as a top destination for Malaysian industrial heritage tourism.

SUGGESTIONS AND RECOMMENDATIONS

Several strategic proposals are made to strengthen Victoria Bridge's role in promoting industrial heritage tourism. First, conservation efforts should be increased through systematic maintenance programs backed up by enough financing and technical expertise, notably in the management of aging steel structures. Collaboration among heritage authorities, railway agencies, and municipal governments is critical for ensuring long-term structural stability and authenticity. Second, interpretative and instructional facilities need to be enhanced. Informative signage, digital heritage apps, guided tours, and modest visitor centres could all serve to highlight the bridge's historical significance, its relationship to the tin mining sector, and the role of railways in Perak's economic development. This would improve visitor understanding and result in more meaningful tourism experiences. Third, community engagement initiatives should be broadened to include activities to raise heritage awareness among local people, schools, and youth groups. Workshops, heritage walks, and cultural events can help to build community pride and inspire local engagement in preservation efforts. Finally, the Victoria Bridge, along with other well-known sights like the Kinta Tin Mining Museum and Tanjung Tualang Tin Dredge, should be officially included into Perak's industrial tourist network. Creating themed heritage pathways and promotional materials can help position the bridge as an important node in a larger industrial heritage trail, promoting sustainable tourism growth while protecting Perak's railway legacy.

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