

# Engineering and Tourism: Local Opportunities

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## INTRODUCTION

There is Engineering in Tourism; there is Tourism in Engineering; and there is a need for Engineering to support and to facilitate Tourism. Is there Engineering Tourism as in Eco-Tourism? The important thing is that tourists are attracted by something and this could be the Engineering content, or the Engineering support and in order to develop and maintain the industry it is important to know what it is that attracts tourists so that these elements could be maintained and perpetuated.

## SEVEN CHARACTERISTICS OF THE TOURIST

### **Curiosity kills the cat**

It is said that curiosity kills the cat; but satisfaction brings it back. It is this urge to satisfy his curiosity that makes man go to great lengths and cover great distances to be in a place he has never been before to see something he has never seen before and to experience something he has never experienced before. It is such a fulfilling feeling to be one of the Joneses and to be able to see the sheer faces of pure admiration coming from the uninitiated.

### **Glimpses into the past**

The ability to take a glimpse into the past and be able to imagine how things were thousands of years ago and marvel at the ingenuity of the people at those times to perform great and formidable tasks and leave such awesome artifacts for us to ponder.

### **Be one with Nature**

Man also appreciates and enjoys the awesome unspoilt raw beauty and colour of Nature for him to behold. He is at peace with the beautiful sunset and mountains, skiing down the white snow slopes, or just walking through green parks and the Black Forest, clear blue seas and scuba-diving for the underwater wonders, the underwater parks and aquaria, and the waves and water skiing and surfing, the

white sand and sun-bathing, the clear blue sky and hand-gliding and others.

### **Experience uniqueness of things**

There are so many things in every country which have their own special interesting and attractive characteristics and to witness such uniqueness of these things is such a challenge and witnessing them makes living worthwhile.

### **Taste the thrills**

A sense of adventure, or one may say a once in a life-time experience and the ability to taste the thrills of such activities like bungee jumping from a suspension bridge like the Golden Gate or even suspended from a crane over the waters of Sunway Lagoon, or parachuting from the Twin Towers, and going on several-G equipment at the amusement parks are all like the cat spending the proverbial nine lives. He would be very upset, however, if he actually has to spend it because the equipment was not adequately engineered to fit its purpose. 'Never again!! I'll never get on that even if you pay me.' But he keeps coming back. Or sitting in the Bull Ring - not in Birmingham, but in Madrid - with a scorching Spanish sun on the back of your neck secretly hoping against all hopes that perhaps this time the bull will engineer something extra special and for once will prevail over the matador and break his neck or something. And driving through the more-than-seven tunnels of Brussels looking for the pissing Manikin just to come out at the wrong place because you have taken a tunnel too many.

### **Appreciate the Fine Arts**

Leisurely strolling through museums and galleries enjoying the works of famous artists, relaxing at the Albert Hall listening to the London Philharmonic Orchestra or watching a Musical at one of the West End Theatres.

### **Fulfill a dream**

Man has ambitions. He wants to see as much of the world as he possibly can. He does not want just to listen but to personally experience being in places and doing things that people commonly talk about. He wants to fulfill all his dreams. If possible he wants to be able to solve mysteries and understand complex technologies.

## SEVEN TYPES OF ATTRACTIONS

### **Historical places and Monuments**

Bringing to real what one use to read in History books is to remember and appreciate and perhaps picture the true meanings of those events that happened so long ago and able perhaps to be in the shoes of the people involved then. Artifacts of heritage - something that have lasted and survived the times through natural as well as man-made disasters always possess some kind of attraction. Ruins from past civilizations, tombs of the rich and famous, and other monuments always leave one wondering at the awesome nature of the will and perseverance of the people involved in the construction. It goes beyond the architecture, buildings from ancient times of Rome, Florence, Paris, Athens, Anchor Wat and other cities. Even Malaysia has offerings of remnants from the Portuguese and Dutch era.

### **Rare oddities**

Some things are created to capitalise on unusual, unexplained and sensational phenomena such as UFO crash sites, Loch Ness monster, and even ghost sightings. The roles of the various disciplines of Engineering are consequent to the need to have the necessary support infrastructure to ensure the continued safety and welfare of both the attractions and the attracted.

### **Buildings and Structures**

Old castles, libraries, former prisons, skyscrapers and bridges are some examples. Engineering and Architecture are

so intertwined that for every architectural dream there are at least seven engineering nightmares. Tourists may focus on the architecture and take the engineering for granted. Engineering looks at suitability or fit for purpose; sound structure, with the wind-structure interactions and all, and ability to withstand natural as well as man-made disasters; the materials of construction; the space utilisation; safety; sanitation; ease of access and comfort of inhabitants; supply of utilities and power; and the integrity of the foundation. Do tourists come for the engineering contents of the following? Big Ben – the spectacular clock tower with its faces illuminated at night. Most are unaware that it actually refers to the 13 ton bell inside and not the tower itself. Buckingham Palace – the official London residence of the Queen. Stonehenge – megalithic ruins dating back about 5000 years. Brandenburg Gate – built in 1791 as a symbol of peace but ironically included into the Berlin wall, but now has become a symbol of the reunification of modern Germany. The Eiffel Tower – built for the International Exhibition of Paris in 1889 commemorating 100 years of the French Revolution was almost sold for scrap but is now established as one of the symbols of Paris. The Great Wall of China – built over 2,000 years ago to keep the enemies from the north out. The Leaning Tower of Pisa – the bell tower of the Cathedral, began construction in 1173 and continued for 200 years and started to incline during construction – little wonder no one wanted to own up to being the architect. We see that even engineering failures but with successful recovery processes can have its own attractions. Imagine the millions of pictures taken with people trying to prevent it from collapsing. The Great Pyramid of Giza – the only surviving seven ancient wonders – a tomb built for the Pharaoh to protect the soul from marauding tourists. The Coliseum which was the largest sports arena of its kind built in the 1st century. Sydney Opera House – with its unique and distinct architecture. Machu Picchu, Peru – a fortress city of the ancient Incas built straddling two mountain peaks – is just inspirational. The Taj Mahal – India's most famous architectural wonder and most beautiful tomb in the world built by Emperor Shah Jehan in memory of his

second wife Mumtaz also has attractive features all its own. Each male tourist secretly would love to engineer something that will outdo the Shah. Like all the above examples, do tourists go for the architecture or engineering of the Arc de Triumph or are they too fascinated to experience driving anti-clockwise round and round on a free-for-all round-about, which does not even look like a round-about, looking around for the seventh exit out of more than three-times-seven possibilities. The fascinating structure does not need to be massive; it could be as miniscule as the Pissing Manikin which oozes out enough awesome power to entice the typical tourist to drive through the tunnels of Brussels looking for the seventh exit only to be told that he is out of the map because he has taken one tunnel too many which has taken him out of the city towards the A4 to Leuven.

#### ***Ethnic Communities***

Examples of ethnic communities which have become tourist attractions are the Pennsylvania Dutch Amish community, the Solvang (Danish-themed town), in California, the China Towns all over the world, Little India, in Manchester, the Portuguese Settlement in Melaka and the Long Houses of Sarawak and to experience the unusual colourful culture and beautiful arts, dances and exotic culinary tastes of the aborigines.

#### ***Theme Parks and Carnivals***

The developments of engineered theme parks like Cedar Point, in Ohio; the Disneyland of California, Paris, and Tokyo; Walt Disney in Orlando; Dreamworld in Gold Coast; Hershey Park in Pennsylvania; Seaworld in Orlando and San Antonio; Universal Studios in Orlando and Osaka, and Europa Park in Rust-Freiberg are world famous and have established their own unique identities which attract tourists from all over the world. Here is a chance to experience the thrills and amusement of bungee-jumping, the Ferris wheels, and the roller coasters. Even though it is not the high point, engineering for safety and operability is of paramount importance.

#### ***Zoos, Botanical Gardens, Parks and Forests***

The London Zoo, Kew Gardens, Hyde Park, the Grand Canyon, Niagara Falls

and Taman Negara are among a few examples of establishments which are attracting tourists with their own special offerings. Mountain and rock climbing, jungle trekking, or being a few meters from bubbling lava of an active volcano in East Java, waiting for the sun to rise from behind the mountains, could very well be an experience of a life-time.

#### ***Museums and Galleries***

Notable examples of museums which have the tourist pull are the British museum, the Louvre, Ripley's Believe It Or Not, Madame Tussauds, and perhaps Melaka Museum which is a museum piece in itself.

#### **ENGINEERING FOR TOURISM**

Tourism brings in billions of ringgit every year and tourists expect a certain level of ease of transport and comfort while they are staying in the country. Appropriate consideration must be taken in the design of infrastructures like airports, ports, highways, bridges and tunnels not only for their functional requirements but also wherever possible, their tourist attraction aspects. Similarly, man-made lakes, reservoirs and waterways could offer recreational possibilities apart from their normal requirements [1]. Coastal engineering and breakwaters are part and parcel of the activities required to protect beaches like Tanjung Bidara from being too close to the continually-dredged Tangga Batu port, or the Pantai Beach near Tanjung Kidurong for being too close to the continually-dredged Bintulu port, or the Rantau Petronas Beach, including the golf course, which are being affected by the continual dredging of Kemaman port all in order to maintain the required draft for incoming ships. Environmental engineering is another discipline that needs to be practised in order to protect the very thing that tourists come for to visit because they could be destroyed by the sheer numbers of visitors. Orderly development of islands and highlands, of Pulau Besar, Pulau Langkawi, Pulau Perhentian and Pulau Tioman; and Frasers Hill, Genting and Cameron Highlands have to be insisted. Boat rides, ferry service and cable cars have to be operated and maintained in tip-top conditions.

## SEVEN WONDERS OF THE ANCIENT WORLD

Of the Seven Wonders of the Ancient World viz: The Pyramids of Egypt, Hanging Gardens of Babylon, Statue of Zeus at Olympia, Colossus of Rhodes, Temple of Artemis at Ephesus, Mausoleum of Helicamassus and Pharos of Alexandria only the Pyramids remain intact. The rest had been destroyed by either earthquakes or fire. Would knowledge of earthquake engineering and rubber bearings, or fire and safety engineering with active and passive protective equipment been able to make those wonders last to this day and remain as tourist attractions? One could only speculate and wonder.

## SEVEN WONDERS OF THE MODERN WORLD

### **Channel Tunnel**

The Channel Tunnel: is a 31-mile underwater tunnel system connecting England and France with two train tubes and one maintenance tube complete with intelligent machinery. Is it a tourist wonder? Maybe not, since a lot of people try to avoid using it, but it definitely is a wonderful engineering achievement.

### **Itaipu Dam**

Another engineering wonder, the Itaipu Dam is a dam built across the Parana River at the Brazil/Paraguay border capable of supplying nearly 30% of the electricity requirements for most of Southern, south-eastern and central western regions of Brazil and more than 70% of Paraguay's total electricity requirements. It may attract tourists to get there if they are already around the area but would you consider organising an IEM technical visit there? But engineering-wise it is definitely awesome and mind-boggling.

### **Panama Canal**

The Panama Canal is an example of the combined skills of the structural, geotechnical, hydraulic and sanitary engineers. The control of flood waters of the Chagres River and the different levels of the Atlantic and Pacific oceans are fantastic challenges which required the building of the largest man-made lake of the time. It is a fantastic engineering

achievement and it is viewed as meeting its functional requirements rather than its value as a tourist attraction.

### **CN Tower**

The CN Tower is the world's tallest free-standing structure which soars 1815 ft above the sidewalks of Toronto. Tourists can easily access the structure.

### **Empire State Building**

The Empire State Building is the best-known skyscraper in the world and was the tallest building in the world for over forty years. Built in record-breaking time it revolutionised the tall building construction industry. It overlooks the Hudson Bay and provides easy access to tourists.

### **Golden Gate Bridge**

The Golden Gate Bridge remains as the world's tallest suspension bridge for over sixty years. It contains enough cables to circle the earth three times and is sturdy enough to survive any expected earthquakes. It also remains as one of the world's most beautiful and most photographed bridges.

### **North Sea Protection Works**

The Dutch North Sea Protection Works is a vast and complex system of dams, floodgates, storm surge barriers and other engineered works which literally allows the Netherlands to exist without which it will be mostly under water. It exemplifies humanity's or the engineer's ability to control, manage and co-exist with one of the wonderful elements of nature.

## SEVEN POTENTIAL MALAYSIAN ATTRACTIONS

### **Hills and Mountains**

Malaysia has mountains like Gunung Kinabalu and Gunung Ledang and highlands like Cameron the Entertainment City of Genting to mention just a few. With the innovative application of slope engineering, bridge and tunneling engineering, and environmental engineering the tourism industry will definitely greatly benefit from the orderly development of hill and mountain activities and resorts. The access which may include cable cars and

cable trains, the half-way stops and the paths could further be enhanced to make the experience more pleasant.

### **Limestone Hills and Caves**

The annual pilgrimage to Batu Caves during Thaipusam by over a million participating devotees and observing tourists is well established; the former honouring Lord Subramaniam or Goddess Parvathi and son Murugan, doing the ultimate devotion of kavadi carrying, climbing up and down the 272 steps, and praying at the feet of what must be one of the biggest deities in the world, the latter not only being fascinated by the festivities but would also be thrilled by the shrills of the Bats of Batu Caves, pick-pockets of the tailed and un-tailed kind, and amazed by the massive stalactites and gigantic mites. One may even entice and lift the spirit and excitement of the curious and the adventurous by starting a story that one can actually get to somewhere at the back of Kuantan if one walks long enough through the underground tunnels and rivers starting from Batu Caves. Not only would the tourists be fascinated to see the silhouette likeness of Lincoln at the Niah Caves but perhaps also the hazy imprints of Lulu or Nelson of Waterloo or even the Penghulu of Mulu on the walls of Mulu Caves if they care to look and imagine hard enough. Again the engineers can make the access to and the paths within more leisurely and less treacherous.

### **Plantations**

Tea plantations of Cameroon Highlands, with food processing and engineering, rubber plantations with jungle trees all in nice rows with polymer engineering and bearings for earthquakes, oil palm plantations and biofuels and the Taman Negara contributing to the oxygen/carbon dioxide balance nicely for the environmentalists, are all possible offerings from Malaysia.

### **Water related**

We have the man-made water-worlds of Alor Gajah and Batu Pahat and the natural blue seas, lakes and rivers which can be developed; stars of fire flies of the upper reaches of Sungai

Selangor to light up the dark nights which is a sight to behold just like the skies at night, somewhat similar to a night view of the starry, brilliant City of Lights from the KL Tower. Not very fascinating during the day but definitely a delightful sight at night. We already have Tioman and Langkawi with clear blue sea and Masuri; and Besar, Sepadan and Perhentian with snorkeling and fishing and just lots of fun. There are hundreds more potential islands and miles upon miles of pure white sand that can be developed. Imagine how excited the tourist will be with sun, sea and sand to reckon with. There are adequate winds and waves for other related activities. All that is needed is the support infrastructure which includes all means of transportation, food outlets and lodging facilities have to be properly planned, engineered, operated and maintained. And we must always be mindful that we do not damage the attractive elements like the flies being driven to fly away somewhere else, just like the turtles of Trengganu beach being driven to swim away looking for a more tranquil and less intrusive sanctuary to lay their eggs. Tourists will then follow suit and fly to other alternative destinations.

### ***Cultural Village***

We have some Portuguese and Dutch heritage in Melaka. We also have the Cultural Village there all of which can be further developed. Perhaps a Multi-Cultural Village could be developed to bring in all the more-than-seven available variety of ethnic cultures which is Malaysia. Here again, quality standards and the maintenance culture have to be maintained.

### ***Buildings and Structures***

Malaysia has its own attractive buildings and structures. The Twin Towers have made their way into the Tourist Guide books. We can also promote the TM Rebung and the KL Tower. As we see in the case of the Leaning Tower of Pisa a successful engineering recovery process can also become a tourist attraction. We have our own albeit smaller version of the Leaning Tower of Teluk Intan.

Somehow it does not sound as catchy as the original. Maybe we can rename the location of the clock tower in Teluk Intan as Kg Pisang. There are also examples of remarkable engineering recoveries which may also be highlighted. It cannot, however, be a hundred percent recovery otherwise can you imagine Pisa Tower being restored to its vertical position? The essential attractive elements would have been lost.

### ***Bridges and Tunnels***

The Penang Bridge is already an attraction to tourists, perhaps we might want to reconsider constructing the Crooked Bridge or something like that for another bridge attraction. We have a few fairly short tunnels, perhaps we may want to consider constructing a Melaka-Dumai Malindo Tunnel somewhat similar to the Eurotunnel bridging England and France or a series of seventy-seven bridges and seventy-seven tunnels burrowing in and worming out of hill-sides along the Main Titiwangsa Range meandering to seek for the optimum slope and alignment and to challenge and match those series of tunnels and bridges found in countries like Austria, Switzerland, Italy and others.

### **CONCLUSIONS**

What attracts the tourist are the historical places and monuments where he could imagine and have a glimpse of the past; the ability to be close to and be one with Nature by walking through zoos, botanical gardens, parks, forests and the like; and the chance of enjoying rare pieces of art and heritage at museums and galleries. He is also attracted by theme parks and carnivals; famous buildings and structures; ethnic communities and rare oddities where his curiosity could be satisfied, or he could taste the thrills and the dare-devil experience of a life time, may have also witnessed the uniqueness of things, and perhaps understood the marvels of Nature and Engineering.

### **FURTHER READING**

Proceeding-IEM International Conference on Engineering and Tourism, Sept 1989, Melaka. ■