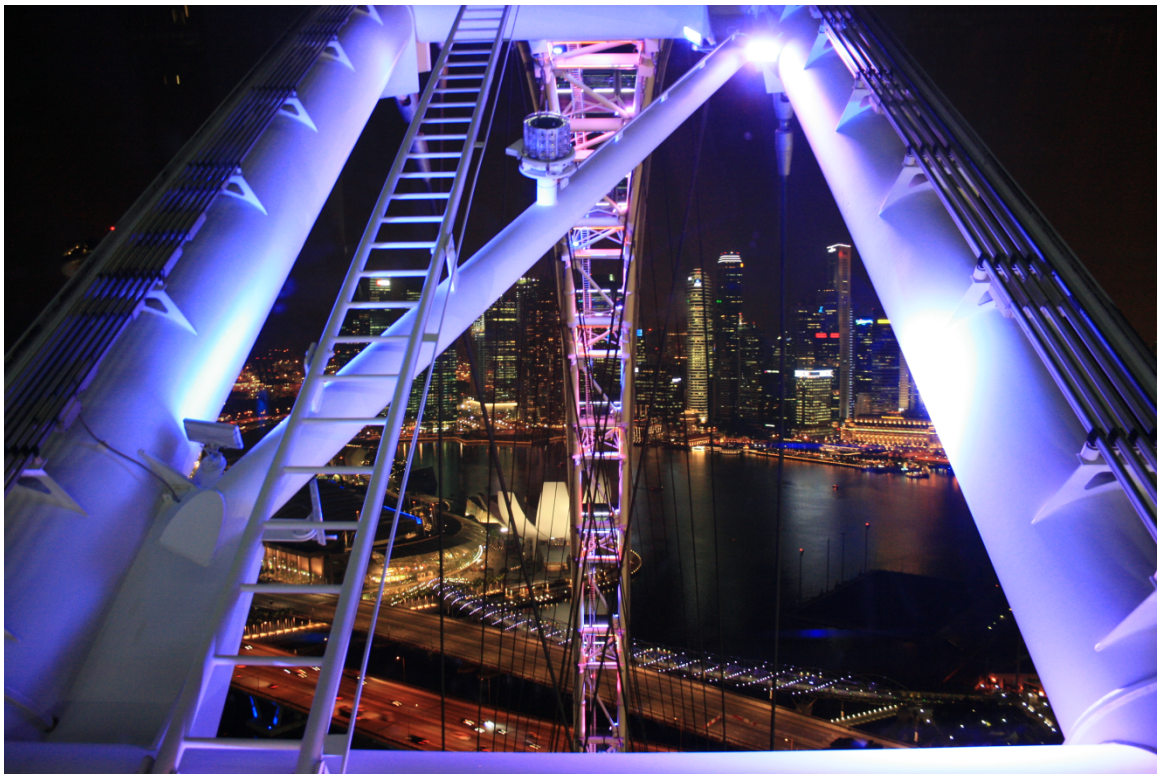
Lighting the Ultimate Tourism Experience

A CASE STUDY IN SINGAPORE



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Abstract for "Lighting the Ultimate Tourism Experience"

Economic growth of the tourism industry has led to continual urban redevelopment worldwide and the need to create new experiences that are unique, welcoming and memorable. Urban lighting on its own, as a way to revitalize urban areas, is a relatively fresh concept and is becoming an integral part of the urban tourism development process worldwide. Urban lighting projects and lightscapes such as light based events lure people to a particular place from various geographical locations to engage in the activity or attraction. These lightscapes are emerging temporary installations (e.g., festive/event lighting) and fixed installations (e.g., architecture/skyline lighting). As a case example, urban lighting in Singapore has been a major area of focus for the Urban Redevelopment Authority (URA). The URA oversees and develops both codes of practice and lighting master plans with the aim of providing a destination to 'explore, exchange and entertain' for tourists.

A quality lighting environment was defined by Veitch (2001) as 'a lit space that supports human behavioral needs, with considerations for architectural and economical aspects of the installation.' Although there are many urban design codes and practices to develop a quality lighting environment, very little research has addressed the impact of urban lighting on the individual human psychology and visual perception phenomenon. Previous studies on the perception of environmental and visual urban landscapes suggest that a 'legible' environment was necessary to develop a positive living environment (Kaplan, 1983; Lynch, 1960, Nasar, 1998, Rapoport, 1977). These studies focused on the

design codes and parameters that were preferred from the human perspective resulting in the definition of lighting quality we know today.

The research for this thesis will seek to understand the importance of lighting quality and the lightscape perception of tourists as they experience a tourism destination - Singapore. Qualitative interviews with urban designers and management have been conducted in conjunction with short interviews with tourists to establish whether the goals of Singapore becoming a destination to 'explore, exchange and entertain' have been achieved. The research results illuminate individual psychological processes that impact tourists' personal perspectives of urban lighting and the lit environment. The results suggest that individuals often do not care about urban lighting until it is absent or is inefficient in providing a coherent and legible experience. However, those who do address urban lighting consciously express an awareness of the potential harm that it could have to the environment. These results invite further discussion and serve as a reference for potential future research. The results of this research can be part of the evolving study of urban lighting design and can help future lightscape designers to be effective in providing a quality lighting experience that is efficient in executing its purpose, whether for practical, aesthetic or entertainment purposes, in order to provide the 'ultimate' environment for tourists.

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Authorship

"I declare that this submission is my own work and to the best of my knowledge contains no material previously published or written by another person except when explicitly quoted, referenced or acknowledged."

D. Andrew Potvin

Ethics Approval

In-depth and short interviews with human participants were utilized in this thesis. In coordination with the ethical guidelines set by the AUT Ethics committee, extreme care was taken into account to ensure that the research would be conducted in such a way that would be respectable. AUTEC gave permission for this research to be conducted under the application number 12/248.

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CHAPTER ONE:
Illuminating the Stage for the Ultimate Tourism Experience

It is no secret urban destinations are continually striving for innovative ways to stand out and capture their share of the global tourism market. The continual need for economic growth has resulted in large cities developing their own tourism attractions to compete on a global scale (Crang, 1990; Hall, 2000; Kotler, Haider & Rein, 1993; Short & Kim, 1998). The impact tourism brings to the economy has resulted in numerous academic research articles on urban tourism and redevelopment by such researchers. As a result, 'standard' tourism attractions such as museums, art galleries, monumental or iconic buildings and sporting venues have been built in almost every major tourism destination resulting in the need for new tourism attractions that can promote the destination and stand out from its global competitors. Since the 1980's, the advancement of technology and specifically the Internet has affected the tourism and event industry significantly (Dayan & Katz, 1992). The accessibility of information online allows potential visitors sneak peaks of what their destination has to offer. Therefore, the need to be unique has never been so important.

Ever since Singapore has become an independent city-state, Singapore's Prime Ministers have been determined to make their homeland a place of high interest to live, visit and identify with (Qeuk Choon Keat, 2008). During the National Day Rally speech in 2005, Singapore's Prime Minister Lee Hsien Loong stated his vision of Singapore turning into a "vibrant, global city: a city which is full of life, energy and excitement, a place where

people want to live' (National Day Rally, 2005). In result, the tourism industry was identified to be a point of interest to advance the city-state economically and build a stronger international reputation (STB, 2014).

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Photo 01: Vibrancy of Singapore's Marina Bay. Source: Vibrancy (2014)

Singapore has quickly become a leading urban tourism destination over the last two decades through the implementation of 'standard' attractions and through the implementation of urban lightscape projects, with the hopes of enhancing the city's economic value, tourist experience and community living. Singapore's focus on lightscape experiences has since led to international recognition and awards (Singapore Tourism Board & Ministry of Information, Communications and the Arts, 2013). However, there is little academic proof that these lighting initiatives impact the tourist

experience and ultimately their impacts on the tourism industry as suggested by Cosgrove (1985), Goodwin (1993), Hall (2000) and Jackle (2001).

In an effort to create a vibrant global destination located along the hot equator, the importance of cooler nocturnal activities help extend the 'active' hours of the people living and experiencing Singapore. Ultimately, these longer hours and nocturnal engagements potentially help stimulate economic spending and night activities. Thus, lighting Singapore's infrastructure has become a major focal point in promoting Singapore's nightscape experiences and marketing potential (Urban Redevelopment Authority, 2013).

The potential economic benefits have resulted in Singapore "trying to reinvent themselves as a place of creativity and play, based on a vibrant and colorful 'after dark' experiences" (Sim, 2006: 3). As a result, Singapore's Urban Redevelopment Authority (URA) was created and tasked with the goal of redeveloping its city infrastructure and nightscapes to create a leading economic destination that is unique, vibrant and livable while simultaneously becoming a major tourism destination unlike any other in the world. As a way to improve the city's identity, enhance the night experience and instill pride within the local community, the URA's lighting projects were developed to create a unique work and play environment for both locals and internationals (DAS Studio, 2012).

The importance of urban lighting is often taken for granted and not really noticed until one is without it (Jackle, 2001; Mende, 2005; Quek, Choon Keat, 2008). Urban lighting is

the design of artificial lighting for all elements in the urban environment (Hong, 2007). Ultimately, urban lighting is everywhere in major destinations and is necessary for a majority of nocturnal activities. Illumination is needed for a variety of purposes such as safety, practical use, architecture, theming and entertainment (Veitch, 2001). The relationship with artificial light has become so normal that it's often unnoticed and unappreciated until it isn't there. Ironically, lighting has become an integral element to the identity of a nightscape, as it provides the ability to see, feel safe, highlight or pull focus and attract the attention of those nearby. Interestingly, there is a lack of evidence that proves that urban lighting has any impact at all (Qin, 2011) on urban tourism and thus the tourist perception. Destinations such as Singapore, Hong Kong, Tokyo, London, Paris, New York and Las Vegas having unique urban lightscapes that are integral to the destination image with lightscapes can leave a distinct impression on a visitor and an ultimate experience.

The modernization and transformation of Singapore's landscapes since independence has significantly changed and segmented the city-state themed districts. For instance, the natural geography and addition of vibrant entertainment centers along Singapore River has provided a district specifically tuned for nightlife and dining. The nearby Marina Bay has seen the additions of Marina Bay Sands Resort, Gardens by the Bay and the Singapore Flyer, which have all been strategically planned to compliment each other practically as well as aesthetically. Each district plan also focused on the implementation of specially retrofitted and themed lighting enhancements that are practical, aesthetically pleasing, sustainable and in some cases can be an attraction themselves.

Trying to understand the perception of tourists' interactions of lightscapes is important to the future success of lightscape development and psychology. Our interaction in these landscapes is so complex and so normal that it seems only fitting to explore the phenomenon. Interestingly, the simple fact is that our night experiences would not be the same without lighting. A common perception of light is that it is used so we can see and function easily at night and purely a practical necessity until now. Singapore's implementation of lighting as a major contributor to entertainment and aesthetic purposes is only recently a recognized contributor to the overall goal of competing with other leading destinations looking to attract and retain visitors for a longer experience. The longer a tourist stays in a destination, the more money that will be 'invested' into the economy. As a result, the Urban Redevelopment Authority studied other nightlife based cities and not only copied their ideas but improved upon them through the development of a long-term development plans and a government backed strategic incentive plan for the private sector.

Tourism experiences utilize all human senses in a variety of different ways. Notably in the nightlife tourism industry, vision is integral as it accentuates the beauty and essence of the surroundings. Therefore, the understanding of lighting perception within the tourism industry can only provide a future where light quality and efficiency are utilized to provide the ultimate tourism experience. This research can lead to discovering more about the impact lighting has and its importance on the tourism experience.

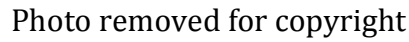

Photo 02: Before and After Earth Hour Source: Weather Network (2014)

With governments, corporations and private groups investing large capital into lighting projects, there is the need to understand the lightscape interaction and the experienced perception of the destination. The research on tourist lightscape perception is important to academia as previous conducted research on urban lighting is centered on the economic and practical benefits, resulting in little academia on the perception of the tourist experience. Ultimately, this research will help fill a hole in tourism redevelopment, urban tourism and tourist's perception of lightscape academia. In addition, this case study of Singapore's lightscapes and tourist perception will examine whether their lighting projects have fulfilled the goals of becoming a 'global, vibrant city.' The results will then become useful to other urban destinations and designers looking to lighting as a way to enhance the nocturnal tourism experience, city livability and marketability. The data will also be pertinent for academic literature on urban lighting perception that was previously vacant.

Research aims and objectives

For this research, the term 'lightscape' is used to define the environment in which lighting plays an integral role in the participants perception whether subconscious or consciously. 'Nightscape' is used to define the environment during the hours of sun down to sunrise. The term 'urban tourism' is used for the high tourist traffic areas of major tourism destinations including major attractions and city centers.

The aim of this research is to develop a framework of how tourists perceive and experience lightscapes within Singapore by analyzing common themes. Thus, the results can benefit the future development of urban lightscapes and provide a case study of how lighting impacts the urban tourism experience. To do this, the following objectives are necessary:

1: Establish the background of Singapore's lighting practices and understanding of lighting quality and environmental perception

2: Provide a case study of urban lighting perception to be used to improve and educate future urban lighting designers and management

3: Justify whether Singapore's lighting initiatives have created an effective destination for tourists to 'explore, exchange and entertain.'

As a result of these three objectives, this research can assist future planning commissions and consultants in generating quality urban lightscapes by having a better understanding of what makes an 'ultimate tourism experience.' Since the aim of this study is to understand the role lightscapes on have on tourism perception, a holistic-qualitative

research approach is appropriate. While considering the planning of urban nightscapes, it is important to look for detailed considerations of lighting techniques used to enhance the interaction of those whom experience it. Reviewing literature on nightscapes will contribute to academia knowledge on urban lighting and help balance against the plethora of day landscape literature. This research will provide a comprehensive understanding of the elements of nightscapes in Singapore and the relationship to its tourists.

Based on economic results, it seems that the detailed focus of Singapore's Urban Redevelopment Authority lighting projects have helped the destination become a vibrant global city, competing with other world-class tourist destinations. However, it is important to acknowledge that Singapore's implementation of lighting projects is not the sole reason for becoming a successful tourism destination, as there are many other contributing factors such as events and culture. Singapore's intensive lightscapes have been achieved in collaboration with the private sector, event organizers and government enforcement. The Singapore government has a continual interest in feedback from the public, residents and tourists to improve its urban lightscapes and develop the best destination experience possible.

Significance of the Research

'Lighting the ultimate tourism experience' will present and question the effects urban lighting has on tourists perception. This thesis will create and define a theoretical framework called the Urban Lightscape Tourism Interaction Theory (Page 152). ULTIT will present a framework to understand the relationship between light quality, individual

experience and the tourist experience. This foundation will be able to be used by architects, urban designers, city planners and governments looking to renew city livability and tourism. The tourist perception of lighting is a phenomenon that occurs everyday in our lives and is one of the least understood interactions. The results of this research will not be a final answer but a beginning point for future urban lighting perception research.

Overview of thesis

Research must have clear and appropriate methods in order to achieve accurate and beneficial results. The role of the research methods is not only as a way to get the results but also as a necessary skill for all theoretical practitioners. A qualitative approach to this research will provide a platform to build upon in exploring tourism perception and behavior within lightscapes. The methodology chapter will explain the types of methods used for this thesis and give a rationale behind each method and their restrictions. This chapter will also make sure that all AUTEC guidelines are properly adhered to and taken into consideration.

Integral to the validity of the data collected it is important to provide enough data to back up any results. The fact that this research project is reliant on three key elements, background, the designer / government point of view and the tourist experience requires three different sections of research. The first research discussed will focus on the background and history of Singapore in correlation to the rise of urban lighting (Chapter Two). The existing literature on Singapore's redevelopment provided a sufficient

foundation of knowledge about the subject and helped establish questions for the industry / government interviews.

The second section of data is the results received from the industry interviews. The data collected from these interviews will support the initial questions of what makes the ultimate lighting experience and will enhance the available academia and analysis of the initial objectives created by the Singapore government. The identified initiatives will then be used to compare the results from the tourist's interviews. The interviews conducted with tourist of Singapore (section three) will question destination perception, tourist anticipation, tourist experience and the experience outcome. The comparison of these results will see if the objectives of the government and designers are actually being achieved.

CHAPTER TWO:

Illuminating Research Methods

Chapter two will explore the challenges of research methodology by discussing the types of methods used for this thesis and give a rationale behind each method. Presented in two parts, the first section is a literature review of research methodology, and the second part explores how the research methods were conducted. This particular study explores psychological experiences requiring a primarily qualitative approach. However, to ensure validity of the research, a mixed methods approach has been designed to help ensure research accuracy and depth.

Ryan (2005) suggests that tourism research is predominantly based on the behavior of tourists (those traveling in an unfamiliar destination away from home and is motivated by mean of vacation). In addition, Ryan suggests that when researching tourism there is three processes or stages of learning for the researcher.

1: Something is learnt about the chosen topic.
2: Something is learnt about the process of research.
3: Something may be learnt about one self (however not always the case.)

In this section, the second stage of understanding the role of research methodology is important in creating accurate and ethical research techniques and analysis. Although not always considered as the most academic enlightening form of research, case studies are used often in tourism research and studies (Beeton, 2005). Understanding the

psychological perception of one's experience within urban lightscapes cannot be solely defined on a global scale, because every destination is unique and has its on story. As a result, using Singapore as a case study is a viable and accurate form of study for this topic. However, the case study approach cannot rely solely on one type of research due to the complexity of tourism psychology. This requires the research to not only rely on qualitative data from short interviews but also from detailed interviews and secondary research. In addition, for demographic purposes some quantitative data was also acquired. Beeton (2005) goes on to suggest 10 features of a case study (Table 01) that can be relevant to this research.

Ten Features of a Case Study	
1	Explains why something works or failed
2	Advantage of hindsight / Relevant to present and future
3	Illustrates complexities involved by recognizing multiple contributing factors
4	Recognizes influences of personalities and politics
5	Influenced by time and space
6	Reader can apply own perspective
7	Can evaluate potential alternatives
8	Utilizes information from a variety of resources
9	Results can be presented in a myriad of ways
10	Can illuminate a general problem to a specific instance

Table 01: Ten Features of a Case Study, Beeton (2005)

The absence of existing current research on the impacts urban lighting has on the tourist experience makes this research the starting foundation to the phenomenon, which could be explained further in additional research. Beeton (2005) confirms that case studies have a significant place in the exploratory stage of an investigation and they establish place-specific insights that could be tested in other locations (Yin, 1994). The way research is

handled and sourced must have clear and appropriate methods in order to achieve accurate and beneficial results. The importance of including research methodology is that it helps ensure the stated results have been rigorously obtained and are accurate. The skill of effective methodology is important for all theoretical practitioners to understand.

Mixed Methods Approach

Mixed methods by definition is the combining of qualitative and quantitative methods (Bergman, 2008; Hesse-Bfiber & Leavy, 2006.) Using mixed methods, the validity of results can be further justified and helps reduce the risk of error. Silverman's (2006) research on mixed methods suggests mixed methods can be used to justify and qualify qualitative and quantitative results. Qualitative methods can be used to identify key attributes of a particular topic and then can be verified by quantitative methods. Secondly, quantitative methods to develop a broad understanding of a topic, allowing qualitative methods then to discover key focal points (Silverman, 2006.) The use of mixed methods can be more time consuming and have the potential to encounter more difficulties than using a single method. However, the use of mixed-methods provides more comprehensive, realistic and logical results, where qualitative or quantitative results cannot justify alone.

Secondary Research

A firm understanding of the background is essential before beginning primary fieldwork. In order to achieve a solid foundation, secondary research is required from available data resources such as academic journals, published literature and documents which can be

found in print or via the Internet (Walliman, 2006.) Secondary research materials include both non-academic data and theory. Collectively, these sources enable a reasonably complete understanding of the research context to be established.

Qualitative Research

Qualitative methods in relation to tourism research have a long relationship (e.g. Boorstin, 1964; Cohen, 1972, 1973; Graburn, 1976; MacCannell, 1973, 1976; Smith, 1977). When exploring the 'why' of a phenomenon however numerical answers do not necessarily provide the answers of one's psychological experience. The holistic nature of qualitative data also focuses to obtain a greater understanding of values, morals, attitudes and cultural and behavioral patterns (Densin & Lincoln, 2003; Silverman & Marvasti, 2008). Cohen (1988) suggests that some of the most lasting contributions to academia have occurred when the researcher used 'an often-loose qualitative methodology.' The idea of understanding human experiences requires the obtaining of information from a variety of disciplines and subject matters, reinforcing the need for a qualitative approach (Lincoln, 1994). The primary strategy is to capture the conscious and subconscious experience of participants in their own words. The framework for qualitative research is based on the ontological, epistemological and methodological paradigms as suggested by Denzin and Lincoln (1994.) As seen in Table 02, the aim and objectives of this research clearly belongs in the emerging paradigm.

Stages of travel experience in relation to fieldwork experience

Stages	Stages of Tourism	Tourist Experience	Stages of Fieldwork
1	Decision making and anticipation	Decision to visit, prep, and thinking about the site	Decision to undertake study
2	Travel to the Site	Start of reflection and perception in comparison with previous experiences	Preparation to undertake study
3	On-Site behavior	On-site behavior and engagement	Execute field activities and relationships
4	Return Travel	Reflection on destination builds and the anticipation of a return home	Return from field
5	Recollection	Reflect and establishes perception of destination	Recollect and develop results

Table 02: Stages of the travel experience in relation to fieldwork experience (Hall, 2011).

The interaction within tourism requires fieldwork to be conducted to not only understand the interaction with tourists and the geography but also to understand the economic, social and political environments (Hall, 2011.) Hall compares the five stages of tourist experiences as mentioned in the literature review with that of fieldwork by a researcher.

The role of the researcher within the realms of qualitative research is different from that of a researcher using quantitative techniques. The qualitative researcher will constantly reflect on his/her research process, as the path is often highly flexible. Researching qualitative data requires a vast amount of communication; in turn obtaining empirical data that can then be analyzed and interpreted (Walliman, 2006).

According to Meuman (2006), the reliability of qualitative research is similar to any other form of research in the fact that the research depends on consistency and authenticity.

Consistency and authenticity are more important then the quantity of data collected and as such, effort must be taken to maintain a high level of integrity with the research process (Meuman, 2006.) Due to this research being a case study of participants experiencing Singapore's lighting the research will require in-depth interviews with design and urban management personnel, short interviews with tourists and core secondary data as suggested by Marshall and Rossman (1999). In this case, the aims and objectives of understanding tourism perception suggests that a qualitative approach is more appropriate because there is rarely an exact answer to research problems involving one's experience or psychology (Denzin & Lincoln, 1994).

Quantitative Research

Quantitative methods are those in which the results are presented in numerical/empirical form and can easily be described and identified. A numerical based research is often seen as highly beneficial and deductive in nature when the research revolves around social research (Black, 1999). The presentation of qualitative results provides concrete data to reference, however the data may not be illuminating the whole spectrum of the research topic. For instance, situations and behavioral patterns are impacted by a multitude of factors that cannot be explained through numerical practices alone. This reality makes quantitative data methods practically irrelevant for such social based research projects as "Lighting the Ultimate Tourism Experience." However, by including quantitative methods in collaboration with qualitative and secondary research provides a good counter balance to the validity of the concluded hypothesis (Silverman & Marvasti, 2008).

Research conducted in a qualitative manner often occurs in two phases; planning and execution (Black, 1999). The 'planning stage' is when the research issue is identified by the researcher and a preliminary design and structure is established. The 'execution stage' is where the actual data methods are implemented and when completed, analyzed. In order for these stages to be efficient, it is highly recommended that a solid background of research from secondary research should be conducted (Sapsford, 1999).

Quantitative data should be gathered through techniques that are simple and easy to understand no matter the background of the respondent (Walliman, 2006). It is also suggested that the questions asked reflect a variety of questions that can potentially have open-ended answers. It is important that when requesting demographic information, straightforward questions should be used.

Triangulation

Decrop (1999) defines triangulation as the means of looking at the same phenomenon or question from three different angles. The triangulation theory is important to verify the findings from qualitative and secondary research by comparing the results with three independent sources. Triangulation analysis not only justifies the findings but also helps limit any potential biases and enhances the ability to accurately generalize the results. This form of research design is especially useful in relation to the results chapter of the thesis. In this particular case, data triangulation will be used to reinforce results. Data triangulation is the use of a variety of data sources (Decrop, 1999). The combination of data collected from secondary research, primary field research from the in-depth and

short interviews (both quantitative and qualitative) will help identify and generate more theories and ideas.

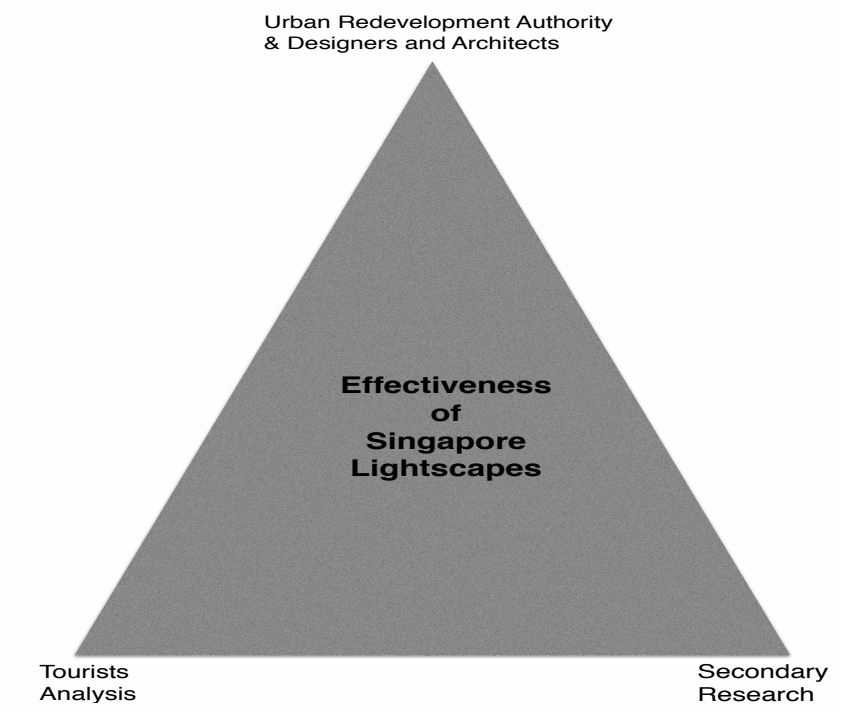

Figure 1: Triangulation Framework.

Framework for Analysis

Analysis of the data gathered from interviews will be synthesized to align common themes. These themes will establish whether the objectives of the Urban Redevelopment Authority have achieved their goals and what the tourists perceive of the experience. The conceptual topics will be consistent with the idea of this case study in developing the foundation for future urban lightscape research.

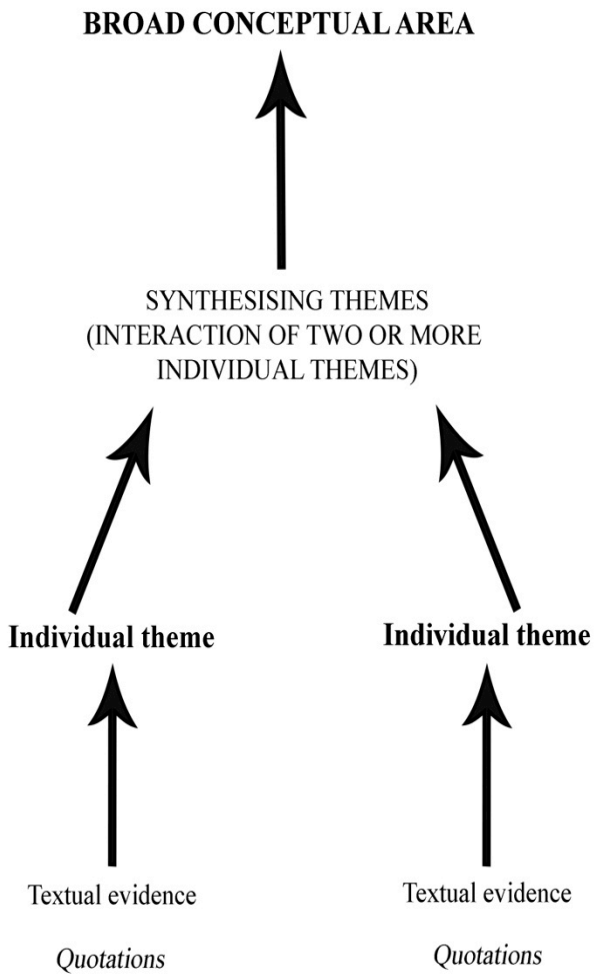

Figure 2: Common Theme Framework
Adapted from Dunn, K. 2005

Trustworthiness of Data

One of the hardest parts of any research project for the researcher is to make sure and provide trustworthy data. The vast array of potential individuals whom would experience urban lighting in Singapore make it practically impossible to come to an exact conclusion that would apply to all who attended. Urban lightscapes in Singapore will be looked at from three different angles, existing literature and secondary information, the individuals whom design and implement urban lighting and the individuals whom experience the lighting as a tourist. This literature review will provide the reader reassurance that the researcher has significant knowledge in the subject matter. It will be this knowledge that will help assist the development of the interviews and will help with the overall goal of identifying the ultimate lighting experience.

Simultaneously, the design and time put into the interview structure are important to ascertain valid data. It is important to create a well thought out structure that is open ended, neutral, focused and allow participants to elaborate if they wished. The interviewer must be mindful to not lead the interviewee into conclusions. In addition, there has been four criteria that have been considered throughout the research process to help ensure the validity of the research as suggested by Lincoln and Guba (1985) and deemed necessary by Marshall and Rossman (1995).

1: Credibility (Internal) How truthful are the findings?
2: Transferability (External) How applicable are the findings to another setting?
3: Dependability (Reliability) Are the results consistent and reproducible?
4: Confirmability (Objectivity) Are the findings neutral and unbiased?

These recommended criterions are applicable to this research process and will be used to provide and validate the research findings. The research will be credible by provided accurate unbiased field findings from meaningful sources. The results will be able to be used as a case study for other destinations looking to understand the relationship between lighting and the environment. The research should be dependable but are unlikely to produce the same results exactly do to the amount of external factors involved. The range and scope of the findings, the various factors both positive and negative provide objectivity to the research process.

Data Collection and Analysis

Research Experience

This research used a flexible research design. Due to the research being conducted within Singapore, the ability to be flexible with the design was needed to take into account the cultural and social paradigms that could not be completely planned. The use of mixed methods is appropriate for this research as qualitative research was necessary within the social/behavioral context and is validated by the analysis of quantitative data derived from common themes and demographics. This data is then synthesized with data gathered by secondary research.

Ethics

In conjunction with the ethical guidelines set by the AUT Ethics committee, care was taken to ensure that the research would be conducted in such a way that would be respectful. AUTEC gave permission for this research to be conducted under the application number 12/248. This particular research was not focused around Maori or Pakeha, however the Treaty of Waitangi offers partnership principles that were adhered to ensure a high level of ethical integrity in executing this research. These included (AUT ETHICS, 2010)

- Informed and voluntary consent
- Respect for rights of privacy and confidentiality
- Minimization of Risk
- Truthfulness, including limitation of deception
- Social and cultural sensitivity
- Research adequacy
- Avoidance of conflict of interest
- Respect for property

Limitations of Research

It is important to note that research conducted for 'Lighting the Ultimate Tourism Experience,' has opened the door and provided a valuable foundation to understand the tourist-lightscape phenomena. However, this research does not come without limitations. Due to the strict rules of the Singapore government and confidentiality, only two government officials were able to accept the invitation for an interview. The sample size of 104 short interviews was a relatively small sample size due time constraints. This may result in some limitations of developing generalizations, as the amount of tourists whom experience Singapore yearly is far greater.

Text Analysis and Secondary Data Sources 'The Story'

Knowing the background and history of Singapore's Urban Lighting schemes is important to establishing a solid foundation to execute the following research method, in-depth interviews with urban lighting experts. Textual research is a useful source to fill in gaps of other research methods limitations (White, 2003). The research used in this project was received through textual mediums such as newspapers, magazines, journal articles, public material, urban plans and photographs. This data provided current information about Singapore's urban strategies, marketing and events all focused on lighting schemes. The high level of text support provided a substantial foundation of lighting development and a glimpse into the future plans for urban illumination of Singapore. The data not only provided opinion from the public, but strategic planning and enforcement from the URA and third party events.

The additional use of the Internet sources provided unique and useful visual and textual based data depicting the Singaporean night experience. For instance, there is a wealth of personal websites, blogs and social forums of peoples experience within Singapore and the images capture their highlighted moments. This provided intriguing information as some of the photos provided variations of lighting installments because of the variation in times in which they were taken. More intriguing is the blogs and captions that accompany such sources as it gave a warm up of some of the consumed experiences individuals had experienced within Singapore.

Combining the textual and visual data provided a foundation and enough information to compliment the building structure of step twos in depth interviews. Taking this information and adapting it to clarify the questions with professional individuals whom have first hand experience with the implementation of urban lighting within Singapore followed suit.

In-depth Interviews "The Management & Designers"

In-depth interviews provide an integral step to understanding the goals and needs of the individuals and parties involved in creating and implementing lighting schemes throughout Singapore. The interviews provided further detailed information from the source first hand and provided valuable insight into the lighting schemes. The research interviews are comprised of two groups – the governments take and reliance on lighting strategies (Appendix A) and those from the private sector (Appendix B) whom design and create urban architecture, events and environments with lighting in mind.

All interviews were conducted in English averaging between 20 and 50 minutes in duration. Using a semi-structured interview (Appendix C) provided a semi-structure format for the interview key themes and areas of interest. Simultaneously, it allowed the flexibility needed to create a relaxed and comfortable environment to converse. This relaxed environment provided the interviewee the freedom to relate to their personal experiences including any additional facts that may have otherwise missed and provide the details of that nature. In times where a question provided large amount of receivable data, the semi-structured format allowed for the adaptability of additional questions.

A majority of the interviews were digitally recorded and partially transcribed. Both individuals interviewed with the Singapore government requested to be anonymous and in addition, that some information be withheld from the thesis. These requests were fair and expected as Singapore government is extremely structured and a wealth of knowledge is still not made public. However, it is important to note that none of these restrictions hindered the information needed to use the data collected to establish the foundational goals and importance lighting has to the Singaporean government and its people. Additional and follow up correspondence took place via email and phone conversations. This was necessary as the researcher is based in New Zealand and the interview subjects live and work within Singapore. The documented research from the in depth semi structured interviews were used to create the short interview questionnaires with tourists in Singapore.

For an in depth analysis of the satisfaction levels, two qualitative samples are required: (1) A sample of tourists experiencing Singapore lighting (2) A sample of the design and management personnel whom implement lighting projects. Participants of the research will need to be willing to commit time thinking and discussing in depth about their responses based of their expectations and perception of their personal experiences. Responses gained from research participants that do not take the process seriously may be limited or removed from the research process. Due to the large amount of people and the various elements that impact their personal experiences, there is a need for a large sample size that will limit potential findings. However, it is anticipated that the depth of the research and quality of detail provided would produce intangible results of value that may be applicable for other tourism destinations.

A verbal introduction to the prospective research participants will occur at major pre-determined tourist locations throughout the Singapore. It is at this time that the information about the purpose of the research and the interview questions will be provided. At any time, participants will have the opportunity to ask questions to ensure that the participant feels safe and secure. This sense of security is more likely to produce better and more reliant results (Marshall & Rossman, 1999). When the meeting is over, the potential participants who are still considering participating at this stage will take the consent forms. This sampling from participants can be defined as a mixture of criterion and convenience sampling (Marshall & Rossman, 1999). This research would go under community and goals/expectations categories of sampling based of Marshall and Rossman's (1999) diagram.

The second sample that is required is that of design and management members by elite interviewing. Elite interviews, is a interview of a influential, prominent or well informed member of an organization/community and are chosen based off of their expertise in the relevant research area (Marshall and Rossman, 1999). The following criteria will apply for potential interviewees are; must have a management role in the planning and execution of the Singapore lighting or tourism; must also be able to provide in depth answers to questions regarding the goals and expectations of the event. This sample size will be significantly smaller as the goals of the management team should be the same and will most likely be reliant on published and documented information like their website, etc. One interview of a high management official of the games and activities would be sufficient to get a thorough understanding of their goals by exploring, discussing and comparing to the perceptions of its attendees.

Integral to the validity of the data collected it is important to provide enough data to back up any results. The fact that this research project is reliant on three key elements, background, the designer / government point of view and the tourist experience requires three different sections of research. The first section will establish the background research and historical overview for Singapore and the importance of urban lighting to them (See Chapter Two and Three). The background and already existing literature on Singapore lighting provided a sufficient foundation of knowledge about the subject and enough to establish interview questions for the industry / government interviews. This

order also helped find any holes in the literature and any additional areas of interest that needed to be explored more.

The second section of data is the results received from the industry interviews. The data collected from these interview will only support initial questions of what makes the ultimate lighting experience and will enhance the knowledge and understanding of the creator's objectives. This data will also provide data to compare results to see if the objectives of the government and designers are actually being achieved.

The third step and most important to this research is the short interviews with the tourists themselves. These interviews will question their experience and provide context to what they were hoping to experience, what they ended up experience and now their perception of the experience. The following section will now go into further detail on short interviews.

Participant Short Interviews "The Tourist"

The research goals of getting a better understanding of the tourism destination experience rely heavily on short interviews with tourists in Singapore. Effective and appropriate research methods are integral to the success of research. In order to get quality results, participants were chosen at random, through convenience sampling, in predetermined high-density tourist locations throughout Singapore. These destinations were predetermined due to the extensive lighting schemes implemented within the area. These interviews took place over a three-week period. These interviews were conducted during

'nightscape' hours often between 7-11pm. No tourist interviews were conducted during sunlight hours. These areas include Marina Bay, Singapore CBD and Skyline, Chinatown, Clarke Quay, Sentosa Resort and Gardens by the Bay. 104 short interviews were conducted with tourists whom had recently experienced or were currently in one of the pre-determined urban lightscapes. The respondents were verified as tourists upon introduction by simply asking if they were tourists.

Methodology Summation

This chapter has provided a literature review of research methodologies and how they were executed. The use of mixed methods approach was chosen in order to help validate the qualitative and quantitative findings. In addition, triangulation was used to compare secondary data, with both sources of primary data to establish whether the goals of the Urban Redevelopment Authority (Singapore government) were achieved.

CHAPTER THREE:

The Relationship between Tourism and Light

The academic study of nightscapes has increased in popularity in the last two decades in a wide variety of disciplines (Law, 1997; Skelton & Valentine, 1998; Talbot, 2007; Quek Choon Keat, 2008). The importance of the 'night' has been increasingly acknowledged and more so regarded as a time frame integral to the success of urban space, identity and livability of a space (Roberts, 2006). Simultaneously since the 1990's, Singapore has created urban development plans developed around lighting their nightscapes (Quek Choon Keat, 2008; www.ura.gov.sg, 2013). In order to understand the role lighting has on the experience of tourists, it is important to understand the reasoning and strategies Singapore used to develop these lightscapes. In this chapter, a literature review on urban redevelopment, lighting and tourist motivation/perception will be presented. This in depth analysis will provide a conceptual framework to segment the study into urban tourism and lighting perception.

In many of the academic studies on geographical research, the role lighting plays on the location is largely ignored (Quek Choon Keat, 2008). Ironically, it is unfair to say that lighting is a major element to the success of a nightscape because without it, a majority of our night experiences would not be possible. The fact that there is so much literature and case studies on geographical nightscapes themselves, makes fine tuning the perception of lightscapes a very intriguing and important topic to look further into. In 1981, Lynch addressed the importance of lighting in the city for the basic needs however does not go

into detail beyond this. The role of lighting in the context of ones experience in the environment is rarely acknowledged consciously and may be a reason for not being studied. The fact is, studies explore how lighting engages specifically in urban design, architecture and engineering only (Arup, 2007; Brandi, 2001; Quek Choon Keat, 2008), resulting in an academic gap. The perception of those experiencing these lightscapes would seem to be important element to a good quality design/development.

The literature review will provide a foundation to develop research questions to use in the field research. By combining the insights of those who develop lightscapes and the perception of the tourists whom engage within them, the foundation for the ultimate tourism experience can be derived. Thus, filling a niche within urban nightscape literature. This chapter will explore four key areas; urban redevelopment, lighting, tourist motivation/perception and the conceptual framework for the study.

Definition of Tourism and Tourist

Urban tourism is constantly adapting and changing (Haider, 1992; Holcomb, 1994; Kotler, Haider & Rein, 1993). In order to fully understand urban tourism, a solid understanding of tourism is needed. A ‘tour’ is a trip that returns to it’s starting point and comes from the Latin word ‘tonare’ and the Greek word ‘tornos’ which represents a circle or movement around a specific location (Turco, 2002). The ‘ism’ of tourism represents the action or process of leaving and returning to the same point. The ‘ist’ in tourist represents the person whom engages with the particular action or function (Turco, 2002). Therefore, for the purposes of this study, the tourist is a person whom acts in the cycle of leaving one location and later returning to the same point.

The World Tourism Organization (2013) defines tourism as 'activities of a person traveling to a place outside his or her usual environment for less then a specified period of time with a main purpose other than the exercise of activity remunerated from within the place visited.' Leiper (1979) defines tourism as discretionary travel and temporary stay of persons away from their usual place of residence for one or more nights.' However, these definitions of tourism can still be considered vague and for the purposes of this research will be further discussed. An 'usual environment' means a location that one interacts with that is experienced in a routine matter or a location that is easily reachable from one's place of residence. 'Less than specified period of time,' and 'remunerated from within the place visited' is meant to exclude long term migration, for instance people who travel somewhere to live for a prolonged amount of time and those who moved for work. This definition will define the guidelines and prerequisites for short interview respondents in the field as further discussed in chapter four.

Urban Tourism Redevelopement

Urban tourism literature is found in abundance on a variety of intertwined disciplines (Crang, 1990; Hall, 2000; Kotler, Haider & Rein, 1993; Short & Kim, 1998). One of the common themes addressed in the literature from these researchers is that destinations are constantly redeveloping to maintain interest and compete in the global tourism market. Some destinations have in-depth strategies of achieving urban renewal by implementing new infrastructure or attractions to stand out and be attractive to foreign investors, tourists and retain local interest (Hall, 2000). Singapore for example, continually looks at current and upcoming trends by using other cities past and present objectives as examples (www.ura.gov.sg, 2013). This is important because Singapore's Urban Redevelopment

Authority can analyze other destinations pre-existing strategies and recognize what worked well and what didn't (Quek Choon Keat, 2008). In result, Singapore can adapt from other's mistakes, develop their own lightscapes, and provide a 'memorable' nightscape within Singapore.

The international identity of urban destinations can be established in a variety of ways (Goodwin, 1993; Haider, 1992). For instance, some global destinations are recognized by their unique skylines and structures, which help create an identity for the destination. Some destinations can be identified by international events that are held on a yearly basis as a way to identify a vibrant destination. This 'my stick is bigger then yours' philosophy isn't a new concept, global competitiveness goes back to tribal times (Kotler, Haider & Rein, 1993), however, today's significance is different in that technology and the importance of economic growth are making it very difficult to stay the leader among destinations (Hall, 2000). Buildings are consistently getting taller and events are getting bigger and more spectacle based. The need to be the urban leader all stems from the need to reinvent and change the destination image and experience with the intended goal of attracting investors, tourists and entice people to live there (Short & Kim, 1998: 55). The international challenge of staying a global leader has been referred to as ' place wars,' ultimately leading to destinations being treated like products and advertised as such (Haider, 1992).

The need to update and renew cities is not getting easier (Haider, 1992; Hall, 2000). Many older and smaller urban destinations are running out of space to build new urban

developments, therefore ideas are being rebuilt rather then becoming brand new attractions, as is the case with Singapore (www.ura.gov.sg, 2012). As 'standard' attractions are in almost every major destination, these attractions are less attractive and motivating for potential tourists to visit when they can go to the similar type of experience somewhere closer (Holcomb, 1994). Congruently, the media and marketing view of a destination is also becoming a big area of concern and focus for urban planners (Kotler, Haider & Rein, 1993). The truth is that media affects us on a daily basis, in a variety of mediums and plays a part on the perception and judgments we place upon the subject. This allows people to make judgments about destinations without experiencing them, purely based on its reputation from word of mouth, the Internet, radio and television (Avraham, 2000). It is important to note, that there are many other ways marketing can impact us.

Photo removed for copyright

Photo 3: 'Urban Light' LACMA Exhibit. Los Angeles. Urban Light & Art (2014)

In a highly competitive market of destination marketing, it is important to continually look for new and innovative ways to make the destination (product) stand out from the

rest (Buhalis, 1999; Enright & Newton (2004)). Ideally, every major city tourism department wants their city to be a 'poster city' that is recognizable by sight all around the world (Quek Choon Keat, 2008). Tourism destinations can find their marketing niche through architecture, culture, nature, monuments, events, food, shopping or any assortment of them (Buhalis, 1999). For instance, take the sky tower philosophy; ever since the first 'sky tower', many other destinations have included a unique version of their sky tower so that way they can provide a similar yet unique destination experience (Dixit, Belwal & Singh, 2014). This particular example does not only provide an experience but arguably, and more importantly, is the ability to use such structures as a way to provide a unique, iconic image of the particular destination.

Research on destination life cycles by Butler (1980), provided a six-step sequence (Table 03). The initial step of a destination life cycle is when it is a new destination and is being explored irregularly and does not have much tourism infrastructure. As knowledge of the destination begins to increase, more involvement begins to occur resulting in the need for basic tourist amenities. At this time, the potential for tourism growth is identified, infrastructure is developed, and the destination will begin to be marketed in various mediums beyond word of mouth. As the tourism economy grows there eventually will be the need for tourism management to focus on extending the stay of visitors as opposed to getting increased numbers. Butler (2006) suggests the longer the tourist stays, the economic benefits the destination acquires. However, the interest from tourists does not continually grow as the destination can go into a period known as stagnation. It is at this time that the tourism destination is no longer fashionable and will need to be rebranded or

marketed to regain interest. If there is a redevelopment of the destination, Butler (1980) says a period of rejuvenation can occur. However, if the destination continues to be in the stagnation stage the interest in the destination will begin to decline. This cycle establishes that a destination has its initial birth and interest that steadily grows. However, as other destinations begin to match or provide similar experiences, the decline of interest begins, ultimately leading to the need to evolve.

Stage	Explanation
Exploration	Small tourist numbers following irregular tourist patterns No specific facilities provided for tourists
Involvement	Increase in tourist numbers High levels of visitor-local contact Some tourist facilities beginning to be provided
Development	Tourism marked defined Marketed as a tourism destination
Consolidation	Rate of increase in visitor numbers will decline Tourism a major part of economy Efforts made to extend tourist season and market area
Stagnation	Peak of visitor numbers reached Capacity levels reached; social, environmental and social problems No longer fashionable destination
Decline	Area unable to compete with newer attractions No longer appealing for holiday goers
Rejuvenation	May occur if there is a complete change in attraction

Table 03: Stages of a Destination Life Cycle, Butler, 1980

Butler (2006) expanded on the tourism area cycle specifically focusing on the latter stages of rejuvenation and decline (Figure 01). The further study concluded that there is five different potential levels of rejuvenation/decline; rejuvenation (A), slight rejuvenation (B), slight decline (C), steady decline (D) and rapid decline (E). In order for rejuvenation to occur, a full redevelopment plan must be put in place. Butler goes on stating that a slight rejuvenation occurs when only a partial redevelopment plan is put in

place. The maintaining of existing tourism areas will maintain small interest and slow down the decline interest however, is likely to not last long. Steady decline occurs when the destination is not competitive with other similar destinations and has nothing new to offer. Rapid decline happens because of war, disease, terrorism or any other catastrophic event, which has an immediate effect on the destination (Butler, 2006). An example of this would be he tourism industry in New York immediately following the 9/11 terrorism attacks.

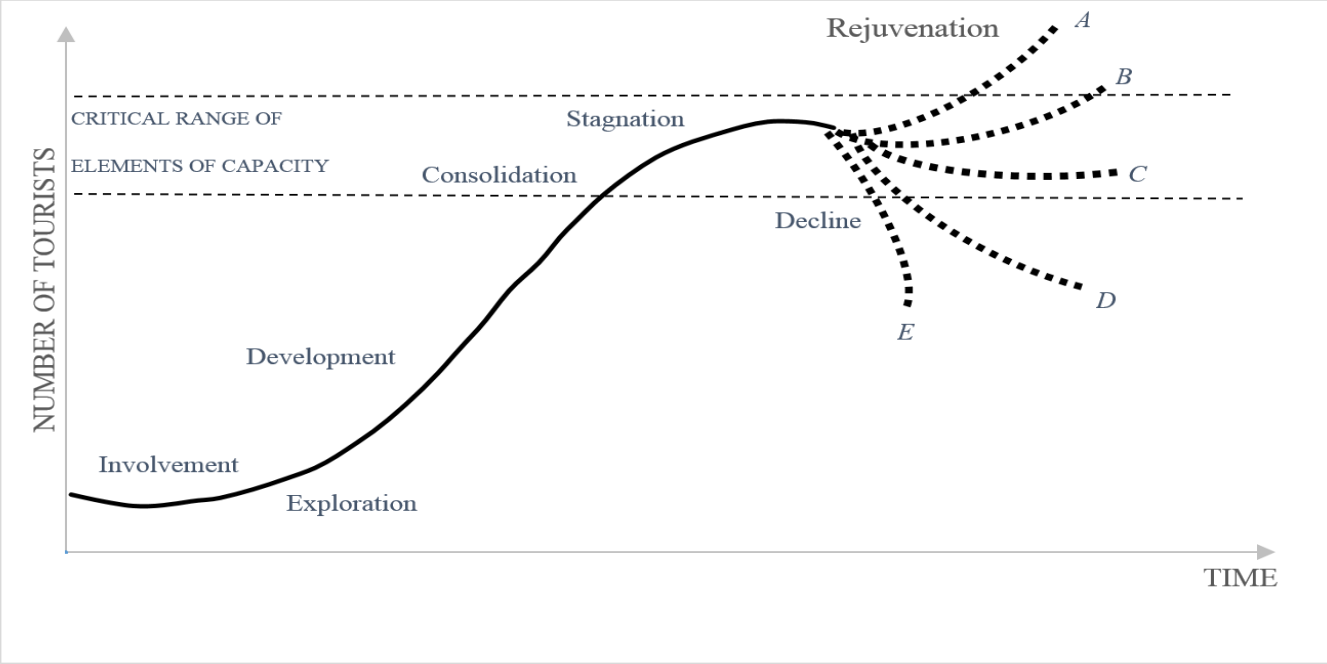

Figure 3: The tourism destination cycle of evolution (Butler, 2006)

Developmemt & Legacy

When it comes to the design and maintenance of a product there is a life cycle process (Moss, 2009). First, the exploration of ideas and the final concept is determined in the beginning stages. Once the concept is established, parties involved in the process must be included to provide concepts and ideas. The resulting ideas then are consolidated based

on realistic approaches and the best option is chosen. After the project is complete there needs to be some time in order to discover the true impact of the project, which is called the stagnation period. When a product or destination enters the stagnation period, there is the need to evaluate the development. If new growth or restructuring does not occur, the product can dissolve and lose interest due to the lack of fresh marketing, However, an evaluation can lead to redevelopment in order to keep the destination attractive and competitive. A prime example of this life cycle and the continual need for new development is the theme park industry (Gottdiener, 1997). Theme parks are constantly changing, adding new elements, and renovating to provide new and refreshed experience to those whom are experiencing it first hand (Farrar, Straus & Giroux, 1992). If theme parks did not continually provide new and innovative attractions, the interest in visiting them would begin to wear off, especially if they are not kept as up to date as other competitor theme parks.

The success of a destination or product can be determined by the 'legacy' it creates (Shone & Parry, 2004). The legacy of urban development is important to understand because legacy is important to the success of a destination from a developer's perspective. Similar to Moss' development cycle, a five-step review process to determine the legacy of a destination can be derived (Figure 04). In order to determine the legacy the objectives of the development need to be clear and understood. With the objectives in mind, the development process and management of its implementation is integral to avoid any negative press or views from those involved. Once the development is complete, a period of time is needed before evaluation in order to determine the success

of the objectives. Once the evaluation is complete, the legacy outcome of the development can be made. An example of legacy review cycle is that of Olympic Games (Shone & Parry, 2004; Ziakas 2014). The true success of the Olympic development cannot be determined until well after the games are complete as the development not only needs to be efficient and effective for the games but also for the post games community, tourism and economy (Ziakas, 2014).

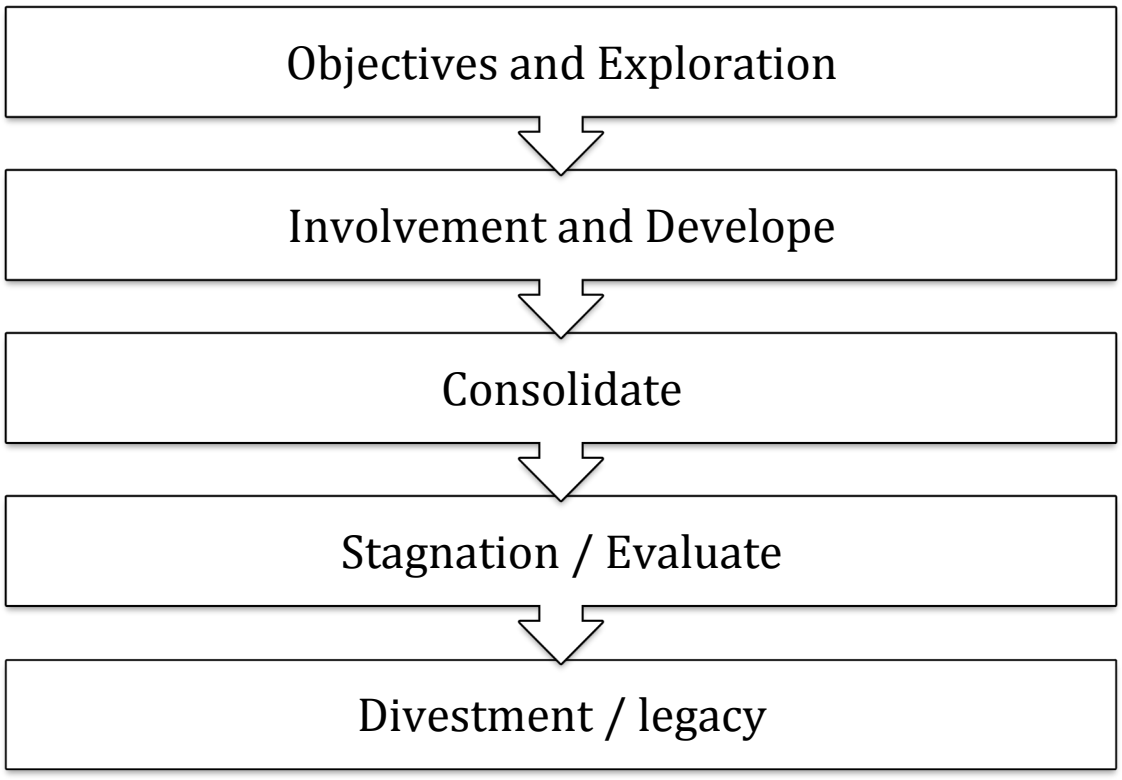

Figure 4: Development vs. Legacy Cycle (Synthesized from Butler, 2006; Shone & Parry, 2004)

Tourist Motivation and Perception

In order to understand the interaction and impact urban lighting has on the tourist experience we must look into existing tourist behavior and motivational literature. It is

suggested that for the purposes of engaging participants, urban tourism activities can be narrowed down to two sets of choices (Kurtzman, 1997). The first aspect is that the tourists are not fully aware of the influence on them to travel for the sake of a particular urban attraction; otherwise known as 'pseudo-choice.' Pseudo-choice is the result of consistent forces such as friends, family, groups and media that influences the experience. The second type of choice is known as 'intentional choice,' which occurs when a tourist has a passion for a particular element of the urban destination. Note, that these motivational choices are narrow and could be further expanded however is not integral to the outcome of this research.

However, the choice of which destination to visit is determined by two factors. First is that the destination is interesting to the personal interest of the visitor and second because the theming enhances the overall experience and services that are marketed the consumer. The marketing of such destinations is difficult at times because image and theme are two different things (Wong, 1999). Often marketing focuses on image because it is the image that people recognize and use to relate to the tourism attractions. However, theme marketing is often done by the careful and immaculate attention to detail of said theme, which then represents the quality of the overall product to help produce word of mouth marketing.

However, when looking into research of the determinants and motivations of individuals who attend events it is very difficult to determine a single overall factor because of the variety of forces that impact ones behavior (Hoxter & Lexter, 1987). Much like events,

the variety and scope of lighting purposes and fragmentation of lighting uses makes singling out an assessment of the forces driving the market a challenge (Shone & Parry, 2004). The variety of lighting uses and platforms means a more in depth conceptual framework needs to be explored. It is only then possible to look at the individual districts or types of lighting and its correlation with the motives to explore such environments or attractions.

Process of Perception

1	Decision to Visit
2	Compares Experience vs. Initial Perspective
3	On-Site Behavior Compared to Home Behavior
4	Return from Destination
5	Perspective is developed

Table 4: Five Stages of Perception and Motivation (Hall, 2011)

In addition, Hall (2011) provides a theory of tourism perception and motivation by breaking the process into five stages (Table 04). A tourist must first make the decision to visit a particular location which can be established through a variety of factors from word of mouth, digital media, personal interest and so on. When a tourist arrives at the location, the tourist begins to compare and create a perspective of said destination in comparison to other destinations that have been experienced. It is at this time that the early stages of reflection begin to occur. As the individual begins to interact within the destination there is stage three ‘on-site behavior, which is the sensation and feelings the destination create compared to the ‘home’ behavior. Stage four is the return travel from a destination, which

is followed by stage five, recollection where the tourist reflects and establishes perspective of the experience.

Human perception is always being updated and derived through the information received and analyzed from his or her surroundings (Hong, 2007). Previous studies on environmental perception by Rapoport (1977) suggest that there is three ways human obtain information from their environments,

1. Environmental Evaluation and Preference: involves perceiving, knowing and thinking, the basic processes whereby the individual know his/her environment
2. Environmental Cognition: the way people understand structure, learn the environment, and create mental maps to negotiate it.
3. Environmental Perception: referring to the direct sensory experience one would have within the environment

Rapoport's (1977) study suggest that perception is effected by 'the nature of the stimuli, the physiology of perception and the state of the organism – expectation, attention, motivation, selectivity or adaption.' The identified processes don't occur independently however, coexist to create the experience of one's environment.

It is important to note that there are other determinates in the complicated individual outcome phenomenon. The interest in individual outcomes has increased due to the

variety of demographic backgrounds integrating and living in the same communities (Shone and Parry, 2004). Shone and Parry also state that today's accessibility to technology and home entertainment are counter intuitive to the community experience, however the social and psychological factors still provide the need to interact in community events and gatherings. Economic, organizational, political, status, philanthropic and charitable needs are just a few reasons and factors to consider when catering to motives (Shone and Parry, 2004).

In analyzing the variety of main elements of demand for interactive community activities and spaces means that there is not one but a variety of multiple motives or determinates whether primary or secondary (Figure 05). The multiple uses of lighting and the reason they are implemented result in more then just social needs. Interestingly, lighting provides an opportunity to be a primary and secondary factor at the same time.

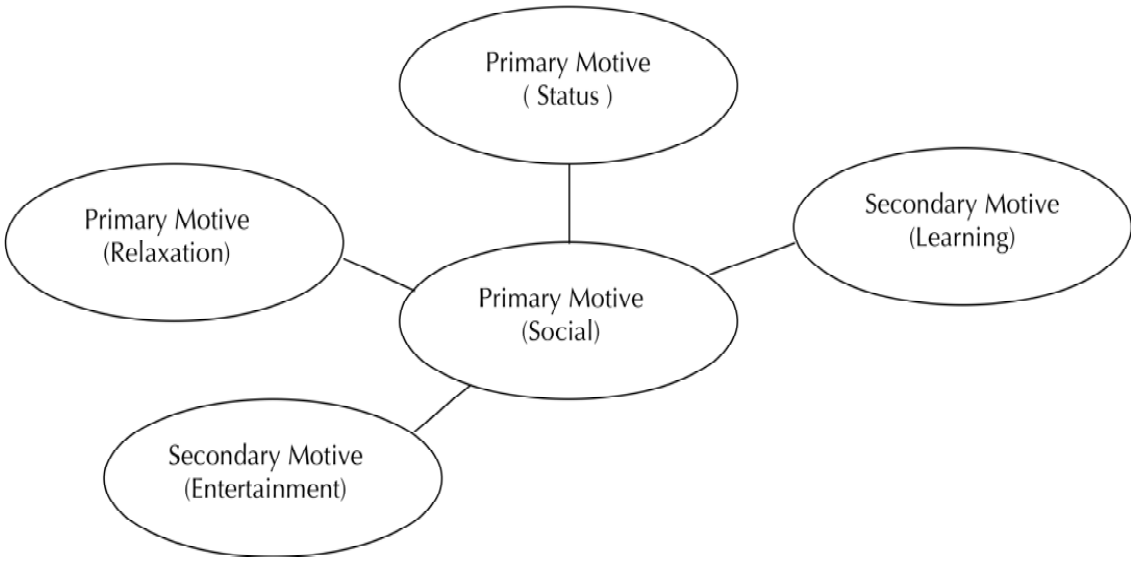

Figure 5: Primary & Secondary Motives for Travel (Adapted: Shone & Parry 2004)

Academic research has suggested that motives for tourists in large capacity events fall into two categories; social and psychological motives (Crompton, 1979). Social motives relate to the interactions with others who are at the same event, like those who attend large music festival for social purposes as opposed to those who attend for the bands. Psychological motives are in relation to individual held reasons like visiting an ancestral village to learn more about the family's history and background. Crompton's study of tourist motives to visit a particular destination includes various push and pull factors that ultimately help decide whether a particular destination and product is worth exploring further.

Historically, the most common motivation to attend events or in this case lighting based experiences is for social reasons (Shone and Parry, 2004). Much like the goals of the Urban Redevelopment Authorities in creating community spaces to explore, exchange and entertain (National Day Rally, 2005), it is suggested that such lighting based events and activities can promote an opportunity for social integration, engagement with one another and the community and the integration of social norms. This platform can thus be broken down even further into status, background and scale.

To go along with motives and determinants of one's desires it is important to also look at individuals needs. Since lighting in the context of this research is predominantly recreational based, the understanding of the individual's need for recreation must also be explored from a psychological standpoint. According to psychologist Abraham Maslow the need for recreation stems from the essential need to fulfill our cognitive and aesthetic

stimulation (Pilgram and Jenkins, 1999; Moss, 2009, p. 7). As seen in Figure 06, Maslow (2009) created a hierarchy of needs that was designed to demonstrate what the human essentials are in order to survive and thrive. The lowest level of Maslow's pyramid is our basic needs. The next level up is the needs that allow us to feel safe and have a sense of well being. From here is the need for love and belonging that represents our need to be with other people. Narrowing it down more, level four is self-esteem and the opportunity to feel positive within our society and community, ultimately, leaving the top of the pyramid for the fulfillment of self-actualization. The top need of self-actualization is where events, recreation and attractions predominantly come to play (Moss, 2009). This is where people can participate for peer enjoyment and for no other reas

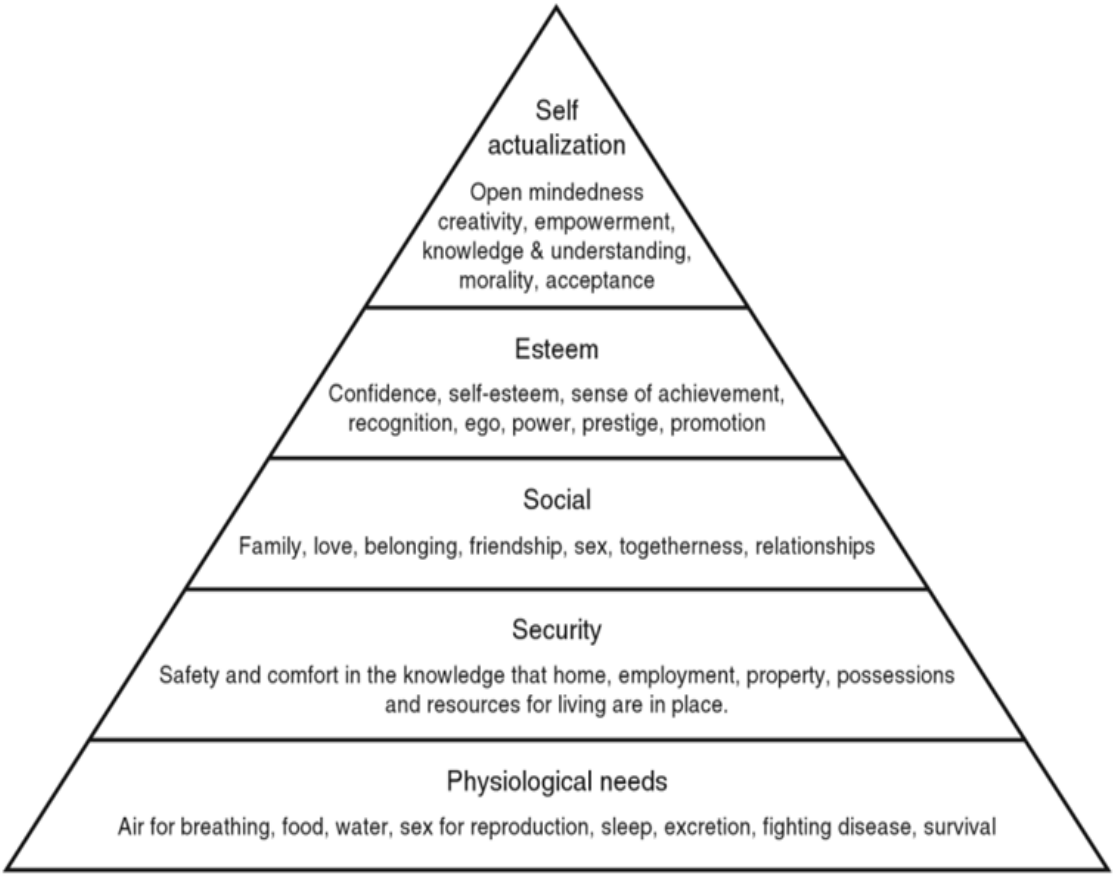

Figure 6: Maslow's Hierarchy of needs. (Maslow, 2009)

According to Pearce (1993) and Wong (1999), there are five reasons people visit destinations (Self Fulfillment, Self-Esteem, Relationship, Stimulation and Relaxation). These reasons can be used in conjunction with another or as a sole reason. Understanding the reasoning for travel is integral to developing appropriate research questions for the interviews with tourists, as their reason for travel, ultimately impacts their perception and view of a destination. In order for this research to be effective, it is important to understand the psychological reasoning's for the choice to travel on an individual level. It is only then a better understanding of the relationship between lighting and perception of a destination or product be discovered. Now that a review of individual's determinants and needs have been provided, the role and need for lighting must be explored.

The Role of Lighting in the Night

More or less, half of a full day cycle is the night. Not surprisingly, the role of the 'night' as we know it today hasn't always been so. Before the advancements in technology and the creation of artificial light, the night is a time with minimal activity. Peglar, for example, describes how the features of the day ' vanish into the void of the night' (Pegler, 1998: 148). The night is when the human body slows down its activity, in order to rebuild energy. Humans also spent nights in shelter, avoiding the colder and time of poor visibility before the invention of artificial lighting. Additionally, in most research of lighting and the night, safety is a reoccurring topic that is studied. Danger and evil were traditionally prominent during the hours of the night (Jakle, 2001)

However, the invention and advancement of artificial lighting technologies has resulted in an increased growth and development of human activity in nightscapes. The increased amount of lighting technology in strategic urban locations has normalized nocturnal activities. Lighting created the ability for celebration and recreation at night where previously not possible. As the development of lighting and night activities increased, there became two primary types of lighting, the lighting of order and the lighting of festivity (Schivelbusch, 1998: 137). Shivelbusch went on to say that 'lighting of festivity' seemed to increase individuals emotions more so then the 'lighting of order' because it not only provided light to see and helped people feel safe and provided thematic and enhanced atmosphere.

The technological enhancements have led the role of modern lighting to not only provide for practical needs but also for theming and product regeneration. Thematic lighting techniques are one way to provide urban renewal and twenty-four hour urban life (Menda, 2005: 12). As energy efficient technologies are becoming easily accessible to city developers, the role of urban illumination is often normalized and often unnoticed by those experiencing it. This is ironic considering that without it the accessibility and livability within the night would once again diminish. Surprisingly, finding research on the variety of lighting uses has been difficult. For the purposes of this research, four uses of non-natural lighting have been identified (Figure 08); practical, event, infrastructure and seasonal.

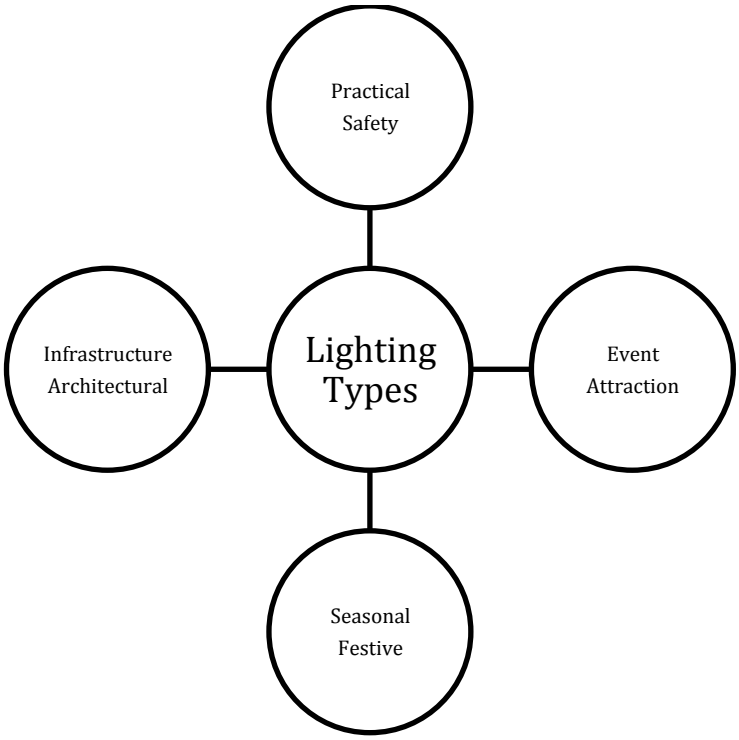

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Figure 7: Reasons for Lighting Use (Andrew Potvin,)

Practical lighting is the most common use of light in our everyday lives and is usually a permanent install. Practical lighting also is used for organizational purposes such as traffic control, medical use and heat. The concept of practical lighting is like the mother to all uses of lighting. Infrastructure, event and seasonal lighting can be considered part of practical lighting whether intentional or not.

Photo removed for copyright

Photo 4: Various Practical Light Symbols Source: moonbattery.com (2009)

Infrastructure lighting is the use of lighting to enhance or define an architectural or natural structure and is often a permanent install. Infrastructure lighting is often used to pull focus to the particular structure or enhance its architectural features.

Photo 5: Lighting of Singapore's Skyline Source: Andrew Potvin (2012)

Event lighting is when lighting is used as a primary element of entertainment. Light shows (often permanent) and light events (often temporary) are two different ways lighting is used as a primary or supporting source of entertainment.

Photo 6: Event lighting from Sentosa Resorts Water-Light Show Source: Andrew Potvin

Seasonal lighting is temporary lighting that is installed for a limited duration of time and occurs in conjunction with a seasonal theme or holiday. Common uses of seasonal lighting are Christmas lights in the December and spooky lighting for Halloween. Singapore's Orchard Road is known for its winter lighting decorations.

Photo removed for copyright

Photo 7: Orchard Road Seasonal Christmas Lighting Source: fourseasons.com

The Fear of Darkness through History

Due to the scientific nature of the universe in which we are apart of, the earth is naturally half shadow and half lit on its axis in proximity to the sun (Harder, 2008). Through the evolution of humans need for light, homo sapiens have become increasingly dependent on it to extend our lives beyond the natural lit hours of livability (Mosseri, 2001). Harder (2008, p.9) goes on to say, "Then came fire, the candle, and the light bulb, gradually drawing back the curtain of darkness and giving us unprecedented control over our lives." This evolution of the need for light goes back as far as religion is documented. This long history is due to humanities need for safety, comfort and beauty in comparison to the lack of lighting which commonly represents danger, fear and non-livable at night (Schreduer & Narisada, 2004).

According to Mosseri (2011), public lighting schemes go as far back as the middle fourteen hundreds as London addressed the use of street lanterns to help curve the amount of crime and 'ensure public safety.' This recognition of lighting schemes eventually led to mandates from the government resulting in a foundation of the importance of nocturnal light as a necessity to provide a sense of safety. In the 1600's France took street lamps to a new level by incorporating street lighting into the development of street infrastructure and requiring a lighting system that was enforced by local police authorities (Boyce, 2003).

The continued social development into the early 1880s resulted in a demand for more community lighting to extend public safety and meet social needs (Mosseri, 2011). With the development of gas lamps and the increased efficiency of the light duration and brightness made the lighting of the night easier and more reliable. The rapid growth of the gas lamp saw a dramatic reliance on a gas fuelled street light system in major cities throughout the world. Boyce (2003) goes on to describe how the importance of street lighting transformed again with the development of electricity. The electric light bulb was recognized and so reliable as a light source the New York Police chief in 1850 stated that every electric streetlight is one less police officer needed on the street (Mosseri, 2011). It took until the 19th century for the incandescent light bulbs and an infrastructure to be fully developed. As a result, reliable lighting systems began to pop up in major cities operated by local government authorities. This background and reliance on artificial lighting has carried through to today as a main contributor to provide a safe and

comfortable space, resulting in some cases over lit and uncontrolled illuminated environments (Mosseri, 2011; Perkins, 2009; Schreduer & Narisada, 2004).

> "There is sheer delight in sensing the world: the play of light, the feel and smell of the wind, touches, sounds, colors, forms. A good place is accessible to all the senses, makes visible the currents of the air, and engages the perceptions of its inhabitants."
> (Lynch, 1981)

Illuminated Intangibility and Experience

Using urban lighting events and experiences as an element of the tourism experience is challenging because there is not a lot of tangible product that can be sold to the tourist to take home (Mannel, 1987). This is a challenge for tourism sectors because many of these lighting 'products' are unique, permanent installs to the location. When a tourist is experiencing urban lightscapes, the product being sold is the experience, not necessarily a tangible product. The experience of a light show or lightscape cannot be brought to the consumer's home and therefore is an intangible product, as ultimately the tourist returns home with only memories and photos. An exterior light show for instance has many factors that a travel agent or producer cannot guarantee, for instance there can be rain or high winds, low clouds or heavy fog (Turco, Riley and Swart, 2002). Once experienced, you may find that it was not as exciting as you thought it to be. Unlike buying a car, a tourist cannot test drive a light show in person, before experiencing it. From a producing standpoint, this makes investment in lighting as an attraction a risky investment because you cannot return a lighting installment. However, like other sectors of intangible tourism services there are a few ways to make an experience a little more tangible as suggested by Turco, Riley and Swart (2002).

- Provide an experience organized and run by quality professionals with credentials to ensure a high quality experience and high standard of professionalism
- Use the people behind the product as a marketing advantage
- Involve celebrities or other identifiable individuals that can provide the potential consumer the idea that it must be a good product if such person will endorse it.
- Provide a credible and clear brand that is recognizable
- Ensure that all elements involve compliment each other visually and practically
- Use YouTube and media as a way to provide 'trailers' of the product.
- Provide follow up and review surveys to see how the product could be improved in the future.

In Lynch's (1981) studies, vitality, sense, fit, access and control are identified as dimensions pertinent to ones experience. For the benefit of this research, sense is extremely important to the cities visual form. As defined by Lynch, "urban sense" is the 'clarity with which it can be perceived and identified, and the ease with which its elements can be linked with other events and places in a coherent mental representation of time and space and that representation can be connected with non-spatial concepts and values. Human perception is further aided when he/she is able to 'make sense' of the space by visually and mentally organizing his environment into forms in which he could identify with' (Kaplan, 1983).

"Vision, I say, is related to light itself. But of this sensation and the things pertaining to it I pretend to understand but little, and since even a long time would not suffice to explain that trifle, or even to hint at an explanation, I pass over this in silence."
Galileo Galilei, The Assayer, 1623

In research conducted in landscape interaction, the importance of sight in modern spatial experiences is not only genetically and biologically traditional but is also the result of human cultural and socio-historical development (Cosgrove, 1984). The 'visual experience' is the medical phenomenon between human vision and the experience (Manner, 1987). Vision is an element of the five human senses and is considered one of the more influential senses of an individual's experience. Vision is an important part of the individual experience of environments (Rodaway, 1994). The physiology of vision and the influence of cultural tradition are the two key elements that determine the visual experience (Cosgrove, 1984). Additionally, the visual experience is also the result of consistent reflective process of past personal experiences.

It is important to acknowledge that the sense of sight is not the only way humans navigate and experience space but is an important one. The use and advantages of sight are often taken for granted due to its normalization of everyday use and it is not until the gift of sight is absent, that we realize its impact on our experiences (Mannel, 1987). The importance of sight is also highly reliant on the mental development and understanding behind it. For instance, a bright path compared to a dark path would not mean anything if it wasn't for our mental understanding and societal recognition that the brighter path would be the safest route to take. The role of the mental 'decoder' in relation to sight is important to note, as it would prove that sight is useless without the mental acknowledgment of the individual and the previous personal experience (Quek Choon Keat, 2008).

The elements of visual experiences have been noted in geographical case studies as some cultures and professions are highly reliant on the importance and domination of sight (Quek Choon Keat, 2008; Mannel, 1987; Rodaway, 1994). Navigators and indigenous societies for instance, primarily relied on sight. Once again, the role lighting plays on the experience of sight has predominantly been left in the dark. Lynch (1960) said that distinctive and interactive environments help establish the creation of an identifiable and memorable experience. This concept is still very alive today as we think of visual destinations like New York, Las Vegas, London, Sydney and Tokyo. This research concentrates specifically on the reactions of the visitor in relation to the visualization of the city and will help determine whether Singapore's focus on lighting enhancements to create an innovative place to live, work and play. This research does not look to prove that sight is most important to the perspective of ones environment but rather a player in how we consume urban experiences and the intended strategies of urban redevelopment.

Visual form is also identified as playing a major part in developing appreciation of environments (Kaplan, 1983). The perception of improvements of a visual space is not only isolated on the city's visual form but also the cultural and historical experience (Nasar, 1998). Through various perception studies within landscapes, it has been determined that urban destination pleasure derived from the experience of the urban environment (Kaplan, 1983, Nasar, 1998). This understanding is important as it suggests that participation from those whom experience the environment in the design process would result in further appreciation of their environment.

"Likeability refers to the probability that an environment will evoke a strong and favorable evaluative response among the group or the public experiencing it. Inhabitants of a city with good evaluative image find pleasure in the appearance of its memorable and visible parts (Nasar, 1998, p.3)

Kaplan (1998) suggests for environmental attributes that when achieved create a design that is functional and preferred (Table 05). A preferred environment enhances the effectiveness of the environment and is supportive of the body and mind's functionality (Kaplan & Kaplan, 1998). Previous studies on the effects of environment and orientation and its impacts on humans have resulted in negative feelings in relation to being disoriented (Nasar, 1998; Kaplan & Kaplan, 1998; Lynch, 1960). Such findings suggest the urban lighting design of the environment allows for easy recognition of landmarks, pathways and minimization of visual chaos would receive positive feedback.

Number	Positive Environment Attributes	Definition
1	Naturalness	The presence of vegetation, water or mountains. Typically involves the users' perception of an area as natural or predominance of natural over built environment.
2	Upkeep / Civilities	Maintenance of areas. Untidiness of urban spaces is referred as physical incivilities, pointing to cues of social disorder.
3	Openness	Vistas
4	Historical Significance	Places having historical significance.
5	Order	Degree of which an area looks organized, visual order, meaning the area's order, cohesiveness and compatability

Table 05: Positive Environment Effects, Kaplan (1998, p62)

Kaplan's (1998) research identified five environment attributes (naturalness, upkeep, openness, historical significance and order) that are integral to a positive environment experience. 'Naturalness' includes resources such as water and nature that impacts the

environmental experience and is often not man-made. The importance of up keeping (cleanliness) an environment is integral for the experience to feel safe, welcoming and welcoming. The importance of open space and greenery is integral to the clarity of an environment. This is why places like New York, New York and Auckland, New Zealand have open areas around their central business district. Openness and naturalness can be considered to go hand and hand. Historical places of interest are important because it builds a connection between the individual and the environment. A well-organized environment displays order, which results in livability, legibility and cohesiveness.

The Need for Light

	UNDERSTANDING	EXPLORATION
Immediate	**Coherence** Organization – Ease in which the environment can be read or understood.	**Complexity** Richness – Variety of objects [*rather than the number of objects]*.
Inferred	**Legibility** Way finding – Ease of understanding orientation.	**Mystery** Sustained interest – Potential for more information.

Table 6: Environmental Preferences. Source: Adapted from Kaplan (1998, p. 13)

Kaplan's research on environmental perception prescribed four preferences (coherence, complexity, legibility, and mystery) that humans look for whether consciously or subconsciously. An environment must be coherent and organized. If an environment is complicated and overwhelming, the result of one's perception can quickly lead to negative thoughts. The legibility of an environment is equally important in the human preferences of a destination as it assists in the orientation of ones surroundings. Coherence and legibility go hand in hand in the environmental preferences of individuals

(Kaplan, 1998). Simultaneously, individuals yearn for richness and complexity within the design experience of an environment. Kaplan (1998) suggests that variety and quality is important over quantity. In conjunction with complexity, individuals also prefer mystery within an urban environment. Mystery stimulates interest and the potential to obtain more information, which engages the individual with the environment.

Lighting is an integral contributor to the design of architectural and landscape environments (Mosseri, 2011; URA, 2013). Lighting infrastructure facades and special environments has become a staple ingredient to making structures unique, stand out and highlight the building architectural traits (Quek Choon Keat, 2008). Commercially, lighting applications are commonly used to identify themselves and pull attention of those in the area (Schreduer & Narisada, 2004). This is complimented by the age-old tradition of lighting being used for safety and security of nocturnal activity (Boyce, 2003). A recent phenomenon over the last decade has been to use lighting technology as an attraction itself to help market a destination and create a vibrant atmosphere (DAS Studio, 2012). Even though through these three most common reasons for lighting implementation there is a need to strike a balance with the interest in natural moon light and intimacy (Mosseri, 2011).

Environmental Attributes of Perception

Visual attributes	Characteristics
Coherence	Organized into clear areas: Few distinct regions Repeating themes and unifying textures Limited number of contrasting textures
Complexity	Richness of elements: Different visual components Greater richness or variety would encourage exploration However, increase in complexity may not suggest a decrease in coherence, as long as the different groups are distinctive
Legibility	Distinctiveness Memorable components that help with orientation Legible space would allow ease in navigation
Mystery	Desire to explore a place would be enhanced if there were promise of more offerings in the visual scene Studies in people's preference for different environments showed that mystery is a particularly effective factor in making some scenes highly favored.

Table 7: Environmental Attributes of Perception, Source: Adapted from Kaplan (1998)

Furthermore, a preferred environment would not only 'enhance people's effectiveness' but also support mind and body. Such environments designed to enhance orientation could also entice exploration and a quality experience. As a result, the relationship between urban lightscapes can be extremely effective and more satisfying if the design incorporates the needs of all involved (Kaplan, 1998). For the purposes of this research, the combination of effectiveness and mind and body can be referred to as an element of 'livability' as used in the light quality framework.

Mosseri's Research: The Perception of Lighting

With the continually growing population of urban metropolitan areas around the world, the natural cycles of day and night have been skewed using lighting (Mosseri, 2011). To some environmentalists, the constant lit environment is ultimately impacting the

environment and those whom interact within it. Mosseri's primary research focused on getting a better understanding of how artificial lighting from various urban needs are inefficient that has resulted in air pollution and light pollution. Light is such a powerful tool for humanity whether from the faint glows of campfires to the millions of miles of street lamps. The evolution and necessity of lighting has transformed our social lives in both positive and negative ways (Mosseri, 2011). Mosseri acknowledges the rapid growth and abundance of lighting in urban destinations for a myriad of purposes, has resulted in a sudden demand to research lighting perceptions, practices and principles. He recognized that in order to fully understand the urban lighting and its impact, there is a need to better understand not just one particular element but instead environmental, societal and economic factors. This concept is consistent and familiar to that recommended by Veitch (2001) who developed a conceptual framework (Figure 12) to determine what is quality lighting and is used as a basis for this research. Quality lighting will be discussed near the end of the chapter.

Impacts of Poor Design, Practices and Policy

Lighting is used in urban destinations to enhance the city aesthetic and environment by highlighting architecture, roadways and water features. Based on the previous and available literature, a common result of the need for lighting develops positive and negative impacts. In relation to negative impacts, getting rid of lighting cannot be an option due to societies reliance of light to promote safety and livability (Mosseri, 2011). However, there is a recognized need to improve lighting design to minimize excessive light pollution and fixture efficiency (Schreuder & Narisada, 2004).

As lighting technology advanced, especially in the nineties, lighting availability and affordability significantly increased. These advancements ultimately have led to the demise of natural darkness in urban areas (Schreuder & Narisada, 2004). Ultimately, the negative affects of urban lighting pollution is misplaced and not a concern amongst the majority of public due to the lack of awareness from the governing authorities (Mosseri, 2011). In most cases, the negative impacts derive from ineffective development and design of urban lighting.

Environmental Impact

The negative effects of lighting pollution vary from global warming to the daily cycle of living species. According to Mosseri (2011), the United States alone contributes to thirty-eight million tons of carbon dioxide emissions a year based solely just on excessive lighting. Rightfully so, these emissions are a constantly growing concern as scientist, researchers and governments are becoming more aware and environmentally conscious. The awareness of lighting emissions has significantly been addressed in conjunction with the research on global warming over the last two decades (Mizon, 2002).

J. L. W. Brooks once said, "Your path is illuminated by the light, yet darkness lets the stars shine bright." One of the most common misconceptions with urban lighting is that more light is better, especially to the aesthetic. Such theory results in environmental issues such as glaring urban spaces that are hard on the eyes to the negative impacts lighting can have on the ecosystem and sleep patterns (Cabello, 2001; Li, 2006). In relation to animal species, research has suggested that an abundance of urban lighting has had an affect on birds, sea turtles, frogs and insects. More so then any other species, birds

have been affected the most by artificial lighting according to existing research conducted by the Fatal Light Awareness Program (FLAP, 2005). This research has suggested that more birds die from light attraction then that of a major oil or pollution spill. FLAP's research of Toronto, Canada has reported the death of over one hundred and fifty bird species in one year. Another study conducted by FLAP also suggest that one-hundred million birds died in the United States in 2010 due to the lethal combination of glass, attraction to light and disorientation. Taking consideration of artificial light and its effects on living species mean that they must adapt in urban cities and their surroundings (Mosseri, 2011).

Economic Impact of Excessive Lighting

The abundance of inefficient light fixtures, wattages and trajectories are the three main factors of wasted energy consumption and excessive carbon emissions. This lack of lighting schemes and design regulation results in high costs and waste of money (Mosseri, 2011). A 2008 study conducted in the United States suggested that the government invested $10.4 billion dollars in inefficient lighting (International Dark Sky Association, 2008).

In order to get a full understanding of how lighting consumption impacts us, there is an importance of understanding how lighting consumption is distributed amongst various sectors. According to Schreuder and Narisada, approximately 10% of the United States power consumption comes from household energy. The remaining 90% comes from public road lighting, heating and commercial use (2004). The resulting significance of non-household lighting makes it an integral area to learn how to create efficient lighting

schemes. This awareness can result in techniques that use proper wattage, throw, and fixture consumption in turn creating less emissions and energy consumption (Mosseri, 2011).

Social Impact of Excessive Lighting

Due to the abundance of artificial lighting, there is an impact on the human biological rhythms (Morresi, 2011; Philips, 2012). These biological rhythms are what humans rely on to determine "sleep patterns, vigilance, tiredness and fatigue" (Schreuder and Narisada, 2004). Secreted from the pincal gland, the hormone melatonin is responsible for regulating sleep and duration of brain activities (Pauley, 2003). Artificial lighting and the biological impacts they have on humans has been increasingly studied recently and the studies suggest the constant light suppresses the secretion of melatonin resulting in irregularities and in some forms of cancer (Harder, 2008). Accordingly, the normal process time for the human body to develop melatonin occurs between 2 and 4am. This release of hormones rests during broad daylight (Mosseri, 2011). This process however, is significantly impacted by exposure to light and will not process the secretion in light environments. This is not just important to the sleep cycle of humans but also to the psychological health of humans as it is the same hormone that regulates a balanced psychological state and produces antioxidants. Conducted studies, suggest the exposure to blue LED lighting temperatures are the worst and affect multiple bodies functions such as body temperature, hormones releases and sleep patterns (Mosseri, 2011).

Night shift employees have shown the most irregular distribution of melatonin (Mosseri, 2011). Studies, suggest that a significant larger portion of woman whom work nights are

subject to 3 to 5 times more likely to be diagnosed with breast cancer when compared to other destinations with significantly less artificial lighting exposure. This increase has also been seen in research of colorectal cancers cases as well (Mosseri, 2011).

It is important to note, that there is no direct proof that lighting creates these irregularities however, research shows a significant increase in commonalities. There is additional evidence that suggests that exposure to artificial lighting do not live as long as those whom work normal day shifts, as much as 5 years (Schreuder and Narisada, 2004). Mosseri (2011) suggests that the quality of light can only be determined through individual interpretation and scale. He suggests this is based on his analysis on how artificial lighting impacts ones perception of security within a lit environment. The traditional belief that darkness leaves us blind and helpless is also not completely true. The human eye also produces a hormone (rhodopsin) that stimulates the cells in the retina to dilate and adapt to low light environments making it easier to see. The retina in turn adapts to the environment that in turn helps one not be tired (Mosseri, 2011), a good example is when someone is driving down a low-lit highway.

Background literature suggests that lighting has positive and negative effects and the fact that lighting perception is a further issue to be explored. It can be assumed that the social needs of lighting whether actually valid or not make lighting a necessary element of nocturnal life (Mosseri, 2011). However, he also recognizes some important negative affects that need to be addressed. Through the implementation of improved design techniques and education of the impact lighting has on the environment, provided by

academia, an improvement within light efficiencies and the minimization of negative impacts can be achieved.

Improving Lighting Design in Urban Destinations

The fact lighting is part of our normal routine and our relationship with it often goes unnoticed unless there is an absence of it. This uneducated experience is why little is being done to curve the amount of lighting pollution and energy waste in lighting design (Mosseri, 2011). For many, the answer for societal improvement is to increase the amount of lighting because 'the more, the better,' but both Philips Lighting (2012) and Mosseri (2011) have recently suggested that less is more because technology and design awareness can provide the same experience in an effective way. The education of society, installation of efficient lighting schemes and implementation of regulations are three integral ways to start this societal change and understanding of lighting. As a result, an international understanding of the role of urban lighting is needed and the regulations that should be determined. Through the collaboration of all involved as suggested by Philips it will provide the best outcome and manage light quality on a global level.

Figure 8: Adapted for Lighting from McDonnell, Allen & O'Toole (1999)

McDonnell, Allen & O'Toole (1999) stated that lighting events have four types of impacts (social, economic, development and political) when they are implemented. As a result, the implementation of lighting will create secondary impacts in social, economic, development and political realms (Figure 09). Understanding and being aware of these potential impacts are important, as it will help provide context for this researchers in-depth interviews and foundation of Singapore's master lighting plans.

For destinations that have an abundance of urban lighting, there needs to be a study of the existing infrastructure and alternate options provided that can maximize objectivity while simultaneously minimizing the impacts on the environment. Many corporate office buildings for instance, have installed motion sensor lighting that allows the lighting systems to shut down when there is no activity. Mosseri (2011) suggests that this technology should be used not just in the office setting but also for streetlights and parks.

Singapore's Urban Redevelopment Authority recognizing the importance of also being a 'green' country has kept these concepts in mind and thus have implemented an educational and regulatory lighting design site for architects and planners to use while designing Singapore buildings and infrastructure (Huffman, 2013; URA, 2013). Fortunately, not only is the Singapore government educating effective lighting design techniques, they are also enforcing them through consent and enforcement from the URA departments (URA, 2013). By creating the most efficient impacts of lighting, the Urban Redevelopment Authority hopes to create lighting sustainability (Figure 10).

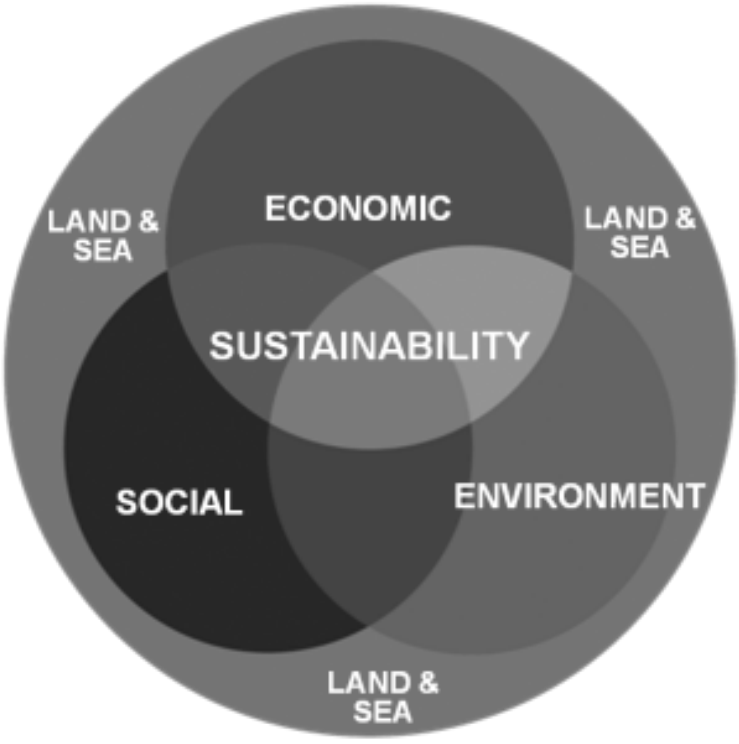

Figure 9: Lighting Sustainability Source: www.ura.gov.sg

For many years, the use of anything other then practical use lighting was not even considered because of the high costs and maintenance that was involved in the installation and maintaining process (Quek Choon Keat, 2008). However, as technology progressed in lighting, so has the ability to implement these technologies with lower maintenance expenditures. In particular, the advancement with LED's (Light Emitting Diodes) has steadily increased and has changed the stance on the importance of lighting urban areas.

Fundamentals of Lightscape Strategies & Design

Literature discussing urban lighting primarily focuses on architecture, planning, design methods and environmental impacts (Chavis & Wandersman, 1990; Mosseri, 2011;

Walker, 1977). The strategies provided discuss effective and strategic ways to illuminate urban spaces for safety and practical needs with the minimal amount of impacts. The rapid development and innovation of lighting has complimented the urban lifestyle going further into the night. However, city planners are recognizing that the aesthetic of the lighting is as important as the architecture in providing a sophisticated and memorable experience (Gaardboe, 1978). The use of lighting extending beyond practical and safety needs has seen the need for lighting designer as an independent profession. This is especially the case in the entertainment and architecture fields. These urban architectural lighting designers become responsible for the integration of urban features. “I can’t stand a naked light bulb, any more than I can a rude remark or a vulgar action.” Tennessee Williams, Street Car Named Desire, Scene 3.

Traditional lighting design theory and practice is all about light positioning and fixture type (Philips, 2013). The importance of these two factors relate to the designer’s understanding of space and atmospheric environment. In order to establish a uniform plan with city developers these decisions on fixture types and position are determined in the early planning phase (Clair, 2003). Much like lighting for film and television the importance of lighting plays a major impact on the environment and perception of those viewing it. Lighting can provide playful

Photo 8: Gardens by the Bay (2012)
Source: Andrew Potvin
Gardens by the Bay 2012

environments, festive environments and magnificent environments (Clair, 2003). Clair's film and television research into these types of illuminated environments suggest that lighting would have the same effect in personal experiences. If this is true, lighting no matter its use must have strategic plans for placement and fixture type to provide a lighting effect that compliments its environment.

This research and lighting strategy are evident in the background and current affairs of Singapore's Urban Development Authority planning. In 1994, the URA released the Civic District Lighting Plan (CDLP) as a way to create and reinforce the night identity of the Civic District, encourage nightlife and promote the architecture and parks within the area by highlighting key areas (URA, 1995: 5). Since then, the URA has developed a new lighting plan that was released in 2006, called the Urban Redevelopment Authority Light Master Plan. This lighting plan expanded on the idea of expanding the nightlife through enhanced lighting however expands the concept into newly developed and nearby districts.

Since Singapore's independence in the nineteen-sixties, the government has recognized the importance of urban renewal and place marketing. However, unlike many other destinations, Singapore avoids just copying ideas from other leaders. Singapore strives to be the best candidate to live work and play in by taking other ideas and manipulating them to be unique, effective and thematically placed by taking the ideas and making them better with a twist (Chang, 1997).

Singapore's recognition of the importance of the night has steadily increased over the last two decades and has significantly increased in importance recently, so much so that it is

one of the main areas of focus for Singapore. This has resulted in Singapore now being a global leader in strategic lighting development that is practical, aesthetically pleasing and effective by extending the normal hours of activity further into the night. The illumination of already existing infrastructure and special environments has become the newest effective way to reinvent the destination experience.

Urban Lighting in Themed Environments

The definition of themed spaces has been increasingly explored in recent decades as a way to maximize positive experiences within events and more recently urban landscapes. Throughout the research that has been published, there has been a variety of takes of what a themed space is. For example, 'themed space' is an over overarching theme that creates a holistic and integrated special organization of a consumer experience (Luka, 2007: 1). Another researcher suggests a thematic space as a 'fantasy city' that operates day and night and highly themed in a centralized ideology (Hannigan, 1998: 3). He goes on to say that these cities are often intertwined in a growing economy that has established roots in the tourism, sport, culture and entertainment sectors. Both Luka and Hannigan suggest that urban developments need commercialized elements to successfully compete on the global scale for urban leisure destinations.

The illumination of these cities can and often do attract consumers and visitors to themed areas and ‘fantasy cities’, this interest is considered the modern phenomenon of interest in visual spectacle. The theming of a landscape brings a unique and exhilarating environment for the participant to create his or her own experience. Theming is considered to provide a significant cultural, political and cognitive experience (Gottdiener, 1997). Themed areas with thematic lighting stands out, often due to the aesthetically pleasing and organized visual experience. Spaces lacking lighting at night are also being recognized as possible growing tourist destinations because it allows people to explore nature and escape from the fast paced life within city centers. As both extremes are often attractive and of interest to visitors, the importance lighting plays on the value of an experience provides a critical role.

Photo 9: Auckland Chinese Lantern Festival, 2011 Source: Andrew Potvin

Lighting Psychological Framework

Lighting impacts people internally and externally whether we acknowledge it or not. These psychological processes are complicated and involve a variety of factors that ultimately impact the perspective of ones experience within a social or organizational

context. Previous research has proven that lighting impacts one's perception on two main fronts; chemically and psychologically (Mosseri, 2011; Veitch, 2001). In addition, these processes are also impacted by a myriad of external factors as seen in Figure 11, which ultimately impact the individual outcomes. These outcomes include effectiveness of seeing, task performance, communication, social interaction, mood, health and safety and aesthetic judgment. In collaboration with lighting quality, suggesting that if all these outcome potentials are ticked as successful, the goal of lighting the ultimate tourism experience has been achieved.

Through the combination of urban redevelopment, tourist motivation and lighting strategies discussed in this literature review, a conceptual framework for this research can be derived (Figure 11). The individual outcome of lighting perception is both a psychobiological and psychological process that embodies a myriad of secondary factors of one's personal experiences and social context. It is the resulted outcome that helps develop product legacy and determinates of a tourist experience making a solid foundation of determining the ultimate lighting tourism experience.

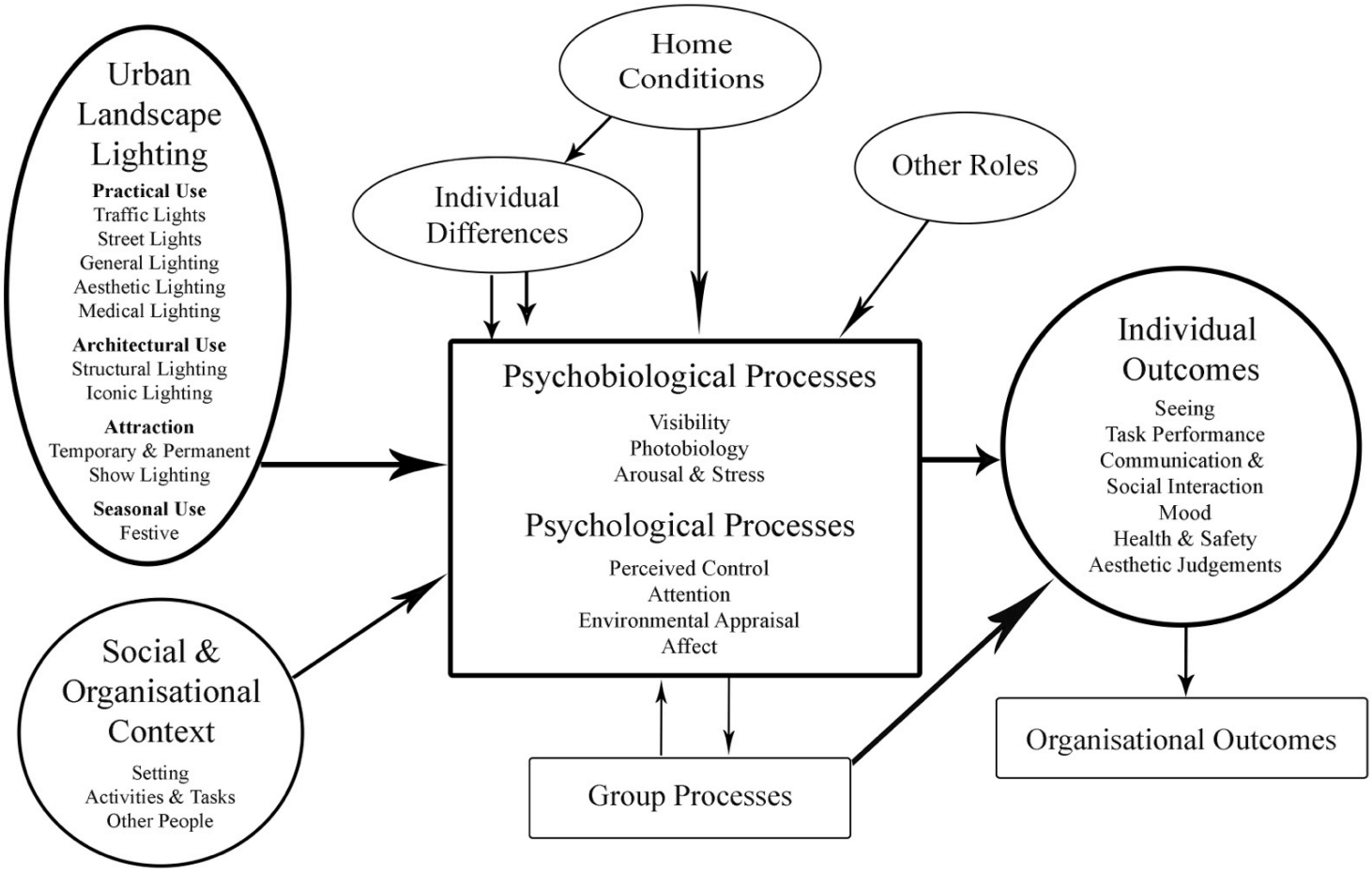

Figure 10: Psychobiological and Psychological Process. Adapted from Veitch, 2001.

Light Quality Framework

In addition to the conceptual framework of individual outcomes, the framework of quality lighting must also be explored (Figure 12). Veitch (2001) defines quality lighting as 'a lit space that supports human behavioral needs, with considerations for architectural and economical aspects of the installation.' To provide quality lighting there are three main elements to consider; economic, design and individual well being (Veitch, 2001, p.19). The light quality framework will be used in conjunction with the in depth and

short interviews conducted to verify if Singapore is providing a quality lighting experience. Light quality framework suggests that quality cannot be achieved unless all three elements (economic, individual well-being and design) are collaborative. The relationship between well-being and the economy alone provide a sustainable environment but may not meet the design aesthetic and community theming. On the other hand, individual well-being and design can provide a good 'consumer-product' relationship however may not be sustainable or environmentally friendly. Lighting that is designed with the economy and design in mind is effective and efficient however may not meet the needs of locals and tourists on an individual level. This framework will ensure that Singapore lightscapes are impacting individual wellbeing in the most efficient way. However, lighting quality does not equal a perfect outcome, as the individual's experience also plays a role in one's perception.

Lighting of nightscapes has been explored, however the research is focused primarily on the practical and literal needs it provides. The research neglects and often does not mention the role the lighting has on those whom experience it which arguably can be just as important to the future development and livability of cities (Griffiths, 1995; Malbon, 1998, Scraton and Watson, 1998). Thus, there is a need to examine the role of lighting and the impact it has on the individual spatial experience. Singapore's urban districts provide locations of interest to conduct field research with individuals in thought out and planned lighting placement. The results will provide a critical reading of illuminated urban landscapes within the Asian metropolis and potentially be of use to other cities interested in moving forward with urban lighting enhancements.

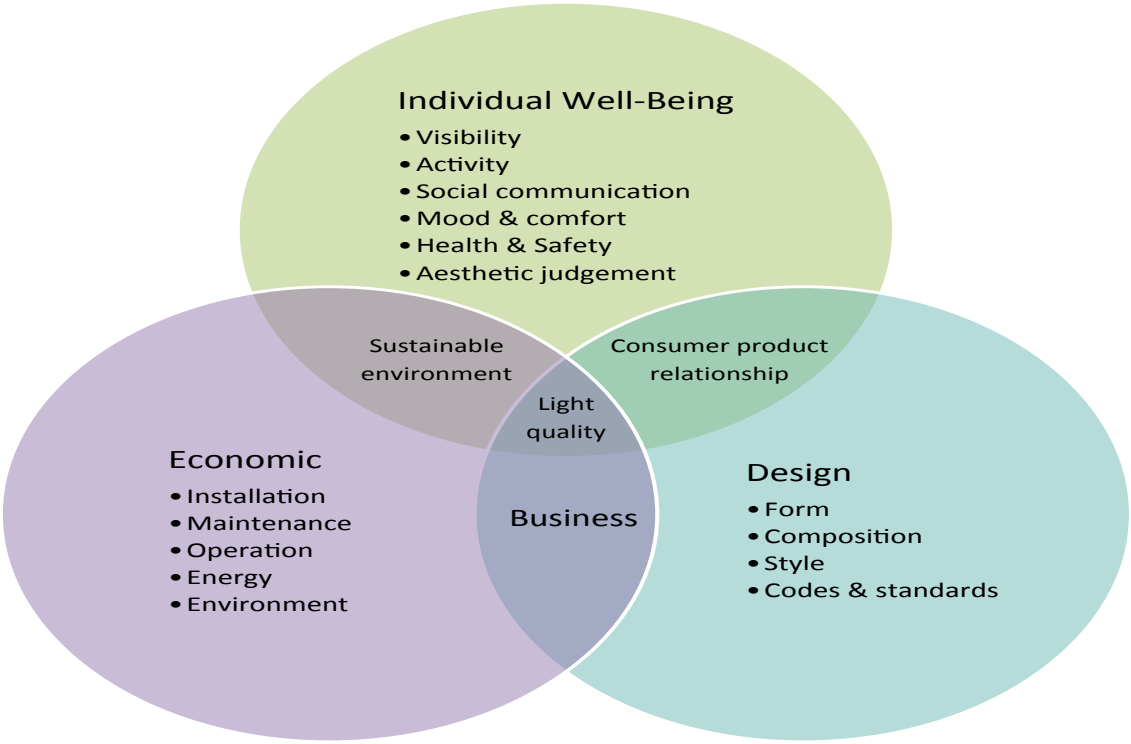

Figure 11: Elements of Lighting Quality. Adapted from Lighting Quality, Veitch, 2011.

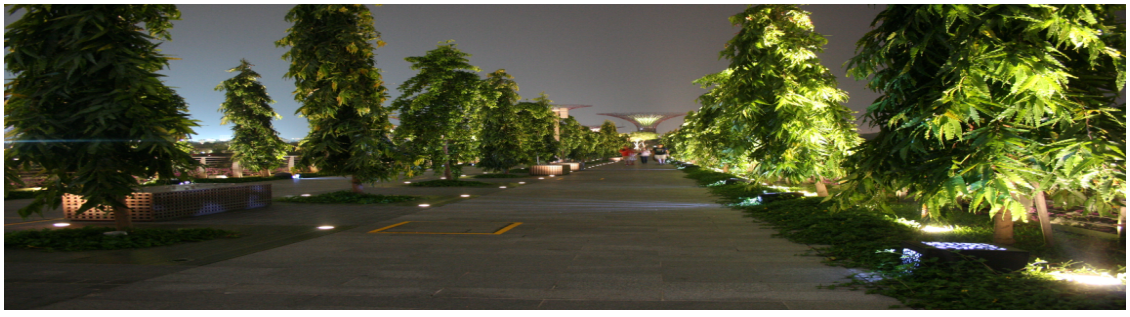

Photo 10: Gardens by the Bay Entrance, 2012. Source: Andrew Potvin

Summation

This chapter has provided a literature review of urban tourism and redevelopment, facets of urban lighting and tourist's motivations. The literature on urban tourism suggests urban redevelopment is a continuous cycle needed to maintain tourism interest. Lighting impacts of human perception is often a subconscious phenomenon and impacts ones experience both psychobiology and physiology.

This chapter has provided a contextual background and highlighted contributing key conceptual frameworks to be used in this research. Ultimately, the research is looking to understand the relationship between urban lighting and the tourists whom experience it. Therefore, the psychological and psychobiological processes in conjunction with 'lighting quality' will help create an ultimate tourism experience that is practical for locals as well as being internationally attractive and efficient for everyone. The next chapter will take into consideration the background and history of Singapore to establish the foundation for the background of this research and develop an understanding of how Singapore became the destination marketed today.

CHAPTER FOUR:

The Evolution of Singapore

Urban tourism destinations have been looking at ways to enhance the nightlife experience and improve destination marketing (Holcomb, 1994). Singapore stands out as a leader, constantly innovating, pushing the boundaries and implementing lightscape projects that impact the tourism industry. Singapore's vast array of events and constant renewal projects often include large lighting initiatives that continually make the nightlife experience a unique and refreshing one (Hui, Wan & Ho, 2007).

In order to understand the tourism experience of Singapore, it is important to determine how Singapore has become the destination it is today. Singapore was not always the thriving international destination for economic, art, entertainment, tourism and infrastructure as it is today (Turnbull, 2005). It is fair to suggest, that Singapore three decades ago would not be considered the vibrant, world-class destination it is today. In order to understand the Singapore of today, it is important to understand how Singapore became the westernized Asian destination it is. When looking on a map, Singapore is merely a small dot on the tip of a peninsula predominantly occupied by Malaysia; geographically, Singapore is only 699-sq km and surrounded by water. So, how did this small island survive through depressions and world wars to become one of the most successful and competitive markets in the world?

Singapore's History

The successes of Singapore as a 21st-century hub for global growth go back to the East-West trading days between merchants and sailors (Insight, 2005). Singapore's reputation started from its prime location between the East and West trading destinations (InSight, 2006). Malays, Greeks, Romans, Indians and the Chinese all used the area for early trading as early as the 5th century (National Museum of Singapore, 2012). Through the advancement in marine geography maps, the Strait of Mallaca became a well-known trade route and point of contact between the East and West trade ships (Oakley & Brown, 1991). However, traveling in these waters did not come without dangers. Not only were the waters known for 'sea monsters' and strong tides, but there were pirates who would attempt to raid and steal the goods coming into port (Insight Guide, 2006).

In the 14th century, Singapore was known as 'Temasek' and was formally founded in 1390 by the Palembang ruler Paramewara (InSight, 2006). For much of the next four hundred years there was no stable leader or authority due to the small number of residential inhabitants and dense jungle with very little infrastructure (Unger, 1997). The instability of power remained until January 29th, 1819 when Sir Thomas Stamford Raffles of England re-founded Singapore (URA, 2014).

When Sir Raffles arrived to Singapore along the river, he found a lone village with approximately 100 Malay huts and a few nomadic families further upriver (Cangi, 1993; InSight, 2006) led by the Malay chief, Temengong. The land itself was owned by the Sultan of Johor, however Johor did not leave a clear heir to the throne, because his only

sons were that of commoners and not royalty (Trocki, 2007). This left the youngest son from a commoner in charge upon Johor's death, however he was not considered a true heir to the land among the tribe (Low, 1974). In conjunction with the vulnerability of land ownership, Sir Raffles recognized the potential for Singapore to be a prime trading post location due to its access from both the East and West (Huff, 1997). Subsequently, on February 6th, 1819 Raffles signed a treaty with Temenggong and the new Johor to establish a new trading office in Singapore in exchange for Spanish money (Turnbull, 1969).

When Sir Raffles departed Singapore, he left the island's first Western resident Major Farquhar in charge and to retain control of the land (Insight Guide, 2006). While Raffles was away, Major Farquhar began to clear forest for space, constructed buildings and dealt with a rodent problem making the destination livable (Meng, 2004). Within a year, the population increased to about thousand people as traders and merchants from China and the Middle East saw its value as a trading post (Saw, 2012).

Three years later in 1822, Raffles returned dissatisfied with Major Farquhar's progress with infrastructure and provided a detailed plan for the continued development of Singapore under Lt. Jackson (Pearson, 1969). As the popularity of the trading post increased, Sir Raffles paid off Johor and the Temenggong for full control of parts of the land (Wake, 1975). Unfortunately, Raffles passed away in 1823 leaving Singapore under the Indian colonial government and the representative became John Crawford (Insight Guide, 2006). Singapore's population grew significantly again reaching 11, 000 in 1824

(Saw, 2012). It was under Crawford's control that trading began to make significant money for the British (Insight Guide, 2006).

Throughout the remaining 18th century, Singapore became a well-known trading post and developed as an emerging township with the building of three banks and houses of worship (Turnbull, 2009). In 1867, the settlements amongst the Singapore Strait went under direct control of the British Crown and a governor was appointed (Lee, 1991). The government transition provided the difference in securing the strait as a major trading post that is vital to the trade route, resulting in Singapore becoming the 7th largest trade port in 1903 (Müller, 1997).

Immigrants from various countries coming to Singapore made a melting pot of cultures (Insight Guide, 2006). In 1911, Singapore was home to 312,000 people including 48 races, and 54 languages (Saw, 2012). The construction of the airport in the 1930's was seen as the final step in making Singapore a modernized destination. However, World War Two soon put a halt to the British colonial rein (History Learning, 2014).
During World War Two, Singapore became a main post for military in the South-East Asia region (Insight Guide, 2006). However, the defense of the colony was not efficient in covering the whole perimeter of the island making it possible for the Japanese to take over the colony on the same day as the Pearl Harbor attack on December 8th, 1941 (Allen, 2013). For just over three years, the Japanese occupied Singapore renaming the land 'Syonan' (Light of the South) and imprisoned or exiled many (Lee, 2005). During this

time, the economy deteriorated and there was a lack of food due to no trade and unsuitable farmland (Insight Guide, 2006).

On August 21st, 1945 the Japanese surrendered allowing the British to return to the colony, however this came with resistance from the remaining locals (Gopinathan, 2008). The communist rule from the Chinese occupation rubbed off on locals now determined that they could govern themselves without British presence (Insight Guide, 2006). For the next fifteen years, the English tried to work with the locals to create a democratic system however, were slowly being pushed out. Lee Kuan Yew of the People's Action Party (PAP) became Singapore's' first Prime Minister and main visionary of developing the 'modern' Singapore destination it is today (Yew, 2000). His leadership and the building of racial and cultural tensions led to Singapore's Independence on August 9th, 1965 from British control (Clammer, 1998) and formally joined the United Nations a month later (Insight Guide, 2006). Lee Kuan Yew held the post of Prime Minister all the way through to 1990 (McCarthy, 1999).

However, the separation and Independence of Singapore was more of a worry than a celebration for many locals (Turnbull, 2005). With the exiting of Britain's military base, Singapore was facing some serious economic and self-defense concerns (Hill, 2013). In response, Singapore introduced a compulsory two-year national service for all 18 year olds resulting in one of the strongest and sophisticated fighting forces today (National Service, 2014).

Economically in the mid 1960's, Singapore had high unemployment rates, inadequate housing and no natural resources to export (Huff, 1995). The melting pot of ethnicities in the population was also seen by some as an impossible way to create a cohesive nation (Chang, 1997). However, Lee Kuan Yew saw it as an opportunity to develop a multinational country that could offer political stability, cheap labor and prime location for international corporations and investors (Huff, 1995). The new strategic vision ignited the execution of careful, long term planning development to establish Singapore as a successful international destination.

Through the second half of the 60's and throughout the 70's, Singapore provided a prime location for electronic giants Sony and Matsushita to build their headquarters. This corporate move developed other interest for high-level companies to develop products using cheap labor in a prime location for trade and commerce (Hui, 1997; Lim, 1997). The development of such industry paved way for the need and building of knowledge and research facilities. Soon, Singapore became a place for innovation and manufacturing for all of Southeast Asia competing with Beijing, Hong Kong and Tokyo (Tsao, 1985).

However, in the early nineties Singapore's success from tech corporations was imitated by other destinations throughout Asia resulting in the need for a refreshed economy (Insight Guide, 2006). Ultimately, Singapore government officials and the Urban Redevelopment Authority realized they were going to have to look for something new in order to sustain economic growth (Khan, Phang & Toh, 1996). As a result, Singapore focused its plan on becoming a world-class technology center and a financial hub luring

banks and IT companies to bring their headquarters to Singapore. Attracting financial institutions to build their headquarters in the CBD of Singapore provided a sense of financial and economic security through new job opportunities and revenue streams (Kui, 1998). The economic stability of Singapore was integral to the success of the Urban Redevelopment Authority goals to become a destination to live, work and play in (URA, 2014).

In the early 1990's, as Singapore increased in international popularity and recognition as an emerging first world country, the tourism industry was identified as a major potential source of income (Teo & Chang, 2000). Lee Kuan Yew's vision of a place to explore, exchange and experience not only increased tourism statistics but also coincided with his vision of Singapore becoming the most livable destination in the world (URA, 2014). In conjunction with the development of mega entertainment complexes, Marina Bay Sands Resort, Sentosa Island and local cultural districts, Singapore has become one of the leading tourism destinations in the world (URA, 2014).

Government & the Urban Redevelopment Authority

"To heighten the imageability of the urban environment is to facilitate its visual identification and structuring. The elements isolated above paths, edges, streets and regions are the building blocks in the process of making fun, differentiated structures at the urban scale." (Lynch, 1960, p.95)

A city's nocturnal vibrancy, aesthetic, character and even functionality rely heavily on light, without it, the character of a destination could be lost during the night (Quek Choon Keat, 2008). Today, some destinations install lighting with only the practical use of lighting in mind so that day activities can carry over safely into the night hours.

Singapore's commissioning of the Urban Redevelopment Authorities 'Civic District Lighting Plan of 1994,' suggested that 'lighting can contribute to building up an image of Singapore as a vibrant night city – an image that is lasting for visitors and a source of pride for its people' (URA, 1995: 3).

Since then, Singapore's lighting initiatives have expanded country wide from the 1994 plan, which only focused on the Civic District. The most recent lighting plan is the 'Lighting Master Plan of 2006' which was also created and enforced by the URA (URA Lighting, 2014). The Lighting Master Plan of 2006 includes four major districts and established Singapore as a global leader through its efficient and innovative lighting techniques. The goal of the plan is to create a 'beautiful tropical metropolis' that would 'attract visitors to enjoy the most magical moments at night' (Ministry of State for National Development, 2006: 8). Now almost eight years on, Singapore's goals and relevance to lighting strategies are still prevalent as a way to keep Singapore a fascinating place to experience, resulting in an attractive and vibrant global destination (URA, 2014).

The Urban Redevelopment Authorities focus on lighting is designed for the needs of the people of Singapore but is also important to the economy and livability of the city. Singapore's hope of becoming a 24/7 city-state needs lighting to help stimulate activity in business districts. The lighting strategies help gear people to areas of interest that the government and STB want people to be attracted too, potentially avoiding less appealing areas. Additional lighting plan goals of the government include making the people within Singapore feel safe, secure and vibrant throughout the night. The lighting planning also

takes into consideration the aesthetic of the city structure and how lighting can help define order and structure.

The latest lighting plans focus on Singapore River Districts, Marina Bay, Chinatown and light attractions with the main hope of contributing to the overall night experience of Singapore for its locals, visitors and tourists by creating a unique signature experience that will be lasting and talked about. There is also collaboration with festive night events and local attractions to stimulate night traffic and experiences.

Singapore looks to achieve these goals by creating individual plans for each district or event throughout the city that will allow the lighting implementation to not only benefit its direct environment but will also flow with the surrounding environment. These lighting goals can be achieved by controlling the amount of lighting and the colors used in each project and allowing for consistency that is fair and innovative.

The Urban Redevelopment Authority (URA) in recent years has worked in collaboration with the Singapore Tourism Board (STB) to provide an experience that not only pertains to the cities livability but also the tourism industry and marketing strategies (STB1, 2014). The feedback the government would like to receive from the tourists is very much the same as those of event organizers; they want to create an experience that is unforgettable and often referred to as the ‘wow experience’ (Gram, 2005). The ‘wow experience’ can be achieved through a myriad of ways and is usually reliant on sensory experiences (Rumsey, 2006). By creating an experience that instills a lasting impression and provides

a unique experience can encourage positive word of mouth. Much like event organizers, the goal is to provide not only a one-time experience but to provide an experience that will build anticipation and interest for the future events (McDonnell, Allen & O'Toole, 1999). This interest provides hype that ultimately becomes an important and necessary element to the success of the product and brand (Ranaweera & Prabhu, 2003). Creating a lasting experience for tourists provides a foundation for a sensory experience that can stimulate and enhance the overall experience of Singapore as a product and branding.

URA Evaluation Cycle

Urban development strategies in relation to lighting cannot by fully understood without a good understanding of how all the elements involved interrelate. As seen in Figure 10, Singapore uses a system of teamwork and feedback that helps provide the most effective lighting strategies that are not only practically effective but are also thematically enjoyed.

Singapore achieves this but having a government body that oversees all urban planning and development initiatives, called the Urban Redevelopment Authority (URA). The URA is responsible for creating, managing and enforcing the city-states Master Plans, regulations and incentives. The latest URA lighting scheme was released in 2006 and is known as the Lighting Master Plan of 2006. With the URA's function now as an oversight committee of the plan, the control of the overall image of Singapore can be strategically planned and controlled. However, it is important to recognize that the Singapore lighting scheme is not solely reliant on the government ministry but is also heavily reliant on the private sector. This allows the goals of the government to coincide

with the needs of the private sector that help fund the plans integration and the public who experience it.

The URA is also is conscious of the needs and opinions of the locals within these redeveloped lighting areas. In this respect, the URA and other Singapore ministries are constantly using feedback from locals, tourists and the private sector to ensure that Singapore can become the vibrant, livable city that is attractive and efficient for all parties involved. Singapore stays fresh and sustainable through a constant evaluation cycle (Figure 10) and the innovation of new eco technologies.

Like in business, customer satisfaction and involvement is integral to the success of any business or government plan. Since the Singapore government have the final say in the development, it is important that they listen and take into consideration the feedback from the other sectors. This not only allows them to find the practical effectiveness of the implementation but also see if there are any elements that may have been overlooked and need to be addressed.

This collective framework of urban redevelopment strategies is a continual cycle that allows for improvement and adaptability, with the potential of making Singapore closer to becoming a globally unique, practical and effective place to live, work and play in. The result of this cooperation ideally provides illuminated nightscapes that meet the needs and satisfaction of all those involved (Figure 13, next page).

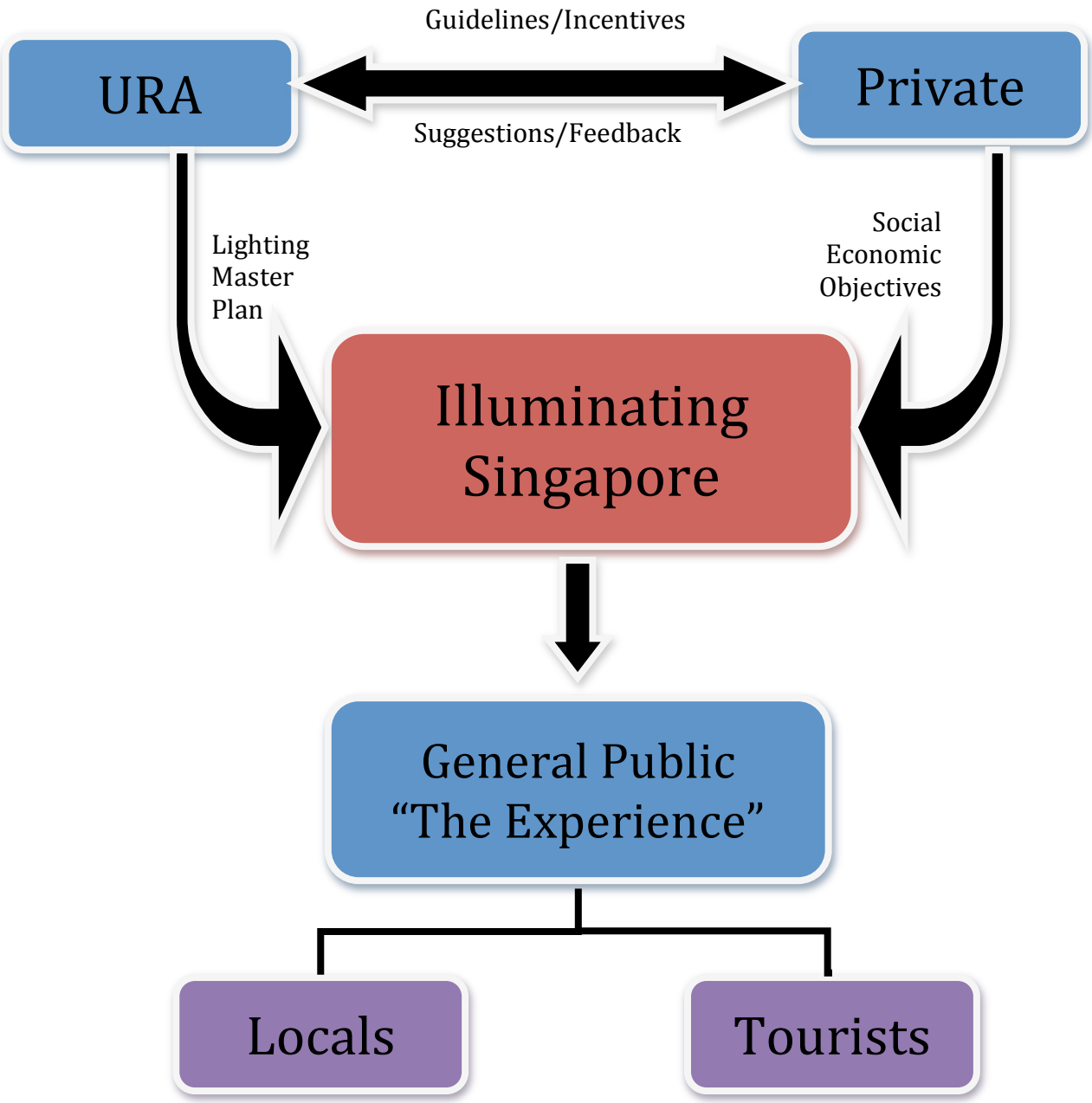

Figure 12: Framework of URA Evaluation Cycle. Source: Quek Choon Keat, 2008.

Singapore Skyline and Marina Bay

The Singapore skyline and Marina Bay area as it is today was a completely different scene thirty years ago. The establishment of the URA and their lighting plans provided a strategic plan to make Singapore's image one of business power and success. However, the URA also wanted the skyline to create a 24/7 environment that would stimulate increased economic benefits and enhance the city night experience. In order for Singapore to achieve these goals, they have learned that a long-term strategic plan must be in place to provide a coherent and structured illumination of the city skyline and infrastructure. The guidelines in these plans include various lighting design elements from intensity, color, positioning, and fixture type.

The analysis of each lighting project and how it would impact not only the direct area but also the surrounding environment provides illumination that is beneficial to all parties involved and promotes a visually clean and structured aesthetic that follows the reputation Singapore strives for while simultaneously promotes Singapore as a fun, vibrant and successful destination.

The intense planning and approval process is not only used for aesthetics but also for practical lighting. One of Singapore's lighting guidelines stipulates the importance and need to use lighting as a way to establish well-defined streets, junctions and borders. The lighting layout achieves this goal by providing efficient and professional focus of white lighting around streets and thoroughfares. This brings definition and contrast to the overall image of Singapore skyline enhancing the accessibility and identity of main

routes. The strategically located Marina Bay Sands Resort was designed and implemented with the goal of becoming Singapore's "sparkling jewel" that symbolizes the 24/7 destination to live, work and play that the Singapore government has been striving for. The resort frames the city and provides fluid contrast to the rest of the skyline. The lighting for the three-towered building was designed to enhance the architectural accents that are unique and integral to its design aesthetic. The design collaboration with the URA provided input from all parties including the investors, private sector, the public and other government ministries to make sure the project would return benefits to all parties.

Photo removed for copyright

Photo 11: Marina Bay Skyline Source: Singapore Wikipedia, 2014

The building also took steps to recognize the importance of green and eco-friendly technology. They achieved this by capping the three towers off with what is referred to as the sky garden, which offers 360-degree panoramic views of the Singapore's urban landscape and the reliance of natural light during the day to illuminate its main thoroughfares. Overall, this unique and innovative addition provides a platform to be illuminated at night in thematic colors and even sets the stage for their nightly light show, 'Wonderful'. More information on this will be brought up in the coming chapters.

Singapore River Front (Clarke Quay)

With a majority of the major urban areas being developed on reclaimed land it was important to use the waterfront as entertainment and recreational points of interest. During the day providing a cooler environment to relax and escape the hustle and bustle of the business district and hot day temperatures. Taking into consideration the geographical weather patterns of Singapore lying on the earth's equator with typically humid and warm temperatures the URA saw the waterfront as an opportunity to create an environment that would stimulate a buzzing atmosphere and be the magic of the night with downtown Singapore.

Photo removed for copyright

Photo 12: Clarke Quay Lighting. Source: Tripadvisor.com, 20014

Singapore urban planners and third party lighting companies looked to achieve this goal by designing and installing lights that are colorful, playful and welcoming. Singapore also looked to improve and install lighting in underpasses, bridges, boats, landing points and key infrastructure. This transformation hopes to convert the area into a lively and active location and provide an attractive and livable urban environment.

Cultural Lighting (Chinatown)

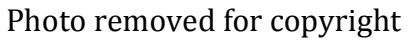

Photo 13: Chinatown Mid-Autumn Lantern Festival, 2014 Source: Festivalasia.com

In collaboration with district management, the URA and the Singapore Tourism Board see lighting of cultural events as a way to enhance the experience and improve interest in visiting the area while stimulating the economy. The introduction of lighting into these areas brings additional thematic elements and attention to the event ultimately becoming part of the attraction itself.

One of Singapore's biggest districts is Chinatown. This district is sponsored and organized by the Chinese Heritage Society and works closely with the Singapore Tourism Board. The lighting schemes for this area serve two purposes, first to enhance the cultural value of the environment while providing practical and safe illuminated pathways and secondly, creating a lively vibrant destination for commercial activity.

The Chinatown district looks dramatically different at various times of the day. Whilst in Singapore conducting field research the opportunity to observe tourists on Pagoda Street

in the center of Chinatown and the Lantern Festival provided an interesting perspective on peek hours. From the early morning until about 10am, the streets were deserted, empty of people but often full of roaming cockroaches. At 11:00am, the traditional Chinese street vendors begin to set up and the day tourists have a look around. However, the magic truly occurs at night when the Chinese lanterns are turned on. When the lanterns are lit, the Chinese market area suddenly becomes a busy and energetic attraction. In an interview conducted in 2008 with Quek Choon Keat about Chinatown's night experience Jennifer Lee stated, "When the lights come on, the whole place seems to come alive" (Quek Choon Keat, 2008).

Festival and Event Lighting

In recent years, Singapore's focus on urban design has provided an opportunity to use the environment and infrastructure lighting to support the branding of the nation. For instance, Singapore hosted the first ever nighttime Grand Prix, where state of the art lighting technology was used to make the course as bright as the day. This lighting provides practical use and brings interest to the area through its international televised broadcasting.

"Color is like food for the spirit… Plus, it's not addictive or fattening." Isaac Mizrahi

The Singapore government and the Urban Redevelopment Authority could not achieve the proposed lighting plans without the cooperation and support from the private sector. This sector is integral to the overall vision that Singapore will be a worldwide leader in providing a vibrant destination to live work and play in. Without private sector business,

the government would be primarily self-reliant on achieving urban planning with few infrastructures needed for external business ventures. The private sector provides jobs, infrastructure, funding for local projects and stimulates the economy. Often these private sector partners also work with the community to sponsor events and festivities that ultimately impact the destination experience.

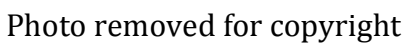

Photo 14: iLight Festival, 2013. Source: Nbcnews.com

When the Urban Redevelopment Authority created the Light Master Plan of 2006, they knew that they were going to need support from the private sector to help finance, execute and provide a platform for the new lighting schemes to take place. The private sector's collaboration with the Singapore Tourism Board and URA occur within three specific areas, the CBD skyline, local events and cultural districts. All of which provide unique and varied lighting experiences that impact the destinations aesthetic.

The following will analyze the lighting schemes offered to the private sector and the three main areas that the private sector plays a part in the implementation of lighting schemes within of Singapore. It is important to understand the basis and background of the urban lighting schemes before analyzing the data of the public in order to effectively comprehend the role lighting has on society.

Lighting Concepts for CBD / Marina Bay Lighting

The Singapore skyline by day in the mid-nineties provided a fresh and upcoming signature city. However, at night the city skyline seemed to go unnoticed and unrecognizable. In order to change this, the URA provided some concept goals to make it a signature city at night as well. The overall goal of the area is to use lighting to enhance and promote Singapore's identifiable skyline and its features of being a tropical and green city. By implementing key conceptual goals, the overall goal can be achieved; ("Updates to the lighting incentive scheme," 2013).

- Use light colors such as white and blue to temper the hot Singapore climate
- Establish natural day shadows through the use of lighting, mimicking day activity
- Providing a variety of methods to provide a visually pleasing and unique experience
- Highlight and enhance areas of greenery and water to promote the tropical environment
- Use white lighting on low levels of the main streets of the CBD to enhance areas energy
- Bring out the city skyline and enhance the building crowns, facades and main architectural features
- Balance between light and shadow
- Prevent light trespass and spill
- Use lighting that showcases Singapore's multicultural diversity

Lighting Schemes

The collaboration between the private sector and the URA is integral to the success of specifically the Central Business District and Marina Bay area. The area is the prime district to showcase the cities unique skyline, infrastructure and entertainment. Fortunately for all involved, Singapore as we know it today is relatively new. The fact that many of the buildings and areas were being built and planned throughout the duration of the planning of the Lighting Master Plan allowed for elements to be thought out and supportive in the overall aesthetic. The facilitation and realization of the plan needed to go beyond just the government's vision but also to the companies and executives who were financing the buildings themselves. Minister of National Development, Mr. Mah Bow Tan released a plan to make the bay area sparkle and looked to government authorities to find ways to entice businesses to consider the nighttime aesthetic of their company. In return, the Urban Redevelopment Authority simultaneously introduced lighting incentives in 2006 to persuade building owners to enhance or initiate lighting into the infrastructure plans.

Lighting is like make up. Lighting is essentially a nocturnal makeup that can be used to bring attention to areas of interest and turn potential eyesores into works of art. Lighting can create a unique and memorable experience in turn increasing its appeal bringing energy to a destination and make people feel safe. Singapore's focus on lighting helps create a signature "Poster City" at night that is vibrant and attractive.

These impacts of lighting have been talked about before specifically within the developers and infrastructure industry. However, there has been little research on whether these goals are actually translated into the visitor's experience. The importance of lighting to architects will be discussed in a further chapter.

Lighting Incentives

The ability to encourage and organize more building owners to invest in quality and strategic building lighting was obtained through the creation of lighting incentives proposed by the Urban Redevelopment Authority. The main incentive to the private sector CBD owners is what the URA called the Gross Floor Area (GFA) incentive. This incentive offered new developments and renovation projects up to two percent additional GFA over the original maximum GFA stipulated in the Master Plan of 2003 under the provision of enhanced and cooperative enhanced building lighting. The additional GFA is calculated based on the value amount of the lighting installed.

The second lighting incentive provided by the URA is the Cash Grant. The Cash Grant was established for existing building owners who did not have plans to renovate however, did have an interest in enhancing the building lighting strategies. This incentive allowed owners to apply for a cash grant that would cover up to fifty percent of the cost for the lighting installation. This incentive however did carry a maximum grant of $500,000 or 2% of the GFA.

To support this incentive the government put aside $10 million in funds to be distributed over five years. The owners of the buildings then submit lighting proposals to the URA that are then considered for quality lighting and its contribution to the skyline. The URA also looked at proposals that were energy aware and easily maintainable.

Local Events

Singapore events are abundant throughout the year thanks to its warm climate and 24 hour atmosphere. It is rare to have a weekend without an event somewhere in the main hub districts. However, the role the private sector has had on these events has helped them become bigger, better and more identifiable. Recently, Singapore has established a few events that are reliant of lighting and multimedia. These events would not be possible without the sponsorship support of the private sector.

One of the most promising urban light events within Singapore is the iLight festival within Marina Bay that coincides with the International Earth Hour (iLight, 2014). The iLight festival is an annual light art festival that is presented by the Urban Redevelopment Authority and organized by Smart Light Singapore. The festival promotes, educates and showcases light installations that are energy efficient and interactive. In order to make the festival engaging, the events include guided walks of urban lighting, night picnics, lantern workshops, night parades, light education symposiums and the presentation of upcoming urban initiatives (iLight, 2014). The event has put Singapore in international media for their forward thinking and sustainability initiatives (URA Media, 2014).

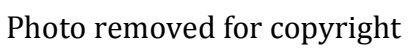

Photo 15: iLight Festival – 2, 2013 at Marina Bay. Source: www.finecomposition.com

Cultural Festivals

While in Singapore to conduct field research, the Deepavali Festival was beginning and the area that it took place in was completely transformed with thematic lighting specifically for the festival. Also known as the "festival of light," this has become much more then the cultural foundation of its spiritual significance. The internationally recognized event immerses attendees through a visually stunning illuminated landscape. This mysterious and attractive environment brings individuals to the festival, which have no interest in the cultural significance of the festival but rather by the sheer interest in the lights. This phenomenon has provided context for the private sector to promote their culture, stimulate the local business economy and create an identifiable brand experience.

Understanding the role of urban lighting, the Little India Shopkeepers and Heritage Society offer commercial tours specifically designed around urban lighting.

Photo 16: Singapore's Lantern Festival Source: Littledayout.com (2014)

During the duration of this research, Chinatown was celebrating the Lantern Festival. Traditional lanterns are pivotal to the central celebration as Chinatown's marketplace is transformed with hundreds of lantern decorations (Lantern Fest, 2014). The lanterns theme change every year in correlation with the Chinese year theme. These celebrations of Chinese culture are not limited to the boundaries of Chinatown and often can be found throughout Singapore in malls and food courts. The 2013 celebrations included over 20,000 multi-colored lanterns, which transformed parts of Singapore into a bustling, cultural and engaging environment (Little Day Out, 2014).

Summation

The goal of becoming a destination to 'Live, Work and Play' in Singapore's growth from a country with little infrastructure to a first world infrastructure and financial center has been achieved through thorough planning, incentives and cooperation between the government, the private sector and ultimately the public. Through government agencies like the Urban Redevelopment Authority, Singapore will be consistently looking for ways to market themselves as a global tourism destination that could ultimately inspire people to live, work and play. All of which, stimulate the economy.

CHAPTER FIVE

Illuminating the Impact of Urban Light

The results chapter will address the research findings of those interviewed that experienced one or more urban-lit pre-determined areas; Marina Bay, Clarke Quay, China Town and the downtown Skyline. Divided into four parts, part one will present the results from the in-depth interviews with those who implement and design urban lightscapes. These results will be presented as individual interviews as they each focus on a different element of urban design planning and management. Part two will present demographic results of the short interview participants as suggested by Marshall and Rossman's (2010) effective qualitative research. Part three will present the short interview findings from tourists and will present common themes from the 104 short interviews. Part four will present research findings from conducted secondary and field research.

Photo 17: Gardens by the Bay Walkway (2012). Photo by Andrew Potvin

Photo removed for copyright

Photo 17A: URA Landscape Model Source: ausbt.com.au (2014)

In depth Interview Results

In depth interview results are presented independent from each other as each interviewee has a specific design or management specialty. The in depth interview respondents had/have specific knowledge or experience with Singapore's urban design and are from prominent organizations (Table 08). The results from the in depth interviews were used to verify the findings found in the secondary research and were synthesized to refine the questions with the tourists.

Company/Organization	Position
Singapore Government Urban Redevelopment Authority	Managing Director
Philips Lighting	Executive / Designer
Eight Inc.	Spatial Designer
Marina Bay Sands Resort	Developer & Manager

Table 08: In-depth Interview Company and Position

An Interview with a Director from the Urban Redevelopment Authority

It is integral to the research quality, to get the perspective of the major organizations that are involved with the design and implementation of lighting projects throughout Singapore. When is comes to urban design and social landscapes, there is no organization more important within Singapore than the Urban Redevelopment Authority. Fortunately, the Director of the Urban Redevelopment Authority who has first hand knowledge in the implementation of Singapore's urban design over the last decade was available for an interview. He asked to be anonymous in his contribution to this research.

This individual has the final sign off on all city center designs to ensure that they meet the guidelines and regulations enforced by the Urban Redevelopment Authority. He and his colleagues are also involved in the negotiating with the private sector to make allocated square footage deals and building incentives. The URA has developed a twenty-year plan that is reviewed every ten years. This strategic plan organizes plot allocation by size and the type of development that can happen on the land. This long-term planning provides well thought out designs that are not only beneficial to the specific building or plot but also the environmental aesthetic surrounding it.

The official mentioned how lucky Singapore is because much of the development over the last few years has occurred on reclaimed land that allowed them to do what they wanted with it and not have to worry about pre existing infrastructure. This was acknowledged as a major benefit that Singapore has over its other competitors, in the race to be the world's leading tourism destination.

In discussion of how the Lighting Master Plan of 2006 started, he provided historical context on the importance of lighting within the URA. During the 70's and 80's when the URA was starting to quickly developed, the interests of the URA were more about the physical developments and not so much about lighting and the night experience. It wasn't until the late 1980's and early 1990's that the URA began to focus on specifically developed lighting plans. The result was Singapore's first official light plan, the "Lighting Master Plan of 1994." Since then the lighting plan has been updated, modified and shifted according to the needs of the public and the experience that the Singapore government would like to sell. Originally, the lighting plan focused on enhancing the public spaces like parks and boardwalks. Since then, the lighting plan has continued its focus on public spaces but has also expanded to building facades and urban districts. One example of this was the 'Singapore River Experience.' This precinct was an area of focus in the late 1990s in conjunction with the Singapore Tourism Board to be developed into a commercial tourism hotspot.

In order to ensure a quality lighting product and visual experience, the URA studied other comparable cities such as Sydney and Hong Kong to learn from their mistakes and make an improved lighting experience. Such research of other destinations and the use of such self-diagnostic techniques as SWOT (Strength, Weakness, Opportunity, Threats) allowed all elements to be micromanaged and planned. The director went on to explain how everything from the type of plants and trees chosen, the color schemes, building height, the utility belt, the lighting and scents are preplanned in such newly developed areas such

as Marina Bay. This control allows for the elements of one's experience within the district to be themed and provide a well received public space that is complimentary with each other.

During the development of the Marina Bay area, they knew that the space was going to be important not just to tourists but also to the locals. Considering this, the use of the public space and the importance of lighting within the night was an area of specific focus during the planning process. In order to ensure a well designed public space, the URA engaged a lighting consultant to help take a look at how the existing CBD is lit and how the new areas can compliment each other and enhance the beauty of the bay area and leave an impression for those whom experience it first hand.

Indirectly, this focus on lighting and the relationship to urban architecture and public spaces indirectly provided a foundation and an image that enhanced international branding and provided a 'vibrant' unique skyline. The director acknowledged that the lighting has had impacts on the Singapore experience beyond the locals and local businesses however, when it was first designed the aims were to create a space where people can exchange ideas, explore and experience. Now, the lighting has provided the ability to enhance and support the Marina Bay events, attractions as well as the nightly experience. Due to this, lighting has continued to be an important area of interest within the development of Singapore.

The fact that urban lighting has been used for multiple uses has separated the lighting requirements and type of lighting into two different categories, festive and standard lighting. The festive lighting can be themed and can be controlled/collaborated in conjunction with the event. This lighting however, is not always on and is often used only in special events such as the National Day Parade.

In recent guidelines, all buildings along the waterfront and around the bay are required to enhance their lighting to the minimum specifications of the URA over the next few years. This is applicable to not only new infrastructure but also to existing infrastructures. Depending on whether the infrastructure has been built or not, resulted in the need for two different types of incentives. For existing buildings, there are cash incentives to developers to help install lighting that will support and make the installation more affordable to the building owner. However, this incentive has not been as successful as the floor space incentive that offers additional square footage to future developed buildings instead of cash. This incentive has been extremely successful, however it has created a habit for developers to put lighting on buildings in order to get more square footage. Developers as such, go to the lighting consultant and ask for a design that meets a pre-determined budget that can ultimately be rewarded in a certain square footage allowance by the URA. This has been considered as one of the very few negative elements of the lighting incentive program. Within the public spaces and urban experience, there has been little negative feedback from the public. The director believes this is possible due to the detail to design, energy efficiency and placement.

This detail of lighting control is very important because there is little separation between the urban districts and the residential districts, the high population density and small space of Singapore means that many housing blocks and apartments are high rises themselves. Therefore lighting design and implementation must consider the impact it could have on the residential experience and do this by lighting fixture placement and double-glazing of windows.

Even though he admitted that his opinion is biased due to his role with the Urban Redevelopment Authority, he believes that the focus on lighting has enhanced the Singapore skyline, aesthetic beauty and experience. The lighting has helped in promoting Singapore as a vibrant nation, which is why Singapore wanted their Grand Prix to be held at night. He also mentioned that each city is different and has a different persona. Therefore, he recommends that destinations who are considering enhancing the city through lighting projects, look at what the city wants to be, how other destinations around the world have done similar and how it could be manipulated to the respective destination.

One of the areas of improvement that the Urban Redevelopment Authority acknowledges is the Financial District area. This is because when the URA designed the financial district, they pushed developers to provide for financial institutions and business spaces, resulting in a somewhat bare night experience. During the growth of Marina Bay, the URA used lighting and collaboration with local businesses to provide a night atmosphere within the district that brought life into the area and promoted businesses and restaurants to stay open later.

With light installations becoming more prominent within the art and museum exhibits around the world, it has become apparent to such organizations as the URA and STB that lighting itself can be the product for an event. As such, Singapore has promoted and incorporated light attractions and festivals throughout Singapore to provide entertainment and bring people together. Two stand out examples that occur with the Marina Bay area is the Marina Bay Sands Resort shows 'Wonderful,' and the light festival iLight.

As a resident of Singapore, he believed that the atmosphere of nocturnal Singapore is welcoming and enjoyable. As a common theme with the other interviews, he also mentioned that less is more and the Fullerton Hotel is a perfect example. The lighting system for the hotel is basic and not fancy, however, the building stands out even when they other nearby buildings have multi million dollars lighting systems that can be programmed and change colors. Unfortunately, he was not in a position to mention the URA's faults with lighting design, if any.

URA Interview Key Points addressed:

- Singapore's Urban Redevelopment has had the advantage of being developed on reclaimed land, which allows the majority of work to start from scratch.
- The URA educates project developers to not only think about themselves but also the impact the design will have on the surrounding environment.
- Strategic Lighting Plans started in 1994 and have been continually updated to meet the needs of the present and future.
- Singapore compares their strategic goals with other similar destinations to find strengths, weaknesses, opportunities and threats (SWOT Analysis).
- Lighting plans were developed with all parties considered; tourists, locals, businesses, architects, etc.
- Lighting enhances the 'vibrancy' of the destination and the destination marketability.
- Minimum lighting requirements are required for all developments in key areas.
- Incentive programs have been established to influence the private sector to invest in light projects, especially for those companies along the waterfront and skyline.
- The results and control of Singapore's urban lighting has helped the nation become a livable, vibrant city to 'live, work and play' in.
- The URA is constantly seeking the advice and opinions of the public and private sector.

An Interview with an Executive of Philips Lighting

The opportunity to interview a leader in the lighting design and technology sector presented itself at the World Architecture Festival. Throughout the interview he explained how as one of the biggest lighting companies in the world, Philips was not only interested in manufacturing practical light bulbs, but also how the technology and impact of lighting has in relation to our daily lives. Rogier stressed the importance of not only providing for today but also the needs of tomorrow.

"A great city is the inventory of the possible." Fernand Braudel (French Historian)

As a leader in science and technology of light Philips has provided research documentation that proves the impact of lighting on one's experience is physically based on our body's biochemistry. Depending on the wavelengths of light, we release or suppress hormones that impact our stimulation to the environment.

The executive stressed the importance of lighting design in the urban context and it must be conducted in a collaborative way that can adjust to changing demographics and urbanization. Collaboration is important in the lighting design of urban areas in order to provide a design that is useful now and in the future. At the same time, a good urban design can provide the ability to not only be practical but also provide a lighting experience that is meaningful and engaging. When the practical and the interactive come together, you can provide an experience that is efficient, sustainable and attractive.

"Lighting is like a campfire, and cities need more campfires." Rogier Van Der Heide

Lighting provides a place for human activity that incorporates the environmental spaces and infrastructure around us. The ability to provide an illuminated city helps stimulate the potential for a long-term livable city that is sustainable and engaging. Much like a campfire, lighting brings people to a location to share stories, engage with each other in a comfortable setting.

"Well planned lighting can connect places and stimulate night energy." The lighting connects the city to its transport hubs while simultaneously providing a sense of place. Tunich, Germany for instance, has installed lighting from the train station into the city, which provides a memorable entrance that is unique, energy efficient and engaging. Some cities, not only connect the urban experience through urban street lighting but also through festivals. These events and designs that require collaboration from all involved to provide an effective stimulating experience and benefit all of those involved.
"Lighting in relation to the tourism industry is a delicate one."

For some time, the goal of many lighting designers was that the more the lighting was abundant, the better the experience. However, this is not actually the case. Sustainability and energy consumption has become a major drawback in the urban lighting campaign over the last two decades. Fortunately, the advancement in technologies has allowed for collaborative lighting projects that are energy efficient, controlled and relevant. In Roger's opinion, an example of somewhere that has too much lighting is Hong Kong. For years, Hong Kong businesses had the mentality that the brighter the building the more

'powerful' the icon. It is true that lighting attracts, but it is also true that when everything is bright and competing with each other, the lighting experience is ineffective. "Any room, whatever its size, looks better with many little pools of light rather than a general glare. I like intimate low light just where and when you need it."
Roger Banks-Pye

Keeping this in mind, we can do a lot more with a lot less. This drastic change in the understanding of lighting to be imbedded into our daily experiences provides an opportunity for cities and governments to embark on a completely unique visual experience that is achieved through subtlety, moderations rather then brightness and power. This change comes in an important time as many cities and governments around the world are implementing restrictions on illumination. Providing effective urban lighting environments for the future is harder than one would think. Suggesting, the future is impossible to predict, so he recommends exploring our vision. Lighting design that is practical, well maintained and sustainable not only benefits the future but also our today. "Thinking of the future, is an excuse for not thinking about today." Rogier

Key Points Addressed:

- Philips Lighting is interested in the practical use of lighting and it's relationship to human interaction.
- Lighting is a visual experience and a physical one. Wavelengths of light impact the human body's reaction thru biochemistry.
- The constant changing of destination demographics and globalization means that urban lighting design must be a collaborative one that is useful during the present and in the future.
- Practical lighting should be meaningful and engaging through efficient, sustainable and attractive lighting.
- An illuminated city can engage livability through sustainable and interactive lighting projects.
- Well-planned lighting can connect places together and stimulate nightlife.
- More light is not better.
- Environment and energy sustainability has resulted in restrictions on urban lighting in mega cities around the world.
- The advancements of lighting technology have allowed for more energy efficient designs that are controlled and multi-purposed.
- When there is too much and no control, lighting is ineffective.
- More can be done with less.
- The understanding of urban lighting's relationship to human interaction provides the opportunity to provide a unique visual experience.

An Interview with Designer of Eight Inc.

Photo 18: World Architecture Festival, 2012. Andrew Potvin

When considering design for a product or spatial environment, it is important to understand how it will impact the relationship with its consumer. Tim Kobe, the founder of Eight Inc. who is responsible for the design of Apple Retail stores worked directly with Apple for 10 years. The opportunity to interview Tim was important because of his understanding and commitment to design aesthetic and human-spatial interaction.. He provided a further understanding of how spatial design can impact the experience of the environment. Ultimately, the environment and visual awareness has a major impact on the way customers relate to the experience of a product. However, in order to provide an effective experience, it is important for the designers of the environment to research and incorporate the needs and ways people think, feel and interact with existing items. When this important element of spatial design is taken into consideration, the design helps instill product value and loyalty amongst those interacting with the environment. This research of how one interacts with the 'product' is applicable for Singapore's urban area and redevelopment. By researching the needs of the local, tourist and private sectors within public spaces can provide urban planners the knowledge to develop engaging experiences that impact how they feel, experience and think.

Key Points Addressed:

- Good 'design' is one that is aesthetically pleasing and interactive.
- The consumer experience is persuaded by environment and visual awareness.
- A good designer takes in consideration the way the consumer thinks and acts.

An Interview with Developers of Marina Bay Sands Resort

In order to prepare the interview questions with the tourists themselves it was important to find out what the goals of those who design and implement lighting in urban areas. One of the most prominent and recognizable tourism destinations in Singapore is the Marina Bay Sands Resort as a unique structure that not only stands out but also adds to the Singapore skyline. The Marina Bay Sands Hotel is a 3-tower building that is linked by ground levels and a boat shaped structure at the top and a mall, casino and convention center. At night, the Marina Bay Sands Resort (MBSR) is illuminated to highlight the buildings sidewalls as they provide depth and a better sense of scale, ultimately bringing interest to the nighttime Singapore skyline.

"This project was a lesson that less is more." Developer of Marina Bay Sands Resort
When the architecture firm was designing the building, natural light was important to the design as it represents comfort. When the nightscape design was being brainstormed, the lighting was only going to be white light that would highlight the architecture's structure. During the original install, lights were placed pointing up along the structure and were disguised for visual aesthetic. Lighting all elements of the building is not needed, as there is reflective ambience lighting that sets a comfortable atmosphere. Another major element to the resort is the incorporation of its art installation that often is a play on natural and environmental light. Light, art, architecture go hand in hand in the resort experience. However, when the design aesthetic is incorporated into the design experience 'the art is part of the architecture.'

Once the building was completed, further interest was put into how lighting can impact the architecture, the visitors and the role MBSR would have in the urban night experience. Most of this focus was based on the role lighting of stores within the complex would have on the bay experience. Marina Bay Sands officials refer to the lighting within the shopping complex as 'display lighting.' When in negotiation with the stores and their lighting both parties agree the lighting plays a major role in bringing an element of attention to a certain focal point if executed correctly. This phenomenon is like a moth being drawn to the flame. However, MBSR also realizes that too much light can also ruin the aesthetic of the environment. In their case, they have encountered issues with their storefront for Chanel and how bright it is compared to the rest of the resort. It stands out, however does not compliment the environment. During the interview, they also mentioned that every store has different lighting needs and therefore the design planning and design must be taken on a store-by-store basis. Marina Bay Sands Resort and its architects worked together to provide a waterfront and skyline that would define the Marina Bay skyline and experience. As an incentive, MBSR was asked to look at ways to create a visual experience for visitors. Ultimately, MBSR hired multimedia consultants LazerVision to create and install the urban lighting experience.

Photo 19: Marina Bay Sands Resort Light Show, 2012. Photo by: Andrew Potvin

The installation of the light show and multicolored LED (Light Emitting Diodes) fixtures has provided the ability for MBSR to change color and be themed to local events and holidays adding to the thematic and visual experience within Singapore. With the advancement of technologies and the need to maintain a competitive edge, the technology and use of lighting within the resort is constantly being upgraded to help provide the most comfortable and optimal experience.

Key Points Addressed:

- MBSR used architectural lighting to provide structural depth and sense of scale.
- Less is more.
- Architect only wanted white light so that way the focus was the structure itself.
- Architectural lighting does not need to light every element of a building.
- Light, art and architecture are all interrelated.
- Display lighting for the shopping mall has very strict regulations to compliment the whole resort.
- Too much light can ruin the aesthetic of the environment.
- Every project is unique and has its own elements to consider.
- MBSR took advantage of the URA incentive program and implemented lighting solely for the incentive of more land allocation.
- Using energy efficient technical lighting solutions, MBSR can now customize their lighting nightly to events and holidays. Ultimately, this supports the overall experience of the destination.

Tourist Background Demographics

In total, 104 tourists accepted the invitation to participate in short interviews about their lighting experiences. The guidelines to be a participant were simple, one must be able to read and speak English, be a tourist to Singapore and be willing to participate. In order to get a fair assessment of the tourist's perceptions there were no restrictions in regards to where they were from. If anything, their individual experiences and background are of greater interest to the data analysis.

Of the 104 short interview participants, 53 percent were male and 47% female (Figure 14). Having the male to female ratio almost split in half provides a fair perspective from both males and females.

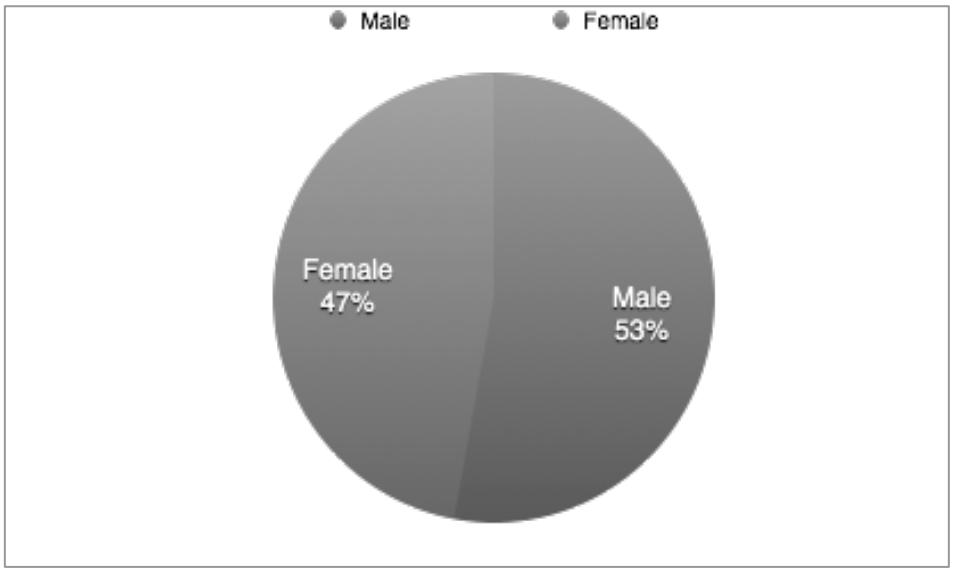

Figure 13: Percentage of Male and Female Short Interview Respondents

Of the 104 short interview participants, 29% were residents of an Asian country, 10% were residents from the Oceania region, 53% were residents from a European Nation, 6% from North American and 2% from South America (Figure 15).

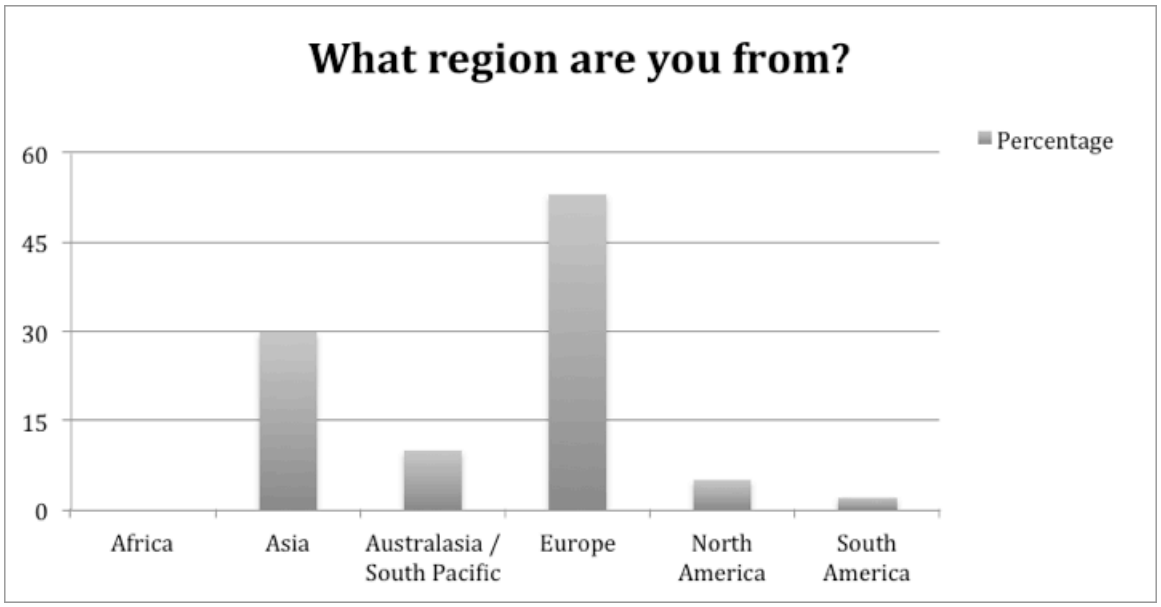

Figure 14: Percentage of Short Interview Respondents by Geographical Location

Of the 104 Short interview participants, 14% were aged between 18-23, 35% were aged between 24-30, 27% were aged 31-40, 8% were aged between 41-50, 10% were aged 51-60 and 6% were aged 61 or over (Figure 16).

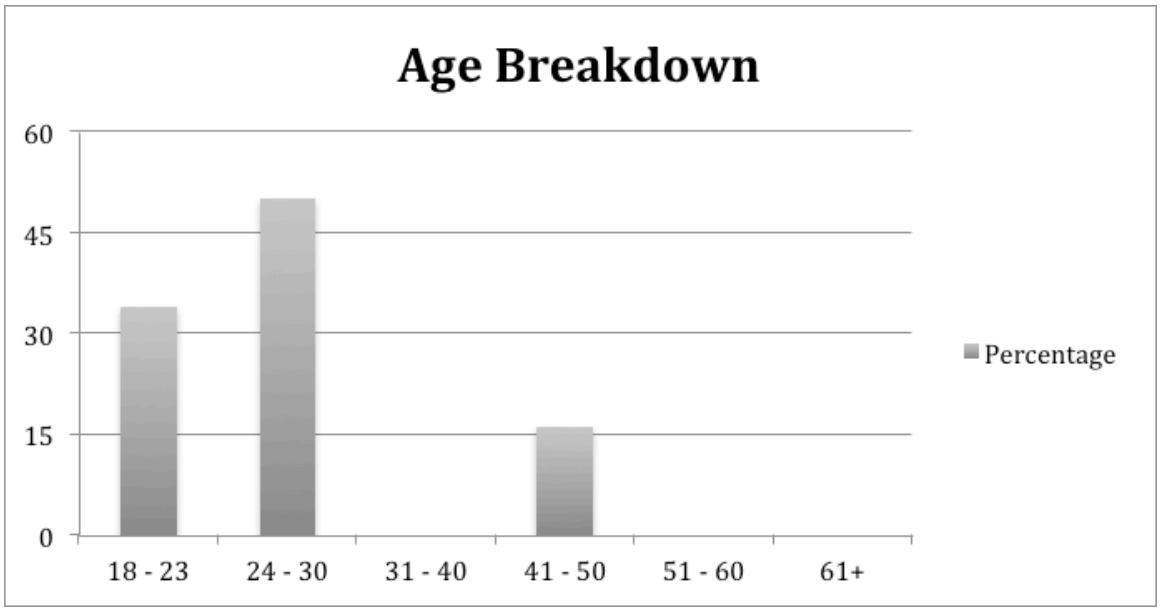

Figure 15: Percentage of Short Interview Respondents by Age

There is also an interest in knowing why these tourists chose Singapore to be their tourism destination. While compiling the participant background information, they were also asked why they chose to come visit Singapore and what their desire was to experience. Figure 17, shows that there is a variety of reasons as to what participants were looking to experience in Singapore, complimenting the variety of participants chosen to partake in the research.

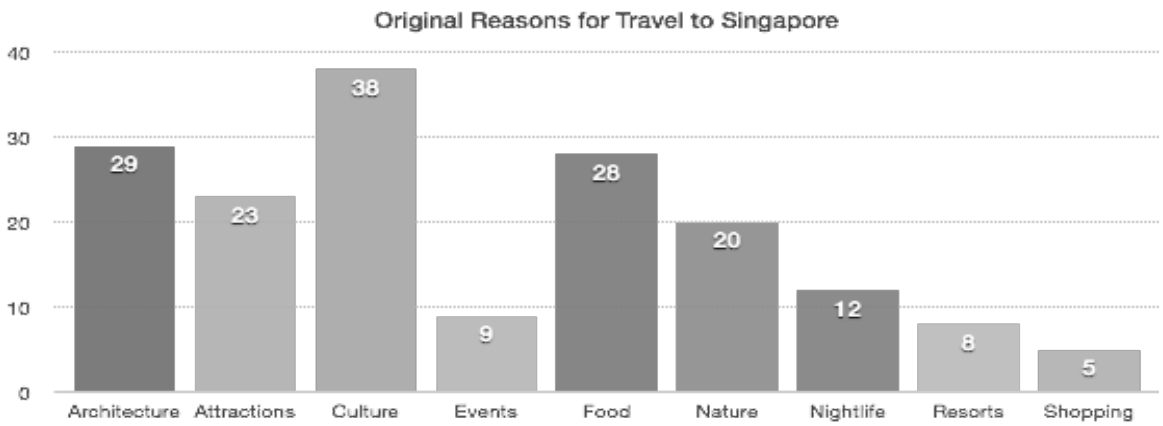

Figure 16: Short Interview Respondents Reason for Travel

Through the various short interviews conducted with tourists, main themes were identified on how the lightscapes impacted them. Interviews results suggest the perception that humans 'are like moths to the flame' and are generally attracted to well lit areas is apparent. The light stimulates our curiosity and often draws us near. Well lit areas help create an environment that provides a sense of security and comfort.

Tourist Perspectives

An Interview with tourists from Scotland (001)

"In Scotland, we prefer to not move to fast with the times. Light has a perception there, to bring us down. I think lighting brings us out more." Lighting brings a sense of a warmer climate and brings a sense of identity. However, lighting must not be "too gaudy." The lighting experience within Singapore's district of Chinatown provides a sense of unique identity and attraction. For one of the interviewees the lighting was important to her as it provided a sense of safety and a sense of security. "Light attracts us, much like a moth." Singapore's bay area provides a sense of the 'wow' factor. "We come here year after year,

and I am captivated by the same captivating view and take the same picture." However, the there was some mixed feelings amongst the group that Singapore was becoming to globalized. They mentioned that when they first saw Singapore 13 years ago there was a good sense of heritage and history, where as today it is 'too much' and a 'critical mass' that is often over whelming. Another member of the group said that it was an age thing and that the vibrancy was good for the economy and Singapore. The personal thoughts on advanced lighting in the urban areas was that is does attract locals and tourists to enjoy the city center and especially so for tourists. "I wonder, if Chinatown would be as buzzing if it wasn't lit up the way it is." This is a very interesting question, especially for such heavily dependent night activities. For them, the thematic lighting and ambience of the Chinatown market provides a more lively and vibrant atmosphere. When asked if there was anything they would do differently they would make the Chinatown lighting more ambience based rather then direct and in your face.

An Interview with a tourist from Malaysia (002)

In discussion with this individual from Malaysia, we discussed what he was interested in experiencing when he came to Singapore and he mentioned architecture and the available infrastructure. However, he did mention that lighting was prominent in his experience of Clarke Quay, Marina Bay and Orchard District. The most standout lighting destination in his experience within Singapore is the Marina Bay experience. Lighting brings a sense of safety and awareness and ultimately comes down to the architecture and design layout. The infrastructure ultimately defines the layout and experience. Lighting in his opinion is like make up and only enhancing the actual product. "The lighting is not a primal factor,

it plays a part, but is not something that is subconscious in deciding whether to go somewhere, however lighting brings people together." He continued to say that lighting does not play a factor in his decision to go into town, however is a bonus to his experience that highlights and enhances the overall experience. Lighting is recognized as an element of safety that ultimately depends on the individual perception. The lighting plays a part of his experience and when lighting is brought up as a factor, it plays a role in the experience. When discussing night activities that have a 'wow' factor often involve lighting, he mentioned some experiences such as Las Vegas, Tokyo and Singapore that all occurred at night and were results of lighting displays and environments. When asked how lighting impacts the tourism experience within Singapore, the interviewee responded with a vague answer. "It depends on the environment and what the goal is." Ultimately, the needs are that the lighting is practical, provides a sense of safety and is cost effective." He felt that it is also important that there is a balance between heritage and globalization.

An interview with some tourists from Germany (003)

These tourists were interested in experiencing the cultural districts and the architecture of the city. Ultimately, the experience of multiple cultural districts were of major interest for participants. When asked how and if lighting played a part they mentioned that the Little India light festival and the Chinese Lantern Festival captured their attention and was something they went to experience specifically due to the interest in the lighting. "The Chinatown market looks ridiculously ugly by the day with just a bunch of plastic stands whereas night, it is so much more interesting." On the way in from the airport to the city, they say the skyline illuminated brought a sense of 'wow,' and was "very impressive."

Ultimately, lighting played a role in safety, interest and the wow factor. However, lighting did not make the aesthetic, however instead complimented it. When asked whether they would like to see more lighting initiatives around the world they said no and that there was already too many light based events. The fact the lighting is becoming prominent in many large cities, developers are interested in going back to basics. Lighting when there is too much doesn't look nice. "It's cool but it doesn't look nice… and it's expensive." The idea of taking enviroscapes and illuminating it brought a sense of 'fakeness' that was compared to a theme park.

An interview with a tourist from Holland (004)

Interested in seeing many different cultures is what brought this tourist to Singapore. She experienced Chinatown, Clarke Quay and Marina Bay at night. "Lighting did not consciously cross my mind, however if it had been dark it would have been different." "When you ask about it, I don't think I was aware of its impact on my experience." Her favorite night location was her experience within Clarke Quay along the riverfront. She felt that the lighting provided a sense of safety but was never a conscious decision. However, the lighting brought interest, aesthetic and complimented the experience. She was interested in seeing more lighting in Holland because she feels like it would bring more interested and aesthetically pleasing environments during nocturnal activities.

An interview with some tourists from Malaysia (005)

"It is awesome because in our hometown, we do not have this type of stuff." This group was very intriguing to interview as their background was from villages with little

advanced infrastructure. So coming to Singapore is very interesting and provides a sense of amazement. One of the groups was interested in the light shows and the spectacle that Singapore had to offer. As some of the group had been to Singapore before they were interested in the difference the enhanced environmental lighting for the festivals made to the space. In particular, "the Chinese Lantern Festival brought Chinatown to a new element of life." They mentioned that is helped provide cultural meaning, context and color. When it came to lighting shows as attractions themselves one member of the group was worried about the quality of the event and how effective it is. "The crane dance light show, I think was not as good as it could be." It was compared to ones personal experience with other lights shows of better quality. Whereas, the Marina Bay Sands show 'Wonderful,' provided a clear story and was free. "At one point, they shoot bubbles over our heads and brings us into the story." Even though these environments and the impact lighting had on the overall experience was optimistic and thoroughly enjoyed, they did not want to see more of it especially in their hometown. By having it in another location, it provided a yearning to go see it and escape their daily lives. They enjoy the darkness of their hometown. They acknowledge that they feel safer in Singapore due to the amount of light compared to their home precinct in Malaysia. The tourist also recognizes that the lighting in Singapore is well thought out. They continued to state that when light it there for no reason, the designers don't consider the potential impacts it would have on all those involved.

An interview with a tourist from India (006)

"Before you hear the sound, you see this beautiful illuminated area. This gained my interest." "The lighting has a certain ambience and beauty that has complimented Chinatown's cultural experience." Singapore illuminated techniques help highlights what Singapore's infrastructure has to offer and makes things feel bigger then life. The lighting drew him to certain areas, at some times consciously, and others indirectly. Lighting did not play much of a role on the aesthetic of the experience that was more about the product rather then the highlighting of it. However, the Marina Bay area and the MBSR light show 'Wonderful' brought a major factor of spectacle which brought interest to the area and makes me want to explore and experience more. As someone who is a seasoned traveler, he explained that he was interested in seeing more focus on efficient lighting while at the same time maintaining nightlife and energy. He would like lights to be installed more due to a focused use rather then just to illuminate an area. By doing this, he reckons that lighting can be more environmentally friendly and efficient. "Flashy lights are what you expect, but if you are going to a quiet dinner, you want more focused lighting." Places like Hong Kong and Times Square often seems to have lights just to have lights. When asked if there was a destination that he would reckon would be based specifically on its lighting at night, he mentioned Las Vegas. This is because of the shear amount of lighting it has to try to keep visitors awake and the spectacle it provides. It is also important to him to enjoy the nature of natural moonlight and what stars have to offer. His travel has provided him opportunities to experience clean, no light pollution locations around the world that has also provided 'wow' experiences and is memorable. "Lighting is not a major draw or creator of disappointment. Personally, I can't stand the

amount of energy being wasted." "If you can implement systems that are efficient, practical and non-intrusive then they should be implemented." "Seasonal lighting is a physical manifesto that brings people together, provides an atmosphere that makes me happy."

An interview with a tourist from Thailand (007)

Lightings impact on the tourism experience within Singapore's urban districts helps provide a sense of uniqueness and makes it fun to experience. However, with the exception of the light shows, there wasn't ever an interesting viewing area specifically prominent to the lighting design. "Architecture and lighting nowadays go hand in hand." In his opinion, lighting of architecture in cities is most important and then should be followed by thematic environmental lighting. "If you lose the lighting, you wouldn't feel safe, you would lose the wow factor." "Lighting creates the illusion of safety, but doesn't actual make an area safe." After conducting the interview, we continued talking because of his interest in the topic and spare time waiting for a meeting. During this free discussion, he went on to say how he doesn't understand lightings role but acknowledges that it definitely does play a part on what he prefers to experience. He was curious how the research will help making urban lighting affordable and more effective for all involved.

Common Themes from Interviews

The fact that lighting impacts our perspective of the same destination whether the individual consciously acknowledges lighting or not is a very interesting phenomenon.

Surprisingly, when participants were asked to choose the top or bottom picture (pg. 139), the answers resulted in two different types of reactions. Those who knew exactly why those chose the photo and those who chose it but really didn't ascertain what really persuaded their choice.

To find out what locations had lightscapes that consciously played a part in tourists' experiences and perception, short interviews asked about the perception of visited destinations. Suggested by secondary literature on the lighting environments, lighting was not a major factor in ones perception at first (Figure 18). This can reaffirm that lighting no matter what the use is so common to our daily experience that it is a predominantly subconscious experience. Out of the 104 short interviews, only 39 destination experiences were identified to have the lighting play a conscious part in the tourist experience only after the subject of lighting was brought up.

Photo 20: Singapore Skyline and Marina Bay, 2012. Photo taken by Andrew Potvin

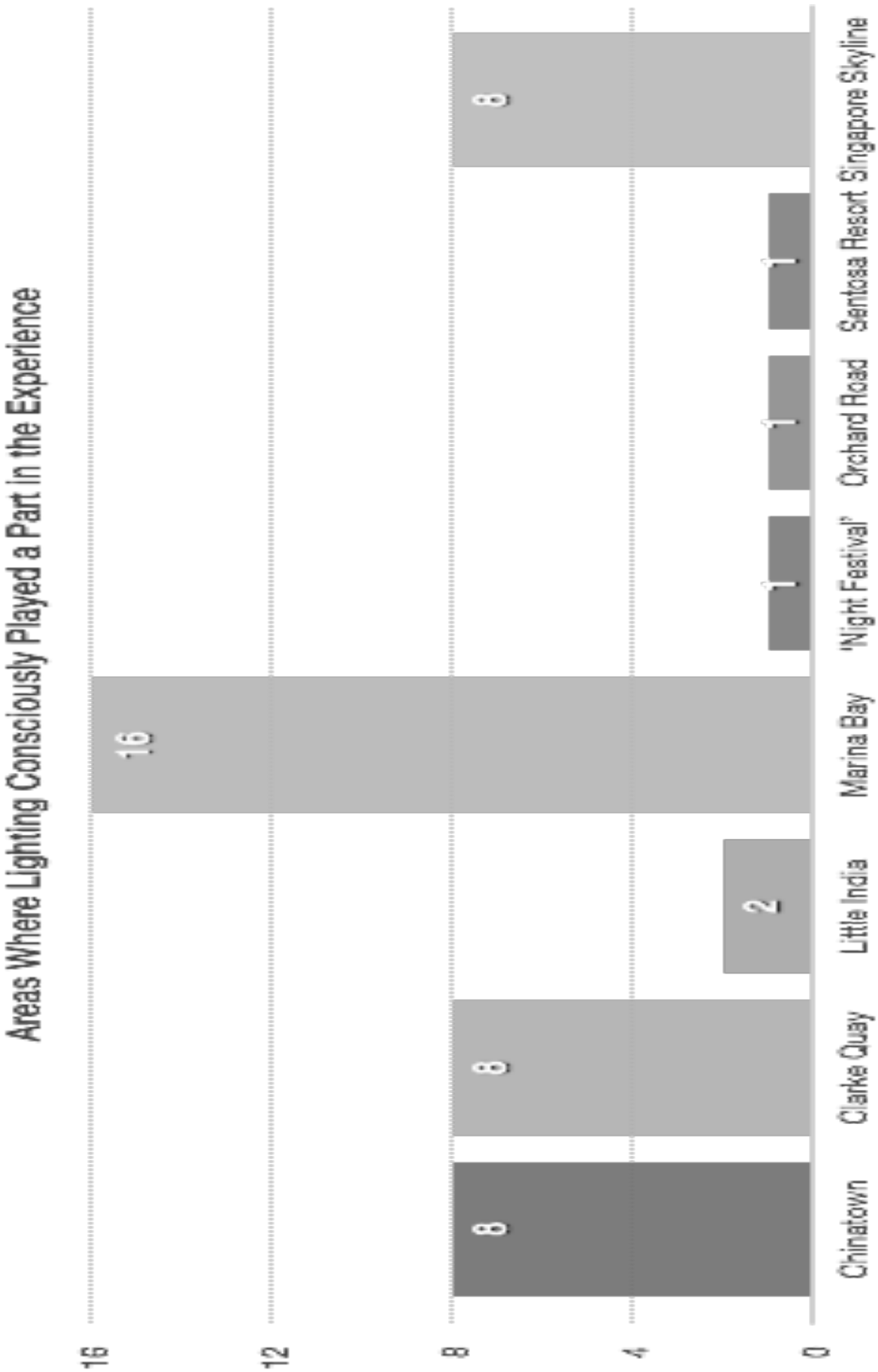

Figure 17: Areas Where Lighting Played a Conscious Part in the Experience

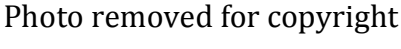

Photo 21: Marina Bay Sands Resort Comparison between ‘advanced’ and ‘practical’ light. Source: www.ibtimes.co.in 2014

In order to determine whether urban lighting impacted the interest of a certain destination two photos of Marina Bay Sands Resort taken from the exact same location were used for field research. The top photo is what Singapore’s nightly experience looks like on a clear average night. The bottom picture is also Marina Bay Sands Resort however was taken during the Internationally recognized ‘Earth Hour’ event where participating destinations

and companies turn off power and lighting to non-mandated areas. One of the first questions asked to participants involved these two photos. If you had to choose between these two images of Singapore's MBSR, which experience would you prefer? The results were lopsided with ninety-six percent of the results stating they would prefer to experience the top destination. From there, interest was in why they chose the locations they did. Interestingly, seventy percent of participants mentioned lighting as a reason. However, eighty-two percent mentioned that it seemed to be 'livelier,' 'vibrant,' 'fun,' 'energetic,' 'exciting' and 'outgoing.'

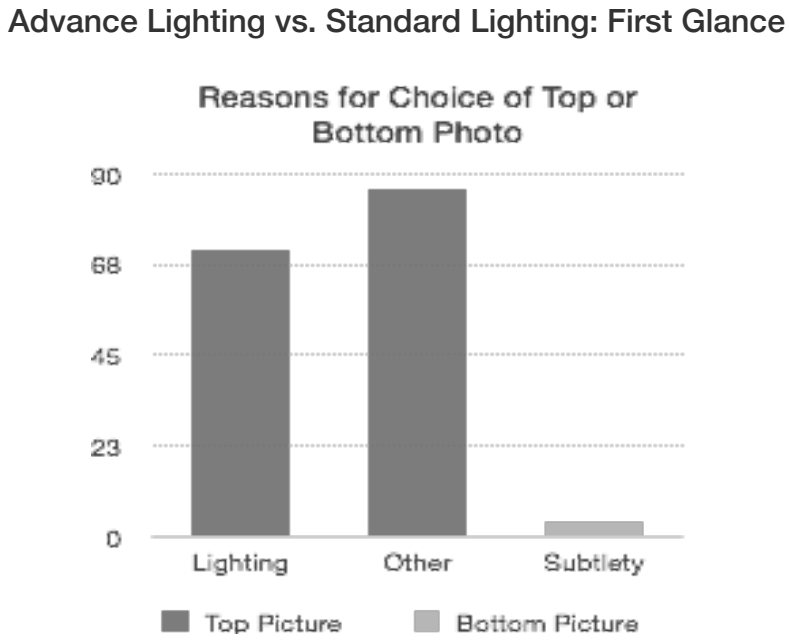

Figure 18: Advance Lighting vs. Standard Lighting: First Glance

The four percent who chose the bottom picture stated that they preferred the bottom photo because of the subtleness and realism of the photo. They were not interested in the 'in your face' experience the top photo provided. All of the participants who chose the

bottom photo also stated that environmental sustainability or waste of electricity as a contributing factor to their decision.

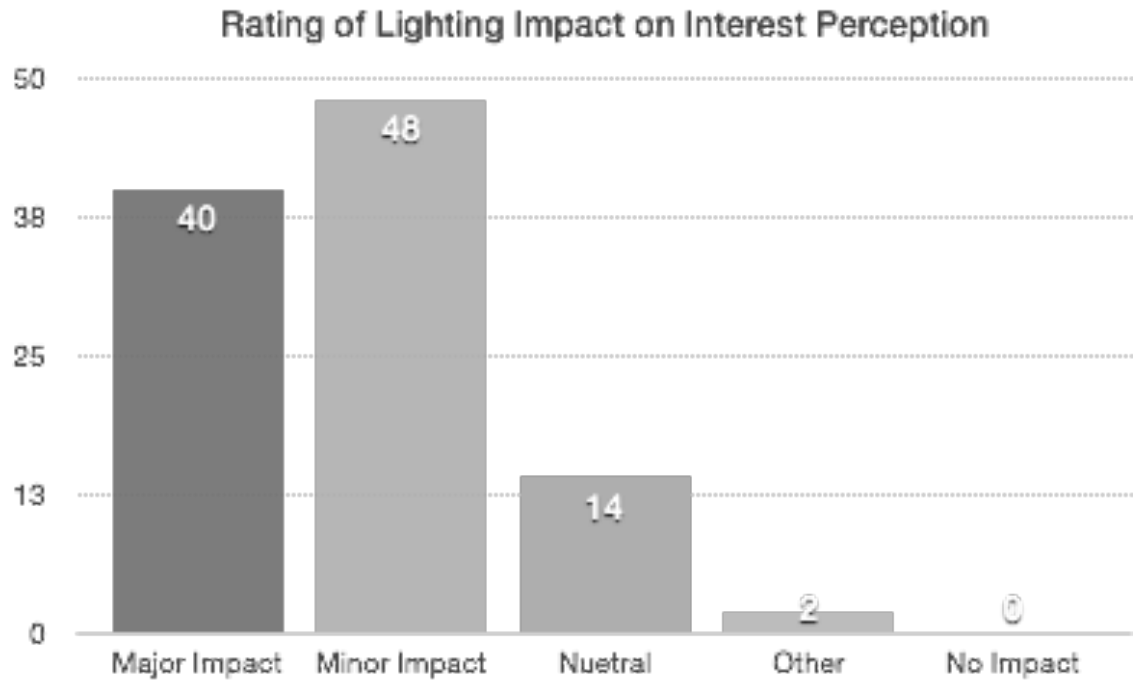

Figure 19: Lighting Impact on the Perception of Interest

"For me, a landscape does not exist in its own right, since its appearance changes at every moment; but the surrounding atmosphere brings it to life - the light and the air which vary continually. For me, it is only the surrounding atmosphere which gives subjects their true value." Claude Monet

Does lighting impact perception of one's interest in a destination or experience?

Only 40 of the respondents felt that lighting played a major impact on their interest in engaging with a particular destination. Those who did feel like it played a major part in their interest were those engaged in activities at Marina Bay Sands Resort and Chinatown where lighting is heavily integrated into the experience of the destinations through shows and cultural theming. 48 respondents felt like it did contribute to their interest however was not a major player in their interest of the particular nightscape. The 16 remaining

respondents said that lighting played no conscious role in their experience. These findings are consistent with the goal of the URA to develop lightscapes of interest that is vibrant, livable and marketable. However, lighting is not a primary factor in ones interest of a particular destination. Only a few of the respondents state lighting as they main interest of the visited destinations.

Does lighting impact perception of one's safety in a destination or experience?

When asked whether the urban lighting experienced within Singapore impacted their perception of safety, the results suggest that urban lighting and the sense of safety coexist as suggested in the secondary research. Sixty respondents mentioned that lighting made a major impact to their perception of safety, while thirty mentioned lighting as a complimenting feature to safety however was never consciously thought about. Fourteen of the respondents never even considered the correlation between their lighting environments and their perception of safety. Overall, lighting does play a conscious and subconscious role on one's perception of safety.

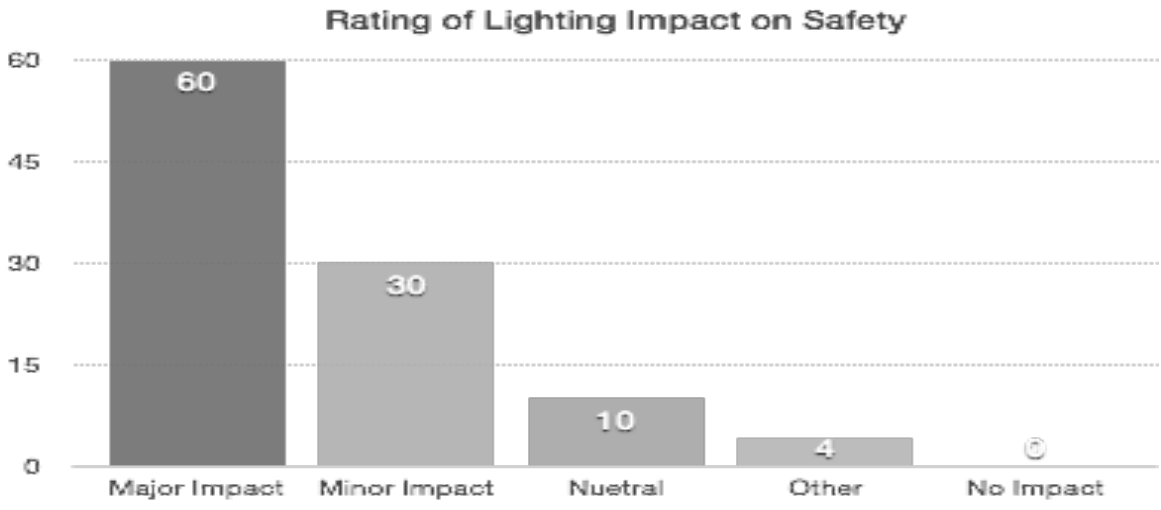

Figure 20: Lighting Impact on the Perception of Safety

Does lighting impact one's perception of the aesthetic of a destination or experience?

When questioned about the aesthetic of a destination, lighting commonly was identified as a contributing factor to the experience. Forty-eight respondents mentioned that lighting played a major impact in the overall aesthetic and forty-eight said that it was a complimentary feature but not necessarily a determining factor in the aesthetic. Out of the hundred and four respondents only eight mentioned that lighting did not play a part in their aesthetic perception, two of which said that lighting was too much and took away from the beauty of nature. Overall, lighting has been identified as playing a part on one's perception of destination aesthetic.

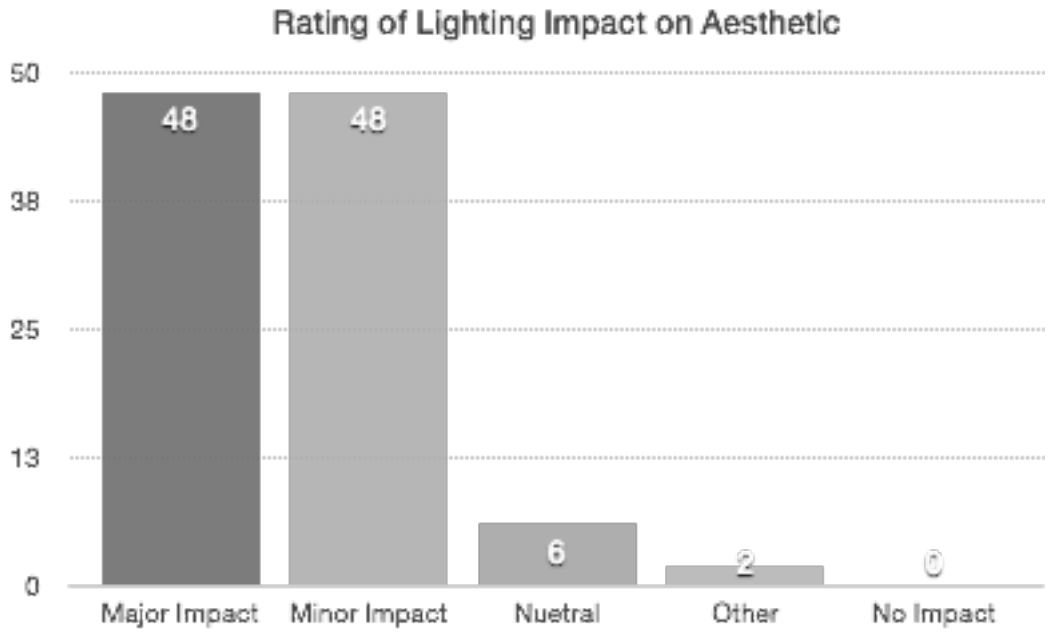

Figure 21: Lighting Impact on the Perception of Aesthetic

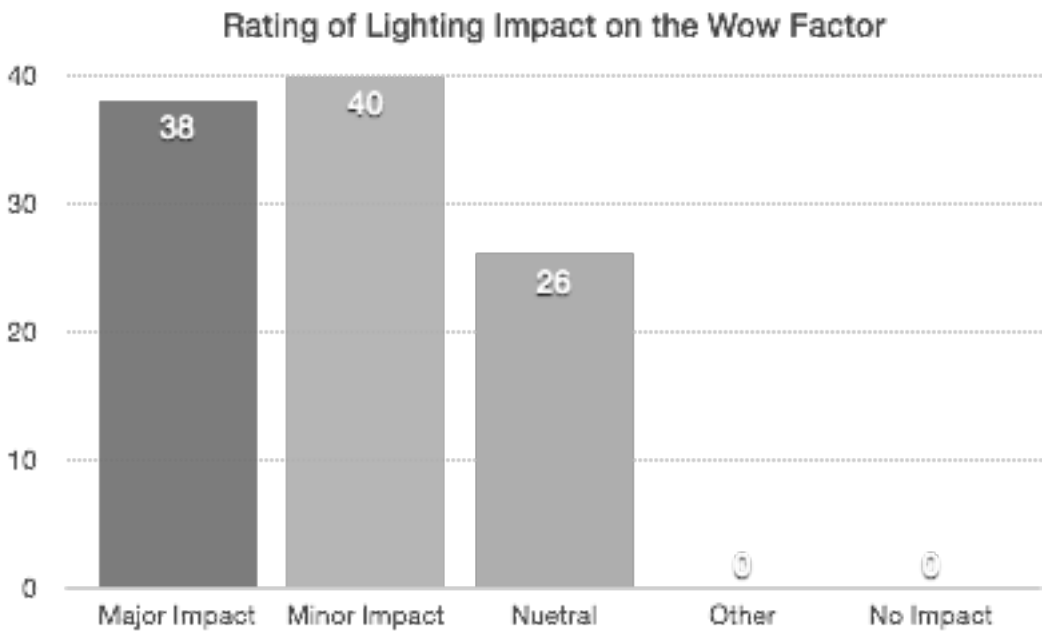

Figure 22: Lighting Impact on the Perception of the 'Wow Factor.'

Does lighting impact the perception of the 'wow' factor of a destination?

The wow factor is one of particular interest because in order for a wow experience to occur one must be surprised or taken back by the engagement. As found in the secondary research, wow experiences are not commonly found when there is nothing new to the one experiencing it. Seventy-eight participant's mentioned lighting as having an impact on the overall wow factor of their experience. Thirty-eight of them mentioned lighting as having a major part. Once again, these respondents identified Marina Bay Sands Resort and Chinatown as standout locations. Forty of the respondents said that lighting was a complimentary feature that assisted the 'coolness' of the destination however was not the sole factor. Twenty-six participants didn't recognize lighting as playing a part on their experience whatsoever. From this we can affirm that lighting does play a role in the 'wow factor' of an experience.

The Results

This section will combine the data between the tourists and the architects and how it establishes the tourist's perspective. These results will ultimately, provide the answer to whether urban lighting impacts the tourism experience and if there should be a focus on it in further urban planning around the world. From the design and management side of urban lighting there are a few key themes that were consistently discovered. From a management standpoint, lighting the urban city is one way to highlight the community spaces that help them feel welcome, safe and lively. Lighting projects and their implementation provide nightscapes that are capable of extending business hours and community interaction between the hours of daylight. Lighting is seen to enhance the overall theming of a destination or product but must be taken into consideration with the surrounding elements to ensure overall aesthetic and subtleness. The recent studies light pollution and the taking advantage of the incentives program has led to the discontinuation of the development square footage scheme. Simultaneously, businesses were beginning to put x amount of dollars into lighting just to get more square footage, resulting in buildings with too much light that was over the top or not sufficient to the overall objectives of the Urban Redevelopment Authority. In order to provide the best lighting experience, Singapore must continue to use its feedback from the community, businesses and tourists to ensure a quality experience. Ultimately, the community experiences the lighting and engages with it with no preconceived understanding of it. Tourists experience the urban space with fresh eyes, making their opinions potentially more valuable. By conducting constant community feedback sessions the continued applications of lighting projects will continue to meet the needs of all those involved.

Interestingly, architects and designers who were interviewed had little interest in how the architectural lighting was going to impact the tourism industry. The architects were for the most part only interested in providing lighting that accentuated the structures architectural design features and that helped be consisted with the overall design aesthetic. Unless otherwise required, lighting of the structures met the specific requirements for lighting that was supportive of the Singapore skyline, enclosed and provided a background to the Singapore downtown experience while at the same time providing a warm to cool lighting design to help instill a sense of comfort and urban consistency.

For the tourism industry and marketing lighting plays a major role in the nightlife campaign. The lighting of the Singapore skyline provides a backdrop of wealth, vibrancy and interest to its viewers. It helps create a unique sense of place and highlights the urban layout. Through places like Clarke Quay, lighting supports a nightlife that is fun and attention grabbing. It is specifically designed to feel cool even if it is hot in the equator climate by using cool colors and accenting water features. The lighting in such locations is often experienced sub consciously. Lighting Singapore has proven to be an effective marketing strategy and should be recommended to other major tourism destinations.

However, the lighting up of Singapore was not always seen as a positive experience and enjoyed by all. Through the research interview with urban management officials, architects and the tourists themselves there is a clear need and interest in providing a future experience that is sustainable, efficient and practical. For some tourists, Singapore lighting was too much and had a sense of electrical waste. These interviewees seem to

have a strong interest in the long-term sustainability of the environment and ecology of other living animals.

Not only is lighting seen to some as a waste of electricity and money but is also is seen to have an impact on such normalcy as the sleep cycle of birds. Both an architect and a tourist mentioned lightings impact on birds sleep cycle. In one case, one shared that his experience within Orchard Shopping District was bright and illuminating. However, simultaneously he noticed that one of the most prominent noises of the environment at 9pm was the chirping of birds. He is concerned that the trend lights getting brighter in commercial areas will begin to have its toll on birds and become an interesting subject for study.

However, Singapore is considered one of the greenest countries in the world ensuring that lighting programs are efficient and have a minimal impact on the environment. This is being done in a variety of ways to save electricity, costs and impacts on the environment. For instance, almost all lighting in urban areas is now being done with light emitting diodes (LED) that use a significantly less power consumption rate and last up to ten times longer then the normal bulbs. It also helps offset the carbon footprint, as LED lighting does not release as much heat and CO2 emissions into the atmosphere. In conjunction with the use of sustainable technology, Singapore does not have all of its lighting on all the time. As the interview with the Urban Redevelopment Authority pointed out, the lighting schemes throughout Singapore and specifically the downtown skyline area have two distinct lighting systems; the normal illumination of the architecture and the festive

illumination to occur during special and media events. This provides the ability to customize the lighting to the needs of all those involved and keeps the integrity and awe of the lights when they do appear.

Ultimately, the research findings of tourists in conjunction with the literature review and information gathered from the Singapore government, architects and planners provided a result that was somewhat expected but simultaneously a little clearer. The ability to provide one illuminated experience that would create the 'ultimate tourism experience' to all whom engage with it is impossible. The large variety of lighting purposes and types make it practically impossible to fully understand the motivations for one experiencing it. This is because the background and previous experiences of the millions of tourists who visit Singapore are vast and their desires are all different. A comparison of ones previous experience with lightscapes to the experience in Singapore needs to be explored. It can be gathered however, that from the research interviews that most people do not actually recognize the lighting experience unless it is brought to their attention. Lighting to them is an element of the experience but is not often singled out.

Experience vs. Perception

Through the academic literature on individual tourist perception theory, there is a clear understanding of the factors that impact the overall outcome of one's experience. Of the factors acknowledged in the secondary research ones perceptions of an experience is clearly relatable to their personal experience and background in similar environments. Through the analysis of the qualitative short interviews with tourists, particular attention

was made to determine any statements that compared ones experience in Singapore with those experienced preciously resulting in three broad variations of engagement (minimal, basic and advanced) as seen in table 09.

Background Experience	Expectation	Singapore Experience
Minimal Urban Light	vs.	Advance Urban Light
Basic Urban Light	vs.	Advance Urban Light
Advanced Urban Light	vs.	Advance Urban Light

Table 09: Experience of previous urban lightscapes to Singapore lightscapes.

Minimal Light Experience > Singapore "Advance" Lighting

Tourists visiting Singapore with little experience in destinations with advanced urban lighting provides a sense of theme parkification and a 'wow factor'. Everything is bigger than life and often extremely appreciated. The lighting is more likely to stand out consciously in this experience. The perception of one's experience during this phenomenon tends to sway to two extremes. Perception of advance lighting when one's previous experience of advance lighting is minimal, results either in awe and a sense to it experience again or be disgusted by the amount of light pollution and waste of electricity. In some cases, a person would prefer the stars and the moonlight. It is important to note however, that based on my interviews and asking what type of destination they would like to experience, a majority chose the image with the more advance lighting where only a few chose the more natural lit destination.

“Basic” Light Experience > Singapore “Advance” Lighting

Tourists visiting Singapore that have had previous experience with basic urban lighting environments acknowledge lighting as a conscious element of their experience. However, the conscious lighting experience is significantly less obvious. This is probably the most common of experiences for tourists of Singapore, as it is one of only major tourism destinations that have advanced lighting technologies, multiple lightscapes and is controlled by one uniform managing body. As suggested in Maslow’s recommended emotional feelings of entertainment, one’s experiences would commonly fall into two categories; those with positive interests in lighting the experience would tend to result in enjoyment and attraction of the experience whereas those whom are discouraged by the amount of lighting may feel dissatisfied or annoyed by the amount of illumination.

“Advanced” Light Experience = Singapore “Advance” Lighting

When tourists of Singapore have had previous experiences with advanced urban lighting from other destinations is interesting because advance lighting is a normalcy of this individual’s experience. In this case, the lighting usually is not consciously noted however it is expected and compared. However, to experience a new environment different than one’s daily routine that is illuminated. First impression of lighting provides a sense of anticipation, awe and contempt. It is commonly only when the individual is seeking nature or less technology (whether due to interest or environmental sustainability) that one would think otherwise.

Background Lighting Experience vs. Minimal Lighting Experience

The areas of focus for this research are in 'advanced' urban lighting areas within Singapore. However, it is important to acknowledge that there are other types of lighting engagements that are minimal in urban lighting. As a result, the following are three suggested environmental experience vs. destination in minimal lighting environment (Table 10). This suggested finding should be further researched in more specific urban lighting perception research.

Background Experience	Expectation	Minimal Urban Light Experience
Minimal Urban Light	vs.	Minimal Urban Light
Basic Urban Light	vs.	Minimal Urban Light
Advanced Urban Light	vs.	Minimal Urban Light

Table 10: Comparison of previous urban lightscapes to minimal destination lightscapes.

Minimal Light Experience = Minimal Urban Lighting

Assuming the individual knew what to expect, this phenomenon has little or no relevance. The lightscape experience would be normal and what is expected as the essentials to function and feel safe within one's environment. The lighting would for the most part never be a conscious point of topic unless there was a lack of it.

Basic Light Experience = Minimal Urban Lighting

An individual who has experience in basic urban lighting destination may or may not consciously think about lighting consciously in a minimal urban lightscape. This phenomenon is truly dependent on a multitude of factors such as purpose of engagement and expectation of destination.

Advance Light Experience = Minimal Urban Lighting

In this particular case, there would be the assumption that the individual is looking to escape the 'big city' and return to basics for a while. This phenomenon is typical not based on lighting but the need to escape commercialization and is often nature-based experiences. The lack of lighting can be consciously thought about however is unlikely unless not expected. It is also possible to consciously think about lighting after experiencing a clear night of stars with no light pollution.

Summation

This breakdown of lighting backgrounds in relation to potential lighting experiences it provides the conclusion that lighting the ultimate tourist experience that can be applicable to everyone is virtually impossible. The tourists emotional response as perceived by previous experience ultimately drives the destination perception and the emotional stimulus in which it created. This chapter has provided qualitative data obtained from in depth and short interviews in the field. The demographic results of the short interviews have been provided to show that care was taken to ensure validity of results and participant neutrality. In the following chapter, these results will be compared with the

research obtained from the Literature Review (Chapter Three) and the Background (Chapter four) to formulate a discussion on how the findings of urban lighting impact the tourists experience within Singapore and whether it is a viable option for the future design of urban destinations.

CHAPTER SIX

Igniting the Flame

This chapter will be focused on synthesizing the research results with the lighting quality framework and psychobiological/psychological frameworks presented in chapter three. Synthesizing the findings will conclude whether the goals of the government to provide a place to 'explore, exchange and entertain,' have been achieved. More importantly, the comparison will provide whether an ultimate tourism experience is possible and how urban designers can enhance the design-experience relationship in the future. The discussion of secondary literature found in the literature review in collaboration with the field research will help determine the importance of urban lighting in the tourism experience and whether urban lighting should be an area of focus for future urban design destinations.

"The future of lighting is in connecting closer to people. Light gains much more dynamic and adaptive qualities, and our interaction with it richly involves the social, physical and emotional capabilities of people. Light will be an actor in our environment, with an impact on the way we act in our daily lives." Dr. Phillip Ross

Lighting Quality

The importance of lighting quality is increasing by the day as more awareness of lighting design and environmental impacts are studied. However, lighting quality is a complex phenomenon involving a myriad of factors that play in defining quality lighting. This complexity is due to improbability of universal individual backgrounds. However, as Veitch (2001) stated, individuals expect the ability to see and carry out their nocturnal activities. For some individuals, how, why or what is lighting the environment does not

matter as the activity or experience is expected and normal as has been found in this research. A juxtaposing position is that the in order for the lighting to be of quality, it must incorporate economical, architecture and individual awareness simultaneously, therefore there is nothing to lose for designers to take all elements into consideration while designing.

The findings of this research suggest that lighting does impact ones experience and therefore it's important to establish lighting of the highest quality to benefit all parties and factors. Even though the sample size was small in this research, the negative findings were all based on awareness of the environmental impacts lighting may be creating. A common theme in interviews and secondary research from industry urban lighting designers is that less is more. For much of the 1990's, the idea was that the more lighting, the better the attraction. A recognized example of this philosophy is Hong Kong were lighting was installed in a 'my building is brighter then your building mentality' that did not take into consideration all the elements of 'quality lighting.' It wasn't until 2010 when urban lighting was identified as a problem by the Lighting Design Association, that the destination was not legible and was blending into each other, giving no sense of direction and form. As a result, Singapore's Urban Redevelopment Authority has used the mistakes of Hong Kong urban lighting as a learning curve better development. Therefore, the consideration of lighting quality is necessary in order to develop an ultimate lighting experience.

As Veitch (2001) mentioned, research in the understanding of lighting quality does not take away from the potential creativity and importance of lighting designers. However, Veitch requests that the design process should incorporate all effected elements and needs of parties involved. In addition, light quality is not a factor that is determined by the light alone. Light quality is defined by its relationship to the environment in which it serves. Lighting is useless without an environment to serve. Therefore, lighting quality will not result in the ultimate tourism experience alone, although lighting quality helps eliminate potential negative perceptions of urban lighting if designed properly.

The continuous advancement of lighting technology also means that there is a continual need for the understanding and execution of lighting quality to be achieved. As such, the importance of continual feedback from parties interacting with urban lighting should be a never-ending cycle. If the needs and views of those whom it affects are not being met then there is no chance of achieving quality lighting or an ultimate tourism experience. A designer may be aware of initial and basic needs when creating a design but often there are new areas that need to be addressed once such designs are implemented and often are discovered by those engaging within the space. As a result, Singapore's Urban Development Evaluation Cycle is effective in maintaining the best possibility of providing or developing quality lightscapes. Architecture, economics and individual well being when considered together are the stepping-stones to an ultimate lighting experience.

Architecture

The element of architecture design and practices in creating quality lighting is an important element to the overall success of lighting efficiency and practicality. Lighting

design form, composition, style and collaboration with modern design codes are an integral element in achieving an environment complimentary design. Architectural lighting alone could be effective in providing an environment that is bright and complimentary in design to its environment but may not be the most practical, efficient or environmentally friendly when not taking individual needs and economics into consideration. If a design incorporates the needs of the individual and the environment, the design may be effective for 'today' but is impractical for 'tomorrow,' as it would not be economically or environmentally friendly and not sustainable. Alternatively, a lighting design that is complimentary to its environment and is economically and environmentally efficient would be useless if it did not meet the need of the individuals engaging within the environment.

Economic

As energy use and environmental awareness are becoming ever more important to not only the future but to the design of today, the economic element of lighting quality must not be taken for granted. As technology progresses it is important to continue to educate designers of the most efficient and economic lighting technologies available and the most efficient strategic lighting practices and standards. The need for lighting education extends beyond just the urban designers and managers. The tourists and locals who experience these destinations should also be educated on how the urban lighting effects environmental, economic and sustainability. The accessibility of knowledge is part of an individual well being and therefor makes economic education important. Singapore actively promotes the importance of educating and promoting a sustainable yet attractive

destination. As such, Singapore has become known as a leader in urban lighting design and as one of the most 'green' and environmentally friendly destinations in the world. Some interviews with tourists suggested the importance of 'going green' as a major contributing factor to their individual well being. However, while conducting research there was an article in the Singapore Strait Times (2012) that accused the Singapore Tourism Board of requesting that all central business district buildings leave all lighting on throughout the night during the Singapore Grand Prix event. The issue from the accuser was how could Singapore government be 'green' conscious if they are requesting 'a waste of electricity.' However, lighting up the city initial goals of creating a 'vibrant city' would only be achieved if the lighting were on display. The fact that it was during the Grand Prix, an event Singapore hosts at night meant that a 'vibrant city' was exposed to millions of viewers around the world watching through various media streams showcasing a 24/7 city that is vibrant and alive. The fact that both sides of the situation are understandable, it is just another example of how individual well is manipulated by individuals' background and experiences.

Individual Well-Being

The expectations of urban lighting as suggested in previous research (Veitch, 2001; Mosseri, 2011) is that lighting supports the individual's well being of those engaging within it. As humans in the modern world, many of us expect our standard lighting needs to be met including the ability to see, interact, engage with our activities, communicate, compliment our experience, help create a sense of safety and provide an aesthetic environment. Through this field research, the importance of urban lighting on an

individual's well being can be confirmed through the majority findings that lighting impacted the tourists perception of safety, aesthetic, wow factor and interest. Ultimately, it is the individual's well being factor, that lighting is important in the first place. This does not mean that it is any more important than that of economic or architectural design standards but it could be suggested the needs of the individual should be the goal of the design using economically friendly practices. At such time, lighting quality can truly be achieved.

Individual Outcomes

If there is one thing to take away from this research, it is that lighting the ultimate tourism experience cannot make the ultimate experience, however it can provide the opportunity for one to occur. One's experience weighs on many factors outside of third parties control, making an experience highly unpredictable. The experience of an urban landscape as described in the previous research suggests that one's perception of a destination is heavily dependent on the previous experience and expectation from similar destinations. In the realm of urban lighting experience, one's hometown, experience in similar destinations and exposure of expectations are all contributing factors to the perceived reception of one's experience. The myriad of 'other factors' also plays a strong role in the perceived outcome even if the destination lighting provided its best atmosphere. For instance, if one is sick, it can ruin the whole experience of the destination, as the whole experience could not be enjoyed. If someone is having financial issues then they may not be able to relax and enjoy the environment they are in because they are continually worried and not fully consumed by their environment. Ironically, it is these very complicated life worries that people look to entertainment and holidays for an escape.

However, the findings of this research suggest that urban lighting does not consciously play a defining part in one's experience however, it plays a role more then they think.

None of tourists interviewed during this research mentioned lighting as a reason for visiting Singapore. However, when asked to chose between a picture of the same destination with the only difference being the urban lighting being turned on at night, almost all respondents chose the lit environment. As stated in the results section, the tourists were asked why they preferred the top destination over the bottom destination.Again, at no point did the respondents say it was the 'lighting' that made the difference. Instead vibrancy, color and 'looks more exciting' were the type of responses received. Those who did not choose the 'lit' destination were consciously aware and promoters of nature and environmentally friendly experiences stating that the location was 'too much' and felt too much like a 'theme park.' The key point to pull from this is that for a large majority of the respondents lighting did play a major role in their experience and developing their interest however they are not aware of it.

As discussed in chapter two, the triangulation of three different sources involved in Singapore's urban lighting (URA, Secondary Research, Tourist) could help determine the effectiveness of the lightscapes on the tourism experience. Through this approach, the goals of the URA to create an environment that is legible, engaging and efficient has been executed through the creation of design codes and practices that are enforced to ensure an communal aesthetic design that takes into consideration all parties affected. The secondary research and importance of the economy provided previous research on the importance of sustainability, efficiency and marketability. It was determined that there is

a myriad of factors that come into play with one's perception of a lightscape and is impacted the most by one's previous experiences. Finally, the results from the tourist interviews suggest that lighting plays an important role in one's experience and their perception of the destination. However, this psychological phenomenon is not one that happens consciously. This is suggested by the results because the event and interaction with urban lighting for many has been expected and normal, thus not being a conscious experience unless it is absent. The combination of these elements suggests that the urban lighting in Singapore is effective because the results state that it is often unnoticed. As lighting should be a complimentary element to the environment, going unnoticed is not a bad result.

Urban Lightscape Tourist Interaction Theory (ULTIT)

The future of the lightscapes within Singapore will be constantly evolving as technology and the understanding of light interaction is developed. Thus, the URA's feedback cycle is integral to the overall success of the development of future lighting plans and a platform for designers to use to develop the most effective, efficient and engaging experience possible. At such time, the ingredients to an ultimate tourism experience from a lightscape perspective have been achieved. This feedback cycle in collaboration with the understanding of lighting quality provides the foundation for the ultimate tourism experience that limits potential negative perceptions.

Figure 23: Urban Lightscape Tourist Interaction Theory

CHAPTER SEVEN

To Light or Not to Light… That is the Question.

Major urban tourism destinations are asking themselves whether urban lighting should be an area of focus and rightfully so. Lighting is integral for destinations to be attractive during nocturnal areas and the 'livability' and 'legibility' of a destination. This chapter will reiterate the key arguments of the thesis in correlation with the research findings and discussion found in chapters five and six. The research findings have proved that lighting is an integral part to enhancing the cities livability, aesthetic and the tourism industry however there is no universal ultimate lighting experience. The site-specific study of lighting initiatives within Singapore provided a platform for future urban renewal lighting developers to establish a better understanding the role urban lighting has on tourist perception, consumption and experience. It is only when urban lighting is ineffective or vacant that we realize our reliance on this fundamental element of urban space. Effectively, urban renewal committees should not take the importance of urban lighting for granted and instead, should actively promote and highlight the foundations of existing landscapes.

Singapore being one of the first countries to understand and recognize the importance of urban lighting has established lighting initiatives to help ensure that Singapore's image is one of a vibrant city by providing an environment for locals and visitors to explore, exchange and experience. It is important to consider that these lighting incentives and projects do not result in a livable and vibrant city solely, however, contribute to the

overall urban experience in collaboration with the urban environment, providing benefits for all involved.

The vision to develop a 24/7 city that is vibrant and full of energy has been established within Singapore by creative and managing well-planned lighting plans that involve all parties affected from the public, private sector and government. The revolving cycle of feedback and advancements in technology have allowed Singapore to continual grow as an urban lightscape through quality, effective and efficient lighting in its individual purpose. The Urban Redevelopment Authority's 'Light Master Plan' for the districts have inspired the question amongst lighting consultants to see how lighting has helped shape the nightscapes within Singapore and influence the perception of the lightscapes (Asia Lighting Design Network, 2014). In conjunction with the further understanding of light perception in urban environments, the Asia Lighting Design Network has also identified the need for lighting designers and urban design consultants to talk to each other to continue developing quality lighting experiences.

The opinions and suggestions of the tourists whom were interviewed serve as a platform of effectiveness of the lighting techniques and provide academic literature that can improve future lighting strategies and improvement of future lighting projects. As a result of this thesis, a foundation for urban lighting as an important role in urban renewal and infrastructure in society and academia has been presented. This work contributes to the academia of nightlife studies focusing specifically in Singapore, the tourism industry, urban renewal, lighting and architecture by providing a reference of to a variety of

impacted fields. Most importantly to the researcher, the thesis provides research that helps understand the multiple processes and psychological experiences that affect how illuminated nightscapes are perceived, experienced and translated from the consumer. The more knowledgeable the designer is about how one experiences an urban lit landscape, will only help provide future quality designs that are effective, efficient and engaging.

Singapore's development of urban lighting engages all the attributes and preferences humans look for and is ideal for the tourism industry. The lightscapes have the most impact on tourists because they experience the environments for the first time and are not part of their normal environment. The effective and strategic design lightscapes have resulted in legible and coherent environments that feel comfortable, engaging and unique as suggested by Kaplan (1998). Singapore integrates their urban lightscapes by using light temperatures and angles that replicate natural lighting and sense of depth. The lighting serves its purpose as a feature that compliments the overall image and does not glare out from the rest of the environment. Lighting ties urban elements together and can be used like make-up to make features look better than they may be.

Singapore's goal to be a destination to explore, exchange and entertain is certainly one step closer through its integration of advanced urban lighting. The urban lighting extends daytime activities into the night hours and makes it possible for businesses, work and social life to continue at hours, which would not be as efficient if light was absent. By designing the lighting to compliment the aesthetic of the environment, the night doesn't

feel like its hour. Lighting provides the opportunity for people to exchange and interact with each other during nocturnal hours. Light as an attraction has also provided the opportunity to entertain, engage and interact with through light shows and light festivals. Even though lighting itself does not achieve these goals alone, they would certainly be a lot more difficult to achieve at night without.

Theoretical Contribution

As human senses are a major contributor to one's experiences, it is important to note that vision is not the only factor of one's experience. Previous research also backs up this work up by stating that the sensory experience is combined with ones knowledge to create the 'experience' (Law, 2001). This analysis of results combined with the overall objectives of the planning committees provide different perspectives from all those involved and how they shape our experience outcomes.

Policies

This thesis focused on enhancing the qualities of lighting throughout urban spaces however it is important to note that policies are now being placed throughout the world to limit urban illumination or at least to control it more effectively. This side of urban illumination can be referred to as the 'darker' side of urban illumination. It is important to note that urban lighting does have a political side to it as it does have a utilitarian and aesthetic logistical element. For example, Lake Tekapo in New Zealand has a very strict urban lighting policy and for a good reason. Lake Tekapo is home to one of the southern

hemispheres largest telescopes and is a remote part of the country. The strict lighting policies within the town allow for minimal light waste and environmental impact.

In Singapore's case, the urban planning structure is predominantly a top – down structure so it is important for the urban planners to consider how their implementations will affect the society. Essentially, the implementation for the lighting cannot only benefit the elite elements of the country but also must provide the same amount of attention to the areas that need improvement. Ultimately, the implementation of lighting projects should result in effective and aesthetically pleasing lighting that can provide a sustainable and enjoyed urban space.

It is also important to note the potential environment impacts these lighting projects have on their surrounding environments. Even though lighting can provide an attractive façade or environment, it must be taken into consideration during the design phase to create a 'green' lighting system that benefits the cities environment and is low maintenance. With the continued advancements in lighting technology and low energy consumption light sources, Singapore has been able to promote themselves as a global leader in the fight against global warming while simultaneously increasing its lighting package. Therefore when releasing a new lighting plan to the public, information also includes how the URA are considering the environment. Thus, it is important to include the economic impacts and how they are being considered into all urban design plans.

Much like Singapore's continuous cycle of feedback and improvement, it is important to ensure that feedback opportunities are not only available but also welcomed and taken into consideration. Ultimately, the public experiences the urban lighting and can share their opinions of the outcomes of their experience. This can provide designers and planners the opportunity to fix any unforeseen problems or make improvements in gaps not noticed by the designer and management team.

Furthering Urban Lighting Perception Research

This research subject is relatively new. As a result, these findings serve as a starting ground for future research to be undertaken and is not a conclusion to the research lightscape perception design basis for Urban Lighting Master planning. Existing research focuses on codes and guidelines for urban lighting design, there is a need for more case study research of urban lightscape perception to fully understand the role lighting has on one's experience. This research was a small sample size of the tourist's numbers that actually visit Singapore on a yearly basis. Based on the results and findings, further research is needed focusing specifically on categorizing the tourists previous experience to truly understand the perception phenomenon. For the sake of the URA, this suggested further analysis is not necessarily important, as they are not targeting any tourists' previous urban experiences. However, this research is integral and beneficial for the psychological understanding of human lightscape interaction. As this research is applicable and changing in real time, further research should be detailed and quick as technology is constantly upgrading.

The analysis of the findings has presented a variety of opportunities and potential for

future studies in urban lighting and lightscape perception. Continuing research in these suggested areas can help organizations like the URA to continue to develop quality lighting that stimulates coherent and exploratory engagements. The following is potential subjects for further studies.

Design Questions:

- Does urban lighting colors (warm and cool) affect the mental body temperature of a destination?
- How does urban lighting impact the tourist perception when the tourist goes to a 'minimal lighting' environment?
- Can a controlled and managed lighting program work in an environment that is not government controlled and enforced?

Perception Questions:

- Chinatown day vs. Chinatown night experience? The only major difference is that at night the market is illuminated through artificial lighting instead of natural light. So why do most people attend at night?
- Do places like Hong Kong which have an ample amount of lighting but no design control, have the same perception effect of controlled urban lighting found in Singapore?
- Why is it that one of the most important factors to nightlife is taken most for granted?
- When is urban lighting too much?

Summation

As Singapore continues to enhance the 'vibrant' city image in the coming years, there will be no doubt that changes will be observed in the lighting of nocturnal urban spaces as it is seen as an integral element to the city's image and long term urban plan. Urban lighting design is integral to the overall experience of an urban destination in order to create a legible, coherent and exploratory environment. The constant advancements in lighting technology and further understanding in design practices means the urban lighting development is a topic that is not going away anytime soon. Thus, it is important that urban lighting development take into consideration all potentially impacted elements. This consideration and planning can help reduce the risk of inefficiencies and provide positive results to all involved.

Through the analysis of tourist perception, there is now a case study on the urban lightscape and tourist interaction within Singapore. As a result, the tourist experience of such a lightscape can result in a destination that is 'vibrant' and a global tourism destination. Further research is suggested to be taken in specifically targeting individual lighting perceptions based on previous background experience of lightscapes. It should be noted that due to the rapid growth of lighting technology and interest in urban lighting sustainability, lighting design and human perception would require constant study of human perception. Ultimately, the perception of urban lightscapes is purely an individual phenomenon that occurs more often than not subconsciously and is rarely noticed until it provides a 'wow factor' or is vacant in a time of need.

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APPENDIX A

Consent Form

Project title: ***Lighting the Ultimate Tourism Experience***

Project Supervisor: ***Dr. Charles Johnston***

Researcher: ***Andrew Potvin***

- ○ I have read and understood the information provided about this research project in the Information Sheet dated 09 September 2012.
- ○ I have had an opportunity to ask questions and to have them answered.
- ○ I understand that notes will be taken during the interviews and that they will also be audio-recorded and transcribed.
- ○ I understand that I may withdraw myself or any information that I have provided for this project at any time prior to completion of data collection, without being disadvantaged in any way.
- ○ If I withdraw, I understand that all relevant information including tapes and transcripts, or parts thereof, will be destroyed.
- ○ I agree to take part in this research.
- ○ I wish to receive a copy of the report from the research (please tick one): Yes○ No○

Participant's signature: .....

Participant's name: .....

Participant's Contact Details (if appropriate):

……..

……..

……..

……..

Date:

Approved by the Auckland University of Technology Ethics Committee. AUTEC

APPENDIX B

Participant Information Sheet

Industry Participants

Date Information Sheet Produced:
30 October 2012

Project Title
Lighting the Ultimate Tourism Experience

An Invitation

I invite you to participate in my master's research. The title is: 'Lighting the Ultimate Tourism Experience,' and the goal is to identify the relationship between urban lighting and the tourist experience. This research will qualify me for the Auckland University of Technology, Master of Tourism Studies degree.

What is the purpose of this research?

The research will fill a gap in the relationship between urban lighting and the tourist experience. The findings can result in potentially globally significant research, assisting in the future of urban lighting design and the tourism industry.

How was I identified and why am I being invited to participate in this research?

You have been identified as a potential participant through your involvement or knowledge with Singapore's' lighting initiatives or the Singapore tourism industry. Your contact information was obtained through public information or referral.

What will happen in this research?

The research involves interviews with urban design, tourism, and lighting industry professionals. You will be given the questions upfront and have the right to decline your participation.

What are the discomforts and risks?

It is very unlikely that you may feel uncomfortable participating in this research. There should be no personal risk to you as the research does not identify you by name.

How will these discomforts and risks be alleviated?

The structure of the interviews will completely confidential and optional.

What are the benefits?

The research findings can potentially influence planners of other destinations around the world to use lighting as a way to influence the tourism experience. The academic community will benefit from this research as there is little research on the impact lighting has on the tourists experience.

How will my privacy be protected?

Your identity will never be released to anyone and you have the opportunity to receive a copy of the research findings at your discretion. All personal information and data will be locked and secured in a university cabinet only accesssible by myself and my supervisor. To ensure your confidentiality, the information will be partially transcribed using alias names.

What are the costs of participating in this research?

In-depth interviews will take place in a comfortable setting and occur within a two hour time frame. Your participation is voluntary and you can end the continuation of the interview at any time. You may be requested to have a follow up interview after the field research has been conducted which would take no longer then one hour. Approximate time required for project is two to three hours.

What opportunity do I have to consider this invitation?

Your participation with this research is voluntary and you have the right to withdraw at any time prior to the completion of data collection.

How do I agree to participate in this research?

You will agree by signing the research consent form that will be provided to you. This will take place before any formal research takes place to ensure your confidentiality.

Will I receive feedback on the results of this research?

Industry professionals participating in an in-depth interview will have the option of receiving the results from the tourist interviews once analysed.

What do I do if I have concerns about this research?

Any concerns regarding the nature of this project should be notified in the first instance to the Project Supervisor, *Doctor Charles Johnston, Charles.johnston@aut.ac.nz or* +64 9 921 9999 extension 5120.

Concerns regarding the conduct of the research should be notified to the Executive Secretary, AUTEC, Dr Rosemary Godbold, *rosemary.godbold@aut.ac.nz*, 921 9999 ext 6902.

Whom do I contact for further information about this research?

Researcher Contact Details:

Andrew Potvin, dapotvin@me.com

Project Supervisor Contact Details:

Doctor Charles Johnston, Charles.johnston@aut.ac.nz

APPENDIX B2

Participant Information Sheet
Tourist Interview

Date Produced: 30 October 2012 **Project Title:** Lighting the Ultimate Tourism Experience

An Invitation

I am formally inviting you to participate in my master's research, entitled, 'Lighting the Ultimate Tourism Experience.'

What is the purpose of this research?

The research will fill an academic gap in the relationship between urban lighting and tourists whom experience it.

How was I identified and why am I being invited to participate in this research?

You are a tourist in Singapore within one of the pre-determined urban precincts.

What will happen in this research?

The research involves a short interview on the current urban lighting areas that you are experiencing.

What are the discomforts and risks?

It is very unlikely that you may feel uncomfortable participating in this research.

How will these discomforts and risks be alleviated?

The interview questions are general and no response can be wrong.

What are the benefits?

The findings can influence future urban lighting design to meet the desires of tourists in urban destinations.

How will my privacy be protected?

To ensure your confidentiality, the information will be annotated using alias names.

What are the costs of participating in this research?

The field interviews will take ten to twenty minutes. No follow up will be required.

What opportunity do I have to consider this invitation?

Your participation with this research is voluntary. You have the right to decline participation.

How do I agree to participate in this research?

You will agree by signing the research consent form that will be provided to you.

What do I do if I have concerns about this research?

Any concerns regarding the nature of this project should be notified in the first instance to the Project Supervisor, *Doctor Charles Johnston, Charles.johnston@aut.ac.nz or* +64 9 921 9999 extension 5120.

Concerns regarding the conduct of the research should be notified to the Executive Secretary, AUTEC, Dr Rosemary Godbold, *rosemary.godbold@aut.ac.nz*, 921 9999 ext 6902.

Whom do I contact for further information about this research?

Researcher Contact Details:

Andrew Potvin, dapotvin@me.com

Project Supervisor Contact Details:

Doctor Charles Johnston, Charles.johnston@aut.ac.nz

Approved by the Auckland University of Technology Ethics Committee,
AUTEC Reference number (12/248)

APPENDIX C

Suggested Design Interview Questions

What is a brief background of your profession?

What were the goals that the Singapore urban lighting projects look to achieve?

What areas of focus were used to try and achieve these goals?

What effects did you hope the lighting installations would achieve?

What reactions did you hope to achieve from those whom experience the lighting?

What does the role of lighting in nightscapes mean to you?

Present Questions

What purposes does the installation of lighting serve today? Has it achieved its initials goals? What are its new goals?

What impacts has the projects resulted in the Singapore experience? Both negative / positive?

Has the lighting impacted tourism? How?

Has it proven to be cost effective?

Future Questions

What do you think the future has in store for such lighting applications within urban lighting design?

What would you do differently, if any, for future projects of similar goals?

Would you recommend the implementation of lighting in urban tourism destination to other growing and well-established tourism destinations?

APPENDIX D

URA Interview Questions

Background Questions

What is a brief background of your profession?

What were the goals that the Singapore urban lighting projects look to achieve?

What areas of focus were used to try and achieve these goals?

What effects did you hope the lighting installations would achieve?

What reactions did you hope to achieve from those whom experience the lighting?

What are the overall goals of the Lighting Master Plan today?

Present Questions

What purposes does the installation of lighting serve today? Has it achieved its initials goals? What are its new goals?

What impacts has the projects resulted in the Singapore experience? Both negative and positive?

Has the lighting impacted tourism? How?

Has it proven to be cost effective?

Future Questions

What do you think the future has in store for such lighting applications within urban lighting design?

What would you do differently, if any, for future projects of similar goals?

Would you recommend the implementation of lighting in urban tourism destination to other growing and well-established tourism destinations?

APPENDIX E

Lighting the Ultimate Tourism Experience
Interview Result Sheet

Date_____ Audio code:_____

Tourist: Yes / No

Place of Residence: Asia / North America / South America / Africa / Europe / Australia / _____

What is your age range? 18-23 / 24-30 / 31-40 / 51+

What attracts you to the districts of interest? Waterfront / Architecture / Light / Transport / Culture / Food / Events / Markets/ _____

What districts have you visited? Chinatown / Fin. Dist / Clarke Quay / Marina Bay / Orchard Dist / Sentosa Rst / Gardens by the Bay

Did lighting in these locations play a role in your overall experience?
Chinatown / Fin. Dist / Clarke Quay / Marina Bay / Orchard Dist / Sentosa Rst / Gardens by the Bay

What Singapore destinations do stand out to you based on their lighting atmosphere?
MBS Wonder Full / Clarke Quay / Sentosa Light Show / Gardens by the Bay / Skyline / Chinatown / _____

How did the lighting impact your experience of the destinations?

	Felt Safe	Interest	Aesthetic	WOW'	No Impact	Other
MBS Showl						
Clarke Quay						
Sentosa						
Gardens 'Bay'						
Skyline						
Chinatown						

Would you like to see more focus on urban lighting in urban tourism destination around the world?
Absolutely:
Yes:
Neutral
No:
Other:

How can lighting be more effective in developing the "Ultimate Tourism Experience?"

APPENDIX E2

Tourist Additional Questions

What is your country of residency?

What age range do you fall under?

What is the primary purpose of your time here in Singapore?

What elements brought an interest in visiting Singapore?

What destinations would you recognize as having a strong urban lighting presence?

What interests have brought to this particular location?

What elements of this location stand out for you?

How do you feel within this environmental landscape?

How has the lighting impacted your experience within the area?

Would the outcome of your experience be different if it was not thematically lit?