

WAYFINDING AND ACCESSIBILITY IN THE SAN ANTONIO RIVERWALK: A MODEL FOR URBAN DESIGN EDUCATION

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Abstract

The San Antonio RiverWalk is an exquisite and dynamic destination for tourists from Texas, as well as from other states in the US. Because of its location in downtown area, the entire area including the RiverWalk, has been incorporated into various guides and maps, all of which seem to be disregarding the interrelationship between the RiverWalk level and the street level. While most maps show either the street level or river level, there are none that illustrate the accessibility the RiverWalk offers to major attractions and buildings at both levels, and none offer an orientation for pedestrians to the destinations on the RiverWalk level, which encountered the lack of visual clarity due to the multilayered terrain. This study investigates the visual obstacles of wayfinding in, and accessibility to the East RiverWalk area. This study, which represents the first phase of a multi-phase analysis of a broader research, emerged from urban research undertaken by a group of architecture educators and students which sought to allow students to become more involved in empirical and action research. A number of tools to investigate pedestrians' ease of wayfinding and efficiency of identifying accessible transition points in the East RiverWalk area were developed. These tools categorize a number of spatial urban and accessibility features (i.e., entryways, ramps, staircases, and circulation elements) which were used to create 3-D virtual environments demonstrated on two focus groups. The study concluded with a number

of recommendations for improving the existing visual and graphic tools, enhancing planning and design considerations, and incorporating the voice of community businesses in addressing wayfinding and accessibility concerns. This study and its outcomes not only engage architecture students in urban research, but also emphasize the significance of the RiverWalk in creating a more livable downtown San Antonio.

Keywords

Wayfinding, accessibility, qualitative methods, urban pedestrians, San Antonio RiverWalk

Introduction

The challenge of pedestrian navigation in most urban milieus increases with the complexity of the urban area, particularly in unfamiliar territories, and has become an even more complex endeavor throughout the field of urban tourism. This notion has been addressed by Karski (1990), who stated that urban environments have for many years been among the most significant of all tourist destinations. He emphasized that people with the means and preference for urban experiences have been drawn to various cities in order to visit and experience a multiplicity of sensations, engaging with such sensations by

both seeing and doing. Due to its complexity, which increases with the size of each city, finding one's way becomes an obstacle to tourism and a major issue for study, particularly by urban designers and planners who need to respond to what Carpman and Grant (2002) have suggested are the basic principles of successful wayfinding. These principles involve being aware of where you are, knowing your destination, knowing and following the best route to your destination, being able to recognize your destination upon arrival, and being cognitive of the process of finding a way back out (Carpman and Grant, 2002).

This process is currently a challenge for many visitors to the San Antonio RiverWalk area, which is one of the more tourist-friendly areas in the US, and which offers an abundance of activities. This area, located in the heart of a San Antonio downtown neighborhood, has been identified for this study on wayfinding and accessibility because of its richness of complex and dual-level walkways. It offers an upper level of streets, pedestrian walkways, and parking facilities, as well as a lower level of river, pedestrian walkways, and area attractions. While visitors are usually eager to explore area attractions and activities, the existing urban context encompassed in the RiverWalk experience is a product of complex structures and articulations, and irrelevant street patterns, all of which result in obstacles to finding one's way. These pathways lack the clarity necessary to facilitate pedestrians locating easy access points for circulation among the various RiverWalk elements and desired destinations.

Despite the availability of different guides and maps of the downtown and RiverWalk areas, a visual illustration of this multi-layered locale is needed. This study aims at responding to this

need through its methodology and analysis which provides a clear 3-D map of the RiverWalk area with an overlay of the street level. Such an output will ease the obstacles to wayfinding and enhance both circulation and accessibility. This study is also an attempt to provide a better understanding of the relationship between urban design research and education.

Background

Understanding Wayfinding

Finding one's way in an urban setting is a process that requires knowledge about one's current location, destination, and the spatial relationship between the two which, according to Cubukcu (2003), can be referred to as spatial knowledge. In most complex urban settings, spatial knowledge decreases the risk of decision-making influenced by uncertainty (Holscher, Buchner, Meilinger & Strube, 2009).

Wayfinding studies, as observed by Passini (1981), have mostly been integrated into the literature on environmental psychology, psychology, geography, and even anthropology. In these disciplines, wayfinding is generally portrayed as a spatial problem-solving process and, in particular, as a form of investigation of spatial orientation, and of cognitive maps and imagery.

Arthur and Passini (1992) noted that to achieve spatial knowledge, one has to take into account previous experiences and possess the ability to read and evaluate environmental contexts. This would involve the ability to understand and synthesize the spatial characteristics of a setting, as well as to determine different locations within that setting. In their study of the

relationships between signage and wayfinding, Arthur and Passini (1992) acknowledged the first use of the wayfinding term by Kevin Lynch in his book *The Image of the City*. In that book he described maps, street numbers, and route signs as wayfinding devices. Lynch's studies examined cities with regards to the legibility of the cityscape, a concept which he explained as the ease with which an individual recognizes the different components of the city and organizes them in a coherent pattern (Lynch, 1960). He also suggested that legible surroundings are the most effective means of stimulating emotional satisfaction, communication frameworks and the conceptual organizations of everyday experiences.

Lynch (1960) also concluded that there is a connection between the contextual image and the generalized mental picture of the exterior physical world that is established by an individual. The individual, then, uses the present sensation and past memories of a given experience to interpret the information that guides him or her in finding a desired location. Like Lynch, Spiers and Maguire (2008) referred to the ability to make use of long-term spatial memories to guide wayfinding. They stressed the need for a wide range of cognitive abilities in order to find one's way in a spatially extended environment.

Wayfinding as a Behavior

Wayfinding has been explored as a behavior in the context of the discipline of environmental psychology. This exploration was supported by the notion of Carpmann and Grant (2002) who emphasized the need for integrating environmental psychology analyses when design and behavioral professionals become involved in improving wayfinding in a given setting. In such

processes, wayfinding ought to be conceived as a macro-issue involving the physical and operational environments in which that wayfinding occurs, rather than being understood as something dealing with individual perception and cognitive behavior. Similar to this notion, Cubukcu (2003) stressed the importance of incorporating behavior into the process of wayfinding through the perception and cognition of a setting. While perception refers to the experiencing of the world, which happens in a particular moment of time and requires little or no information processing, cognition refers to the comprehension of an environment which is a process that involves more information processing, and requires some level of mental activity. One needs both perception and cognition to develop spatial knowledge about a given built environment in order to maintain orientation and to find a way from one location to another.

Montello and Sas (2006) also emphasized the incorporation of human factors into wayfinding and navigation. They referred to successful navigation as when one demonstrates the ability to identify one's whereabouts. This requires identifying one's location in reference to one's destination, as well as to other landmarks. Their study identified three major environmental factors that affect orientation and wayfinding, including differentiation, visual access, and layout complexity. Visibility was later examined by Omer and Goldbatt (2007) in their study which suggested that wayfinding is more feasible when a good form of the urban environment is available. This configuration of form is characterized by simplicity, symmetry, regularity, and continuity. They also suggested that a high degree of overlap between the visual fields of an origin and target landmark could help people

to construct the spatial knowledge required for wayfinding tasks (Omer and Golddbatt, 2007).

Montello and Sas (2006) added a fourth environmental factor, signage, which also includes posted maps. According to Arthur and Passini (1992), a sign's design and placement in the urban setting clearly affect orientation, as people tend to need graphic information in order to formulate an action plan with respect to wayfinding in an unfamiliar setting.

Wayfinding Tools

Successful wayfinding systems enhance the pedestrian experience, and make a pedestrian's trip both safe and easy (Grant and Herbes, 2007). Researchers have developed a number of supporting tools to investigate the experience of success in finding one's way, from the use of conventional paper maps to modern Location-Based Services (LBS) such as electronic navigation systems. These systems, according to Gasibauer and Frank (2008), are currently commonly in use. The Virtual Environment (VE) is another prominent tool that has been explored in a study by Richardson, Montello, and Hegarty (1999). They compared the use of VE for spatial knowledge acquisition by locomotion versus by viewing a map.

They concluded that: 1) even though individuals are able to acquire substantial amounts of spatial knowledge from a VE, important differences in spatial representations are found after learning from real environments; 2) map learning leads to superior performance only when directions are aligned with initial orientations on the map; and 3) the cognitive process necessary for maintaining orientation in a real environment can be used to control a virtual one. Adding to

this, the application of VE has been examined by Li (2006), who utilized a simulated LBS for investigating user preference in information requirements throughout the process of wayfinding. Li concluded that in new settings, individual need a range of information for completing spatial tasks such as wayfinding.

Designing for Wayfinding

Most designers underestimate the importance of wayfinding and rely on the utilization of signage (Carpman and Grant, 2002). However, according to Hunter (2010), incorporating the principles of wayfinding throughout the design process can help designers provide more inclusive solutions, especially when wayfinding obstacles such as poor identification of building entrances and lack of clear access from parking facilities or mass transportation hubs are issues that could be resolved during the design phase, as was clearly illustrated by Chapman and Grant (2002). In a broader context, Arthur and Passini (1992) stressed the often-seen absence of considerations regarding wayfinding during the planning of buildings or cities. As in HVAC drawings, their study urged for the generation of wayfinding plans by planners and designers. They went on to suggest what they referred to as a utopian situation which could be created via a three dimensional, colored model. This model would reduce the complexities and increase the ease of knowing one's way, as well as the direction to one's final destination.

The Study

This study developed different tools to establish a method for identifying pedestrian wayfinding in the East RiverWalk area of San Antonio, Texas. The developed tools were utilized to investigate users'

views towards spatial obstructions, including a number of visual urban features identified by the research team. The team examined the impact of those identified features on the clarity of wayfinding, as well as the ease of circulation in the RiverWalk area. This was followed by examining a number of computer-generated virtual images of the pedestrian walkways in two focus groups: 1) local employees of the commercial area and security personnel, and 2) visitors to East RiverWalk area. Focus group discussions concluded with how those two groups of users perceived wayfinding and accessibility in the East RiverWalk area, and suggested a number of improvement plans and actions.

Documenting Urban and Accessibility Features

A number of urban features and accessibility means were documented at both levels of East RiverWalk area as shown in figure 1. Students from the research team were trained in observing and documenting the urban features of the building-fronts on both banks of the river, as well as the connections between the street (the upper level) and the river (the lower level). The documentation utilized a number of field visits for the systematic coding of each feature onto a separate map showing the existing location of each feature or element. Upon completion of coding all ten features, an icon representing each element was generated, and was later placed in 3-D computer-generated map of the

area (Figure 2).

Generating a 3-D Virtual Environment (VE)

Following the documentation process of urban features, the research team identified six locations along the two banks of the river that were used to photograph different vistas. The pictures were then used to generate a 3-D VE using the following computer programs: ACAD, Rhino, Revit, and Photoshop. The virtual maps were regenerated in multiple set-ups, in which a single urban or accessibility element was excluded. The outcomes of these 3-D VE's were then presented to focus group participants.

Focus Groups

To examine the identified features and means of accessibility, independent focus groups were conducted with participants representing two types of users: 1) employees of businesses located in East RiverWalk commercial areas and local security personnel, and 2) visitors to the RiverWalk area. This selection was intended to track the views of local employees who have become accustomed to the setting, and the views of visitors who have recently experienced the setting for the first time. Discussions were conducted using a facilitation guide developed a priori by the research team to enable the team to compare a number of issues across the two groups. Focus group discussions addressed the following topics: the urban experience of



Figure 1: Graphical icons of urban and accessibility features. (Source: Authors).



Figure 2: 3-D map of the locations of identified urban and accessibility features. (Source: Authors).

pedestrians in the San Antonio RiverWalk area; perceptions regarding the visual clarity of access to the buildings and connectivity between the street level and the RiverWalk level; the impact of accessibility on both business owners and visitors; the role of the community and businesses in addressing wayfinding concerns; and plans suggested by participants to improve wayfinding

and accessibility.

Focus group discussions, each of which lasted an hour, took place in March of 2010 and were moderated, audio-recorded, and transcribed by the research team which included graduate students from the department of Architecture at UTSA. The following are a number of

considerations for each group discussion:

First: Employees of the local businesses

Data gathered from this group discussion emphasized the identified variables of wayfinding and accessibility important in the RiverWalk area. However, staff members' familiarity with the setting was taken into account. In this focus group, the digital 3-D VE created in the first phase of this project were shown to the participants in order to compare visual barriers and wayfinding obstacles. Maps for the six identified vistas included were presented in two scenarios: 1) each vista included all of the features on it, and 2) each vista with the exclusion of one or two features. The discussion concluded with a number of areas of concern and suggested plans to eliminate the difficulties currently associated with wayfinding.

Second: Visitors to the waterfront area and hotels

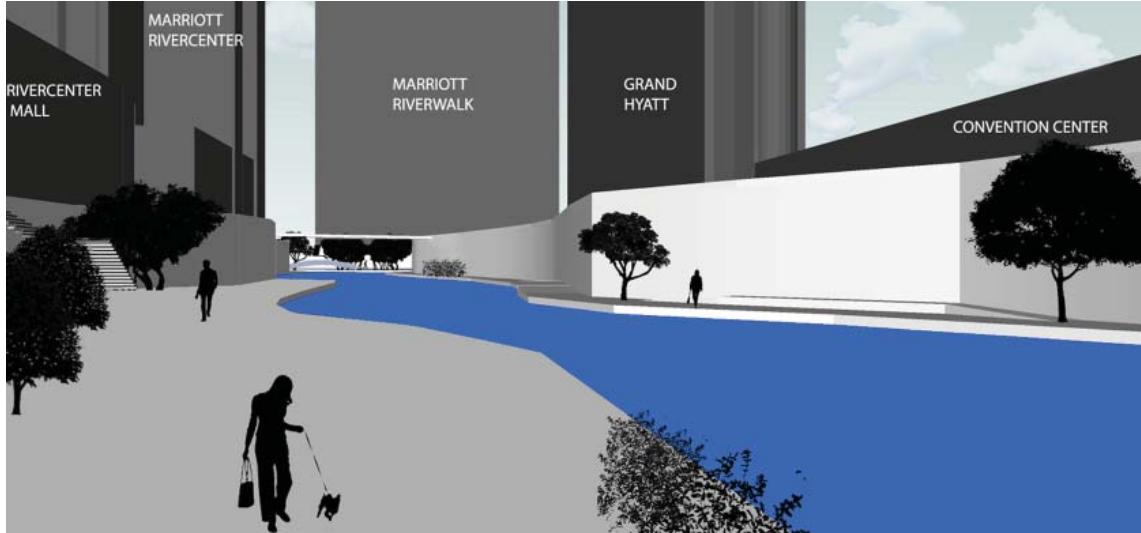
This focus group discussion provided data on the same variables investigated in the employees' discussion. Nevertheless, familiarity with the setting among this group's participants was only a minor factor due to the fact that all participants had only been to the RiverWalk area for a short time during recent visits. Throughout the discussion, the same digital 3-D VEs shown to employee participants were also shown to this group of participants (as shown in Figure 3). Discussion concluded with a number similar and yet different issues of concern and plans for enhancing wayfinding in, and accessibility to, the RiverWalk. Conclusions drawn from this discussion were compared with those gathered from the discussion with employees in order to establish the common themes and key issues that emerged among users of the RiverWalk area.

One limitation of this study design involves the use of qualitative methods, which provide rich, and in-depth information that is useful in understanding what and how people view a certain issue, and how they feel and behave. Nevertheless, due to the small number of groups and participants, qualitative findings are not capable of being generalized, though both the conclusions and the context can provide a rich depth of understanding.

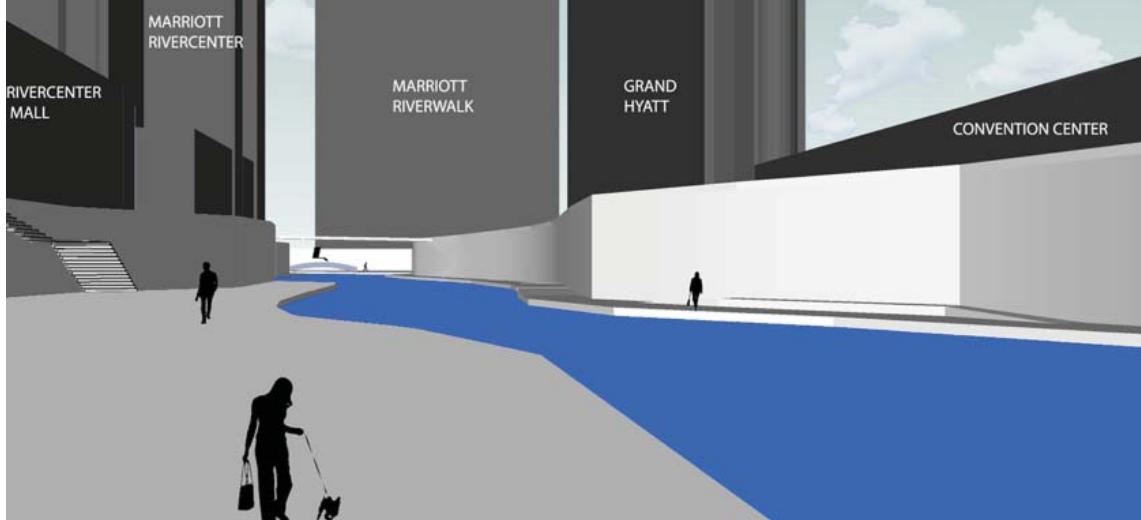
Analysis and Findings

Focus group discussions were organized around the themes and issues shown in Table 1. The themes which emerged from the focus group discussions spanned a range of issues involving the clarity of pedestrian wayfinding, as well as the ease of accessibility associated with each level and between both levels of the RiverWalk area. These issues include, but were not limited to, the ease of accessibility, the clarity of walkways and buildings, the impact on and roles of the community and local businesses, and a vision for further improvement. A number of challenges arose amid discussions involving community and businesses accountability for addressing concerns of accessibility and wayfinding, and adventurous experience of pedestrians. A special consideration was also made by the second group of participants regarding a lack of parking spaces in proximity to clear points of access to the RiverWalk level.

Discussions also stressed issues shared by the two groups, such as the ambiance of the urban features (bridges, trees and staircases), the apparent lack of readable signage, particularly on the RiverWalk level, the gap between staircases and ADA ramps and elevators, the



a.



b.

Figure 3: Virtual images of the Riverwalk level showing urban and accessibility features: a) with all features in; b) after removal of some features. (Source: Authors).

THEMES	KEY ISSUES
Ease of Accessibility	<ul style="list-style-type: none"> a. RiverWalk level b. Street level c. Connections between the two levels d. Parking
Walkways and Clarity of Buildings	<ul style="list-style-type: none"> a. Signage b. Aiding tools: Maps and personnel c. Safety considerations: day and time d. Ambiance
Impact and Roles	<ul style="list-style-type: none"> a. Community impact and role in addressing concerns b. Businesses impact and role in addressing concerns
Vision for Further Improvement	<ul style="list-style-type: none"> a. Signage b. Use of color c. Overlaying maps d. Walking vs. Parking e. Vertical accessibility f. Refining landscape g. Safety and services

Table 1: Themes and key issues emerged from focus group discussions (Source: Authors).

risk of the lack of safety precautions due to the limited width of pedestrian walkways, security concerns regarding an absence of lighting in some areas, and the need for community and business interference to address these issues with policy makers and planners. On the other hand, there were differences between the two groups' views towards a number of key issues such as railings on the riverbanks, refining the landscape, and the clarity of buildings/ hotel entrances.

Analysis of Themes and Key Issues

Participants in the focus groups were asked about the image that comes in to their minds when they think about the urban experience of the RiverWalk area. Participants shared a common view identifying that image as confusing, ambiguous, and lacking clarity. These responses were clearly distinct when each group interpreted

the causes for that view. Employees' reflections addressed a functional standpoint including hazards and safety concerns of pedestrians, and the centralization of activities and entertainment areas in segregated zones along the river which weakens the experience of a continuous unified representation of all activities along the river bank. Another point was made by the visitors' group who identified the urban experience as an image composed of a number of tall buildings, the irregularity of forms and walkways, and the ambiguity of identifying destinations due to form and articulation of confined zones. Following this broad discussion, groups were asked a number of questions concerning East RiverWalk area in particular, which concluded with the following themes and key issues:

1) Ease of accessibility

All groups responded to questions about accessibility and ADA accessible routes/facilities by stressing concerns regarding the availability and clarity of routes on the both street and RiverWalk levels. All groups agreed on the sizeable distance between street parking and access points on the street level leading to the RiverWalk, insufficient parking facilities (garages, metered street parking, and parking lots), a deficiency of readable signage for ADA-accessible entrances (ramps and elevators) due to improper use of size and color, particularly on the RiverWalk level, and only the minimum use of bridges connecting the two banks. Both groups also addressed the need for a Color-Coded Trail (CCT) at the RiverWalk level leading to major buildings, attractions, and facilities.

".....Boston is much easier to get around because they have a T system. Mass-transit. They have color code...called the "freedom trail" (historic landmarks) they have a bricked walk way. It is on a map and the brick is colored.....". Employee focus group participant, 2010,.

"....The issue is truly wayfinding and you are looking for a restaurant in point C and you are point A. color coding might help..... you are on the green or red line.....", Visitor focus group participant, 2010.

The employee group also addressed frequent concerns regarding the risks resulting from the hazardous planning of RiverWalk because of the tightness of sidewalks, which raises security concerns, especially due to the absence of railings on both banks. This became an issue that was later taken on by this group, in the form of a recommendation to increase security. On the other hand, the visitor group argued that any help that a railing might offer would also pose

implications regarding seclusion and a sense of enclosure, which would be contrary to the current sense of openness and visibility.

Accessibility considerations shifted to other areas of concern when questions were raised regarding the street level. Discussants has an absolute consensus regarding the inadequacy of parking and a lack of direct connections between parking areas and the RiverWalk level, in addition to an inability of users to visualize access points to the RiverWalk level. Additionally, visitors were concerned about emergency access to the RiverWalk level, but not to the area hotels, because of the easy access offered from the street level to the hotels and the River Center mall. Visitors stressed the time that they wasted finding convenient parking due to either unavailability or the limitation on driving both ways down downtown streets. They also emphasized the unfriendliness of the street level area because of the intertwined vehicular and pedestrian routes, and suggested that the area should be claimed as a pedestrian-friendly zone through relocating vehicle routes around the parameter.

2) Walkways and building clarity

Discussion among participants in the two groups focused on unidentifiable and invisible activities at the RiverWalk level as perceived from the street. Participants stated that despite the visual clarity and identifiable buildings on the street level, as compared to the RiverWalk level, only hotels encompasses identifiable locations due to their size. On the other hand, the access points from the street to the RiverWalk level are unclear. Both groups also raised concerns regarding the ambiguity of RiverWalk paths and the invisibility of desired destinations, in addition to the absence of references between the two levels, and to invalid references to landmarks in the vicinity.

Participants in both groups also shared the same view as they regarded a question about visual obstructions contributing to ambiguous images. Participants perceived building forms and irregular planning grids as obstructive. They also distinguished a number of contributing factors such as density, lack of space, crowds, a difficulty in finding/observing tourist guides, and the tightness of walkways, particularly at the front of restaurants. Participants also shared the same reaction toward the moderator suggestion of the removal of previously identified urban features (i.e., trees, bridges, staircases, etc.), and they stressed the importance of the ambience and charm of the locale due to the presence of these features.

".....I don't consider those things (bridges, trees, etc...) an obstacle. We need these things.....", Visitor focus group participant, 2010.

All group participants added that there is an extreme absence of useful signage, and an improper utilization of colors and sizing in current signs. In what was obviously a major concern, participants elaborated in response to questions concerning signage by stressing that there is not enough signage on both levels. However, the street level is at a more advanced stage when it came to wayfinding. Also, a lack of signage developed from problems ranging from an absence of signage for restrooms, primary destinations, attractions, locations of restaurants, and locations of access points (on both levels).

".....If there were more signs, then maybe they would keep going instead of going back.....", Employee focus group participant, 2010.

In accordance with signage, participants also

addressed the implementation of Location-Maps (LMs) as a helpful wayfinding tool. The visitor group thought that these maps, placed at identified locations along the river banks, would enhance the opportunities to find things and thus help visitors to be more adventurous. Participants also indicated that LMs are not an easy tool for everyone to read and use. A concern was therefore raised by employees group regarding the frustration visitors might experience as a result of being unsuccessful in finding desired places, an experience which might lead them give up and leave without finding the place they sought. Additionally, finding one's way to one of the area attractions, the River Center Mall, demonstrated a point of significant distinction in the ideas related by the two groups. Employees stressed that by not having signs, people often got lost, and because the visitors wouldn't have enough time to find the mall, sometimes they would give up. On the contrary, visitors did stress clarity in viewing the River Center Mall, due to its building mass. The following are some comments in their own words:

"Everyday complaints from visitors.....If there were more signs, then maybe they would keep going instead of going back....." Employee focus group participant, 2010.

".....The mall is pretty straightforward to find.....", Visitor focus group participant, 2010.

Participants also stressed their concerns regarding the safety of pedestrians, particularly on the RiverWalk level. Employees stated that individuals could get hurt or fall into the river, particularly at night, because of insufficient rail lighting. The concerns and frustrations of the participants were significant when they stated that sections in between the two ends of the

RiverWalk were more dangerous at night. They referred to the inadequacy of police patrols, people, and lighting under the bridges.

3) Impacts and roles

When asked about the impact on the community and businesses regarding issues of ambiguity and risks of inaccessible areas, participants from the two groups thought that the lack of clarity in the destinations and attractions would impact local business due to frustrations that might cause an early departure from the area without visitors reaching their desired destinations. Visitors thought that departures might reduce the number of customers for local businesses, and employees supported their view and stressed the wasted time experienced by visitors and tourists when trying to find various places. A subsequent question was addressed regarding the role of the community and businesses in addressing these concerns. Participants from both groups shared the same view that the local community and businesses should have a representative to address their concerns with the RiverWalk authority. They stated that if the community and business representatives stood up and said something, in the end they would benefit. They also believed that there should be an association of business owners, hotel managers, and residents that could formally address these different issues.

"I think they should take initiative and write the city, yeah," Employee focus group participant, 2010.

4) Vision for further improvement

Participants from both groups stressed the need for more utilization of signage at different locations, particularly on the RiverWalk level. They indicated that handicap-accessible spots,

the location of restrooms, overall orientation, the locations of river boats and other major destination spots, and finally, staircases needed to be particularly addressed by signage which, in turn, needed to be more visible and larger. Not only signage was suggested by visitor groups, but also the use of identical sheds to highlight the locations of vertical circulation elements which, according to participants, would help identify places connecting the two levels. Additionally, participants perceived the use of LMs to be a successful and highly recommended tool that could either be provided in the form of handouts to visitors and tourists, and could be designed in a way that overlaid the upper (street level) and lower (RiverWalk) levels, such that they properly referenced each other.

Both groups also shared the same view regarding a number of contributions to an improvement plan: 1) inventing a color-coded trail on the sidewalks, particularly on the RiverWalk level (employees group compared such an invention to similar ones in hospitals and jails); 2) enhancing walkability by prioritizing pedestrians at the street level, and eliminating vehicle routes; and 3) increasing connections between the two river banks by adding more bridges (which was more of a concern to the visitor group). Employees suggested putting ramps and staircases in close proximity to one another, to eliminate visitors wasting their time and wandering about to find an accessible ramp. Another major point concerning safety was made by the employee group. Participants were very specific in suggesting adding a well-designed, matching railing along the river banks, and employing more rail lighting and pole lighting under the various bridges.

Conclusion

The intricacies of the San Antonio RiverWalk area encompass a number of elements affecting the richness of its ambiance and the magnet it is to millions of visitors every year. Representing a utilization of a virtual environment (VE) analysis and the incorporation of empirical research in urban design education, this study investigated the complexity of urban wayfinding and accessibility to the San Antonio RiverWalk area. The study analysis concluded with a number of recommendations for improving visual and graphic tools, stressing planning and design considerations, and incorporating the voice of the local community and area businesses (Figure

4). By employing the following considerations, East RiverWalk area will be recognized as a more livable and identifiable experience for pedestrians.

Visual and Graphic Tools

RiverWalk level: Policy makers should develop alternate aid tools – both visual and graphical – to eliminate ambiguities. a) Visual aids should include the use of color-coded trails (CCT) leading to major destinations and area attractions (i.e., hotels, theaters, etc.). Proposed trails should be designed as part of the sidewalk pavement pattern, and should be identifiable and readable; b) Current location maps (LMs) need to be replaced by clear 3-D maps relating

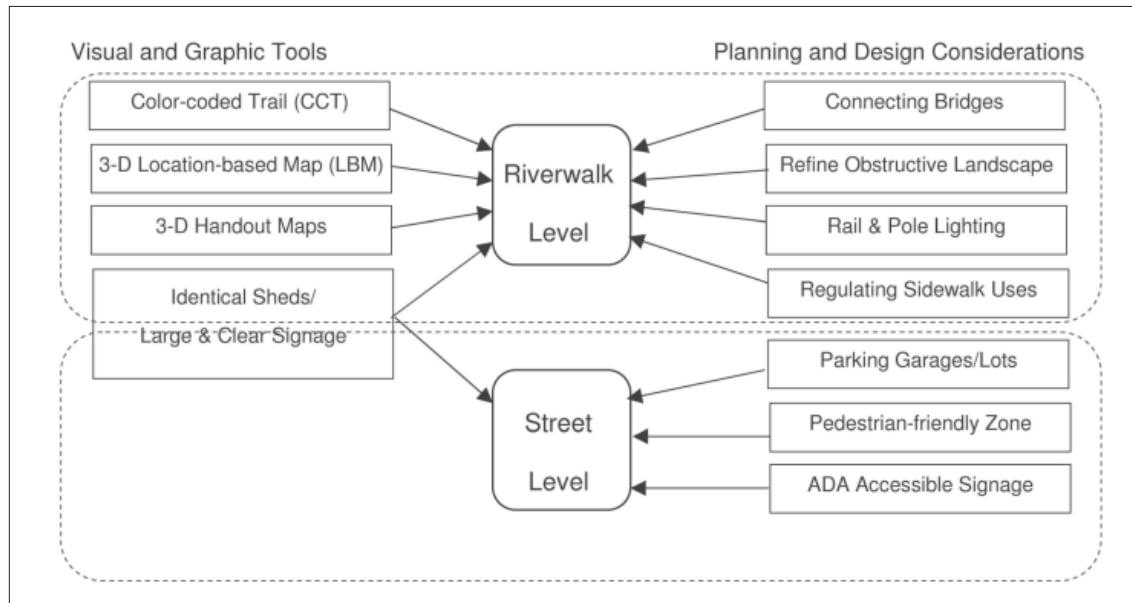


Figure 4: Interrelationships of factors improving wayfinding and accessibility. (Source: Authors).

to the RiverWalk level street level and referencing major area attractions and land marks; c) The implementation of larger and clearer signs for major destinations, orientation, and circulation elements, which also reference the street level; d) The distribution of 3-D maps to visitors and tourists, not only showing main attractions and landmarks, but also referencing major landmarks on the street level.

Street level: Attention should be paid to enhancing the connectivity between the street and RiverWalk levels by increasing the size and number of signs leading to main access points for the RiverWalk level, and the utilization of identical sheds or large signs, similar to those used for access to subway stations in large cities.

Planning and Design Considerations

As part of an improvement plan, policy makers should also implement the following planning and design decisions: a) Increasing parking garages and street parking, and at the same time, making pedestrian routes leading toward main access points to the RiverWalk level clearer by utilizing clearer signage; b) designating the area around the RiverWalk access points as a pedestrian-friendly zone by increasing pedestrian routes on the street level and relocating vehicular routes on the perimeter of this zone; c) adding more connecting bridges to enhance circulation between the two riverbanks; d) identifying locations of emergency and ADA-accessible areas by adding larger and brighter signs; and e) carefully refining a number of obstructive landscape elements to allow more visibility.

Safety Considerations

Improvement plans to the RiverWalk area on both levels should encompass a number of

safety considerations, including adding rail and pole lighting, particularly for under the bridge areas, and enforcing regulations for RiverWalk restaurants to control their occupancy of pedestrian walkways, which will allow a more flexible circulation.

Local Community and Area Business

An advocacy group from business and community representative should be responsible for addressing concerns regarding the RiverWalk area, as well as engaged in decisions regarding prospective improvement plans for wayfinding and accessibility in the San Antonio RiverWalk area.

Acknowledgement

The research team would like to thank the San Antonio Area Foundation (SAAF) for their support to this study. Their philanthropic and dedicated missions have inspired us and help us throughout this study.

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Azza Kamal is a senior lecturer in the college of architecture at UTSA, where she teaches graduate research courses, undergraduate studios, and housing course. She holds BS, MS and PhD in Architecture and urban planning from Cairo University (Egypt), and MS in architecture from Texas A&M University. She practiced architecture in Egypt since 1992. Both her practice and research focus on patterns of residential development and housing morphology. She received multiple grants to conduct housing policy studies. Her research areas include unplanned (informal) settlements in the US-Mexico border, analysis of housing morphology; self-help housing policies, housing incremental production, applications of GIS in spatial analysis for urban planning and housing policy, and residential facilities for the homeless. Before joining UTSA, she was assistant professor in Morgan State University, and she taught in Texas A&M University while earning her MS in Architecture degree. She also taught in different schools of architectures in Egypt. She can be contacted at azza.kamal@utsa.edu

Sedef Doganer

Sedef Doganer holds B.Arch, MS and PhD degrees in Architecture from Istanbul Technical University at Istanbul, Turkey. Her PhD studies on "Time Dependent Transformation and Consumption of Resort Hotels – Case Study: Antalya" in 2005. Her research focuses on hotel design, consumer behavior, globalization and multi-cultural related design practices, tourism alternatives in rural areas, tourism destination planning, and tourist places. She worked in the University of Maryland as a research scholar, and she thought at Virginia Tech as a visiting professor. She was awarded for "Excellence in Teaching Award" while she was teaching at Virginia Tech in 2008. Professor Doganer has also gained considerable experience in practice

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Judith Ruvuna

Judith Ruvuna holds a Bachelor of Science in Textile Technology and Design from the University of Bradford in the UK, a certificate in Interior Design from the University of Alabama at Huntsville and a Masters of Architecture from the University of Texas at San Antonio. The focus of her Masters preparation and Masters Project was Adaptive reuse as vehicle for revitalization with an emphasis on adapting abandoned industrial sites. She has over 20 years working as a designer and until recently owned and operated J R Interiors Solutions with clients in Austin and San Antonio Texas. She was an Allied Member of ASID for over 10 years. She is currently employed by Main Street Architects in San Antonio Texas

Jennifer Flores

Jennifer Flores recently graduated with a Master of Architecture from the University of Texas at San Antonio. She also holds a Bachelor of Environmental Design degree from Texas A&M University. While in school, she worked as an architectural intern at three different firms throughout Texas. She also worked as a graduate assistant in writing the College of Architecture newsletter. She currently works at a small firm in San Antonio, Texas.

Edward Hernandez

Edward Hernandez received his B.S. in Architecture in 2005 and his M.Arch degree in 2010 from the University of Texas at San Antonio College of Architecture. His thesis and master project were concerned with a social approach to urban parks and green spaces.

In 2010, Edward was inducted into Omicron Delta Kappa, a national leadership honor society, and also earned a graduate assistantship at UTSA. In 2009, he earned the H.A.B.S. national Peterson Prize and the local Anderson Prize in conjunction with Sue Anne Pemberton-Haugh, professor at UTSA. Other research includes a collaborative survey of Mid Century Modern architecture in San Antonio, Texas and a Cast Iron survey of Galveston, Texas, both with James R. Lewis, professor at UTSA. Currently, he is a member of the NCARB Intern Development Program and working towards the Architectural Registration Exam. He is also in the process of acquiring AIA membership and LEED certification.

Taeg Nishimoto

Taeg Nishimoto is a professor at college of architecture at UTSA. He teaches graduate level design studios in UTSA. His interests include all aspects of architectural design and the mechanism that encompasses design technique from the artistic to the technological, the spatial to the material, and the digital to complete tactile spontaneity. He holds B.Arch degree from Waseda University in Tokyo and M.Arch degree from Cornell University. He has worked for Architektenburo Herman Hertzberger in Amsterdam and Kunihiko Hayakawa & Associates in Tokyo. In New York he had his own practice, Taeg Nishimoto + Allied Architects, while he was also an adjunct faculty at Columbia University GSAPP and the Pratt Institute. He also taught as a visiting critic at Temple University and the University of Texas at Arlington. In 2001 he moved to Texas as a tenured faculty member of Texas A&M University and in 2007 he joined UTSA. He is currently the Associate Dean of the College of Architecture.