

Assessing the Active Living Impacts of Urban Design Improvements: Brenham TX Main Street Program

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Abstract

Literature search indicates that Main Street Program (MSP) is considered to be successful in achieving the goals of ‘preferred place to live’ and ‘increased active living’. The four point approach of MSP, (organization, promotion, design and economic restructuring) reportedly improves businesses by improving the urban character while allegedly improving active living. This paper focuses on the urban improved areas under the MSP.

This research links observable design changes incorporated in the MSP of Brenham TX with identified characteristics of active living. Time constraints prevented collecting sufficient data for a statistically significant study. However a framework is hereby established for future work that more rigorously links MSP and active living for statistical analysis. Preliminary conclusions are drawn based on analysis of the limited available data.

Keywords

Brenham TX, Main Street Program, active living, urban improved areas

Introduction

A national survey conducted by the University of California found that historic neighborhoods, also known as traditional communities, have been voted as the most preferred place to live due to the quality of life it provides (Handy et al. 2008). This recent survey is indicative of a nascent trend reversing the urban sprawls that the United States has experienced in the last 50 years.

In recent years, the government has promoted the redevelopment of historic neighborhood through tax incentives and policies. One such historic neighborhood redevelopment program is titled the “Main Street Program”. The MSP is developed by the National Trust for Historic Preservation (NTHP) and works towards the revitalization and management of downtowns (National Trust for Historic Preservation 2009). To accomplish its goal of achieving sustainable community revitalization, MSP has developed a Four Point Approach – Organization, Promotion, Design and Economic Restructuring.

A direct benefit of revitalization of traditional communities is the promotion of active living (Frey & Yaneske 2007). Sallis et al. (2006) has found that urban living enhanced by the MSP is directly linked to the opportunity of human physical activity like walking or biking, items associated with sustainability and the environment (US Green Building Code 2006).

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Obesity is one of the major causes of health problems in the United States. A recent report released by the Center for Disease Control (CDC) declares obesity an “epidemic” while stating that approximately two-thirds of adults and one fifth of children in the US are either obese or overweight (Khan et al. 2009). One among many recommendations, to overcome this problem of obesity, is improved physical activity - also known as Active Living. Moudon & Hess (2005) establishes positive linkages between urban design and physical activity. According to Kahn, the solution to this problem is the incorporation of active living in environmental factors across communities. The urban design improvements that form a part of the MSP should provide a high quality urban space (Ozdil 2006). Figure 1 indicates the number of studies that relate neighborhood characteristics with walking, according to Frank et al. (2003).

Graph 3: Number of studies with neighborhood characteristics related to walking¹⁴

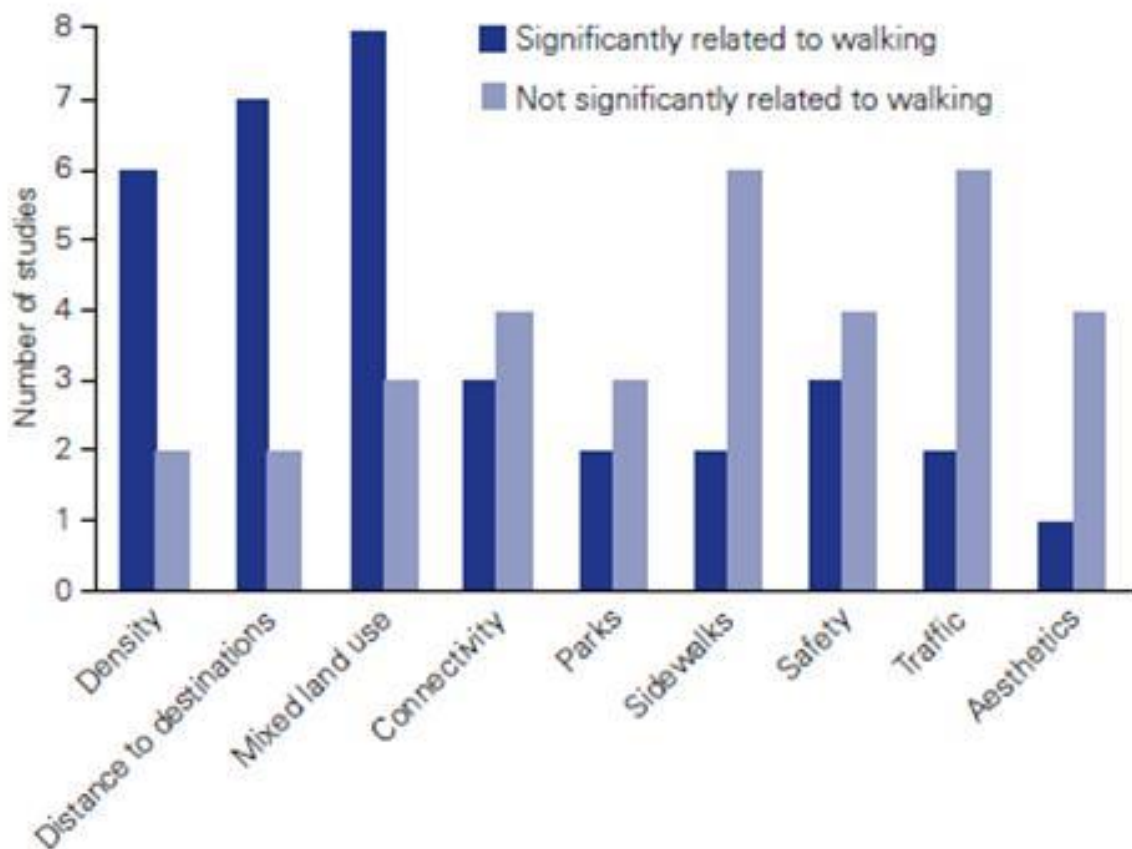


Figure 1 Number of studies with neighborhood characteristics related to walking (Frank et al. 2003)

Can additional activity be attributed to the MSP improvement in Brenham TX when compared to unimproved areas? If so, can a framework be created to relate active living with MSP to replicate in multiple cities and towns and a statistically significant conclusion drawn? These are the two research questions that this paper investigates.

Method

This is an exploratory, qualitative/quantitative research to establish a relationship, deals with an open-ended question that will form a hypothesis for future research. It explores the complex situation of historic neighborhood to gain a better understanding if MSP can be related to Active Living (Frey & Yaneske 2007).

The Robert Wood Johnson Foundation has developed an Active Living Research (ALR) database consisting of comprehensive literature based on empirical researches done in the field of active living. Our research used this ALR database to derive urban design guidelines related to physical activity. The urban design guidelines were then compared against the urban design improvements of MSP.

To understand the effect of urban design improvements of MSP on active living, the research was divided in two parts – qualitative and quantitative.

Comprehensive and systematic review of published literature constitutes the qualitative part of research and was done on two aspects:

1. Urban design improvements on MSP.
2. Effect of urban design improvements on active living.

Firstly, urban design improvements on MSP were identified through earlier research and published literature. Urban design guidelines for active living were derived from published literature. The identified urban design improvements were then studied for their active living impacts through the ALR database; see Figure 2 that highlights major existing studies and the purpose of this research.

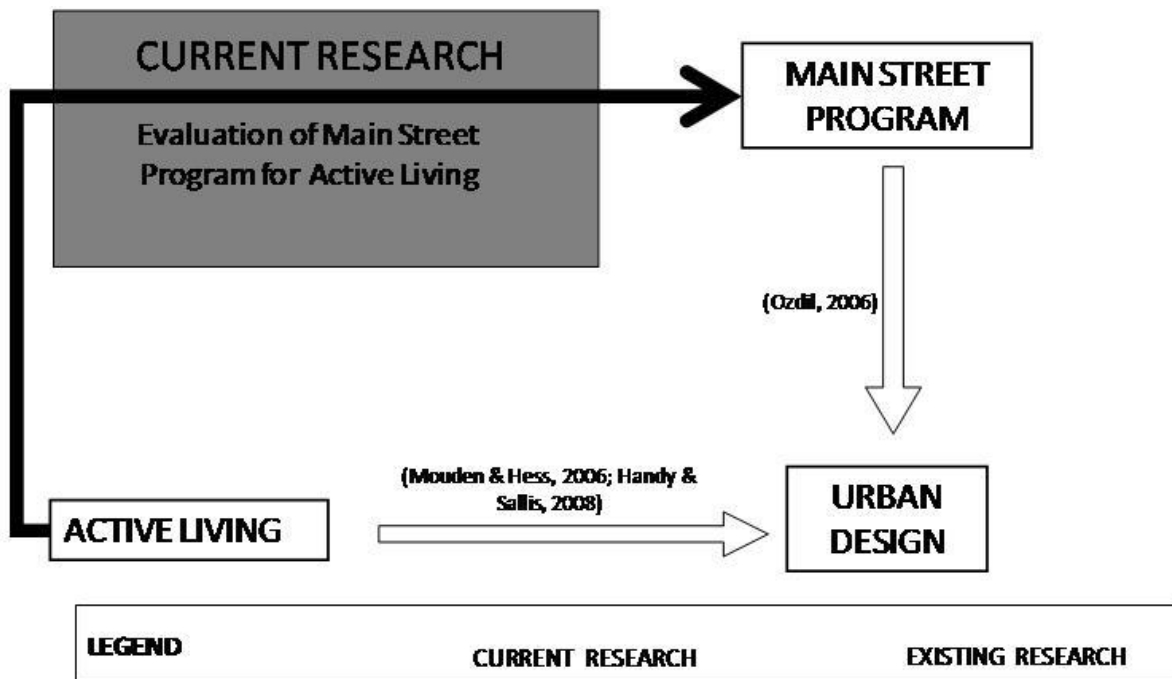


Figure 2 **Current Research: Framework for evaluating MSP regarding observed Active Living**

The quantitative part consists of field observations done covertly and field notes taken of presence and activity in six designated areas in the town center of Brenham TX.

Analysis

After identifying the urban design improvements of MSP in Brenham TX, active living impacts were studied from the literature database for each identified urban design improvements. Pattern matching method (Yin, 2009) was used and causal linkages between the urban design improvements and physical activity were established. The pattern matching method of analysis of this research is derived from Yin's (1988) "Studying the implementation of public program". According to Yin, research analysis is divided into the following steps:

1. Piecing together the facts of program implementation
2. Merging evidence from various sources
3. Explanation construction
4. Summary

Interpretation

Causal linkages between urban design improvements of MSP and physical activity (Active Living) establish the relationship between the two.

Significance of the Study

MSP improves on the urban design of the place thereby attracting more people to spend time in the town-center of Brenham TX. A positive correlation of design improvement and physical activity in the MSP area could validate the town expense in the improvements and become a model for other towns that seek re-vitalization.

Limitations

- This is an exploratory research which tries to establish a hypothesis that design changes of MSP lead to increased human activity.
- Due to time limitations, the observations made for the case study were done only during a specific time of the day and during a specific season of the year. Effects due to seasonal and daily variation could not be recorded.
- There is no historical data available for Brenham MSP, regarding the number of visitors and their pattern of walking.
- Only covert observations were made and no interaction between the researcher and the visitors on Main Street took place.
- There is no historical data available for the reasons that visitors come to Brenham from other parts of the State or other States. Time and resources prevent a detailed survey of human activity.

Main Street Program – Literature review

The MSP was started in 1976, by the National Trust for Historic Preservation (NTHP), to revitalize the Central Business District (CBD) which was abandoned due to the widespread development of suburban areas and shopping malls (National Trust for Historic Preservation 2009c). Traditionally, the Main Street developed as the center for commercial as well as social interactive activities like ceremonial parades, a meeting place for young and old, etc (Davies 1981). Over the years, it was considered as the prime location of the town and the privileged and wealthy class of the town's inhabitants preferred to live near the Main Street (Rifkind 1977). It could be derived that the Main Street reflected the socio-cultural character of the town.

But, the early 1940's mass production of automobiles helped in the realization of the American dream. The emergence of the tall building city skyline that was the landmark of the modern metropolis eliminated the traditional pedestrian scale limits to a building's height (Rifkind 1977). Also, after World War II, people wanted to raise their children in peaceful suburban neighborhoods and moved away from the downtown (Ozdil 2002). Rifkind describes this migration thus, "For a nation whose goal was suburban, the economic, social and functional mix of the traditional city center was rejected, a relic of an obsolete life" (Rifkind, 1977, pp. 228). This drift away to suburbia created the physical, social and economic weathering of the downtown.

Stipe (2003) in his book records the reopening of the revitalized Quincy Market, also referred to as 'festive markets', in 1976 which was the first experiment in accordance with the principles of MSP. Following this example, in a span of three years, National Trust's MSP grew from 3 participating Main Streets to 1600.

To overcome the downturn that the Main Street was facing, the NTHP's creation of MSP has been considered a by and large success (National Trust for Historic Preservation 2009a). MSP was developed with a twofold objective targeting the revitalization of the downtown while preserving its historic character, and the improvement of the business conditions on the Main Street. It uses four main approaches to achieve its goals (see Figure 3):

1. **Organization:** Involves establishing cooperation between the human and financial resources working to implement a Main Street revitalization program (National Trust for Historic Preservation 2009b). This includes stakeholders such as the public, city and county governments, local bankers, merchants, property owners, community leaders and volunteers (Smith et al. 1996).
2. **Promotion:** Aims to create a positive public image of the downtown, using advertising tools, retail promotional activities, special events and marketing campaigns, to attract shoppers, investors, developers and businesses (Smith et al. 1996). It also showcases the multiple uses of the downtown and increases consumer and investor confidence in the district (National Trust 2009b).
3. **Design:** Involves the consideration of visual inbuilt opportunities by focusing on physical elements in the downtown, such as: buildings, storefronts, public spaces, landscaping, displays, etc. (Smith et al. 1996). The installation of complimentary maintenance practices, rehabilitating historic buildings, encouraging appropriate new construction, developing sensitive design management systems and long-term planning are also included in design activities (National Trust 2009b).
4. **Economic restructuring:** Proposes to develop the Main Street as an economic hub by developing and implementing policies that strengthen existing businesses and aims towards diversifying its economic base. It also intends to sharpen competitiveness among existing business owners and attract new businesses by providing funds, converting unused and underused properties to productive ones, and developing an economic district that caters to the demands of the local consumers (National Trust 2009b; Smith et al. 1996).

MSP was developed with a comprehensive approach to revitalize the downtown and improve the business condition that it provides. Its four point approach includes :

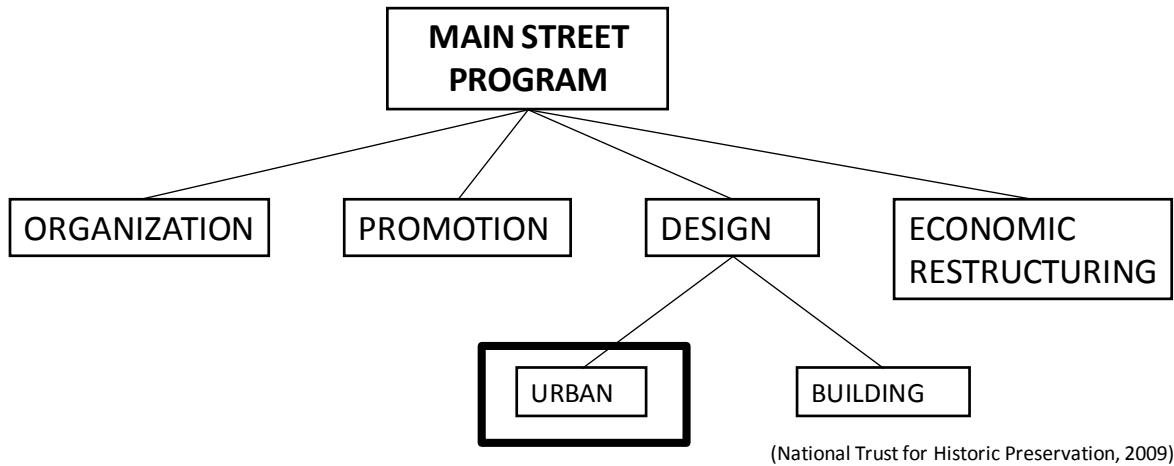


Figure 3 Main Street Program and Urban emphasis of current research

Urban Design of Main Street

Historically, towns and cities across the United States have emerged from their proximity to agriculture, industry and transport routes such as ports, inland waterways, road and rail crossings. It was during this 18th century era that layouts such as the grid pattern of the town and city were incorporated in planning (Texas Historical Commission 2006). As development took hold, civic and public buildings such as the city hall, theater, public school etc. distinguished themselves by their uniform design and began to define the character of the particular setting. Although most developing towns and cities used the same building materials and styles, topography and circumstance contributed to the uniqueness of each place.

Design improvements constitute a significant portion of revitalization through MSP. The MSP makes an effort to understand the history of the city/town and ‘gel’ the newer developments in a manner that is preserving and incorporative of the original character of the town. Originally, colors, building materials and signs were used to create a unique image of the town. Materials used in newer styles of construction such as aluminum, steel, structural pigmented glass, porcelain enameled panels are, nowadays, carefully integrated to complement this unique image.

Previously published literature by the National Main Street Center has laid a great emphasis on improvement of urban design elements. They enumerate street façade, awnings, sidewalk, lighting, landscaping, furniture, parking lots, public parks and signs as design elements on the Main Street that should be improved to attract more visitors (Flory & Mullen 1986). Also, studies published by Smith et al. (1996) emphasized the comprehensive approach to downtown and Main Street revitalization by dividing design recommendation into five parts – buildings, public improvements, signs, parking and graphics (Smith et al. 1996). Main Street bears the character of a high quality urban designed space (Ozdil 2006). Clemente et al. (2005) have compiled a scale through which the urban design quality of a place can be measured using five characteristics:

1. Imageability: The characteristic of a place that successfully creates a distinct, memorable and lasting impression upon the viewer.
2. Enclosure: The degree by which streets and other public spaces are surrounded by buildings, walls, trees and other elements.
3. Human scale: The size, texture and character of the physical design elements in proportion to the size of the human being and the speed at which he/she walks.

4. Transparency: The degree to which people can see or perceive human activity and sense what lies beyond the edge of a street or a public space.
5. Complexity: The visual diversity of the physical environment in that place.

Table 1 Main Street Program Summary Results: Design Improvements as observed by MSP managers. Adapted from Ozdil (2006)

		Decreased	Not Changed	Increased
1	Renovated and/or improved storefront (street level façade)	2.6	5.1	92.4
2	Renovated and/or improved building facades (upper façade)	5.2	7.7	87.2
3	Greenery (other than trees)	5.2	12.8	82.1
4	Handicap accessibility related equipment & improvements	2.6	17.9	76.9
5	Signage	10.2	12.8	76.9
6	Canopies, awnings, trellises, shades	7.7	15.4	76.9
7	Street furniture	5.1	23.1	69.3
8	Streetscape maintenance	10.2	23.1	66.7
9	Banners, posters, & advertisements	10.2	23.1	66.7
10	Outdoor seating	2.6	28.2	64.1
11	Lighting	5.2	28.2	61.6
12	Sidewalk & pavement quality (color, texture, material)	12.9	25.6	61.5
13	Outdoor displays (Sculptures, murals, fountains, etc.)	5.2	41	48.7
14	Parking space in walkable distance (max. 600 feet)	5.1	48.7	43.6
15	Public open spaces (Plazas, market areas, & play areas)	7.7	43.6	43.6
16	Street trees	10.3	41	43.5
17	Outdoor cafes, restaurants, and food stands	10.3	41	41.1
18	On street parking spaces	10.3	51.3	30.7
19	Sidewalk width	5.1	66.7	25.7

20	Garage and open lot parking space	10.3	53.8	23.1
21	Public bathrooms	10.3	64.1	17.9
22	Loading zones and transportation stops	2.6	61.5	17.9
23	Number of traffic lanes dedicated to automobiles	5.2	79.5	10.3
24	Allowed traffic speed	10.2	79.5	5.1
25	Bicycle related equipment & improvements	5.1	76.9	2.6
26	Number of visitors	2.6	7.7	82.1
27	Amount of crime	48.7	33.3	2.6

Highlighting the crucial role played by streets, Ewing and others state that, “For routine physical activity, no element of the urban environment is more important than streets” (Ewing et al. 2006, pp. S226). According to them, the street is the center of active travel to places for working, shopping, eating out, walking for exercise and engaging in other daily activities. While parks, plazas, trails, and other public places have a role in physical activity, this study focuses on urban design qualities that make one street more walkable than another.

Ozdil (2006) established the relationship between urban design improvements and economic activity on the Main Street. He interviewed Main Street managers of 78 Texas MSP cities. The participants were asked to evaluate 27 urban design related changes that they observed in their cities after being included in the MSP. Some among the urban design elements - renovated improved storefronts, greenery, handicap accessibility, signage, canopies, awning, shade, street furniture - were observed to have been improved more in comparison to the others (Table 1).

Active Living and Urban Design

The exact definition of built environment has been constantly reviewed and revised in accordance with changing circumstances. Generally, the built environment ‘encompasses all buildings, spaces and products that are created or modified by people’. By extension, it includes schools, homes, business areas, electric transmission lines, subway routes, waste disposal sites, cross country highways, etc. Thus it impacts the indoor and outdoor physical environment, social environment and has an overall impact on the health and quality of life (Health Canada 2002).

It has been found that environment of the neighborhood plays a very important role in the amount of physical activity achieved by an individual (King et al. 2002). Research has concluded that places we live and work in have an impact on our health (Srinivasan et al. 2003). Stahl et al. (2002) highlights the growing interest in ecological models as a productive framework for physical activity promotion.

This intrinsic quality of built environment of having an overarching effect on individual’s health aspect successfully attracted the attention of multi-disciplined professionals eager to examine this further. According to Frank et al. (2003) in the last 20 years, transportation planners, urban planners, and urban designers began studying how to design cities that enable people to walk and cycle more.

There have been numerous research conducted to determine the characteristics of a walkable neighborhood. The Robert Wood Johnson Foundation has developed an ALR database. It uses a search engine to find journal articles related to physical activity for the specific urban design element (ALR

2009). Using this database, the total numbers of studies conducted on each urban design element were searched (Table 2). Every identified urban design element was analyzed to establish their effects on physical activity.

Table 2 Number of studies establishing significant relationship between physical activity and each urban design elements. ALR Database (2010)

	Urban Design Elements	Number of Studies
1	Amount of crime	489
2	Public open spaces (Plazas, market areas, & play areas)	241
3	Aesthetics (Building façade/outdoor displays)	215
4	Outdoor cafes, restaurants, food stands/multiple businesses	168
5	Sidewalk & pavement quality (levelness, color, texture, material)	120
6	Loading zones and transportation stops	115
7	Greenery/street trees/canopies, awnings, trellises, shades	38
8	Bicycle related equipment & improvements	33
9	Lighting	29
10	Number of visitors	29
11	Streetscape maintenance	28
12	Signage (Motivational)	19
13	Parking (Garage and open lot/on street/walkable parking)	11
14	Handicap accessibility related equipment & improvements	10
15	Public bathrooms/facilities	9
16	Allowed traffic speed	3
17	Street furniture / Outdoor seating	2
18	Banners, posters, & advertisements	No study found
19	Sidewalk width	No study found
20	Number of traffic lanes dedicated to automobiles	No study found

1. **Parking:** An inverse relationship was found between parking and increased physical activity. According to Boer et al. (2007), abundant available street parking allows people to own more vehicles, use them more often and therefore walk less. This hypothesis is re-enforced by the findings of Rodriguez et al. (2008) who concluded in their research that perceived car parking difficulty was positively related to higher levels of walking.
2. **Public Open Spaces:** It has been found that proximity to environmental supports for physical activity like recreational facilities, parks, public open spaces and playground increases physical activity (Addy et al. 2004). Open spaces with trees, shrubbery and broken ground triggers physical activity and this can be observed across age groups (Boldemann et al. 2006).
3. **Lighting:** It has been found that adequate lighting contributes to an enhancement in physical activity (Addy et al. 2004; Cleland et al. 2008). It has also been reported that streetlights are positively associated with leisure walking (Huston et al. 2003; Chad et al. 2005). Active living research has also focused on the positive influences of the road environment, mainly traffic lights, on walkability and physical activity (Carver et al. 2008).
4. **Biking related Equipment:** Research shows that an intrinsic link exists between bike related equipments, bike lanes and other such improvements and physical activity. Harkey et al. (1998) have found that the provision of a wide bicycle lane or paved shoulder and the presence of on-street parking led to an increase in the perceived comfort of cyclists (Harkey, et al. 1998). Agreeing with this conclusion, Cervero et al. (2009) links provision of bike lanes and set-aside street space for recreational cyclists and pedestrians to physical activity.
5. **Signage:** There was no link found connecting street signage and active living, according to research. Although, there seems to be a significant link between motivational signage and increased physical activity (Ford & Torok 2008; Webb & Eves 2007).
6. **Crime in the Neighborhood:** Whilst conducting research on the constituents of an obesogenic environment, Boehmer et al. (2006) has found that crime safety was a significant factor adversely affecting physical activity among research subjects. Trusting people in the neighborhood is predictive of increase in walking for leisure and recreation, according to Cleland, et al. (2008).
7. **Greenery/Trees/Shade:** Active living research has combined elements such as canopies, awnings, trellis, shade, street trees and other forms of greenery under the same category. In this regard, research suggests that perceived greenery significantly increases odds of better physical and mental health (Sugiyama et al. 2008). Perceived greenery could also be correlated with recreational walking and enhanced walking for leisurely activities (Cleland et al., 2008).
8. **Handicap accessibility/Ramps:** It was found that people with physical disabilities living in neighborhoods that provide environmental buoys (supports) are more inclined to participate in leisure time physical activities (Spivock et al. 2008).
9. **Improved Building/Storefront Facade:** Building and storefront facade has been grouped under the category of aesthetic/condition and appeal in active living research. Research conducted by Ball et al. (2001) has reported that a less aesthetically pleasing environment was less likely to encourage participants to walk for exercise or recreation. This highlights the significant role that perceived environmental aesthetics play in encouraging physical activity.
10. **Street Furniture/Outdoor seating:** It has been documented that high quality street furniture will show that the community values its public spaces. It was also found that walking environments are directly enhanced with the presence of outdoor seating/street furniture (Antupit et al.1996).
11. **Streetscape Maintenance:** Perceptions of neighborhood cleanliness have been associated with the realization of physical activity (Duncan & Mummery 2005). In contrast, Ellaway et al. (2005) in their

research conclude that incivilities, such as litter and graffiti, have been associated with general wellbeing but not with levels of physical activity.

- 12. Banners, Posters and Advertisements:** There seems to be no connection establishing the relationship between outdoor publicity and physical activity.
- 13. Sidewalk and Pavement Quality:** Research shows that physical activity was negatively associated with sidewalk levelness (Hoehner et al. 2005).
- 14. Outdoor Displays:** There has been no specific research conducted on outdoor displays such as sculptures, murals, fountains etc. Conversely, as mentioned earlier, the research based on the aesthetic/design/condition/appeal of the neighborhood has a positive influence on physical activity.
- 15. Parking Space in Walkable Distance (max. 600 feet)/On Street Parking Spaces:** Specific research on parking within a walkable distance does not appear in the active living research database. However, as mentioned earlier, provision for parking has an inverse effect upon physical activity.
- 16. Outdoor Cafes, Restaurants and Food Stands:** There has been no explicit relationship drawn between the presence of outdoor eateries and active living. But, research shows that increasing business diversity in a neighborhood i.e. presence of two or three types of businesses, considerably improves the probability of walking. But when there are already four or more types of businesses, increasing the types of businesses does not lead to a further increase in walking (Boer et al. 2007).
- 17. Sidewalk Width:** Active living research on specific sidewalk width did not produce any results.
- 18. Public Bathrooms:** There has been no research connecting public bathrooms and physical activity, according to the ALR database. However, access to other public amenities such as free communal public facilities have shown to encourage active living (Li et al. 2006; Cleland et al. 2008).
- 19. Allowed Traffic Speed:** Cleland (2008) is of the opinion that a controlled local traffic speed is a factor predictive of an increase in transport related walking (Cleland et al. 2008).
- 20. Number of Visitors:** A cross-sectional study conducted throughout the United States concluded that neighborhood characteristics such as heavy traffic were positively associated with physical activity. The study also found that a social factor such as being surrounded by people exercising was also an incentive increasing reported physical activity (Brownson et al. 2001).
- 21. Loading Zones and Transportation Stops:** Research suggests that an increment in the number of transportation stops in a neighborhood is positively associated with increased leisure and transportation related physical activity (Aytur et al. 2008).
- 22. Number of Traffic Lanes Dedicated to Automobiles:** The available research on the active living database does not suggest that a link between number of traffic lanes dedicated to automobiles and physical activity has been found.
- 23. Street Safety:** Although physical activity is the preferred mode of active living, Carver (2005) opines that formal sports might be too much work for adults. Therefore, commuting to work or place of study might be a good alternative to indulge in physical activity (Carver 2005). Sallis (2000) identifies many environmental influences on physical activity. Amongst them, one of these influences is road and pedestrian safety, according to him. Reinforcing this assumption, Carver (2005) in a study conducted examined the influences of safety on walking. It was determined that walking was inversely related to the number of unsafe crossings and lack of pedestrian pathways.

Case Study – Brenham Main Street Program

History of Brenham

Brenham is located in Central Texas, between Austin and Houston, and is the county seat of Washington County (Handbook of Texas Online, 2010). According to the 2000 census, Brenham has a population of 13,507 residents and the city has a total area of 8.8 square miles (US Census Bureau, 2010).

Established in 1844, Brenham soon emerged as a supply center for the surrounding prosperous agricultural areas. The construction of the Washington County Railroad in 1860 with its rail terminus setup in Brenham allowed it to develop as a distribution point for Texas' other interior towns. Throughout the 19th and 20th century, Brenham remained a center of economic activity with banking, cottonseed oil manufacturing, mattress manufacturing, food and fiber processing, and metal fabricating being some of its significant industries (Handbook of Texas Online, 2010).

History of Brenham Downtown

The Brenham downtown was established with the setting up of the railroad in 1860s and flourished with the variety of skills that the immigrants brought with them towards the end of the 19th century. Cattle herders from surrounding areas used to converge onto the Brenham downtown to prepare for rail shipment of their herds.

The first remodeling of the downtown can be traced to 1912 with storefronts rebuilt using marble, copper, canvas and metal awnings to spruce its general appearance (Downtown Brenham, 2010). Modernization in the 1950s and 1960s led many owners to use aluminum screens over building's historic façade. It was also during this time that the shopping district began to relocate towards the outskirts of the city and the downtown was turning into a business and governmental agency center rather than a commercial center (Downtown Brenham, 2010).

Brenham Main Street Program

In 1983, the Brenham downtown was added to the Texas Main Street Program. Since then, more than \$15 million have been re-invested in projects associated with the MSP (Downtown Brenham, 2010). The revitalization efforts of the MSP have been attained with the involvement of public and private partners and with an overall goal emphasizing the preservation of Brenham's past. The main objective of the MSP is to promote tourism through retail development and diversity of businesses in the downtown area (see Figure 4 for map of the town center and areas where observations were conducted).

The Brenham downtown consists of the Washington County Courthouse, Unity theater, farmer's market and approximately 40 businesses. These stores retail antiques, arts & entertainment, home décor, gifts, fashion & jewelry and specialty goods. The downtown district also consists of many offices towards the north and the east of the downtown. The Washington County Courthouse is situated at the center of the downtown with large open spaces on all four sides and a gazebo situated on one of its sides.

The downtown also has a Brenham Heritage Museum and a Fire Station, containing antique fire trucks, located on the far-east side. The Fire Station and Brenham Museum is housed in a Classical Revival style building previously owned by the United States Post Office that now showcases the region's history and heritage.

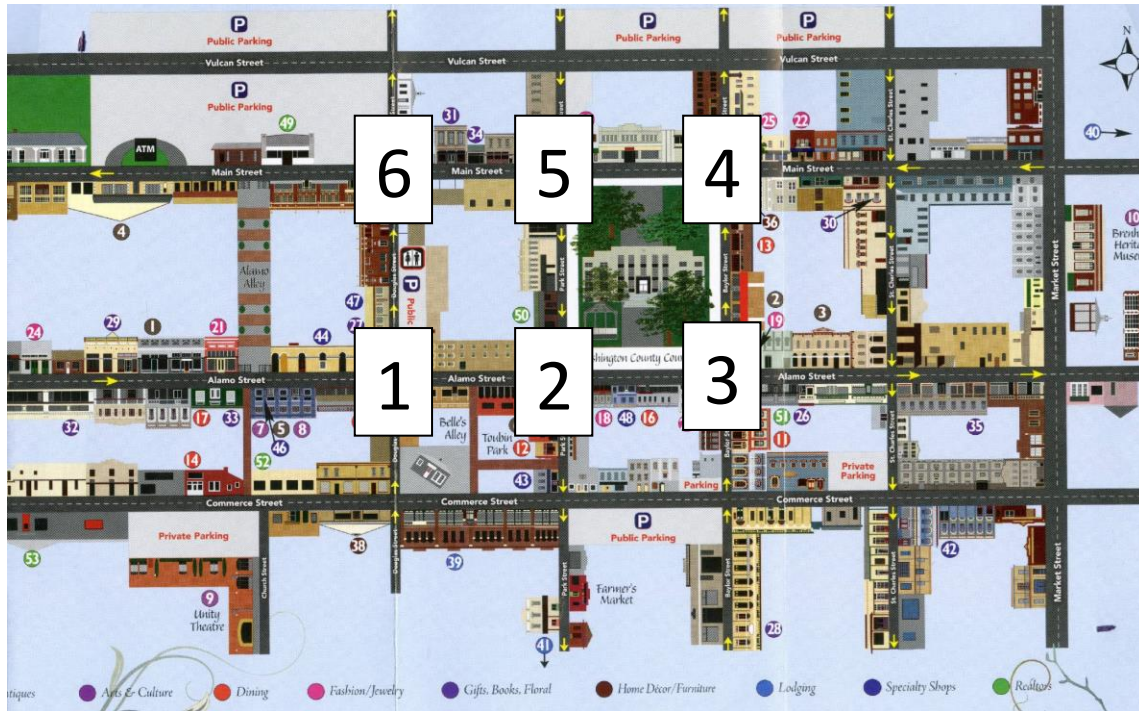


Figure 4 Map of Downtown Brenham. Source: City of Brenham and observation areas

Visitors to Brenham

Situated between Austin and Houston, Brenham is a popular destination for heritage tourists seeking small-town charm (Texas Historical Commission, 2006). It is a favored stopover for visitors travelling between these two major cities. The antique market that has developed in Brenham downtown attracts specialty shoppers from all parts of Texas. Blue Bell Creameries, one of the largest ice-cream makers in Texas, was started in Brenham in 1907 and continues to provide guided tours to their production facility here (Blue Bell Creameries, 2010). Must Be Heaven, located in downtown Brenham, is another eatery famous with visitors and locals alike. Brenham lies at the heart of the Bluebonnet Trails that attracts numerous visitors each spring.



Figure 5 **Hot nights Cool tunes performance, Brenham downtown.** Source: Texas Main Street Newsletter - Main Street Matters

The Brenham MSP has developed three festivals – Country Flavors, Hot Nights Cool Tunes Summer Concert Series and Christmas Stroll & Lighted Parade – held at various times of the year. These are held on the square in downtown Brenham and have successfully attracted tourists to the downtown (Texas Main Street Program 2009).

Study

The study was conducted in downtown Brenham near the Washington County Courthouse on two streets – East Alamo Street and East Main Street. The six intersections observed were –

1. East Alamo St. & Douglas St.
2. East Alamo St. & Park St.
3. East Alamo St. & Baylor St.
4. East Main St. & Baylor St.
5. East Main St. & Park St.
6. East Main St. & Douglas St.

Covert observations were made and field notes were taken at each intersection on two random weekdays and one day over a weekend. The study lasted for one hour each time and was conducted during the afternoon (see Figures 6, 7 & 8).

Observations were made for a period of 10 minutes at each intersection regarding –

- Number of people walking
- Number of people seated

Also, field notes describing the following were recorded –

- Pattern of people walking over more than one intersection
- Pattern of people parking their vehicles in front of the store
- Quality of urban design elements

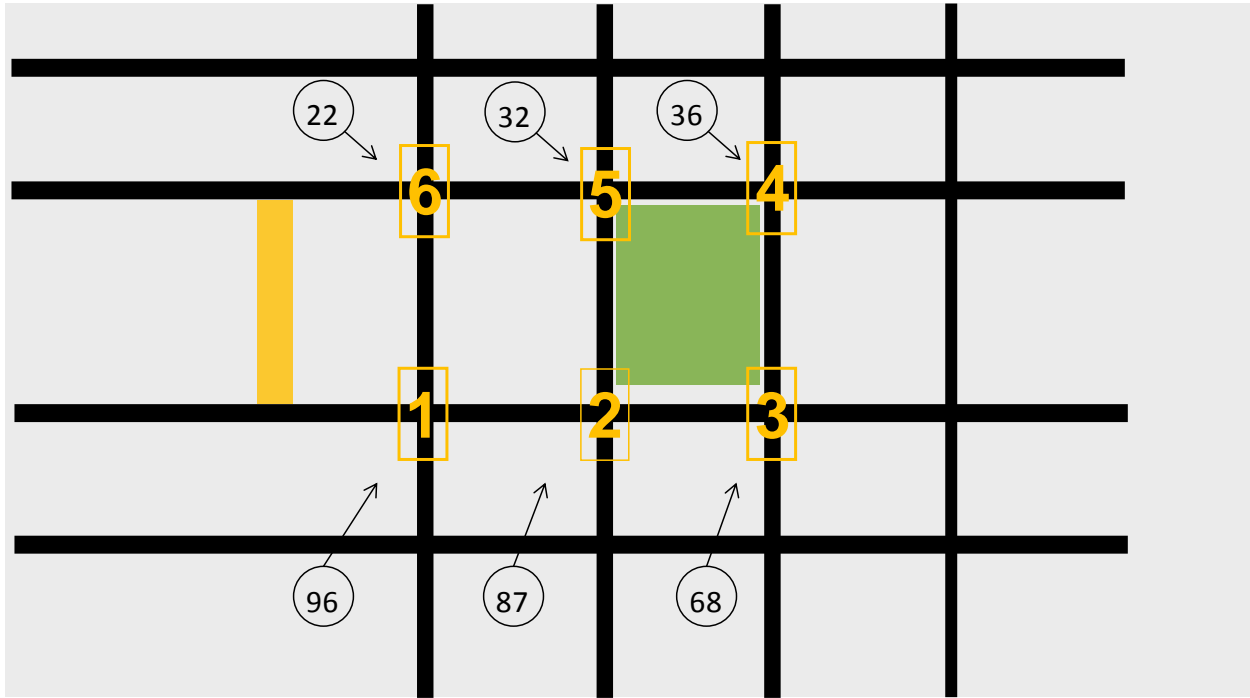


Figure 6 Number of Visitors - Observations made on a Tuesday afternoon at an interval of 10 minutes spent on each intersection. Source: Hasan

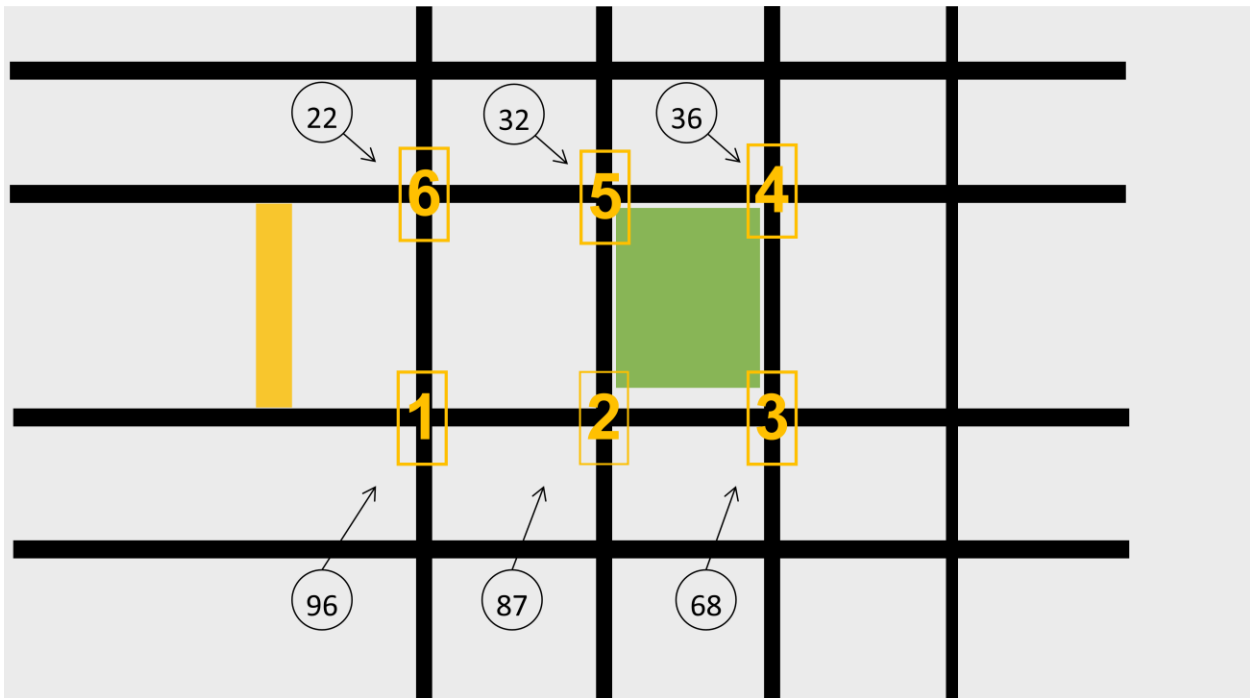
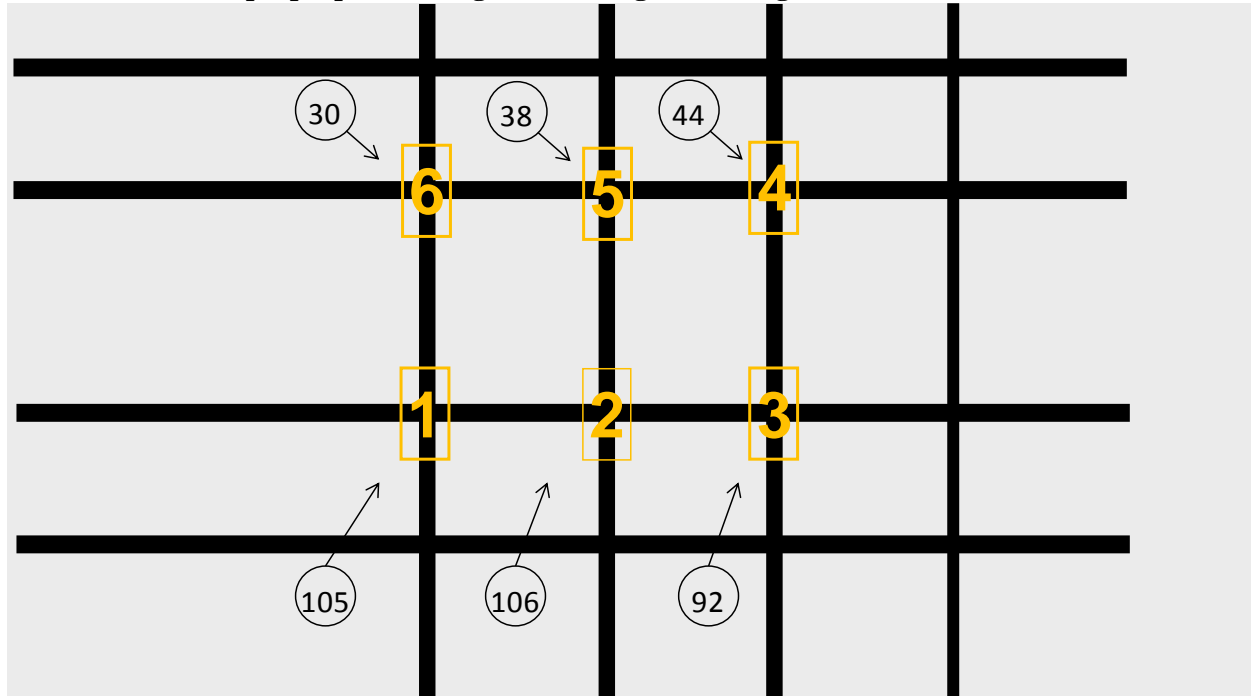


Figure 7 Number of Visitors - Observations made on a Thursday afternoon at an interval of 10 minutes spent on each intersection. Source: Hasan

Figure 8 Number of Visitors - Observations made on a Saturday afternoon at an interval of 10 minutes spent on each intersection. Source: Hasan

Table 3 Number of people per crossing and ranking of crossing UD features



Crossing	Number of people				UD Ranking
	Tue	Thur	Sat	Avg	
1	97	91	105	98	6
2	86	87	106	93	1
3	68	76	92	79	2
4	36	29	44	36	3
5	32	27	38	32	4
6	22	15	30	22	5

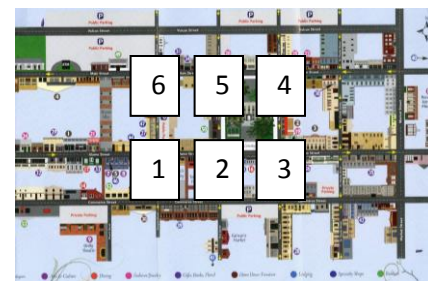


Fig 1. : Map of Downtown Brenham
Source : City of Brenham

Observations and Discussion

This study creates a framework to further study the relationship between MSP urban design improvements and active living.

The identified urban design improvements in Brenham TX were examined individually against the ALR database in order to establish each design element’s presence. According to Ozdil (2006), some urban design elements were combined to form a bigger design category. This was done to aid the search of the ALR database. For example, Street level façade, building façade and outdoor displays were searched under the aesthetics group. Greenery (other than trees), street trees and canopies, awnings, trellises and shades

were searched as one group. Different specifics of parking were also combined together (see Table 4 for amenities locations and ranking).

Literature indicates 27 possible urban design elements that can affect active living. In Brenham, there was no relationship found between sidewalk width, banners/posters/advertisements, outdoor cafes, restaurants and food stands, number of traffic lanes and physical activity.

Brenham case study showcases several distinct results: First, it was observed that some of the noted urban design elements on the Main Street were street furniture, lighting, outdoor seating, sidewalk & pavement quality, outdoor displays, public open spaces and on street parking spaces. A marked contrast was found in the urban design elements among the six intersections that were studied (see Table 3). It was observed that intersections 2, 3, 4 and 5 had better urban design elements than intersections 1 and 6. The difference was noticed in sidewalk quality, street trees, open spaces, street furniture and greenery as compared to the intersections 1 and 6 where these qualities were less developed.




Second, during the case study, it was found that there were more people walking at intersections 1 and 2 than intersections 3, 4, 5 and 6. Notwithstanding the inferior urban design quality of the space, more people preferred to walk across intersections 1 and 2. Covert observations made from this study inform us that most visitors were interested in visiting antique shops and restaurants. From the layout of Brenham downtown it can be seen that a majority of shopping and restaurants are located around intersections 1 and 2.

Third, although there were fewer benches, trees, open spaces and inferior pavement quality on intersection 1, people seemed to prefer this area mostly for its shopping and restaurant experience. It was also observed that people parked their cars as close to the restaurant and shops as possible. This action is supported by literature that illustrates an inverse relationship between parking ease and physical activity (Boer et al., 2007).

Fourth, an alley called the Alamo Alley was developed through MSP connecting Alamo Street to Main Street for high pedestrian traffic usage. This alley was close to intersection 1 which was the busiest intersection in downtown. Although containing attractive design elements such as engraved pavement, water fountain, street furniture and a theater, it was observed that the alley was largely underutilized with hardly any visitors. There was no shopping or eating oriented activity on the Alamo alley or on the Main Street end of the alley that could have caught the attention of visitors.

Fifth, there were six major parking lots developed through the MSP around the downtown which were noticed as being empty even during high traffic times. It was observed that visitors preferred to park on the street so as to easily walk to their destination. It was seen that visitor numbers were quite high during the weekend and the weekdays. Even though the research was conducted in the afternoon, the downtown was busy with pedestrians.

Table 4 Quality of Urban Design spaces observed at the crossings on Brenham MSP

Legend	
Present	
Moderately Present	
Not Present	

	Crossing 1	Crossing 2	Crossing 3	Crossing 4	Crossing 5	Crossing 6
1 Renovated and/or improved storefront (street level façade)						
2 Renovated and/or improved building facades (upper façade)						
3 Greenery (other than trees)						
4 Handicap accessibility related equipment & improvements						
5 Signage						
6 Canopies, awnings, trellises, shades						
7 Street furniture						
8 Streetscape maintenance						
9 Banners, posters, & advertisements						
10 Outdoor seating						
11 Lighting						
12 Sidewalk & pavement quality (color, texture, material)						
13 Outdoor displays (Sculptures, murals, fountains, etc.)						
14 Parking space in walkable distance (max. 600 feet)						
15 Public open spaces (Plazas, market areas, & play areas)						
16 Street trees						
17 Outdoor cafes, restaurants, and food stands						
18 On street parking spaces						
19 Sidewalk width						
20 Garage and open lot parking space						
21 Public bathrooms						
22 Loading zones and transportation stops						
23 Number of traffic lanes dedicated to automobiles						
24 Allowed traffic speed						
25 Bicycle related equipment & improvements						
26 Number of visitors						
27 Amount of crime						
RANKING (according to UD quality)	6	1	2	3	4	5

Conclusions

This study, due to its limitations and exploratory nature, is unable to establish a significant relationship between MSP and active living. This hypothesis could be further researched through field observations at different places during various times and in different towns across Texas and other States of the Union.

Summary of findings

1. MSP has high urban design quality. When compared with the urban design qualities outlined in the Walkable Urban Design Manual (Ewing et al., 2005), used to score the walkability of a street, characteristics measured in different MSPs show that Main Street has five urban design quality characteristics:
 - a. High imageability as the Main Street is filled with people, many signs and strong landmarks.
 - b. Low enclosure because the Main Street does not contain a well defined street wall. The atmosphere on the Main Street feels open with the ability to see far into the distance.
 - c. High human scale as small buildings, narrow streets and ample street furniture provides continuous active uses at street level on the Main Street.
 - d. High transparency, since the Main Street has continuous active uses and windows at the street level.
 - e. High complexity as the Main Street has diverse visual elements, buildings, colors, pedestrians etc.
2. Literature analysis through empirical studies establishes that most urban design improvements of MSP improve physical activity.
3. Visitors on the Main Street are motivated by shopping and eating out and not many people prefer to walk. For these reasons, they prefer to park their vehicles as close to their destination point as possible.
4. Being a high quality urban design space with urban design improvements that, theoretically, enhance physical activity; MSP still is unable to motivate people to enhance physical activity.
5. As observed on the Alamo alley, urban design qualities of a space are not enough by themselves to attract visitors on Main Street. It should ideally be complemented by shopping or eating oriented activities.
6. MSP has improved the physical and economic condition of the Main Street. This has led to increased visitation and renewal of interest in older neighborhoods.
7. The redevelopment of Main Street in neighborhoods that existed before the automobile age allows it to recreate a pedestrian oriented environment. Thus, MSP not only rejuvenates the place but also the activity around it.

Recommendations

Future studies can use this framework with additional observations and a survey questioner for folks in the area. Other town centers in TX that have recently completed MSP could be surveyed such as Fredericksburg TX and others in different states to gather sufficient data for a statistically significant study.

Brenham TX recommendations for increased active living in the town center based on this case study:

1. Motivational signage – The MSP improves signage but no motivational signage that encourages walking has been introduced, yet. Motivational signage should be introduced on the Main Street which in turn could encourage visitors to walk more.
2. Comprehensive planning for walking – Economic revitalization is a natural objective of the MSP but it should not undermine its ability to provide health benefits through urban design quality of space. If walking as a physical activity is comprehensively developed alongside the existing walking tours of the downtown, it could attract more visitors and local residents.
3. Spread out development of attractions throughout the Main Street areas – Throughout this research, it has been highlighted that shopping and restaurants, which are major attractions, be located across the Main Street.
4. Directing visitors to park cars in the allotted parking lots developed by the MSP would contribute to promoting the health benefits of walking on the Main Street.

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