

**ADAPTIVE REUSE OF ABANDONED HISTORIC CHURCHES:  
BUILDING TYPE AND PUBLIC PERCEPTION**

A Dissertation

by

YOU KYONG AHN

Submitted to the Office of Graduate Studies of  
Texas A&M University  
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

August 2007

Major Subject: Architecture

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## ABSTRACT

Adaptive Reuse of Abandoned Historic Churches:

Building Type and Public Perception.

(August 2007)

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This study investigates the adaptive reuse of abandoned historic churches. Since churches serve as cultural heritage symbols, the public becomes concerned with maintaining the historic integrity of these buildings. More so, this phenomenon is accentuated when the church is recognized as a historic building by the National Register of Historic Places. Yet, more and more churches are abandoned due to decreases in congregation size and financial constraints that limit the maintenance of the churches. Adaptive reuse projects of these abandoned churches are often initiated to save and preserve these buildings.

This research focuses on the question: What is the public perception of critical architectural features of a historic church when it is adapted to a new function (new building type)? To support the importance of this question, the study integrates two

major bodies of knowledge. The first body of literature is research conducted in cognitive science focusing on human perception of environments. The second body of literature is on historic preservation with a focus on adaptive reuse. The integration of these literature reviews is further demonstrated in the analysis of examples of past and recent adaptive reuse projects of religious buildings. Following this investigation, a conceptual model was developed to illustrate how research variables and hypotheses were made based on the findings from this literature review.

To test the research question and its hypotheses, two prototypes of historic churches were developed. Then, typologies of changes in the important architectural features (interior volume and light quality) of the churches were constructed from examples of adaptively reused historic churches listed in the National Register of Historic Places. These typologies were developed to represent various building types (e.g., community/cultural, institutional, commercial, and residential). Finally, an experiment was conducted to test public perceptions of acceptable and desirable degree of each reuse and the degree of retaining religious origins by use of these typologies.

The findings of this research illustrate the importance of public perception and building type in adaptive reuse projects. This in turn provides theoretical and practical implications for adaptive reuse projects in the field of historic preservation.



## **DEDICATION**

To my family and God, both of whom are always with me.

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## 1 INTRODUCTION

Numerous scholars demonstrate that churches serve as cultural and heritage symbols and thus act as a center of individual and community life. Churches are rooted in the collective memories of the members of a society and become a source of identity; consequently, with strong emotional bonds, the public becomes concerned with keeping the integrity of these buildings and maintaining their cultural heritage symbols (Cantacuzino, 1989; Cohen and Jaeger, 1998; Geva, 1995, 2002; Jaeger, 2005; Lindberg, 2004; Vangelova, 2005).

This phenomenon is accentuated when historic churches are recognized by the National Register of Historic Places (Cohen and Jaeger, 1998; MPC & NTHP, 2005; NTHP & PSP, 2005). Yet, more and more churches are abandoned due to “neglect, lack of restoration funding, changes in congregation size and income, and the lack of training in historic building maintenance” (NTHP, 2006: Help from the National Register). Often an adaptive reuse project is initiated to save these buildings. This study investigates the issues related to the adaptive reuse of abandoned historic churches.

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This dissertation follows the format and style of the *Journal of Architectural and Planning Research*.

The adaptive reuse of the prairie churches of North Dakota demonstrates this phenomenon in a salient way. The prairie churches, as representatives of ethnic heritage, contained diverse architectural features of various European origins such as Sweden, Norway, Iceland, Germany, Hungary, and Russia. The churches were the symbols of community lives and cultural identities. However these buildings were abandoned<sup>1</sup> mainly because of rapid changes in congregation size in the 1990's. To save these churches, preservation measures were initiated by church congregations and nonprofit local preservation organizations (Jacobs, 2004; Lindberg, 2004).

The architectural and cultural significance of these churches was underpinned by preservation professionals. The churches of North Dakota were classified as historically significant rural churches by the National Trust for Historic Preservation in 2001. Since then, the adaptive reuse of these abandoned rural churches has been accelerated to save them. The reuse is comprised of various new functions: coffee shops, day-cares, museums, community centers, homes, offices, businesses, and theatres (Bentley, 2006; Jacobs, 2004; Lindberg, 2004).

The phenomenon of converting abandoned historic churches into new uses is prevalent in urban settings as well. For instance, since 2004, many of Boston's Roman Catholic churches have been abandoned due to a shortage of clergy, financial difficulties, and decrease in congregation size. The closing of those churches initiated diverse reuses including residential, commercial, and educational functions. As the churches were



recognized as historic community symbols, church officials and community preservation groups became concerned with keeping the churches' original architectural integrities. The reuse plans for the churches in Blessed Sacrament parish of Boston reflect this concern as the designer focuses on preserving critical exterior and interior features while adapting them to new uses (Bowen, 2007).

As a preservation strategy, the adaptive reuse often turns out to be more controversial than any other preservation strategy such as preservation, restoration, or even rehabilitation. The reason stems mainly from the fact that adaptive reuse premises functional changes in the original buildings. Faced with this problem in the processes of adaptive reuse of the churches, professionals turn to the Secretary of the Interior's Standards for Rehabilitation as guidance (Appendix A). However, the Standards are basically designed to be used for the rehabilitation<sup>2</sup> of historic buildings and do not consider the issues of public perception and building type (i.e. new use)<sup>3</sup> as factors in adaptive reuse projects. This study attempts to demonstrate the importance of these issues in the reuse of abandoned historic churches.

### **1.1. RESEARCH QUESTIONS AND OUTLINE**

This study focuses on the following research questions: What is the public perception of a historic church's critical architectural features when it is adapted to a new function? And, how do new building types influence this perception? The perception of a modified church can be tested in three different levels: acceptable degree for new

use, degree of retaining religious origins, and desirable degree of reuse. In other words, the converted churches for new building types are examined in terms of the appropriateness for the new function, the extent to which their original integrity has been kept, and the overall quality of the conversions.

## **1.2. RESEARCH OBJECTIVES**

To pursue the research questions, this study developed three major objectives:

- (1) To examine sacred buildings being converted into secular buildings as a phenomenon of the adaptive reuse of abandoned historic churches.
- (2) To demonstrate the importance of public involvement in adaptive reuse projects through the study of the public perception of changes in the critical architectural features of historic churches.
- (3) To investigate the role of building type (e.g., community/cultural, institutional, commercial, and residential) in adaptive reuse projects by means of typologies of physical changes as derived from their new functions.

## **1.3. RESEARCH SIGNIFICANCE**

This research has significant theoretical and practical implications for the field of historic preservation. The theoretical contribution is in the integration of cognitive sciences into preservation projects, along with the introduction of a rigorous methodology to investigate the phenomenon of the adaptive reuse of historic churches. The practical contribution of this research is in understanding the role of public

perception in adaptive reuse projects and its interaction with new building types. Considering the public's perception of changes in historic churches may help the design process of adaptive reuse projects. In turn, this will affect public acceptance of adaptive reuse projects and facilitate public involvement in the projects. Furthermore, the public perception of the extent of changes to the original architectural features of a church can be an indicator of what cultural and religious values should be maintained in adapting it to a new building type.

#### **1.4. RESEARCH PROCEDURE**

In exploring the research questions and pursuing the study's objectives, this dissertation consists of four parts: literature review, conceptual model, methodology, and results and analyses. A summary and conclusion section follows these parts.

The literature review integrates two bodies of knowledge: cognitive science and historic preservation:

(1) *Cognitive science studies*: These studies examine areas such as environmental psychology, behavioral science, and aesthetics. The literature review establishes the link between shared values of architecture and society, and its cultural symbols.

(2) *Studies of adaptive reuse in historic preservation*: These studies highlight the goals, design criteria, and strategies of adaptive reuse projects in historic preservation.

Furthermore, this project analyzes past and recent examples of the adaptive reuse of houses of worship. These analyses integrate the two bodies of knowledge as previously

described.

Based on the literature review, a conceptual model of this study is developed. The conceptual model comprises of the procedure of the adaptive reuse of historic churches as practice today, and the issues derived from those procedures. Following this model, the study's variables and hypotheses are established.

The methodology of the study includes three major steps. The procedure used for each of the steps is described and includes: selection of study samples and populations, development of prototypes<sup>4</sup> and typologies<sup>5</sup> of the samples, research design, pretests, development of the instrument and questions on the web, the procedure of data collection, data coding, and data analyses.

The fourth main section consists of the results and analyses. The results are analyzed by means of statistical methods including frequency and descriptive statistics, repeated measures of ANOVA, and Post-hoc Test (Scheffe's).

Finally, based on the findings that are generated from these analyses, the limitation of the methodology, the validity of the research hypotheses, and suggestions for further research on this topic are discussed in the summary and conclusion section.

## 2 LITERATURE REVIEW

This literature review integrates two bodies of knowledge: studies of cognitive science and studies of adaptive reuse in historic preservation. The integration is based on the scholarly contention that public perception (cognitive science) generates the cultural and historical values of architecture to be preserved by society (historic preservation).

### 2.1. PUBLIC PERCEPTION AND ARCHITECTURE AS CULTURAL SYMBOL

The cultural value<sup>6</sup> of architecture can be accounted for by various scholarly works in fields such as cognitive science, behavioral science, environmental psychology, aesthetics, architectural theory, and architectural history (Brand, 1995; Carlson, 2000: viii, x, xiii; Day, 2002; Dewey, 1934; Downing, 2000; Karsten, 1997; Knobler, 1971:i; Langer, 1953:v; Scruton, 1979; Tuan, 1977; Watkin, 1977). Studying the interpretation of the cultural value of architecture reveals that it can be summarized into two general trends: (i) the cultural symbolic value of architecture originates mainly from its relationship with social values representing an epoch (Karsten, 1997; Watkin, 1977); and (ii) this value is derived from the relationship between built environments and individuals' daily lives (Brand, 1995; Day, 2002; Dewey, 1934; Downing, 2000; Langer, 1953:v; Tuan, 1977). While this first viewpoint is bound up with broad contextual changes in a society such as the aftermath of a war or an economic crisis, the second viewpoint has bearing on humans' perception and their activities in their

environments.

The first view utilizes deduction in reasoning cultural values of architecture. This view establishes similarly reasoned design theses based on the understanding of social economic and cultural situations, which are embodied in architecture. The second view uses induction to sum up design theses based on understanding the relationship between individuals' activities and built environments, including architecture. The design theses are related to the cultural values of architecture.

Adapting a Hegelian view<sup>7</sup> and following the German-Swiss art-historical tradition (e.g., Burckhardt, Wolfflin, Gideon and Pevsner), some architectural theoreticians and historians assert that architecture should be the reflection of the *zeitgeist* (time spirit) of a society. It is suggested that architecture should express “the *Lebensgefühl* (attitude to life) of an epoch,” which leads to the determination of the architectural style and the criteria that evaluate it (Karsten, 1997; Scruton, 1979:53; Watkin, 1977:10). Often, this tendency is regarded as elitist, since the architectural style and evaluation criteria have been established by only a few leading architects, theoreticians and historians. This standpoint is identified as an ethical one by some scholars such as Gideon (Brolin, 1980:i; Karsten, 1997; Sharp, 1998; Watkin, 1977). This view helps build paradigms of architecture and architectural styles by referring to the broad social, economic, and cultural contexts of an epoch, which in turn, offers criteria to estimate the architectural value of the buildings that were built during that epoch.

This phenomenon is clearly demonstrated in the modernist architectural code of the ethics<sup>8</sup> (Arnason, 1986:iv, xii, xvi, xxiii; Brolin, 1980:i; Karsten, 1997; Watkin, 1977; Wolfe, 1999). The pioneers of this Modernist approach (e.g., Gropius, Mies Van der Rowe, and Le Corbusier) announced that architecture should reflect the social changes of the early 20th century; they emphasized the importance of the modern industrial (machine) methods and materials in architecture that were derived from the technological advancement of that time. Not only did they express their idea through their work, but they also propagated it through publications, meetings (e.g., CIAM), and education (e.g., Bauhaus). Modernism was germinated by them and flourished through their followers all over the world and ultimately engendered a clear architectural style that was called the International Style (Arnason, 1986:iv, xii, xvi, xxiii; Brolin, 1980:i; Sharp, 1998; Wolfe, 1999).

Scholars supporting the second viewpoint that the cultural symbolic value of architecture is derived from the relationship between humans and their built environments take notice of the perceptual and behavioral characteristics of human beings in their daily lives, as associated with common biological and psychological factors (Arnheim, 1977; Bloomer and Moore, 1977; Brand, 1995; Casey, 1999: 202-213; Day, 2002; Dewey, 1934; Downing, 2000; Hildebrand, 1999; Knobler, 1971:i; Lakoff and Johnson, 1999; Langer, 1953:v; Rasmussen, 1959; Rentschler, et al., 1988;i; Tuan, 1977). According to this standpoint, architecture obtains a cultural value in the course of affording humans' activities and through the relationship with humans'

perceptions of buildings.

The phenomenon is demonstrated most clearly in vernacular architecture. Vernacular buildings are generated by the quotidian needs of the public. These buildings are the outcome of practical needs, geographical conditions, and long cultural tradition and beliefs rooted in a society. The buildings survive through an evolution of their forms that accommodates the changing needs of the public<sup>9</sup>, which is reflected in society and culture<sup>10</sup>. In vernacular architecture, cultural values are autogenesis (Brand, 1995; Day, 2002; Geva, 1995, 2002).

This research focuses on the latter views in explaining the significance of the public perception in adaptive reuse of historic churches. This perspective is supported by cognitive science studies, which demonstrate the significance of public perception as a foundational source that coins the cultural and aesthetic values of architecture.

The efforts to clarify aesthetic perception as part of cognition shed light on the existence of shared values in the public perception of architecture (Arnheim, 1977; Carlson, 2000:viii, x, xiii; Freeland, 2006:i; Knobler, 1971:i; Lindgaard and Whitfield, 2004; Rentschler, et al., 1988:i). These efforts take notice of the cognitive mechanisms in human beings as the foundation of aesthetic experience, which is different from many philosophical approaches that focus on the meanings and values of beauty.



In cognitive science, aesthetic is defined as a pre-linguistic form, which leads to the integration of emotion and cognition in aesthetic experiences<sup>11</sup> (Knobler, 1971:i; Lindgaard and Whitfield, 2004).

Aesthetic satisfaction is the result of a complex combination of subjective attitudes and perceptual abilities. The aesthetic experience may be defined as satisfaction in contemplation, or as a satisfying intuition (Knobler, 1971:6).

Therefore, what these experiments suggest is that the sensations we receive have no meaning for us until we know how to order them into a coherent perception. Sensation is only one part of perception. Also included in the construction of a percept is the past experience of the observer and his ability to combine sensations into a meaningful form. Visual information combines with other sensory data and interacts with emotional and intellectual functions of the brain to shape his perception (Knobler, 1971:19-20).

In this sense, Carlson (2000:viii, x, xiii), Rentschler, et al. (1988:i), Dewey (1934), Knobler (1971:i), Argan (1996), Broadbent (1996), Colquhoun (1996) and Langer (1953:v) all suggest that art is encoded in aesthetically appealing ways to convey messages as cultural symbols. For instance, Dewey (1934) sees the function of art as a communication, too. He maintains that art is the product resulting from the interaction of human beings with their environment, and in particular, architecture is a notable instance of the reciprocity of the results of this interaction. He suggests that the aesthetic of architecture as a fine art is characterized by the embodiment of collective human values through its interaction with humans. Following this line, Broadbent (1996:126) and Langer (1953:96) contend that the meaning of a building is “humans’

perceptual matter” and the image that the architect creates should reflect “human beings’ continuous functional patterns which constitute a culture.”

Casey (1999:202-213), Bloomer and Moore (1977), and Tuan (1977) also suggest that the human experience of the environment is the basis for the cultural value of architecture. Tuan articulates that culture and experiences are crucial influential factors in understanding environments. Hence, built environments influence our culture by defining “social roles and relations” in a society (Tuan, 1977:102).

Rentschler, et al. (1988:i) explain this viewpoint in terms of the biological and physiological understanding of aesthetics, which leads to assuming the existence of a common level of the public perception of beauty. Gestalt psychology<sup>12</sup> serves as a good example of this perspective.

Hildebrand (1999) and Rasmussen (1959) illustrate the existence of a categorical perception in the public realm.<sup>13</sup> Hildebrand regards the perception not only as part of Gestalt psychology, but also as part of inborn bodily reactions to surroundings. He connects this perception with humans’ psychological fundamental desire for safety and suggests that architectural aesthetics originate from a shared characteristic of human perception as related to survival. This in turn, creates aesthetic values of architecture.

Downing (2000) and Knobler (1971:i) contend that there is a common level in humans’

past experiences and memories with regard to place. In the book, *Remembrance and the Design of Place*, Downing reveals common thematic and categorical concepts that designers utilized to sort their personal experiences of places. These concepts contain critical metaphors such as “cultural coherence metaphors” and reflect fundamental common values of places (Downing, 2000:79). Ultimately, she argues that the abstract concepts of places exist on both the personal and shared levels of memories; and the procedure of the abstraction is the fundamental way that humans understand their world.

Lakoff and Johnson (1999) write that the interaction between perception and conception, in other words, phenomenological embodiment and neuro-embodiment, categorizes our experiences. Such interplay renders shared culture from built environments through what they call the “basic level of categorization” and “primary and universal conceptual metaphors” in our daily lives (Lakoff and Johnson, 1999:28-30). These metaphors are learned unconsciously through “immediate conceptual mapping via neural connections” (Lakoff and Johnson, 1999:56-57). Scruton (1979:76) supports this contention by arguing that experience and interpretation, perception and conception happen at the same time in our brain. The concurrence makes a patterned image of the world.

In short, the interplay of human perception and conception in environments functions as a major driving force. This force fashions shared cultural values of architecture, and

in turn the cultural values dictate the interplay as appealing to our perception. At the center of this procedure basic metaphors originate not only from humans' biological and psychological nature (inborn nature), but also from the course of learning and socialization in a society (acquired tradition). The metaphors help the categorization and abstraction of our environmental experiences, and this course of conception is not separable from perception (Bloomer and Moore, 1977; Casey, 1999:202-213; Downing, 2000; Tuan, 1977; Langer, 1953:v; Lakoff and Johnson, 1999). Therefore, these cognitive science studies indicate that humans' perception of the environments is one of the most fundamental sources of engendering the shared cultural values of architecture.

The importance of humans' perception was noticed in city planning and environmental design during the 1960s and 1970s. The resulting efforts to build humanistic environments during those decades introduced environmental psychology and behavioral sciences into urban and architectural designs as they began to deal with the public perception of built environments and their activities (Alexander, 1977; Jacob, 1989; Lang, 1987; Lynch, 1960).

For instance, in his book *A Pattern Language*, Alexander (1977) suggests the formal characteristics of desirable built environments. Alexander investigated the relationship between public perception and activities in existing and varied built environments. As a structuralist, Alexander assumed that there are basic structural characteristics in the

environments appealing to most human beings<sup>14</sup>. He observed humans' behaviors in built environments, categorized the behavioral characteristics along with each designated place, patterned the characteristics in terms of visual diagrams, and suggested the desirable design patterns for each place.

In the book *The Image of the City*, Lynch (1960) suggests several fundamental factors that help people in mapping the city through studies of public perception and their memories of the cities. Lynch concluded that critical elements such as paths, districts, nodes, and landmarks make the city readable in terms of public perception. Like Alexander, Lynch also suggests a specific pattern of a city composed of critical factors in order to build humanistic urban environments. Both studies demonstrate how behavioral science and environmental psychology branched out from cognitive science and were applied to architecture and urban design. The studies expose the significance of public perception not only in evaluating the built environments, but also in designing these environments to satisfy people's physical and psychological needs.

## **2.2. PUBLIC PERCEPTION AND CHURCHES**

As discussed above, public perception endows our environments with cultural values, and in turn the perception is dictated by these values. Numerous researchers and critics in architectural theory and historic preservation looked at these shared values. Wolfe von Eckardt, an architecture critic, says that humans' "psychological necessity" to maintain their memory creates the desire for historic preservation (Woodcock, 2002:9).

Likewise, the researchers argue that the on-going course of history that contains each generation's culture should be preserved as the public is concerned with the preservation of their memory that has been fashioned in the relationship with their environments (Brand, 1995; Cantacuzino, 1989:174-177,184-187; Day, 2002; Diamonstein, 1978:13-28; Denslagen, 1994; Downing, 2000; Lynch, 1972; Powell, 1999:9-19; Robert, 1991; Warren, 1998; Worthington, 1998).

Might it also be possible to use environment to teach change instead of permanence – how the world constantly shifts in the context of the immediate past; which changes have been valuable, which not; how change can be externally effected; how change ought to occur in the future? Past flux might be communicated by marking out the successive locations of activities or populations or by representing the changing aspect of a single place (Lynch, 1972:43).

Men have always been concerned with timing, however little or much they may care about the distant past or future. They are necessarily preoccupied with the practical problems of allocating time, of coordinating joint activities. But beyond that (practical problems) they attempt to harmonize their perceptions of inner and outer time, to feel the fullness of life, and to still the anxiety of death. If this is the aim, then environment ought to support it (Lynch, 1972:66).

The characteristics of this memory are selective<sup>15</sup>, changing in the flow of time,<sup>16</sup> and perceptible by a cultural group<sup>17</sup> (Day, 2002; Lynch, 1972; Robert, 1991). Therefore, its preservation provides the public with “a sense of stability in the face of rapid environmental change” (Mavis, 1976:1).

This memory can also be called collective memory, which represents the shared

cultural values of a society (Day, 2002; Downing, 2000; Lynch, 1972; Robert, 1991). As the memory appeals to a shared public level as well as to the personal level, it is expressed in various terms such as, “spirit of place” (Day, 2002:159), “palimpsest” (Robert, 1991:6), and “objective memory” (Downing, 2000:105).

Historically, just as religion has been concerned with group activities reflecting the cultures they come from, a house of worship intrinsically represents cultural values appealing to the public (Dewey, 1934:7; Geva, 1995, 2002; Langer, 1953:97).

...but the great architectural ideas have rarely, if ever, arisen from domestic needs. They grew as the temple, the tomb, the fortress, the hall, the theatre. The reason is simply enough: the tribal culture is collective, and its domain therefore essentially public. When it is made visible, its image is a public realm. Most early architecture – Stonehenge, the Mounds, the Temple of the Sun-defines what might be called “religious space.” This is a virtual realm (Langer, 1953:97).

Geva (1995, 2002) demonstrates that public perception of various building types is a function of the interaction of cultural, regional climate conditions and architectural forms. Geva analyzed the degree of architectural modifications of single family houses and community churches built by immigrants who arrived to South Central Texas from North Europe. Changes the target buildings underwent were examined by analyzing the adaptation of the building to the regional conditions. The results showed that the churches, as shared cultural symbols, underwent fewer formal changes than the houses built in the same area. The immigrants were reluctant to change the original form or

image of churches while they readily changed houses to accommodate their thermal comfort. Consequently, the study illustrates the emotional bonds of the public with their churches, which can serve as the collective memory of their cultural origins and identities.

Thus, churches as a building type are significant to the public as they serve primarily as cultural symbols (Cantacuzino, 1989:174-177, 184-187; Cohen and Jaeger, 1998; Geva, 1995; Jaeger, 2005; Lindberg, 2004; Vangelova, 2005). In terms of collective memory, old churches work as “community anchors” associated with people’s “emotional rootedness” in places (Cohen and Jaeger, 1998:21; Langer, 1953:98). Consequently, the public becomes reluctant to change or remove their churches and are quite willing to preserve them based on the perception of their significance (Cohen and Jaeger, 1998:21; Geva, 1995, 2002; Langer, 1953:98; Murtagh, 1997:110; Upton, 1986).

In summary, the public perception of churches is deeply connected with the cultural identities of the communities in which they exist. As they are often located at the center of a community and concerned with many life enhancing events, churches become the anchor of a society across generations. The preservation of these buildings is a way of preserving the collective memory of the community. As described before, the shared cultural value of churches and its relationship with public perception are also supported by cognitive science studies. Therefore, public perception should be



considered an important factor in historic preservation projects including adaptive reuse of historic churches.

### **2.3. THE NATIONAL REGISTER OF HISTORIC PLACES AND THE SECRETARY OF INTERIOR'S STANDARDS**

The stamp of the National Register implies that the historic and cultural values of an old building were acknowledged officially in the field of preservation.

The National Register of Historic Places is the Nation's official list of cultural resources worthy of preservation. Authorized under the National Historic Preservation Act of 1966, the National Register is part of a national program to coordinate and support public and private efforts to identify, evaluate, and protect our historic and archeological resources. Properties listed in the Register include districts, sites, buildings, structures, and objects that are significant in American history, architecture, archeology, engineering, and culture (NRHP, 2006: About the Register).

The National Register acknowledges their importance only in terms of their historic significance, which is determined by one or more of four evaluation criteria: “association with events, activities, or patterns in history, association with an important person or persons in history, distinctive design or physical characteristic, and potential to yield important information in either prehistory or history” (Shrimpton, 1990:ii).

#### **2.3.1. *Event***

Single and/or repetitive events should be clarified by their associated historical

contexts, such as series of events associated with cultural traditions of a community (Shrimpton, 1990:vi). An example of this category is Independence Hall, Philadelphia, Pennsylvania. It is recognized on the national level as a symbol of the American independence. The Declaration of Independence was signed in this building and therefore, the building is regarded as the birth place of the nation. In 1966, the building was listed on the National Register. The historic significance of the building was categorized under event, architecture, and engineering. In 1976, preservation work was begun focused on restoring the building to its July 4, 1776 shape as well as reinforcing structural weaknesses (Fitch, 2001:104,146; NRHP, 2006:State Listings).

### **2.3.2. Person**

This criterion is based on the contributions of a person to local, state, and national histories. For instance, if a person who used the building is considered significant as a member of, “an identifiable profession, class, or social or ethnic group,” the person’s contributions to that group must be clarified and evaluated in a historic context based on scholarly research evidence (Shrimpton, 1990:vi). The person’s relationship with a place will enhance the significance of that place, which is illustrated in the example of Mount Vernon, Fairfax County, Virginia. The significance of Mont Vernon as a place where George Washington lived and died was first recognized by Pamela Ann Cunningham. She organized the Mount Vernon Ladies’ Association, a private preservation group of women to save the mansion. The preservation work started in 1858 and focused on restoring the old mansion to its physical condition of the period

of Washington's life. The preservation work was done based on existing documentation and the work that was conducted was also well documented. The mansion was listed in the National Register in 1966 (Fitch, 2001:90; NRHP, 2006:State Listings).

### ***2.3.3. Design and/or Construction***

The eligibility of a historic building for this criterion depends on the clear presentation of, "distinct architectural styles," and/or, "construction practices" (Shrimpton, 1990:vi). This criterion is often concerned with the preservation of a building's values that express, "aesthetic ideals, design theory, principles of a certain style, and periods" (Shrimpton, 1990:vi). In this criterion, "historic adaptation of the original property," can be also considered significant evidence that illustrates, "changing tastes, attitudes, and uses over a period of time" (Shrimpton, 1990:vi; NRHP, 2006:State Listings). Frank Lloyd Wright's Unity Temple, Oak Park, Illinois built in 1905 is one of the earliest examples in the world of an architectural masterpiece built with reinforced concrete. In 1970, the building was listed in the National Register under the category, "architecture and engineering." In the same year, the preservation and restoration work were conducted. Recently, the building is undergoing another series of preservation efforts (Fitch, 2001:118-119; NRHP, 2006:State Listings).

### ***2.3.4. Information Potential***

Under this criterion, properties should provide or have the potential to provide important information about prehistory or history as, "filling current data gaps or

alternative theories that challenge existing ones,” and, “maintaining priority areas identified under State or Federal agency management plans” (Shrimpton, 1990:vi). In general, places should be evaluated for their important relationship with, “specific time, location, and ethnic contexts” (Shrimpton, 1990:vi). Fairview Indian Site, Costa Mesa, California, can serve as an example of this category. The city of Costa Mesa in Orange County, California contains many archeological sites that reveal evidence about the Native Americans’ life who first settled the region prior to 1500 B.C. Many artifacts were discovered there including pieces of pottery, tools made of bone and stone, and collection of shells. Some burial sites were found, yet the most common sites are habitation sites that are concentrated around the bluff that overlooks the Santa Ana River. The site was relatively well preserved as the area was undeveloped and it was listed in the National Register in 1972 under its historic significance for information potential (Costa Mesa General Plan, 2002; NRHP, 2006:State Listings).

The characteristics of these four main criteria can be summarized as follows:

First, the eligibility for criteria is generated based on research. This scholarly data is used by preservation professionals to follow a three phase procedure: determination, identification, and evaluation as related to historical contexts (Shrimpton, 1990). However, in this procedure local historical significance is often ignored or misconstrued while national historic significance is emphasized (SAH, 1986). Second, as the four criteria are defined by distinct terms, some ambiguous boundaries appear among them. For instance, the criteria, “person,” and, “design and construction,” can

be redundant for a building designed by a famous architect. Such a building is listed in both categories of historic significance<sup>18</sup>. Third, the criteria allow some flexibility in associating a property with its historic contexts. For instance, a birth place and burial place that are not regarded as historically significant properties can be eligible when this place is the only way to remember and commemorate a historically significant person or event. Fourth, the criteria include an evolutionary viewpoint of historical significance which originates from John Ruskin's notion of preservation<sup>19</sup> (Murtagh, 1997; Weeks, 2005). For instance, design additions of a later period that are associated with social and cultural values of that time are eligible for the criterion, "design and construction" (Shrimpton, 1990). This fourth characteristic is also relevant for historic buildings that were transformed into other functions:

The National Register listing does not mean that an entire building or district is frozen in time and that no change can be made without compromising the historical significance (Weeks, 2005: 2).

The National Register's criteria admit the significance of a building that has undergone physical changes throughout its history. In the physical changes, the continuous adaptation work as a natural procedure to take care of buildings can be included (Brand, 1995:23). Thus, adaptively reused buildings can be listed on the National Register by satisfying one or more of the four criteria.

Once an old building is recognized and registered, its preservation processes become more realized with reference to the Secretary of the Interior's Standards (Shrimpton, 1990:preface). These Standards (Appendix A) focus on preservation principles – how

to preserve historic buildings and what the goal of the preservation treatments is (Murtagh, 1997; Park, 2006). In other words, the Standards are intended to, “promote responsible preservation practices that help protect our Nation’s irreplaceable cultural resources” (Woodcock, 2002:47).

Therefore, both of the National Register’s criteria and the Secretary of the Interior’s Standards function as major yardsticks justifying preservation procedures of historic buildings including churches. The ten guidelines of the Standards help preservation architects’ work by articulating ways to maintain historic integrity in preservation projects. The guidelines recommend that the architects mainly focus on preserving distinctive architectural features; in other words, that they make minimal physical changes and find compatible uses for new materials (Appendix A). These preservation efforts can be supported by various U.S. governmental programs such as tax credits which often result in the acceleration of the preservation procedures (Cantacuzino, 1989:10; Diamonstein, 1978:21; Murtagh, 1997:123; Stipe, 2003:12).

#### **2.4. SIGNIFICANCE OF HISTORIC CHURCHES LISTED IN THE NATIONAL REGISTER OF HISTORIC PLACES**

The National Register serves as an evaluation tool of the historic significance of buildings while the Secretary of the Interior’s Standards serves as the guidelines for the practice. Old churches are considered symbolically and emotionally significant by their community members (Cohen and Jaeger, 1998; Coryel, 2005; Geva, 1995; Jacobs, 2004; Lindberg, 2004; Schmertz, 1984; Vangelova, 2005). However, the churches are

evaluated by the four criteria of the National Register, which do not necessarily include religious and cultural values that are originated from community members' experience and perception across the generations. The lack of cultural and traditional symbols of the community trait in the criteria leads to the difficulty in including traditional cultural properties in the list of the National Register. For example, the attributes of Native Americans' traditional cultural properties lie in their spiritual characteristics and ambiguous boundaries, not clear cause and effect. As a result, despite the 1992 revisions of the National Historic Preservation Act that intends to include the cultural properties (e.g., section 101, 106, and 304), the Indians' traditional cultural properties were not able to be included in the list (Parker, 1993).

Tomlan (1998) asserts that historical significance cannot be objectively defined. Each group of people tends to interpret the significance differently. For instance, in their preservation project of the Alamo, San Antonio, Texas, the DRT<sup>20</sup> focused on the siege and battle period. The project intentionally created, "the atmosphere of awe for military sacrifice in the church" (Brear, 1999:11), and not awe for God even though the Alamo was built as a mission. Visitors are intended to experience the battle period and the lives of the heroes of the Alamo through the exhibition and gift shop items. In this context as well as in an economic sense the Alamo is a successful preservation case (Brear, 1999).

However, Brear (1999) argues that the historic significance of the Alamo should be

extended to include its significance as one of the first Franciscan missions built in San Antonio and as a shared heritage for Hispanic community members, most of whom are Catholic. Brear asserts that the religious significance related to the Hispanic history was rarely reflected in the Alamo preservation project. As a result, unlike other existing missions in San Antonio, the Alamo church is not used for religious services. The DRT holds only one service a year to memorize the anniversary of the 1836 battle and invites mainly wealthy businessmen groups. Currently, the historic significance of the Alamo is listed in the National Register as a military event (NRHP, 2006:State Listings).

Therefore, the National Register's evaluation criteria determine the historic significance in set terms and rely on professionals' interpretation, and thus cannot cover the whole range of diverse historic significances (Tomlan, 1998). Based on this notion, some scholars claim that the National Register is, and should not be, a closed system (Parker, 1993; Tomlan, 1998). They point out that the National Register is in on-going procedure used to comprise numerous historic significances that originate from different interpretations by the public.

As mentioned previously, historic churches that are significant only by public perception cannot be listed in the National Register, unless they fall under the four established criteria. Since these criteria were established in "secular terms", the evaluation of religious properties is conducted through secular uses and themes: the old



churches hosted famous statesmen who gave historically important speeches, were used for historically important meetings, were used as “hospitals during the Civil War, or served as important buildings in religious history, settlement, social philanthropy, or education histories” (Shrimpton, 1990:vii). Consequently, the National Register Criteria provide limited interpretations in explaining the significant values of historic churches as related to public experiences and perception.

## **2.5. GENERAL ISSUES OF ADAPTIVE REUSE**

Upon the approval of the National Register for old churches being historic buildings/sites, the buildings are protected from being destroyed (NRHP, 2006). Different preservation methods can be applied to these buildings depending on their, “relative importance in history, physical conditions, proposed uses, or mandated code requirement”: preservation, restoration, rehabilitation, reconstruction<sup>21</sup>, or adaptation to new functions (Fitch, 2001:viii; Murtagh, 1997). Sometimes, more than two methods are combined. For instance, the adaptation work on an abandoned historic church can be carried out together with the preservation and restoration of its exterior fabric or other special features (Cantacuzino, 1989:174-177, 184-187; Coryel, 2005; Jaeger, 2005; Lindberg, 2004).

In the discussion of the meaning of adaptive reuse, numerous scholars interpret it in either a broad way or a more focused way. For instance, Douglas (2002:1) sticks to the lexical meaning of adaptation that originated from the Latin *ad-aptare*, “to fit.”

Douglas considers all the possible techniques for adapting existing buildings, including historic buildings, in this for long-term use. Each method (e.g., restoration, remodeling, recycling, renovation, rehabilitation, and refurbishment) intends to make optimal use of an existing property. The methods are characterized in terms of the levels of intervention. For instance, maintenance, consolidation, stabilization and reconstruction are hierarchically applied to properties in terms of the degrees of their obsolescence (Diamonstein, 1978:13; Douglas, 2002:2-3). Consequently, the adapted property is intended to obtain characteristics such as “convertibility, dismantlability, expandability, and flexibility” (Douglas, 2002:5-7).

For long-term use, Douglas (2002) claims that adaptable buildings should be easily changed and reused not only as a whole but also as pieces of materials. This concept introduces environmental concerns to adaptive reuse projects. The reuse should be carefully conducted without harming the environment. In this sense, Douglas (2002:20) calls the reuse “sustainable adaptation,” which requires, “profitability, flexibility, energy efficiency, and eco-friendly materials.” This environmental concern in adaptive reuse is acknowledged by many other researchers in historic preservation such as Diamonstein (1978:13-28), Fitch (2001:viii), Murtagh (1997), and Robert (1991). These scholars agree that the concept of adaptation includes the future, as well as current, use of existing resources based on environmental considerations.

The causes of this adaptation are categorized by, “internal and external factors”

(Douglas, 2002:12). Global issues such as “technological innovation, sustainability, and economic growth and urbanization” correspond to external factors and apply mainly to the revitalization of cities, neighborhoods, and communities<sup>22</sup> (Douglas, 2002:9-12; Stokowski, 1996).

Unlike external factors, internal factors are, “normally user-generated” (Douglas, 2002:12). These factors include neglect, lack of maintenance, and a rapid decrease in number of users of a building (Douglas, 2002:9-12). As demonstrated in the Prairie churches of North Dakota (see page 2), many adaptive reuses of abandoned historic churches are derived from a rapid decrease in congregation numbers. This in turn causes financial problems in maintaining the churches and contributes to their deterioration (Cohen and Jaeger, 1998; MPC and NTHP, 2005; NTHP and PSP, 2005).

In fact, the case of the Prairie churches in North Dakota implies that both external and internal factors are reciprocal in the adaptive reuses of historic churches. In the late 19th and early 20th centuries, the influx of European immigrants to North Dakota abruptly raised the population numbers. Yet due to changing farming conditions, the decrease in population accelerated. As a result, greater number of Prairie churches became redundant and abandoned (Lindberg, 2004).

Compared to Douglas (2002), Murtagh (1997), Robert (1991), and Latham (2000) interpret adaptation in a more focused sense. According to them, adaptive reuse implies

physical changes originating from functional changes in old buildings. Latham indicates that the motive of adaptive reuse projects can come from the archeological, aesthetic, economic, functional, or psychological appeals of buildings.

Numerous researchers in historic preservation suggest that the economic factor is as important as the psychological in reusing abandoned properties as part of revitalization efforts (Diamonstein, 1978:13-28; Murtagh, 1997; Robert, 1991). A good example of this notion is the Ghirardelli Square in San Francisco that was built in the 1860's and was abandoned after the Ghirardelli chocolate factory moved in 1960. It was the oldest extant factory in the west. Lurline Roth and her son William purchased the property for preservation in 1962. The new plan for its reuse included commercial facilities such as shops, restaurants, galleries, cinemas, and offices. The adaptation work is considered a successful revitalization project as it became one of the most famous tourist sites in San Francisco (Diamonstein, 1978:208).

Based on the understanding and inquiry of adaptive reuse projects, Diamonstein (1978:22-25) recommends avoiding five plausible tendencies: "boutiquefication, gentrification, danger of the sameness, museumization and over-preserving or over-recycling of old buildings"<sup>23</sup>. Diamonstein (1978:13-28) asserts that too many cultural, commercial, and industrial buildings such as churches, schools, libraries, city halls, railroad stations, mills, and barns are abandoned and all of them cannot be saved.

In sum, adaptive reuse is interpreted as either all possible measures for longevity of buildings or simply functional changes in buildings. Many internal and external factors function in interactive ways as causes of adaptive reuse projects. These general issues of adaptive reuse are applied to adaptive reuses of historic buildings including historic churches. The point of the adaptive reuse of historic buildings is reusing the buildings wisely. This wise reuse stands on the basis of not only psychological but also economic considerations given the context such as the neighborhood or district (Douglas, 2002; Latham, 2000; Robert, 1991).

## **2.6. PROFESSIONALS' VIEWS ON ADAPTIVE REUSE AND THE SECRETARY OF THE INTERIOR'S STANDARDS**

Numerous scholars and professionals support adaptive reuse as a preservation strategy for saving historic buildings.

Adaptive reuse is an excellent way to create valuable community resources from unproductive property, substantially reduce land acquisition and construction costs, revitalize existing neighborhoods, and help control sprawl (Spector, 2003:9).

While the National Register certifies the historic significance of old buildings, the Secretary of the Interior's Standards address the architectural integrity of the buildings in order to preserve their historic significance. In other words, preservation methods are carried out in line with the goal of preserving the architectural integrity of historic buildings (Murtagh, 1997:118). Compared to other methods, adaptive reuse is more

controversial in preserving the historic buildings' architectural integrity (Crawford, 1988; Denslagen, 1994; Powell, 1999:1-19). The difficulty of using adaptive reuse as a preservation method lies in building type changes, which is illustrated clearly by Robert's statement.

Function creates form, but what is to be done with the form once the function disappeared? Can the existing form accommodate the new function? The whole business of working with existing buildings turns upon the form/function dialectic: a conversion only succeeds when there is a good match between new function and existing form (Robert, 1991:8).

In the course of finding a new function, a collision between original and new architectural integrities may occur (Murtagh, 1997:118; Nelson, 2005:1).

Faced with this problem, preservation architects refer to the Secretary of the Interior's Standards which were developed to, "measure the success of preservation treatments," based on the National Historic Preservation Act of 1966 (Park, 2006:13). Although specific standards were developed for various treatments, the ten guidelines of the Secretary of the Interiors' Standards for Rehabilitation are the most frequently used<sup>24</sup> (Appendix A). The major characteristics of the guidelines are as follows:

- 1) Standards #1 and #9 recommend, "minimal alteration," and, "compatible," use as ways to keep the, "integrity." It should be noted that those terms are too abstract to clarify the acceptable degrees of physical change.
- 2) Standards #2, #5, and #6 focus mainly on the materiality of the historic building and the preservation of its distinctive architectural styles.

3) Standard #10 presents the bottom line of physical changes for future restoration work. The Standard suggests that the original integrity should not be impaired when new additions and alterations are removed in the future. However, the Standard does not suggest the desirable degree in physical changes.

Morton (Murtagh, 1997:118) interprets architectural integrity as an abstract term that is characterized by several factors such as “style, workmanship, setting or location, materials, building type or function, and continuity.” According to the definition of the American Institute of Architects that follows the Secretary of the Interior’s Standards, architectural integrity implies, “the intactness of the building,” which is systematized by, “its plan, features, materials, finishes, structural system, and the presence of architectural features” (AIA, 2000:457).

To follow the Standards, Park (2006) claims that the examination of historic properties (e.g., significant materials, cultural characters, time periods, and physical features and conditions) should serve as part of the decision making process on the type of preservation treatments needed for each historic property while referring to the Standards.

According to Nelson (2005), the goals of the Secretary Interior’s Standards are to preserve historic materials and to preserve the building's distinguishing characteristics. Nelson maintains that the distinctive characters are made of specific materials, building

types, and architectural styles. The characters are fundamental sources that compose the architectural integrity of a building together with its sense of time and place, and association with events or people.

Following this line, Weeks (2005) argues that the distinctive characters of a historic building are embodied through, “its shape, materials, features, craftsmanship, window arrangements, colors, setting, and interiors.” Furthermore, the studies on a building’s history in terms of its functions can enhance the understanding of the characteristics.

As mentioned previously, most preservation professionals follow the Standards to preserve the architectural integrity of historic buildings (AIA, 2000:457; Murtagh, 1997; Shrimpton, 1990). Yet, the Standards include general guidelines that often consist of ambiguous terms and narrow definition of integrity. Hence, they leave the decision of the extent of physical alterations principally in the professional architects’ hands. For this reason, there is a notion in the field of preservation that the Standards are “neither technical nor prescriptive,” in making design decisions. Rather, they work as philosophical guidelines (Mills, 2006; Park, 2006; Woodcock, 2002:47).

Consequently, the contemporary radical designs of adaptation projects remain controversial in the academic and professional fields of historic preservation and cannot be resolved by the Standards. In general, opponents of radical designs argue that the changes should be moderate to maintain the existing settings and reflect the



flow of time, while proponents argue that radical designs are acceptable as long as they reflect radical change in time (Byard, 1998; Denslagen, 1994; Stephen and Hart, 2001; Sharp, 1998).

Public perception is often included in the review and appeal process of preservation projects as a factor to be considered in the preservation of historic buildings (Jaeger, 2005; Lindberg, 2004; Mavis, 1976; Warren, 1998). Still the Secretary of the Interior's Standards for Rehabilitation do not include the *public perception* of social and cultural contextual changes. Moreover, the Standards do not refer to the fundamental issue of the role of the new *building type* (function) or its impact on the reuse projects in terms of maintaining/changing the original architectural integrity (Robert, 1991). As it is addressed by Nelson (2005), Weeks (2005), and Murtagh (1997), building type is one of major factors that constitute architectural integrity. Hence, a change in building type is a critical issue in adaptive reuse projects. For that reason, the Standards' recommendations of minimal changes in original physical features are often impossible.

This situation raises the following questions: What specific features of historic buildings are critical to preserve their architectural integrity when the buildings are transformed into new building types? To what degree can the specific features be changed or retained? And how can the changes of the specific features be made in relationship to the original architectural integrity of the historic buildings? As described previously, the Standards leave these questions open to the interpretation of

the preservation professionals.

## **2.7. PROFESSIONALS' VIEWS ON ADAPTIVE REUSE OF HISTORIC CHURCHES**

Professional architects in preservation point out that the conversion of historic churches is more difficult than any other building type. This conclusion is derived from their observation of the spatial uniqueness of churches that include symbolic meanings. For instance, the large volume of the interior and the quality of natural light are difficult to convert in an economical way. It often leads to detrimental changes in preserving the original architectural integrity (Latham, 2000: 82; Murtagh, 1997:120).

Focusing on the church's physical and psychological characteristics, Latham (2000) suggests desirable ways of converting churches into secular buildings. The new building types have a hierarchical order in terms of their appropriateness in physical changes and public use: "community center, charitable uses, civic roles, recreational uses, commercial uses, and residential use" (Latham 2000:85-86). This order is defined by the extent of a church's association with the public as well as its original spatial characteristics.

In other words, this hierarchy reflects Latham's perception of the church as a cultural heritage of a community. Thus, the, "community, charitable, and civic uses," are valued the most desirable as they respond to the church's original critical

characteristics (Latham 2000:85-86). Latham (2000) contends that converting a church into residential and retail use is the least favorable. The reasons are because the reuses do not match with the original cultural symbolic characteristics of the churches and present fewer chances for keeping the openness of the original interior space. Thus, according to him, such reuses often lead to undesirable radical changes. Latham suggests a number of principles in church adaptation (Appendix B), yet does not furnish sufficient explanation for how each of the physical changes and new building types can uphold the public's perception of the church's cultural and architectural significance.

Douglas (2002) also suggests various adaptive reuses for churches: "monument, another religious, community, commercial, recreational, residential, mixed residential/church, and industrial uses." Douglas warns of insensitive reuses that are detrimental to the church's critical characteristics (e.g., large open space and daylight coming through tall vertical windows). Like Latham (2000), Douglas seems to suggest hierarchical reuses by considering the original cultural and architectural characteristics of the churches on one hand, and public preference for reuses on the other; he claims that the public prefers community reuse and abhors industrial reuse.

However, compared to Latham, Douglas (2002:159-160) emphasizes more economic benefits coming from the conversions, which lean more towards commercial and residential reuses. For example, Douglas (2002) regards the transformation of churches

into mountaineering facilities and restaurants as ideal reuses to keep their large open interior space as well as for the economic benefits. Moreover, Douglas addresses residential use as the most viable and sustainable option. However, he does not mention how the change into a residential building, such as dividing an abandoned church into several flats, maintains the church's original architectural integrity and how the public perceives the converted church.

In the adaptive reuse projects of historic churches that are listed in the National Register, most professionals contend that they strived to maintain the original architectural integrity of the churches. Like Latham (2000) and Douglas (2002), preservation architects seem to recognize the significance of historic churches in community cultural identity (Cohen and Jaeger, 1998; Coryel, 2005; Jaeger, 2005); yet the design decisions of which features should be preserved to keep the identity seem to be made principally based on the professionals' perception, experience, and skills.

In general, in reusing historic churches, new building types are suggested in a hierarchical order, which is established based on the symbolic meanings and physical characteristics of the churches. Professionals also appear to work on the dichotomy of economic and cultural values of historic churches when faced with their adaptive reuse. Yet, in many cases, how the two values can be compatible enough to be accepted by the public remains unexplained.

## 2.8. CHANGING PHENOMENA OF ADAPTIVE REUSE OF HOUSES OF WORSHIP

Adaptive reuse became a major area of focus in architectural practice in the late 20th century. Adaptive reuse has bearing on the acknowledgement of failures in modern cities in the 1950s and 1960s (Brand, 1995:104; Diamonstein, 1978:16,28; Fitch, 2001:179; Murtagh, 1997:116; Robert, 1991:4). This notion widened the horizon of historic preservation by asserting the importance of buildings in historic contexts and fostered the adaptive reuse of these buildings. In the book, *Death and Life of Great American Cities*, Jane Jacob says,

Cities needed old buildings. By old buildings I mean not museum-piece old buildings... but also a lot of plain, ordinary, low-value old buildings, including some rundown old buildings. (Jacob, 1961:187)

Also, in Diamonstein's book *Buildings Reborn*, Ada Louise Huxtable, the architecture critic of The New York Times says,

Preserving a limited number of outstanding buildings, while failing to retain and enhance the more modest streets and space that form their proper setting, has been likened to keeping the cherries out of the cake and throwing the cake away. (Diamonstein, 1978:13-14)

These changes demonstrate that common old buildings, as related to collective shared values, become significant in their historical and urban contexts as evidence of the historical evolution of a society (Brand, 1995; Day, 2002; Diamonstein, 1978:13-18; Jokilehto, 1998; Powell, 1999:1-19; Robert, 1991; Tomlan, 1998). Adaptive reuse

became an important and effective method in their preservation. This was fostered not only by the tax benefits insured by enacted laws such as the 1976 Reform Act and the 1981 Economic Recovery Tax Act, but also by the additional economic benefits such as those associated with tourism (Cantacuzino, 1989:10; Diamonstein, 1978:21; Murtagh, 1997:116; Stipe, 2003:12).

The common characteristics of such adaptive reuse projects are that they focus on keeping the cultural identities of designated districts and thus they are influenced by various contextual considerations (e.g., social, economic, demographic, environmental, historical and urban). Furthermore, the conversion of such buildings became a major driving force of urban revitalization projects<sup>25</sup> (Brand, 1995:104; Cantacuzino, 1989:9; Diamonstein, 1978:13-18; Douglas, 2002:9; Fitch, 2001:165-169; Jokilehto, 1998:44; Latham, 2000; Murtagh, 1997; Powell, 1999:5-6; Robert, 1991:5; Stipe, 2003:169-182; Sparks, 1998; Warren, 1998).

This broad context of adaptive reuse projects and the wide horizon of historic preservation accelerated the adaptive reuse of old abandoned churches. The phenomenon is concerned with understanding old churches as community cultural symbols and identities, in addition to their historical significance. As a result, the adaptive reuse of older abandoned churches that generally retain landmark values become essential in urban renewal projects along with the adaptive reuse of the other ordinary old buildings in a district. In addition, cultural and economic reuses are used

to preserve the old churches while focusing on keeping their landmark values and helping to revitalize historic districts<sup>26</sup> (NTHP, 2006; NTHP and PSP, 2005).

## **2.9. EXAMPLES OF ADAPTIVE REUSE OF HOUSES OF WORSHIP**

Scholars in preservation contend that the adaptive reuse of old buildings has a long history and is not a phenomenon of the late 20th century (Cantacuzino, 1989:8; Fitch, 2001:165; Latham, 2000:79; Powell, 1999:1). Thus, this study analyzes examples from the past as well as from the recent past. Past examples demonstrate that cultural and political factors worked as the forces behind the adaptive reuse projects (Dodds, 1992; Kultermann, 1979; MacDonald, 1976; Necipoglu, 1992). In other words, the past examples illustrate that the cultural meanings and political benefits latent in the buildings had significant roles in the adaptive reuse of these sacred buildings; recent past examples of adaptive reuse of houses of worship demonstrate the cultural and economic forces behind the projects.

The analysis of each example consists of three parts: physical transformation; meaning embedded in the transformation; and conclusion. Based on an understanding of the major factors leading to their adaptive reuse, the analyses will focus on how the perception of the original buildings and the new building types influenced the changes in original architectural integrities while adapting them to new functions.

### **2.9.1. *Past Examples***

The past examples include the Pantheon of Rome, Hagia Sophia of Istanbul and the Great Mosque of Cordoba. These buildings were selected since they are considered prominent examples of adaptive reuse projects as well as world heritage sites (Necipoglu, 1992:195).

#### **2.9.1.1. *The Pantheon of Rome, Italy***

Hadrian's Pantheon was built about in 126-128 C.E. on the site of Augustus's temple after the latter was burned twice (Jacobson, 1986:80; MacDonald, 1976:12). Augustus's temple was a rectangular sanctuary which was dedicated by the emperor's minister, Agrippa, in about 25 B.C.E. while Hadrian's temple was a circular sanctuary. Until 609, the Pantheon existed as a Roman temple. In 609 the Emperor of Constantinople, Phocas permitted Pope Boniface IV to consecrate it as a Christian church and it was renamed as *Sancta Maria ad Martyres* (Kalas, 2005:1; MacDonald, 1976:14).

##### **2.9.1.1.1. *Physical Transformations***

###### **2.9.1.1.1.1. *The Pantheon as a Roman Temple: 126-609 C.E.***

The physical form of Hadrian's Pantheon combines two parts with distinctly different shapes; one is the porch shaped temple with columns and a wooden roof, and the other is the domed rotunda (Jacobson, 1986:80; MacDonald, 1976:14) (Figures 1). In the domed rotunda, the lateral diameter of the hemispherical dome has the same



measurement as the height of the vertical elevation from the pavement to the apex of the dome, the oculus (Jacobson, 1986:84; MacDonald, 1976:34). The dome, built of concrete, is stabilized by a series of rings on the exterior and coffers on the interior (MacDonald, 1976:35,42; Mark and Hutchinson, 1986:24) (Figure 2). In addition, the oculus, a ring 27' in diameter, serves as the key stone of the dome. This feature characterizes the architectural uniqueness of the Pantheon (Figure 3).

The temple interior contains 8 very large recesses whose spaces set back from the cylindrical wall. Each of the recesses is screened by two marble columns (Figures 2 & 4). The floor is paved in “grid patterns of squares, and circles in squares, made of colored granites, marble, and porphyry” (MacDonald, 1976:35) (Figure 4).



FIGURE 1. The Pantheon (Exterior view)<sup>27</sup>

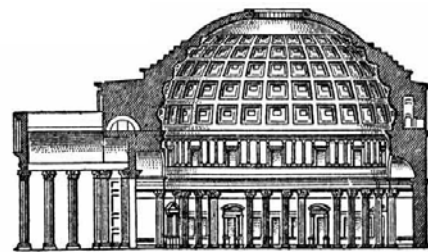


FIGURE 2. The Pantheon (Section view)<sup>28</sup>

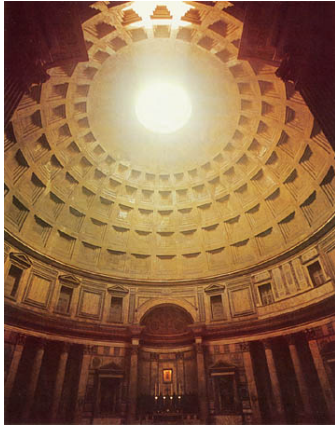


FIGURE 3. The Pantheon  
(Interior view with oculus)<sup>29</sup>



FIGURE 4. The Pantheon  
(Floor patterns)<sup>30</sup>

#### ***2.9.1.1.1.2. The Pantheon as a Christian Church: since 613 C.E.***

The conversion of the Pantheon focused on its practical use as a Christian church. It was consecrated to all martyrs as well as saint Mary just as the Pantheon was built for all gods. The conversion basically followed the instructions of Pope Gregory<sup>31</sup> about how to convert temples into Christian churches. Since the pagan statues were already destroyed by then, there was no need for their removal. Yet the relics of two saints, Rasmus and Anastasius were placed in the original main altar; a symbolic cleaning by holy water was conducted, and an altar was placed in the main niche where an icon of Mary with Child was surmounted (Blaauw, 1994; Kalas, 2005; Krautheimer, 1980; i, ii Licht, 1968). The conversion embraced the formal characteristics of the Pantheon, including its centralized spatial axis: the main altar was located simply at the opposite side of the main entrance and no division of the space by means of partitions was made.

Most important of all, the oculus remained as it was (Blaauw, 1994; Krautheimer, 1980:i, ii).

In later centuries, the Pantheon went through other significant physical changes: additions of a bell tower in the late 13th century and twin towers in the early 17th century (Meek, 1960) (Figure 5); removals of roof tiles by Constantine II and removal of 200 tons of bronze by Pope Urban VIII; the addition of the tomb of Raphael under the rotunda in 1520; and the placement of the tombs of Kings Victor Emmanuel II and Umberto I in the great west and east niches (MacDonald, 1976). However the Pantheon has been restored continuously until the present time, and is considered as one of the most well preserved antiquities still functioning as a church (Licht, 1968; MacDonald, 1976).



FIGURE 5. The Pantheon (Façade with twin bell tower)<sup>32</sup>

### ***2.9.1.1.2. The Meanings Embedded in the Pantheon***

Although there is no definite evidence of the motivation behind building the Pantheon and the meaning inherent in the building, there seems to be a consensus among scholars in interpreting its meanings: the integration of Earth and Heaven as the symbols of the State and Divinity (Kultermann, 1979; MacDonald, 1976; Sperling, 1998). This was not necessarily a new theme as it was already evident in Augustus's Temple which stood on the same site prior to Hadrian's Pantheon. Agrippa who dedicated the Temple to Augustus, colored the building with political character by trying to put Augustus and Julius Caesar's statues inside of the Temple<sup>33</sup> (MacDonald, 1976:76).

The theme of this integration is represented by the repeated circular and square patterns of the floor and the dome of the Pantheon. For instance, on the floor, the circular patterns imply heaven while the square patterns imply earth and the grid of the pavement symbolizes the roads of the Roman Empire. In addition, while the oculus and the hemispheric shape of the dome imply both heaven and universe<sup>34</sup>, the square coffers consisting of the dome imply "the many parts of the earth and the Roman surveyor's plan for town" (Kultermann, 1979:84; Licht, 1966:199; MacDonald, 1976:87) (Figure 3).

The centralized plan of the Pantheon allows all the architectural features to be converged into one point, the apex of the dome (127' diameter). The oculus (27'

diameter), as the focal point of the Pantheon, dramatizes the meaning of the integration by changing natural light that penetrates through it. Working like a sundial, the sunbeams from the oculus projected on the pavement and dome symbolize the Roman Empire<sup>35</sup> as well as the energy and power of the heavenly god or sun (Kultermann, 1979:84; MacDonald, 1976:89-90; Rassmussen, 1959:193-194; Sperling, 1998:129; Trachtenberg & Hyman, 1986:138). Consequently, the integration of heaven and earth as a metaphor of the unity of the Divine being and the State is embodied throughout the Pantheon (MacDonald, 1976:87).

The conversion of the Pantheon, one of the most cherished Roman cultural assets, was intended to show the power shift toward the Christian world. The painting placed within, Mary with Child reinforced this meaning. However, the conversion required only minimal changes to the Pantheon as its original architectural features appealed to Boniface IV in a Christian sense.

As described before, the original meaning of the Pantheon was derived from its simple and powerful geometric forms, which is highlighted by the hemispheric dome with its oculus. Impressed by these original architectural features, Boniface IV stated that it must have been designed by an angel, not by a human. He perceived the concept of heavenly god and emperor inherent in the Christian churches through the critical architectural features in the pagan temple. Based on this perception, he converted the building into a church by retaining most of the existing Roman architectural features of

the Pantheon despite the practical inconvenience. For instance, the preservation of the oculus raises the question of whether or not the converted Pantheon was able to provide for daily clerical work. The indoor environmental conditions of the Pantheon were difficult to control. It exposed believers, priests, and religious features to rain, dust, and humidity; celebrants had to wear hats and warm clothes to stand the wind coming from the big opening and the altar platform located near it got wet, when it rained (Blaauw, 1994).

As a Christian symbol, the dome with its oculus was considered to be heaven where God resides; for example, the oculus visualized heaven when the celebration *Dominica de Rosa*<sup>36</sup> was held (Blaauw, 1994). A late medieval legend about this conversion supports the prevalence of this meaning by recounting that evil spirits escaped through the oculus when paganism was defeated by the Christianization of the site (Kalas, 2005).

When Rome was handed over to Constantine, Roman cultural assets were perceived as the most sophisticated ones in the world. In political sense, by keeping the splendid Roman cultural assets, not only did Christian emperors intend to appease existing Roman aristocrats but also to gain political benefits as a guardian of these splendid properties (Alföldi, 1969; Krautheimer, 1980:i, ii, 1983:i).

Thus, the Pantheon being converted into a Christian church also continued its life as a

symbol of the State as well as a religion, which became the other motivation leading to the minimal change of the Pantheon. The heavenly God embodied in the Pantheon empowered heavenly emperors. It was not simply a symbol of Christianity. Rather, it was a symbol of the Christian world, which included the powers on earth. Later events, such as the use of the Pantheon as the burial of a significant artist and politicians through the sixteenth and nineteenth centuries demonstrate its significance as a national symbol (MacDonald, 1976:19).

#### ***2.9.1.1.3. Conclusions***

As it was constructed at the center of Rome by the emperor Hadrian, the Pantheon delineated the Roman Empire as the center of the earth and this political ideal was merged together with the religion of the Roman Empire.

The value of the Pantheon as a religious and political symbol was inherited to Christian powers by converting it into a Christian church. Yet, the conversion kept original architectural characteristics, of which the meaning appealed to Christianity. Thus, in addition to the Christian powers' attitude toward gaining political benefits derived from safeguarding the structure, the meaning latent in the building available for both religions worked positively in keeping the architectural integrity of the Pantheon.

#### ***2.9.1.2. Hagia Sophia of Istanbul, Turkey***

The present Hagia Sophia is the third church of the same name on the present site. It is

said that the first Hagia Sophia was planned and constructed by Constantine (326-360 C.E.) as a church and destroyed by fire during a riot in 404. The second Hagia Sophia was built in 415 and it was destroyed by fire on the 5th year of Emperor Justinian's reign during the Nika Riot (Krautheimer, 1983:50-53). As soon as the riot was quelled, Justinian began the reconstruction of Hagia Sophia on an even grander scale than before (Mainstone, 1992:9-10). According to Procopius, a historian of that time, Justinian appointed the architects Isidoros and Anthemios for this construction (Mango, 1972:72, 1992:44). The building was dedicated in 537 C.E., five years after construction started, and its clear form was asserted again in 562 following an earthquake and a reconstruction of the central dome (Curic, 1992:16; Mainstone, 1988:9).



FIGURE 6. Hagia Sophia  
(Exterior view of today)<sup>37</sup>

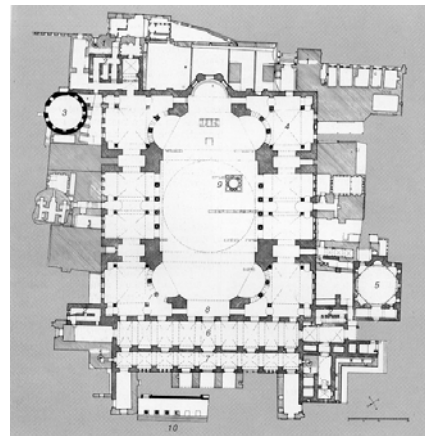


FIGURE 7. Hagia Sophia  
(Floor plan of today)<sup>38</sup>



Hagia Sophia served as a Christian church for almost a millennium. In 1453 it was transformed into an imperial mosque of the Ottoman Empire. During that period, it was called *Ayasofya*; the overall form was maintained under the rule of Ottoman emperors even though changes, such as covering the original mosaics and adding minarets occurred (Necipoglu, 1992) (Figure 6). After the First World War, the defeat of the Ottoman Empire led to the foundation of the Turkish Republic. Mustafa Kemal Atatürk, the founder of the modern Turkish republic, allowed the secularization of Hagia Sophia (Aydingun and Rose, 2003:1). It was opened as a museum early in 1934, ending its use as a place of worship (Mainstone, 1988:11,14; Necipoglu, 1992:225; Nelson, 2004:155).

#### ***2.9.1.2.1. Physical Transformations***

##### ***2.9.1.2.1.1. The Period from Justinian to the Ottoman Conquest: 537-1453 C.E.***

According to Curic (1992:25), the overall form of Justinian's Hagia Sophia follows the formal character of the Pantheon as its architectural origin. However, Hagia Sophia is different from traditional Roman buildings in that the gigantic central dome of Justinian's Hagia Sophia hovers above the rectangular plan supported by the pendentive system while the dome of the Pantheon rests on the round shape of the building. In addition, Hagia Sophia comprises a central dome, two semi domes of the same diameter, and four buttresses: two on each side. Furthermore, the dome of the Pantheon was built from concrete while Hagia Sophia was built from bricks. Hence, the sixth century interior of Hagia Sophia was distinct from its ancient and antique

predecessors (Ahunbay, 1992:179) (Figures 6 & 7).

Procopius describes the beauty of its interior before the collapse of the dome in 558 focusing on the impression of its luminous character. According to Procopius, this luminosity came from light reflected from the golden mosaics on the dome surface and provided a “heavenly feeling” (Mango, 1972:74-75, 1992:43-44; Webb, 1999:69). In addition, the large scale colorful marble pendentives and columns and semi-circular domes are delineated as major architectural features (Mango, 1972:74-75) (Figures 8 & 9). Since its first dedication to Holy Wisdom, Justinian’s Hagia Sophia was damaged several times by earthquakes and fires (Mango, 1992:50-56). Most of the damage occurred due to the weak structural system supporting the dome (Mainstone, 1988:10; Mango, 1992:48).



FIGURE 8. Hagia Sophia (Interior view of today)<sup>39</sup>



FIGURE 9. Hagia Sophia (Dome and openings)<sup>40</sup>

#### ***2.9.1.2.1.2. Ottoman Period: 1453-1931C.E.***

The Ottoman Sultan Mehmed II, the conqueror of Constantinople, perceived Hagia Sophia as a valuable imperial monument. Converting it into a mosque, Mehmed II added only a few critical signs of Islam (e.g., minbar<sup>41</sup> and mihrab<sup>42</sup>, minarets<sup>43</sup>, and madrasa<sup>44</sup>) to the original church, after having removed its relics, crosses, and icons associated with the Christian tradition. The first two wooden minarets were added as an Ottoman imperial symbol after the sultan removed the bells and crosses from a bell tower; those were repaired by Sinan when he was commissioned to build two new minarets by Selim II (Figure 6). In addition, Mehmed II had a madrasa built for the study of Muslim theology. The marble minbar and mihrab were placed off the building's main longitudinal axis since the apse of the church was not aligned with Mecca (Figure 8). Muslim relics, emblems of victory, and banners eulogizing the conquest of Constantinople were also added (Necipoglu, 1992:203,208).

Following Mehmed II, other sultans left new additions of Islamic cultural stamps in *Ayasofya*. For instance, the mausoleum of Selim II and the domed tomb of Mehmed III were added in 1574 and 1608. Both demonstrated the Islamic tradition of funeral mosque, which consequently emphasized the role of the mosque as an Ottoman imperial mosque (Necipoglu, 1992:210). Thus, a combination of political and religious powers manifested in the building.

Generally, the figural mosaics were not seriously destroyed until Mahmud I covered them up completely during the years 1730-1754. Even though figural mosaics on the central dome were whitewashed and inscribed with large Arabic letters during the reign of Ahmed I (1608 C.E.), most of the mosaics that were out of view by the congregation remained (Figure 9). When Abdulmecid I ordered major restoration of *Ayasofya* to the Fossati brothers between 1847 and 1849, mosaics were covered in a manner that did not to destroy them (Necipoglu, 1992:211-213). Some functional and symbolic features were added to the mosque by Mahmud I and Abdulmecid I: a library, fountain, kitchen, and school for children were added by Mahmud I; and 8 large circular panels with Arabic inscriptions were added by Abdulmecid I (Necipoglu, 1992:221) (Figure 7 & 8).

#### ***2.9.1.2.1.3. The Period of Turkish Republic: since 1931***

Under the government of the modern Turkish Republic, a Council of Ministers officially authorized the Byzantine Institute to uncover Byzantine mosaics in June

1931. The work was executed on the mosaics above the imperial door, in the southwest vestibule on the ceremonial route of the inner narthex, and in the south galleries (Nelson, 2004:176-177) (Figures 10 & 11). A process of secularization to turn the mosque into a museum was fostered by this restoration work authorizing the Turkish government under Ataturk, in 1934 (Aydingun and Rose, 2003:1).

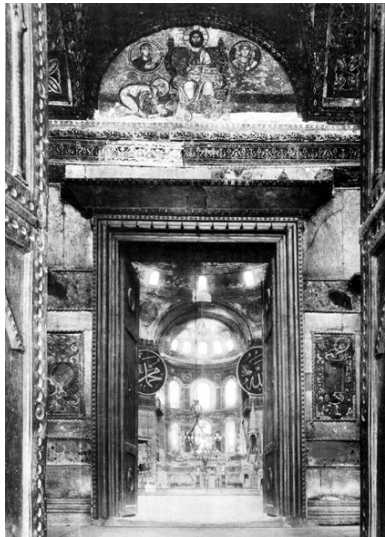


FIGURE 10. Hagia Sophia  
(Mosaic above entrance door)<sup>45</sup>



FIGURE 11. Hagia Sophia  
(Mosaic of the south gallery)<sup>46</sup>

Repairs of the structure and the removal of adjacent facilities such as coffeehouses and an orphanage were made to Hagia Sophia in the early 20th century. The building's

interior turned into a Byzantine art museum which additionally features some Ottoman works. In the middle of 1930s the apse mosaic was restored (Nelson, 2004:180). Most of the mosaics that the Fossati brothers had treated using easily removable plasters were restored, with the exception of some that had been ruined by an earthquake in 1894 and others that had been damaged by water leakage on the roof. In 1987, while being researched, the mosaics of Christ, the Virgin Mary, John the Baptist, and the Emperor Palaiologos V were discovered in the eastern arch, one of the four arches that bolster the main dome (Yenisoganci, 1994:39-40). Even today, conservators continue to examine the small tesserae through cleaning and consolidating processes (Aydingun and Rose, 2003:2). As a museum, Hagia Sophia focuses on the preservation of its Christian mosaics and the “signs of Islamic past” (Carrier, 2001:180). Thus, other than the removal of the prayer rugs that once covered the floor, many Islamic features of the mosque survived, including the discs with Arabic inscriptions at the center of the dome and a large number of small lamps with hoop shapes (Carrier, 2001:180; Mainstone, 1988:14) (Figure 8).

#### ***2.9.1.2.2. The Meaning Embedded in Hagia Sophia***

Hagia Sophia was the product of Justinian’s ambition to regain his political authority after a riot. The ambition was merged with “divine will” in Hagia Sophia, which symbolized a “universal rule” (Necipoglu, 1992:199). Such symbolic meaning of politics and religion latent in the architectural forms was recognizable to other powers that had conquered the city. Ottoman sultans gave a continuous life to Hagia Sophia,

using it as a mosque, which resulted from the perception of Hagia Sophia as symbol of “imperial power” (Necipoglu, 1992:199; Webb, 1999:66). The sultans thought that the patronage of Hagia Sophia could ensure their authority.

The aesthetic value of the mosaics of Hagia Sophia was attractive to Ottoman emperors. Although unacceptable iconography in their religious viewpoint, such as the mosaics of Jesus on the interior and the easily viewed mosaics on the lower levels, were whitewashed, other figural mosaics survived until Mahmud I (1730-54) covered them up completely (Necipoglu, 1992). In the 19th century, when the mosaics appeared in the course of restoration work by the Fossati brothers, Sultan Abdulmecid said,

They are all very beautiful, but for the time it is not appropriate to leave them visible. Clean them and cover them over again carefully, so that they may survive until they are revealed to view in the future (Aydingun and Rose, 2003:1).

The sultan’s admiration of the mosaics prevented them from being destroyed physically and made future restoration of the mosaics possible.

From the late 19th century to the early 20th century, Hagia Sophia began to be known in the Western world as the symbol of not only the city of Istanbul, but also of Byzantine art and architecture that upheld the Turkish ambition for westernization (Nelson, 2004:81). This owes to the development of tourism and literary and scholarly interest in Byzantine art. Especially, the latter fostered the restoration of Byzantine

mosaics and the reuse of Hagia Sophia as a museum (Nelson, 2004).

### ***2.9.1.2.3. Conclusions***

During the Byzantine period as well as during the reign of the Ottoman Empire, Hagia Sophia was perceived as imperial power and divinity being used as a house of worship. In its meaning Hagia Sophia as a mosque inherited Justinian's tradition. The perception of the symbolic value resulted in its gradual and relatively moderate physical transformation together with aesthetic value in spite of the attenuation or removal of its original Christian mosaics (Powell, 1999:2). In short, every time adaptation was carried out, Hagia Sophia played a significant role in the contemporary culture of the era as the symbol of a nation and its political authority, which functioned as another major factor leading to its preservation until today. It should be noted that although Hagia Sophia differs from the Pantheon, both were preserved by combining a political role with religion.

### ***2.9.1.3. The Great Mosque of Cordoba, Spain***

In the year 788 C.E, the Great Mosque of Cordoba began its construction under the rule of the Umayyad Caliph Abd al-Rahman I who survived the slaughter of Abu Futrus in Syria and settled in southern Spain (Lopez, 1997:8). Then Abd al-Rahman I became the first independent Emir of the Umayyad Caliphate, called al-Andalus, and built the mosque to accommodate an increasingly Islamic population (Lopez, 1997:6,8).



At the time of the Islamic conquest of Cordoba, Muslims seized from the Mozarabs one half of a large church dedicated to Saint Vincent, which was converted into a mosque leaving the other half in the hands of Christians (Dodds, 1992: 11). However, the growth of the Muslim population and the small size of the old mosque led ultimately to the construction of the Great Mosque of Cordoba (Lopez, 1997:6).



FIGURE 12. The Great Mosque (Top view)<sup>47</sup>

Since the late 8th century, physical changes were continuously made to the functioning mosque due to the growth of the Muslim population until King Fernando III reconquered Cordoba on the 29th of June 1236. On the 6th of July that same year, the Bishop of Osuna, Don Juan, consecrated the mosque to the Christians, dedicating it to

the blessed Virgin Mary. From then it was called *Santa Maria la Mayor*. Services were held until 1275 C.E. at the abandoned chapel dedicated to *San Clement*. In that year, Bishop Don Alonso de Manrique converted the part occupied by the lantern, the place added by Al Hakim II, into a *Capilla Mayor* or grand cathedral (Dodds, 1992:24; Lopez, 1997:28). Today, the building is preserved as a museum called *Mezquita* (Kjeilen, 1996) (Figure 12).

### **2.9.1.3.1. Physical Transformations**

#### **2.9.1.3.1.1. The Period during the Reign of Caliphates: 786-1236 C.E.**

The original mosque of Abd al-Rahman I was divided into two parts: an open air courtyard partly dedicated to ablution rituals and a covered area or prayer hall (Lopez, 1997: 8). A mihrab, sabat,<sup>48</sup> dome, and minaret were added later in conjunction with extensions to the prayer hall and restoration works on exterior walls and the entrance doors (Dodds, 1992:11-25; Lopez, 1997).

The extensions were the major task of these caliphs to accommodate the increase in Islamic populations in the region (Dodds, 1992:11-25; Lopez, 1997). Among these added features, Al-Hakam II added “lit dome of the central aisle” and mihrab with decorative mosaics including Quranic writings made during the years 961-966 (Figures 13 & 14). Al-Hakam II’s mihrab is estimated as an aesthetically outstanding one (Lopez, 1997:11-12). Most of the caliphs<sup>49</sup> followed the original tradition of its construction except for Almanzor; Almanzor’s extension of the year 987 destroyed the

symmetrical order of Al-Hakam II's mihrab and the original hierarchical arrangement of the original plan (Figure 15). Some ancient doors of that façade were destroyed and others were covered by walls because of his extension (Dodds, 1992:23; Lopez, 1997:20). In addition, Almanzor commanded Christian slaves to remove the bells of the church of Santiago de Compostela and bring them to Cordoba, where they were used as lamps suspended from the ceiling of the Great Mosque (Dodds, 1992:24). This was an act of political power as well as a religious statement.



FIGURE 13. The Great Mosque  
(Dome)<sup>50</sup>

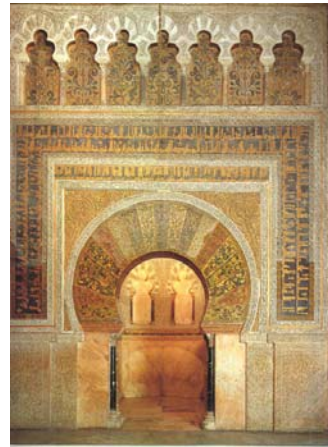


FIGURE 14. The Great Mosque  
(Mihrab with decorative mosaics)<sup>51</sup>



FIGURE 15. The Great Mosque (Prayer hall)<sup>52</sup>

#### ***2.9.1.3.1.2. Since the Re-conquest of Ferdinand III: 1236 - 1492 C.E.***

Occasional chapels and tombs were incorporated in the mosque when Cordoba was re-conquered by Ferdinand III. In the 13th century, the *Capilla Real*, a burial place for the kings of Castile, was constructed. These changes subtly transformed some corners of the Muslim space. By the end of the 15th century, a Christian space for worship was made by a constructed Gothic nave, choir, main altar, and sacristy, which covered up some parts of the mosque arcade. In addition, the royal chapel featured frescoes (Dodds, 1992:24; Lopez, 1997:28).

#### ***2.9.1.3.1.3. From the 16th Century to the 18th Century***

Bishop Don Alonso de Manrique requested radical changes for the construction of a vast cathedral at the mosque's center (Lopez, 1997:29). Permitted by the emperor Charles V, this was started in 1523 and was completed at the end of 18th century

(Dodds, 1992:23; Lopez, 1997:31). The cathedral occupied a part of the mosque's prayer hall (Figure 12). A dome and a nave were made for the cathedral while converting the minaret into a bell tower (Dodds, 1992:24) (Figures 16, 17 & 18). Gothic tracery, classical orders, and an enormous array of Renaissance sculpture constitute the interior ornaments of the cathedral. Many of the vaults and walls use abstract patterns of Gothic tracery, which are said to be influenced by the previous Muslim decoration style (Dodds, 1992:25).



FIGURE 16. The Great Mosque (Interior of the cathedral)<sup>53</sup>



FIGURE 17. The Great Mosque  
(Dome of the cathedral)<sup>54</sup>



FIGURE 18. The Great Mosque  
(Bell tower of the cathedral)<sup>55</sup>

#### ***2.9.1.3.2. The Meaning Embedded in the Great Mosque of Cordoba***

The Great Mosque of Cordoba was a unique example of Islamic architecture that functioned symbolically to demonstrate Abd al-Rahman I's domination over al-Andalus. The meaning embodied in the mosque by Abd al-Rahman I was handed over to the following caliphs (Dodds, 1992:11-25). The caliphs utilized the mosque as the emblems of "Islamic identity and caliphal dignity" (Dodds, 1992:17-18).

These symbolic meanings were reinforced when the caliphs confronted social unrest. For instance, a new minaret was added by Abd al-Rahman III when many churchmen took their own lives as a mark of disobedience to Islam. The minaret took on the role of a powerful symbol of Islam over Christian resistance (Dodds, 1992:17). This

symbolic meaning was also featured by Almanzor's alteration. Almanzor's extensions that are considered the biggest ones, aimed at the consolidation of his dignity, which occurred right before the fall of the caliph (Dodds, 1992:23-24; Lopez, 1997:20). In the same context as described previously, Almanzor also brought the bells of a church of Santiago de Compostela to Cordoba and used them as lamps of the mosque. Later, they were returned to the church when Ferdinand III re-conquered Cordoba.

Although Almanzor did not follow the original architectural tradition of the mosque in emblemizing his dignity, most of the caliphs respected the tradition of the original mosque (Dodds, 1992:23; Lopez, 1997:20). In other words, they followed the architectural tradition of Abd al-Rahman I's mosque, where Islamic features are merged with regional culture. By doing so, they thought that they were able to succeed Abd al-Rahman I's authority.

Dodds (1992:11) asserts that the dialogue between Christian and Muslim cultures was embodied in the Great Mosque of Cordoba. The dialogue worked as a major driving force in fashioning a new Spanish regional culture. In other words, the Great Mosque of Cordoba was incorporated into Spanish culture by its integration with existing Christian and regional formal languages. This is represented by a series of columns supporting arches that are similar to the Roman aqueduct that was found in the region (Dodds, 1992:13) (Figure 15). Also, the creation of mosaics with Quranic writing in the mihrab of Al-Hakam II is linked with the tradition of Christian ornaments

(Figure14). The mosaics were intended to educate and provide a visual link to the past Umayyads (Dodds, 1992:22).

According to Dodds (1992:11-25), this dialogue is glanced in the radical conversion of the Bishop Don Alonso de Manrique. Although Fernando III and the Bishop Don Alonzo both regarded the mosque as a precious booty and understood its reuse as a way to regain their power and authority, their plans for its reuse went in two opposite directions. Fernando III, and most Christians, seem to have perceived the Great Mosque as an “intrinsically Spanish monument” rather than either an Islamic or Christian monument (Dodds, 1992:25). However, Don Alonzo perceived it as an Islamic monument, which led to the radical insertion of the church building (Figures 12, 16 & 17). Yet, even in the conversion, the mosque’s own tradition of using abstract iconography turns out evident in the abstract patterns of the Gothic tracery.

#### ***2.9.1.3.3. Conclusions***

The main motives behind the construction and adaptation of the Great Mosque are rooted in its functional and political history. In particular, political ambitions were continuously presented in terms of physical extensions, alterations, and insertions of new features into the building. Interestingly, regional cultural features were incorporated in the mosque to establish Umayyads’ unique culture in Cordoba. Consequently, the mosque became a part of Spanish cultural assets.



The reuse of this mosque as a Christian church is derived from the perception of the mosque as a political and cultural symbol. Even though the building underwent a radical change by the Bishop Don Alonso de Manrique, a few architectural features of the building demonstrate that the conversion still follows the tradition respecting existing cultural assets. In short, the contextual understanding of the building continued to weave it into regional culture featured by Roman, Christian, and Islamic traditions, which led to its long term use as a museum until today.

### ***2.9.2. Recent Examples***

Three recent past cases of adaptive reuse have bearing on historic preservation contextualized in the participation of various professional fields and organizations. The distinction of these cases from the past ones lies in the change in ownership, the motive leading to reuses, and building types adapted to them.

#### ***2.9.2.1. All Saints' Church of Oxford, UK***

The construction of All Saints' Church was completed in the early 18th century through public involvement right after the collapse of the original medieval church on the same site (Figure 19). An amateur architect, Henry Aldrich, designed the church in collaboration with Hawksmoor who designed the tower. Since then, All Saints' Church functioned as a collegiate church for the adjacent Lincoln College. During the early 20th century, the interior became underutilized due to a rapid decrease in the number of members of the congregation. Finally, in 1972 it was declared unfeasible as a church

by the diocese and assigned to Lincoln College for use as a library (Cantacuzino and Brandt, 1980:119; Lancaster, 1972:28).

#### **2.9.2.1.1. *Physical Transformations***

All Saints' Church was built as a Georgian style building with a rectangular plan (Figure 19). Originally it was one story building, yet looked like a two story building because exterior walls were visually divided into two unequal parts by means of protruding horizontal moldings and double layered windows. The building contained a bell tower that helped featuring it as a street symbol (Cantacuzino and Brandt, 1980:119-121; Lancaster, 1972).

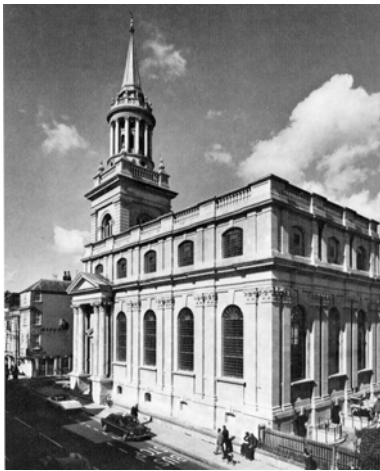


FIGURE 19. All Saints' Church  
(Exterior view)<sup>56</sup>



FIGURE 20. All Saints' Church  
(Original interior view)<sup>57</sup>

The decorative interior ceiling and oak pews featured the interior of the building. A series of Corinthian pilasters were used in both internal and external walls of the building (Figures 19 & 20). The division of the walls made by these pilasters created unique rhythm of the building; the small interior box pews that were set along this division emphasized the module (Cantacuzino and Brandt, 1980:119-121; Lancaster, 1972) (Figure 20).



FIGURE 21. All Saints' Church (Interior view of new library)<sup>58</sup>

The church's new plan for a library increased the existing floor level and lowered the basement level while restoring its original beauty (Cantacuzino and Brandt, 1980:119; Lancaster, 1972:28) (Figures 21). Aesthetically, the original modular design and style were respected and maintained while the 19th Victorian additions such as the Victorian gallery and the windows with "Victorian grisaille" were removed (Cantacuzino and Brandt, 1980:119). Furthermore, the effect of the raised floor level and the addition of book shelves were intended to remind patrons of the original interior module. The original colors on the ceiling and exterior stone surface were restored. Before starting the work, the Oxford Archeological Society recorded all of the previous medieval church and earlier structures that used to be on the site. The Royal Fine Arts Commission initiated this project, which was approved by the Historic Buildings Council (Cantacuzino and Brandt, 1980:119-121; Lancaster, 1972).

#### ***2.9.2.1.2. The Meaning Embedded in the Building***

The meaning of All Saints' Church was interpreted in two values. One is its landmark value in the community viewpoint, and the other is its aesthetic value in professional viewpoint. Both values were merged together in its adaptive reuse. This project was supported by the public and professionals in external fields including governmental organizations. In initiating this project, the community perception of this church as a district landmark worked as a major driving force. The community members not only appealed the significance of its preservation to the preservation council, but also took part in fundraising to preserve this church as a landmark.

The project was assigned to the architects of the Potter and Hare Partnership. They focused on the restoration of the church's original beauty while adapting the new use. Thus professionals found that the church's aesthetic value in Aldrich's time deserved to be preserved. The meaning of the building as a community landmark was embodied through the restoration of original beauty of the building as well as its new use as a public library (Cantacuzino and Brandt, 1980:119-120; Lancaster, 1972:28).

#### ***2.9.2.1.3. Conclusions***

In the case of All Saints' Church, the significant features in its adaptation work were defined by both public and professional interpretations of its values. In interpreting the values, the public focused mainly on the value related to their community life while the professionals' interpretation favored its aesthetic value. Through this conversion work, the building continued to survive as a community landmark symbol.

This example demonstrates that public participation became an essential factor in saving and reusing the church as a landmark of the district. In addition, the cooperation of diverse professional disciplines and systematic support by preservation organizations became critical processes to adaptive reuse project. This conversion is considered a successful one which reflects Latham's view on the adaptive reuse of historic churches as the conversion into a library features public as well as institutional use.

### ***2.9.2.2. The Hospitalet Church of Ibiza, Spain***

Hospitalet Church was originally built for the impoverished persons staying at a nearby hospital in the 18th century. In middle of the 20th century, the church had been abandoned due to a lack of maintenance and was falling into disrepair by the 1970s. Between 1981 and 1984, restoration work was carried out with the support of the Spanish Ministry of Culture (Cantacuzino, 1989:184; Crawford, 1988:92). Renovation of the church was assigned to the architect, Lapena Torres and done to contain religious ceremonies together with holding a gallery, and a music hall (Progressive Architecture, 1988:59).



FIGURE 22. The Hospitalet Church (Exterior view)<sup>59</sup>

### ***2.9.2.2.1. Physical Transformations***

The Hospitalet Church was a small scale vernacular building. It featured a white stucco façade with a small oculus and a simple bell tower (Figure 22). It had a rectangular floor plan consisting of a chancel and a nave, to which a small triangular sacristy was attached (Cantacuzino, 1989:184-187; Crawford, 1988).

Faced with its dilapidation, the church was transformed into a multi-purpose cultural building. The upper level of this building turned out to become a gallery, which is approached by a staircase next to the sacristy. A small sign was attached to a corner of the exterior wall while the surface of the walls was restored. A simple bell replaced the demolished original bell tower (Cantacuzino, 1989: 184-187; Crawford, 1988).

Financial and spatial limitations of the original church made the architect design a flexible facility in terms of its function (Progressive Architecture, 1988). The changing scenery of a stage set and religious elements (e.g., 18th century paintings and a newly lightened altar canopy) were supported by hinges on the presbytery wall. They can be used only for religious ceremonies and are hidden when concerts and exhibitions are conducted (Cantacuzino, 1989:185; Progressive Architecture, 1988:59). For instance, the altar canopy with its corresponding spot lights can be folded and placed against one side of the chancel as the blank backdrop for theatre. (Crawford, 1988: 94) (Figures 23 & 24). A new floor that contains square pieces made of white marble functions to accommodate diverse exhibition layouts (Progressive Architecture, 1988:59-60) (Figures 25 & 26).



FIGURE 23. The Hospitalet Church  
(Interior view I: use for a worship)<sup>60</sup>

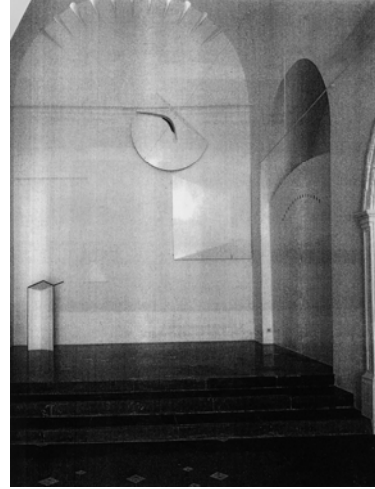


FIGURE 24. The Hospitalet Church  
(Interior view II: use for a performance)<sup>61</sup>



FIGURE 25. The Hospitalet Church  
(Interior view III: use for an exhibition)<sup>62</sup>



FIGURE 26. The Hospitalet Church  
(Interior view IV: use for an exhibition)<sup>63</sup>



The use of natural light and colors became the main design interventions of this conversion project (Crawford, 1988; Progressive Architecture, 1988). The quality of natural light in the church was changed by various features. For instance, an incised slit reflected the movement of the sun's path in the east wall; the sliding shutters covering an oculus represented the changing moon; and small wedge shaped windows recessed under the vaulted ceiling of the altar area represented stars (Figures 27). The former church's transitional spaces were painted in vibrant orange or blue, while the balustrade of the upstairs gallery was painted white characterized by glass (Cantacuzino, 1989:185; Crawford, 1988:93; Progressive Architecture, 1988:59-60).

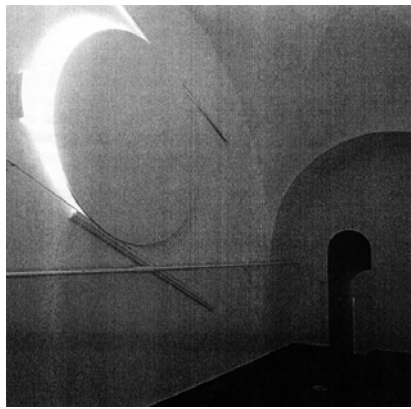


FIGURE 27. The Hospitalet Church (Circular sliding shutter)<sup>64</sup>

#### ***2.9.2.2.2. The Meaning Embedded in the Building***

The combination of color, light and movement in the space were the main features of designing this multi-purpose cultural building. The features were designed to illustrate the geographical, cultural, and religious contexts of the church as well as the abstract and minimal design language of Lapena Torres (Crawford, 1988; Progressive Architecture, 1988:58).

For example, the floor pattern of exhibition space, the sliding shutter of oculus, and the openings in the east wall represent the universe and the divinity (Figures 23, 25 & 27); vibrant orange, blue, and white symbolize the building's regional context such as the sun, blue sky and sea, and the white-washed walls of a hot day in Ibiza. In addition, cultural context of the building is manifested by abstract art work of Joan Miro, who used to live in Ibiza (Cantacuzino, 1989:185,187; Crawford, 1988:95).

#### ***2.9.2.2.3. Conclusions***

The meaning of this church was derived mainly from the architect's contextual understanding of the church as this project was administered by Spanish government, and assigned to a professional architect. The architect combined the traditional and regional meanings of the church with abstract forms and vibrant colors that also catered to the economic and cultural use in a tourism site. As a result, the interior was featured by modern design.

The meanings created by the architect were not necessarily regarded acceptable by residents as their community symbol. Even though the restoration of the exterior of the building accompanied this conversion project and public reuse was made, the work at the former Hospitalet church remained controversial to residents: the abstracted formal language combined with the strong color scheme was counted too radical by some residents, who protested that the church had become just a tourist attraction (Crawford, 1988:90,92).

### ***2.9.2.3. The Charles Street Meeting House of Boston, USA***

The Charles Street Meeting House was originally the Third Baptist church built in 1807 in Boston for a white congregation (Architektur Wettbewerbe, 1985:63; Cantacuzino, 1989:174; Greene, 1940:87; NPS, 2002; Schmertz, 1984:135). After the Civil War in 1876, it was sold to African American members of the First African Methodist Episcopal Church and was renamed as Charles Street AME Church. The National Federation of Afro-American Women was created in 1895. In 1939, the African Methodist Episcopal Church left the meeting house for another church to accommodate increasing membership in their congregation (Greene, 1940:90-91; NPS, 2002).

The Society for the Preservation of New England Antiquities and the Charles Street Meeting House Society were organized in the early 1930s. In December 1937, it was decided to make continuous use of the building and to protect it from dilapidation

(Greene, 1940:93). Still, it was used sporadically between 1975 and 1980 and became seriously damaged. In 1980 the Charles Street Meeting House Associates, organized by the public, purchased the building for commercial reuse (Architektur Wettbewerbe, 1985:63; Cantacuzino, 1989:174; Schmertz, 1984:135). The conversion work was done by public involvement following the National Register criteria (Schmertz, 1984).



FIGURE 28. The Charles Street Meeting House (Exterior view with main facade)<sup>65</sup>

### ***2.9.2.3.1. Physical Transformations***

Since its original construction, a fire led to the demolition of much of its original interior. After the fire, only a few original features such as columns and some details of the barrel vaulted ceiling, capitals and arches remained (Architektur Wettbewerbe, 1985:63). Existing evidence indicates that the exterior of this church is similar to the original one (Figure 28). In terms of style, the original church had a New England style entrance and a red brick façade. In the mid-1850s, it changed into a Victorian style entrance with dark brown paint on the bricks (Greene, 1940:88-89).

In 1920, due to the decision of the City of Boston to widen the street, the church was moved and its exterior was restored with the aid of a member of the congregation along with a group of European American neighbors of the district: the dark brown paint on the bricks was carefully removed and the upper part of the brick tower and the steel trusses of the roof were repaired (Greene, 1940:91).

In 1982, new functions (e.g., retail shops, offices and apartments) were found to ensure the continuous use of this building (Figures 29 & 30). Five retail shops were located on the ground floor. Each shop is accessed by a separate entry from the Charles Street (Figures 29). Office space occupies most of the interior with new floor levels inserted and is accessed by the main entrance (Figures 29). In the interior, the original structural details were intended to be exposed. The original clock was restored and set in one office lobby (Figure 31). The residence space took up parts of the basement and the

bell tower (Architektur Wettbewerbe, 1985:63,65; Cantacuzino, 1989:174-176; Schmertz, 1984:135) (Figure 30).

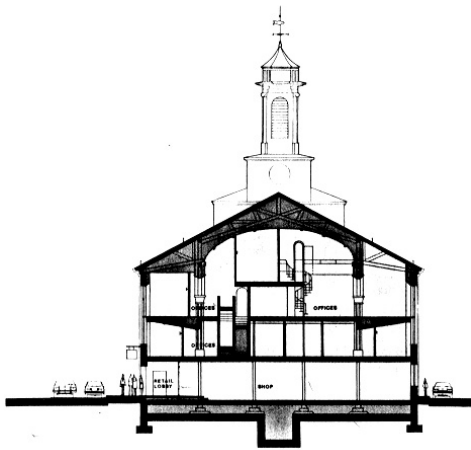


FIGURE 29. The Charles Street Meeting House  
(Section view I: office and shops)<sup>66</sup>



FIGURE 30. The Charles Street Meeting House  
(Section view II: apartment)<sup>67</sup>



FIGURE 31. The Charles Street Meeting House (Interior view of office lobby)<sup>68</sup>

The exterior fabric was mostly retained (Cantacuzino, 1989:174). Only a few minimal changes were made: a projecting sign was detached from the building (Figure 29) and three entrance doors were set on sliding tracks. New double glazed windows were inserted for energy efficiency, but they maintained the form of the existing fenestration (Cantacuzino, 1989:176).

#### ***2.9.2.3.2. The Meaning Embedded in the Building***

Since 1835, when Timothy Gilbert challenged segregationist policy in the church, the Charles Street Meeting House has kept its significance in African-American history: a meeting for the abolition of slavery was held in the building before Civil War; the church was the first integrated church in America; and a major center of African-American religious, social, and cultural activities until the congregation of Charles Street AME Church left the meeting house (Greene, 1940; NPS, 2002). Interestingly, the white community members of the district were concerned with the preservation of this building. The building as a district symbol was recognized by them, which became a foundation of this adaptive reuse project.

Faced with serious disrepair in the late 1970s, the economic use of the church was prioritized over other uses (Architektur Wettbewerbe, 1985:63; Greene, 1940:93). The exterior of this building was restored while the interior went through relatively radical changes for secular uses. The interior changes were regarded acceptable in terms of preservation regulations since most of the original interior features had been destroyed

by fire. The meaning as a community symbol was retained mainly depending on the restoration work of the exterior building (Architektur Wettbewerbe, 1985:63; Cantacuzino, 1989:174).

### ***2.9.2.3.3. Conclusions***

This meeting house is identified as a Boston African-American national historic site by the National Park Service (NPS, 2002). An interesting thing is that the members of the organization and associates that initiated its preservation were community members of the district (Greene, 1940; Schmertz, 1984: 135). The efforts to preserve the meeting house were supported mainly by friendly neighbors who are not African-Americans. They freely organized the associates based on the perception of the landmark value of the church. Even though the interior went through a radical conversion that prioritized economic benefits, the exterior was preserved to give passers-by the feeling of the building's significance and antiquity, as well as to maintain the value as a community symbol.

### ***2.9.3. Summary of the Examples***

While the abandonment and dilapidation of historic buildings is generally accepted as the catalyst of adaptive reuse today, the past examples as described in this project – the Pantheon of Rome, the Great Mosque of Cordoba, and Hagia Sophia of Istanbul – had been neither dilapidated nor abandoned when they were transformed. Thus the examples demonstrate shifts in power and religion. Necipoglu (1992:195) finds the



reason in their transcendent being of aesthetic qualities. Gilson (1966) demonstrates that such aesthetic quality is the nature of religious buildings.

This is why, in all times and perhaps most obviously in our day, religious edifices, whether temples or churches have directly belonged to this relatively untrammelled architecture which can attain its particular utilitarian end while committing itself to the creation of beauty as an artistic end. The architect is free to conceive of it as a pure object of beauty, that is, as if its very beauty constituted the essence of the offering made by man to the divinity. This is why the church is the only object of beauty in so many a village (Gilson, 1966:45-46).

In addition to the aesthetic value, the perception of these historic buildings as political and cultural religious symbols of their nations prompted their preservation through adaptive reuses. For instance, the Pantheon as the emblem of the heavenly gods and emperors was available to promote Christian powers and made the structure reusable for a Christian church. Likewise, the Great Mosque as a Spanish regional and political symbol survived by being converted from one faith to another. Hagia Sophia, an Orthodox Christian church, survived as a political and cultural religious symbol of an empire and nation. This symbol was conceived when it turned into a mosque and a museum.

The original symbolic value of each of the examples was perceived as significant by new powers. The conversion was led mainly by these new authorities such as emperors, caliphs, and popes. Their perception was the most influential in transforming the

buildings. Each building was converted into a different religious building retaining the original symbolic value that was regarded as significant by the authorities, and therefore, led to minor changes of the critical architectural features.

Unlike the past examples, the recent examples of adaptively reused historic churches have significance on the local level as community cultural symbols (e.g., landmark of a community). The conversion projects were designed by professional architects utilizing their interpretation of the aesthetic and economic values of the sacred buildings. The projects were carried out with the aid of non-profit preservation organizations including governmental and private preservation organizations. The phenomenon indicates that the adaptive reuse of historic churches became a systematic and deliberate process. The adapted new building types became more diverse than in the past: the recently-converted church examples were all secularized for new functions (e.g., retail shops, offices, residences, and concert and exhibition halls).

The difference between the past and recent past examples reflects the shift in relationships between religion and political power. When religion and politics were tightly related, the patronage of religious authorities maintained political power. This was demonstrated by the protection of a grand sacred building (Sabau, 1998:3). Currently, economic and cultural patronage appears to take the place of religion. Therefore, historic churches are being converted to commercial and cultural uses. A good example of this trend is how Hagia Sophia was eventually converted into a

museum by the Turkish government in the early twentieth century. This conversion also manifests the shift of power from religion to the secular.

In this adaptation procedure, the public often joins by providing financial support and appealing to community values of the buildings in the initiation phase of the projects. However, public participation and perception are not guaranteed by any preservation standards and sometimes they are excluded. The exclusion of public perception on changes seems to be a major factor leading to the controversy in projects such as the Hospitalet church of Ibiza.<sup>69</sup>

The adaptive reuse of the late 20th century emphasizes the economic reuse of historic buildings for their long term preservation (Diamonstein, 1978:25). Accordingly, the changes in adapting historic churches have become more diverse and creative by including varied building types (Diamonstein, 1978:13). As a result, compared to past examples, the recent examples appear to have undergone more radical changes. In other words, the perception of a building type in terms of its practical function and symbolic value seems to define the extent of physical changes.

Such a standpoint recalls Latham's view about adaptive reuse. Unlike Fitch (2001:44), who asserts that museological reuse of a building is the most favorable choice since it can keep almost all of the original features to the greatest extent, Latham (2000:85-86) prefers the reuse of the sacred building as a community or cultural center because of

the similarity in their functions and meaning. Mavis (1976) supports Latham's notion by putting emphasis on the public's concerns with the original characteristics of their settings in the viewpoint of a community preservation program<sup>70</sup>. Interestingly enough, Carrier (2001) opposes Fitch (2001:39-47) with the notion that the concept of a museum naturally separates objects from their original settings. He asks if the restored mosaics of Hagia Sophia still keep their original values (Carrier, 2001:180). This implies that the perception of building types is not only concerned with the physical features, but also conceptual features such as cultural and symbolic values as well.

## **2.10. SUMMARY OF LITERATURE REVIEW**

The studies on cognitive science and historic preservation demonstrate the existence of shared cultural values in built environments as perceived by the public. The inborn perceptual nature and acquired perceptual traditions of the public function as forces which fashion the values in their daily experience of the environment. In historic preservation, these shared values are interpreted as collective memories. Preservation of these shared memories is considered significantly related to the basic psychological necessity of a community. As a symbol of community identity, culture, and heritage, historic churches serve as an essential part of the collective memory. Therefore, even when the churches may be abandoned, the public has a tendency to preserve them as community symbols. Adaptive reuse is often conducted to save the churches. For example, churches are converted into varied building types such as community/cultural, institutional, commercial, and residential buildings.

However, as the National Register interprets the historic significance of the sacred buildings in secular terms, the current preservation criteria do not include the shared values of churches as significant community symbols. Furthermore, the Secretary of the Interior's Standards do not consider public perception nor the concept of building type as factors influential in adaptive reuse projects.

In general, adaptive reuse of historic buildings is regarded as more difficult projects because it premises a functional change in the buildings. Faced with adaptive reuse projects of historic churches, professionals seem to favor the cultural and economic aspects of the churches. They acknowledge that some functional changes are more difficult to be made compatible with the original meanings and physical uniqueness of these churches than others. Yet, in adaptive reuse projects the design decisions are mainly in professionals' hands, while public perception of desirable degree of the project remains questionable. The case studies of sacred buildings that were transformed into other religious buildings, cultural buildings (e.g., museum, library, concert hall, gallery, etc.), or mixed use buildings demonstrate the significance of public perception and building type in reuse procedures.

Following this literature review, conceptual models were developed. These models illustrate the process of maintaining and changing architectural integrity of abandoned historic churches in their adaptive reuse projects. Moreover these models demonstrate the relationship between public perception and building type in the reuse projects.

### 3 CONCEPTUAL MODELS

#### 3.1. ADAPTIVE REUSE OF HISTORIC CHURCHES

Based on the literature review, conceptual models were developed to illustrate and re-examine the adaptive reuse processes of historic churches on the National Register.

Current practice in the adaptive reuse of historic buildings, including historic churches, is composed of two parts as seen in the linear flow chart of Figure 32. The first part (I) is the process of defining the historic significance of a church and its critical architectural features based on the National Register criteria. The historic significance is interpreted as referring to the four criteria of the National Register (see page 22). The second part (II) illustrates the processes of adapting the church to a new use (building type) using the Secretary of the Interior's Standards. The change in use, from one function to another (i.e. church to community, cultural, commercial, institutional, or residential use) leads to the creation of a new architectural integrity.

Based on the first two parts of the model, it is suggested that prototypes of the historic building and typologies of changes in their architectural features due to the procedure of adaptive reuse be developed.

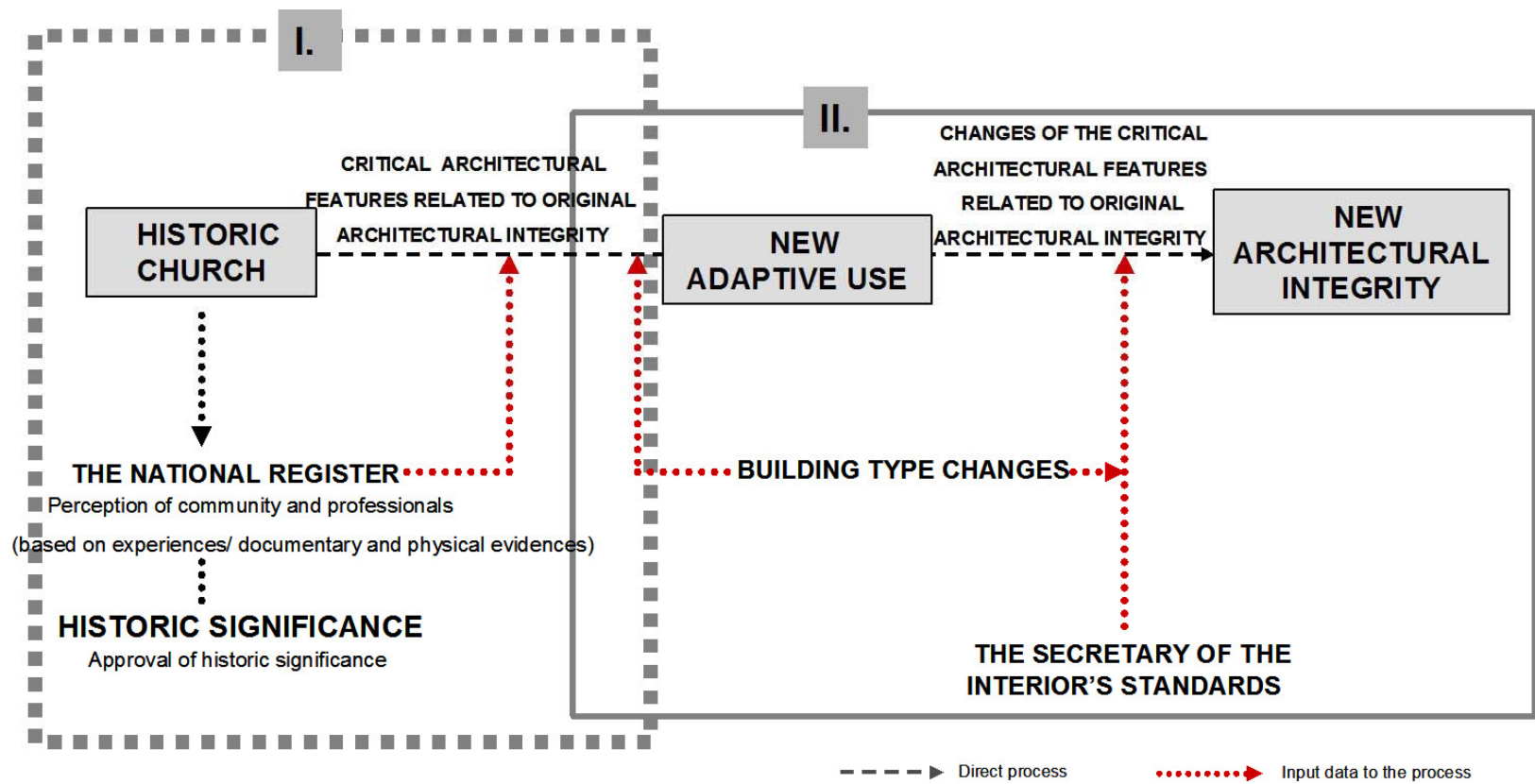


FIGURE 32. Current practice in adaptive reuse of historic buildings

The proposed practice in the adaptive reuse of historic buildings consists of a re-examination of the creation of the new architectural integrity (Figure 33). It uses the typologies developed from the two phases of the current practice as visual catalysts. In addition, this model introduces public perception and new building type as influential factors in the proposed practice. This study tests these two factors as its two main variables.

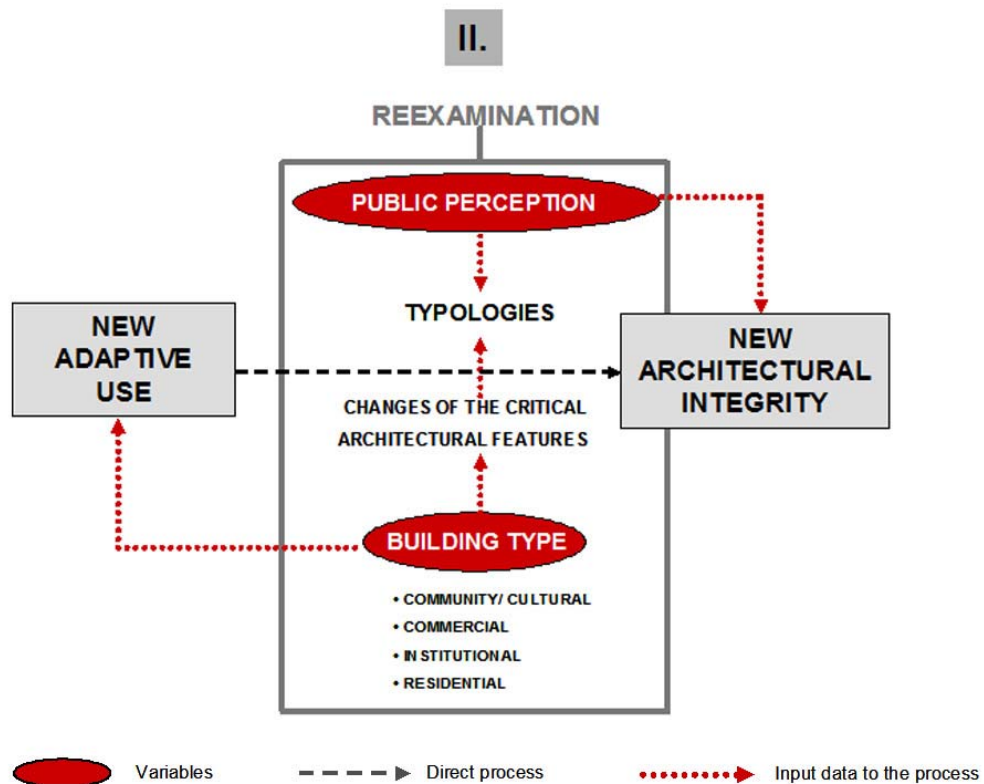


FIGURE 33. Proposed practice in adaptive reuse of historic buildings



## 3.2. RESEARCH VARIABLES

### 3.2.1. *Public Perception* (dependent variable)

Gifford, et al. (2000) refer to the significance of public perception in architectural design by demonstrating the difference between architects' and laymen's perceptions in evaluating the beauty of building facades. They suggest that the gap of aesthetic perception between the two groups is so significant that architects should understand clients' perception and reflect it in their design procedures.<sup>71</sup>

Lynch (1972) claims that the recognition of transformed things owes not only to actual physical changes (e.g., building type changes) but also to how we understand the present being of the things and the prospects of their future, which should be perceived by the public. In this sense, Lynch argues that the adaptation and conservation work of the built environment should reflect the present and future image conceived by the public.

Our images of past and future are present images, continuously re-created. The heart of our sense of time is the sense of "now." The spatial environment can strengthen and humanize this present image of time (Lynch, 1972:65).

Adaptation and conservation need psychological support as well as an ethical base (Lynch, 1972:113).

Most important of all, we must monitor the user's perception of change: what shifts he is aware of, how he organizes and values them, how he tries to control them (Lynch, 1972:206).

Following this line, some other scholars also demonstrate that public perception affects

the transformation of the built environments. For example, Van der Hoorn (2003) describes the Berlin Wall as representing the sorrow of the first generation involved in the events that stemmed from a divided post-WWII Germany. The author says that the wall was a frowning architectural feature for a long time. However, after the reunification of Germany, the demolition of the wall became a symbol of joy to the next generation. Fragments of the Berlin Wall became memorabilia which attracted tourists, and were subsequently sold to museums located all over the world. The public perception of the wall affected its physical change and endowed it with new life.

In the book, *Shadowed Ground*, Foote (2003) addresses the trend of memorializing tragedy sites. According to Foote, the interpretation of the worth of remembering a site is influenced by public perception and affects the design of the memorial sites. Public perception changes from generation to generation and there can be a perception gap between the remnants directly related to the event and the public. Therefore, Foote claims that such a perception gap should be resolved when designing the sites.

These studies imply that the public perception of a built environment is not static. Furthermore, the studies illustrate that the changing perception of the public can work as a critical factor for defining the alteration and new use of built environments (Lynch, 1972; Foote, 2003; Gifford, et al., 2000; Van der Hoorn, 2003). Consequently, public perception should be considered as a major design factor in designing and in making changes to built environments.

### **3.2.2. *Building Type*** (independent variable)

The suggested use of building type as a variable is based on four reasons. First, as described previously, many preservation scholars claim that building type is one of the most important factors defining architectural integrity<sup>72</sup> (Murtagh, 1997:118; Agrest and Gandelsonas, 1996: 117; Nelson, 2005; Weeks, 2005). Second, change in building type is regarded as a core issue in adaptive reuse projects (Robert, 1991). Third, the significance of the concept of building type in the architectural design procedure has been noted in scholarly work (e.g., Kwun, 2001). According to Kwun (2001:6), building type implies a group of buildings share “a particular characteristics or a set of characteristics” such as “the pattern or model from which the building is made”. The concept of building type turns out to be the most influential to architects in the initial phase of a building design as the concept is utilized to be a foundation of architectural typology<sup>73</sup> (Kwun, 2001). Lastly, the importance of new building types in the alteration of original churches was noted in the examples of adaptive reuse (see pages 40-85).

Based on the notion that building type is a critical symbolic element affecting architectural design, including adaptive reuse, and eventually has a critical role in constructing/maintaining an architectural integrity, building type is suggested as the independent research variable.

### **3.3. RESEARCH HYPOTHESES**

This research examines public perception on churches that were modified into various secular uses. Public perception is the dependent variable and building type change is the independent variable. Consequently, the research hypotheses are as follows:

- (1) Public perception of the adaptive reuse of a historic church is a function of the new building type.
- (2) Public perception can be changed not only by the extent of alteration in each critical architectural feature, but also by the combination of the extent of alterations in critical architectural features.

## **4 METHODOLOGY**

The research methodology was designed to test the hypotheses as derived from the conceptual model. The method used in this study consists of the following phases: (i) samples of adaptively reused historic churches listed in the National Register were collected and analyzed; (ii) based on the samples, two prototypes of historic churches and the typologies of the changes that originated from the new building types were developed; (iii) a research design was developed to examine the hypotheses by means of the prototypes and typologies; and (iv) an experiment was conducted to test public perception on the changes derived from different building types using the prototypes and typologies of changes developed in the previous stages.

### **4.1. STUDY SAMPLES OF HISTORIC CHURCHES**

In order to develop the prototypes of historic churches and typologies of changes in their adaptive reuse, 16 examples of adaptively reused historic churches that were listed on the National Register of Historic Places were selected. The National Register of Historic Places was used for selection because its list means that a building's historic significance was officially approved to be worthy of preservation.

The selection was also based on the availability of data (e.g., texts, pictures, drawings, etc.). Lastly, the consistency in the architectural styles of the churches also worked as a

factor in determining the number of samples. All of the 16 samples represent the Gothic Revival style<sup>74</sup> of urban churches that were constructed in the late 19th and early 20th centuries.

The adaptive reuse of these sample churches was organized along their new functions (e.g., community/cultural, institutional, commercial, or residential use). The following churches are part of each of the new building types.

- Community/cultural use: Saint George Church, Cincinnati, Ohio (1850); Sacred Heart Church, Augusta, Georgia (1875); St. Andrews Episcopal Church, Jacksonville, Florida (1875); St. Dominic's Roman Catholic Church, Portland, Maine (1893); Second United Presbyterian Church, Pittsburgh, Pennsylvania (1903); Associate Reformed Presbyterian Church, Charlotte, North Carolina (1926-27)
- Institutional use: St. Ann's Episcopal Church, Brooklyn, New York (1843); St. Mary of Sorrows Roman Catholic Church, Buffalo, New York (1891)
- Commercial use: First Congregational Church, Fall River, Massachusetts (1850); St. Joseph's Roman Catholic Church, Newark, New Jersey (1850); Charles Street Meeting House, Boston, Massachusetts (1876); Church of the New Jerusalem, Philadelphia, Pennsylvania (1881); St. John the Baptist Catholic Church, Pittsburgh, Pennsylvania (1902)
- Residential use: Former Lutheran Church on Chicago's North Side (1883); Methodist Episcopal Church, Denver, Colorado (1889); Second Presbyterian Church, Oak park, Illinois (1905-06)

## **4.2. PROTOTYPES OF HISTORIC CHURCHES**

Scholars in cognitive sciences suggest that visual things are understood through their abstract images (Abu-Obeid, 1993; Argan, 1996; Kwun, 2001; Lakoff and Johnson, 1999). A prototype is defined as an abstract image that is created, “through the averaging of the features of the category members” (Abu-Obeid, 1993:148). By means of a cognitive approach in his architectural study, Abu-Obeid (1993) demonstrates that architectural prototypes are stored as mental images and the public feels more familiar with these abstract images than with the real images.

An architectural prototype is formed through referring to two features of architecture, style and function. Thus, an architectural prototype is characterized by the typical architectural style of a period, “analogue to another building in a later period,” and the typical qualities of a building type (Kwun, 2001:6).

Based on the prevailing architectural style of the project’s examples, two prototypes of Gothic Revival churches were developed (Figure 34: I). The specific features of the selected 16 samples are categorized into a basilica style hall, towers, steeples, buttresses, trusses, galleries, vertical arch windows, rose windows, clerestory, columns, side aisles, pews, and altars. The details of selected features and their compositions turned out slightly different depending on the scale of the churches. For instance, two towers are common in large churches while one tower appears most frequently in the smaller churches (Appendix D). To increase external validity, only one large and one

small prototype urban Gothic Revival churches were developed for this study. To make convincing representations of the churches, these prototypes were developed according to the dimensions of similar churches as documented in the Historic American Buildings Survey.

#### **4.3. TYPOLOGIES OF THE CHANGES OF HISTORIC CHURCHES**

Typology is a commonly used method for understanding and suggesting a certain style in architecture. For instance, in the book *A Field Guide to American Houses*, McAlester (1984) uses this method to establish the architectural styles of American houses. Through data collection by means of field studies, classification of the samples based on similarities in architectural features, and analyses of the groups of samples, they categorized domestic houses into several styles that could be referred to in practical architectural applications.

Abu-Obeid (1993), Kwun (2001), Argan (1996) and Colquhoun (1996) all note that typology is a useful method to help people understand architecture. This notion stems from the symbolic and communicative values of typology, which has bearing on the tendency to consider architecture as language in cognitive psychology (Abu-Obeid, 1993). Interestingly, the symbolic value of typology is rooted in the culture and history of any given population group (Argan, 1996).

...when a type is determined in the practice or theory of architecture, it already has an existence as an answer to a complex of ideological, religious, or practical demands which arise in a given historical condition of whatever



culture (Argan, 1996:243).

Like the prototype, typology is also the outcome of analyzing a building in terms of basic design components by averaging existing architectural features which appeals to people in the form of a “mental abstract image” (Abu-Obeid, 1993:146; Argan, 1996; Kwun, 2001). The cognitive nature of human beings elucidates the usefulness of typology not only for architectural design but also for architectural perception (Abu-Obeid, 1993; Argan, 1996; Colquhoun, 1996; Kwun, 2001). Abu-Obeid (1993) and Kwun (2001) claim that architectural typology can work as a design guideline for solving spatial problems. Furthermore, they value it as a cornerstone of creative design.

While the usefulness of architectural typology for architectural professionals is supported by Abu-Obeid (1993) and Kwun (2001), its usefulness for the public is confirmed by Mahdjoubi and Wiltshire (2001). In their article, *Towards a Framework for Evaluation of Computer Visual Simulations in Environmental Design* they address the importance of the representativeness of suggested images to increase the lay persons’ understanding of a computer simulation of a space. They suggest that basically lay persons prefer photorealistic images while architects prefer abstract images. However, the quality of computer simulations does not depend on the degree of their similarity to the real world.

Consequently, by representing an architectural space, a typology could be an effective

tool for measuring the public perception of a space. In particular, the usefulness of typology in religious architecture is supported by Argan (1996) claims that in religious architecture, the typology could be developed more easily than in any other building type; and that the developed typology could work as an effective design tool.

Religious architecture which answers demands rooted in the past has resulted in typological repetition or in attempts at freeing the artist of all typological precedent (Argan, 1996:246).

To constitute a set of typologies from the 16 samples, the important architectural features that are pertinent to the new uses (building types) were analyzed (Figure 34: II). It should be noted that this study examines only the changes in the interior space, since the exterior fabrics of historic churches listed on the National Register hardly undergo any alteration as per the Secretary of the Interior's Standards. The reason is partially derived from the notion that the public is concerned only with the preservation of the exterior fabrics of their historic buildings (Mavis, 1986).

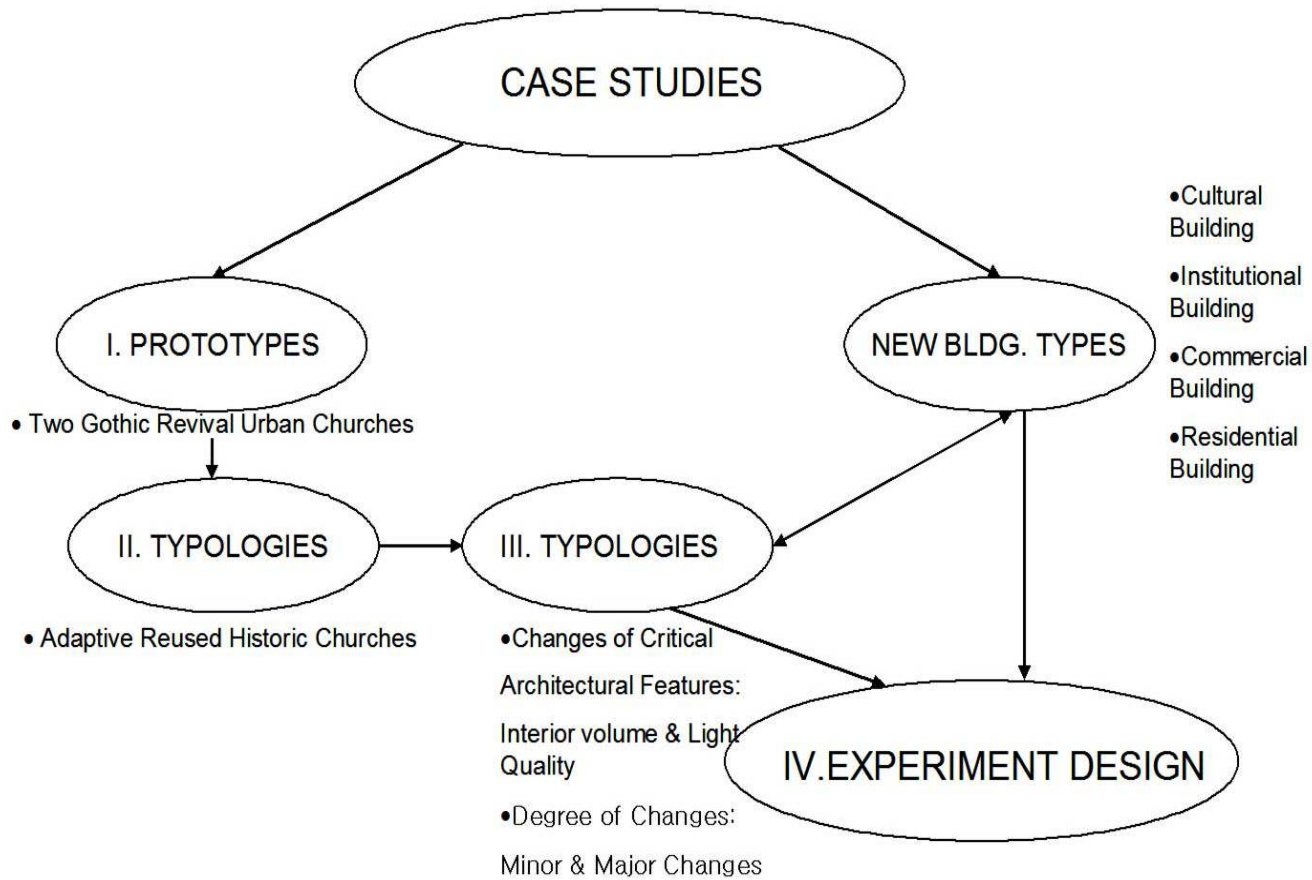


FIGURE 34. Procedures of creating the prototypes and typologies

Figure 34: III illustrates the development of the typologies of changes in critical architectural features. The interior changes were analyzed by referring to existing texts, pictures, and photographs describing the design intention and subsequent changes.

First, the study developed a list of architectural features considered in the interior changes (e.g., floor level, wall, vaulted ceiling, atrium, artificial light, natural light, clerestory, duct work, pews, altar, etc.). Second, the list was categorized into five groups that consist of common architectural characteristics (e.g., interior volume; light quality; interior finish; HVAC system; and furniture and specific features related to worship). Finally, the degrees of change in each feature were marked.

Table 1 shows the spectrum of changes and their variations (e.g., no change, minor modification, additions, relocation, and removal). Throughout this procedure it is noted that two architectural characteristics (interior volume and light quality) were considered the most important by professionals. Subsequently, the changes were summarized as minor or major changes in interior volume<sup>75</sup> and light quality.<sup>76</sup>

Based on the analysis of Table 1, the typologies of changes were created as one point perspective images using AutoCAD.<sup>77</sup> One point perspective was used to represent the symmetric characteristics of the church. The views of the converted church interiors from the entry spaces were drawn. To increase the three dimensional feeling, tones and different line weights were added to the drawings; to understand the interiors, the perspectives of the second floors that are invisible from the first floors were generated as separate drawings. No colors were added to the perspectives except for yellow and

TABLE 1. Architectural features and their changes according to building type changes  
(derived from the sample churches listed in the National Register)

		community cultural use						institutional use		commercial use					residential use		
		a	b	c	d	e	f	a	b	a	b	c	d	e	a	b	c
Interior Volume & Circulation	floor level	NC	C/A?	NC		C/A	C/M	NC	C/A	NC	NC	C/A	C/A	C/A	C/A		C/A
	wall	NC	NC	NC		C/A	C/A	C/A	C/A	NC	NC	C/A	C/A	C/A	C/A		C/A
	vaulted ceiling	NC	NC	NC		NC		NC	NC	NC	NC	NC	NC	NC		NC	
	atrium	NC	NC	NC	NC	C/M	C/M	C/M	C	NC	NC	C/M	C/M				
	cruciform plan												NC				
	balcony								A				A	A			A
	column							NC	NC	NC	NC						
	staircase						?		A			A	A			A	A
elevator				A	A			A			A	A					
Lighting Fixtures	artificial light	C/A		C/A		A/R	A/R	A/SR	NC/L/A	NC	C/A	A	A	A			NC
Lighting Fixtures & Light quality	natural light	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	C/M	C/M**		C/M**
	clerestory							C/M									
	high window (arched)	NC	NC	NC	NC	NC	NC	NC	NC		NC	NC	NC				NC
	stained glass window	NC	NC	NC	NC	C	NC	NC	NC		NC	NC	NC	NC/A-	NC/A-	NC	NC/A-
	door				A*	A	A	A	A						A	NC/A	
Interior Finish	color					C/A		C/A	C/A		NC						
	material									C/R	NC						
HVAC	electrical system					A/H				A/H			A		A	A/H	
	ductwork					A/R?		A/SR		A/H			A			A/H	
	acoustic system		A		A											A/H	
Other	pews	C/R	C/R	C/M	C/M					C/M	C/R	C/R	C/R***				C/M
Specific Features	chancel	NC	NC	NC		NC		NC			NC		NC				
Related to	altar	NC	NC	NC	C/M			NC		C	NC		NC				
Worship	confessional							C/M		C/R							
	choir loft							C/M									
	belfry/ bell tower							NC						C/M		NC	
	bell																C/M
*added exit in the basement because of fire code																	
**skylight																	
***box shaped chairs, sofas, and low wall cubicles to echo the box pew																	
NC: no change		A/R: addition revealed															
C/M: change by modification		A/SR: addition seriously revealed															
C/R: change by removal		A/H: addition hidden															
C/A: change by addition		NC/A: no change and separate addition															
A: new addition		NC/L/A: no change, relocation, and addition															

blue to represent lighting; this was intended to make light quality changes more easily perceivable by subjects. Photographs of lighting effects as relevant to the changes were included in the typology images to provide more realistic explanations of light quality changes.

#### **4.4. RESEARCH DESIGN**

Table 2a, b, and c illustrate the research design of an experiment, where the typologies of changes in architectural features of various building types were used to evaluate the public perception of these changes.

Table 2a describes an experiment design of 2x2x2 design. Each cell in the table includes a typology of changes in 2 important architectural features (volume and light), characterized by 2 degrees of changes (minor and major changes), and applied to 2 church prototypes. Table 2b shows that each cell is also tested on four categories of new building types (e.g., community/cultural, institutional, commercial, and residential). This research examines the first hypothesis: public perception of the adaptive reuse of a historic church is a function of the new building type. Eventually it yields 8 typologies for each building type and total, 32 typologies were tested (Table 2c).

TABLE 2. a) 2x2x2 experiment design, b) design applied to 4 categories of building types, c) design of the typologies: changes of each critical architectural feature and combination of them in each building type

a

	Interior Volume		Light Quality	
	Minor Changes	Major Changes	Minor changes	Major changes
Church Prototype I				
Church Prototype II				

b

Building Type	Church Prototype	Interior Volume		Light Quality	
		Minor changes	Major changes	Minor changes	Major changes
Community/Cultural	I				
	II				
Institutional	I				
	II				
Commercial	I				
	II				
Residential	I				
	II				

c

BUILDING TYPES	CHURCH PROTOTYPES	CRITICAL ARCHITECTURAL FEATURES			
		Interior Volume		Light Quality	
		Minor Changes	Major Changes	Minor Changes	Major Changes
Community/Cultural	I				
	II				
Institutional	I				
	II				
Commercial	I				
	II				
Residential	I				
	II				

The number of typologies is bound up with the increase of external validity (the representation of the real world) of this experiment. The combinations of minor and major changes in each architectural feature were intended to cover the architectural changes analyzed from the limited number of samples. The test of those combinations was intended to examine the second hypothesis: public perception can be changed not only by the extent of alteration in each critical architectural feature, but also by the combination of the extent of alterations in critical architectural features (see page 94).

## **4.5. EXPERIMENTAL PROCEDURES**

### ***4.5.1. Study Population and Data Collection***

This experiment used undergraduate students from Texas A&M University to represent the general population. As a result, the obtained data has demographic limitations. Yet, performing the experiment on campus provided high accessibility to subjects and effectiveness in use of time and cost.

The subjects were recruited by contacting professors of undergraduate classes. For the pretests, 6 classes of Design Communication Foundation (ENDS 115) were used: five classes consisted of non architecture students (Construction Science students) and one class included architecture students. In total, 147 students participated in the pretests. The pretests were conducted in a classroom.

For the main test, the subjects were recruited in two departments: architecture and



philosophy. As each target classes were open to all undergraduate students of Texas A&M campus, there was a diversity among the students' majors. The subjects were recruited from an architecture introductory class (ENDS 102) with 150 students, two architectural history classes (ENDS 150-501, 150-502) with total of 500 students, one class of history of building technology (ARCH 345) with 150 students, and two philosophy classes (PHIL 205, PHIL 381) with 90 students in total. Hence, 890 Texas A&M University students were introduced to this experiment. To encourage students' participation several methods were conducted. First, the experiment was posted on the web. Second, the students were encouraged to participate in this experiment by the professors of the classes by relating this experiment to their course content. Third, the duration time of this experiment was less than 10 minutes in order to foster their participation. Fourth, the link to the experiment web site was sent to students through an information sheet, email, and/or a display on the web sites of the classes. Finally, the students were reminded of the experiment by means of email one week after this experiment was introduced to them. In total, 186 students out of the 890 Texas A&M University students who were introduced to this experiment participated.

As this experiment uses human subjects, it followed standard Texas A&M University IRB (Institutional Review Board) protocol. Not a single datum was collected until IRB approval was obtained (Appendix C).

#### **4.5.2. *Pretests***

To increase the internal validity of this experiment, pretests were conducted. The procedure of the tests was as follow:

- (1) The perspective images of typologies were presented on a plasma screen.
- (2) A set of questionnaires was given to the subjects.
- (3) The duration time of a pretest was approximately 30 minutes.
- (4) All testing was conducted in an interior classroom.

The data set that originated from the architecture group was compared to the construction science group and the test results were similar. Because there were no notable differences between the two groups, the data were combined.

The large amount of missing responses in the pretest dataset suggested that the instructions to the experiment's parts were misunderstood, the experiment was not effectively controlled, the duration time was too long to keep subjects' attention, or all of the above. In an attempt to rectify these possible shortcomings, the experiment was converted into a web based survey. In addition to its efficiency as an experimental procedure, web based experiments typically provide clear instructions, increased compliance, and better control and prevention of missing data (Solomon, 2001; Wyatt, 2000). The maximum duration time was reduced from 30 minutes to 10 in order to sustain the participants' attention during the entire session of the experiment, as well as to increase the number of volunteers because no explicit incentives were given to the subjects (e.g., credit points, money, etc.) for their participation.

To reduce the duration of this experiment, the required free-end questions that were included in the pretest questionnaire were removed. Instead, participants were given the opportunity to write comments at the end of the web survey. In addition, based on the finding that 95% of the pretest participants were Christians, the question regarding religious affiliation was eliminated.

#### ***4.5.3. Development of the Instrument on the Internet***

The experiment was conducted as a web based survey (<http://thereuse.net>) in order to make it inclusive in recruiting subjects, cheap, controllable, and quickly analyzed (Solomon, 2001; Wyatt, 2000). To implement the web survey, ASP (Active Server Pages) programming language was used on an IIS (Internet Information Services) server by Microsoft.

The subjects participated in this experiment anonymously and were randomly assigned to the experimental conditions. All the responses were recorded on an MS Access database, yet only the completed surveys were counted as available data sets. In this research, the collected data on the web were digitally stored with an access only by the researcher. To increase the controllability of this survey and prevent missing data, a user input validation function programmed with JavaScript was used so that the participants had to answer the specific questions on a page before moving to the next page.

The experiment started with pictures of sample churches. This first page provided subjects with a brief explanation of the content, duration time, and procedure of the survey (see page 175, Appendix D). On the web site, the developed prototypes and typologies were presented to subjects as digitized perspective images. The web site consisted of four parts: subject background, church characteristics, adaptive reuse of churches, and perception of new uses.

The questions in Part I were intended to help specify the background and limitations of this experiment (see page 177, Appendix D). The subjects were asked to respond to demographic questions (e.g., department, gender, age, ethnicity, department, and hometown setting) first and then proceeded to Part II, where they were asked to answer questions that asked their association and familiarity with churches (see pages 178-179, Appendix D). The subjects were asked to indicate the degree of importance of each interior characteristic and each interior architectural feature on a one to ten scale. They then proceeded to the questions of Part III (see page 180, Appendix D). They were asked for their opinions about the four different adaptive reuses (e.g., community/cultural, institutional, commercial, and residential) of historic churches. These questions asked the subjects about the acceptable degrees of new building types in reusing historic churches. The questions in Part III were accompanied by the prototypical interior and exterior images of churches (see page 180, Appendix D).

The questions in Part IV (see page 181, Appendix D) focused on the subjects'

perceptions of the changes in the original architectural features of the interior volume and light due to changes in the building type. Two images, the interior of the original church (prototype) and the interior of the church adapted to a new building type, were presented side by side. The subjects answered the questions on one to ten scale (from “not at all” to “strongly”, or from “highly unacceptable” to “highly acceptable”) referring to the presented images (see pages 181-185, Appendix D). The questions asked about three different levels of perception: the acceptability for the new use; the degree of retaining religious origins; and the desirability of the adaptive reuse (see pages 181-185, Appendix D). Finally, the subjects moved on to questions that asked about the degree of changes in each converted historic church. These questions were followed by the presentation of the images of the four adaptive reuses at once (see page 186, Appendix D).

#### ***4.5.4. Data Coding***

Survey responses were coded on SPSS<sup>78</sup> spread sheets. The information that was obtained through the internet survey was coded with a legend of numbers. Column one includes their identification. In the following second, third, and fourth columns, the series of numbers indicate the types of the 8 typology sets; the types of prototypes (large and small); and the degrees of the changes in interior volume and light quality (major and minor). Lastly, the survey questions were coded consecutively in columns. The coded data were then rearranged along the main three questions as related to each building type change: (i) if the modified church would make a good use for its new

function; (ii) if the modified church retained its religious origins; and (iii) if the modified church was an acceptable reuse. In these rearranged data sets, the different building types (e.g., community/cultural, institutional, commercial and residential) were coded as variables affecting subjects' responses to the questions.

#### **4.5.5. Data Analysis**

The survey data were analyzed using statistical methods such as frequency and descriptive statistics for subjects' backgrounds and associations with church buildings. Conservative statistical analyses such as Analysis of variance (ANOVA), and multiple comparisons (Post-hoc Test: Scheffe's) were used to demonstrate the relationship between building types and subjects' perception. The use of conservative statistical analyses is based on the notion that this research introduces an innovative methodology to a qualitative field such as historic preservation. Stat View was used to perform ANOVA and Post-hoc Test (Scheffe's).

As the perception of the changes were examined on three levels (i.e. acceptability for the new use, degree of retaining religious origins, and desirability of the adaptive reuse), the questions of Part IV that asked for the public perception of the changes were rearranged along a spread sheet in Stat View. The influences of the within subjects (e.g., building types) and between subjects (e.g., large and small prototypes, major and minor degrees of changes, and interior volume and light quality) on the public perception of the changes were analyzed by means of the repeated measures of

ANOVA ( $p < 0.05$ ) and Post-hoc Test (Scheffe's). Scheffe's analysis was used to reveal the significance in the perceptual differences resulting from building type changes. Column charts were used to visualize the test results (see pages 121-135 & Appendix P).

#### **4.6. STRENGTH AND WEAKNESS OF METHODOLOGY**

The multiple methods of this study include case studies and an experiment. The use of these combined strategies can increase the research validity through triangulation. For instance, while case studies are concerned with the increase of external validity, experiments are concerned with the increase of internal validity (control of the research variables) supporting causal claims, which makes the research more convincing (Groat and Wang, 2002; Zeisel, 1997). To ensure the tenability and testability issues of research, pretests were conducted. The modification of the questions based on the analyses of pretest results was anticipated to increase the internal validity of this research (Zeisel, 1997:160).

The issue of external validity in the experimental setting is slightly controversial. Mook (1983:386) states that the goal of research is to, "help us to understand everyday life," which comes from, "understanding theory or mechanism," and not from external validity. For that reason, Mook (1983:379) suggests that we, "specify what ought to happen in the laboratory rather than making predictions about the real world from the lab." In that sense, it may be better to focus on increasing internal validity to increase

the quality of the experiment.

As this experiment was conducted as a web based survey, the experiment becomes inclusive in recruiting subjects, cheap, controllable, and quickly analyzed (Solomon, 2001; Wyatt, 2000). For instance, as the experiment is designed to proceed to next phase only when each question is answered, it becomes more controllable. Moreover, it was designed to be stopped or quit at anytime should participants feel uncomfortable.

In summary, this experiment retains strengths and weakness as follows.

#### Strengths:

- (1) In this research, theory building from apparently complicated phenomena is relatively easily done through case studies. It increased the ability to explain causal links among variables (Groat and Wang, 2002).
- (2) The case studies generated convincing hypotheses by, “investigating contemporary phenomena within its real life context” (Groat and Wang, 2002:346).
- (3) The experiment provides high internal validity by supporting claims for causality in the obtained results (Groat and Wang, 2002).
- (4) The web based experiment entails efficiency in collecting measurable data and analyzing them quickly and economically (Solomon, 2001; Wyatt, 2000).

#### Weaknesses:

- (1) The major weakness of this research stems from the representativeness of samples



and subjects used in the case studies and experiment (Groat and Wang, 2002; Zeisel, 1997).

(2) The typologies that were built based on the case studies have the possibility of hiding some important features by focusing too much on communality in samples (i.e. too much simplification) (Groat and Wang, 2002).

(3) Instead of using inert test groups like samples in a laboratory, the experiment used human groups on the web. Thus, specificity<sup>79</sup> can be an issue (Zeisel, 1997).

(4) Control of the subject groups in terms of questions could possibly generate unwanted results by allowing them to make distorted answers, which is why pretests are beneficial (Zeisel, 1997:160).

## 5 RESULTS AND ANALYSES

This experiment was designed to examine both the research hypotheses and any potential limitations of this research. As has been previously described, the research hypotheses are: (1) the public perception of the adaptive reuse of a historic church is a function of the new building type; (2) public perception can be changed not only by the extent of the alterations in each critical architectural feature, but also by a combination of the extent of the alterations in the critical architectural features. Subsequent to examining these hypotheses, the test results are reported and analyzed not only to expose the relationship between building type and public perception, but also the relationship between the extent of change and the public's perception of the adaptive reuse of a historic church.

This section includes the results of the data collected in the experiment. As previously described, this includes the background of the subjects and their perception on building types.

### 5.1. BACKGROUND OF THE POPULATION SAMPLES

#### 5.1.1. *Demographic Characteristics*

Frequency analyses were used to report demographic characteristics such as scholastic major, years in school, the class from which the subject was recruited, gender, age,

ethnicity, and hometown setting.

89.8% of participants responded to the question regarding their majors. The majority consisted of students came from the College of Architecture (41.4%), the Department of Architecture (30.1%), Construction Science (5.9%) and Landscape Architecture and Urban Planning (5.4%). The rest of the subjects' departments were distributed throughout four colleges, including Agriculture and Life Science, Education and Human Development, Liberal Arts, and Engineering. Only a few students from the colleges of Geosciences, Science, Veterinary Medicine, and Business participated in this experiment (Appendix E).

99.5% of the participants were undergraduate students. Over one-third of the respondents (35.5%) were freshmen, 22.6% were sophomores, 17.2% were juniors and 24.2% of the respondents were seniors. The participation of junior level students was relatively low, even though two classes used in this experiment (ARCH 345 and PHIL 381) are designated for upper level students (Appendix F).

The respondents were asked to report the classes from which they were recruited for this experiment. Of 186 respondents, 78 (40.9%) were students in an architectural history class (ENDS 150). However, it is worth observing the relative response rates. The highest response rate, 66.6% (20 responses out of 30 students), was received from a philosophy class (PHIL 205). The second highest response rate was 38.4% (56

responses out of 146 students) in a history of building technology class (ARCH 345).

In both classes the instructors encouraged their students to participate in the experiment by linking the experiment's content with their class topics. It could also be assumed that the recruitment of subjects was more effectively conducted in the relatively smaller classes (e.g., PHIL 205). In another philosophy class (PHIL 381), 18.3% of the 60 students responded; in an introductory architecture class (ENDS 150), 15.6% of 500 students participated; in ENDS 102, 14% of 150 students participated (Appendix G).

The sample population was nearly balanced in terms of gender; i.e. 50% were males, 48.9% females, and 1.1% had no available data. (Appendix H). Out of 186 subjects, the majority (82.8%) were European American (Appendix J). 60.2% were raised in an urban setting and 32.3% came from rural settings (Appendix K). 50.5% of the respondents were 19 years old or younger and 47.8% were between 20 and 29 years of age (Appendix I). This was expected as the classes used for this experiment were comprised primarily of undergraduate students (Appendix F).

### ***5.1.2. Association of the Subjects with Churches***

Frequency analyses were used to report subjects' major activities and involvement with churches. Descriptive statistics were used to report subjects' familiarity with church buildings. In accordance with the fact that most students at Texas A&M University are

Christians (see page 109), 87.1% of the participants reported that the major activity they performed in churches was worship (Appendix M). Interestingly, the responses of the participants with regards to their familiarity with church buildings averaged 3.39 (SD=1.07) on a scale of one to five, with five “being strongly familiar” (Appendix L).

The subjects were asked to report their association with the characteristics of the church buildings. Descriptive statistics were used for the 13 items integrated in the questionnaire. On a ten-point scale ranging from 1=“not associated” to 10=“strongly associated,” the means of the two characteristics “Open” (mean=7.52, SD=1.79) and “Spacious” (mean=7.52, SD=1.77) were the highest. “Tall” (mean=6.95, SD=1.97), “Bright” (mean=6.58, SD=2.01) and “Intimate” (mean=6.48, SD=2.38) were recorded as the second major group of church characteristics. “Narrow” (mean=4.02, SD=1.94), “Dark” (mean=3.77, SD=2.12), and “Closed” (mean=3.20, SD=1.91) were recorded as the least associated characteristics (Appendix N).

This experiment examined the degree of the subject’s familiarity with the architectural features of churches using descriptive statistics for the 15 items. On a ten-point scale ranging from 1=“not associated” to 10=“strongly associated,” the means of “Worship Space” and “Stained Glass Windows” scored the highest, 8.77 (SD=1.54) and 8.14 (SD=2.17), respectively (Appendix N). “Tall Ceiling” (mean=7.83, SD=1.92) and “Natural Light” (mean=7.83, SD=2.19) scored the second highest, and “Entry Space” (mean=7.55, SD=2.03), “Patterns of Windows” (mean=7.40, SD=2.35), and “Visible

Structure” (mean=7.28, SD=2.05) scored the third highest (Appendix O).

These findings revealed that subjects perceived the functional and symbolic architectural features of churches (e.g., worship space and stained glass windows) as the most critical. In addition, both the interior volume (e.g., atrium, floor level, balcony, wall, vaulted ceiling, and column) and the light quality (e.g., natural light, artificial light, clerestory, high windows, and stained glass windows) seemed critical in forming the subjects’ church-related images.

### ***5.1.3. Association of the Subjects with Building Types in Reusing Historic Churches***

Repeated measures of ANOVA and Scheffe’s post-hoc test compared the acceptable degrees of building types in reusing prototypical historic churches. Table 3 (see page 201, Appendix P) and Figure 35 illustrate acceptable degrees of building types when the subjects were exposed to either a small or a large prototype. In the case of a small prototype, the mean acceptances of reusing this prototype for new building type (e.g., community/cultural, institutional, commercial and residential) were 6.77, 5.49, 3.09, and 2.87 using a ten-point scale ranging from 1=“highly unacceptable” to 10=“highly acceptable.” In the case of the large church prototype, the means were higher than those of the small prototype. The means for each building type were 7.54, 5.8, 3.52, and 3, respectively (see page 201, Appendix P: Table 3 & Figure 35).

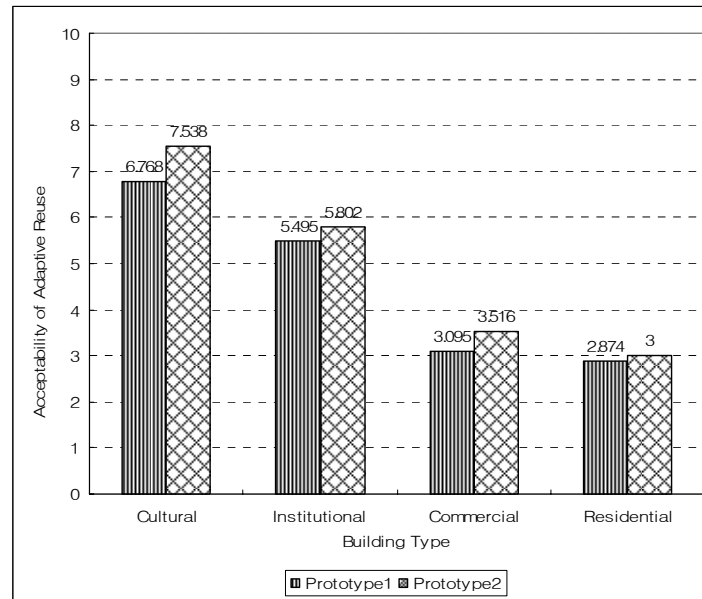


FIGURE 35. Comparison between prototypes in acceptability of new use in the two prototypes  
(1= small prototype; 2= large prototype)

In both prototypes, the category of community/cultural reuse was considered the most acceptable with institutional reuse as second. Since the average means of commercial and residential reuses scored under the mid-point of 5, these reuses appeared to be unacceptable by the subjects. According to Scheffe's post-hoc test, the community/cultural and institutional reuses showed no significant differences in their acceptable degrees (see page 201, Appendix P: Table 4).

It is interesting to note that acceptable degrees of new building types rated higher when the subjects were exposed to the larger prototype that was intended to represent large

scale urban Gothic Revival churches, as opposed to the small scale prototype (Figure 35). However, the results of ANOVA demonstrated that prototype is not an influential factor ( $p=.4312$ ), whereas building type was in terms of subjects' acceptance of new building types ( $p<.0001$ ) (see page 202, Appendix P: Table 5).

## **5.2. PERCEPTION OF THE SUBJECTS ON BUILDING TYPES**

### ***5.2.1. Acceptable Degree of Changes Conducted for New Building Types***

The typologies of the changes derived from the new building types were developed from the same prototypical church images. The subjects were exposed to images of changes in interior volume and light quality and asked to report the acceptable degree of these changes for new functions using a scale of one to ten similar to previous questions.

ANOVA was used to analyze the responses (see page 202, Appendix P: Table 6). The results showed that building type was the most critical factor influencing subjects' perception of the changes for new functions ( $F=60.46$ ,  $p<.0001$ ); the relationship between building type and degree of changes in interior volume was the second most critical factor ( $F=3.50$ ,  $p<.0154$ ); and the relationship between building type and prototype ( $F=3.074$ ,  $p<.0273$ ) was the third most critical factor. The amount of changes in the degree of light quality was not statistically significant; the interplay between the extent of changes in interior volume and light quality rarely influenced subjects' reactions.



Participants' perception of the acceptable degree of changes for each new function was rated (see page 203, Appendix P: Table 7). On a ten-point scale, the community/cultural category scored the highest acceptable degree for new functions (mean=6.457, SD=.17); the second highest was the commercial category (mean=4.656, SD=.21); and the third highest was in the institutional category (mean=4.339, SD=.19). Residential use scored the lowest degree of acceptance (mean=3.973, SD=.20) (see page 203, Appendix P: Table 7 & Figure 36). Assuming that 5 is the mid-point of the scale, it is reasonable to conclude that changes producing community/cultural buildings are acceptable, while changes producing the other three listed functions are not acceptable, although commercial buildings come close (mean=4.656, SD=.21). According to the results of the Scheffe's post-hoc test (Table 8), the acceptable degree of changes mark no significant difference between institutional and commercial reuse ( $p=.4892$ ). However, changes for commercial reuse (mean=4.656, SD=.21) seem more acceptable than changes made for institutional reuse (mean=4.339, SD=.19). There was no significant difference between the subjects' reactions to institutional and residential reuse ( $p=.3593$ ).

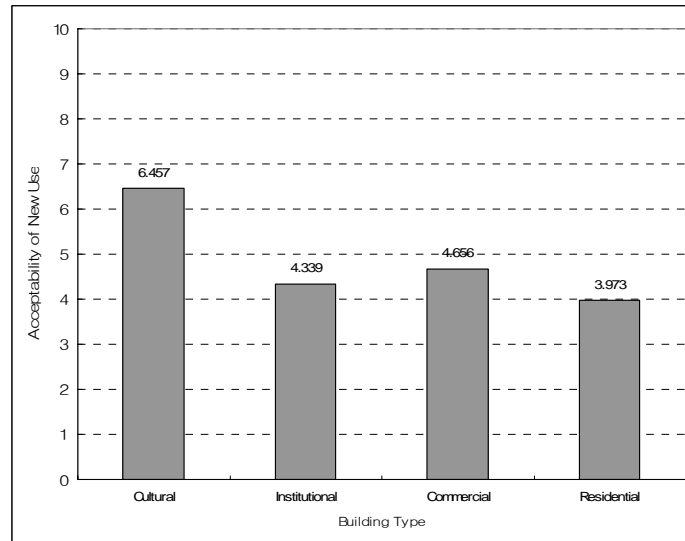


FIGURE 36. Acceptable degree of new use by building type

Scheffe's analyses were conducted to discover the difference between the acceptability of the building types for reusing historic churches when subjects were exposed to only the church prototypes, as opposed to them being exposed to typological changes. The results illustrated that there are significant differences between the initial degrees of acceptable reuse and the acceptable degrees of typological changes (see pages 211-212, Appendix P: Tables 23, 24, 25 & 26). A comparison between the results as shown in Figure 35 and Figure 36 indicates that the changes for the community/cultural functions and institutional functions became less acceptable than the subjects initially thought. In the mean time, the changes for commercial and residential functions became more acceptable than the subjects' initial indications. From this comparison, it can be assumed that the subjects thought that the changes for institutional reuse were

more radical, while the changes for commercial reuse were less extreme than they had expected.

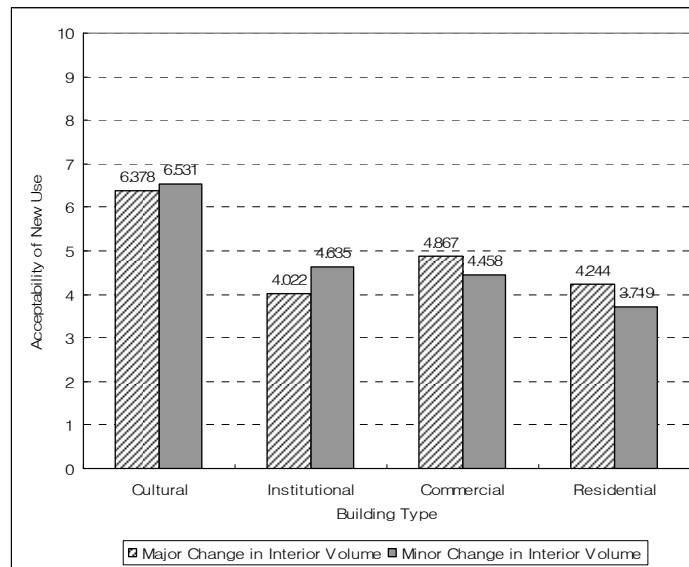


FIGURE 37. Comparison between degrees of acceptance of changes in interior volume

As previously shown in Table 6, the extent of changes to interior volume was found to be another factor related to building types and affected the subjects' acceptance of the changes for new functions. Table 9 (see page 204, Appendix P) and Figure 37 illustrate that in institutional reuse, minor changes in interior volume (mean=4.635, SD=2.70) increased the acceptability more than major changes in the volume (mean=4.022, SD=2.50). However, in the cases of commercial and residential reuse, minor changes

in interior volume (mean=4.458, SD=2.93 and mean=3.719, SD=2.82) were less acceptable than major changes in interior volume (mean=4.867, SD=2.81 and mean 4.224, SD=2.67).

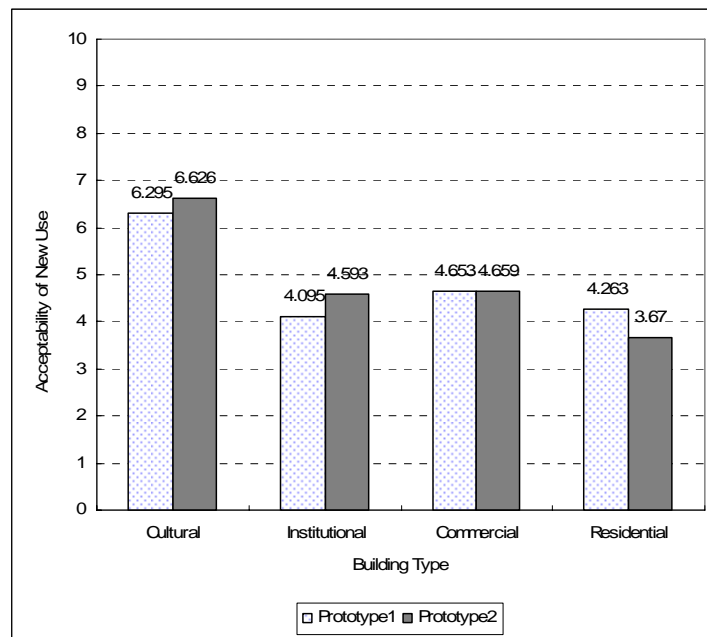


FIGURE 38. Comparison between prototypes in acceptability of new use

According to Table 10 (see page 204, Appendix P) and Figure 38, the large church prototype (Prototype 2) slightly increased the acceptable degrees of community/cultural and institutional reuse. However, the difference between the two

prototypes did not influence the acceptability for commercial reuse. The large prototype had slightly less influence on the subjects' perception of the changes for residential reuse (mean=3.670, SD=2.72). Therefore, it can be assumed that in the case of the large scale prototype church, the changes were neither desirable for commercial reuse nor appropriate for residential reuse.

### ***5.2.2. Degree of Retaining the Religious Origins of the Changes***

Participants were asked to rate the changes for the retention of religious origins on a scale from 1 (not at all) to 10 (strongly).

ANOVA was used to analyze the responses (see page 205, Appendix P: Table 11). The results demonstrated that only building type influenced the subjects' perception of the degree of retaining religious origins ( $F=30.026$ ,  $p<.0001$ ). The mean for community/cultural reuse was 5.595 (SD=2.55); commercial was 4.957 (SD=2.75); institutional was 4.581 (SD=2.69); and residential was 3.855 (SD=2.67) (see page 205, Appendix P: Table 12 & Figure 39). These findings illustrated that community/cultural reuse retains the religious origins of churches to the most acceptable degree while residential reuse is the least retentive (Figure 39). Using 5 as a mid-point, commercial reuse also retains the religious origins to an almost acceptable degree (mean=4.957, SD=2.75); and institutional reuses retain the religious origins of historic churches to a somewhat unacceptable degree (mean=4.581, SD=2.69). However, the results of the Scheffe's post-hoc test showed that the mean differences between institutional and

commercial reuses are not significant, while the differences between the other building types are (see page 206, Appendix P: Table 13).

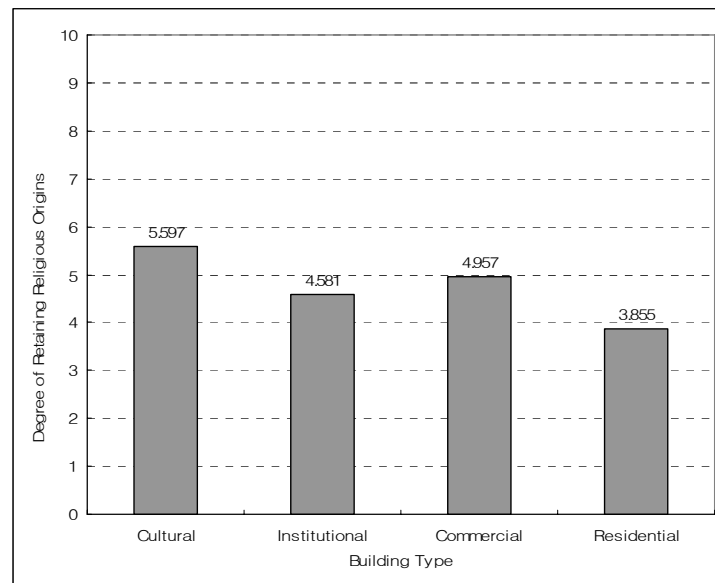


FIGURE 39. Degree of retaining religious origins by building types

The results of Scheffe's analysis illustrated that there are significant differences between the initially acceptable degrees of the reuses and the degrees of religious retention in the changes made for reuse (see pages 211-212, Appendix P: Tables 23, 24, 25, & 26). Under the assumption that a greater degree of retaining religious origins increases the level of acceptability of reuse, the comparison indicated that the changes

for community/cultural and institutional functions retain their origins less than the subjects initially thought (Figure 35 & Figure 39). The changes for commercial and residential functions retained their origins more than the initial speculation of the subjects.

Table 23 (see page 211, Appendix P) shows that there was a significant difference between the acceptable degree of the changes and the degree of retaining religious origins in converting a historic church into a community/cultural building. It implies that the degree of retaining religious origins in community/cultural reuses was less related to its degree of acceptability when compared to other building types.

### ***5.2.3. Degree of the Changes for Desirable Reuses***

On a ten-point scale ranging from “highly unacceptable” to “highly acceptable,” participants were asked to report the degree of changes acceptable for desirable reuses.

ANOVA was used to analyze the responses. Table 14 (see page 206, Appendix P) illustrates that building types ( $F=56.803$ ,  $p<.0001$ ), the relationship between building type and prototype ( $F=2.659$ ,  $p=.0476$ ), and the relationship between building type and the extent of changes in interior volume ( $F=3.333$ ,  $p=.0193$ ) all influenced the subjects’ perceptions of the desirability of the reuse. Light was not found to be a significant factor. The extent of changes in light quality did not interact with building types in a way that influenced the subjects’ perceptions of the degree of desirable reuses.

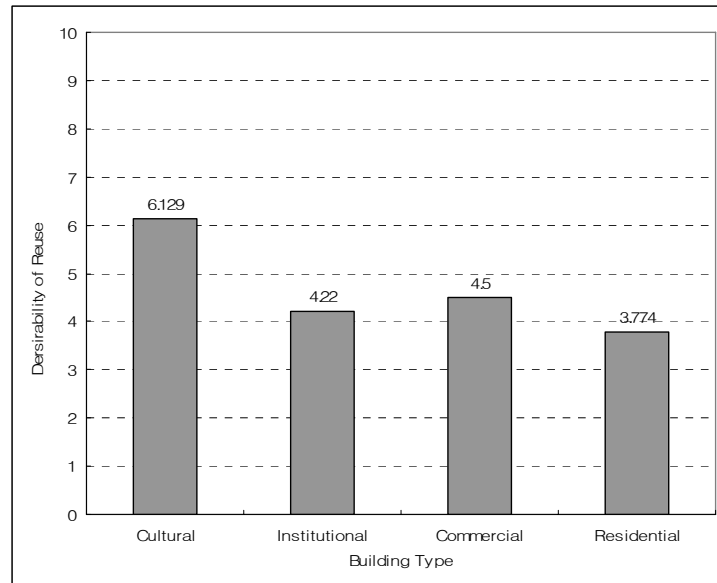


FIGURE 40. Desirable degree of adaptive reuse by building type

The desirability of adaptive reuses for the prototypical churches scored highest in community/cultural reuse (mean=6.129, SD=2.48) and lowest in residential reuse (mean=3.774, SD=2.69) (see page 209, Appendix P: Table 15 & Figure 40). The results of Scheffe's test indicated that perception differences regarding the desirability between commercial (mean=4.5, SD=2.87) and institutional reuses (mean=4.22, SD=2.65), and between institutional and residential reuses, (mean=3.774, SD=2.69) are almost non-existent (see page 207, Appendix P: Table 16). Assuming that 5 is the mid-point of this evaluation scale, only community/cultural reuse can be considered to be a desirable conversion (Figure 40).



The results of Scheffe's test illustrated that there are significant differences between the initial acceptance of a reuse and the desirable degrees of those reuses (see pages 211-212, Appendix P: Tables 23, 24, 25 & 26). Under the assumption that desirability is directly proportional to acceptability, the changes for commercial and residential reuses were perceived to be less radical, while community/cultural and institutional reuses were perceived to be more radical (Figure 40). In particular, while the subjects initially thought that the institutional reuse was the second most acceptable reuse (Figure 35), when considering the changes this reuse became undesirable.

According to Table 17 (see page 208, Appendix P) and Figure 41, the large church prototype (Prototype 2) slightly increased the degree of desirability for both institutional and commercial reuses. Yet, the difference between the two prototypes did not influence the subjects' perceptions of desirability regarding the community/cultural reuse. Furthermore, the large prototype had slightly less influence on the subjects' perception of the desirable degree of residential reuse (mean=6.126, SD=2.31). In comparison with Figure 35, Figure 41 indicates that in the community/cultural reuse of the large prototype church the changes were not desirable. By contrast, the changes were more desirable in the residential reuse of the small prototype church (see page 208, Appendix P: Table 17 & Figure 41).

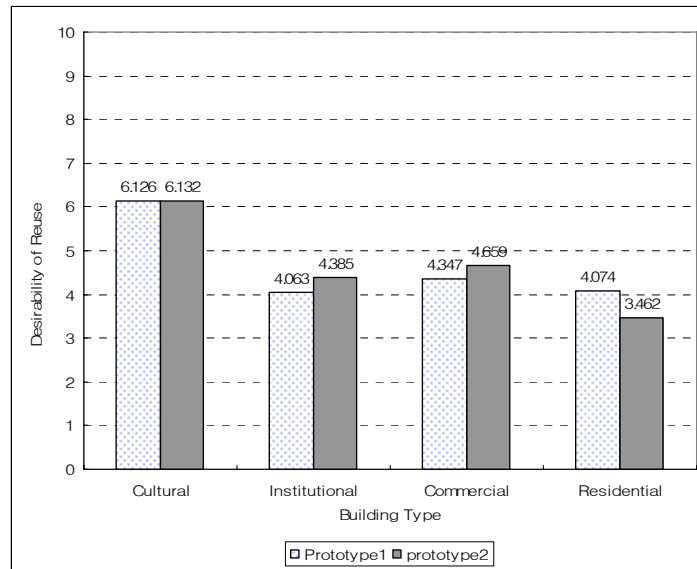


FIGURE 41. Comparison of desirability of adaptive reuse by prototypes

The relationship of building type and the extent of the changes to interior volume was more significant with regards to the perception of the desirability of adaptive reuses ( $F=3.333$ ,  $p=.0193$ ) than between building types and prototypes ( $F=2.659$ ,  $p=.0476$ ) (see page 206, Appendix P: Table 14). Minor changes to interior volume slightly increased the degree of desirability in institutional reuse, yet decreased it in commercial and residential reuses (see page 208, Appendix P: Table 18 & Figure 42). In community/cultural reuse, the degree of its perceived desirable reuse was barely influenced by the extent of the changes in interior volume (see page 208, Appendix P: Table 18 & Figure 42).

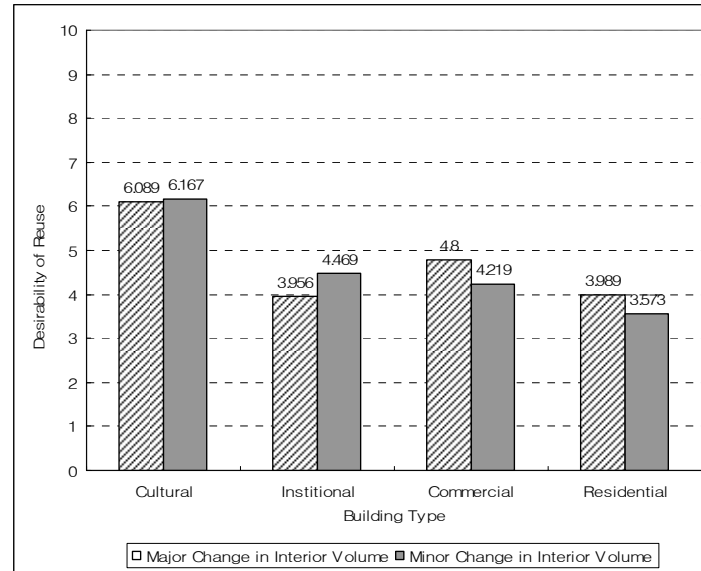


FIGURE 42. Comparison of desirability of adaptive reuse by degrees of changes in interior volume

#### ***5.2.4. Degree of the Changes in Adaptive Reuses***

Participants were asked to rate the degree of changes that were performed on each building type (e.g., community/cultural, institutional, commercial and residential buildings). All of the changed images for new uses were presented to the subjects on the same web page and subjects were asked to rate the degree of changes for each reuse on a ten-point scale ranging from 1=“not at all changed” to 10=“extremely changed.”

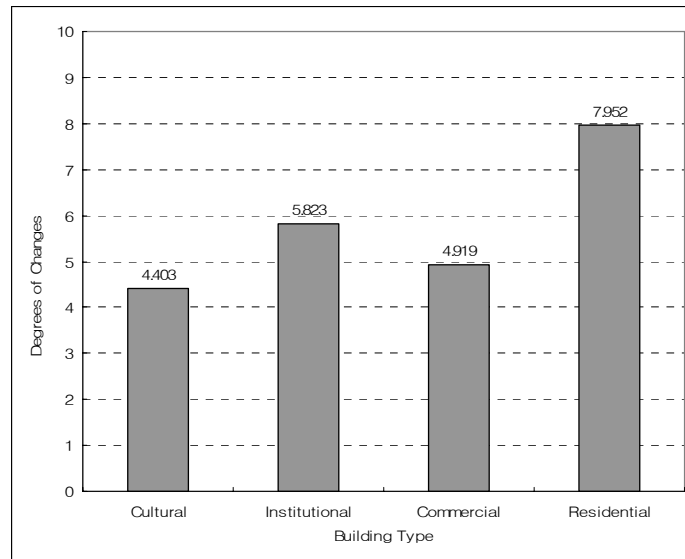


FIGURE 43. Degree of changes of new use by building type

According to Table 19 (see page 209, Appendix P), building type significantly affected the subjects' perception of the extent of the changes for different reuses ( $F=131.936$ ,  $p<.0001$ ). The average response to the degree of changes was rated highest in residential (mean=7.952,  $SD=2.33$ ) and second highest in institutional reuse (mean=5.823,  $SD=1.93$ ) (see page 209, Appendix P: Table 20 & Figure 43). Scheffe's test showed that the average responses between the degree of changes in community/cultural (mean=4.403,  $SD=1.93$ ) and commercial reuses (mean=4.919,  $SD=2.43$ ) had no significant differences (see page 210, Appendix P: Table 21). With the assumption that 5 is the mid-point, it is reasonable to say that both the community/cultural and commercial reuses underwent neither moderate nor radical changes, while residential and institutional reuses underwent radical and somewhat

radical changes.

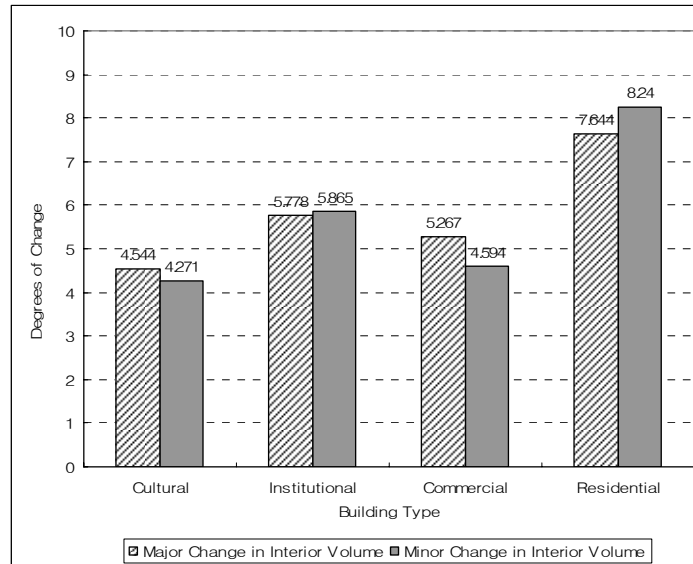


FIGURE 44. Comparison of degrees of change of interior volume in degree of change of new use

The relationship between building types and changes to interior volume ( $F=4.024$ ,  $p=.0076$ ) significantly influenced the perception of the degree of changes for new building types, while the relationship between building types and changes in light quality ( $F=1.516$ ,  $p=.2093$ ) did not (see page 209, Appendix P: Table 19). Minor changes for community/cultural and commercial reuses led to subjects to perceive a lesser degree of change (see page 210, Appendix P: Table 22 & Figure 44). However,

the relationship between minor changes in interior volume and residential buildings led subjects to perceive a greater degree of alteration. The relationship between minor changes in interior volume and institutional buildings had little effect on subjects' perceptions with regards to the degree of alteration (see page 210, Appendix P: Table 22 & Figure 44).

In summary, the experiment results indicate the findings as follows.

Descriptive findings:

Some of the findings of this experiment demonstrate subjects' association with the church image. In this experiment, most respondents were Christians, yet they were not familiar with the actual building of the church. The church image that they contain was bound up mainly with characteristics such as "Open," "Spacious," "Tall," "Bright," and "Intimate," as well as architectural features such as "Worship Space," "Stained Glass Windows," "Tall Ceiling," "Natural Light," "Entry Space," "Patterns of Windows," and "Visible Structure."

Concerning the adaptive reuse of historic churches, when the subjects were asked the degree of physical changes in each reuse their perception indicated that residential and institutional reuses went through the most and second most radical physical changes; community/cultural and commercial reuses went through relatively moderate changes to almost a similar degree. Therefore, the subjects thought that community/cultural and institutional reuses were acceptable, while commercial and residential reuses were not.

Thus, building type was an influential factor affecting their notion of acceptable reuse. In general, the subjects were more open to the changes in a large church than a small church. Yet the scale of the church was not significantly influential to their acceptance of new building types in their conception of the adaptive reuse of historic churches.

When the subjects were exposed to the images of the reused church their perception of the adaptive reuse was different from their initial conception. In general, each building type became less acceptable compared to its initial acceptance by the subjects. The subjects perceived that only community/cultural reuse was an acceptable and desirable reuse in addition to retaining its religious origins to an acceptable degree. Interestingly, in this type of reuse there was a significant difference between the degree of acceptance and the degree of retaining religious origins.

#### Predicted findings:

As predicted the research hypotheses, findings from this experiment indicate that building type significantly influences subjects' perception of the adaptive reuse of historic churches. In addition, changes in interior volume (both major and minor) were found to significantly affect subjects' perceptions. However, the changes in light quality were not significantly influential.

The scale of original churches (large and small prototypes) was found another factor influenced subjects' perceptions. In this experiment, the interplay between building

type and the changes in interior volume in addition to the interplay between building type and the scales of original churches affected subjects' perception of the adaptive reuse of historic churches.



## 6 SUMMARY AND CONCLUSIONS

This study reviewed the role of public perception as a critical factor in fashioning the cultural values displayed through architecture. This review was based on the literature in the areas of cognitive science and historic preservation. In quotidian experiences of the environment, the interplay between conception<sup>80</sup> and perception<sup>81</sup> in the human operates as an impetus for creating cultural values in architecture. The inborn and traditional perceptual natures of human beings work as resources for generating the cultural values through the processes of this interplay. In terms of public perception, these cultural values are interpreted as the collective memory of a given society. Preservation of this collective memory is a reaction to some of the basic psychological needs of the public. The major issue in historic preservation is how to keep this memory. In other words, the question is how to maintain the cultural identity of a society. Since old churches usually serve as the center of community life, they have taken on an important role in this collective memory as symbols of community identity and heritage. Thus, the importance of the preservation of old churches as related to public perception can be established through the study of cognitive science and historic preservation.

However, a study of preservation criteria and guidelines (the National Register of Historic Places and the Secretary of the Interior's Standards) reveals that they do not

include public perception as a critical factor in defining the historic significance of existing buildings or their future use. The National Register of Historic Places provides criteria for interpreting the historic significance of old churches; however, these criteria do not necessarily include the symbolic significance derived from community members' common and religious activities. Consequently, sacred activities (e.g., worship) and other memorable events related to community life that happened in churches can be often excluded from the National Register criteria. The Secretary of the Interior's Standards for Rehabilitation mainly focus on guidelines for the preservation of the buildings' historic fabric as based on preservation professionals' interpretations.

A study of issues in adaptive reuse reveals that the transformation of a building for a different function is a major concern. Function is one of the critical elements that define the architectural integrity of a historic building. Therefore, an adaptive reuse project is more difficult than any other preservation strategy. Furthermore, many scholars and professionals in historic preservation recognize that changes in function (i.e. building type<sup>82</sup>) tend to be more destructive for historic churches because of their unique architectural characteristics (e.g., large volumes lit by natural light). However, the issues derived from changes in building types are not included in the Standards. Consequently, the Standards leave this topic to be interpreted by preservation professionals.

The study of historic preservation demonstrates that the significance of public perception and building types in the adaptive reuse of historic churches is recognized by some preservation professionals. They suggest the use of a hierarchical order of building types when converting historic churches into secular buildings. It is interesting to note that reuse as a community center, which reflects the public and charitable characteristic of a church, is recommended as the most desirable reuse. However, how the design of an adaptive reuse should consider public perception remains an individual decision for the designer.

Following the completion of the literature review, which includes past and recent examples of the adaptive reuse of historic churches, conceptual models of current and proposed practice in adaptive reuse of historic buildings were developed. Figure 45 illustrates the integration of these two models and shows how the historic significance of old churches is generated (I), how new architectural integrity is created through the processes of adaptive reuse (II), and how new architectural integrity is re-examined in this study following the influence of public perception and building type (III). Two major research hypotheses were derived from the conceptual model: (1) the public perception of the adaptive reuse of a historic church is a function of the new building type; (2) public perception can be influenced not only by the extent of the alteration in each critical architectural feature, but also by a combination of the extent of alterations in critical architectural features. Hence, public perception and building type became the variables of this study.

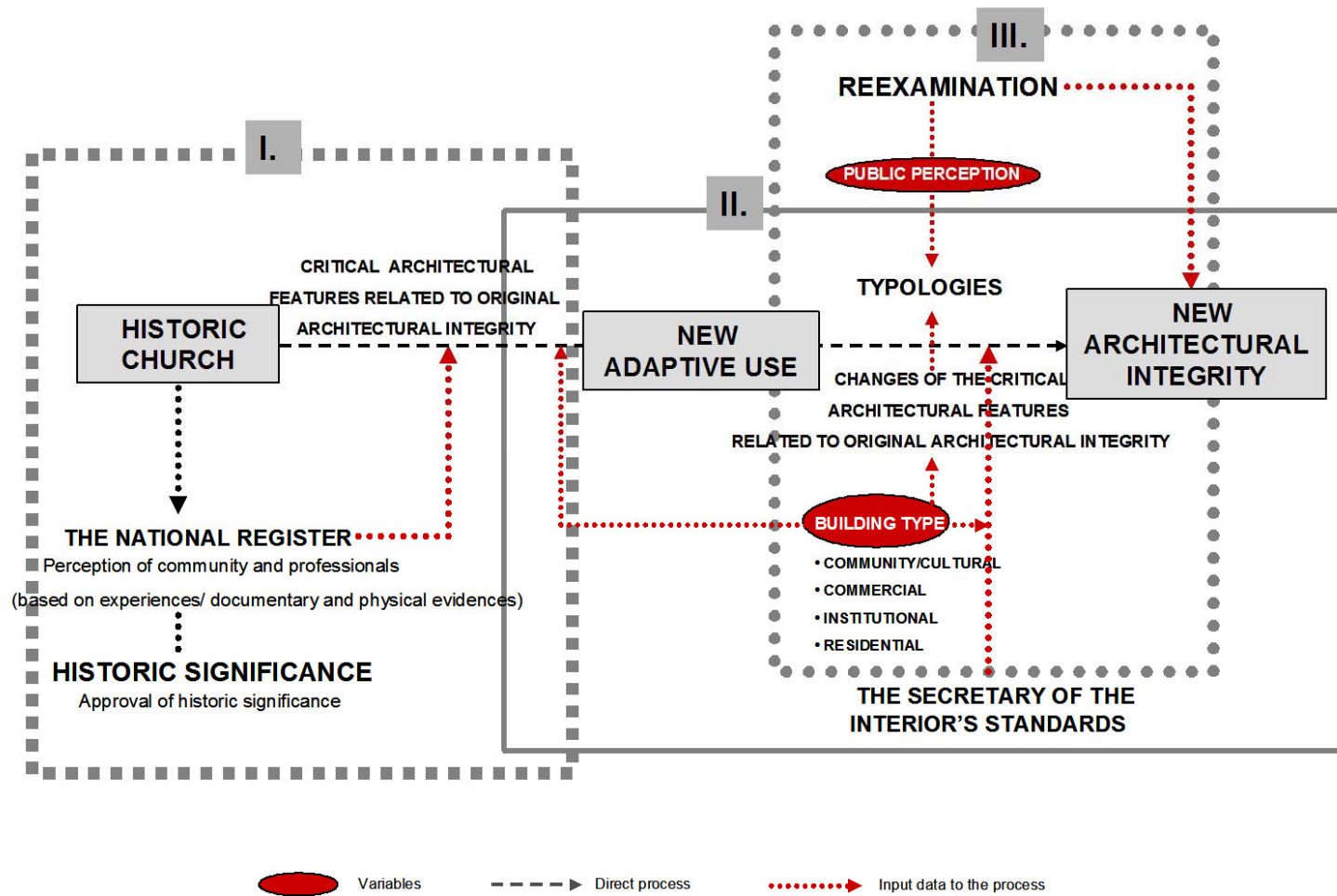


FIGURE 45. Current and proposed practice in adaptive reuse of historic churches

Three major steps were conducted in order to test these hypotheses: (i) 16 samples of adaptively reused historic churches listed in the National Register were selected; (ii) based on these samples, prototypes of the historic churches and typologies of the changes for new building types (e.g., community/cultural, institutional, commercial, and residential) were developed; and (iii) an experiment was conducted to test the public perception of these typologies regarding the changes in the adaptive reuse of the developed prototypes. Two prototypes and the typological changes for each building type were presented on the Internet as perspective images. Three main questions followed each image. The subjects were asked about the degree of the acceptability of the new uses, the degree of the retention of religious origins, and the degree of the desirability in the reuse. The obtained responses were coded and analyzed by means of frequency and descriptive statistics, analysis of variance (ANOVA), and a post-hoc test (Scheffe's).

Subjects were recruited from several undergraduate classes at Texas A&M University. Among the 186 respondents, the majority were freshman students enrolled in the College of Architecture, were European-American Christians, and were raised mainly in urban settings. The gender ratio was well balanced in these subject groups. The subjects' major activity performed in churches was found to be worship. Their familiarity with church buildings was neither high nor low. The subjects indicated that both the interior volume and light quality were critical in forming their images of a church.

When subjects were exposed to the prototypical images of the original churches, the acceptability of the new building types implemented in reusing historic churches was as follows: both the community/cultural and institutional reuses were acceptable, but the commercial and residential buildings were unacceptable. In addition, there was no significant difference between the commercial and residential buildings in terms of their acceptability. These indications can be supported by some of the participants' comments. They claimed that an institutional building was a good reuse since it contains a conceptual similarity with a church – especially as related to a church's educational functions, such as Bible school. In contrast, they maintained that churches should not be converted into commercial buildings in order to create economic benefits (e.g., restaurants). They thought that such commercial reuse would be contradictory to churches' charitable traits.

However, when subjects were exposed to the images of the modified churches as new building types, their perceptions changed. The degree of acceptability, retention of religious origins, and desirability in the reuse were significantly different from the subjects' initial assessments. First, community/cultural and institutional buildings scored lower, and commercial and residential buildings scored higher than the results of the initial acceptability of building types. Second, only the community/cultural buildings were acceptable and desirable reuses, and were able to retain the religious origins to an acceptable degree. It is interesting that there was a significant difference between the acceptable degree and the degree of retaining religious origins in the

community/cultural building. Third, commercial and institutional buildings were the second and third, respectively, in acceptable degree of new use, the degree to which religious origins are retained, and the desirable degree of reuse. Fourth, the institutional building retained its religious origins to almost the same degree as the commercial building. Lastly, there was no significant difference between the institutional and commercial, and between the institutional and residential buildings in terms of the acceptable degree of new use and the desirable degree of reuse.

From these findings it can be concluded that the results of this experiment supported the first hypothesis. Building type was the most significant factor ( $p < .0001$ ) in subjects' perceptions of the adaptive reuse of historic churches. The test results of the acceptable degree of new uses, the degree to which religious origins are retained, and the desirable degree of the reuses created consistent patterns of perception in four new building types (community/cultural, institutional, commercial, and residential).

Moreover, the results demonstrated that the degree of changes in each building type is inversely proportional to the reuse's degree of acceptability, retention of religious origins, and desirability. For instance, since the changes for residential reuse were perceived to be the most radical, the changes were perceived as the least acceptable for new use, retained the least religious origins, and proved to be the least desirable of the reuses. This finding recalls the professionals' view on the public's acceptance of the adaptive reuse of historic churches. Professionals usually claim that the

community/cultural reuse is the most preferred by the public, while residential reuse is the least preferred (see pages 36-38).

The second hypothesis concerning the influence of the degree of changes acceptable in the major architectural features and their combination was not supported by the study's results. The extent of the changes in interior volume was a critical factor which affected the perception of the degree of changes, acceptability, and desirability in the reuse. Yet minor changes in interior volume did not necessarily guarantee a more positive perception. Also, major changes in interior volume did not necessarily result in a more negative perception of the degree of changes, acceptability, and desirability in a reuse. The influence of the degree of changes in light quality was negligible. This is contradictory to the results of the question regarding "the association of the samples with churches," which indicated that the subjects' conception of light quality in the church was as important as the interior volume. It can be assumed that either the light quality was not an important factor affecting the subjects' perception of the adaptive reuses, or the changes in light quality were not expressed in a convincing way in the experiment. In future research projects considering the adaptive reuse of historic churches, it is suggested that the researcher reexamine the influence of light quality with more realistic images and more specific features of light.

The influence of the scale of the original church was found to be another critical factor in the subjects' perception. Its relationship with building type affected participants'



perceptions of adaptive reuse in defining the acceptability and desirability of new uses. As a result, the second hypothesis should be replaced with: public perception can be influenced by the interaction between building type and the extent of alteration in interior volume, as well as the interaction between the building type and the scale of the original building.

In sum, the results of the experiment demonstrated that building type, the extent of the changes in interior volume, and the scale of the church prototypes are, respectively, the first, second, and third most critical factors affecting subjects' perception of the adaptive reuses of historic churches. It can be concluded that the adaptive reuse of historic churches should be conducted while considering the general images of building types, their relationship to the degree of changes in interior volume, and the scale of the original churches.

It should be noted that the experimental settings (e.g., the size of computer screens that the participants used to conduct this experiment on the web and the resolution settings) were beyond the control of this researcher. In addition, this research was limited by the subjects' age, ethnicity, and religion. The size of the study samples was limited to only 16 adaptive reuse historic churches representing only one specific architectural style. To increase reliability and validity, further research should test other architectural styles, address churches in rural settings, include a wider variety of age groups with different ethnicities and religions, and create a more controlled experimental setting. In

addition, it is suggested that further empirical research should include testing public perception using only verbal description rather than the combination of words and images used in this study. This would provide data on the impact of visual information on public perception.

As indicated in the introduction, this research has both practical and theoretical implications for historic preservation. First, the findings can be used to develop a set of guidelines to help guide design professionals in the adaptive reuses of historic churches. These guidelines should be based on the public perception of the church's conversion into a secular function and on the role of building type in this process. Second, this study can be used as background information for developing training sessions for the public (e.g., church congregations and community members) to involve them in historic preservation procedures. Third, the findings of this study provide the grounds for future research into public perceptions and the adaptive reuse of historic churches. Lastly, this research illustrates how cognitive science studies can be integrated into historic preservation and how a multi-method analytical approach (e.g., case studies and experiments), when combined with quantitative results, can support and augment the phenomena of adaptive reuse in a qualitative field such as historic preservation.

## NOTES

<sup>1</sup> According to Oxford dictionary (2005), an abandoned building means the building that is vacated due to the lost of its original function and/or dilapidated due to the lack of its maintenance.

<sup>2</sup> The difference between rehabilitation and adaptive reuse lies in the extent of intervention and whether or not the strategy premises the functional changes. Rehabilitation deals with the changes derived from new spatial requirements of historic buildings not changing their original functions.

<sup>3</sup> According to Oxford dictionary (2005), the term ‘type’ indicates ‘a category of people or things that share particular qualities or features.’ Thus, a building type is defined as a group of buildings with similar functions.

<sup>4</sup> The first or typical form of something (Oxford dictionary, 2005)

<sup>5</sup> A classification of things according to general type (Oxford dictionary, 2005)

<sup>6</sup> Culture means the arts and other instances of human intellectual achievement regarded as a whole; and the art, customs, ideas, and social behavior of a nation, people or group (Oxford dictionary, 2005).

<sup>7</sup> Scruton (1979:52-53) states, “It (the philosophy of Hegel) set out not to *a priori* what at first seem to be the most arbitrary and contingent among all observable facts-the phenomena of history. .. History tends to be viewed even now under the aspect of necessity, and the mere fact that two events are contemporaneous is often regarded as showing some real connection between them. Burckhardt, steeped in Hegelian metaphysics, began a famous examination of the Italian Renaissance ... It seems to him that every work of art of the period must derive its significance from the same underlying spirit or idea. Wolfflin, Burckhardt’s pupil, applied the method to architecture, and Wolfflin’s pupil Frankl passed it on to Giedion and to Pevsner.”

<sup>8</sup> “The modernist architectural code of ethics maintained that history was irrelevant, that our age was unique and therefore our architecture must be cut off from the past. Just a few short decades ago modernists argued that everyone in the world... would soon want to live in the same kind of houses, in the same kind of modern cities, all of which would reflect the spirit of our times. ...While the “times” were always “ours,” the decision as to which forms characterized them was always “theirs,” the architectural elite.” (Brolin, 1980:7)

<sup>9</sup> The extent of modification is determined by new building type (Geva, 2002).

<sup>10</sup> Brand (1995:133,155) says “The heart of vernacular design is about form, not style. Style is time’s fool. Form is time’s student.” “The difference between style and form is the difference between a statement and a language. An architectural statement is limited to a few stylistic words and depends on originality for its impact, whereas a vernacular form unleashes the power of a whole, tested grammar. Builders of would-be popular buildings do better when they learn from folklore than when they ape the elite.”

Day (2002:11-12) says “Style is consciousness led; never an issue for vernacular architecture, which was accepted-stereotype led. Style, is by nature, transient. ... By contrast, vernacular architecture was stereotype-led. But its buildings were never identical. Amongst vernacular form-giving influences are structural functionalism, and expression of purpose. Vernacular buildings were clearly differentiated according to use.”

<sup>11</sup> “Aesthetics, in its classical Greek meaning referred to sensory-perceptual knowledge.” (Lindgaard and Whitfield, 2004:86) In their trial to integrate cognition and emotion, Lindgaard & Whitfield accept emotion not only as “bodily responses” to survive but also “mental states” of them filtered through brain (Lindgaard and Whitfield, 2004:83).

<sup>12</sup> “The tendency to find out order, categorize, and interpret in experiencing beauty.” (Rentschler, et al., 1988:30)

<sup>13</sup> “Creatures are beset by information. One most basic sorting task for any creature involves distinguishing its fellow creatures from others. These examples of course are literally anthropomorphic.” (Hildebrand. 1999:93)

“There are innumerable classic patterns which are identical no matter how you look at them.” (Rasmussen, 1959:47)

<sup>14</sup> Structuralists believe in the existence of patterns explaining people’s collective behavior. They make the efforts to find out a universal language to explain urban structure and human behaviors and use both of induction and deduction to pose logical arguments. In their ways to build theories, Kevin Lynch and Christopher Alexander are structuralists (Downing, 2004).

<sup>15</sup> “Memory cannot retain everything; if it could, we would be overwhelmed with data. Memory is the result of a process of selection and of organizing what is selected so that it is within reach in expectable situations.” (Lynch, 1972:36)

<sup>16</sup> Lynch (1972:240) argues that shared time image should be preserved, which is related to “inner well-being” of human beings.

<sup>17</sup> Day (2002) maintains that built environments should hold memories by rooting themselves in time and cultural continuity.

<sup>18</sup> According to the National Register, Charles Street Meeting House in Boston contains significance in the areas of religion, African American social history, and architecture style (Tudor Revival). The historic significance of the building falls into two criteria of the National Register, “Architecture/Engineering” and “Event”.

<sup>19</sup> Unlike Viollet-Le-Duc who advocated restoration of historic buildings as a way to establish the complete state of the buildings, John Ruskin, a nineteenth century English architectural critic and social reformer, contended that the restoration of historic buildings means, “the most total destruction which a building can suffer,” and the patina of time that the buildings contain should be preserved (Murtagh, 1997:17).

<sup>20</sup> The Daughters of the Republic of Texas

<sup>21</sup> Secretary of the Interior’s Standards identify each of the four treatments as follow: “Preservation

retains the maximum amount of historic fabric along with the building's historic form, features, and detailing as they evolved over time; Rehabilitation acknowledges the need to alter or add to an historic building to meet new or continuing uses, while retaining the building's historic character; Restoration depicts the building at a particular point in time by preserving features and fabric from the period of significance and removing others; and Reconstruction establishes a limited framework for recreating vanished or non-surviving buildings with new materials, primarily for interpretive purposes.” (Woodcock, 2002:35)

<sup>22</sup> Black Hawk and Central City of Colorado illustrate how the industrial shift, an external factor, affected the adaptive reuses of the two towns. Black Hawk and Central City that were used to be two mining boomtowns of Colorado were formed by gold rush in mid 19th century. Then, as the mining industry was collapsed, the towns were adapted to cultural and festive towns and then gambling towns: restoration of Central City Opera house and revival of opera performance in 1932; and gambling redevelopment in 1991 (Stokowski, 1996).

<sup>23</sup> According to Diamonstein (1978:22-25), “boutiquefication”: restoring and recycling old buildings in an excessively fashionable way; “gentrification”: expelling established residents out of their newly revitalized neighborhoods; “danger of the sameness”: the similarity of design; “museumization”: “mummifying” old buildings through their adaptive reuses; and “over-preserving or over-recycling of old buildings”: saving too many old buildings, which leads to the stagnation of the environment.

<sup>24</sup> “The best known and most often used section of the treatment of historic properties is the Standards for Rehabilitation.” (Park, 2006:13)

<sup>25</sup> “Urban renewal had found a way to be acceptable-go indoors and upgrade building services and space plans instead of replacing whole blocks and buildings. It was so commercially attractive that you could do it with private funds. Adaptive use took off as the mainstream of preservationist activity.” (Brand, 1995:104)

<sup>26</sup> Pilsen neighborhood improvement plan in Chicago includes the development of a traffic-free plaza as a main theme, at the center of which the cathedral Centro Familiar Guadalupano is located. Interestingly enough, the plan indicates that the abandoned cathedral will be used for cultural programming in the neighborhood (NTHP & PSP, 2005).

<sup>27</sup> based on Delahunt M (2007) Artlex: Art Dictionary.  
<[http://www.artlex.com/ArtLex/p/images/pantheon\\_photo1.lg.jpg](http://www.artlex.com/ArtLex/p/images/pantheon_photo1.lg.jpg)>

<sup>28</sup> based on Sanford AN (2007) A Life Time of Color.  
<<http://www.sanford-artedventures.com/study/images/pantheon.jpg>>

<sup>29</sup> based on University of Texas at Austin (2007)  
<<http://www.utexas.edu/courses/romanciv/artandarchitecture/pantheon.jpg>>

<sup>30</sup> based on MacDonald WL (1976) *The Pantheon: Design, Meaning, and Progeny*

<sup>31</sup> Gregory's instruction suggests that to transform temples into churches, pagan statues should be removed; the temple should be cleaned by holy water; and relics of saints should be deposited (Blaauw, 1994:13-14; Kalas, 2005:2).

<sup>32</sup> based on MacDonald, WL (1976) *The Pantheon: Design, Meaning, and Progeny*

- <sup>33</sup> “Agrippa, for his part, wished to place a statue of Augustus there also and to bestow upon him the structure named after him. But when the emperor would not accept either honor, he placed in the temple itself a statue of the former Caesar and in the porch statues of Augustus and himself. This was done not out of any rivalry or ambition on Agrippa’s part to make himself equal to Augustus but from his hearty loyalty to him and his constant zeal for the public god.” (MacDonald, 1976:76)
- <sup>34</sup> “We have no facts to go on for deciding whether the cupola should be conceived as a concrete symbol of the vault of heaven; nothing indicates that this idea was expressed in the building, but with Dio Cassius’ commentary on the name of the temple we have evidence that the dome even in ancient times was interpreted as an imitation of the heavens.” (Licht, 1966:199)
- <sup>35</sup> “The projection of the rays of the sun on the pavement at the summer solstice indicates knowledge about the real size of the earth and the Roman Empire. The east-west axis of the rotunda represents the northern Tropic of Cancer (the farthest northern latitude at which the sun can appear directly overhead, which occurs on the June solstice) the center of the beam of light on 21 June marks Rome’s latitude (41.88).” (Sperling, 1998:129)
- <sup>36</sup> The papal masses were held twice a year in the Pantheon: the first of January, and the consecration day of the Pantheon. Then as the worship of the first of January was transferred to another church of Trastevere, a special non- traditional celebration called *Dominica de Rosa* was held to eulogize the annunciation of the Holy Spirit in the Pantheon. In this event, the roses sent falling down from the top of the Pantheon represented the Holy Spirit as the oculus was used as the passage through which the Holy Spirit came down to land on earth (Blaauw, 1994).
- <sup>37</sup> based on Graves D (2006) Archaeological Imaging Research Consortium  
<<http://arcimaging.org/GeisslerRex/IstanbulHagiaSophia20001.jpg>>
- <sup>38</sup> based on Yenisoganci VH (1994) *Museums’ Guide*
- <sup>39</sup> based on Swarthmore College Computer Society (2004)  
<<http://www.sccs.swarthmore.edu/users/06/adem/personal/turkiye/images/inside%20hagia%20sophia.jpg>>
- <sup>40</sup> based on Columbia University (2007)  
<<http://www.columbia.edu/cu/gsap/BT/EEI/MASONRY/09sophia.jpg>>
- <sup>41</sup> a seat or pulpit (Hoag, 1977:405)
- <sup>42</sup> a niche in the Qubla wall of a mosque indicating the direction of Mecca (Hoag, 1977:405)
- <sup>43</sup> tower from which the call to prayer is made (Hoag, 1977:405)
- <sup>44</sup> an endowed theological school providing student lodgings, a prayer hall, and sometimes classrooms (Hoag, 1977:405)
- <sup>45</sup> based on Yenisoganci VH (1994) *Museums’ Guide*
- <sup>46</sup> based on Yenisoganci VH (1994) *Museums’ Guide*
- <sup>47</sup> based on Islamic Architecture (2007)

<<http://www.islamicarchitecture.org/architecture/i/mosques/cordoba/i117.html>>

<sup>48</sup> a covered passage (Dodds, 1992:15)

<sup>49</sup> leader of the Muslims in both a spiritual and political sense (Hoag, 1977:405)

<sup>50</sup> based on Al-Awwal J (2007) Islamic City

<<http://www.islamicity.com/culture/mosques/Europe/cordoba.htm>>

<sup>51</sup> based on Haverford College (2007)

<<http://www.haverford.edu/relg/sells/courses/rel262/CordobaGreatMosqueY470.jpg>>

<sup>52</sup> based on Yale University Library(2007)

<<http://www.library.yale.edu/judaica/maimonides/spain.html>>

<sup>53</sup> based on Lopez S (1997) *The Mosque of Cordoba*

<sup>54</sup> based on Lopez S (1997) *The Mosque of Cordoba*

<sup>55</sup> based on Yale University Library(2007)

<<http://www.library.yale.edu/judaica/maimonides/spain.html>>

<sup>56</sup> based on Cantacuzino S, Brandt S (1980) *Saving Old Buildings*

<sup>57</sup> based on Lancaster O (1972, July) Church into Library. *Country Life*152

<sup>58</sup> based on Cantacuzino S, Brandt S (1980) *Saving Old Buildings*

<sup>59</sup> based on Kontaktieren SU (2007) Eivissa Web

<<http://www.eivissaweb.com/bilder-ibiza/ibiza/sehenswurdigkeiten/offset/6/>>

<sup>60</sup> based on Cantacuzino S (1989) *Re architecture: Old Buildings, New Uses*

<sup>61</sup> based on Crawford I (1988, February) Momento Miro. *The World of Interiors*

<sup>62</sup> based on Cantacuzino S (1989) *Re architecture: Old Buildings, New Uses*

<sup>63</sup> based on Kontaktieren SU (2007) Eivissa Web <<http://www.eivissaweb.com/news/culture/offset/36/>>

<sup>64</sup> based on Crawford I (1988, February) Momento Miro. *The World of Interiors*

<sup>65</sup> based on Hopkid (2007) Virtual Tourist

<[http://www.virtualtourist.com/travel/North\\_America/United\\_States\\_of\\_America/Massachusetts/Boston-794476/Things\\_To\\_Do-Boston-MISC-BR-5.html](http://www.virtualtourist.com/travel/North_America/United_States_of_America/Massachusetts/Boston-794476/Things_To_Do-Boston-MISC-BR-5.html)>

<sup>66</sup> based on Schmertz MF (1984) Finding New Functions to Save a Landmark from Restoration and Recycling of the Charles Street Meeting House, Boston, Massachusetts. *Architectural Record* 172

<sup>67</sup> based on Schmertz MF (1984) Finding New Functions to Save a Landmark from Restoration and Recycling of the Charles Street Meeting House, Boston, Massachusetts. *Architectural Record* 172

- <sup>68</sup> based on *Architektur Wettbewerbe* (1985, March) Charles Street Meeting House, Boston, USA.
- <sup>69</sup> Sorkin (2004) states that there can be a conflict between architects' design and community members' spatial necessity. Sorkin (2004) claims that the controversies should be resolved by the change of architects' attitude considering the collective values of the community that create the sense of neighborliness.
- <sup>70</sup> "A community preservation program must encourage adaptive reuse while protecting the public's interest in maintaining the traditional character of the site and its neighborhood." (Mavis, 1976:18)
- <sup>71</sup> "Non architects tended to provide evaluations that were predominantly affect based and descriptive, whereas architects provided evaluations that were more abstract and conceptual." (Gifford et al., 2000;167)
- <sup>72</sup> Agrest and Gandelsonas (1996;112-117) claim that building type changes lead to changes in the meaning of significant architectural features. This comes from the notion that architecture has a communicative function and "building type is semiotic."
- <sup>73</sup> "The concept of building type should be significantly involved in the schematic design phase of the design process by providing:
1. a basis for the ramifications of the design direction which are not considered in the initial phase,
  2. a building's character that can reduce the scope of the functional and visual search,
  3. grounds for intuitive decision making,
  4. and the usual order of synthesis existing within the design source." (Kwun, 2001:146)
- <sup>74</sup> "Gothic Revival is a style that was prominent in literature, art, and architecture in European countries and United States in the late 18th and early 19th centuries. The style was experimented with by architects the most in the design of mansions and churches. In the case of churches, this style remained the most influential in the 20th century. Gothic Revival style was distinguished by the pointed arch, towers, steep gabled roofs, leaded stained glass windows, verandas, clustered columns, crenellation, lacy bargeboards, foliated ornaments, bay, and oriel windows and tracery." (Poppeliers, et al., 1981:17-20)
- <sup>75</sup> Changes in Interior Volume: Minor and major changes of interior volume are defined by the changes in, "the amount of space occupied by substances and objects." (Oxford Dictionary, 2006) (e.g., new floor levels, partitions inserted, and removed pews)
- <sup>76</sup> Changes in light Quality: Minor and major changes of light quality are defined by the extent of functional light necessary for new use, the extent of any structural changes occurred by new lighting devices, and the design of lighting fixtures (e.g., traditional or modern style).
- <sup>77</sup> a Computer Aided Design software program
- <sup>78</sup> a statistics software program.
- <sup>79</sup> "Specifiability describes the degree to which research results can be used to control consequences of action in the testing situation studied." (Zeisel, 1997:83)
- <sup>80</sup> Conception means "the way in which something is viewed or regarded" and/or "ability to imagine or understanding something." (Oxford dictionary, 2005)



<sup>81</sup> Perception means “the ability to see, hear, or become aware of something through the senses” and/or intuitive understanding.” (Oxford dictionary, 2005)

<sup>82</sup> The term “building type” is more concerned with image than the term “function” as it is related to patterns of similar buildings (see page 93). Therefore, in this dissertation, the term “building type” was used since this study tests public perception of the images derived from functional changes.

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## APPENDIX A

### THE SECRETARY OF INTERIOR'S STANDARDS FOR REHABILITATION

(HPS, National Park Service)

1. A property shall be used for its historic purpose or be placed in a new use that requires minimal change to the defining characteristics of the building and its site and environment.
2. The historic character of a property shall be retained and preserved. The removal of historic materials or alteration of features and spaces that characterize a property shall be avoided.
3. Each property shall be recognized as a physical record of its time, place, and use. Changes that create a false sense of historical development, such as adding conjectural features or architectural elements from other buildings, shall not be undertaken.
4. Most properties change over time; those changes that have acquired historic significance in their own right shall be retained and preserved.
5. Distinctive features, finishes, and construction techniques or examples of craftsmanship that characterize a property shall be preserved.
6. Deteriorated historic features shall be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature shall match the old in design, color, texture, and other visual qualities and, where possible, materials. Replacement of missing features shall be substantiated by documentary, physical, or pictorial evidence.
7. Chemical or physical treatments, such as sandblasting, that cause damage to historic materials shall not be used. The surface cleaning of structures, if appropriate, shall be undertaken using the gentlest means possible.

8. Significant archeological resources affected by a project shall be protected and preserved. If such resources must be disturbed, mitigation measures shall be undertaken.

9. New additions, exterior alterations, or related new construction shall not destroy historic materials that characterize the property. The new work shall be differentiated from the old and shall be compatible with the massing, size, scale, and architectural features to protect the historic integrity of the property and its environment.

10. New additions and adjacent or related new construction shall be undertaken in such a manner that if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.

(see National Park Service: Illustrated Guidelines for Rehabilitating Historic Buildings, <http://www.cr.nps.gov/hps/TPS/tax/rhb/stand.htm>)

## APPENDIX B

### DESIGN PRINCIPLES OF CHURCH ADAPTATION

(Latham, D (2000) *Creative Reuse of Buildings*)

“When dealing with churches a number of useful principles deserve observance:

1. A conversion scheme must always be considered in three dimensions.
2. If floors must be inserted, one way of maintaining a sense of the original space is to keep floors back from the walls, thus creating voids or light walls.
3. New divisions, both horizontal and vertical, need to take account of the main structural elements of the building. It is important to let the existing structure suggest the floor to floor heights.
4. Where practicable, work should be reversible; not least since the flexibility this allows can be used to advantage where demands of the property market alter. The future of the building should always be considered in the longer term.
5. As many internal fittings and fixtures should be retained and reused as possible, including stained glass, if not of museum quality.
6. Exterior alterations are best kept to minimum to safeguard the landmark value of the church. Original windows should be retained and unavoidable new openings detailed to match existing ones. When available, use reclaimed stonework. Restrict alterations to elevations least visible from surrounding streets or viewpoints. Extensions often damage the integrity of the building and should be considered a last resort.
7. With careful attention, car parking need not detract from the setting of the church.
8. Consideration must always be given to the archaeological interest of both the building and the site, particularly where medieval churches are concerned.
9. Use ancillary buildings, such as Sunday schools and vestries to provide additional sources of income. A more intensive use of the church and its buildings can unite all the activities of a community, introduce a commercial element and open up sources of grant aid (Latham, 2000: 85, 86).”

## APPENDIX C

### IRB (Institutional Review Board) APPROVAL LETTER

#### TEXAS A&M UNIVERSITY

#### VICE PRESIDENT FOR RESEARCH - OFFICE OF RESEARCH COMPLIANCE

1186 TAMU  
College Station, TX 77843-1186  
1500 Research Parkway, Suite B-150

979.458.1467  
FAX 979.862.3176  
<http://researchcompliance.tamu.edu>

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Institutional Biosafety Committee

Institutional Animal Care and Use Committee

Institutional Review Board

---

**DATE:** June 20, 2006

**MEMORANDUM**

**TO:** You-Kyong Ahn  
Architecture MS

**FROM:** Office of Research Compliance  
Institutional Review Board

**SUBJECT:** Initial Review

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**Protocol Number:** 20 06-0373

**Title:** Adaptive Reuse of Abandoned Historic Churches

**Review Category:** Exempt from IRB Review

---

The Institutional Review Board (IRB) has determined that the referenced protocol application meets the criteria for exemption and no further review is required. However, any amendment or modification to the protocol must be reported to the IRB and reviewed before being implemented to ensure the protocol still meets the criteria for exemption.

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**This determination was based on the following Code of Federal Regulations:**  
(<http://www.hhs.gov/ohrp/humansubjects/guidance/45cfr46.htm>)

45 CFR 46.101(b)(2) - Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior, unless: (a) information obtained is recorded in such a manner that human subjects can be identified, directly or through identifiers linked to the subjects; and (b) any disclosure of the human subjects' responses outside the research could reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, or reputation.

---

**Provisions:**

## APPENDIX D

### SURVEY INSTRUMENT ON THE WEB

ADAPTED REUSE OF HISTORY CHURCHS

CONTACT

#### ADAPTIVE REUSE OF HISTORIC CHURCHES



This survey is about historic churches and their reuses. The survey is designed to ask the degree of your perception on the reuses. The maximum duration time of this survey is expected to be 10 minutes. Please click the button to participate in this survey and keep in mind that each question should be answered to continue this survey.

START

TEXAS A&M UNIVERSITY © 2006 ALL RIGHTS RESERVED

The survey is best on the screen resolution, 1024 X 768 and higher.  
This site was tested only on MS Explorer 6.0, FireFox 1.5 and Netscape 8.1  
You may encounter the problem with another browser or a lower version of each browser.

## CONSENT FORM

**Please read the consent form below and click a button [agree or disagree].**

Adaptive Reuse of Abandoned Historic Churches: Building Type and Public Perception

I have been asked to participate in the research, Adaptive Reuse of Abandoned Historic Churches: Building Type and Public Perception. This study is being conducted for a PhD dissertation of You-Kyong Ahn, a student in the Department of Architecture at Texas A&M University. The purpose of this study is to better understand public perception of changes of critical architectural features in the adaptive reuse of historic churches. I will be exposed to images of adaptive reused churches and asked questions about my perception and evaluation of these churches. I will also be asked to provide some general demographic information such as gender, age, and ethnicity.

I am a student who has enrolled in courses at Texas A&M University. I understand that I am one of two hundred students who will be given the opportunity to participate in this study. I understand that I will not receive any personal benefits except for educational experience for participating in this study.

I understand that this is a web based survey and I will access this web site ([www.thereuse.net](http://www.thereuse.net)) to fill out the questions by using my extra time. This experiment will take maximum 10minutes. There will be no risks or discomforts to me in this experiment.

I understand that the experiment will be done anonymously. My personal identity will not be recorded in this research. The IP address of your computer will not be recorded. The records of this study will be printed and kept private and only the researcher will have access to the records. No identifiers related to me to the study will be included in any sort of report that might be published. The records will be stored in a locked cabinet for 3 years after the completion of the study and then destroyed.

I understand that my decision whether or not to participate will not affect my current and future relations with Texas A&M University. If I decided to participate, I am free to decline to answer any of the questions that may make me uncomfortable without any adverse consequence. I realize that I am free to withdraw my consent and to discontinue participation in this experiment.

I understand that information obtained for You-Kyong Ahn's research is for her PhD research. If I have any questions related to this experiment, I can contact one of the following persons.

You-Kyong Ahn  
Architecture Department  
Texas A&M University, 77843-4351  
(979) 204-7217, [ykahn@tamu.edu](mailto:ykahn@tamu.edu)

Alternate Contact  
Anat Geva  
Architecture Department  
Texas A&M University, 77843-4351  
(979) 862-6580, [ageva@archmail.tamu.edu](mailto:ageva@archmail.tamu.edu)

This research study has been reviewed and approved by the Institutional Review Board-Human Subjects in Research, Texas A&M University. For research-related problems or questions regarding subjects' rights I can contact the Institutional Review Board through Ms. Melissa McIlhaney, IRB Program Coordinator, Office of Research Compliance, (979) 458-4067, [mclhaney@tamu.edu](mailto:mclhaney@tamu.edu).

I have read the above information. I have been given a copy of this consent document for my records. By signing this document or clicking the button 'agree' on the web page, I consent to participate in this study.

**PART I. Backgrounds of Subjects**

Please provide the following demographic information

1. Department :

Select your department

2. Grade :

Freshman  Sophomore  Junior  Senior  Graduate  None of these

3. Class :

ENDS 115  ENDS 150  PHIL 205  PHIL 381  ANTH 205  ARCH 345  None of these

4. Sex :

Male  Female  Decline

5. Age :

Under 20  20-29  30-39  40-49  50-59  60 and over  Decline

6. Race/Ethnicity :

Caucasian  Arican-American  Middle Eastern  Asian  Hispanic  Mixed  Decline

7. Hometown setting :

Urban  Rural  Not Available

8. Familiarity with church buildings :

Not at all familiar      1      2      3      4      5      Strongly familiar  
                       

9. Major activities in church buildings :

Worship  Community events  Tour  None of these

## PART II. Characteristics of Churches

10. Please rate all the following interior characteristics that you associate with a church building.

Not associated	1	2	3	4	5	6	7	8	9	10	Strongly associated
Spacious	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Comfortable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Intimate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tall	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Narrow	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wide	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Open	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Closed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bright	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Shadowy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Dark	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Colorful	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Contrast	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

NEXT



## PART II. Characteristics of Churches

11. Please rate all the following interior architectural features that are associated with your image of a church.

	Not associated	1	2	3	4	5	6	7	8	9	10	Strongly associated
Entry space	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Worship space	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tall ceiling	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Visible structure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Side passages	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Columns	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Balcony/Gallery	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Patterns of windows	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pointed windows	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Circular windows	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
High level windows	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Stained glass windows	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Natural light	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Artificial light	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Decorative lights	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

NEXT

**PART III. Adaptive Reuse of Churches**

**CHURCH PROTOTYPE**



**Exterior View**



**Interior View**

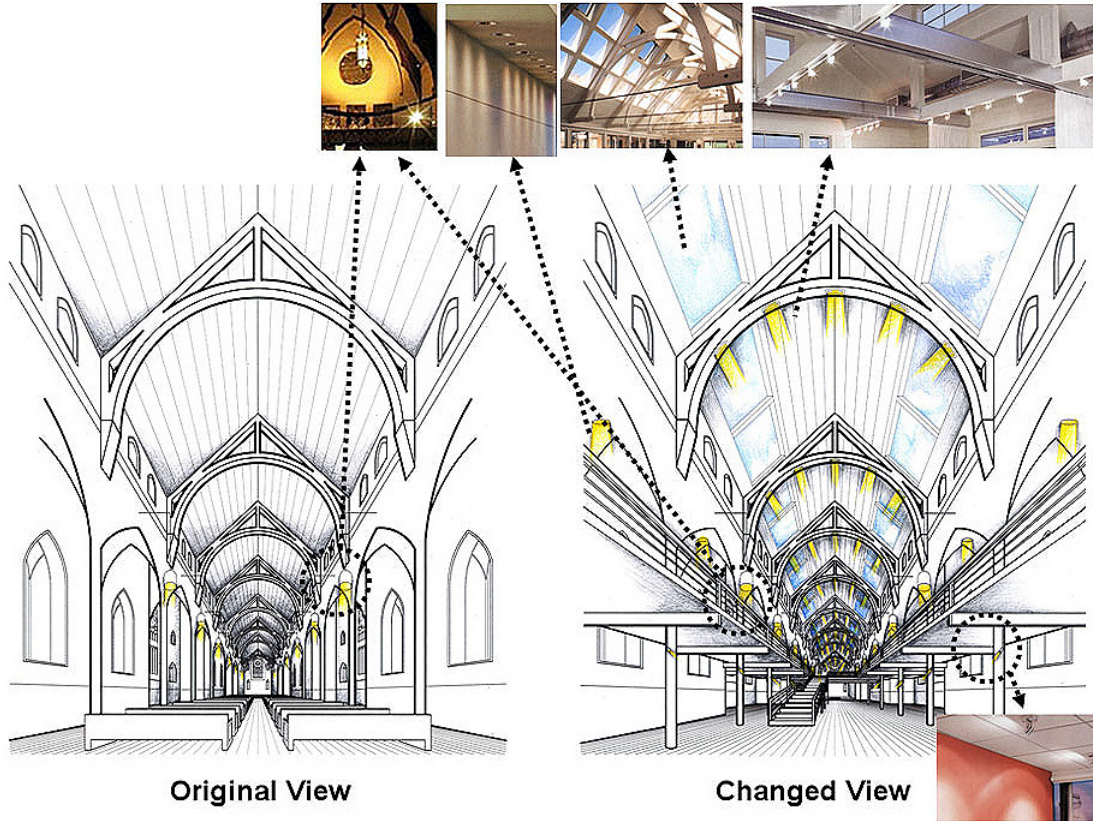
12. Please rate how acceptable it would be to convert an existing church such as shown on the image into one of the following building types.

	highly unacceptable	1	2	3	4	5	6	7	8	9	10	highly acceptable
<b>Community/cultural</b> (e.g. community center, museum, gallery, library)		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
<b>Institutional</b> (e.g. school, college, offices)		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
<b>Commercial</b> (e.g. restaurant)		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
<b>Residential</b> (e.g. condominium, apartment)		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

NEXT

**PART IV. Test for the Perception of New Uses**

CULTURAL USE (e.g. community center, museum, gallery, library)



13. Please rate the degree to which you believe.

	<b>Not at all</b>	1	2	3	4	5	6	7	8	9	10	<b>Strongly</b>
(1) The modified church would make a good <b>cultural center</b>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	<b>Not at all</b>	1	2	3	4	5	6	7	8	9	10	<b>Strongly</b>
(2) The modified church retains its religious origins		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	<b>Highly unacceptable</b>	1	2	3	4	5	6	7	8	9	10	<b>Highly acceptable</b>
(3) The modified church is an acceptable re-use		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

NEXT

**PART IV. Test for the Perception of New Uses**

**INSTITUTIONAL USE** (e.g. school, college, offices)



**Original View**

**Changed View**

14. Please rate the degree to which you believe.

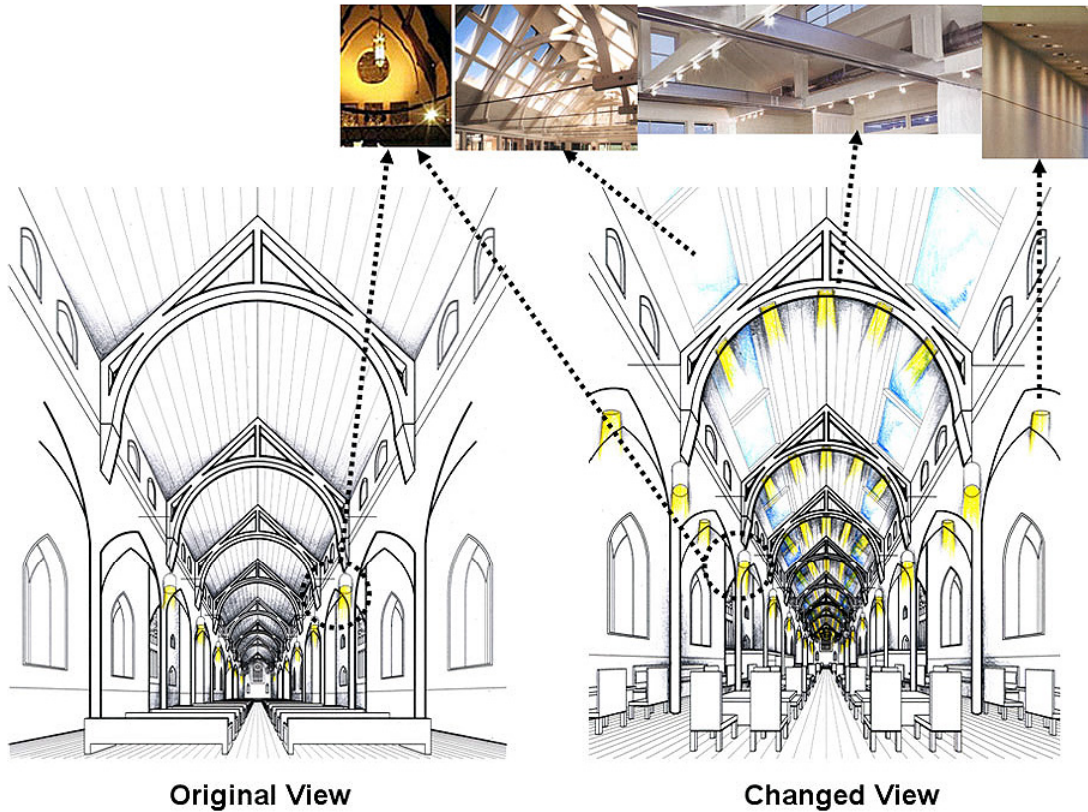
	<b>Not at all</b>	1	2	3	4	5	6	7	8	9	10	<b>Strongly</b>
(1) The modified church would make a good <b>institutional building</b>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
(2) The modified church retains its religious origins	<b>Not at all</b>	1	2	3	4	5	6	7	8	9	10	<b>Strongly</b>
		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
(3) The modified church is an acceptable re-use	<b>Highly unacceptable</b>	1	2	3	4	5	6	7	8	9	10	<b>Highly acceptable</b>
		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

NEXT



**PART IV. Test for the Perception of New Uses**

**15. COMMERCIAL USE (e.g. restaurant)**



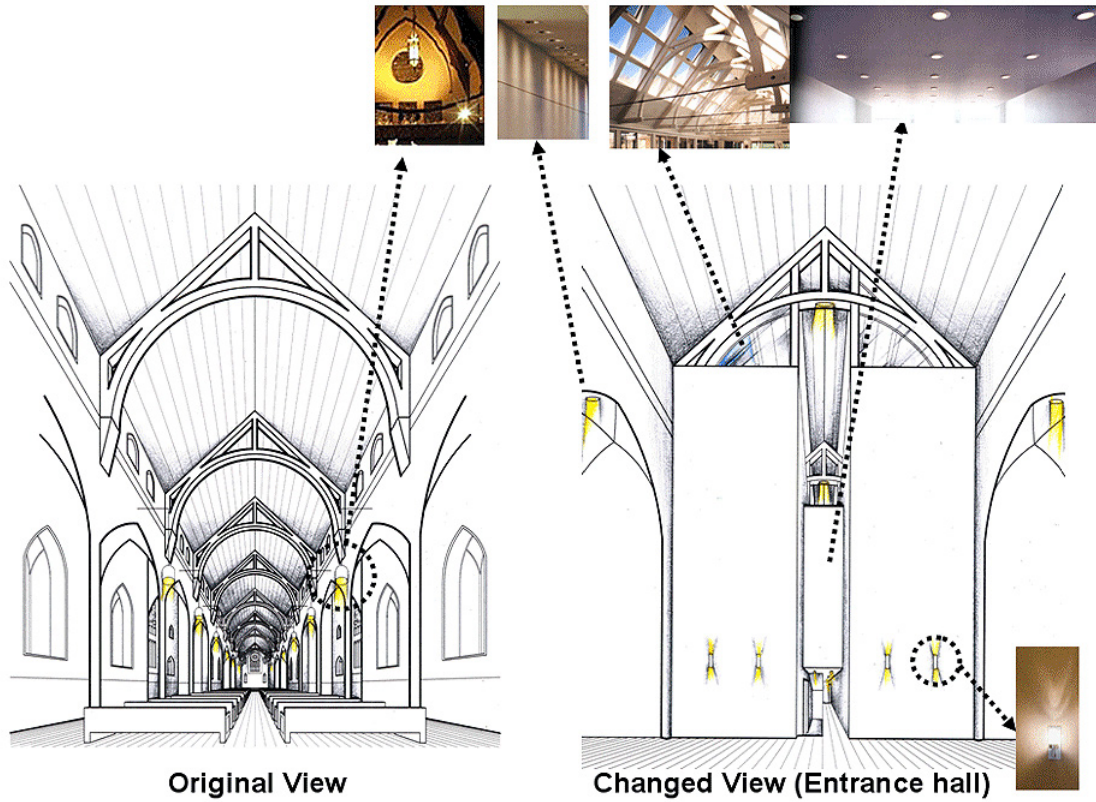
15. Please rate the degree to which you believe.

	<b>Not at all</b>	1	2	3	4	5	6	7	8	9	10	<b>Strongly</b>
(1) The modified church would make a good <b>commercial building</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
(2) The modified church retains its religious origins	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<b>Strongly</b>
	<b>Highly unacceptable</b>	1	2	3	4	5	6	7	8	9	10	<b>Highly acceptable</b>
(3) The modified church is an acceptable re-use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

NEXT

**PART IV. Test for the Perception of New Uses**

**16. RESIDENTIAL USE (e.g. condominium, apartment)**



16. Please rate the degree to which you believe.

	<b>Not at all</b>	1	2	3	4	5	6	7	8	9	10	<b>Strongly</b>
(1) The modified church would make a good <b>residential building</b>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
(2) The modified church retains its religious origins	<b>Not at all</b>	1	2	3	4	5	6	7	8	9	10	<b>Strongly</b>
		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
(3) The modified church is an acceptable re-use	<b>Highly unacceptable</b>	1	2	3	4	5	6	7	8	9	10	<b>Highly acceptable</b>
		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

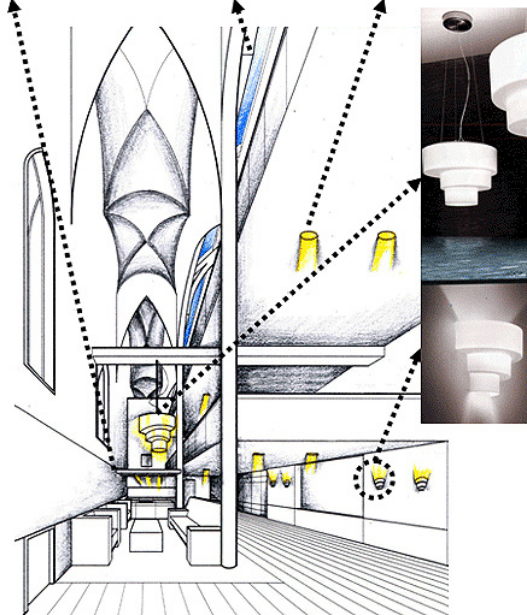
NEXT

**PART IV. Test for the Perception of New Uses**

**16. RESIDENTIAL USE (e.g. condominium, apartment)**



**Original View**



**Changed View (Apartment unit)**

16. Please rate the degree to which you believe.

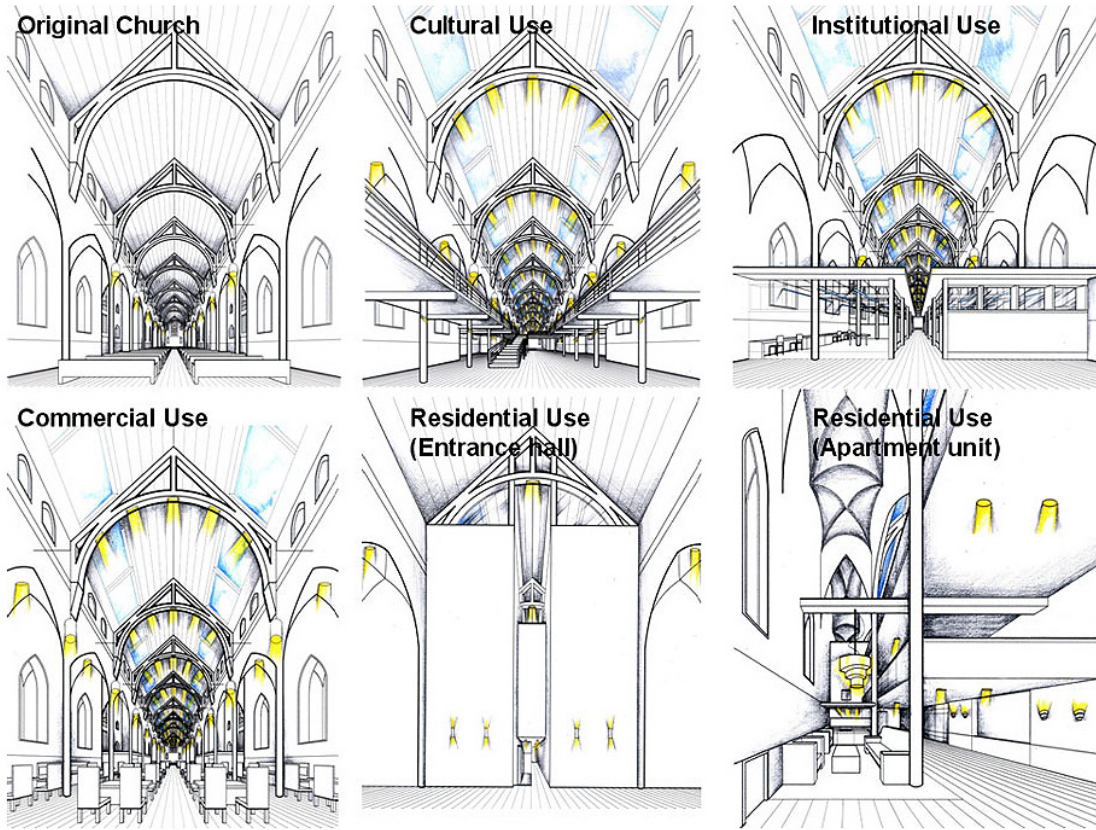
<b>Not at all</b>	1	2	3	4	5	6	7	8	9	10	<b>Strongly</b>
(1) The modified church would make a good residential building	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
<b>Not at all</b>	1	2	3	4	5	6	7	8	9	10	<b>Strongly</b>
(2) The modified church retains its religious origins	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
<b>Highly unacceptable</b>	1	2	3	4	5	6	7	8	9	10	<b>Highly acceptable</b>
(3) The modified church is an acceptable re-use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

NEXT



**PART IV. Test for the Perception of New Uses**

**17. DEGREES OF CHANGES**



17. Please rate the degree of changes that the original church underwent.

	Not at all changed	1	2	3	4	5	6	7	8	9	10	Extremely changed
(1) <b>Cultural Use</b> (e.g. community center, museum, gallery, library)		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
(2) <b>Institutional Use</b> (e.g. school, college, offices)		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
(3) <b>Commercial Use</b> (e.g. restaurant)		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
(4) <b>Residential Use</b> (e.g. condominium, apartment)		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

NEXT



**Thank you so much for your participation.**

**If you would like to give any comments on this experiment,  
please write them in the box below.**

**YOU HAVE TO CLICK "FINISH" BUTTON TO END UP COMPLETELY! THANKS.**

**FINISH**

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The survey is best on the screen resolution, 1024 X 768 and higher.  
This site was tested only on MS Explorer 6.0, FireFox 1.5 and Netscape 8.1  
You may encounter the problem with another browser or a lower version of each browser.

## APPENDIX E

### DEPARTMENTS OF POPULATION SAMPLES

	Fre- quency	Percent	Valid Percent	Cumulative Percent
Valid Agriculture and Life Science - Agricultural Economics	1	.5	.5	.5
Agriculture and Life Science - Agricultural Leadership, Educ	2	1.1	1.1	1.6
Agriculture and Life Science - Animal Science	3	1.6	1.6	3.2
Agriculture and Life Science - Biochemistry/Biophysics	1	.5	.5	3.8
Agriculture and Life Science - Nutrition and Food Science	3	1.6	1.6	5.4
Architecture - Architecture	56	30.1	30.1	35.5
Architecture - Construction Science	11	5.9	5.9	41.4
Architecture - Landscape Architecture and Urban Planning	10	5.4	5.4	46.8
Education and Human Development - Educational Administration	8	4.3	4.3	51.1
Education and Human Development - Educational Technology	1	.5	.5	51.6
Education and Human Development - Health & Kinesiology	3	1.6	1.6	53.2
Geosciences - Geography	2	1.1	1.1	54.3
Liberal Arts - Anthropology	2	1.1	1.1	55.4
Liberal Arts - Communication	3	1.6	1.6	57.0
Liberal Arts - History	2	1.1	1.1	58.1
Liberal Arts - International Studies Degree Program	2	1.1	1.1	59.1
Liberal Arts - Philosophy	8	4.3	4.3	63.4
Liberal Arts - Political Science	3	1.6	1.6	65.1
Liberal Arts - Psychology	6	3.2	3.2	68.3
Liberal Arts - Sociology	1	.5	.5	68.8
Science - Biology	3	1.6	1.6	70.4
Science - Mathematics	1	.5	.5	71.0
Veterinary Medicine - Biomedical Science Program	1	.5	.5	71.5
Engineering - Aerospace Engineering	4	2.2	2.2	73.7
Engineering - Biomedical Engineering	1	.5	.5	74.2
Engineering - Chemical Engineering	1	.5	.5	74.7
Engineering - Civil Engineering	7	3.8	3.8	78.5
Engineering - Computer Science	1	.5	.5	79.0
Engineering - Electrical and Computer Engineering	7	3.8	3.8	82.8

	Fre- quency	Percent	Valid Percent	Cumulative Percent
Engineering - Engineering Technology & Industrial Distributi	3	1.6	1.6	84.4
Engineering - Industrial and Systems Engineering	1	.5	.5	84.9
Engineering - Mechanical Engineering	2	1.1	1.1	86.0
Engineering - Ocean Engineering	1	.5	.5	86.6
Engineering - Petroleum Engineering	3	1.6	1.6	88.2
Mays Business School - Accounting	1	.5	.5	88.7
Mays Business School - Finance	1	.5	.5	89.2
Mays Business School - Marketing	1	.5	.5	89.8
None of these	19	10.2	10.2	100.0
Total	186	100.0	100.0	

**APPENDIX F****YEARS OF POPULATION SAMPLES IN SCHOOL**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Freshman	66	35.5	35.5	35.5
	Sophomore	42	22.6	22.6	58.1
	Junior	32	17.2	17.2	75.3
	Senior	45	24.2	24.2	99.5
	None of these	1	.5	.5	100.0
	Total	186	100.0	100.0	

## APPENDIX G

### CLASSES FROM WHICH POPULATION SAMPLES WERE RECRUITED

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	ENDS 115	6	3.2	3.2	3.2
	ENDS 150	78	41.9	41.9	45.2
	PHIL 205	20	10.8	10.8	55.9
	PHIL 381	11	5.9	5.9	61.8
	ARCH 345	56	30.1	30.1	91.9
	None of these	15	8.1	8.1	100.0
	Total	186	100.0	100.0	

**APPENDIX H****GENDERS OF POPULATION SAMPLES**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	93	50.0	50.0	50.0
	Female	91	48.9	48.9	98.9
	Decline	2	1.1	1.1	100.0
	Total	186	100.0	100.0	

**APPENDIX I****AGES OF POPULATION SAMPLES**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Under 20	94	50.5	50.5	50.5
	20-29	89	47.8	47.8	98.4
	30-39	1	.5	.5	98.9
	Decline	2	1.1	1.1	100.0
	Total	186	100.0	100.0	

## APPENDIX J

### ETHNICITIES OF POPULATION SAMPLES

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Caucasian	154	82.8	82.8	82.8
	African-American	3	1.6	1.6	84.4
	Middle Eastern	2	1.1	1.1	85.5
	Asian	4	2.2	2.2	87.6
	Hispanic	17	9.1	9.1	96.8
	Mixed	3	1.6	1.6	98.4
	Decline	3	1.6	1.6	100.0
	Total	186	100.0	100.0	



**APPENDIX K****HOMETOWN SETTINGS OF POPULATION SAMPLES**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Urban	112	60.2	60.2	60.2
	Rural	60	32.3	32.3	92.5
	Not Available	14	7.5	7.5	100.0
	Total	186	100.0	100.0	

**APPENDIX L****FAMILIARITY OF POPULATION SAMPLES WITH CHURCH BUILDINGS**

	N	Minimum	Maximum	Mean	Std. Deviation
Familiarity with church buildings	186	1	5	3.39	1.066
Valid N (listwise)	186				

**APPENDIX M**

**MAJOR ACTIVITIES OF POPULATION SAMPLES IN CHURCH  
BUILDINGS**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Worship	162	87.1	87.1	87.1
	Community events	7	3.8	3.8	90.9
	Tour	6	3.2	3.2	94.1
	None of these	11	5.9	5.9	100.0
	Total	186	100.0	100.0	

**APPENDIX N**

**FAMILIARITY OF POPULATION SAMPLES WITH INTERIOR  
CHARACTERISTICS OF CHURCH BUILDINGS**

	N	Minimum	Maximum	Mean	Std. Deviation
Interior characteristics - Spacious	186	1	10	7.52	1.771
Interior characteristics - Comfortable	186	1	10	6.17	2.247
Interior characteristics - Intimate	186	1	10	6.48	2.376
Interior characteristics - Tall	186	1	10	6.95	1.968
Interior characteristics - Narrow	186	1	10	4.02	1.938
Interior characteristics - Wide	186	1	10	6.03	2.079
Interior characteristics - Open	186	1	10	7.52	1.790
Interior characteristics - Closed	186	1	10	3.20	1.914
Interior characteristics - Bright	186	2	10	6.58	2.013
Interior characteristics - Shadowy	186	1	9	4.61	2.116
Interior characteristics - Dark	186	1	9	3.77	2.117
Interior characteristics - Colorful	186	1	10	6.13	2.033
Interior characteristics - Contrast	186	1	10	5.75	2.167
Valid N (listwise)	186				

## APPENDIX O

### FAMILIARITY OF POPULATION SAMPLES WITH INTERIOR ARCHITECTURAL FEATURES OF CHURCH BUILDINGS

	N	Minimum	Maximum	Mean	Std. Deviation
Interior architectural features - Entry space	186	1	10	7.55	2.030
Interior architectural features - Worship space	186	2	10	8.77	1.536
Interior architectural features - Tall ceiling	186	1	10	7.83	1.915
Interior architectural features - Visible structure	186	1	10	7.28	2.053
Interior architectural features - Side passages	186	1	10	6.39	2.271
Interior architectural features - Columns	186	1	10	5.67	2.473
Interior architectural features - Balcony/Gallery	186	1	10	5.78	2.516
Interior architectural features - Patterns of windows	186	1	10	7.40	2.353
Interior architectural features - Pointed windows	186	1	10	5.90	2.396
Interior architectural features - Circular windows	186	1	10	5.55	2.443
Interior architectural features - High level windows	186	1	10	7.08	2.329
Interior architectural features - Stained glass windows	186	1	10	8.14	2.167
Interior architectural features - Natural light	186	1	10	7.83	2.191
Interior architectural features - Artificial light	186	1	10	5.73	2.125
Interior architectural features - Decorative lights	186	1	10	5.65	2.335
Valid N (listwise)	186				

## APPENDIX P

### TABLES OF STATISTICAL ANALYSES: ANOVA AND SCHEFFE'S

#### GLOSSARY

CC	: Community/cultural use
INST	: Institutional use
COM	: Commercial use
HOUS	: Residential use
Accept-NU	: Acceptable new use
Retain-RO	: Retaining religious origins
Desirable-AR	: Desirability of Adaptive reuse
CIV	: Changes of interior volume
CLQ	: Changes of light quality
CC-Accept	: Initial acceptance (community/cultural)
CC-ANF	: Acceptability of new function (community/cultural)
CC-DRO	: Degree of retaining religious origins (community/cultural)
CC-AR	: Desirability of adaptive reuse (community/cultural)
INST-Accept	: Initial acceptance (institutional)
INST-ANF	: Acceptability of new function (institutional)
INST-DRO	: Degree of retaining religious origins (institutional)
INST-AR	: Desirability of adaptive reuse (institutional)
COM-Accept	: Initial acceptance (commercial)
COM-ANF	: Acceptability of new function (commercial)
COM-DRO	: Degree of retaining religious origins (commercial)
COM-AR	: Desirability of adaptive reuse (commercial)
HOUS-Accept	: Initial acceptance (residential)
HOUS-ANF	: Acceptability of new function (residential)
HOUS-DRO	: Degree of retaining religious origins (residential)
HOUS-AR	: Desirability of adaptive reuse (residential)

TABLE 3. Means table for acceptability of adaptive reuse in initial conception

	Count	Mean	Std. Dev.	Std. Err.
1, CC-accept	95	6.768	2.460	.252
1, INST-accept	95	5.495	2.629	.270
1, COM-accept	95	3.095	2.471	.254
1, HOUS-accept	95	2.874	2.280	.234
2, CC-accept	91	7.538	2.228	.234
2, INST-accept	91	5.802	2.478	.260
2, COM-accept	91	3.516	2.892	.303
2, HOUS-accept	91	3.000	2.565	.269

(1= small prototype; 2= large prototype)

TABLE 4. Significance of mean differences between building types in acceptability of adaptive reuse in initial conception (Post-hoc Test: Scheffe's)

	Mean Diff.	Crit. Diff	P-Value	
CC-accept, INST-accept	1.500	.561	<.0001	S
CC-accept, COM-accept	3.844	.561	<.0001	S
CC-accept, HOUS-accept	4.210	.561	<.0001	S
INST-accept, COM-accept	2.344	.561	<.0001	S
INST-accept, HOUS-accept	2.710	.561	<.0001	S
COM-accept, HOUS-accept	.366	.561	.3428	

TABLE 5. ANOVA table for acceptability of adaptive reuse in initial conception

	DF	Sum of Squares	Mean Square	F-Value	P-Value	Lambda	Power
Prototype	1	30.704	30.704	2.197	.1400	2.197	.297
Subject(Group)	184	2572.012	13.978				
Category for accept-type	3	2222.989	740.996	199.230	<.0001	597.691	1.000
Category for accept-type * Prototype	3	10.258	3.419	.919	.4312	2.758	.245
Category for accept-type * Subject(Group)	552	2053.052	3.719				

TABLE 6. ANOVA table for acceptability of new use

	DF	Sum of Squares	Mean Square	F-Value	P-Value	Lambda	Power
Prototype	1	1.096	1.096	.068	.7940	.068	.058
QV	1	.418	.418	.026	.8719	.026	.053
CLQ	1	46.457	46.457	2.897	.0905	2.897	.377
Prototype * QV	1	32.179	32.179	2.007	.1584	2.007	.275
Prototype * CLQ	1	21.450	21.450	1.338	.2490	1.338	.198
QV * CLQ	1	10.622	10.622	.662	.4168	.662	.123
Prototype * QV * CLQ	1	54.076	54.076	3.372	.0680	3.372	.431
Subject(Group)	178	2854.425	16.036				
Category for Accept-NU	3	678.244	226.081	60.460	<.0001	181.380	1.000
Category for Accept-NU * Prototype	3	34.486	11.495	3.074	.0273	9.222	.719
Category for Accept-NU * QV	3	39.258	13.086	3.500	.0154	10.499	.784
Category for Accept-NU * CLQ	3	5.171	1.724	.461	.7097	1.383	.141
Category for Accept-NU * Prototype * QV	3	23.788	7.929	2.121	.0966	6.362	.532
Category for Accept-NU * Prototype * CLQ	3	5.365	1.788	.478	.6975	1.435	.144
Category for Accept-NU * QV * CLQ	3	21.880	7.293	1.950	.1205	5.851	.493
Category for Accept-NU * Prototype * QV * CLQ	3	14.102	4.701	1.257	.2884	3.771	.327
Category for Accept-NU * Subject(Group)	534	1996.820	3.739				



TABLE 7. Means table for acceptability of new use

	Count	Mean	Std. Dev.	Std. Err.
CC	186	6.457	2.285	.168
INST	186	4.339	2.611	.191
COM	186	4.656	2.874	.211
HOUS	186	3.973	2.754	.202

TABLE 8. Significance of mean differences between building types in acceptability of new use (Post-hoc Test: Scheffe's)

	Mean Diff.	Crit. Diff	P-Value	
CC, INST	2.118	.562	<.0001	S
CC, COM	1.801	.562	<.0001	S
CC, HOUS	2.484	.562	<.0001	S
INST, COM	-.317	.562	.4755	
INST, HOUS	.366	.562	.3453	
COM, HOUS	.683	.562	.0094	S

TABLE 9. Means table for acceptability of new use along degree of change in interior volume

	Count	Mean	Std. Dev.	Std. Err.
1, CC	90	6.378	2.406	.254
1, INST	90	4.022	2.495	.263
1, COM	90	4.867	2.813	.297
1, HOUS	90	4.244	2.666	.281
2, CC	96	6.531	2.176	.222
2, INST	96	4.635	2.695	.275
2, COM	96	4.458	2.930	.299
2, HOUS	96	3.719	2.824	.288

(1= major change in interior volume; 2= minor change in interior volume)

TABLE 10. Means table for acceptability of new use along two prototypes

	Count	Mean	Std. Dev.	Std. Err.
1, CC	95	6.295	2.010	.206
1, INST	95	4.095	2.552	.262
1, COM	95	4.653	2.812	.289
1, HOUS	95	4.263	2.772	.284
2, CC	91	6.626	2.541	.266
2, INST	91	4.593	2.662	.279
2, COM	91	4.659	2.952	.309
2, HOUS	91	3.670	2.716	.285

(1= small prototype; 2= large prototype)

TABLE 11. ANOVA table for degree of retaining religious origins

	DF	Sum of Squares	Mean Square	F-Value	P-Value	Lambda	Power
Prototype	1	5.846	5.846	.313	.5766	.313	.085
QV	1	26.555	26.555	1.421	.2347	1.421	.208
CLQ	1	.275	.275	.015	.9036	.015	.052
Prototype * QV	1	9.908	9.908	.530	.4674	.530	.108
Prototype * CLQ	1	54.989	54.989	2.944	.0880	2.944	.383
QV * CLQ	1	8.964	8.964	.480	.4894	.480	.103
Prototype * QV * CLQ	1	6.096	6.096	.326	.5685	.326	.086
Subject(Group)	178	3325.228	18.681				
Category for Retain-RO	3	291.622	97.207	30.026	<.0001	90.078	1.000
Category for Retain-RO * Prototype	3	4.214	1.405	.434	.7288	1.302	.135
Category for Retain-RO * QV	3	20.524	6.841	2.113	.0975	6.339	.530
Category for Retain-RO * CLQ	3	6.470	2.157	.666	.5731	1.999	.186
Category for Retain-RO * Prototype * QV	3	10.908	3.636	1.123	.3391	3.369	.295
Category for Retain-RO * Prototype * CLQ	3	21.356	7.119	2.199	.0872	6.597	.549
Category for Retain-RO * QV * CLQ	3	6.935	2.312	.714	.5439	2.142	.197
Category for Retain-RO * Prototype * QV...	3	5.844	1.948	.602	.6141	1.805	.172
Category for Retain-RO * Subject(Group)	534	1728.797	3.237				

TABLE 12. Means table of the degree of retaining religious origins

	Count	Mean	Std. Dev.	Std. Err.
CC	186	5.597	2.546	.187
INST	186	4.581	2.687	.197
CCM	186	4.957	2.749	.202
HOUS	186	3.855	2.666	.195

TABLE 13. Significance of mean differences between building types in degree of retaining religious origins (Post-hoc Test: Scheffe's)

	Mean Diff.	Crit. Diff	P-Value	
CC, INST	1.016	.523	<.0001	S
CC, COM	.640	.523	.0087	S
CC, HOUS	1.742	.523	<.0001	S
INST, COM	-.376	.523	.2554	
INST, HOUS	.726	.523	.0019	S
COM, HOUS	1.102	.523	<.0001	S

TABLE 14. ANOVA table for desirability of adaptive reuse

	DF	Sum of Squares	Mean Square	F-Value	P-Value	Lambda	Power
Prototype	1	.078	.078	.004	.9476	.004	.050
CV	1	2.183	2.183	.121	.7285	.121	.063
CLQ	1	28.228	28.228	1.562	.2130	1.562	.224
Prototype * CV	1	19.486	19.486	1.078	.3004	1.078	.169
Prototype * CLQ	1	16.360	16.360	.905	.3426	.905	.149
CV * CLQ	1	5.453	5.453	.302	.5835	.302	.083
Prototype * CV * CLQ	1	57.068	57.068	3.158	.0772	3.158	.407
Subject(Group)	178	3216.171	18.068				
Category for Desirable-AR	3	584.422	194.807	56.803	<.0001	170.409	1.000
Category for Desirable-AR* Prototype	3	27.353	9.118	2.659	.0476	7.976	.644
Category for Desirable-AR* CV	3	34.293	11.431	3.333	.0193	9.999	.760
Category for Desirable-AR* CLQ	3	.876	.292	.085	.9682	.255	.065
Category for Desirable-AR* Prototype * ...	3	14.045	4.682	1.365	.2526	4.095	.354
Category for Desirable-AR* Prototype * ...	3	18.942	6.314	1.841	.1386	5.523	.468
Category for Desirable-AR* CV * CLQ	3	17.082	5.694	1.660	.1746	4.981	.425
Category for Desirable-AR* Prototype * ...	3	13.586	4.529	1.320	.2669	3.961	.343
Category for Desirable-AR* Subject(Gro...	534	1831.367	3.430				

TABLE 15. Means table for desirability of adaptive reuse

	Count	Mean	Std. Dev.	Std. Err.
CC	186	6.129	2.479	.182
INST	186	4.220	2.651	.194
COM	186	4.500	2.874	.211
HOUS	186	3.774	2.688	.197

TABLE 16. Significance of mean differences between building types in desirability of adaptive reuse  
(Post-hoc Test: Scheffe's)

	Mean Diff.	Crit. Diff	P-Value	
CC, INST	1.909	.539	<.0001	S
CC, COM	1.629	.539	<.0001	S
CC, HOUS	2.355	.539	<.0001	S
INST, COM	-.280	.539	.5484	
INST, HOUS	.446	.539	.1461	
COM, HOUS	.726	.539	.0028	S

TABLE 17. Means table for desirability of adaptive reuse along two prototypes

	Count	Mean	Std. Dev.	Std. Err.
1, CC	95	6.126	2.312	.237
1, INST	95	4.063	2.653	.272
1, COM	95	4.347	2.816	.289
1, HOUS	95	4.074	2.734	.280
2, CC	91	6.132	2.655	.278
2, INST	91	4.385	2.653	.278
2, COM	91	4.659	2.941	.308
2, HOUS	91	3.462	2.617	.274

(1= small prototype; 2= large prototype)

TABLE 18. Means table for desirability of adaptive reuse along degree of change in interior volume

	Count	Mean	Std. Dev.	Std. Err.
1, CC	90	6.089	2.542	.268
1, INST	90	3.956	2.512	.265
1, COM	90	4.800	2.785	.294
1, HOUS	90	3.989	2.624	.277
2, CC	96	6.167	2.431	.248
2, INST	96	4.469	2.764	.282
2, COM	96	4.219	2.942	.300
2, HOUS	96	3.573	2.744	.280

(1= major change in interior volume; 2= minor change in interior volume)

TABLE 19. ANOVA table for degree of change of new use

	DF	Sum of Squares	Mean Square	F-Value	P-Value	Lambda	Power
Prototype	1	6.902	6.902	.816	.3675	.816	.140
CV	1	.598	.598	.071	.7906	.071	.058
CLQ	1	.110	.110	.013	.9093	.013	.051
Prototype * CV	1	18.923	18.923	2.238	.1365	2.238	.302
Prototype * CLQ	1	10.226	10.226	1.209	.2730	1.209	.183
CV * CLQ	1	9.597	9.597	1.135	.2882	1.135	.175
Prototype * CV * CLQ	1	19.420	19.420	2.296	.1314	2.296	.308
Subject(Group)	178	1505.273	8.457				
Category for Change	3	1352.302	450.767	131.938	<.0001	395.814	1.000
Category for Change * Prototype	3	2.794	.931	.273	.8451	.818	.101
Category for Change * CV	3	41.243	13.748	4.024	.0076	12.072	.848
Category for Change * CLQ	3	15.541	5.180	1.516	.2093	4.549	.390
Category for Change * Prototype * CV	3	5.409	1.803	.528	.6634	1.583	.155
Category for Change * Prototype * CLQ	3	10.102	3.367	.986	.3992	2.957	.261
Category for Change * CV * CLQ	3	4.590	1.530	.448	.7189	1.344	.138
Category for Change * Prototype * CV * ...	3	2.419	.806	.236	.8713	.708	.094
Category for Change * Subject(Group)	534	1824.416	3.417				

TABLE 20. Means table for degree of change of new use

	Count	Mean	Std. Dev.	Std. Err.
CC	186	4.403	1.927	.141
INST	186	5.823	1.933	.142
CCM	186	4.919	2.432	.178
HOUS	186	7.952	2.333	.171

TABLE 21. Significance of mean differences between building types in degree of change of new use  
(Post-hoc Test: Scheffe's)

	Mean Diff.	Crit. Diff	P-Value	
CC, INST	-1.419	.538	<.0001	S
CC, COM	-.516	.538	.0655	
CC, HOUS	-3.548	.538	<.0001	S
INST, COM	.903	.538	<.0001	S
INST, HOUS	-2.129	.538	<.0001	S
COM, HOUS	-3.032	.538	<.0001	S

TABLE 22. Means table for degree of change of new use along degree of change in interior volume

	Count	Mean	Std. Dev.	Std. Err.
1, CC	90	4.544	1.961	.207
1, INST	90	5.778	2.032	.214
1, COM	90	5.267	2.398	.253
1, HOUS	90	7.644	2.446	.258
2, CC	96	4.271	1.894	.193
2, INST	96	5.865	1.845	.188
2, COM	96	4.594	2.430	.248
2, HOUS	96	8.240	2.194	.224

(1= major change in interior volume; 2= minor change in interior volume)



TABLE 23. Significance of mean differences between perceptions in community/cultural reuse (Post-hoc Test: Scheffe's)

	Mean Diff.	Crit. Diff	P-Value	
CC-Accept, CC-ANF	.688	.554	.0074	S
CC-Accept, CC-DRO	1.548	.554	<.0001	S
CC-Accept, CC-AR	1.016	.554	<.0001	S
CC-ANF, CC-DRO	.860	.554	.0003	S
CC-ANF, CC-AR	.328	.554	.4317	
CC-DRO, CC-AR	-.532	.554	.0653	

TABLE 24. Significance of mean differences between perceptions in institutional reuse (Post-hoc Test: Scheffe's)

	Mean Diff.	Crit. Diff	P-Value	
INST-Accept, INST-ANF	1.306	.587	<.0001	S
INST-Accept, INST-DRO	1.065	.587	<.0001	S
INST-Accept, INST-AR	1.425	.587	<.0001	S
INST-ANF, INST-DRO	-.242	.587	.7210	
INST-ANF, INST-AR	.118	.587	.9564	
INST-DRO, INST-AR	.360	.587	.3988	

TABLE 25. Significance of mean differences between perceptions in commercial reuse  
(Post-hoc Test: Scheffe's)

	Mean Diff.	Crit. Diff	P-Value	
COM-Accept, COM-ANF	-1.355	.592	<.0001	S
COM-Accept, COM-DRO	-1.656	.592	<.0001	S
COM-Accept, COM-AR	-1.199	.592	<.0001	S
COM-ANF, COM-DRO	-.301	.592	.5661	
COM-ANF, COM-AR	.156	.592	.9088	
COM-DRO, COM-AR	.457	.592	.1979	

TABLE 26. Significance of mean differences between perceptions in residential reuse  
(Post-hoc Test: Scheffe's)

	Mean Diff.	Crit. Diff	P-Value	
HOUS-Accept, HOUS-ANF	-1.038	.566	<.0001	S
HOUS-Accept, HOUS-DRO	-.919	.566	.0001	S
HOUS-Accept, HOUS-AR	-.839	.566	.0007	S
HOUS-ANF, HOUS-DRO	.118	.566	.9515	
HOUS-ANF, HOUS-AR	.199	.566	.8078	
HOUS-DRO, HOUS-AR	.081	.566	.9838	

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