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Convents, Palaces and Churches:

Transformation of Historic Buildings and the Impact on Venice's Neighborhoods

An Interactive Qualifying Project

Submitted to the faculty of

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Submitted by:

Sean Hoey

Marissa Kahan

Paul Marchetti

Kimberly Mazza

Sponsoring Agency:

UNESCO and Assessorato Urbanistica

Submitted to:

Project Advisors:

Fabio Carrera

Guillermo Salazar

On-site liaisons:

Philippe Pypaert

Date: July 31, 2003

convents03@wpi.edu

Authorship

All four Worcester Polytechnic Institute students who worked on this project made an equal contribution to the writing, revising, and editing of each chapter and section located in this report. The quartet also contributed equally to the creation and completion of the databases assembled through this project

Abstract

The main focus of this project was to aid Venice in creating a balance between conservation and adaptation. Our project began by finalizing the 2002 WPI Palaces of Venice catalogue as well as the 1999 WPI Churches of Venice database. We also created a computerized catalogue of convents based on information taken from 1968 by UNESCO. In addition, we created an impact analysis of adaptive reuse within the areas surrounding Santo Stefano and Madonna dell'Orto. Through our project, we also assembled a "touristicity index" comparing the number of residents, number of hotel beds and number of tourist services within each census tract.

Executive Summary

Each city around the world has many characteristics that make it unique and contribute to the city's atmosphere such as its weather, people, and buildings. Although each city must adapt with time to new waves of technology and modern demands of people, the uniqueness of a city needs to be preserved. One of the more obvious ways to accommodate today's demands while conserving a city's special traits is by adaptively reusing a city's buildings. Buildings, all over the globe, can be reused multiple times for functions quite different from their original intended use. An advantageous reuse is one where an old building is given a new function with minimally changing the external appearance of the building. For example, within Venice, Italy the palaces that sit on the Grand Canal still show off their 16th century facades, but instead of housing royalty, many of them have been converted to hotels and office buildings. Although all of the buildings within Venice have not been converted to contain alternate uses, a good number of buildings have been reused to accommodate the increasing number of tourists as well as other contemporary needs.

Over the years, the number of tourists in Venice has increased to twelve million tourists per year. As the number of tourists remains on an increase, the number of citizens continues to drop every year. Since 1950, the number of Venetian residents has declined by more than 110,000 people and now the number rests somewhere around 65,000.[1] With the amount of tourists reaching 2,000 visitors per day, Venice lies in a battle between accommodating the tourists and benefiting the citizens that are left. Presently, Venice has attempted to overcome this battle by reusing a large number of buildings. Some of the more prominent buildings within Venice that have been reused are the palaces, churches and convents. A majority of the palaces were built in the 16th century and most of the churches and convents were constructed before then; due to this fact, these buildings contain a great deal of historical significance as well as architectural beauty.

In order to preserve Venice's beauty and history, the city has placed laws restricting the renovation and remodeling of its older buildings. Therefore, many buildings, such as Venice's palaces, facades, or special traits cannot be changed by reuse. In addition, it is practically impossible to do any sort of new construction or demolition because of the closeness of buildings in Venice as well as of surrounding water. A gathering of approximately 100 islands creates small canals and alleyways leaving no space for erecting new structures. Venice's waterways prevent a building from being constructed which leads its buildings to be reused. The decreasing number of citizens causes palaces to be sold, churches to be unused and convents to be neglected. Each of these significant buildings is often reused according to its structure. The palaces' large size and substantial number of rooms make them great for becoming hotels, or office buildings. Although churches are not reused that often, when they are reused, they are converted to concert halls or museums because of their grand central floor area. On the other

[1] http://www.comune.venezia.it/statistica/

hand, convents have an abundant amount of rooms but are not very luxurious, so they are reused as prisons or schools.

One of the more well known reuse examples in Venice is the Palazzo Grassi. In 1985, this palace was converted into one of Venice's most popular exhibition centers. Although this example was beneficial to the city of Venice, others may cause a surplus of certain types of buildings. For instance within Venice, nothing prevents five palaces right next to each other from all converting into hotels because the city planning agencies rarely look at the surrounding area of a site. This overdevelopment can cause drastic changes on the surrounding area and the people that live nearby. The current system for controlling reuse within Venice lacks the power to predict or to prevent a harsh impact from occurring on the surroundings areas' commerce and residents.

Currently, if an owner wants to reuse a building, an idea is brought to an architect who then brings the proposal to the renovation agencies of Venice such as the *Commissione di Salvaguardia, the Soprintendenza, the Ediliza Privata,* and *the Assessorato all'Urbanistica.* These agencies then approve or reject the proposal for renovation and reuse. Each type of building is categorized by uses that are compatible with its structure. If a site is proposed to become a predetermined compatible use for that type of building, the agencies have no reason to reject any project. These organizations ensure that each building in question is up to date with building codes, but are unable to predict the impact that reuse would cause on the nearby areas. Even though these agencies all review a project, they fail to communicate with each other or share information. Even though a structure is compatible with its future function, a new function can drastically impact the surrounds and even alter the ambiance of Venice.

With the aid of preservation organizations as well as willing collaborators such as students, the battle between adaptation and conservation can come to a compromise. In 1966, there was an enormous flood in all of Venice. This flood made the citizens of the city realize that all of their notable buildings may not last forever and should be preserved. In 1968, the United Nations Educational, Scientific and Cultural Organization (UNESCO) aided Venice in recording and preserving the city's cultural and historical significance. UNESCO started 3 catalogues of information for the palaces, churches and convents of Venice. By recording approximately 380 palaces, over 20 convents and just over 100 churches, UNESCO was able to log the historical significance as well as the beauty of these buildings for everyone to see. With the help of these catalogues, the city planning agencies can also make decisions with more pertinent information about adaptive reuse projects. For a few years now, Worcester Polytechnic Institute has attempted to aid UNESCO in their endeavors. In 1999, a group of WPI students updated the UNESCO church catalogue and almost completed it. A few years later in 2002, another group of students from WPI enhanced the UNESCO palace catalogue. Currently, all of UNESCO's and WPI's information on the churches and palaces of Venice has become electronic and a good portion of it is now on the web. With the help of WPI and UNESCO, the city planning boards should be able to plan reuse projects better and also analyze the impact on the surrounding area.

In order to boost the efforts of all three parties, we went to Venice to expand and enhance the existing three catalogues. Visitation of each site, observation of historical profiles, manipulation of the existing database, exploration of written resources and discussion with Venetian inhabitants led us to the material needed to create these databases in such way that they are beneficial to the users. For the palace catalogue, we validated the information for all of the 386 palaces listed inside. To do this, we fixed incorrect addresses and retook pictures of the correct palaces. We also improved the catalogue by recording information such as current use, and current address for more than half of the recorded palaces. With the palace catalogue, we expanded it by adding a visual representation of the floor plans for all of the palaces within our study area of Madonna dell'Orto as well as the entire San Marco sestiere. For the church catalogue, we improved the visual representation by retaking 30 photographs and inserted the floor plans of the churches within the same two areas where we created palace floor plans. This catalogue now contains pictures and useful information for over 120 of Venice's churches. In addition to finalizing these two catalogues, our biggest goal was to assemble an up to date catalogue of the convents located within Venice. With the help of the 1968 UNESCO database, we extracted the location of 22 convents within the Historic Center of Venice. After looking in Giulio Lorenzetti's *Venice and Its Lagoon* and comparing aerial views with common convent traits, we are able to more than double our number of convents. We located and identified 59 convents, as can be seen in figure 0-1.

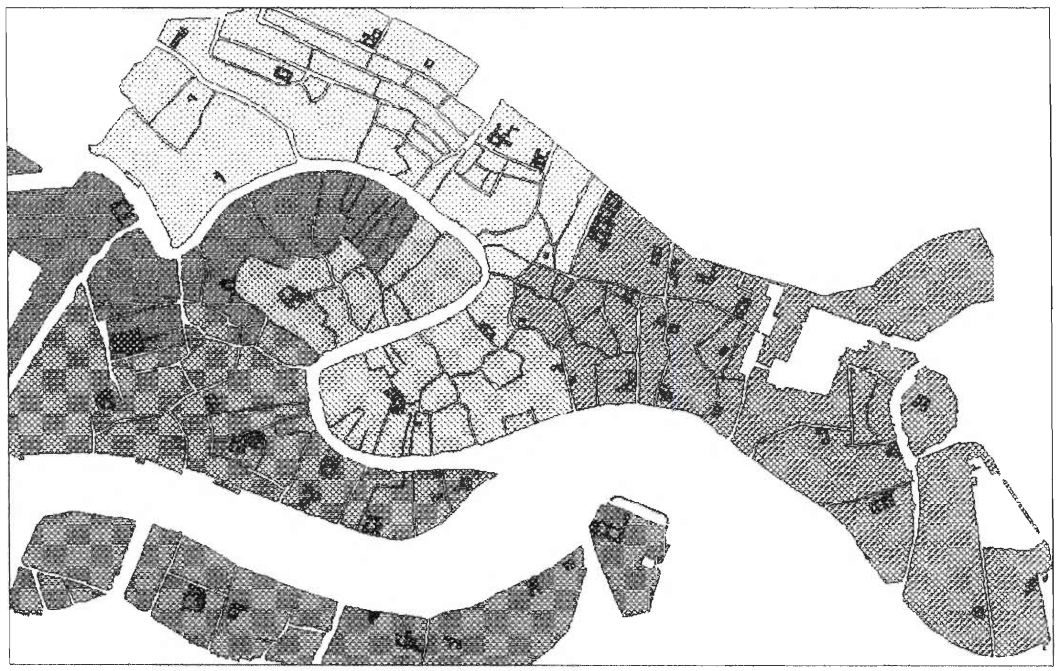

Figure 0-1: All convents within Venice

We collected information on all of Venice's convents such as modern use, current address, number of exposed windows and number of water and land access ways. The group also produced a database strictly devoted to the photo documentation of the convents, as we did for the palace photos. All of our databases provide a means of displaying essential information on these buildings, which will be useful in planning and regulating the renovations of such buildings.

Through examining our results, we found that each type of building has reuses that utilize the advantages of each structure, as we predicted. Convents usually are converted to services such as school or office complexes because of their large room count. Similarly, palaces were found to be used as some kind of housing or hotels. Figure 0-2 shows the breakdown of the current uses for convents and palaces.

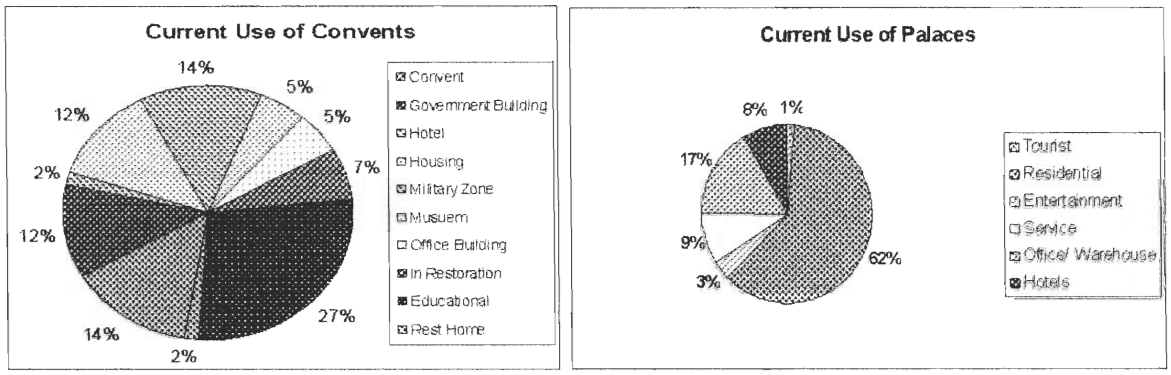

Figure 0-2: Current Uses of Convents and Palaces

As well as collecting field work on site for the three types of buildings we studied, we obtained an up to date hotel database. This datasheet contained information on the hotel capacities of the entire historic center of Venice, which we processed and used in our analysis. We were able to use the number of availabilities in each area to relate to the type of commerce in that area. Figure 0-3 shows all the hotels in Venice.

After processing all of our results, we did a commerce analysis of two different areas of Venice, the areas around the campo di Santo Stefano and the Chiesa di Madonna dell'Orto. We chose these two areas because they represent different types of commerce

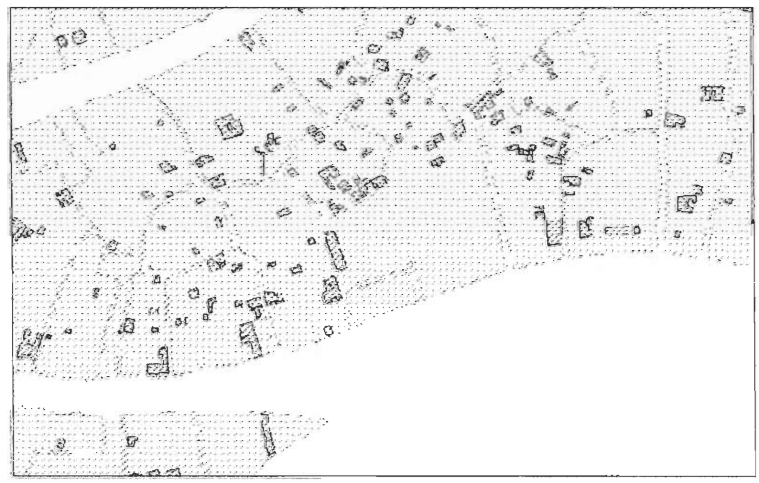

Figure 0-3: Sample of updated 2003 Alberghi GIS layer

and individuals. For our analysis, we gathered census history from 1971 till today from the statistics office of the city, as well as the history of the shops in the area with the help of Venetian residents that lived or worked in these areas. With this information for both areas, we created a comparison between an area of high tourism and an area where the disappearing residents has caused the area to become deserted.

From the previous analysis, we developed a thematic map based on four factors, which were based on tourist shops, local shops, population, and the amount of hotel beds in the area. With this tourisicity index, which can be seen in figure 0-4, we created a map of the entire city depicting the level of tourism. We declared the green section of the map as a low tourism spot, and it is at low risk for becoming highly tourist oriented in the future. The yellow section is deemed the sections of Venice that are on the cusp of becoming a highly tourist area, and the red section marks the highest tourist spots. The majority of the red zones were in the vicinity of the grand canal, the Rialto, San Mark's, and Ferrovia.

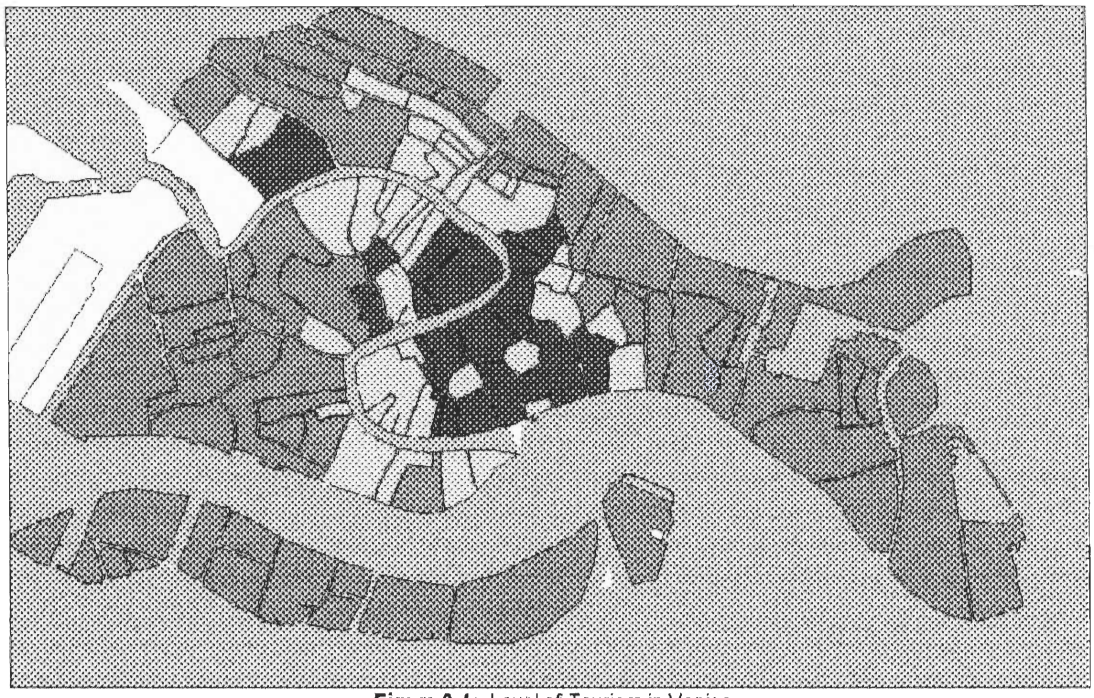

Figure 0-4: Level of Tourism in Venice

In general, we feel that in order to preserve Venice, the criterion of the tourisicity indices is a solid foundation of what should be considered when making decisions pertaining to the reuse of buildings. The planning boards of Venice need to look past the structure itself, but to the effects that the reuse of the building might cause. If these aspects are taken into account, a balance between conservation and adaptation of Venice will be achieved.

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1. Introduction

The buildings of a city provide the skyline, streetscapes, and backdrop, as well as tell tales of the history of that place. Because the buildings of a city play such a large role in defining a particular place, the structures must be preserved so the history and culture they contain are not lost with time. With modern conveniences always changing and technology forever advancing, the old remnants of the past easily become obsolete. One way to preserve the history and culture, while still accommodating today's demands, is through the reuse of these historic buildings. Prominent buildings, all over the globe, are being preserved by adaptive reuse. In other words, they are being given a new function which is well-suited with the building's layout and structure and in turn the new use is compatible with the original use of the building. The reuse of a building is an effective way to preserve the atmosphere and overall look of a city. Some cities can greatly benefit from this type of historical preservation, because modern demands can be met while the historical value of the past can remain to be admired.

This is the case in Venice, Italy. From the palaces along the Grand Canal to more than a hundred and twenty churches throughout the city, the buildings of Venice are extremely rich in history and culture. Many of these buildings have been reused or could benefit from such treatment. Venetians have attempted to accommodate the huge number of tourists by reusing neglected palaces, and convents as hotels and offices. For example, one of the most popular museums in Venice today is the *Palazzo Grassi*, which was recently converted from an 18th century palace. Churches that are no longer used for worship have also been converted into museums, and concert halls. Every year the number of tourists increases and the number of actual inhabitants dwindles. Therefore, it is becoming harder and harder to accommodate everyone's needs while still preserving the Venetian landscape. Venice's palaces are being sold because of the disappearance of Venetian citizens. Fewer and fewer people practice religion, leaving many convents and churches empty and unused. Because of the increasing number of tourists and the decreasing number of inhabitants, the buildings of Venice are being reused regularly and the commerce of the city is being affected by the changes. The reuse of such prominent buildings creates concern with the control of reuse and decision making about renovation in order to accommodate the tourists, and not poorly impact the inhabitants of Venice.

Currently in Venice, attempts have been made to control the renovations of all types of buildings. If someone wants to modify a building for reuse, ideas are brought to an architect, and the architect then brings the proposal to the appropriate agencies that pass the proposal, such as the *Commissione di Salvaguardia*, the *Soprintendenza*, the *Edilizia Privata*, and the *Assessorato all'Urbanistica*. These agencies then approve or reject the proposal for renovation and reuse. Although there is a method for the modification of Venice's buildings, it fails to evaluate the impact the projects can cause. In 2000, the Jubilee of the Catholic faith overtook Venice. Venetians overestimated the tourists' demand and renovated a large number of buildings, including palaces, which were excessive. In producing an excessive amount of hotels, the city of Venice also lowered its historical significance and its originality.

Without looking forward and making educated predictions, the city of Venice lessened the value of the city to its inhabitants.

The Venetian agencies making the decisions on renovation and reuse do not effectively cooperate with each other in order minimize the impact to benefit the tourists and the citizens. In addition, the planning boards fall short of evaluating enough information to make a prediction about the impact of the reuse on the surrounding area. In turn, buildings are being approved by the agencies for adaptive reuse without sufficient knowledge of what will be beneficial to the landscape, community and historical integrity of the city. Overdevelopment and poor reuse choices are causing Venice to lose some of the very elements that define it, such as its people, religion and beauty. In 1968, in the aftermath of the 1966 flood, the United Nations Educational, Scientific, and Cultural Organization (UNESCO) started assembling a series of catalogues containing information on the convents, churches and palaces within Venice in order to assist in the preservation of these buildings. Worcester Polytechnic Institute students began to assist UNESCO and the city in their attempt to preserve Venice in the 1990's by updating existing UNESCO catalogues as well as by developing new, more extensive ones. Examples of these are the 1999 WPI church project and the 2002 WPI palace project. The palace catalogue was lacking 305 pictures and field work for 193 palaces. The students who started the church project failed to visually represent over 30 of Venice's churches. The convents of Venice had not been explored since 1968 and the *Soprintendenza* failed to record over 30 convents. Despite what work has been done, there was still a need for an up to date and informative system, through which renovation agencies of Venice could access the same information and cooperatively assess the impact of reuse. Such a system when used correctly can create a balance between adaptation and conservation.

Through our project, we employed an electronic data system for organizing information on the churches, palaces, and convents of Venice in order to aid the city in minimizing the impact of adaptive reuse. The team accomplished this by collecting information on these historical buildings such as floor plans, photographs, unusual characteristics, and their function, both from the past and present. While at each prominent site, our field work consisted of recording the address, use, name and taking a photograph the façade of the building. Once the information was gathered, we used the material to create a readily available catalogue that the city of Venice can use to help better manage modifications of these historic sites. We also validated, expanded and completed the existing church and palace catalogues by a combination of data collection, observation, and improvement of visual representation and insertion of floor plans. We also created a touristicity index comparing populations, hotel capacities and commerce for the entire historic center of Venice as well as an impact assessment of past reuses for the regions of Santo Stefano and Madonna dell'Orto. Our efforts will aid Venice in blending the modern world with the historic Venetian essence through the adaptive reuse of church, palaces and convents.

2. Background

Venice is a city rich in history dating back to the fifth century. During the middle of the fifth century, invasions led by Attila the Hun swept through northern Italy causing refugees to flock from the main land to islands within the lagoon, as can be seen in figure 2-1. The temporary inhabitants returned

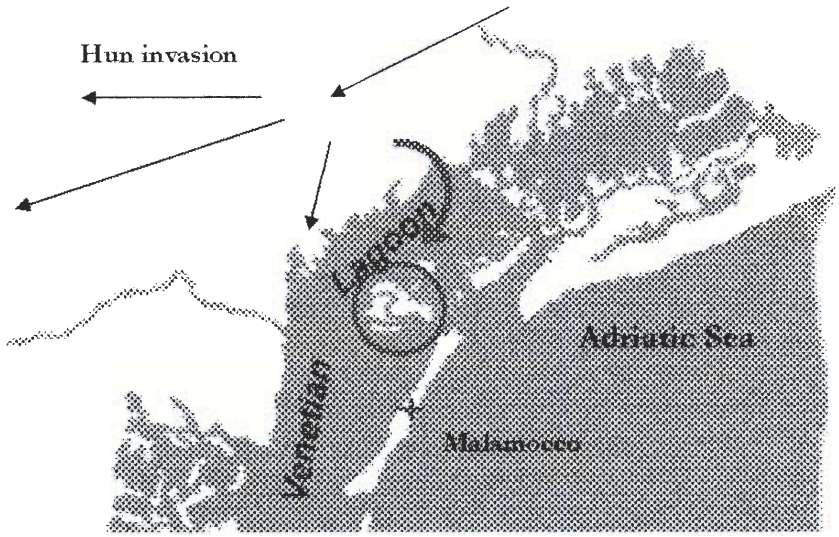

Figure 2-1: Early Venetian lagoon

home upon the completion of the Hun invasion. As more invaders swept through Europe, mainland citizens moved back and forth from the islands as a precautionary measure building semi-permanent homes. Various merchants and fisherman remained there, but it was not until the early ninth century that Venice was actually settled by the first elected ruler, Doge Paolo Luciano Anafesto. In approximately 810 AD, Anafesto moved from Malamoco, located on a barrier island of the lagoon, to the center of the lagoon, known as the islands of *Rivo Alto*. The resettlement of the Doge created an influx of people onto the nineteen central islands within the lagoon where the grand city of Venice was born.

When Venice's roots began to take hold, the new residents developed rustic villages on these nineteen small islands that were set around a main tidal channel, today known as the Grand Canal. The initial inhabitants of these islands had relatively limited resources for development. Thus, they used mostly driftwood and reeds to build semi-permanent residential developments with thatched roofs. As the population increased, more permanent buildings were built to accommodate the growing number of lagoon inhabitants. Each island was considered its own module because each had the same set up which consisted of housing, and a church focused around a central plaza also known as a campo. In addition, as each module began to grow, convents and palaces were constructed to accommodate the needs of the growing population.

Although Venice has strong historic roots, contemporary pressures such as aging, weathering, and tourists accelerate changes that the city must adapt to. Cities such as Venice undergo modifications as time passes, but citizens do not want to lose their history, culture or landscape. One of the organizations helping to preserve the beauty of Venice is the United Nations Educational, Scientific and Cultural Organization (UNESCO). UNESCO was founded in 1945, since then it has helped a multitude of historic sites, like Venice, in their preservation efforts by logging historical significance as well as cultural importance for the future. UNESCO's main objective is to create a peaceful and secure environment through education, science, culture and communication for future. As of 1999, UNESCO was assisting over 180 sites around the world.[2]

In 1966, Venice experienced a flood of over two meters. This was alarming to many Venetian citizens, and many realized that the city needed to be protected and preserved for the future. Thus, UNESCO took action. UNESCO's focus in Venice was the documentation of historic landmarks, and in 1968 UNESCO began to catalogue buildings such as the palaces, churches, and convents of Venice. In Appendix B, one can view examples of UNESCO's 1968 files contained in their catalogues for each type of building. These catalogues were created in order to document the reminiscence and beauty of Venice. For the past several years, students from Worcester Polytechnic Institute affiliated with the Venice Project Center have aided UNESCO in updating, computerizing, and finalizing its catalogues. Each multimedia database consists of pictures as well as data of the building that has been recorded. Although WPI's Venice Project Center and UNESCO's efforts have been extensive, work remains to be done. Thirty three pictures of churches and one hundred and eighty six pictures of palaces needed to be taken. In addition, two hundred and sixty four palaces were in need of updated information, such as the current use. Also, before a database could be constructed for the convents of Venice, each convent had to be pinpointed on a GIS map layer, and the structure needed to be analyzed.

The structures of modern Venice are experiencing changes. With the help of the catalogues that have been created, the structures of the churches, palaces, and convents have been documented and the information will be available via the web for public use.

2.1 Structure of Historic Venice

Although Venice has experienced many changes from when it was first built, some aspects still remain similar, such as the layout of each island module. Each island module was defined an island within the lagoon that contains of a church, a residential area, and a campo. Churches were most often the first building erected on each island, therefore they served as the original center of the community. Also, convents were usually constructed on the island module adjacent to the church. As the island expanded, houses and a few palaces were built on the outer edge of the island, which was an ideal location for both land and water access. These buildings often surrounded the campo creating a close

[2] www.UNESCO.org

knit neighborhood. The campo usually resided in front of the church causing communities to spark because they were utilized by all residents.

All the structures of Venice's buildings were constructed in a similar fashion. The foundation of each building began with wood piles that reached down to the *caranto*, which is a solid layer of clay or stone a few meters below the canal bed. Occasionally the *caranto* was too deep, so a *zattaron* was built. The *zattaron* was a pontoon foundation made up of a layer of large wooden planks and a layer of cement and a mixture of brick and stone. Regardless of the type of foundation, the façades of Venice's buildings were most often constructed out of brick, and roofs were laid with Roman tile. The *gorne* was a stone gutter that extended around the perimeter of the roof of each building eventually draining into the campo. The interior floors of Venetian buildings were mainly constructed of oak beam and board framing. The boards were then covered with a layer of mortar and crushed stone and marble. In order to create remarkable elegant floor in the more lavish structures of Venice, large slabs of marble were spread over the surface. Each of the materials used to build structures were brought to onto the island of Venice from the main land of Italy and southern Europe.[3]

Every island usually had a small and quaint residential area that circled the center of the module. Due to the relatively small amount of available land that formulated Venice, homes and other buildings were closely built, creating narrow and crooked streets between them. Palaces and homes over four stories could simply not be supported by the terrain. With the exception of a few homes such as the Doges palace, many were no taller than four stories. Land restraints were placed on buildings to maximize land use in Venice, as well as to ensure the safety of its residents. Even before permanent housing was built on the islands of Venice, peopled needed a place to worship.

2.2 Churches of Venice

The first truly architectural masterpieces of Venice were the religious buildings such as churches. The churches of Venice were visual splendors that tied religion to community within each section of the island. As churches were erected on a module, they often served as unifying factor for the neighborhoods. Many inhabitants of Venice were drawn to the sense of community and faith that the church created. To accommodate the growing population of early Venice, the number of churches steadily increased from twenty in the ninth century to seventy in the eleventh century. Today, Venice is home to over one hundred twenty churches.

Once island modules began to expand and interconnect to form the city of Venice, the purpose of the church was not simply to serve as a place of worship. Churches also served to display majesty of the state, to exhibit the influence of religious order, and to glorify the importance and wealth of patrician families. Beginning in the early Renaissance period, affluent families of Venice were able to express their wealth and love for their city by serving as benefactors for the construction of churches. No laws existed

[3] Knopf, 97

pertaining to the regulation of the ornate façades of religious architecture, which is why the churches of Venice were elaborately designed.

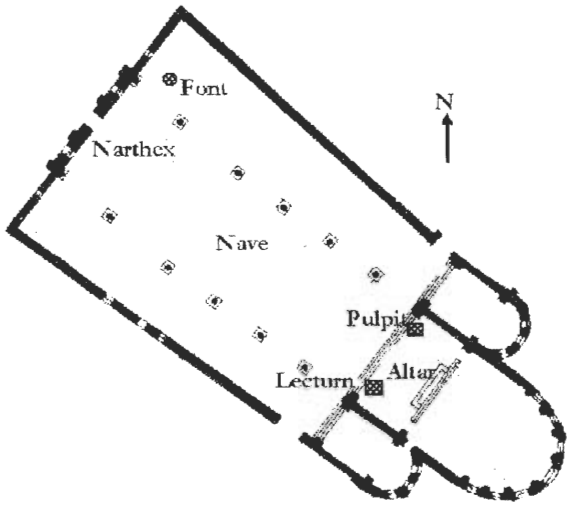

Figure 0-2: Typical Church Layout

Although most facades and internal designs were elaborate and intricate, most churches within the city of Venice follow a basic structural pattern. The pattern followed that of the Western parish, as seen in figure 2-2. A church is comprised of eight common features; the narthex, nave, font, pulpit, lectern, rail, sanctuary, and altar. The first section is the narthex, which is the entrance feature of the church. Once inside, one would view the nave, which is the main body of the church. This is also where the congregation sits during mass. Near the entrance to the nave is most often a font. A font holds holy water, which is thought of as a symbol of preparation for mass. Looking up the aisle of the church through the nave is where the pulpit is located which is used for preaching sermons. This is often to the left of the church, and on the right is the lectern. The lectern is where the priest reads from the bible. Against the East wall is where the altar is located and the mass is presented for parishioners. The altar, the pulpit and the lectern are all located on an elevated platform.

Not all of the churches were built with the same layout. Some were a combination of Eastern and Western influence, such as Saint Mark's Basilica, creating a hybrid church which can be seen in figure 2-3.

In addition to the parts mentioned above, these types of churches had an iconostasis, sacristy, apse, chapels, and a baptistery. Although churches were not exact replicas of each other, the churches of Venice were representations of the time periods they were constructed in. Architects tested new structural designs on churches, such as Byzantine, Gothic and Baroque, making them revolutionary.

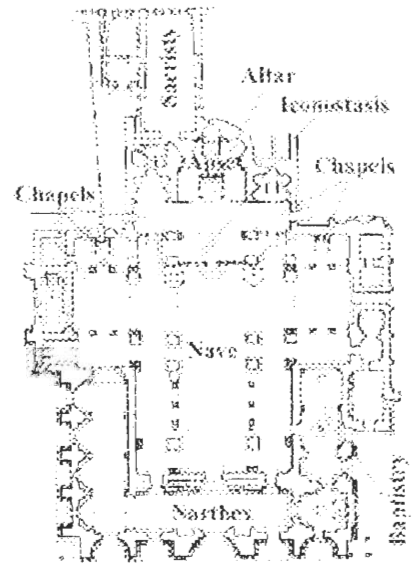

Figure 2-3: Hybrid Church Floor Plan Layout

2.3 Convents of Venice

As churches took root within the city of Venice, religion began to flourish. Convents were erected to house the clerics of religious orders, such as nuns and monks. Also, there was a serious need for convents because of the services that the religious orders provided. "Religious orders throughout Europe served many critical social functions: feeding the poor, tending the sick, providing hospitality for pilgrims, and so on."[4] With such an increase in religious activity and services to society, buildings needed to be erected. In the early sixteenth century, Venice had fifty convents and approximately three thousand nuns.[5]

Although designed more simply than the churches of Venice, convents were eventually erected to centralize the religious efforts of the nuns and monks. The main tie between convents and churches was the religious order that they supported. Some convents were free standing from the churches they were affiliated with, while other convents were attached to a church. A well known example of a connected convent in Venice is the church and convent of Santa Maria Gloriosa, known as the Frari, shown in figure 2-4. The abbey, shown in red in the figure below, was built for the Franciscan religious order in 1222, and the holy ground for the church was given to the order by the Doge in 1236 and the church was built shortly there after.[6]

The tie between churches and convents went beyond serving as a home for nuns and monks. Convents were places where clerics were able to study, pray, and provide aid to the people of their parishes, and communities. Convents were traditionally places that assisted the community any way they could. Some convents were used as hospitals if there were enough medically trained nuns, and they would care for everyone regardless of religion. Other convents were used as orphanages, or schools. In general, these structures were essential to the city because the people who lived in the convents gave so

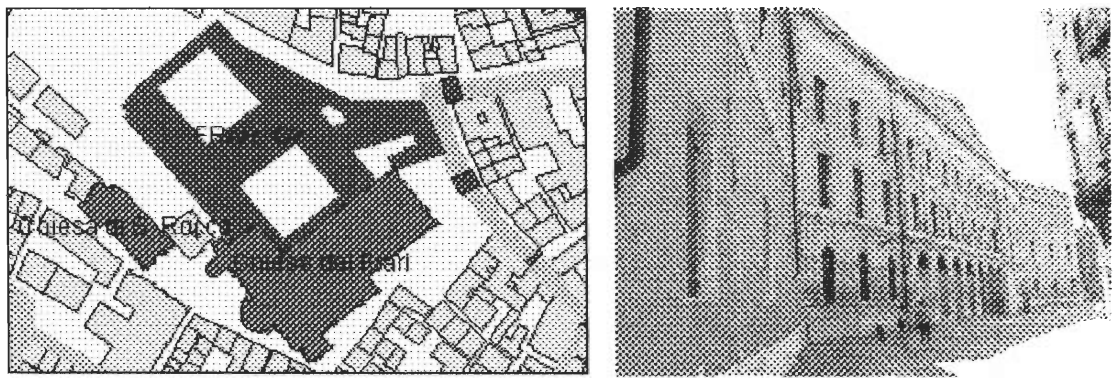

Figure 2-4: Convent of the Frari

much back to the city and churches. Thus, convents were essential to the growth of the church, the religion, and the community.

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[4] National Geographic Traveler Venice. (Zwingle, p132)
[5] Virgins of Venice. (Laven, p. synopsis)
[6] Knopf (p. 292)

The general structure of convents followed a simple layout. Each convent was usually one or two stories high with several common attributes; a choir room, work room, school room, refectory, recreation room, and the cell. Each room within the convent had a simple design and was task specific. Normally, convents were not as ornate as churches, but displayed deeply religious artwork.

In the sixteenth century, the number of nuns greatly increased. This growth in convent size was caused by affluent families sending their offspring to religious institutions. Wealthy families placed their offspring, usually daughters, in religious institutions to prevent the family from giving a dowry to their daughter's husband, or a fund to their sons. This lead to convents and monasteries filled with non devout people who would not normally choose to be there. The behavioral standards declined giving poor testimony to the reputation of God's servants. In 1810, Napoleon swept through Venice and demolished a few inappropriately used convents and reused others as army barracks and prisons.[7] Thus, the behavioral standards of convents were raised back up and practicing nuns were respected once again. On the other end of the extravagant spectrum are the lavish palaces of Venice.

2.4 Palaces of Venice

The palaces of Venice display the brilliance of Venetian architectural talent throughout the city's history. Palaces date back to the origination of Venice, when the Doge developed his palace in the early 800's on an island within the heart of all the islands that make up the city we know today. These visual splendors are a central part of Venice because of the island module set up. Palaces are not hidden by walls or moats. Instead, they are visible for all to see because they sit right on the edge of canals.

The palaces of Venice represented the rich families that lived inside because the represented a display of status and wealth. Although the palaces exhibited the wealth and power of its owner, Venice enacted the Daulo Act which was a law that placed restrictions on residential architecture. This act stated that "houses should be even, similar, of the same size and ornamentation."[8] Although this law was enacted, a number of grand palaces were still constructed within Venice. The insides of Venetian palaces were lavishly decorated with every wall, ceiling, and floor serving as a canvas for builders and artists to display their talents. Most often the owner would hire several artists to beautify the interior with gold leafing, ornate stone pillars, or mosaics.

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[7] National Geographic Traveler Venice. (Zwingle, p. 132), and http://www.spectator.co.uk/bookreview.php3?table=old&section=current&issue=2002-07-13&id=1063

[8] Carrera, The Urban Design Politics of Venice. p. 6-7.

The palaces built within the city of Venice not only served as a residence, but also as a place for the owner's business. The building structure layout was perfect for these two purposes. The ground floor was where most of the business interactions took place. There was a large hallway, known as the *androne*, with offices and warehouse space on either side. The *piano nobile*, which was the first decorated floor, was the main floor of the palace. The ceilings were high and the rooms were spacious. The great hall, or *portego*, spanned the entire length of the house. Smaller rooms, on either side of the *portego*, were used by the family or guests. A central bank of windows, which lit the *portego*, ran along the side of the palace facing the waterway. There were also three to six windows on the opposite side of the building that lit the central rooms. This floor was the most elegantly decorated for the wealthiest family in the palace to live. The basic palace façade is clearly shown in Palazzo Brandolin, in figure 2-5.

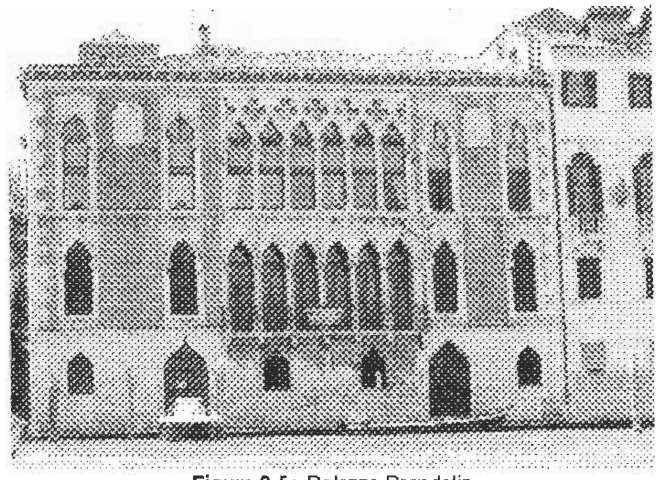

Figure 2-5: Palazzo Brandolin

The second *piano nobile*, or second floor, served as another family space within the palace. It was decorated more simply than the first floor. If more than one family occupied the palace, the less wealthy one would live on the second floor. The second floor had lower ceilings, and it was where most of the recreational occurrences took place. Kitchens were located on the attic floor of the palace. The attic space was also where servants and other help resided. Palaces housed all the matters and workings of each family. A typical example can be seen in figure 2-6[9].

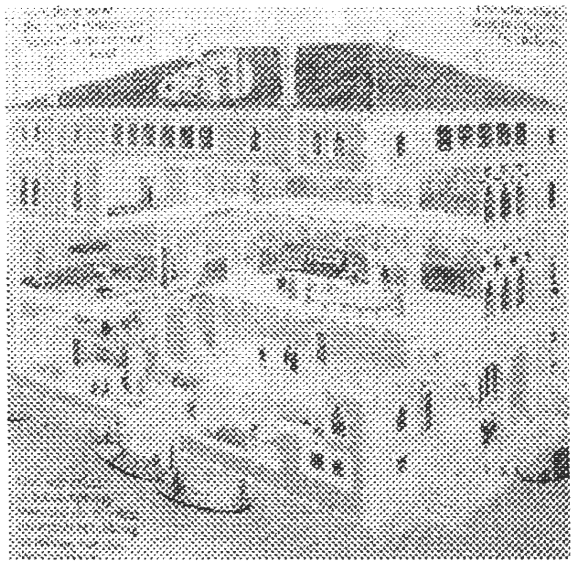

Figure 2-6: Typical Palace Layout

2.5 Pressures for Reuse

Although the streetscapes and scenery of Venice has not been altered significantly in many centuries, its buildings are decaying with age and are in need of renovation and new forms of use. Many churches and convents are no longer used for religious services due to the decline of practicing priests

[9] Knopf, p.104

and Venetian citizens. The population has decreased from one hundred eighty four thousand people in the 1950's to a population of sixty five thousand people today. Young Venetians are traveling to the main land to get jobs that are non-tourist based and to raise families. Although there has been a decrease in the native population, the tourist population is expanding causing a high demand for hotels and accommodations. The economy all over Venice is either based on tourists or is being converted to accommodate them. Because of this switch in demands, the city of Venice must convert to cope with today's pressures. Thus, a good deal of Venice's private residences, shops and services that used to serve the citizens now are being reused into such things as hotels and mask stores to serve the tourists.

2.5.1 Loss of Native Population

The population of Venice has been dwindling for centuries. In the middle of the XVI century, building plots were getting scarce which forced rich merchants to move out of Venice and into the Veneto region to find space to build lavish palaces. This was the first time that Venice saw its wealthy leave the city. They did so in order to live a double life, one as a traditional citizen of Venice and the other as a nobleman of his lands in the Veneto region. Despite this, the city still maintained a strong sense of community throughout the middle ages.

The historical center of Venice has seen a drastic decrease in the number of residents in recent years. Since 1950, the population of Venice has dropped from 184,000 to roughly 65,000 with the average age of citizens reaching 50.[10] Two-thirds of the native population has been pushed out into low-rise apartments and houses in mainland suburbs, while the canals and streets were taken over by tourists and tourist accommodations. A specific example of this problem lies within the churches in the city. Although Venice contains over one hundred twenty churches, there are not nearly enough priests or parishioners to fill them. Because of this, churches are becoming unused and abandoned.

Due to the fact that there is not much opportunity for the youth of today to succeed in professions that are not tourism related, most people are not raising families in Venice like they once did, mainly. Young people have headed to the main land of Italy for work. The life of what at one time was the largest city in Europe is being lost. At one point in time, people were flocking to the largest city in the world; now citizens are fleeing just to make a living.

2.5.2 Impact of Tourism

Tourism has been part of the Venetian setting for centuries. However, in the last thirty years, Venice has faced severe problems due to the tremendous increase of the amount of tourists visiting each year. Most of the visitors are day trippers that flock to the biggest attractions. Tourism in Venice "produces important economic aid to the preservation of the historic and artistic heritages; but, on the other hand, it has become the greatest single threat to their survival."[11] In 2001, the Venice Tourist

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[10] http://www.urbanecology.org/journal/ue00.3.cityfront.f.html
[11] Fitch, James Marston. Historic Preservation (p. 78)

Bureau reported that 50% of tourists who visit Venice will see no more of the city than St. Mark's Square.[12] With an estimated twelve million tourists visiting Venice each year, the impact on the city's affairs is substantial. Due to the substantial amount of tourists, prices have risen and alleyways are more crowded than ever. The city's rapid increase in tourism is transforming Venice into a Disneyland-like tourist center. As services from schools to small bakeries are forced out of the city to make way for less expensive operations like fast food restaurants and souvenir shops, Venice is less and less able to hold on to its sixty five thousand citizens.[13]

Figure 2-7: Crowds in Piazza San Marco

2.6 *Adaptive Reuse of Buildings in Venice*

In order to deal with the changing population and tourism issue, the city itself has gone through various physical changes. Many of its buildings have been renovated for alternate uses. Electrical, modern plumbing and heating systems have been installed in many historical buildings to make them appropriate for living accommodations, work spaces and restaurants. In some cases, these changes are beneficial to the city. For example, in certain run-down areas of Venice, the arrival of hotels or restaurants is desirable; the new business can often revitalize a neglected part of town. The problem lies in altering too many historical buildings and loosing their significance forever. Venice's defining structures are being converted into hotels and restaurants, diminishing their cultural value at a record rate. From 1971-1996 the number of restaurants and hotels on the island increased by 144%.[14] This statistic is alarming because new buildings are rarely constructed. Instead, buildings are being renovated and reused in Venice.

2.6.1 The Reuse of Palaces

Due to their structure, palaces can be reused in a variety of different ways. Often, the large open spaces and corridors of a palace are wonderful for reuse as hotels. Corporate offices and wealthy business spaces are also a common reuse for a palace in Venice. The grand rooms and high ceilings are lowered to minimized cost of heat, and walls are put up to divide the open space.

In some cases, condominium-type housing can be installed into the structure of a palace, which can be seen in figure 2-8. Usually, this kind of reuse is done to the less ornate palaces, while the more

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[12] http://goeurope.about.com/library/weekly/aa073002a.htm
[13] http://www.unesco.org/courier/1999_08/uk/dossier/txt35.htm
[14] http://www.macalester.edu/courses/geog61/ataff/tourists.htm

grandiose palaces are reused for elegant hotels and other high class applications.

One example of elegant transformation is the Royal Danieli Hotel, figure 2-8, located on the Grand Canal next to Piazza San Marco. Palazzo Dandolo, as it was once known, was constructed in the fourteenth century for Doge Enrico Dandolo and his family. The building changed ownership several times over the years until Giuseppe Dal Niel (Danieli) finally purchased it in 1840 and converted it into the world class hotel that we know today. The Royal Danieli is one example of how reuse of a historical building can improve the city as a whole. With its gothic architecture, lavish pine marbled interior, stained glass, gold leaved ceilings, and Murano glass chandeliers, the essence of the Palazzo Dandolo is still alive. Unfortunately, many of the other historic treasures of Venice aren't being preserved as this one has been. In contrast, palaces that are used for housing are not always refurbished and remain rundown.

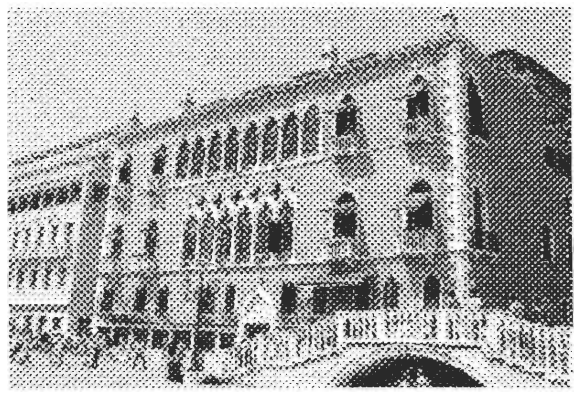

Figure 2-8: Royal Danieli Hotel

2.6.2 The Reuse of Convents

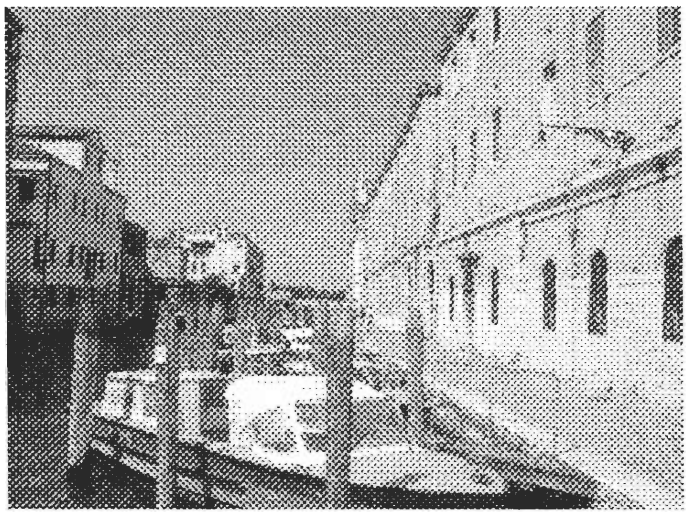

Figure 2-9: Ospeale Civale in the convent of San Giovanni e Paolo

Convents were originally built as a central location for the nuns and monks to base their prayer and good deeds from, as well as to live. Due to the task specific rooms and many bedrooms, convent structures are relatively easy to transform into a hotel, a bed-and-breakfast, or an office building. Despite the easily transformable structure of convents, modernizing systems such as pluming, electricity, and heating may still prove to be an extremely difficult task in some structures. Convents' size and location vary throughout the city allowing these structures to serve multiple functions in today's world.

Convents can support many different types of business even with their unique structure. The Venice Police Department, city hospital and two city jails all lay within the confines of past convents. The convent of San Giovanni and Paolo, seen in figure 2-9, remains the largest hospital in the city. The

building's structure is well fitting for use as a hospital because of the many rooms on the upper floors and large open spaces on the ground floor. Its orientation on the northern shore of the island also assists medical personnel in transporting patients from the water.

Another reuse of a convent is a prison. The square structure that houses an enclosed court yard is prefect for a prison because it allows prisoners to go outside without leaving the confines of the grounds. Due to the simple structure of convents, they can easily be reused for many different things without taking up a lot of ground space.

2.6.3 The Reuse of Churches

The reuse of a church is not quite as simple as a palace or convent, essentially because it is one large room. Finding reuses for churches is much more difficult without entirely transforming the interior. Concert halls, museums, and banquet halls are some of the few, but feasible transformations that a church can undergo without making dramatic interior changes.

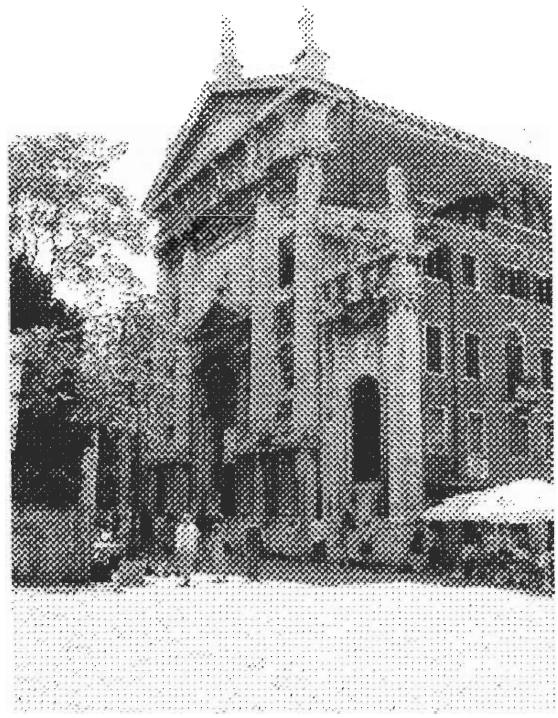

Figure 2-10: Church of San Vidale

Santa Maria Gloriosa dei Frari, one of the largest churches in Venice, is home to many masterpieces of Venetian art. Originally built between 1236 and 1338 by the Franciscan Conventual Friars, it underwent a thorough re-modeling in the fourteenth century.[15] The interior has three naves with a Latin cross plan which gives it the ability to house many paintings. One of the more notable pieces is "*L'Assunta*" (The Assumption of the Virgin) by Tiziano which rests on the main altar Santa Maria Gloriosa dei Frari also contains a collection of unique wooden sculptures, such as "*San Giovanni Battista*" by Donatello, and monuments of Jacopo Marcello and Beato Pacifico.[16] These are just a few examples of the historical significance and beauty that can be lost of damaged with a poor reuse, however

The church of San Vidale, shown in figure 2-10, near the Accademia Bridge is one example of how a church can be reused for another purpose. No longer used for worship, it is now the headquarters of the *Unione Cattolica dei Artisti Italiani*. Although not many churches have actually been reused, the ones that have been converted to museums or concert halls add to the cultural aspects of Venice.

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[15] http://www.chorus-ve.org/index.swf

[16] <http://www.invenicetoday.com/art-tour/churches/churches.htm>

2.6.4 Controlling Change in Venice

Planning is essential to a city like Venice because the history, beauty and culture must be preserved and not lost by inappropriate uses or modifications. Venice has had a planning department since 811 AD when Doge Agnello Partecipazio, established the first building committee. It was a special magistrate that would be in charge of the proper distribution of land in the lagoon and the design of the "Rialto." The city drafted a modern department in 1963, which included the classification of all buildings into pre-eighteenth century, eighteenth century, or nineteenth century categories. The catalogues each had a specific set of rules for modification and renovation. Along with this, palaces were classified as monumental buildings; these building are given special attention and have their own set of regulations under the *Soprintendenza*.

Today several organizations contribute in monitoring change in Venice, all of which are city, or state organizations. The *Commisione de Salvaguardia* is the Italian equivalent to the landmarks commission in the United States. They are responsible for maintaining the historical significance of the area. They not only deal with the city of Venice, but they act from a regional standpoint supervising the whole Veneto region. The *Soprintendenza* is a more specialized office that deals with artifacts, monuments or any item of cultural or historic value. *Comune di Venezia Assesserato all'Ubanistica* is the city planning department and *Edilizia Privata* is the city building department. Decisions pertaining to renovation and reuse are made by each agency on an individual basis, all using different sources of information to base their decision on. After one of the above agencies has seen sufficient evidence that the reconstruction is appropriate for the city, the project is approved. The information is normally presented by the contractor responsible for the construction. Information on the building is required, but not its surroundings. An example is seen in figure 2-12, which displays a flow chart of the planning process in Venice. For instance, a contractor is given information on the buildings history, its past renovations, along with structural faults, and uses of the building. This leads to over-developing in some areas of the city because of the lack of information on the whole area rather than just the plot that the building sits on. [17]

2.7 Impact of Adaptive Reuse

Only through renovation can the city keep its spectacular facade and historic culture, yet accommodate the influx of tourists. As is, twelve million tourists a year flock to the city to take a ride in a gondola and walk through Saint Mark's Square. Venice is faced with numerous problems, such as providing public transportation, food preparation, waste management and public safety for seven million people that are not even residents of Venice.

The concern for public transportation is raised because today's public transportation boats are much larger then the original ones of Venice, and can cause large wakes that crash into the canal walls. Such wakes have damaging effects on the stone and mortar that is splashed by the sea water and can also

[17] *An Integrated, Multi-Agency Approach to the Preservation of the Venetian Palaces*

harm the marine life. In addition, motor boats can pollute the canals with gas and oil. Pollution is another main concern facing Venice as tourist numbers grow even larger in capacity. Venice's waste management is like nowhere else on earth. The typical waste removal system in Venice is rather simple. The waste will collect in a brick settling tank called a *collettori fognari*, where bacteria will slowly decompose the waste, much like the leaching field of a modern septic tank system. The biggest problem in this system is the removal of the final product. In a common leach field, the waste would slowly dissolve back into the ground water being filtered out as it pasted through the soil and gravel. In the Venetian system, twice a day tides pull the waste into the canals and out into the lagoon. Due to the frequency of the tides, often untreated waste is pulled into the canals. This system is why the Venetian planning departments need to closely monitor the locations of future hotels and large attractions in the city.

The city of Venice looks at the impact that the reuse of a structure will have on the surrounding area and assesses an Urbanization Fee to a structure depending on the transformation it will undergo. The fee can be rather large for a building, such as a large hotel that is going to bring a lot more traffic and pollution to an area. Although this fee is assessed and paid, it usually is not used to minimize the effects of the reuse project. With help of our project, the impact on the surrounding commerce and nearby residents can be decreased and a balance between conservation and adaptation can be created.

3. Methodology

Our task was to help the city of Venice and its city planning boards to improve the adaptive reuse process of its buildings, as well as to aid the city in developing an evaluation of potential impacts of new modifications and development. The outcome of our project was the development of three easily accessible databases. Each catalogue can be used to strengthen communication ties between Venetian agencies, to simplify adaptive reuse impact analysis as well as to preserve the historical and cultural resources of Venice. Within these databases there is information pertaining to the structure, design, current use and surrounding area of the convents, palaces and churches of Venice. In compiling all of this information, a foundation was laid which will aid in the renovation and remodeling of Venice's buildings.

Our mission was to help the city of Venice advance the adaptive reuse of its buildings and to aid in creating a balance between adaptation and conservation.

Our team set forth the following objectives in order to complete this goal:

1) The creation of a computerized catalogue expanded from the 1968 UNESCO convents catalogue
2) The validation, expansion, and completion of current WPI palaces and churches catalogues
3) An analysis of the impact on neighborhoods caused by transformation of buildings

3.1 Domain of Inquiry

Our main goal with the project was to computerize and update three catalogues created by UNESCO in 1968. The three catalogues contained information on the churches, palaces and convents of Venice. In 1999, a group of WPI students completed a project entitled "Safeguarding the Churches of Venice." Their mission was to further UNESCO's efforts by updating the catalogue and creating a condition assessment of the churches. Three years later, another group of WPI students advanced the UNESCO palace catalogue with a project called "An Integrated, Multi-Agency Approach to the Preservation of Venice" and also showed the ease of using their database for the renovation process. The UNESCO catalogue as well as the two WPI projects collected information on buildings located within historic Venice. With a solid foundation already in place, we were able to assess the missing information in order to finalize the catalogues. After the WPI group computerized the UNESCO church catalogue in 1999, high-quality photographs of 33 of Venice's 122 churches were still missing along with the floor plans of each church. Although 386 palaces were catalogued by the WPI group of 2002, 186 of the palaces contained no field data collection and 264 were not visually documented.

Although the UNESCO church and palace catalogue had been previously computerized and enhanced, the UNESCO convent catalogue from 1968 had not been computerized at all, and even the paper form of the UNESCO convent catalogue was missing the sestieres of San Polo and Santa Croce. The figure below shows the selected area of research, the historical center of Venice, studied by all the two previous WPI groups as well as our project group.

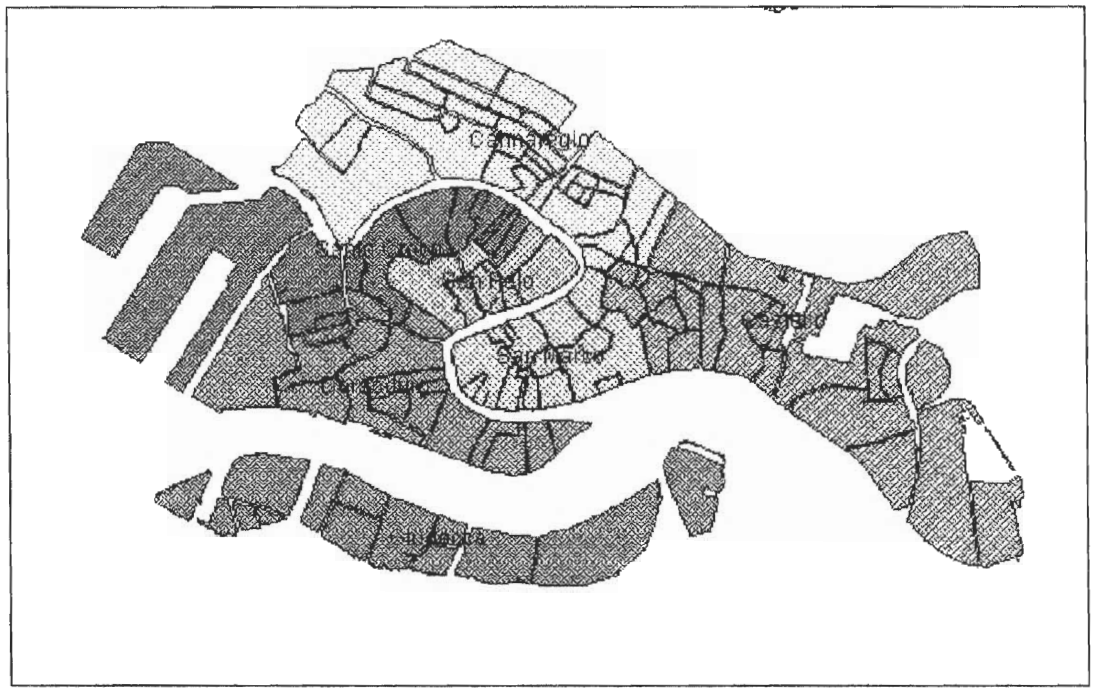


Figure 3-1: The historical center of Venice

3.2 Creation of Computerized Convents Catalogue

The research outlined in this section covers all convents located within historic Venice. As previously mentioned, the original 1968 UNESCO convents catalogue had not been computerized nor updated since it was created in 1968, and it still remained in its paper format. In addition, the information within the catalogue was out of date and the catalogue lacked certain essential data fields, such as the current use of the building and its exact address. Therefore, we added address, architect, date of construction, current primary use, secondary use, number of floors and windows, number and location of access ways to the existing convents catalogue, as well as created a picture database. All information contained within the UNESCO catalogue as well as the information gathered by us was recorded and then entered into a computerized database in Microsoft Access. After our stay in Venice, UNESCO converted our database into a web format and it was added to a compilation of past

UNESCO and WPI projects. All the information we gathered and updated was important for our analysis of the impact of the adaptive reuse of these buildings.

3.2.1 Locating All the Convents within Historic Venice

To accomplish the task of cataloging every convent within Venice, our first main task was to locate and identify all of the convents within the historic center. As a starting point, we used the 1968 UNESCO convents catalogue to derive a list of the previously catalogued convents. An example of the files we researched can be found in Appendix B-1. Each of the 22 convents located within the UNESCO catalogue was accompanied by a map showing its general location, but no formal address or detailed map was given. Therefore, it was our job to pinpoint the convents on a GIS layer to identify their exact position. In addition to this list, we located potential convents by using a Geographical Information System to detect the characteristic "cloister," or center courtyard, that nearly all convents have. Most convents have corresponding churches within the neighboring vicinity; we used the completed map layer of churches to narrow down our search for where convents might be located within the city. In figure 3-2 we show the convent of San Zaccaria (red) in relation to the church, which is purple and labeled in the figure. As a third resource for identifying convents, we used content analysis of guide books, such as the *Knapf Guide* and *Venice and its Lagoon*. We then visited each potential convent to validate our assumptions. In following this process, we were able to locate 59 convents within the boundaries of historic Venice. The location of all 59 convents can be viewed in Appendix C-4.

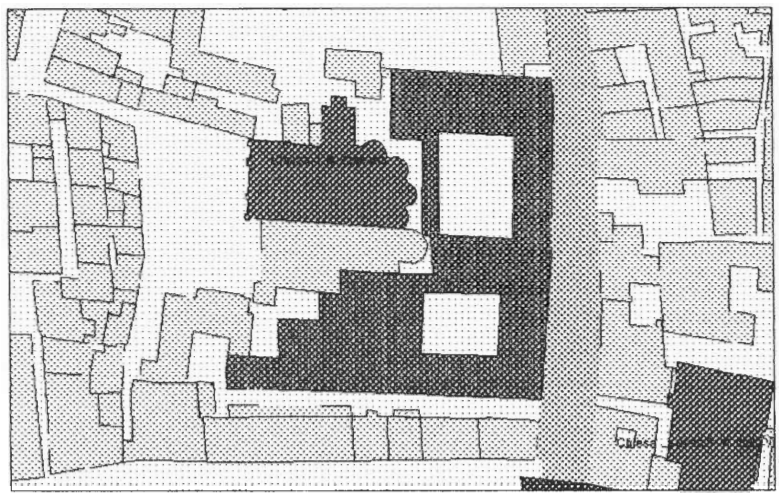


Figure 3-2: San Zaccaria Convent layout showing two cloisters

3.2.2 Convent Catalogue Structure

Our project team identified the necessary information for our catalogue by looking at past projects and the information they gathered as well as looking at adaptive reuse patterns of certain buildings. As a primary guide, we included all the fields contained in the UNESCO paper catalogue. As a secondary guide, the 1999 church and 2002 palace catalogues were used to remain consistent in our analysis of all three catalogues. In addition, we also gathered information we thought necessary for our analysis of the impact of adaptive reuse on the areas surrounding the buildings, such as number of access ways and current function. In order to keep the catalogues uniform, Microsoft Access was used to

assemble the catalogue for the convents, as did the 1999 and 2002 groups. An example of our field data collection form can be examined in Appendix C-2 and our complete database can be observed in Appendix C-3.

3.2.2.1 WPI Identification code

To remain consistent, the same code syntax as the 1999 church database was used. The code was the first four letters of the convent name, which most likely was the same as the church it is associated with. If the name contained less then four letters, we used the full name. Figure 3-3 shows some examples of how we derived the WPI identification code from the actual name of the convent. A complete list all every convent name accompanied by a code can be seen in Appendix C-1.

Convent Name	WPI Code
Convento Santa Apollonia	APOL
Convento San Zaccaria	ZACC
Convento Mendicanti	MEND
Convento Sant'Elena	ELEN

Figure 3-3: Sample of WPI codes

3.2.2.2 Name of Convent

Usually, each convent is named based on the title of the church associated with it. These names were usually the ones located within the UNESCO catalogue. If a convent was not within the UNESCO catalogue, we then referred to other sources such as the *Knopf Guide* and Giulio Lorenzetti's *Venice and its Lagoon*.

3.2.2.3 Location

Before our project, the location of all convents had not been recorded, which means there was not a completed list to work with. For the convents not listed within the existing 1968 UNESCO convents catalogue, we located possible convent sites by searching aerial views and GIS layers of Venice for buildings with convent traits. To verify the existing UNESCO records of convent locations and the existence of other unnoted convents, we visited each potential site. We then recorded the address, including the number and street name.

3.2.2.4 Date of construction

As part of aiding in the preservation of prominent buildings, we entered the dates of construction of Venice's convents into our catalogue. Most of the dates of construction were obtained from articles contained within the 1968 UNESCO catalogues. Also, the book *Venice and its Lagoon*, by Giulio Lorenzetti, was used a reference. When these two references were insufficient, other various sources including books, on site plaques, websites, and human resources were searched.

3.2.2.5 Architect

In addition to date of construction we attempted to catalogue the designer or builder of each convent. We found the name of the architect from such resources as the *Knopf Guide* and *Venice and Its Lagoon*. Once we found who designed each building, we catalogued it and entered it into our database.

3.2.2.6 Number of Windows

While in the field, we also counted all of the windows on each exposed wall for each floor. We then tallied the floors on each wall and coded the wall. Once the number was obtained it was entered into the database. Each wall was given a code based on the cardinal direction it was closest to facing such as North, South, East or West.

3.2.2.7 Number of Access Ways

While visiting each site, we recorded the number of land and water access points. For each convent, we counted the number of doors on each exposed wall and catalogued them according to the cardinal direction. In addition, we counted the number of docks and inserted them into the database accompanied by their orientation.

3.2.2.8 Visual Documentation

Digital photos of every convent were taken upon visiting each site. Our visits were at opportune times of the day, mostly early morning. The season of representation in each photo was restricted to summer, due to the time of our travel. A picture of each exposed exterior wall of the convent was taken and labeled by the cardinal direction in which it faces. Within our database, there is also visual representation of main access ways and notable traits of each convent. A picture of the area surrounding the main access way was taken in order to identify the convents' surroundings for our analysis. All of our convent pictures can be viewed in Appendix C-5.

3.2.2.9 Piani tipo

Floor plans of the buildings were acquired from digital scans of the city's typical floor plans, called *piani tipo*, and were manually traced onto its own map layer in the GIS. Not only did we complete this task for convents, but we also began floor plan layers for the churches and palaces. The piani tipo are the most typical floor plan of each building which is typically the first or second floor. They were presented to us as a collage of 53 .tif image files which when arranged together they formed the

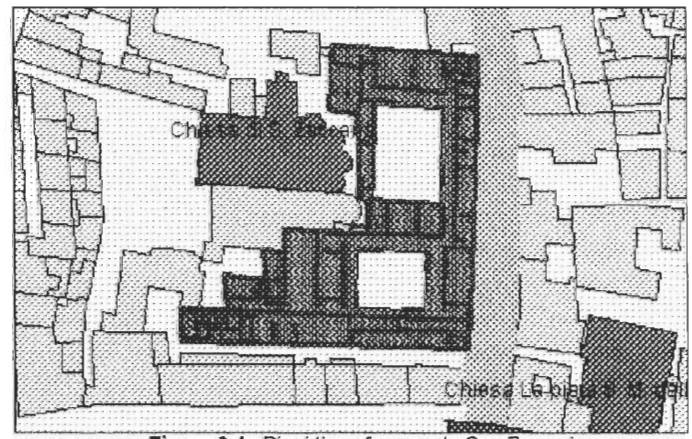


Figure 3-4: Piani tipo of convento San Zaccaria

"typical floor plan" of the entire historical center. For an example of the original scanned images see Appendix D-2. We located the buildings we were studying, and proceeded to transform the images into a more useful form within the GIS. To enter the images in the GIS, several coordinates on the base map were matched to the floor plan layer in order to register each building on the layer. Each building was then registered with a geographical area on the basic map. Once the entire layer was registered, the individual floor plan of each building that was studied was traced into a new specified layer. In this process we created three separate layers entitled; convent floor plans, church floor plans and palaces floor plans. For a picture of the completed floor plan layers, turn to Appendix D. In figure 3-4, we show the traced piani tipo in blue for the convent of San Zaccaria. We traced the floor plans off the registered .tif image onto the new map layer using the GIS draw tool. See Appendix D-1 for a detailed explanation. In turn, three different piani tipo layers were created, one for each type of building that we studied: churches, palaces and convents.

3.3 Validation, Expansion and Completion of Palace Catalogue

The 2002 upgrade of the original 1968 UNESCO palaces catalogue was extensive, but it was not completed. The first objective for this section of our project was to define what had not been completed due to time restrains, or lack of access to information in the 2002 palaces catalogue. The 2002 project group recorded 386 palaces of Venice, however more than two thirds of them were missing pictures or were missing field work. The 2002 project team used the UNESCO catalogue as a guide and only studied the palaces listed in that catalogue. The 2002 palace catalogue was used as the base for our research in order to create a finalized palace database. Figure 3-5 shows all the palaces catalogued by the 2002 project team. Our project team has identified several areas that needed to be completed for this database such as missing palaces, missing information and missing pictures.

Figure 3-5: All the Palaces in the 2002 palaces database

3.3.1 Expansion of Palaces Catalogue

We expanded the existing catalogue to include the piani tipo floor plans as was done for the convents and churches. A new GIS layer called "piani tipo palaces" was created to store the floor plans. In order to obtain a detailed description of the floor plan layer creation, see section 3.2.2.6. In order to view the floor plan layer for the palaces located in San Marco go to Appendix D-4.

3.3.2 Completion of Palaces Catalogue

Although the old palace catalogue was extensive, various fields within the catalogue were missing information. We reviewed the existing 2002 palace catalogue and created a list of all the information that was missing included visual representation. The previous database consisted of 386 palaces. However, only 200 contained actual field research and one hundred and twenty one contained pictures. With this list, we filled in the missing information as well as updated low quality images of the palaces. For the one hundred and eighty six palaces that were not included in the 2002 database, field research was completed to include the modern uses and address. In order to look at that field data collection used for gathering palace information, go to Appendix E-2. For the 305 palaces in need of quality visual representation, we recorded their pictures and inserted them into the database. See Appendix E-5 to view photographic records. Once the information was gathered, it was entered into an updated database. In order to observe the completed database, turn to Appendix D-3.

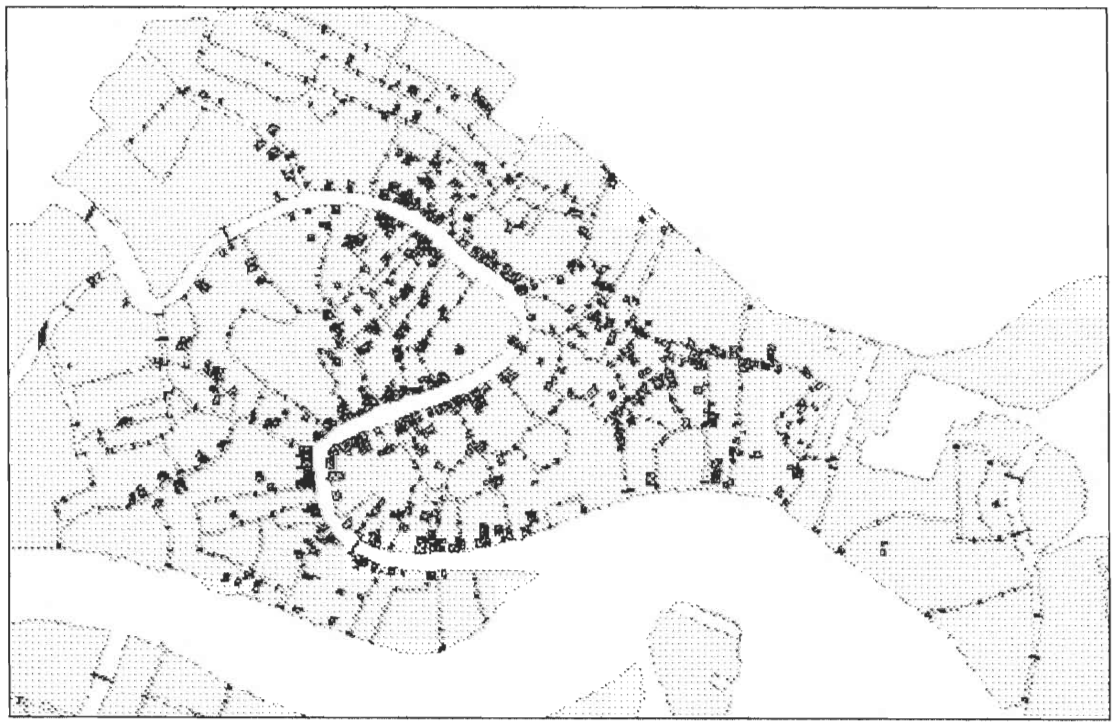


Figure 3-6: Palace work needed for completion

Figure 3-6 shows the completed palaces of last year (light blue), palaces that needed photos (light blue w/ black stripe), palaces that needed field data collection (green) and palaces needed photos and field data collection (green w/ black stripe). In order to see a blown up version of figure 3-6, view Appendix E-1. And to look at the completed palace map layer, go to Appendix E-4.

3.4 Validation, Expansion and Completion of Church Catalogue

One of our main objectives with this project was the validation, expansion, and completion of the existing churches catalogue assembled by the 1999 WPI churches project team. The previous WPI group of students catalogued approximately 120 churches within historic Venice. After reviewing the previous church catalogue, we found that aspects of data were out of date and visual representation was missing. Therefore, we gave a more accurate and current representation of the churches, as well as their surrounding areas.

3.4.1 Validation of Churches Catalogue

In order in ensure the accuracy of previously recorded information; the existing 1999 church catalogue was validated. The existing databases were cross-referenced with the previous catalogues and our own field research. This produced a complete and useful catalogue of all churches within historic Venice. Figure 3-7 shows all the churches completed by the 1999 group.

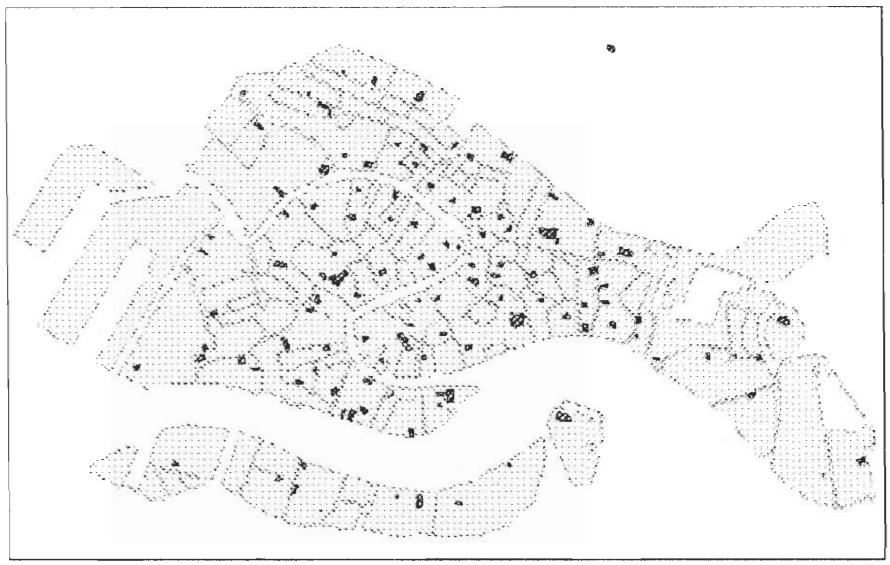


Figure 3-7: All churches in 1999 MapInfo layer and database

Once we realized what information was missing for each church, a site specific form was developed that included previous data, as well as a blank space for any current, pertinent information. These were then used and completed upon visiting each site. After the forms were completed on site, they were then entered into an updated database.

3.4.2 Expansion of Churches Catalogue

In order to enhance on the visual representation of the churches in Venice, the floor plans of each church were traced within MapInfo creating a new GIS layer for our database. The 2003 Church Floors project team aided us in this process. Each floor plan was extracted from the piani tipo. The

church catalogue now contains a GIS layer containing the floor plans of all Venice's churches within San Marco and the area surrounding Madonna dell'Orto. For a detailed description of the process used to create this layer, see section 3.2.2.6. In order to view the church may layer for all of San Marco and Madonna dell'Orto, turn to Appendix D-5.

3.4.3 Completion of Churches Catalogue

In order to complete the churches catalogue, our project team assessed the gaps in the catalogue by analysis of the Microsoft Access file created by the 1999 project team. After validation, we found that there were thirty-three low quality pictures that we replaced with a higher quality, more useful photos. Figure 3-8 shows an example of how we improved the photos for Saint Mark's Basilica. To collect data, we visited all the churches in need of cataloguing and gathered all information to fill in the blank fields. Turn to Appendix E-1 to view out field data collection form for churches. In addition, we completed the visual representation of each church in the catalogue by way of digital photos in a process similar to that of the representation of the convents. In doing so, we made the visual representations within the church catalogue consistent and unified it with the other two databases. In order to observe updated photograph records and current database, view Appendix F.

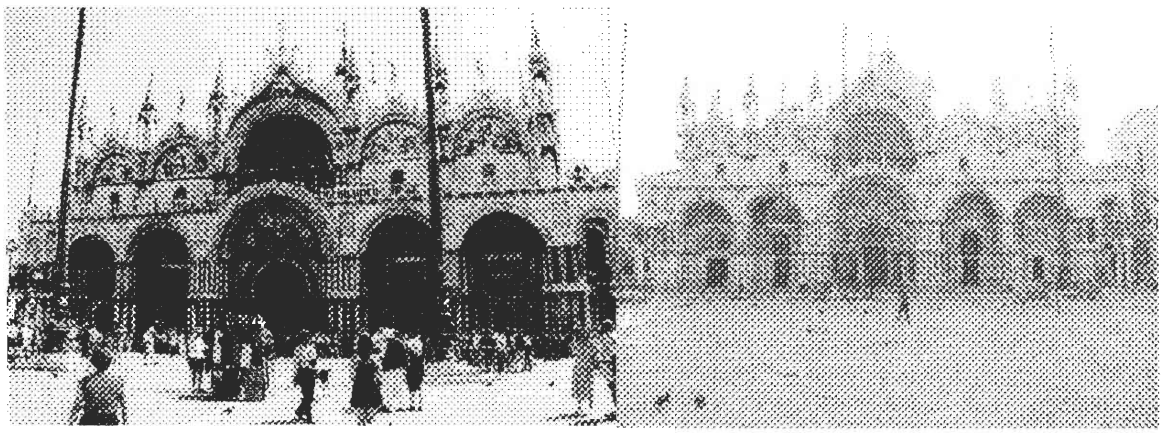


Figure 3-8: Retaken Picture of Saint Mark's Basilica

3.5 *Analysis on Transformation and Adaptive Reuse of Venetian Neighborhoods*

While in Venice, a majority of our field work was reviewed and compared with existing data to formulate an analysis of the impact on the surrounding area of adaptive reuse. In short, we compared building structure and function with population sizes, surrounding commerce, as well as previous functions. An analysis of the impact from adaptive reuse can be used by the Venetian city planning boards in order to improve the adaptive reuse and renovation processes. In improving the process of

remodeling Venice, a balance between adaptation and conservation can be reached. Within this section, we discuss the ways in which we obtained our supplementary information and the process of developing our analysis of the impact of adaptive reuse.

In looking at the convents, palaces, and churches of Venice, we compared our field data concerning current use with other available sources of information, such as census data, obtained from the Venetian Statistics Office, from 1971 till today and a history report of the local commerce of two distinct areas of the city. With all of this information, we analyzed the impact on the area surrounding the buildings that have been, or will be reused.

For the domain of our analysis, we selected two main areas of the city. The Santo Stefano area and the Madonna dell'Orto area were chosen for the analysis. Figure 3-9 shows the areas outlined on a map. In Appendix G-1, you can view a more detailed map of both areas.

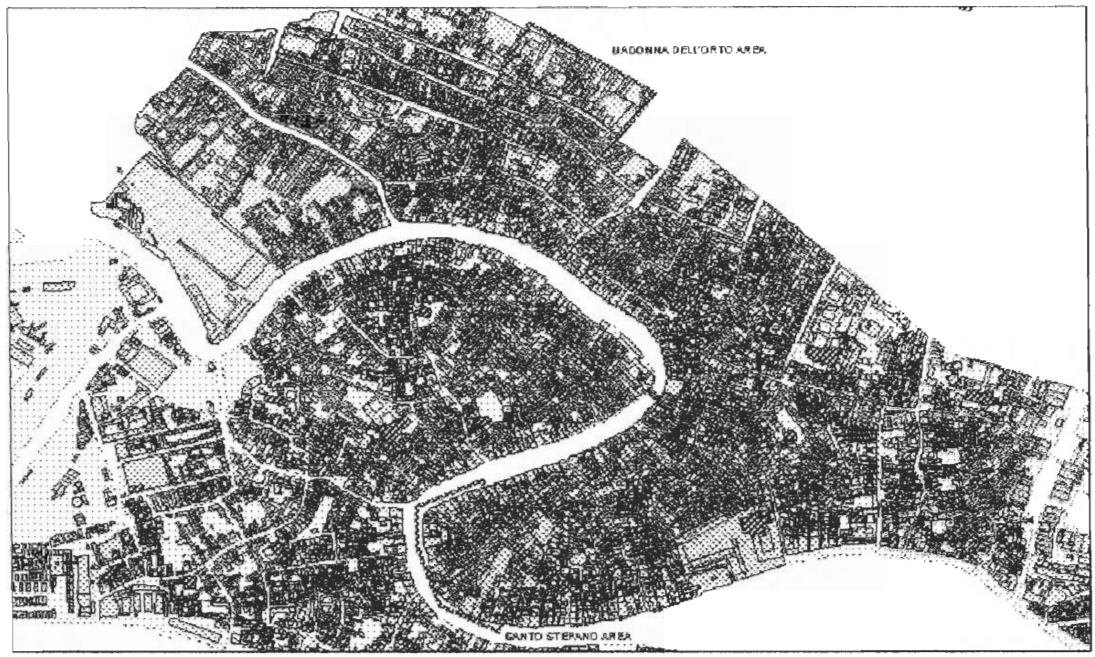


Figure 3-9: Transformation Study Areas

3.5.1 History of Commerce in Santo Stefano and Madonna dell'Orto

We obtained history related to the commercial use of buildings on the main streets in both of the areas of study from Venetians who lived there or who have worked there. One local Venetian, Renato Magagnato, brought us around a neighborhood and we recorded each of the previous uses of the buildings in the Madonna dell'Orto area. Mr. Magagnato lived in the same area of Venice for most of his life. From the 1940's to approximately the 1990's, Mr. Renato made a living with his father renting boats until the company went out of business. For the area of Santo Stefano, we met with Emilio DeGiulio,

ID Code	Address	From	To	Use	Name of Business/Owner	Notes

Figure 3-10: Field form for commerce history

who worked in the coal business in his youth in Santo Stefano, and now he is the owner of a local restaurant around the campo de Santo Stefano.

For each area we collected information on the uses of buildings and the timeframe of the uses by address number. Figure 3-10 shows the field form we used to collect the data. In order to view a completed field form, go to Appendix G-2.

This aspect of our project analysis was similar to a project done by MIT students in 2001 in the region of St. Elena. This group's goal was to observe the impact of reuse within that desired section. They reviewed past uses of each building and reviewed when hotels or tourist attractions were added and the change that those additions produced. In order to view what shops we looked at exactly through out the years, observe Appendix G-3. In order to get complete data, we recorded Mr. Magagnato's and Mr. DeGiulio's information in order to view the adaptations caused by reuse as well as the previous locations of each of the businesses. The completed database recording the transformation in these two areas can be seen in Appendix G-4. After recording the changes each location went through, we categorized each commerce type and recorded the code. Originally, we started out with the 75 codes taking from a WPI project entitled "Re-engineering the City of Venice's Cargo System" which attempted to catalogue and code every type of commerce within Venice. From these 75, we needed to add 21 codes not already listed. Once each location was coded by the 96 types, we then split them into 11 larger categories. From these 11, we broke them down even further into 5 classes. The 5 classes were as follows: Tourist Shops, Local Services, Restaurants and Bars, Storage/abandoned buildings and Mixed Use. The breakdown all of the types of commerce can be seen in Appendix G-6. For our touristcity index and for analysis we also split the five categories in two groups; tourist and local. We also used the Venetian Istat Commerce codes for today to make our database more useful for others. The Istat commerce codes can be seen in Appendix G-7. With this information, we were able to create a before and after scenario analyzing the impact of adaptive reuse within Madonna dell'Orto and Santo Stefano areas. Before and after pictures can be observed for the two areas in Appendix G-5.

3.5.2 Population History

In order to compare commercial history with social history, we need to acquire resident population information. We obtained the census tracts of the Santo Stefano and Madonna dell'Orto areas from Venice statistics office. To view the tract footprints for each area for each time period, look at Appendix G-8. We were able to obtain census data for a span of 30 years, beginning in 1971 and ending in 2001. On the second year of each decade, Venice collects its census information. In order to view the information we obtained for each decade, go to Appendix G-9. The information collected was presented to us in two forms. First, some very broad information was presented online in a question and answer format (www.comune.venezia.it/statistica). This source only presented us with the number of residents for each of the six districts and each census track today. The second form was a print out of the actual census data collected including maps, population numbers as well as business figures. The

Venetian Census Bureau has split the region into small tracks consisting of one or more island modules. The census tracts are rather small and are not all equal amounts of land. Therefore, to normalize the data for out touristicity index (mentioned in section 3.5.4.); we needed to divide the population of each tract by the land area of that tract. This results in a population concentration representing each tract, which allowed us to link it with the commerce and other information, like hotel capacity in the area, most effectively and without bias because of different sized tracts. In order to see the census tract foot prints for the entire historical center broken down by sestiere, turn to Appendix H-1. For our neighborhood study, we were just interested in change over time so we just recorded the information for the same amount of land from each decade.

3.5.3 Hotel Information

As another indicator of the affect of reuse of buildings, we obtained information on all the hotels within the city. This information included number of beds, address as well as some other information we were not particularly interested in for this project. We used a similar process as for the population data to extract a concentration of hotel beds by census tract. This assures that large area tracts which contain many hotels beds weren't mistaken for a "high tourist area," as would be indicated from the number of available hotel vacancies. We calculated the total number of beds in each census tract and divided by the total foot print buildings area which gave us a hotel bed concentration. In order to view the hotel layer as well as the database, look at Appendix H-3 and Appendix H-4.

3.5.4 "Touristicity" Index

In order to categorize different parts of the city as heavily tourist or not, we needed to develop some scale by which we could rate different areas of the city. We chose to use the 2001 census tracts as our breakdown of the city by area, since it is the most up-to-date population information we had. After finding the population concentration and hotel bed concentration, we compared these numbers for each section of the city. Higher hotel beds-to-residents ratios would indicate that the area has a high number of tourists staying in the area compared to the number of residents. Beyond this indicator, we needed to link the number of tourist shops or tourist related businesses to the analysis. To do this, we need to find the number of tourist shops in each census tract. Using the breakdown of class described section 3.5.1 for our focus areas; we categorized the commerce information collected by the 2001 cargo team to fit our needs. Once we categorized all the businesses within the city as tourist or non tourist based on its class, a tourist shop concentration as well as a local shop concentration could be computed for each census tract. The tourist shop layer and the local shop layer can be found in Appendix H-5 and Appendix H-6, respectively. We then compared the tourist-to-local shop distribution for each tract. We felt that this, coupled with the hotel beds concentration, was an accurate indicator of the amount of tourism day to day in any specific area of Venice. In addition in Appendices H-8 and H-9, you can see the maps and databases that make up our "touristicity index".

4. Results

This chapter is a compilation of the data that was collected for the convents, palaces and churches of Venice. The databases that were created contain all of the detailed information from which this chapter was derived. Figures were generated to effectively show the results of our data collection for each type of building studied.

4.1 General Convents Information

We identified, located and obtained data on 59 convents throughout historic Venice. Figure 4-1 shows a map of all the convents we catalogued. A better representation of this map can be seen in Appendix C-4. All of the convent results can actually be viewed in full in Appendix C including our database, pictures, map and codes. For each convent recorded a picture was taken, a floor plan was

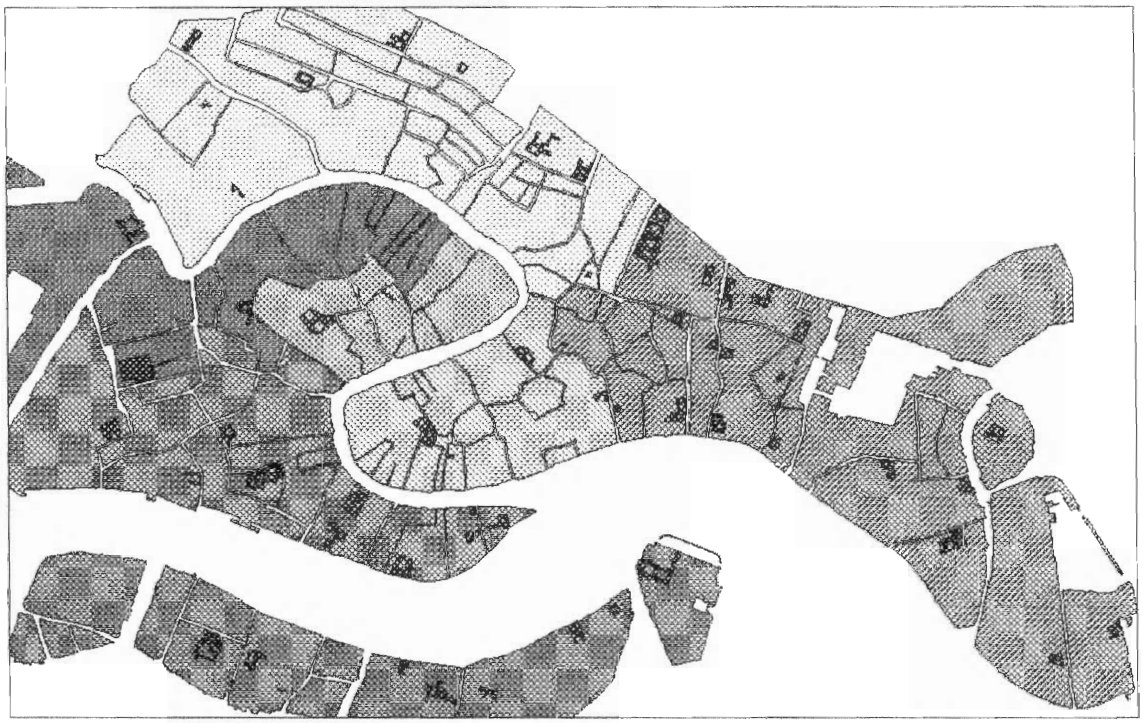


Figure 4-1: All Convents within Venice

drawn and field work was completed.

We obtained information on 22 of the convents from the 1968 UNESCO catalogue. However, two entire sestiere, San Polo and Santa Croce, were missing from the archives at UNESCO and the Soprintendenza. The remainder of the convents were located and identified by the group over the course of our data collection here in Venice. As you can see from the convents in red, the convents are very spread out over the entire Historic Center of Venice.

The distribution of convents by sestiere can be seen if figure 4-2. The region with the most convents we found was Castello, where the lowest number of convents was in San Polo. The high and low found were mostly because of size of the sestiere.

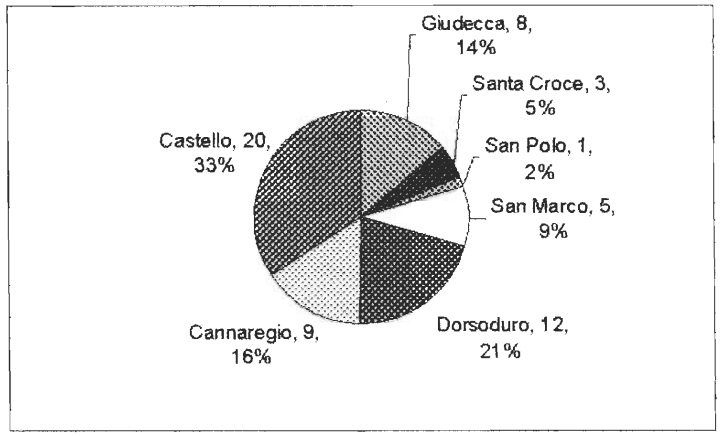


Figure 4-2: Convents in each Sestiere

In addition, we found that the number of convents in each sestiere is semi proportional to the number of churches within each sestiere, with the exception of the Giudecca, which has 9 churches and 9 convents (not directly related to each other), and Cannaregio, which has less convents per churches than any other sestiere. Figure 4-3 shows a graph of the number of convents compared to churches by sestiere. From this it can derived that in each sestiere there at least 1 convent per ten churches. Throughout the Historic Center, there is no sestiere containing more convents than churches. Usually, there are more parishioners than clerics per church in a region causing the ratio of convents to churches to be low.

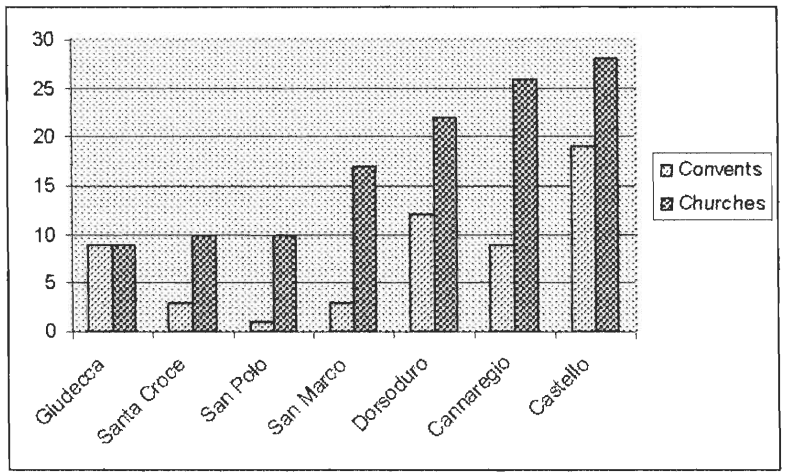


Figure 4-3: Comparison between Churches and Convents by Sestiere

4.1.1 Convent Current Use Information

We found that the current use of the convents of Venice can be roughly categorized into ten main categories, including convent, government building, hotel, housing, military zone, museum, office building, restoration, education, and rest home. The graph in figure 4-4 shows how all 59 convents or former convents fit into these ten use categories. It can be seen from this graph that convents are reused for many different purposes. The largest use we found for previous convents was schooling. Usually, schools require a large number of rooms for teaching as well as a cafeteria and choir room which is all contained within a convent. The second most occurring uses were convent and secure facilities, which includes jails, correctional facilities, and military bases. Government offices and housing were close

behind with twelve percent each. One can also see that less than fifteen percent of the buildings that were originally convents are still convents. Figure 4-5 shows a thematic map of all 59 convents and their uses distinguished by color. As you can see from this map, most of the schools and other services to city such as military zones are located near the outside of the island or away from areas such as the Rialto and Saint Mark's.

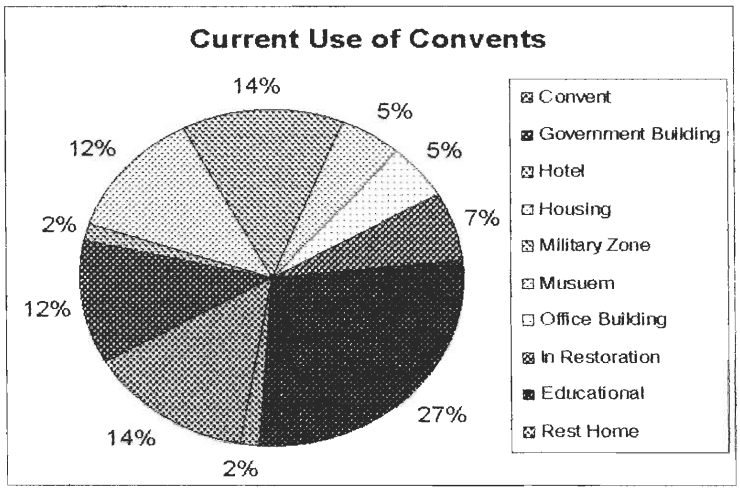


Figure 4-4: Current use of Convents

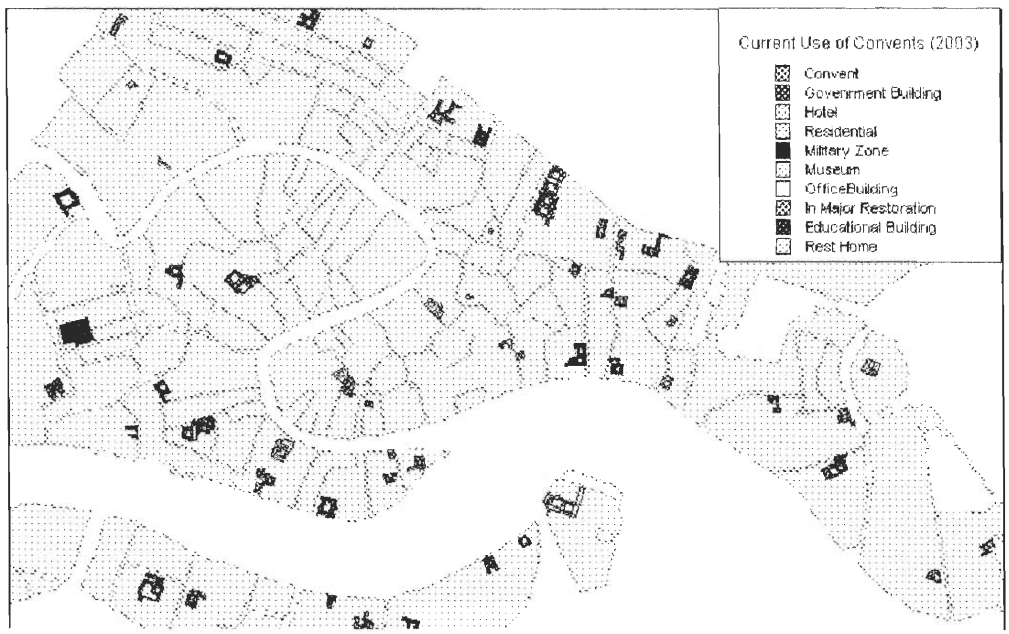


Figure 4-5: Thematic Map of Convent Use

4.2 Palace Use Summary

After collecting current use information on the palaces visited coupled with the results of the 2002 Palace project, we found that the palaces of Venice are used for a variety of purposes. Even though a good number of palaces have been reused or have been divided into smaller living quarters, a majority of palaces are still used as residences. Figure 4-6 shows a color coded thematic map of all 386 palaces by use. Most of the palaces are located along the Grand Canal. Figure 4-7 shows a pie graph of the uses of all 386 palaces divided into 7 categories: Entertainment, Hotels, In Restoration, Offices/Warehouse, Residential, Services, and Tourist shops. This breakdown of use types was derived from 98 different use codes created by the 2001 "Cargo" WPI group.

Figure 4-6: Thematic Map of Palace Use

Although the use of Venetian palaces is primarily residential, it should be noted that the residential category contains palaces that are occupied by a single family, as it was originally intended, as well as palaces that have been split up into apartment type complexes.

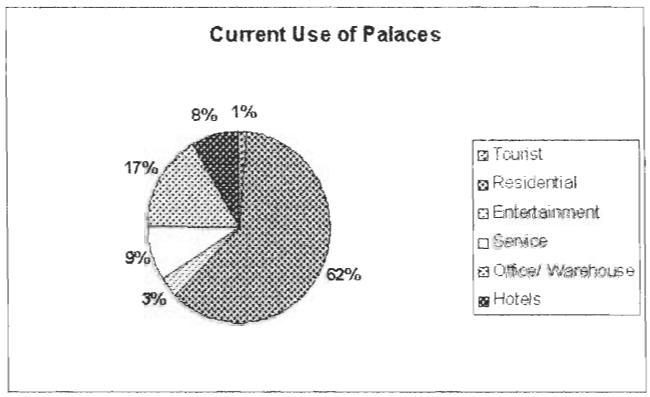


Figure 4-7: Current Use of Palaces

Figure 4-8 shows the same data displayed with the residence category omitted to show how palaces have been used for a purpose which is not the same as its original intended use. The percentage indicators are referring to the number of palaces which are not residence. You can see the function that

most palaces are converted to house is offices of warehouses. Their large size allows them to house these two functions well. One can observe all of our palace records including maps, pictures and databases in full in Appendix E.

4.2.1 Validation of WPI Palace Catalogue

In our validation of the 2002 palace project, we found some prominent misrepresentations in their work. One that was most necessary for our team to correct was the palace layer in the GIS. Overall, three mistakes were found; the wrong building was selected on the 2002 palace layer for 3 palaces. Figure 4-9 shows one example; the Palazzo Centani highlighted with a red circle on the right was represented by the much smaller building to its right in the 2002 palace layer circled on the map on the left.

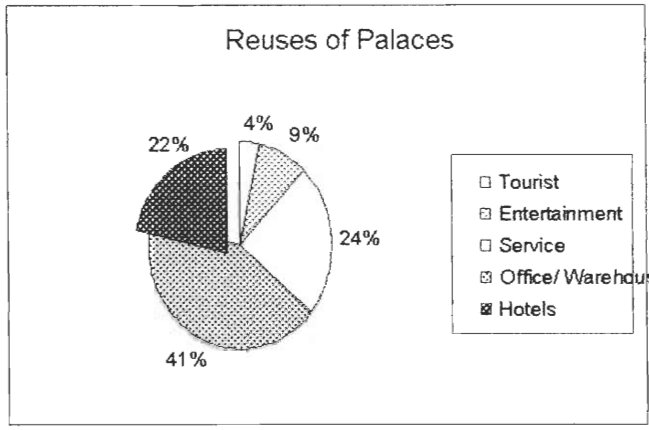


Figure 4.8: Reuse of Palaces excluding Residence

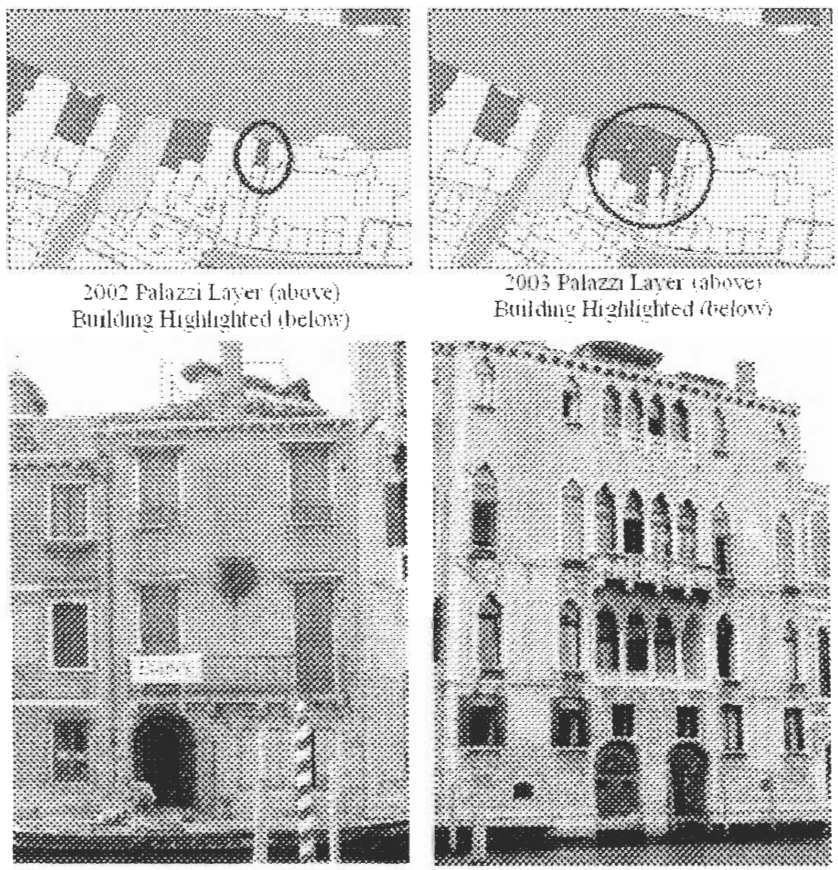


Figure 4-9: Example of Change in 2002 Palazzi Layer

In addition to correcting the palace GIS layer, we also improved their visual representation. On top of taking missing pictures, we also retook pictures of poor quality or poor angles. Figure 4-10 shows an example of how we improved last year's photographs. Overall, we took approximately 182 pictures, which are over 73 percent of last years pictures. In doing so, we gave the catalogue uniformity and a better quality of visual representation. Figure 4-11 displays the amount of pictures that were in need of better visual documentation.

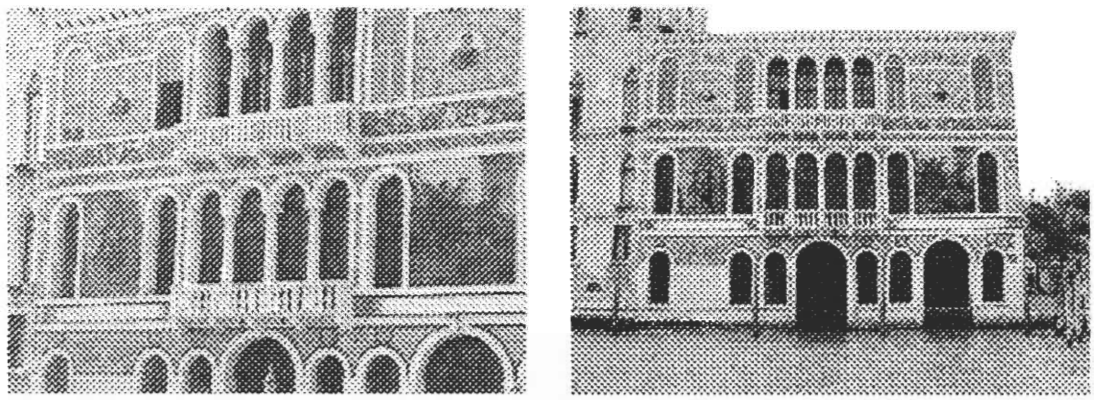


Figure 4-10 Example of Change in Visual Representation of Palaces

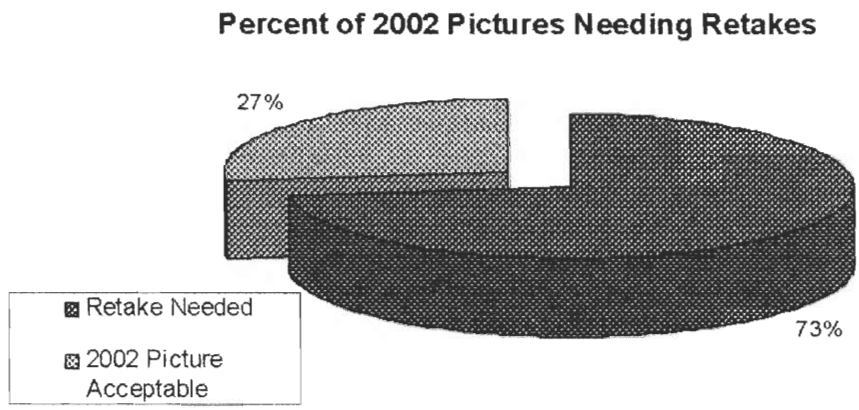


Figure 4-11: Percent of Missing or Poor Quality Photos from last year

4.3 *Validation of Church Catalogue*

In our validation of the 1999 WPI project entitled "Safeguarding the Churches of Venice", we reviewed the existing database, as well as the Mapinfo layer and pictures. From this, we found that thirty three photos were of poor quality, as seen in figure 4-12, but only five could actually be retaken due to

obstructions or close proximity to adjacent buildings. For the other twenty eight churches that could not be fully photographed, we took pictures of the main entrance as well as exterior statues. To further ensure the accuracy of the existing WPI church catalogue, we chose two churches from each sistere and double checked them using the records from UNESCO. No mistakes were found proving that the church catalogue was high quality work and accurate.

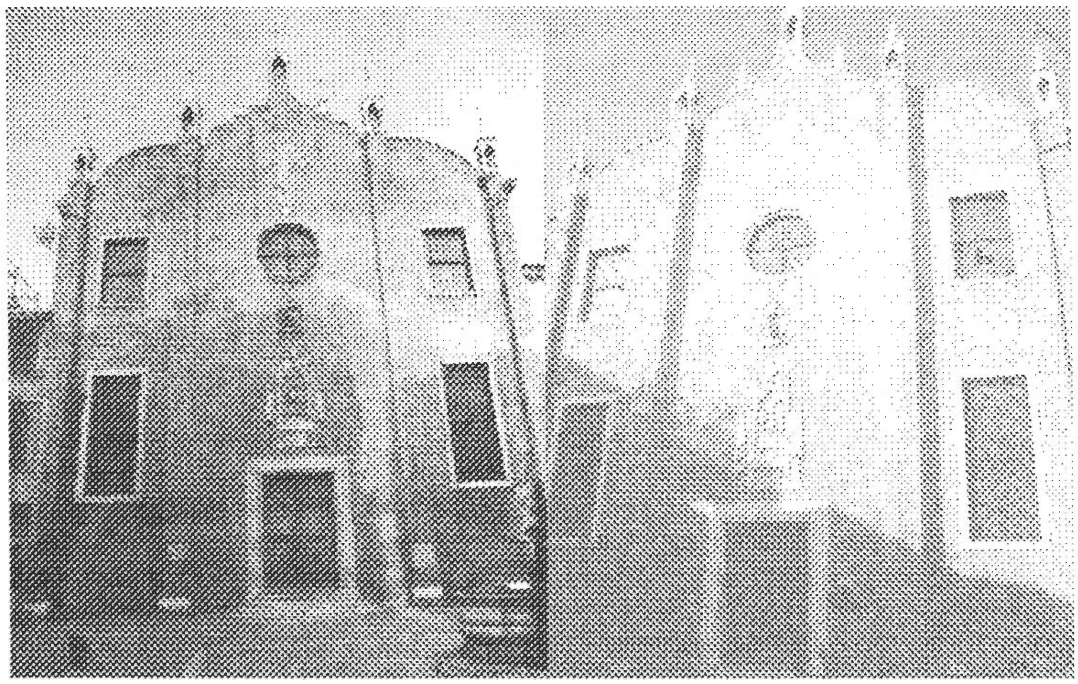


Figure 4-12: Example of Sant' Aponal retake

4.4 Piani Tipo

After completing fieldwork on the convents, palaces, and churches of Venice, a piani tipo layer was started. Every convent within historic Venice was traced and put into a Mapinfo layer comprised of fifty nine convents. Each palace floor plan, as well as church floor plan within the San Marco sestiere was traced. Also, each palace and church in the Madonna Dell'Orto region was traced. There were seventy two palaces and seventeen churches in San Marco, and eight palaces and one church in the Madonna Dell'Orto region.

4.5 Touristicity Indices

In creating a touristicity index, many different aspects of information needed to be looked at. We compared populations, to hotel capacity, to tourist shop concentration to local shop concentration. Each different area has its own results presented in this section. All of the products of this section can be seen in Appendix H.

4.5.1 Hotel capacity

While looking at the reuse of convents, palaces and churches in Venice, we decided to also update the current information we have on the hotels of Venice, since many hotels are reused palaces and convents. We created an up-to date GIS layer of Alberghi. It can be seen in Figure 4-13. In Figure 4-14, one can see that the highest hotel concentrations are near the biggest tourist attractions such as Saint Mark's Square and the Rialto.

Figure 4-13: Sample from updated 2003 Alberghi layer

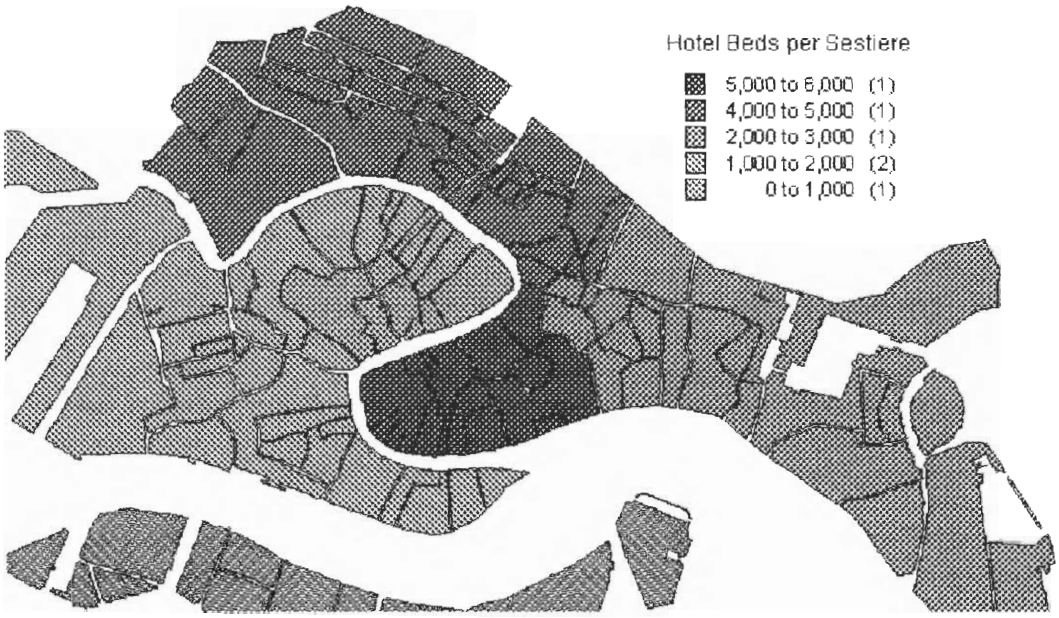


Figure 4-14 Hotel Bed Density per Sestiere

4.5.2 Population Trends

We obtained census information on our two study areas, Santo Stefano and Madonna dell'Orto form 1971 to 2001 in 10 year intervals. Figure 4-15 shows the areas studied outlined in red.

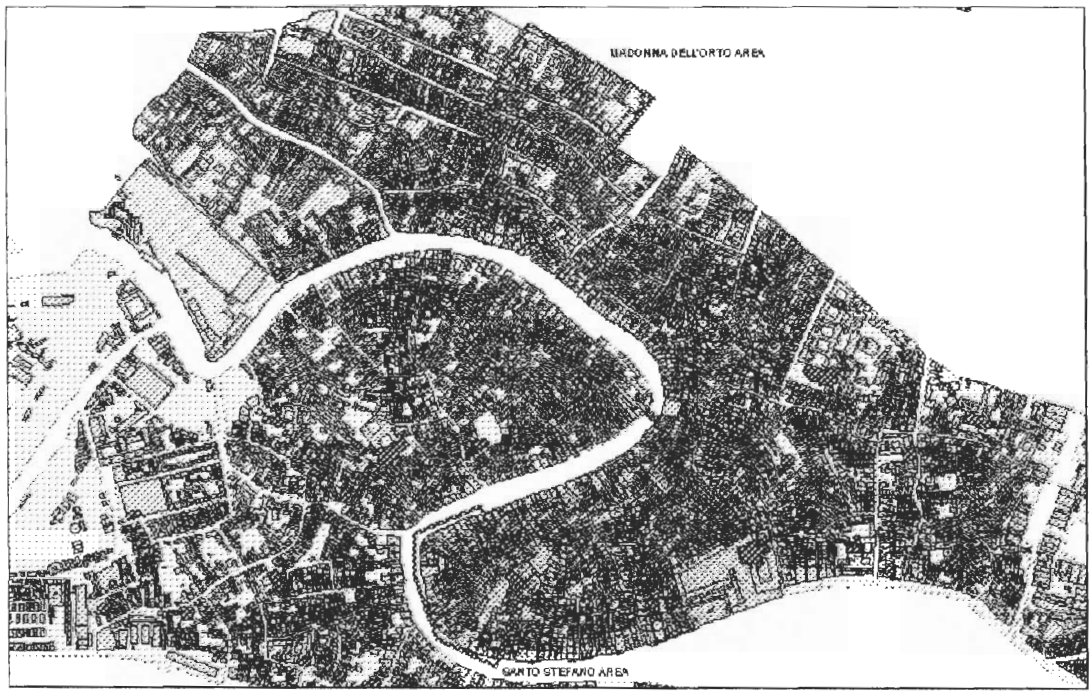


Figure 4-15: Census study areas

The Madonna dell'Orto area lost about 44% of its population since the 1971 census. The Santo Stefano area, on the other hand lost 64% of its 1971 population. The declines can be seen in figure 4-16. As you can see Santo Stefano lost 1570 citizens and Madonna dell'Orto lost 1192. Although both regions lost a significant amount, Santo Stefano was revitalized by tourist where Madonna dell'Orto still possesses local Venetian charm.

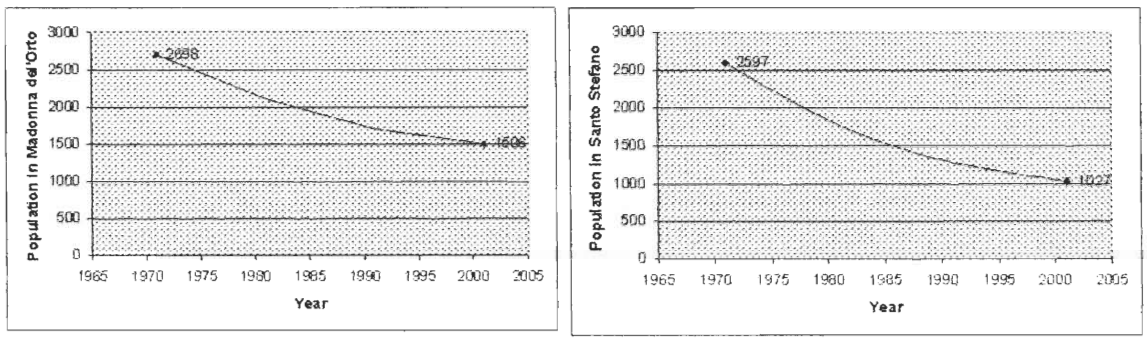


Figure 4-16: Population declines in Madonna dell'Orto and Santo Stefano

4.6 *Transformation of Commerce*

The commerce history for our focus neighborhoods can be seen in figure 4-17 and 4-18. The colored polygons on the maps represent the shops we obtained information on from 1945 to today. The Santo Stefano area has become much more developed towards tourism. The number of tourist shops and restaurants has increased significantly since 1945. In 1945 the two leading business types were local shops. In 2003, the two leading business types were tourist shops and restaurants. As you can see from figure 4-18, a majority of the shops in 1945 were blue representing local shops and services. Today, a majority of the shops are green which symbolizes tourist shops. This change could have resulted from many different things but most likely the conversion of the Palazzo Grassi and introduction of hotels played a part. All the information pertaining to the transformation of our two study areas can be found in Appendix G.

Figure 4-17: Transformation in shops of the Madonna dell'Orto area

Figure 4-18: Transformation in shops of the Santo Stefano area

5. Analysis

After gathering data, it is essential to process the information and prove hypotheses about the reasoning behind the results. We chose to analyze the transformation of commerce in two distinctly different areas of Venice and try to draw conclusions from our findings. Our two focus areas were the neighborhoods of Madonna dell'Orto and Santo Stefano. We also extrapolated what we learned from the histories of these two focus areas to the rest of the city through looking at demographics and statistics to try and recommend useful and beneficial adaptive reuses for buildings.

In looking at the information gathered from Santo Stefano and Madonna Dell'Orto, we compared two sections of Venice, one that primarily changed to tourist shops, while the other section stayed neighborhood-like where the shops did not change at all. Even though our focus areas were miniscule in relation to the whole city, we were able to create a framework for future analysis of adaptive reuse and touristicity.

Our hypothesis for reuse of buildings was that the population of an area creates a demand that the city must accommodate. Therefore, a decrease or increase in the population causes change in commerce which in turn causes the reuse of buildings. In looking at our two areas we observed that population in

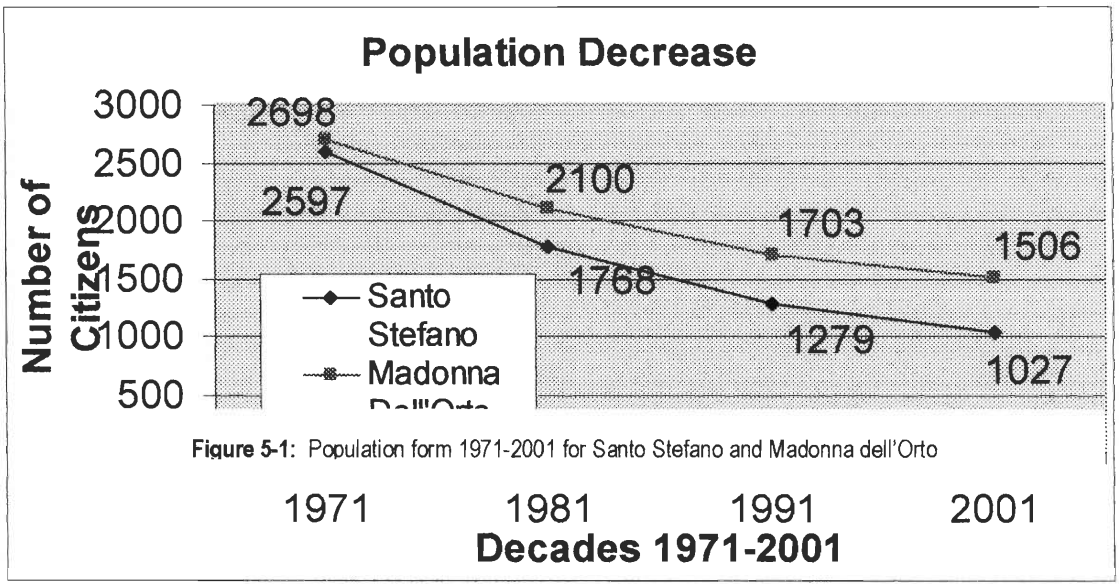


Figure 5-1: Population form 1971-2001 for Santo Stefano and Madonna dell'Orto

each area dwindled since 1971 but now the decrease is beginning to level off. Although both regions suffered from a drastic decrease in the number of citizens, each area was affected differently. Since 1971, the population of native Venetian citizens within Santo Stefano decreased by over 60%, and increased in the number of tourists. On the other hand, the amount of citizens within the Madonna dell'Orto area decreased by approximately 45% since 1971, however no tourists were drawn to this area, as will be shown in this chapter. The trends in population over the last 30 years of both areas can be seen in Figure 5-1.

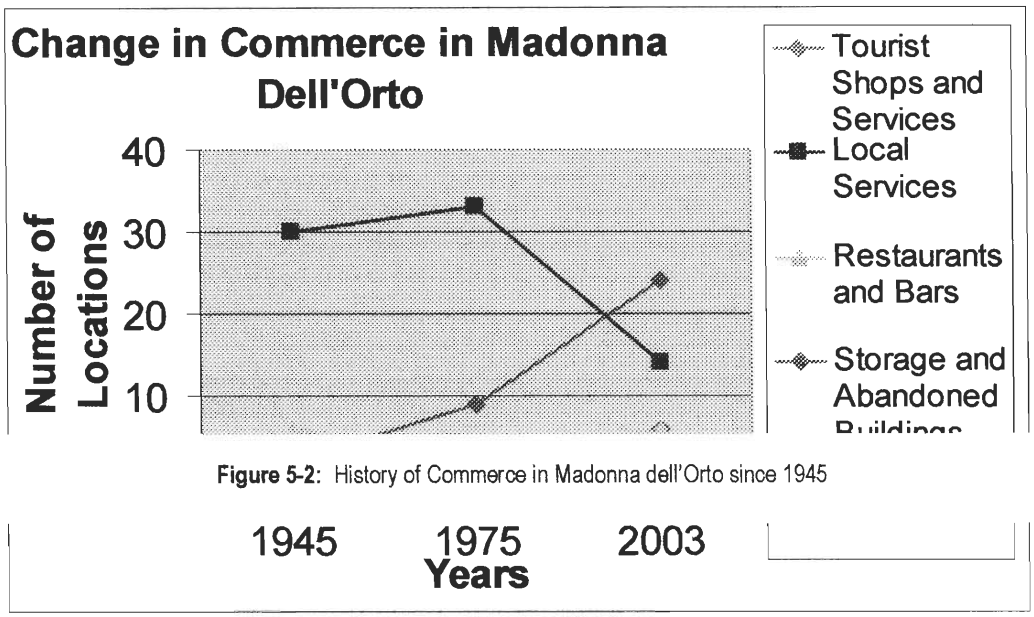


Figure 5-2: History of Commerce in Madonna dell'Orto since 1945

5.1 Transformation in Madonna dell'Orto

Today, the area of Madonna dell'Orto has no tourist attractions at all. The region contains a convent for the church of Madonna dell'Orto. The region of Madonna dell'Orto contains mostly residential buildings and local shops, such as butcher shops and bakeries. The transformation over the last 60 years can be seen in figure 5-2. Around 1975, there was a sharp decease in local services and at the same time an increase in abandoned buildings and storage buildings. This may be attributed to many factors, but behind it all, most likely is the fact that the Venetian population is decreasing rapidly. As Venetian residents moved out, local shops went out of business, and due to the location far away from the usual tourist attractions (St. Marks, Rialto, etc.), hotels and tourist shops never filled the gap that was created when the locals left. In this small area, the demand for commerce was diminished by the decrease in inhabitants and was not replaced by a different group of incoming people. Since 1945, the number of services for citizens, including markets, grocers, bakers and fruit vendors, decreased by over fifty percent dropping to 14 from 30. As the number of services decreased and tourist shops did not open in the area, the number of abandoned buildings and storage areas rose. The number of abandoned buildings started at 2 in 1945 and now is at 24. With such an extreme rise in abandoned buildings and storage areas, the area surrounding Madonna dell'Orto has been able to hold on to the local Venetian essence by not becoming a Disneyland-like tourist attraction. Even though this focus area was small, one can apply the same theories to other areas of similar population and lack of tourism.

5.2 *Transformation in Santo Stefano*

The history of the neighborhood in Santo Stefano tells a different tale than Madonna dell'Orto. Its business history can be seen in figure 5-3. The number of restaurants/bars, as well as the number of abandoned buildings in the area has remained relatively constant up until today, where there is less than 10 of each. Conversely, an unusual trend can be seen in the change in tourist services and local services. As local services began to decline due to the decline in citizens, tourist services filled the gaps and in the late 1970's. The number of tourist shops eventually overtook the number of local shops. As you can see from the graph, the increase of tourist shops and even restaurants began to rise more drastically around 1988. The tourism increase that crept into the area surrounding Santo Stefano is an example of "disneylandization" or conversion to a Disney land type location. This "disneylandization" may have been caused by the opening of the Palazzo Grassi museum, which is one of Venice's most popular attractions today. Although this area is relatively small, the same hypothesizes and theories can be applied to similar areas that experience reuse projects.

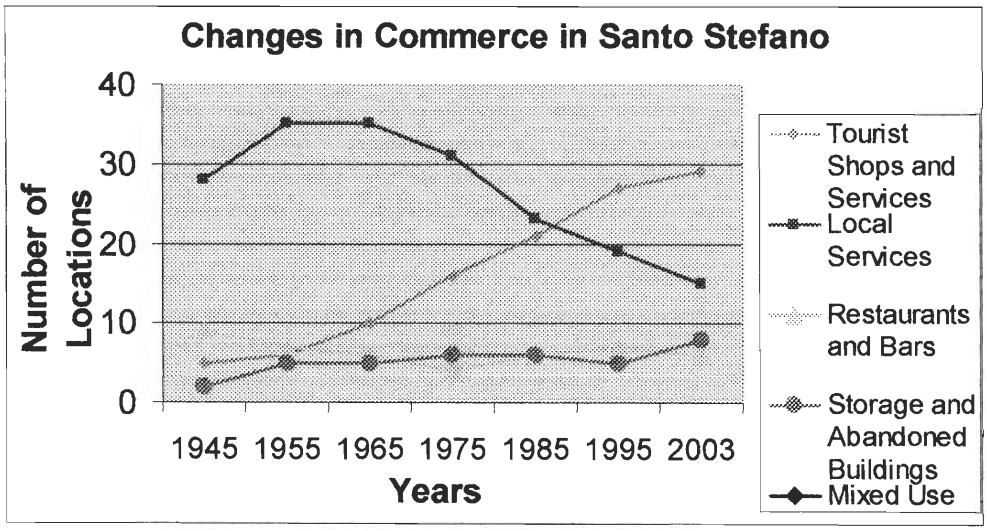
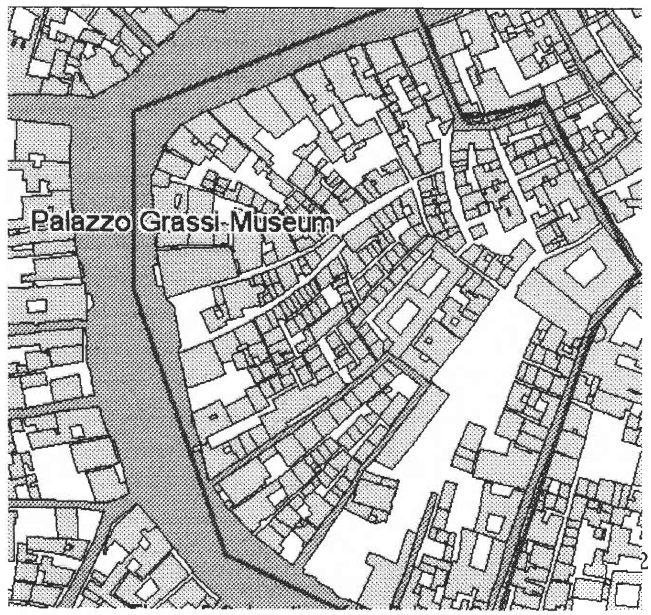


Figure 5-3: History of Commerce in Santo Stefano since 1945

5.2.1 Introduction of the Palazzo Grassi Museum

Originally, the Palazzo Grassi was home to the Grassi family. Today this magnificent building is a widely visited museum. It resides on the Grande Canal, on the western tip of sestiere San Marco, in



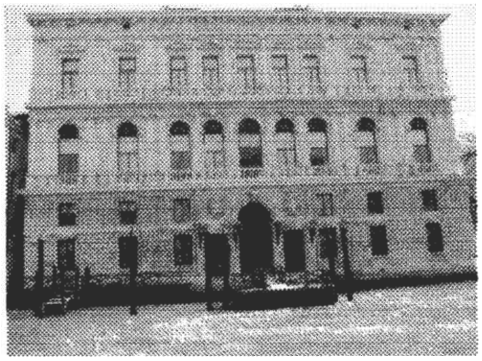


Figure 5-5: Palazzo Grassi Today

the Santo Stefano area. Since its conversion to an exhibition center in 1985, it has drawn a sizeable array of people from all over the world. Near the year of the opening of the museum, between 1975 and 1994, the number of tourist shops doubled from 8 to 16 and the number of restaurants increased by 50% in Santo Stefano. On the other hand, the number of services for the native citizens diminished as the number of inhabitants decreased. Since 1975, the number of shops used primarily by the residents of Santo Stefano has been cut in half. Buildings such as schools, carpenter shops, grocers, household stores, and repair shops have now become scarce due to the vast decrease in inhabitants. In looking at just this one small touristy area, other parts of the city may experience different happenings and all of the key factors may differ. However, in these two focus areas one can observe what types of information must be looked at in trying to predict the impact of adaptive reuse.

From just looking at what happened to these two small areas alone, one can speculate the effects of reuse. Although Santo Stefano and Madonna dell'Orto both lost a fair amount of their original citizens since 1971, Santo Stefano was revitalized and Madonna dell'Orto was deserted. On the other hand, Madonna dell'Orto still possesses the local Venetian essence, where Santo Stefano has become a tourist friendly area. In comparison of the two, the effects of adaptive reuse on the surrounding area seem evident. Because adaptive reuse can cause such extensive effects, it must be controlled and the impact must be predicted before the project is put into action.

5.3 Touristicity Indices

Reuse of a building can cause drastic changes on a surrounding area. In order to prevent these changes from influencing Venice, the city of Venice must predict the impact of reuse and not alter regions that are on the brink of becoming tourist based. To determine what areas within Venice were on

the edge of becoming overcrowded and overpriced like Disneyland, we created a system of evaluating how much tourism is drawn to an area. We included population density, hotel bed density, tourist shop density and local shop density in our evaluation. To calculate these density values, we used the sum of the footprint area of the buildings within each census tract, or small area for which the population is calculated for by the Statistics Office, as the area chosen so there would be no bias towards different sized areas and areas which contained large open squares with nothing in them. From these indicators we were able to estimate the magnitude of tourism potential in all of Historic Venice. Figure 5-6 shows the resident population density for the entire city. In Figure 5-6 the areas of dark blue represent areas with high resident population where the white areas have little or no inhabitants.

This thematic map displays a rather low residential population density in San Marco, while much of Dorsoduro and San Polo have high residential population densities.

Next, we looked at the concentration of hotel beds throughout the island, shown in Figure 5-8.

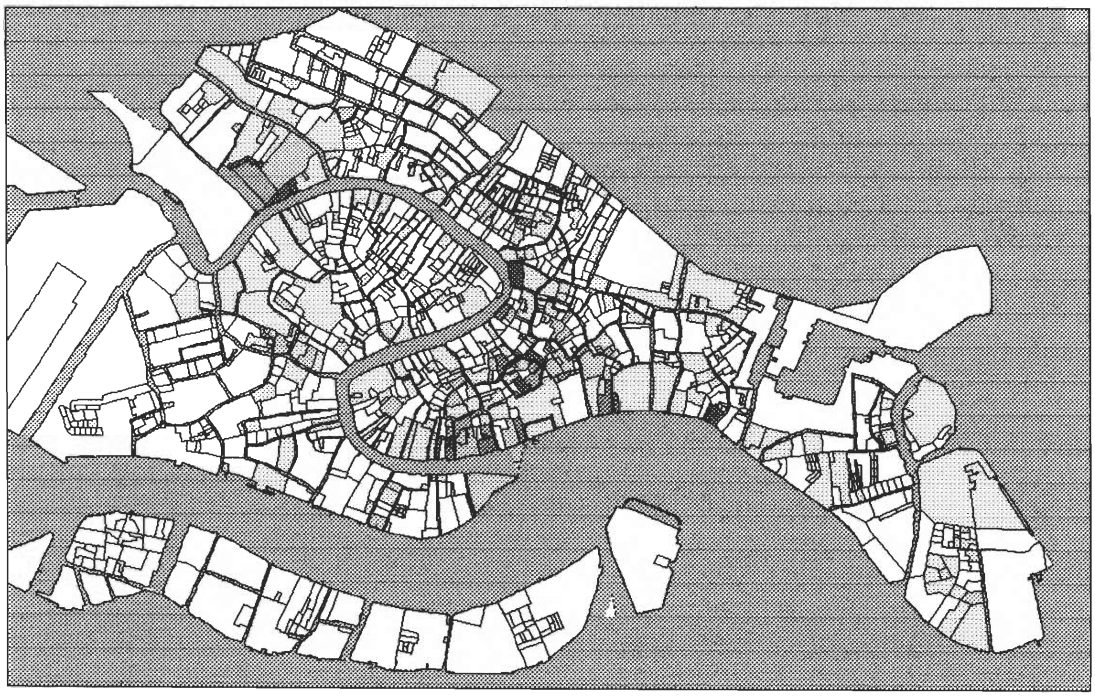


Figure 5-8: Hotel Bed Density

Once again the darker the color red, the higher the concentration of hotel beds in each census tract. The map shows a high concentration of hotel beds in San Marco, where there is very low resident population. The area within the vicinity of the Rialto also has a high concentration of hotel beds and a low resident population. This is a good indicator of possible tourist areas, since tourists generally stay in hotels. Beyond these gauges, we used our classification of businesses to create a thematic map of tourist shop, and local shop density for the whole city. The local shops densities are shown in Figure 5-9, and the tourist shop densities in 5-10.

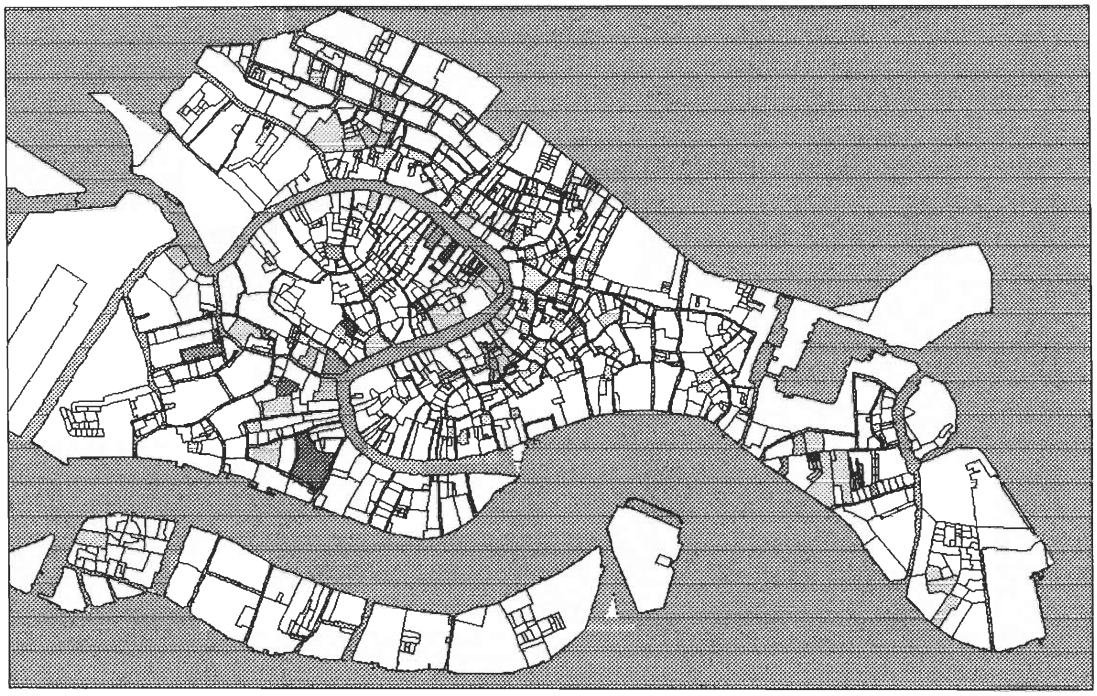


Figure 5-9: Local Shop Density

Figure 5-10: Tourist Shop Density

In examining the distribution of tourist and non-tourist businesses, coupled with the distribution of hotel beds and resident population, educated estimates to which area of the city have high tourism can be made. For example, an area with low resident population density, high hotel bed density and high tourist shops would be at the far end of the "tourist scale." Conversely, an area which has rather high resident population density, few hotel beds, or any at all, and high local shops would be classified as highly non-tourist.

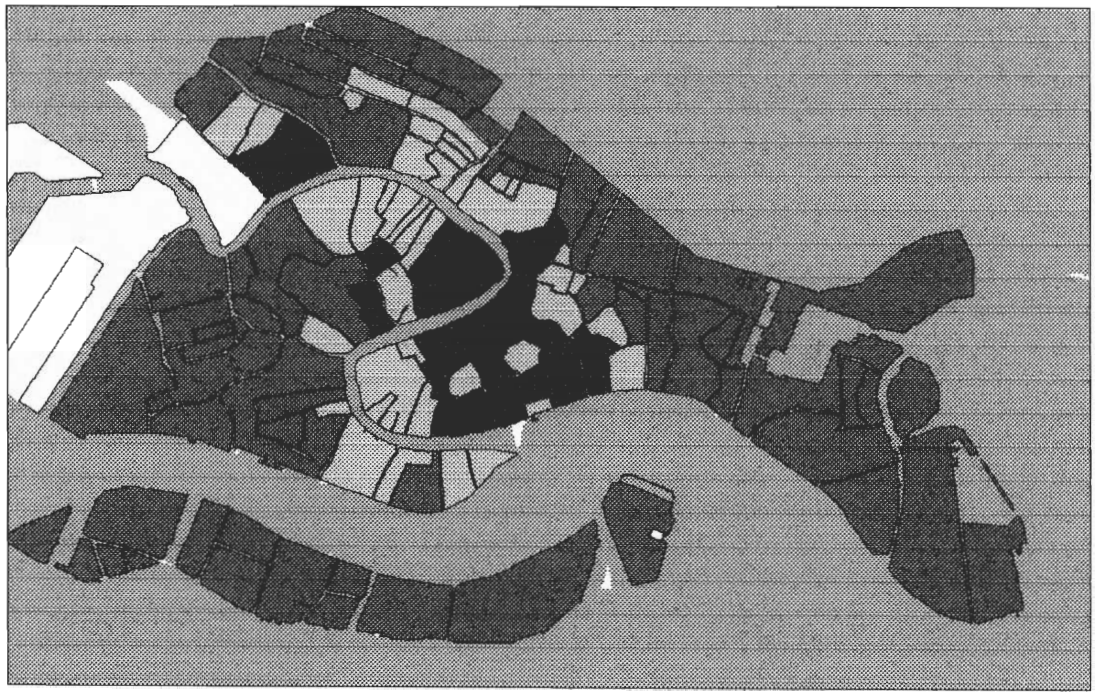
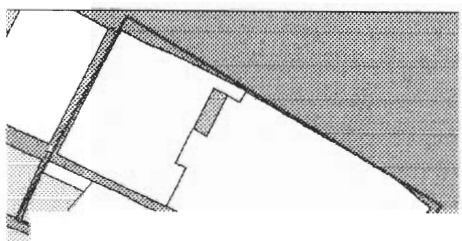


Figure 5-11: Touristicity level

Using this criterion, we classified each island in Venice by extrapolation as tourist (red), in danger of becoming tourist (yellow), and residential (green). These results can be seen in figure 5-11.

5.4 Applying the Touristicity Rating to Focus Areas



If we take another look at Santo

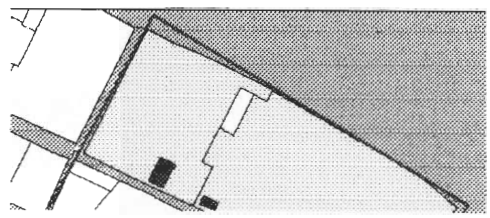
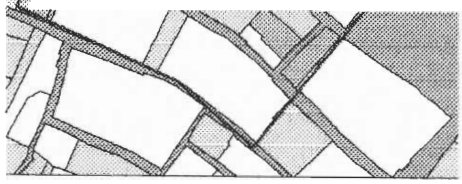


Figure 5-12: Population and hotel bed density for Madonna dell'Orto



Stefano and Madonna dell'Orto,

we can see they might each benefit from some type of change or reuse of some of their buildings. First we will look at the current population densities (blue scale) and hotel bed densities (pink scale) of the area, shown in figure 5-12.

It can be seen that the Madonna dell'Orto region has relatively low population density as well as low hotel bed density. Both tourist shops and local shops are virtually non existent in the area. For this reason, it is in the green area of the above map. It is obvious that commerce is scarce there, other than a few scattered hotels. An area like this may benefit from adaptive reuse. Relating back to our research on convents, palace and churches, there are not many of these buildings here either. The area contains one church, one convent, and only eight palaces, none of which are hotels. Because even the resident population is low, a good adaptation would be local shop or service that would still serve the inhabitants left and perhaps draw more people to live there. The citizens in this area, although few in number, need to be accommodated without the influence of tourism. This area, although in the green residential zone, could be negatively affected if many more hotels or tourist shops open here, because there is no existing commerce in this area so tourism would completely dominate.

The area around Santo Stefano differs from Madonna dell'Orto in a few ways. Classified as slightly tourist (yellow zone), it has few residents living in the area, as depicted in Figure 5-13. However, there is a much higher concentration of hotel beds (purple scale), as well as tourist shops (red scale), shown in figure 5-14.

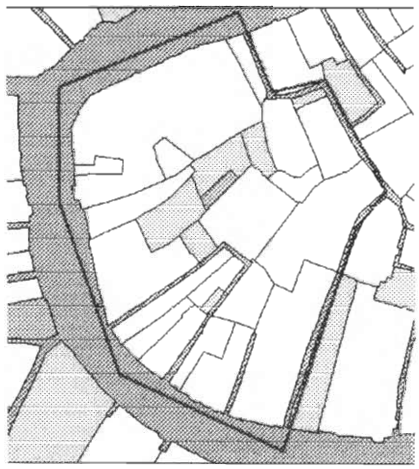


Figure 5-13: Population Density of Santo Stefano

The local shop density of this area is also very low, although there are many buildings used as offices and homes, including many of the palaces along the Grand Canal in this area. As previously mentioned, the Palazzo Grassi is located in this area, which accounts for much of the tourist flow, and in turn provides a market for many of the restaurants and bars in the area.

Figure 5-14: Hotel and tourist shop density in Santo Stefano

Since this area currently has a good balance between its tourist-related attractions and its local services, not much is needed to push it toward or away from becoming more tourist-like. As a general statement this area should monitored, and should not

open many more tourist attractions or hotels, to prevent drawing more tourists to the area. Areas of high tourism should be given more attractions to keep the tourism enclosed in certain areas and to prevent tourism from overtaking the whole island. This area seems steady but the opening of the Palazzo Grassi is a strong indicator that it only takes one adaptation for an area to change. With out this change, the Santo Stefano area may have been much different than we know it to be today.

If we extrapolate this analysis to other areas of the city, we can evaluate the current state of touristicity and hopefully prevent "disneylandization" in areas which have been preserved up until now. In looking at the impact of reuse within the areas of Santo Stefano and Madonna dell'Orto as well as seeing which areas are approaching the threshold of excess tourists, Venice can better accommodate all of the people in Venice, tourists and citizens a like. With a more complex analysis and extrapolation, the effects of reuse become minimized. However, with this framework and foundation a proper estimate of tourism and transformation can be compiled for the historic center of Venice. Although reuse can revitalize an area it must be used with moderation because it can create the destruction of Venice's past, present and future

6. Conclusions

The primary purpose of our project was to provide useful information for the city of Venice to utilize for decision making on the reuse of historic buildings. Furthermore, we wanted to conduct an explanatory study on how this information could be used to increase the awareness on environmental impacts of building reuse. the transformations caused by the reuse of buildings and how the surrounding community is affected. By completing the WPI churches, palaces, and convents catalogues, as well as completing a preliminary analysis on the current state of tourism throughout the city, we formulated several conclusions.

After experiencing two months in Venice and completing extensive field data collection, we have found that the buildings of Venice are widely reused. Although the buildings function is altered, the outside of the building and layout stays the same. Thus, Venice's streetscapes and ambiance are unchanged, while the interior of Venice's buildings have completely transformed. In looking at our two focus areas, the fact that the layout and scenery of Venice has not changed in our focus time period can be seen. The reuse of buildings is caused by the change in the kind of people that occupy the city or a region within it. From our data it is apparent that in Venice the decrease in population causes a change in the commercial surroundings causing buildings to be reused.

This point can be observed within our two study areas. By analyzing two very different sections of Venice, such as Santo Stefano and Madonna dell'Orto, we found that the underlying factor in an area becoming in the level of tourism and reuse is demands of the occupants. The commerce of an area depends on the type of population which is within the area, for example, a residential area is likely to have many local shops, like delis and grocers, where if the resident population is low and there are many hotels, mask stores and glass shops will emerge where the bread shops used to be to accommodate the new flow of people. After viewing our analysis and our touristicity index one can see which areas of the city are approaching the threshold of becoming a Disneyland. Although one thematic map cannot draw any conclusion about the set of people and commerce in that area, a combination of the four can give you a pretty good approximation of what type of area it. As of now, the planning agencies do not look at the impact a reuse project can cause. The thresholds of tourism have to be observed in order to prevent disneylandization. With our thematic maps and impact reuse assessment, thresholds can be formulated and monitored. A few regions of Venice that are endangered of becoming a tourist region are Santo Stefano, Strada Nuova and a portion of Santa Croce. These areas contain a few notable churches and interesting tourist shops, but still contain a good amount of locals. On the high end of the tourism scale is Saint Mark's Square, Rialto and the area near the Piazzale Roma. These three areas contain three of Venice's biggest attractions causing them to be overcrowded and overpriced. In contradiction, areas containing high population density and local shop concentration are Saint Elena, Giudecca and most of Dorsoduro which contain a lot of older Venetian residents and services to accommodate them.

In order to keep areas from crossing over thresholds, the planning agencies must predict the impact from this information and attempt to monitor the balance between conservation and adaptation. The main planning boards of Venice, the Soprintendenza, Commisione di Salvaguardia, Edilizia Privita, and Assessorato all'Ubanistica, fail to do a thorough job looking at the surrounding area of a building before approving it for renovation. Thus, through our tourist indices we defined the major attributes that each planning board needs to analyze when considering a historic building for a reuse. First, the planning board must create an assessment of the current state of the surrounding area by using either the census tract that the building resides in or a certain radius around the building. This assessment needs to contain information on the hotels in the area as well as the ratio of tourist shops to local shops. Also, the assessment needs to include information on the current population in the area. Lastly, the planning board should estimate how the newly reused building will affect the surrounding area and the potential changes that it will most likely cause. Although these are not the only contributing factors to the transformation of the city, we feel that through our analysis, we have identified a basis for which additional data can be built upon to extend the control of the transformation of Venice.

6 Recommendations

Although our project was thorough and we accomplished a large amount, there are still some aspects of our project that could have used more time. Even though our project completed the existing palace and church catalogue for the main portion of Venice, our insertion of the typical floor plans was not concluded. With more time, each floor plan of every church and palace within Historic Venice can be registered, traced and catalogued. With the addition of these floor plans, the Venice planning agencies can observe what type of function the structure is most suited to be reused as. In addition the palaces located on the Giudecca can be catalogued and photographed in order to finalize the catalogue for the Historic center. This expansion does not necessarily need to extend to the Giudecca. Many palace-like structures within historic Venice have yet to be catalogued. For example, the Fondaco Dei Turchi, figure 7-1, an early twelfth century edifice on the Grand Canal has not been catalogued by WPI students.

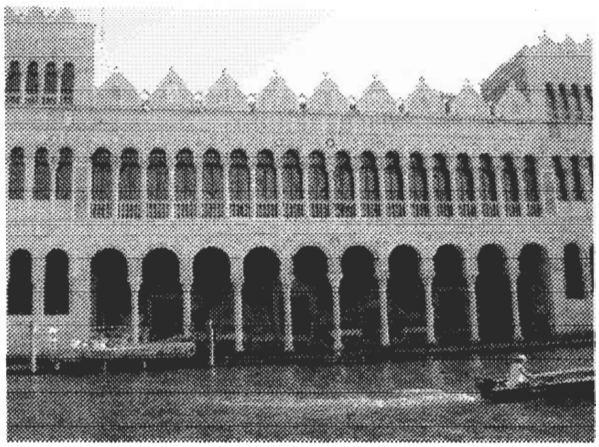


Figure 6-1: Ca' Palmieri-Pesaro built in 1227

Although we updated, and expanded the UNESCO convent files as well as created a computerized database, work could be done in order to record more about the history of the convents. Past reuses as well as original religious orders could be catalogued and used in order to better manage the reuse of these buildings. A group could also create a condition assessment on the convents of Historic Venice and insert more detailed information about the external and internal designs. With this information added to these three databases, they would serve as a great tool for the city of Venice to use to adaptively reuse these buildings to better the city. With the help of this databases and floor plans, someone could create a picture kiosk to be used at a tourist spot. They could create an interactive system displaying pictures of each photographed building and could possibly be linked which the sounds interactive program. This system could aid tourists in finding certain buildings or city planning boards to view the location and picture the building in question for reuse.

In addition to enhancing these existing databases, work can be done to complete the analysis of the impact of reuse on the surrounding area for the whole city. Even though we completed a thorough analysis for two areas, in the scope of things these areas are minuscule. In completing that kind of analysis for the whole historic center, the city of Venice can better observe reuse trends and make better predictions on reuse project results. In following our example and receiving information from actual witnesses, the analysis can be completed and used to show the difference reuse makes.

With all of this information and the tourist index, a group of students could begin to distribute the information to planning agencies and city officials. They could hold conferences discussing how the information can be used to aid in the adaptive reuse process as well as pointing out which sections are in need of reuse and which sections are too close to becoming overfilled with tourists. With help in strengthening communication ties between agencies, the city of Venice can use adaptive reuse to benefit all of the people located near a site. With all of our work and the suggestions we have made, Venice can come closer to reaching a compromise between conservation and adaptation.

7 Acknowledgements

Throughout this project, there have been several people and organizations that have helped us in many ways. Their contributions have aided us in completing our project goals efficiently and effectively. We would like to thank all of these people for their generosity and support.

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