



Public Art Preservation in Venice: Non-public Wellheads and Fountains

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CHAPTER 1 - INTRODUCTION

As our society places more and more emphasis on technological development and further advancement of our civilization, historical heritage is often forgotten. Public art serves as a reminder of the great cultural past. It is significant not only because of its historical and artistic value but also due to its wide availability for everyone to enjoy and experience. Without proper care outdoor art is slowly deteriorating and vanishing from sight.



Figure 1: Architecture and wells ¹

One of the greatest collections of public art is located in Venice, Italy where many historical and cultural artifacts are scattered throughout the city. Some of the most skilled masters in Europe contributed to the city's great artistic heritage (see Figure 1). Even though some objects of art were stolen or destroyed over the years, it is estimated that there is still approximately 5,000 pieces of public art remain in Venice today.³ This abundance of art is located in a city with a population of 292,591 people.⁴ This is sixteen times the density of outdoor art in the U.S., where 30,000 sculptures⁵ are publicly accessible to the population of 293,178,613 people.⁶ Due to the vast amount of public art in existence and no authority deemed in charge for its preservation, much of Venetian public art is at risk of falling into disrepair. Everyday more and more these treasures are deteriorating and breaking down due to neglect for their welfare. Without proper care and maintenance, the decay of public art will continue into the future, and cause the loss of part of artistic history.

The wellheads of Venice are a perfect example of public art in danger. In its prime, Venice had over 7,000 wells to supply drinking water to the population.⁷ The wells served as social centers, where people gathered twice a day to get their ration of water. Today there are only about 2,000 left and less than 300 in public view.⁸ With the completion of the aqueduct in the late 1800s, the wells lost their function, and were consequently abandoned. Tourists and general population have found use for them as



Figure 2: One current use of wellheads²

¹ Blackwell. *Preserving Venetian Wellheads*. pp16-18

² Rizzi, Alberto. *The Well-Heads of Venice*. Stamperia di Venezia Editrice, Venezia 1982. p. 359

³ n.d. <http://www.wpi.edu/News/Releases/19956/venice.html> Accessed 5 May 2004

⁴ n.d. <http://www.venicebanana.com/eng/intro.htm> Accessed 5 May 2004

⁵ n.d. <http://www.heritagepreservation.org/PROGRAMS/SOS/aboutsos.htm> Accessed 5 May 2004

⁶ n.d. <http://www.census.gov/cgi-bin/popclock> Accessed 5 May 2004

⁷ n.d. <http://www.venicemagazine.it/acquad.html>. Accessed February 20, 2004.

⁸ *Idem*.

benches and flowerpots (see Figure 2). But despite the attempt to find a new function for them, these wellheads, and especially the art that decorates them, are still deteriorating, and with them a unique and colorful past (see Figure 3). The lack of repairs stems from the absence of attention and concern for public art and its condition. Wells in the modern society do not have a practical function, which results in minimal concern for their preservation. These factors, combined with the socio-economical affects, lead to destruction of Venetian wellheads and fountains.

The community of Venice, as well as many organizations in Italy and the U.S., is concerned with the condition of Venetian public art. Restoration of particular pieces of art have been addressed in the past, but no single authority was put in charge of monitoring and prioritizing restoration Venetian public art as whole. Past projects and studies took a step forward by documenting and assessing damage of various pieces of outdoor art as well as forming a basis for founding a non-profit organization for preservation.



Figure 3: Example of deterioration of wells⁹



Figure 4: Venetian Fountain

Our research contributes to the existing database of public art in Venice as well as aid in establishing an organization for its preservation. We systematically searched the city to locate and document previously unrecorded wellheads and fountains. We also augmented the existing catalog with information gathered from non-public wells, as well as created a new catalog of public fountains (see Figure 4). From the data and methodologies produced, we provided the final push for the formation of such an organization. Restoration of public art will help to raise public awareness of the problem and increase a sense of pride in Venetian heritage. Our group is hoping to preserve a unique part of world and Venetian history, as well as

create a greater respect for the city's native treasures.

⁹ Rizzi, Alberto. The Well-Heads of Venice. Stamperia di Venezia Editrice, Venezia 1982.

CHAPTER 2 - BACKGROUND

This project focused on collecting information to create a complete documentation of the fountains in Venice, as well as documentation of the non-public wellheads. We considered the formats of past projects documentation, and we made sure to maintain consistency in how the data was stored. This also allowed for the creation of a compatible database with the previous catalogs. With a combination of these new catalogs along with those that were previously created, it provides the most extensive source of data and information about Venetian public art.

Our team designed and organized techniques and processes to be used by a non-profit organization that will serve as the main authority over the welfare and protection of public art in Venice. This association would utilize this extensive source of information created in order to help keep track of the public art as well as to prioritize the restoration processes.

2.1 Types of Public Art

There are many types of public art in Venice, and they are separated into six main categories. These categories consist of: erratic sculptures, flagstuffs, wellheads, *portali*, monuments, and the newly added fountains.

2.2.1 Erratic Sculpture

An erratic sculpture is defined as “outdoor art, also known as public art, basically consists of the ornaments whose purpose is to decorate, for public display, the various buildings of the city of Venice.”¹⁰ This definition excludes art that is a structural part of a building, such as doors, columns, and windows. These erratic sculptures, however, cannot be a part of repeating designs. There have been 300 pieces of such art found in Venice. The majority of these erratic sculptures fall into eight main categories: coats of arms, confraternity symbols, crosses, inscriptions, *patere*, reliefs, statues, and street altars¹¹. Each of these is described in the following sections.

¹⁰ Beltran. [A Computerized Catalog of Public Art in Dorsoduro, Venice](#), pp. 19-20.

¹¹ Elbag. [Preservation and Restoration of Venetian Public Art](#), pp. 17-21.

2.2.1.1 Coats of Arms

Noble families of Venice would often commission a coat of arms to be sculpted on their buildings. They all have the basic shape of a shield, usually surrounded by other symbols that are meaningful to the family (see Figure 5). There are many different styles of coats of arms including gothic, renaissance, and baroque. There are 1064 different coats of arms presently in Venice¹³.



Figure 5: Coat of Arms¹²

2.2.1.2 Confraternity Symbols

Confraternity symbols were very similar function to the coats of arms in the respect that they were a representative of a group. In the case of confraternity symbols, they were representative of the various *scuole* in Venice. They were sculpted on all buildings that had any association with a particular *scuola*. There are 196 confraternity symbols found throughout Venice¹⁴.

2.2.1.3 Crosses

Crosses found throughout Venice were sculpted as are representative of the Christian religion. The three main styles of crosses are Greek, Latin, and Maltese. There are 74 crosses recorded in Venice¹⁵.

2.2.1.4 Inscriptions

Inscriptions are words carved into stone that serve as a memorial of some person or event. There have been twenty eight inscriptions found in Venice.

2.2.1.5 Reliefs

Reliefs are sculptures that are made on walls and are raised up from the surface. There are two different types of reliefs, high and low. They are categorized by the amount of the figure that protrudes from the surface. A high relief sculpture has half or more



Figure 6: Relief depicting The Merchant of Venice¹⁶

¹² Elbag. Preservation and Restoration of Venetian Public Art, pp. 17-21.

¹³ Idem.

¹⁴ Idem.

¹⁵ Idem.

¹⁶ Idem.

of its depth protruding from the surface, while low relief sculptures are those with less than one half protruding. There are 386 relief sculptures found on the walls of Venetian building.¹⁷ An example of a relief is shown in Figure 6.

2.2.1.6 *Patere*

Patere are small reliefs that have a Byzantine background. They are usually circular in shape and display some sort of animal or plant. Some *patere* date back as early as the 1100's. There are 471 *patere* in Venice¹⁸.

2.2.1.7 *Statues*

Statues are carved pieces of stone that are connected to a building but not built into a wall. For example, they can be found accentuating the roof line of an important building or church. There are 173 of these types of sculptures found throughout Venice¹⁹.

2.2.1.8 *Street Altars*

Street altars are religious stations located throughout Venice. The most common of these altars have sculptures or reliefs of Christ, the Virgin Mary, saints, or any combination of the three. There are 108 of these throughout Venice²⁰.

2.2.2 Wellheads

The wells of Venice were not constructed like normal “artesian” wells, simply because the surface of the island was formed from swampland, which were filled with salt water. Due to this problem, the Venetian people devised a system of cisterns that would collect rainwater, filter it, and retain it in a clay basin, which citizen could then access. The wellhead was the part of the well that was above ground. Wellheads can be found throughout the city in most *campes* (see Figure 7)²¹. This system provided Venice’s fresh water for hundreds years until the implementation of the aqueduct from the mainland in 1882-84.²² There are 217 public wellheads in Venice today²³.



Figure 7: Wellhead in Venice

¹⁷ Elbag. Preservation and Restoration of Venetian Public Art pp. 17-21.

¹⁸ Idem.

¹⁹ Idem.

²⁰ Idem.

²¹ Knoph Guides: Venice. New York: Knopf, 2001, p.81.

²² *Ibid*, p. 19.

²³ Elbag. Preservation and Restoration of Venetian Public Art pp. 17-21.

2.2.3 Portali



Figure 8: Portali²⁴

Portali are doorways that include structural artistic elements. *Portali* were created as a way to dignify an entrance to a building or courtyard. There are 552 *portali* located around the doors of Venice²⁵. One is shown in Figure 8.

2.2.3.1 Lunette

*Lunette*²⁷ are a subset of *portali*. *Lunette* are artistic sculptures located in an arch doorways on the outside. The main



Figure 9: Lunette²⁶

purpose of *lunette* are to create an ornate entranceway and to serve as status symbol. There are 71 *lunette* in Venice²⁸. One is shown in Figure 9 .

2.2.4 Flagstaff Pedestals

Flagstaff pedestals are often located in the *campi* around Venice. They support the flagpoles, which served as another method of identifying a certain area with a family, *scuole*, or other organization. The body of the flagstaff generally contains some sort of carved design or inscription. There are 57 pedestals throughout Venice, although only 35 of them contain flagstaffs, one of such is shown in Figure 10.



Figure 10: Flagstaff and Pedestal

2.2.5 Keystones

A decorative keystone is the stone placed at the top of an arch that helps to distribute its weight and arch together. Keystones were generally decorated with human heads to make the arches more interesting and attractive²⁹.

²⁴ Elbag. Preservation and Restoration of Venetian Public Art pp. 17-21.

²⁵ Ibid., pp. 17-21

²⁶ Ibid., pp. 17-21

²⁷ Lunetta literally means “small moon” due to the crescent or semi-circular shape.

²⁸ Ibid., pp. 17-21

²⁹ Elbag. Preservation and Restoration of Venetian Public Art, pp. 17-21.

2.2.6 Monuments



Figure 11: Monument

With the abundance of public art, it would seem strange that they have so few monuments erected across the city. The reason is that before the fall of the Republic, Venetian laws prohibited the people from creating freestanding statues in public areas. This law was made to keep the families of Venice from fighting over who was more important and powerful in Venice. Another reason for the lack of monuments is the lack of land throughout the city. The Venetians couldn't valuable land due to the size of the city³⁰. A Venetian monument is shown in Figure

11.

2.2 Damage to Public Art

Damage to the public art comes in many forms, manmade and natural, intentional and unintentional. Venetian wells are placed in the middle of the plazas, which expose them to many dangers such as: weather, pollution, and biological agents as well as vandalism. The following section describes the effects of each of the above elements on the public art of Venice³¹.

Rain and *Acqua Alta* have a severe affect on the stone, slowly eroding it more and more every year. Another problem that comes up is when water gets into the cracks and freezes; it expands and forms ice and thus widens the existing cracks as well as creating additional ones.³³

Acid rain and gasses such as CO₂, from the motor boats and the surrounding industrial plants all play a large part in the erosion of the stone³⁴. SO₂ is also formed from the stone, and can become sulfuric acid, which takes a toll on the surface.



Figure 12: Biological damage³²

³⁰ Ibid., pp. 17-21.

³¹ Blackwell. *Preserving Venetian Wellheads*, pp 28-30

³² Ibid. p. 137

³³ Amoroso, Giovanni. Fassina, Vasco. *Stone Decay and Conservation*. Elsevier, New York, 1983 p. 23.

³⁴ Ibid. p. 54.

Biological considerations such as fungi, algae, lichens, and bacteria all can lead to destruction of the wells simply by the natural decay of the stone, due to the chemical agents and biological acids they can produce, as seen in Figure 12.

Manmade damage includes the defacing of the structures with graffiti and unintentional abuse (see Figure 13). Examples of such abuse are: people accidentally breaking pieces off the stone as they sit on them; placing an additional weight load or leaning on art, which are pressure they were not designed to withstand. Another example of this was in recent news; someone was caught attacking and defacing multiple pieces of public art in Venice. He was consequently arrested and put in jail³⁶.



Figure 13: Unintentional damage and Vandalism³⁵

2.3 Previous Public Art Studies and Projects

In the past there have been a plethora of projects and studies conducted by many professionals interested in public art and its welfare. Some such individuals that have made big contributions to the awareness and importance of public art in Venice are Alberto Rizzi, Guiseppa Tassini, Ferd. Ongania, and many other professionals.

The Worcester Polytechnic Institute (WPI) has also completed many projects on public art through the WPI Venice Project Center (VPC). From the public art projects done through the VPC, information was gathered on over 4,200 pieces of public art. From this information, five extensive interactive multimedia catalogs of public art were created which integrated Microsoft Access databases, a Geographical Information System (GIS) called MapInfo, and a multitude of photographs. The five consist of catalogs of erratic sculpture, flagstaffs, wellheads, lunette, and monuments.

2.4 Current System Problems

The problem with the preservation of the public art in Venice is that it is not given enough attention by the government and the public. The government is the only authority, as of now, that

³⁵ Blackwell, *Preserving Venetian Wellheads*, p 27.

³⁶ Il Gazzettino. *Venezia, martellate su altre immagini sacre*. 2004 June 28, p 1.

has any sort of jurisdiction over public art in Venice.³⁷ There *are* laws in place that protect public art, however there is no specific branch of the government that is responsible for enforcing these laws.

Ownership is a very important factor in the preservation of public art.³⁸ Some pieces of public art are located between two building floors with each floor having different owner. Because of unclear ownership public art is often neglected. Everyone is willing to claim that they own one of these treasures, but no one is willing to be responsible to pay for preservation or restoration of them.

2.5 Past Preservation Efforts

A major role in the preservation of Venetian public art is played by the United Nations Educational, Scientific and Cultural Organization (UNESCO).³⁹ The specific branch of the organization dedicated to Venetian preservation is called “UNESCO – Private Committees Program for the Safeguarding of Venice” and consists of three components: *soprintendenze*⁴⁰, private committees, and UNESCO. All three branches work closely together to identify and address restoration priorities.

After the devastating flood in 1966, over 30 other organizations were established in a number of countries to collect and channel contributions in order to restore and preserve Venice. These organizations include Save Venice, Venice in Peril, and Pro Venezia. Since 1969, they have funded the restoration of more than 100 monuments, 1,000 works of art, provided laboratory equipment, and sponsored research and publications.⁴¹ Each year, UNESCO, the Superintendents for the Artistic and Historic Heritage of Venice and for the Architectural Heritage of Venice, along with church leaders, and interested citizens suggest works of art and buildings in need of restoration. Then it is up to the board leaders of each specific organization to choose which projects to sponsor according to artistic merit and urgency of need.⁴²

³⁷ Ibid., p. 26

³⁸ Ibid., p. 27

³⁹ n.d. Venice in Peril. Home Page. The Venice in Peril Fund. <<http://www.veniceinperil.org>> Accessed 2004 April 20

⁴⁰ This office in conjunction with the Italian government is responsible for passing laws regarding the preservation of public art.

⁴¹ n.d. Venice in Peril. Home Page. The Venice in Peril Fund. <<http://www.veniceinperil.org>> Accessed 2004 April 20

⁴² n.d. Save Venice. Hazen Polsky Foundation Inc. <<http://www.savevenice.org>> Accessed 2004 April 20

CHAPTER 3 - METHODOLOGY

The focus of this project was to create a comprehensive catalog of fountains and non-public wellheads in Venice, and to create methods and materials used to promote an organization for the preservation of Venetian public art.

There was a few limiting factors of our research; time was a critical concern due to the fact that we need to complete all the catalogs of public art as well as work on the organization in a short eight week period. Another factor that limited our work was the unreliability of certain sources we procured that turned out being either incomplete or inaccurate. Accessibility became a significant limiting factor in creating the wellhead catalog since our group was unable to verify locations of large number of wellheads that were closed for the public view.

In the following chapters the focus of this project is broken down in further detail, describing the various methods and procedures that we utilized in completing our objectives.

3.1 Creating a Catalog of Non-Public Wellheads

Our group continued the effort to catalog Venetian wellheads as started by the project Preserving Venetian Wellheads in the year 2000. The previous project as created a complete catalog of public wellheads. Our project was devoted to cataloging semi-public and private wellheads. Since a majority of these wellheads are not in public view and belong solely to the property, owners we did not concentrate on detailed damage assessment and thus follow the previous methodology. Our team made the first pass through Venice, which was designed to document and take pictures of all existing and potential locations of non-public wellheads. This data was then organized and used in further analysis. A second pass through Venice was required to attempt to gain access to inaccessible areas by contacting the property owner, and also to collect detailed damage assessment data.

3.1.1 Fieldwork for Wellheads



Figure 14: Documented well verses possible well.

To determine the actual locations of non-public wells we used a preexisting map of the city's architecture. First, we established all the potential locations by tracking down small circles in enclosed areas. As shown in the map (see Figure 14) the red circle indicate two possible locations for non-public wells and the orange dot represents a public well

documented by past IQP groups. After we have created a separate MapInfo layer with all the

possible locations we systematically searched the city on foot to verify their existence. Our team began the foot search at the first address of each borough and followed the addresses sequentially in ascending order to ensure that we make a pass through every street. We paid extra attention to the mapped-out potential locations during our foot search. In order to gain access to many of the semi-public locations we had to get a permission to take a picture by explaining the nature of our project. Business cards proved to be the most effective way of establishing our credibility and gaining access. Once our team has located a wellhead we recorded its exact location in the GIS layer, wrote down the condition rating, and took a photograph that was used in later the analysis. The accessibility level was represented on the layer by red, yellow, and green icons. Green represented wellheads located inside semi-public buildings, such as hotels, hospitals, schools, and churches. Yellow represented wellheads located inside privately owned property, primarily residential courtyards. If we were not able to verify the existence of wellhead at a potential site, we marked that location with a red icon.

3.1.2 Wellheads Database

We stored the data that we gathered about non-public wellheads in a Microsoft Access database. Table 1 provides a description of each field. We did not take some of these measurements in the field, but instead performed visual assessment of them later from the photographs. When cataloging the wellheads our team did not concentrate on gathering detailed damage assessment information like in previous projects, since we were primarily concerned with documenting the location and ownership of the wellheads.

Database Fields	
Wellhead Number	A unique number assigned to each wellhead for identification purposes
Wellhead Status	Semi-public, private, or inaccessible
Property Name	A name of semi-public property where the wellhead is located (Ex: hotel, school, etc)
Sestiere	Name of the borough where the wellhead is located
Address	Number address of the property on which the wellhead is located
Period	Approximate century in which the wellhead was created
Condition Rating	A number 1 to 5 identifying the condition of the wellhead. These numbers correspond to “very good”, “good”, “average”, “bad”, and “very bad” where 5 is the best condition.
Metal Accessories	Whether or not metal accessories are present on the wellhead
Filled	Whether or not the wellhead is filled in with cement or other material
Flowers	Whether or not flowers are planted in the wellhead
Unique	Whether or not a wellhead is unique

Table 1: Database Field Descriptions

3.1.3 Wellhead Condition Assessment

After we collected data we were able to perform visual damage assessment of wellheads. Our team devised system to consistently rank wellhead damage. This information can be used by follow up projects to perform more in-depth condition assessment on site. Detailed information about each rank number can be found in Table 2.





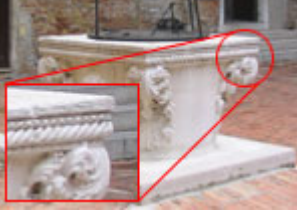
Damage Rating	Picture	Description
1 – Very Bad		Severe structural damage is done to the wellhead. Significant structural cracks are present or large pieces are missing and high grime level.
2 – Bad		Severe structural cracks, numerous surface cracks, and some missing pieces and grime are present on a wellhead.
3 – Average		Wellhead overall is in decent condition. Minor structural cracks and some surface cracks are present as well as grime and signs of aging.
4 – Good		Wellhead is in overall clean and in excellent condition but there are missing pieces and small surface cracks present.
5 – Very Good		Wellhead is in excellent condition. There are no structural cracks, and very few surface cracks and chippings are present.

Table 2: Damage Rating

3.1.4 Wellhead Period Assessment

Venetian wellheads were created in several unique styles typical to the century in which they were created. By knowing the general styles and shapes of each century it was possible to accurately date majority of the wellheads. The styles are broken down in the following categories: 8th-9th century, 10th century, 13th century, 14th century, 15th century, 18th century, and post 18th century. This data is important for the preservation effort since some types of wellheads are nearly extinct and thus require more immediate attention than others. The example of each style can be seen in Figure 15.



Figure 15: Wellheads Styles by Period

3.1.5 Photographic Documentation of Wellheads

In order to perform visual assessment of the non-public wellheads our team has taken digital photographs of all accessible wellheads. We have chosen the maximum resolution for the available camera: 2048x1536 at 3.2 mega pixels. This resolution allowed our team to obtain the best clarity of the picture and revealed the most details that were useful in the analysis. The pictures were stored in “JPG” format in folders corresponding to each borough. We have devised a naming convention for a direct correlation between the map and the photographs. Each photograph was named based on the corresponding address of the property on which the wellhead was located, wellhead number, and number of the picture for that wellhead. For example, if the wellhead was located at address 704 in Dorsoduro, it was the second wellhead on the property, and it was the third photograph taken of that wellhead, the photograph would be named DD704_2_3.JPG.

3.2 Creating a Catalog of Fountains

Another task that was completed by our team was the creation of the catalog of Venetian fountains. We have located all the working and non-working fountains in Venice, cataloged their physical properties and performed detailed damage assessment. The damage information was used in analyzing the condition of Venetian fountains that can be used later in restoration process if it will be deemed necessary. This part of our project takes another step towards completion of a complete inventory of Venetian public art.

3.2.1 Locating Fountains

First we began with a systematic foot search of the city going down every street in the attempt to locate all of the fountains. After completing three boroughs in this manner we obtained a list of all the fountains and their locations from VESTA, the water company in Venice. With this list, we were able to verify all the location of the fountains as of 1996. While completing the remaining boroughs, we verified the list to find the locations of any fountains that were removed.

At each location our team took pictures of all the sides starting with the A side (the side with the faucet) and then going clockwise. At the same time a team member would enter the location and fountain number into MapInfo. After we took the measurements such as height, base area, percent algae, and flow rate we entered them directly into the access database. To measure flow rate, we used a one liter container and timed how long it took to fill it. We measured height and other dimensions with a tape measure and the percentages were calculated from surface area of the affected area divided by the total surface area. To determine the grime level we looked at the total grime coverage of the fountain. If the entire fountain was covered in dirt, concrete spatter, gum or anything else leaving behind a residue it was considered high grime, if only a specific area of a fountain was covered in thick it received a medium rating, and if there was a light coating of dirt on the fountain it received a low rating. High traffic was determined by how many people walked by while we were taking measurements. Visibility was determined based on how easily the fountain can be seen from the campo or an open area. Missing pieces were categorized by “many”, “some”, or “none” based on the amount missing.

3.2.2 Documenting Database

We designed a form for cataloging the fountains in Microsoft Access and with the laptops entered all data directly into the database. We did this to both save time and minimize an error in data entry. Appendix B provides a screenshot of database form we used for the data collection. Table 3 provides a description of quantifiable measurements that our team took in the field.

Quantifiable Measurements	
Number Of Drains	Number of drains used for collecting fountain water
Faucet Length	Length of the faucet measured in centimeters from the tip to the junction with the body
Faucet Height	Clearance height of the faucet measured from the drain to the bottom of the faucet
Flow Rate	Flow rate of the fountain measured in liters per minute
Surface Area	Complete surface area of the fountain

Table 3: Measurements of Fountains Physical Characteristics

Information in Table 4 describes the measurements related to the condition and the state of conservation of the fountains.

Damage Assessment	
Algae	Percentage of the total surface area of the fountain covered with algae
Graffiti	Percentage of the total surface area of the fountain covered with graffiti
Rust	Percentage of the total surface area of the fountain covered with rust
Original Paint	Percentage of the total surface area where original paint is present
Grime	Level of dirt and residue present on the fountain ranked as “high”, “medium” and “low”
Surface Damage	Percentage of the total surface area that contains peeling, chalking, and flaking. Rust is not included as part of surface damage
Missing Pieces	Level of deterioration described as “none”, “some”, or “many”

Table 4: State Of Conservation Measurements for Fountains

When gathering the data quantified as a percentage we have agreed that in order to obtain more consistent results it would be beneficial to round the data to the nearest 5%.

3.2.3 Fountain Condition Assessment

When our team calculated condition ratings for fountains we included a multitude of factors, such as rust, algae, graffiti, surface damage, grime, and missing pieces. When dealing with the fields that were not quantitative we assigned numbers to represent each. For grime, low corresponded to 1, medium to 50, and high to 100. For missing pieces, none corresponded to 0, some to 50, and many to 100. To calculate the percent damage we weighed in each field based on how much each factor contributed to the structural damage of the fountain (see Table 5). For example, algae was given less importance compared to surface damage because it is only relevant to the cleaning process, and is not a deciding factor in whether or not fountain needs to be replaced. The algorithm describing condition ranking was calculated is shown in Figure 16. The damage ranking for each fountain can be found in Appendix D.

Field	Weight
Rust	15%
Algae	10%
Graffiti	15%
Surface Damage	25%
Grime	20%
Missing Pieces	15%

Table 5: Weights of Damage

Algorithm
$\text{Condition Rating} = (\text{Rust} \times .15) + (\text{Algae} \times .10) + (\text{Graffiti} \times .15) + (\text{Surface Damage} \times .25) + (\text{Grime} \times .20) + (\text{Missing Pieces} \times .15)$

Figure 16: Algorithm for Damage Calculation

3.2.4 Photographic Documentation of Fountains

Our team took five digital photographs for each fountain at 1600x1200 resolution. We started taking a picture on the side with the faucet and repeated that for each of the four sides, going clockwise around the fountain. We also took one picture of the area where the fountain was located. We named the sides “a” through “d”, starting with the faucet and going in clockwise direction. We used a ‘v’ for the side view. Our team labeled these pictures with the corresponding fountain number and letter of the side. For example a picture of the back of fountain number twelve is “f12_c.jpg”.

3.3 Creating Promotional Materials for the Non-Profit Organization

The final part of our project was concerned with the promotion of the non-profit organization for preservation of public art, which will emerge as a result of this and several previous projects. To raise the awareness of the organization, as well as public art in general, we have created a promotional book on the Venetian public art and a web presence system that will be used to raise the initial capital for the organization and promote its purpose.

3.3.1 Promotional Journal for Non-profit Organization

Every quarter, INSULA publishes a journal on urban issues in Venice. With their generous support, our team was given an opportunity to layout and produce the contents for one of next year’s issues. The purpose of this issue is to promote the new organization for the preservation of Venetian public art that our team is aiding to create. Along with the details about the organization and membership, there is also detailed and extensive background on public art. We compiled and organized the data from our project, as well as past projects that dealt with related issues. From this

we created a complete layout with all the information about public art included. Each page layout contains statistics, maps, photographs, and descriptions about each type. We are also including articles written by various professionals on related topics into the booklet. This publication will serve as a means to raise awareness the organization as well as current problems with Venetian public art.

3.3.2 Website for Organization

Our team designed and created a detailed website mock up of how the organizations website will function. Below are descriptions of the purpose and the breakdown of each section of the website.

Home	Initial index page of the website. It includes a welcome message and brief description of the organization and its purpose.
About Us	
Our Mission	This section includes the mission of the organization and the goals that it plans to accomplish.
How to Join	This section of the website is dedicated to the membership information, member dues and duties. It also describes all the necessary steps that a person needs to take in order to join the organization.
Completed Projects	The completed projects section provides information about the restoration projects that were completed by the organization. For each project there will be a description with its historical significance followed by the Soprintendenze that provided the direction of works (if applicable), and a list of sponsors who have contributed to the restoration of the project. The list of donors will be sorted based on the amount contributed to the project.
Our Benefactors	This section will include the list people and organizations that have made significant financial contributions to the organization. There will be a separate section dedicated to the corporate support that the organization has received. Financial contributions received by individual people will be grouped into amount ranges and then sorted alphabetically.
About Public Art	
What is Public Art?	This section will give a definition of public art and stating its importance. It will provide information different types of Venetian public art with pictures and link to the interactive GIS maps.
Top Priority	This section will list public art by category and each category will be sorted by the priority for restoration. Each table will provide description

	of each piece of public art with its location and link to a photograph if it is available.
Search for Public Art	This section provides an interface to search the public art database. Instead of searching individual databases of public art, this part of the website will be connected to the combined database of all of public art as started by the 2003 project <i>Preservation and Restoration of Venetian Public Art</i> .
Contribute	
Donate	This part of the website will give a short introductory paragraph about importance of donating to the cause and provide information about tax and other benefits that are applicable to making a donation. It will also use an web-based interface for gathering funds as well provide all the necessary information for making a direct wire transfer.
Other Organizations	
Soprintendenze	This section describes the function of <i>Soprintendenze</i> and how they fit in into the current system for the preservation of Venetian public art.
UNESCO Committees	This section provides a complete list of other organizations dedicated to preserving Venetian heritage with contact information of people in charge.
Get in Touch	
Contact Us	This section provides contact information and everything necessary to get in touch with the people in charge.
Members Only	
News	This part of the website is dedicated to the member-related news. Information about recent developments and achievements within the organization will be posted here as well any relevant information that needs to be passed on to the members.
Top Donors	This section will list the names of the individuals who made the most significant contribution to the organization in the past year. This will provide an element of competition to the members and give more of an incentive to give large donations.
Discussion Board	This is the place where the members can communicate with each other and share relevant information. Members will also have a way to communicate with the people in charge of the organization, give suggestion, and ask questions.

CHAPTER 4 - RESULTS AND ANALYSIS

The purpose of this project was to finalize the cataloging of all the wellheads and fountains in Venice and to add them to a multimedia catalog of public art. In addition to expanding the multimedia catalog of public art, another goal of the project was to create ideas and materials for running and promoting an organization for the preservation of Venetian public art. We produced a structure for a web-based system which will serve as an engine for fund raising, giving credit to the donors. The other material we produced is an issue of the quarterly publication, *Quaderni*, which is issued by *INSULA* about Venetian public art.

4.1 Catalog of Non-public Wellheads

Through the creation of the non-public wellhead catalog, many results were produced from the data we collected, as well as analyses done based on the results. In the process of locating the wellheads, results about the accessibility of the wellheads were produced. The cataloging of the wellheads produced results about the condition and age. From all these results, certain analyses were made as well.

4.1.1 Location of Wellheads

As we visited all the potential locations of the wellheads as well as the locations found during the systematic foot search we marked their accessibility status on the MapInfo layer (see Figure 17).

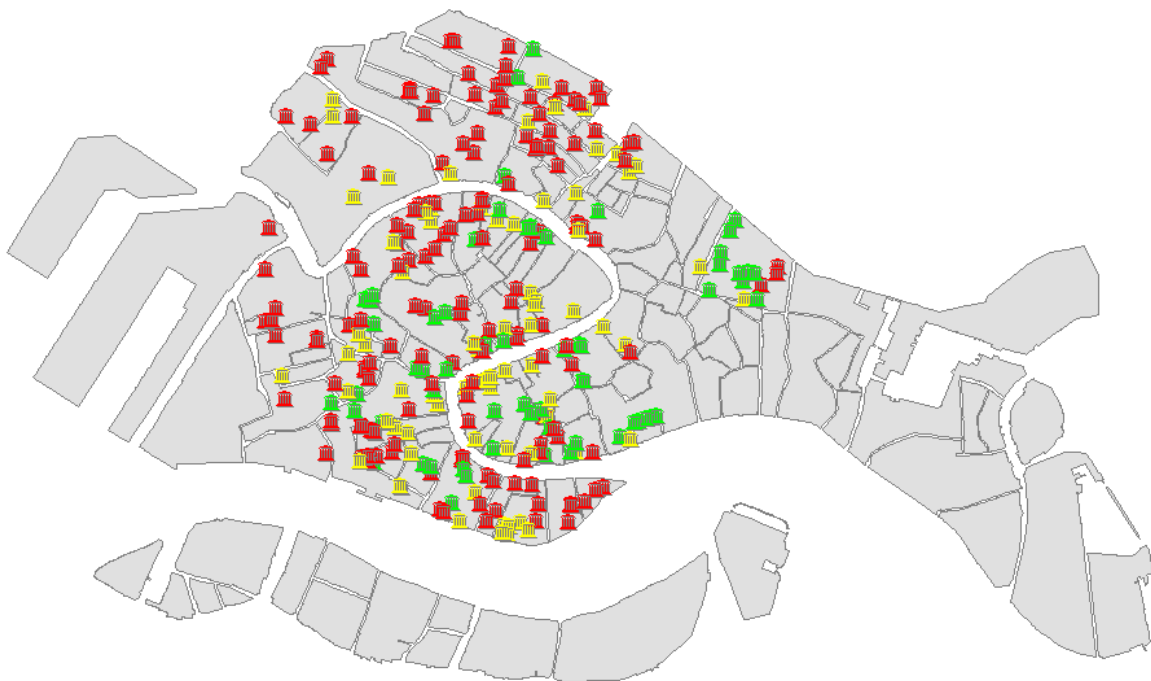


Figure 17: Location of non-public wellheads with accessibility levels

This information is important for other groups continuing the project as well as a non-profit organization for the preservation of public art. Our team did not attempt to get access to privately-owned closed-off potential wellhead locations. Inaccessible status marks the locations that should be visited by the groups continuing the project. Written or oral communication with the owner will be necessary in order to enter the property. The non-profit organization for the preservation of public art can use this information along with the corresponding addresses of each wellhead in order to contact the owner and offer its services. Figure 18 indicates that large percentage of wellheads was inaccessible. From this, it is easy to see which borough requires the most follow-up work in order to create a complete record of non-public wellheads.

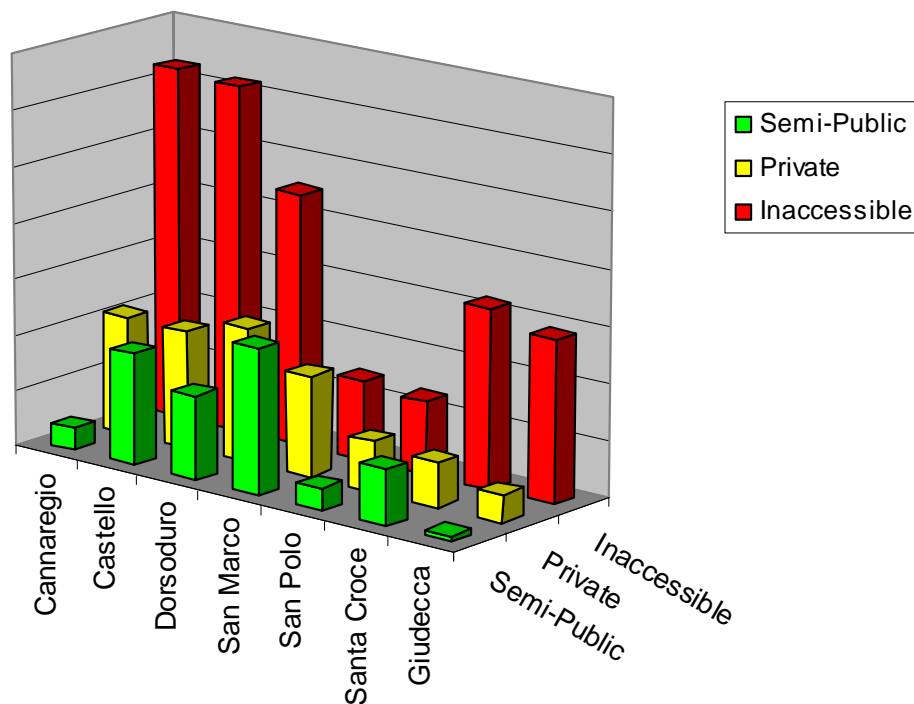


Figure 18: Accessibility levels by borough

4.1.2 Documentation of Wellheads

The documentation of wellheads provided data that enabled us to determine conclusive qualitative results. First, with the condition rating system we created for the wellheads, we were able to determine the condition of each well based of the collected data. After we assigned damage levels to each of the wellheads we created a map of wellhead conditions (see Figure 19). By using this map it is possible to determine which areas need the most attention. Concentrating on the certain areas with the most damage allows for a detailed and accurate damage assessment can be performed more efficiently. If restoration is necessary, concentrating the efforts on a specific island, restoration can be performed efficiently and in a cost effective manner.

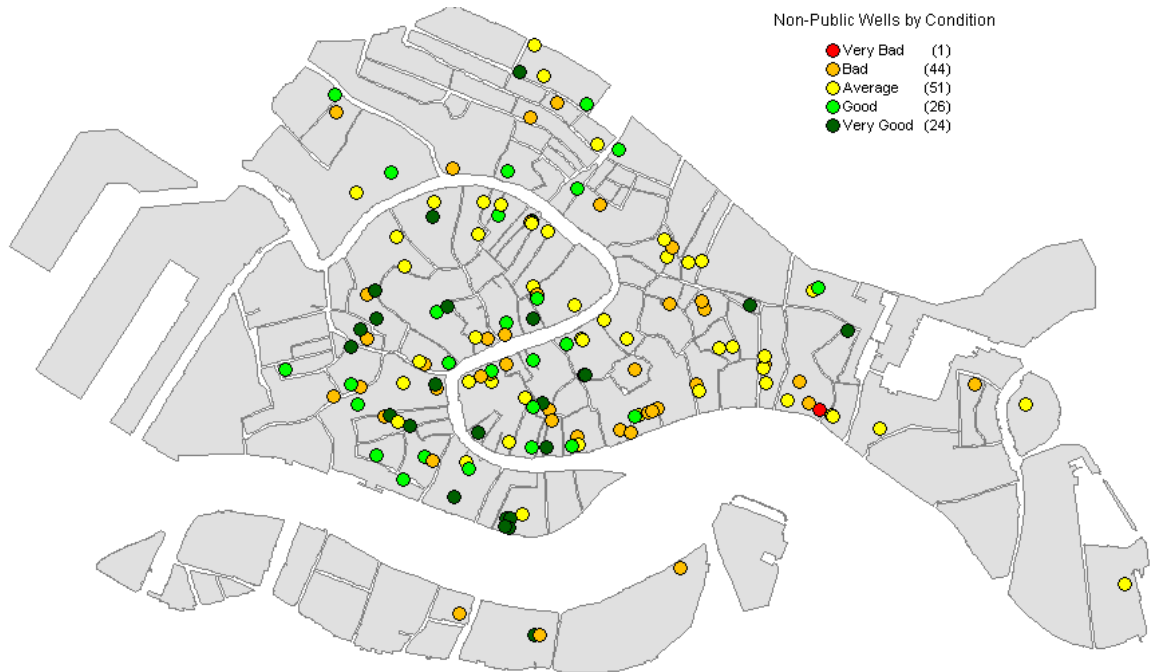


Figure 19: Wellhead damage assessment

The second qualitative result that our data yielded was the age of the wellheads. From research we did on wellhead age we were to create a map of the distribution of the age of wellheads, as shown in Figure 20. The map shows that there are very few pre-14th century private wellheads left in Venice. This information is crucial for the preservation efforts, since older and rarer wellheads have more historical value and should be restored sooner.

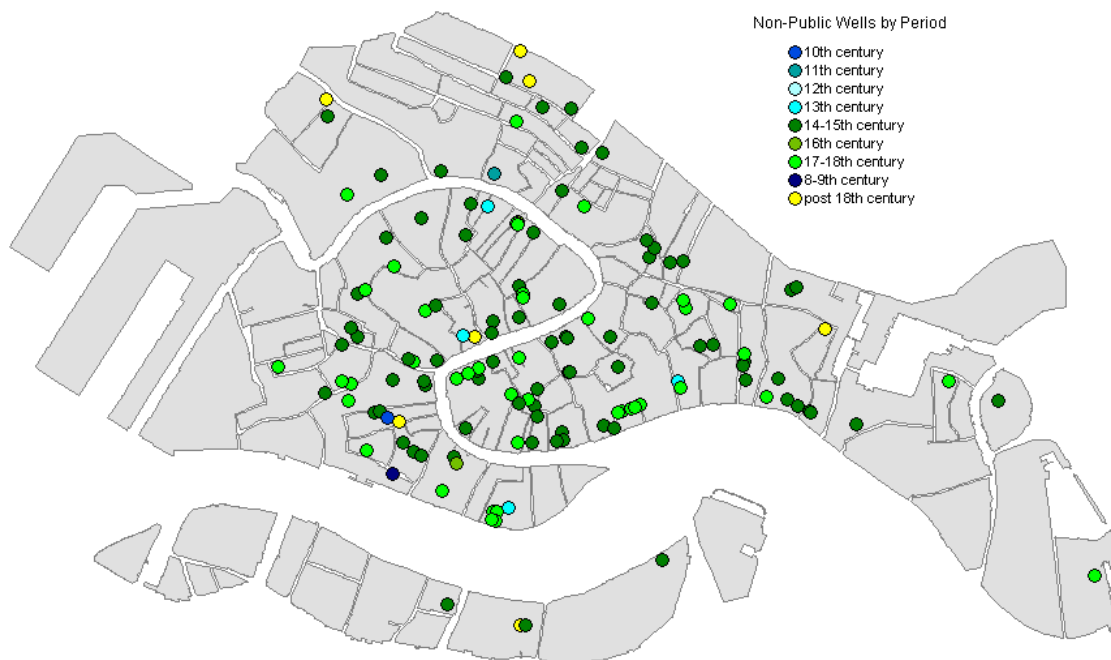


Figure 20: Wellhead Distribution by Period

4.2 Catalog of Fountains

Through the creation of the fountain catalog, many results were produced from the data we collected, as well as analyses done based on the results. In the process of locating the fountains, results relating to the type of fountain were produced. The cataloging of the fountains produced results about their operational status and condition. From all these results, certain analyses were made as well.

4.2.1 Location of Fountains

While locating fountains throughout the city we found that there were many types of fountains, some mass produced and some unique. We separated these types into eight categories, which can be seen in Figure 21. The most common type around the city is what we call Type B as seen in Figure 22 again from the distribution shown in Figure 21. For a detailed list and photographs of each type of fountain see Appendix C.

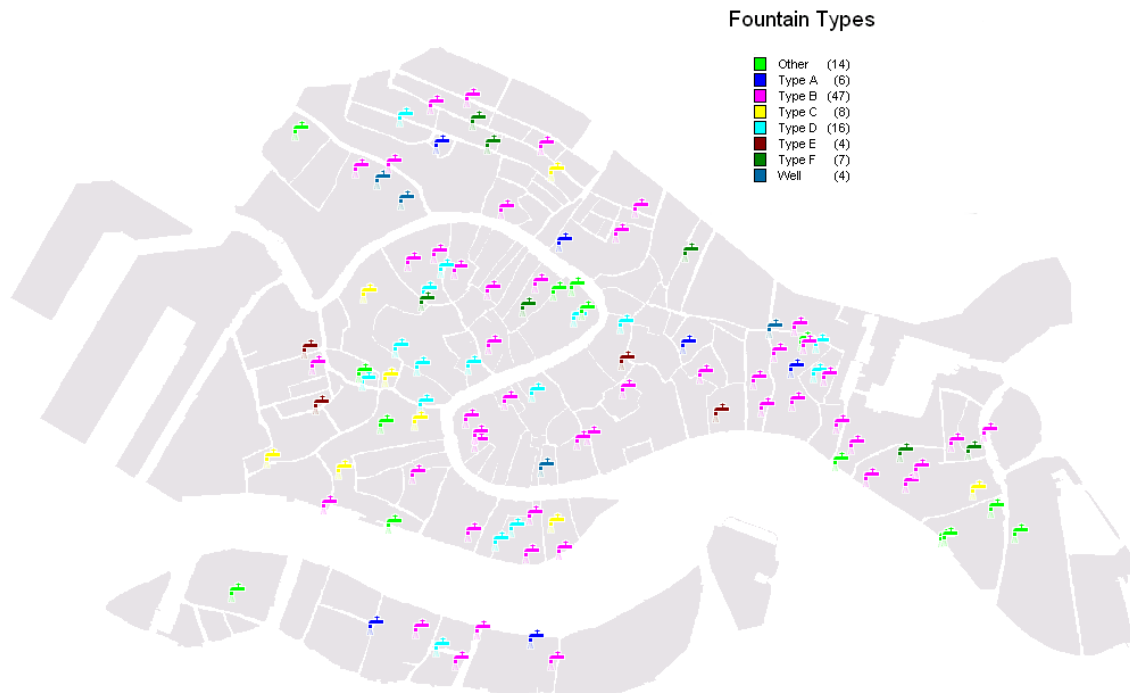


Figure 21: Fountains by Type

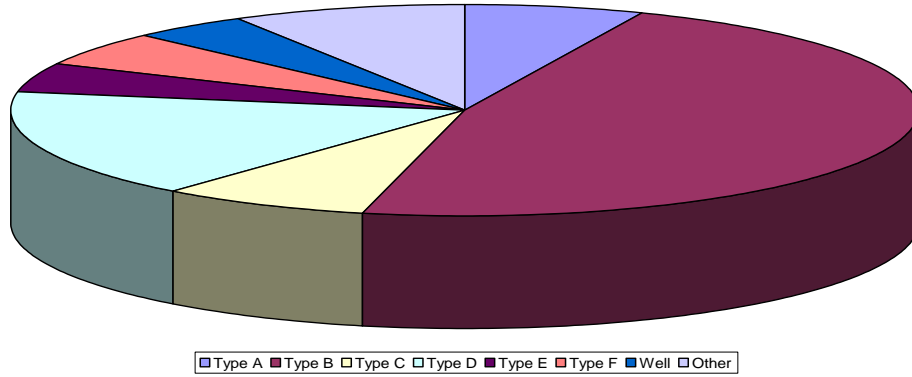


Figure 22: Percentage of Types for Venice

4.2.2 Documentation of Fountains

The documentation of fountains also provided data that enabled us to determine conclusive qualitative results. The flow rate of the fountains proved to be an interesting result from the collected data. It was calculated from the gathered data, that all the fountains collectively dispense roughly 135,867,600 liters, or 41,307,527 gallons, of water every year.

Also while collecting data, it was discovered that there are two main owners of fountains in Venice. The owners of each fountain were determined by the existence of a service panel next to it. The fountains that had a panel were owned by the city, and were installed by VESTA to keep track of the amount of water used in order to accurately bill the city. And so the fountains without a panel were obviously not owned by the city, but by VESTA. We recorded this data and analyzed it to find any correlation with the fountains operational status. The following graph (see Figure 23) shows the percentage that is owned by the city and VESTA. From this data it is possible to see that the city is in control of most of the fountains, split up to roughly 60% owned by the city and 40% by VESTA.

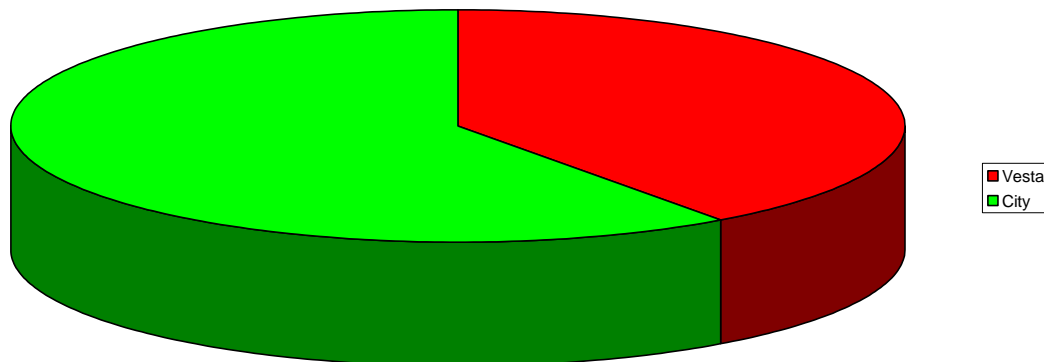


Figure 23:Percentage owned

The map in Figure 24 shows the distribution of fountains owned by the city and VESTA, and the locations of which fountains were running.

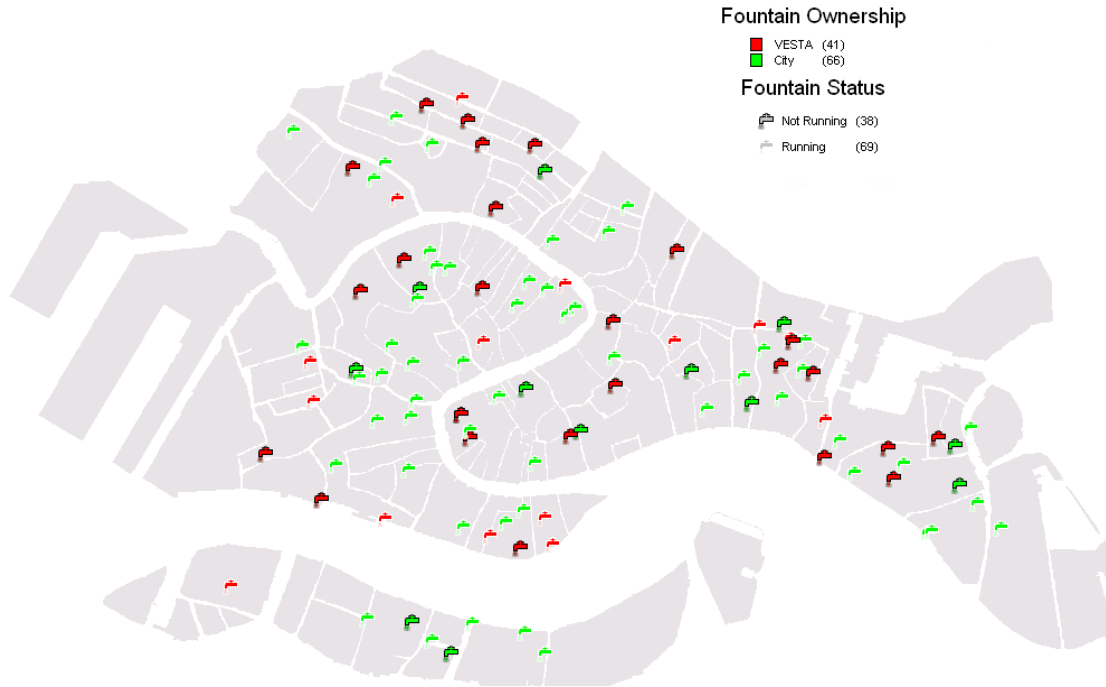


Figure 24: Distribution of Fountain Owners and Status

The next graph (see Figure 25) compares the amount of running fountains to each owner to show which has more operational fountains.

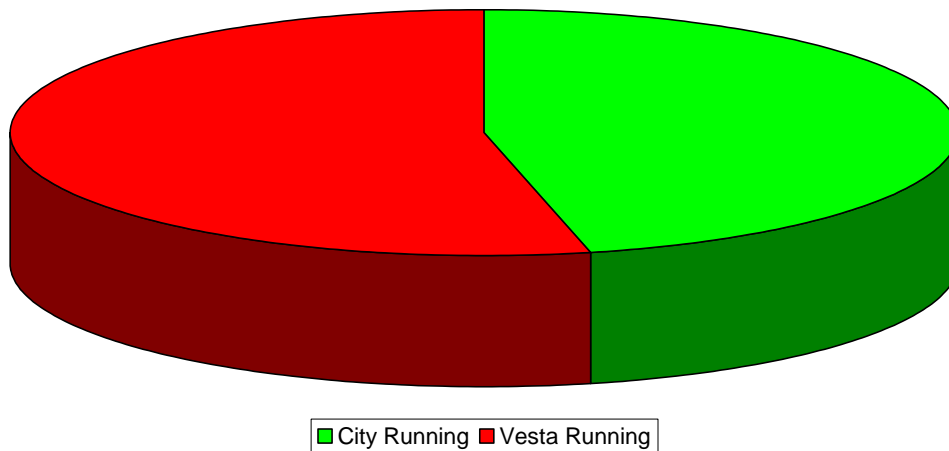


Figure 25: Percentage of Fountains Running by Owner

From this graphs it is possible to determine which owner is providing more water to the city. Out of the running fountains, VESTA has a greater percentage than the city, with VESTA averaging at about 71 percent and the city with 61 percent.

4.3 Creation of Promotional Materials for the Non-profit Organization

The promotional materials that were made will provide the organization with a means of getting out into the community and raising awareness of its cause.

4.3.1 Promotional *Quaderni* for Non-profit Organization

Published by INSULA, the *Quaderni* (see Figure 26) will be released sometime in 2005 as informational source of public art and the organizations concern with its welfare and future. It will be an essential part of raising awareness and gathering people to join the organization.

4.3.2 Website for Organization

The website (see Figure 27) will serve as a new means of making donation to the organization and its cause.



Figure 26: Cover of Book

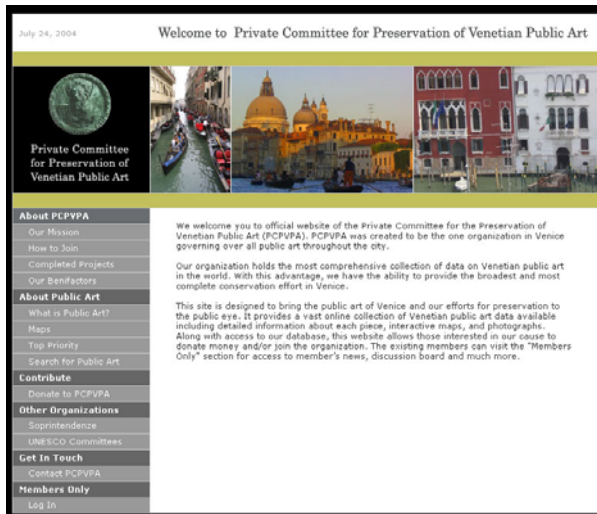


Figure 27: Layout of Website

CHAPTER 5 - CONCLUSIONS AND RECOMMENDATIONS

Within the eight week duration of our project we have produced many results from our work, but there is always more that can be done. There are certain steps that should be taken using the results of our project.

5.1 Recommendations for Public Art Catalog

With the addition of the fountain and non-public wellhead catalogs, the Venetian public art catalog is near completion. The catalogs created should be added to the existing public art catalog and from there used by the organization. With this catalog completed, the organization will be able to use it for more efficient restorations.

5.2 Recommendations for Creating the Organization

With the creation of the promotional materials for the organization, it is the hope that they will help bring the organization, and its cause, into public view. All aspects of the organization have been already planned as seen outlined below:

- Membership Costs and Benefits
- Fundraising
 - Promotional materials
 - Donations
 - Residents and Businesses
- Restoration processes
 - Cost Estimation
 - Bidding and Contracting
 - Supervision



Figure 28: Example of Restoration in Progress

All the detailed plans described can be found in the WPI project entitled, *Preservation and Restoration of Venetian Public Art*, which was done in 2003. With the framework, process, and details of the organization clearly documented by a previous project, it is now possible to put the plans into action and create finally create it. The first step to create the organization would be to find a head administrator that can run the committee full-time. With the leader in place, the organization can be started, and it can begin to restore Venice's public art.

5.3 Conclusions

Now that catalogs are being added to the public art database, and the *Quaderni* being published within the next year, the organization is now ready to start working towards its cause. Using the new website, the organization will soon be able to accept donations online, and begin raising money. Now that all this is in place, public art now has a fighting chance of survival in the future. This can't be done by one group alone; it requires the support of those who share our concern. If you do, we urge to you to take action and join us in the fight to save the unique and artistic heritage of Venetian public art.

APPENDIX A - ANNOTATED BIBLIOGRAPHY

The following annotated bibliography explains each book used in our research, along with the importance it had in our research.

Alfred A. Knopf, Inc.: Venice. New York : Knopf : Distributed by Random House, 2001.

Knopf guide provides very useful information about well construction and other background information on wells. It is not very detailed, but has a good foundation on which we can build. The diagrams of construction will be also useful for our project. This book was found using WorldCat database.

Amoroso, Giovanni, Fassina, Vasco. Stone Decay and Construction. New York: Elseview, 1983.

This book contains detailed information about stone decay especially in relation to the deterioration of buildings and sculptures. Looks like this book will be very useful for the background on preservation efforts. This book was found using WorldCat database.

Beltran, Jesus M., Brophy, Erin E., Cardenas, Alex, A Computerized Catalog of Public Art in Dorsoduro, Venice, Interactive Qualifying Project, E95, Venice, Italy, pp. 19-20.

This IQP was somewhat useful in the creation of the promotional booklet when writing about the erratic sculptures, but otherwise not a lot of useful content.

**Bender, Michael K, Finnegan, David, Francis, Koniers, James, Pete, Lee, Kevin
Fun. Promoting the Conservation of External Sculpture. Interactive
Qualifying Project, Venice, Italy.**

This IQP project completed a decade's worth of work by WPI students on the external sculpture of Venice. To help preserve this art, this project updated and completed a computerized catalog of the 2929 pieces. This IQP was deemed pretty useless for our purposes. It lacked any specific data that we could use.

**Blackwell, Lewis Edward, Fraizer, Meghan Ellene, Rizzo, Adria Michelle,
Vello, Kevin Anthony, Wainwright, Randall Lee. Preserving Venetian
Wellheads. Interactive Qualifying Project, E00, Venice, Italy.**

This IQP project serves to aid and promote the preservation of Venetian wellheads by creating resources in the form of a comprehensive public Venetian wellhead catalogue. It has a great deal of research and first hand measurements of public well heads. It has an annotated bibliography with which we can use to move forward much faster and gather only pertinent information.

**Brown, Patricia Fortini. Venice & Anquity. New Haven. Yale: University
Press. 1996.**

This book contains the history of Venetian public art and pictures of many small sculptures on buildings and other places. It includes bibliographical references and index. This book was found using WorldCat database.

**Davanzo Poli, Doretta: Arts & crafts in Venice. Cologne :
Könemann, 1999.**

This book was ordered from Interlibrary Loan and has not arrived yet. It seems that it will have some background information of Venetian public art in general. It also seems to have a section specifically on wellheads, which might be very relevant to our project. This book was found using WorldCat database.

Elbag, Mark, Epstein, Adam, Hannigan, James, Rosinha, Elizabeth,
Preservation and Restoration of Venetian Public Art. Interactive Qualifying
Project, E03, Venice, Italy.

This is the latest in the Preservation effort done by WPI and has many charts that need to be studied and useful data on other organizations. The bibliography is not annotated making it harder to deem the relevance of the sources to our work.

Lauritzen, Peter. Venice Preserved Bethesda. Maryland: Adler & Adler,
Publishers, Inc. 1986.

This book includes a brief explanation on the preservation of churches, paintings and the conservation of stonework. Each of these topics are organized in chapters that makes it easy to read in the right place. The book includes pictures of damages on walls and sculptures. This book was found using WorldCat database.

Rizzi, Alberto. The Well-Heads of Venice. Stamperia di Venezia Editrice,
Venezia, 1982.

This book is a comprehensive guide to the history, location of wellheads as well as comprehensive catalogue of public wellheads of Venice. This source was found from the E00 IQP, Preserving Venetian Wellheads. It was very useful for pictures and some history, but we mostly derived our history from the IQP due to the fact that most of this book is in Italian. They cited this book as their source for their historical information. Overall, a very useful text.

Tyson, Peter. Data in Venice: Saving Outdoor Art. Boston:
MIT Alumni Association, 1995.

This article is a good look at art preservation in Venice, particularly out door art. This article outlines Fabio Carrera's movement to preserve public art in Venice.

APPENDIX B - FIELD FORMS FOR CATALOGING

The following are the forms used for gathering data in the field. These forms were created by us.

Fountains Form


Fountain Detailed Information

Location		View	Measurements	
Fountain Number	51		Height	150
Sestiere	Castello	Base Perimeter	238	
Closest Address	2157	Base Area	3234	
Street Or Campo	campo de la tana	Faucet Height	80	
Visibility	Medium	Faucet Length	8	
High Traffic Area	<input type="checkbox"/>	Surface Area	14054	
Proximity To Vendor	Far	Flow Rate	5.9	
		Number Of Drains	1	


Shape		Condition	
Type	Type B	Algae	40
Base Shape	Round Cor	Graffiti	5
Material	Stone	Rust	5
Faucet Design	Lion	Original Paint	1
		Grime	Medium
		Surface Damage	5
		Missing Pieces	None

Running	<input checked="" type="checkbox"/>
Service Panel	<input checked="" type="checkbox"/>
Raised Drain	<input checked="" type="checkbox"/>
Bolted	<input checked="" type="checkbox"/>


Notes:




A Side



B Side



C Side



D Side

Non-public Wellheads Form

Non-Public Wellheads of Venice

Wellhead Number: Property Name:

Well Number on Property:

Wellhead Status:

Address:

Period of Creation:

Condition Rating:

Metal Accessories:








Filled: Lid:

Flowers: Unique:



APPENDIX C - FOUNTAIN TYPES

The following are the main types of fountains that exist in Venice.

		
<p>Delfini Type A</p>	<p>Puglia Type B</p>	<p>Alto Type C</p>
		
<p>Ott. Basso Type D</p>	<p>San Marco Type E</p>	<p>Cilindro Type F</p>
		
<p>Pozzo Well</p>		

APPENDIX D - FOUNTAIN DAMAGE ALGORITHM

Field	Weight
Rust	15%
Algae	10%
Graffiti	15%
Surface Damage	25%
Grime	20%
Missing Pieces	15%

Algorithm
Condition Rating = (Rust × .15) + (Algae × .10) + (Graffiti × .15) + (Surface Damage × .25) + (Grime × .20) + (Missing Pieces × .15)