

Adaptive Reuse: Restoring Purpose

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## **Executive Summary**

### **Problem Overview**

Each year many buildings fall into disrepair for various reasons. These abandoned buildings can cause many issues within the community, including increasing the crime rate and decreasing the overall economic value of the area (Garvin, Branas, Keddem, Sellman & Cannuscio, 2012). This makes these properties less appealing to potential contractors and can cause a cataclysmic effect of buildings becoming abandoned in the neighborhood (Vacant and Abandoned Properties: Turning Liabilities Into Assets, 2018). The Our Lady of Mount Carmel Church is located in the center of Worcester, Massachusetts and is an example of an abandoned building that can have a negative effect on the community. This church has been abandoned since May of 2016 and as the surrounding area flourishes under the city's rejuvenation plan, this property is left in the past.

While the issue of abandoned properties can be dreadful for a neighborhood, it can be avoided with the proper steps such as adaptive reuse, reusing a building for a purpose other than what it was initially designed for. It is beneficial to the community, less expensive than demolition, and better for the environment (Berg, F., & Fuglseth, M. 2018). Adaptive reuse is an incredibly viable option as is proven through this analysis.

### **Goals & Objectives**

Our goal is to create an adaptive reuse plan for the Our Lady of Mount Carmel Church located in Worcester. Currently, the Mount Carmel Preservation Society is planning on developing the property into an Italian cultural site. By doing this, they hope to preserve and rejuvenate the Italian roots of the church, as well as addressing some community concerns. There is a large Italian presence in the area, and they wish to see the church remodeled to appease that

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heritage. Our goal is to restore function to the property while reverently preserving the history and encouraging community interactions.

### **Methods**

During our research, we reached out to Deborah Packard, of Preservation Worcester. From Packard, the group gained an understanding of how historic buildings are maintained as well as the different processes for how they can be repurposed. In addition, the group contacted Mauro DePasquale, the head of the preservation group for Our Lady of Mount Carmel church. From DePasquale, we learned what the goals were of the preservation group and were able to better understand the importance of the church to the community invested in it. This gave us the information that we needed to begin brainstorming potential solutions. In order to support these solutions, all aspects were researched thoroughly in scientific journals.

### **Key Findings and Recommendations**

Our final design should develop a community atmosphere while at the same time respecting the historical importance of the church. This was done by analyzing the current structure of the church and developing a solution that expounds upon that. This solution that we created is multifaceted in that it is primarily a venue, but is also a cultural and religious space. This was done by making the main seating area into a venue for concerts, art showcases, weddings, and funerals. The cultural aspect of the community is represented in the wings of the church which will host Italian restaurants and boutiques. This draws the community into the building and showcases the cultural importance of the church. The church will also have a dedicated religious area behind the altar so that the former parish can have a space to worship.

## **Problem Statement**

A city's ability to efficiently use space is fundamental to how livable the city is. The amount of usable space in a city is limited, but the available space needs to accommodate all the services required for the city to be livable. In analyzing this idea our group recognized that the accumulation abandoned or vacant buildings can be a significant problem in cities, especially at the community level. In order to research this problem, we determined several questions that would focus our research. Most broadly our group wanted to know the ways in which abandoned and vacant buildings impacted the communities they are located in and what the frequent response cities have to abandoned and vacant buildings are.

Before and during our research more questions were developed to guide our research more effectively. These questions were: Why are buildings abandoned? What qualifications does a building have to meet to be qualified as an abandoned building? What steps can the city and/or the private sector take transform abandoned buildings into positive contributors to the community they are in? What is adaptive reuse and how can the concept be applied to buildings that are historically and/or culturally significant? Over the course of the seven-week term, these questions got further narrowed as the specifics for our solution became more clear and other pieces of the broader questions were answered.

## **Background**

Vacant properties have a large impact on surrounding neighborhoods as well as the wider community. Abandoned buildings have been shown to negatively affect the economic and general health of communities, as well as increasing crime rates (Shane, 2018). While abandoned properties are commonly viewed as indicators of a declining community, they can also be a cause of the depreciation. This is because abandoned properties perpetuate a cycle of economic decline (Accordino & Johnson, 2000). This, as well as the high insurance rates from the crime and fire risk, makes it difficult for the property to be sold (Accordino & Johnson, 2000). Additionally, abandoned buildings are a monetary burden on local governments because the city has to spend money inspecting, securing, and demolishing them if need be (Han, 2013). This can be seen within the \$2 million spent yearly in Baltimore, Maryland to properly secure abandoned buildings (Han, 2013). A 2008 study found that for every abandoned building, the yearly cost of fire and police assistance increased by \$1,472 per block (Han, 2013). These factors make it so that the properties are unattractive to the surrounding community, and prospective developers.

Abandoned buildings mainly affect the people that live within the immediate proximity. They have been described as making community members feel unsafe and contributing to a negative impact on physical and mental health (Garvin, Branas, Keddem, Sellman, & Cannuscio, 2013). Health risks range from exposure to harmful chemicals, fires, to increased risk of infectious disease (Garvin, Branas, Keddem, Sellman & Cannuscio, 2012). The property values of buildings are depressed accordingly with both, distance from the abandoned building, and the length of time the building has been vacant for (Vacant and Abandoned Properties: Turning Liabilities Into Assets, 2014). Depending on the income bracket of the community, it has been deduced that property values can be depressed between 1.7% and 2.1% if the property is in 500

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feet of an abandoned building (Vacant and Abandoned Properties: Turning Liabilities Into Assets, 2014). This is indicative of the fact that vacant properties bring down the monetary worth of the surrounding area immensely.

The problem of abandoned buildings is widespread and affects urban, suburban, and rural environments. In 2010 alone, the census estimated that 19 million properties were abandoned in the United States (Shane, 2018). Figure 1 shows the data collected on housing vacancy in the United States from the years 1965 to 2010 (Vacant and Abandoned Properties: Turning Liabilities Into Assets, 2014). Properties get abandoned for many reasons, one of the largest causes of abandoned buildings in the suburbs, was the 2008 housing crisis (Pais & Wolf, 2010). Urban areas, however, have faced an increase in abandoned buildings because United States cities are no longer centers for manufacturing. This has resulted in an increase of abandoned commercial and industrial buildings, as well as the residential buildings where workers once lived (Kondo, Keene, Hohl, MacDonald, & Branas, 2015). These formerly thriving manufacturing cities are attempting to find a new use for the buildings that were once vital to their economic health.

When considering repurposing these abandoned buildings the zoning is an incredibly important aspect. Zoning maintains the health, safety, and welfare of the public (Thompson n.d.). Zoning ordinances specify what each zone can entail, including residential, industrial, and commercial areas. They also define the lot sizes, building densities, and structure heights (Investopedia Staff, 2018). To change a property's zoning, it needs to be proposed to a planning board. To develop a better plan, models, drawings and photographs, along with opinions and advice from engineers and lawyers, is incredibly beneficial (Thomson Reuters n.d.). There are multiple procedures preceding the meeting according to what the municipality requires. The

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issue with the highest precedent regarding zoning regulations, shown in Figure 2, is that every city has the option to define their zones any way they please and can enforce them at varying capacities. Every solution created needs to be specific to a single city or municipality which creates a higher level of difficulty when trying to apply a certain method to multiple cities.

A major issue that we strive to solve by decreasing the existence of abandoned buildings is the high crime rate associated with them. They tend to act as a hotspot for criminal activity such as drug labs, prostitution, and meeting spots for gangs (Duncan, 2013). A study conducted in Pittsburgh, Pennsylvania showed that abandoned buildings led to a 15% increase in violent crimes in surrounding areas (Palma, 2017). The broken window theory, which states that visible signs of crime create an environment which encourages further crime and disorder, contributes to the high levels of crime in this area (Kelling & Wilson, 1982). This high crime rate can be combated by nonprofit community organizations and opportunities for residents to build up their community. A study conducted on more than 264 cities, over 20 years, found that in a city of 100,000, each new nonprofit lead to a significant decrease in criminal activity, as can be seen in Figure 3 (Sharkey, Torrats-Espinosa, & Takyar, 2017). These nonprofits foster a sense of pride within the community, which translates into work put into the neighborhood. As the beautification of a neighborhood increases, the crime rate decreases through the elimination of the broken window theory (Sharkey, Torrats-Espinosa, & Takyar, 2017). This betterment causes an increase in the property values of surrounding areas, developing stable real estate. One abandoned building can decrease the surrounding property values by up to 0.97% (Palma, 2017). This value increases linearly with each additional abandoned property and plateaus at 14 vacant buildings (Palma, 2017). Community amenities increase the property value in nearby areas, which would nullify the effect of the abandoned buildings.

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Refurbished buildings better the community in regard to decreasing crime rates, and improving the economy. Research finds that established metropolitans with a mix of older buildings, perform better economically than areas with larger, newer structures (Alter, 2018). Historic buildings are more aesthetically appealing and have lower rent and operating costs (Alter, 2018). These variables establish a higher incentive for small business, which is beneficial because the profits are spent locally. The buildings themselves help the community, and the rehabilitation helps to improve the economy. This is established through the fact that in many cities', rehabilitation is the dominant form of construction (Werwath, 1998). This construction creates jobs, the rehabilitation of one property leads to the rehabilitation of another, establishing a cycle that improves the economic attractiveness of the neighborhood (Werwath, 1998). As a result of this, the betterment of property is an important and beneficial aspect of encouraging economic and social growth within communities.

The adaptive reuse of these properties is extremely beneficial to the community. In many cases, abandoned properties lie on what is referred to as urban brownfields, former industrial areas. Brownfields have suspected, or confirmed soil contamination, containing a wide array of pollutants from industrial activity and poor waste management (Iannone, 1995). The problems resulting from brownfields are prevalent in previously industrial areas, including much of New England (Shaw, 2012). While State and Federal assets are allocated for site remediation, there is growing interest in economic development playing a larger role in the process (Shaw, 2012). The Connecticut brownfields coordinator has expressed that, "economic development is an excellent catalyst for environmental remediation...the brownfields projects...are real estate transactions" (Shaw, 2012). The properties are unique challenges for developers to face. Due to the environmental hazards, the sites fall into different categories, with different levels of feasibility,

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as shown in Figure 4 (Stallmann, 2014). With government and private funding, projects aim to remediate properties and mitigate potential environmental damage. As each site presents different problems, solutions must be carefully evaluated in order to reach beneficial solutions for all that may be affected.

## **Approach to the Problem**

Our mission was to create an adaptive reuse plan for the Our Lady of Mount Carmel Church located in Worcester. However due to time constraints and lack of access to the interior of the building we were not able to obtain a realization of the current state of the building. Instead of creating a full plan for the Church we rather researched the overarching topic of adaptive reuse and this church as our main case study. Over the course of seven weeks, our group read varying peer-reviewed articles that discussed the adaptive reuse of not only other churches but other historically significant buildings as well.

After conducting preliminary research we found a few questions that were still unanswered. We posed these question to our contacts Margaret Dewar, Deborah Packard, Mauro DePasquale, Todd Rodman Esq., Jeff Lambert, and William Hubner. Our contacts greatly assisted us in narrowing the scope of our project from what it was in its inception. From there we developed a four-step plan that evaluates the human influencers, the existing framework, the conservation ability, and the overall potentials for the building. After evaluating each of those steps for a particular building a natural solution should arise. In the case of Our Lady of Mount Carmel Church, we came to the conclusion that the space should have cultural, religious, and venue space so all of the needs of the community are met.

### **Proposed Solution**

To alleviate the many issues associated with abandoned buildings they can be repurposed through the process of adaptive reuse. Adaptive reuse is the process of repurposing a building for a purpose different from its original function. This process requires a thorough analysis of the existing framework of a building to deduce the most effective solution. This is done most effectively by following a set process such as the one shown within Figure 5 in the appendix. This flowchart demonstrates how one might gather information to create a general use plan for an adaptive reuse building. It walks one through the process of establishing the people involved in the building, as well as potential investors and developers. The chart then moves on to an analysis of the existing fabric, to determine specific architectural importance. The chart then moves through a process of balancing new construction with preservation efforts followed by an analysis of the limitations of the property that then results in a natural solution for adaptive reuse. This is the process that was followed to determine the adaptive reuse plan for the Our Lady of Mount Carmel Church.

The first step within the flowchart is the act of establishing the key players within the construction of the new building. This step, referred to as the Definition of Actors in Decision Making, is split into four subcategories. These subcategories determine how the property will be used in the future. The first of these subcategories, users, determines both the original and contextual users. The original users are an important group to distinguish because their input in the overall project is essential if a successful final solution is desired. The original users have a large impact on the final solution because it is probable that they are still involved within the community and that building specifically. Their input and conviction are integral to creating a building that will thrive in the environment, they know what the community needs and will

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advocate for it. The contextual users are also important within this step because it shows how the space is primarily used. The knowledge of the use of the space can be helpful because the developers can determine what aspects of the existing building are most important. The second sub-step involves establishing the producers. This includes architects, designers, engineers, restoration experts, and various specialists. When selecting these professionals it is important to keep in mind the existing architecture of the building as well as the cultural importance it may hold. This means locating specialists who are experts in specific fields of study in order to honor the existing state of the building. This will make it so that less renovation is necessary as well as maintaining the original structure. The third step is establishing the investors, this can include the owner, tenant, municipalities, local government, and funding organizations. These are the people who will actually be able to make this project happen and so it is of utmost importance that they are determined at the beginning of the ordeal. They have a large say in what gets changed about the property in the long run. They are the optimal users in that they determine the monetary direction of the final design. The final step within the definition of actors in decision making involves reaching out to regulators. These are the people who will either pass or reject the final plan once it is established so it is important that they are being consulted throughout the process. These regulators include planning authorities, local authorities, and municipalities. If these three groups are consulted regularly the final design should be able to be approved swiftly.

Our second step is composed of a set building's original function, physical character, the historical values behind it, and what the community needs from it. The building's original function describes how it works and what the pieces of it serve as. For example, The Mount Carmel Church primarily served as a religious institution for mainly the Italian community of Worcester. This is in a sense the meaning behind its architecture. The physical character delves

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deeper into the type of Architecture a building has and its significance. The historical and heritage values are the reason for the Architectural layout. They really signify the pure meaning behind it. Lastly, we gather information about what the community needs from our design according to the knowledge we have.

It is important to first look at the buildings original function and decide what functions work and what do not. With a building of such historical and cultural value, the designer should keep a portion of it as the same function. The physical characteristics of the building would be the building's architecture and this is essential to preserve. The history behind a building really makes up the building. Since there is so much emphasis on the history of the architecture it should be preserved in a sustainable way. This would be mainly keeping the exterior of the building. The community needs would come from how they want to preserve their space and its beauties. If the community is not keen on the new design then it is not worth working on it. This is what really dictates the whole plan because they will be utilizing it in the end.

The third major step in figure 5. pertains to the factors involved with the actual conservation of a building, this is referred to as the decision of conservation actions. This step is divided into six integral sections, each relying heavily on the others in terms of both theory and practice. The sections address separate yet intertwined aspects important to the overarching role of conservation and deciding the scope of the actions involved. The first piece of this specifically regards preservation, which means keeping the structure as close to its original form and design as possible while facilitating new uses and offering “a more affordable alternative to full restoration” (Hein & Houck 2008). This step also influences the following steps in the ways of providing parameters they must adhere to. In regard to historical/heritage buildings which were built a number of years ago with certain unique characteristics whether it be architecture or

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cultural influences, special care must be taken. It is a delicate balance between allowing modern uses and yet keeping the form brought about by the specific use the building was originally erected with.

In doing this, the rehabilitation process must also be addressed. The rehabilitation process of the chosen building takes into account the unique blend of architecture and cues from its original use and addresses any damage or deficiencies that must be repaired. Commonplace rehabilitation tasks may involve roofing or replacing of damaged elements. This leads well into the next section.

The following section on renovation addresses deficiencies as well, however, they tend to be related to the topic of compliance with current/future regulations. The main concerns revolve around ADA (accessibility for disabled people), energy efficiency, and safe indoor air quality. Relating to energy efficiency, the following process is labeled green design. Ultimately, larger scale repairs of the building fall under the process of reconstruction.

Everything comes at a price, leading into the process of cost analysis otherwise known as financial assessment. Under this section, the approximate cost of all the conservation actions is weighed and considered, determining heavily either what can be done within a certain price range or if at all. "A feasibility study will not only evaluate the financial status of the building and estimate renovations necessary to comply with recent codes and adaptive plans, but it can also identify problems likely to be encountered during construction." (Hein & Houck 2008). As part of the cost analysis, the state of the building is considered as is the structural composition and integrity under a comprehensive site survey. Part of the survey could involve factoring in the age of the building and whether hazardous materials such as asbestos are contained. The discovery of such materials requires the enlistment of licensed and bonded specialty contractors

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in order to abate them safely (Lambert 2018). All this is weaved into a financial investigation that factors in the costs of labor and materials attributed with required modifications.

With these six factors considered, the overarching role of conservation actions can now proceed and the fourth step in the flow chart may be undertaken.

Step four uses the determinations made during the analysis of the first three steps to synthesize what has been learned about the building the adaptive reuse plan is being developed for. This analysis creates a set of limitations for what can be done and incorporated into the adaptive reuse plan created for the building and helps to identify what potential solutions should be included in the adaptive reuse plan (Günçeb & Mısırlısoya, 2018). The analysis of the first three steps is broken into several subcategories; however, for the purposes of our adaptive reuse plan for Our Lady of Mount Carmel Church, we chose to focus on five subcategories. These are the physical, functional, environmental, social, and cultural subcategories.

The “physical” subcategory is focused on analyzing the physical potentials of the building, while still maintaining the physical characteristics of the building (Günçeb & Mısırlısoya, 2018). The focus of this concept is to make the building accessible to all people regardless of things like age or disabilities. Because we are examining adaptive reuse in the context of historical and cultural buildings, it was important to consider the preservation of the original architecture. It is also to consider how the building could be made, or be kept if it already is, accessible to people of all ages and to people with disabilities. The aesthetics and how the building appears after the adaptive reuse plan is finished is also important to consider.

The “functional” subcategory focuses on examining how the adaptive reuse plan can use the building space, both inside and around the building, that already exists in the plans. An important aspect of this is acknowledging how the spatial flow, structure to space relationship,

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and the flexibility of the space affect how readily the building can be used for another purpose (Günçeb & Mısırlısoya, 2018). For example, buildings that are already designed with large open space and high ceilings (that have to be preserved for historical purposes) can only be reused for a limited number of other purposes.

The “environmental” subcategory focuses on acknowledging the preservation and conservation actions that must be taken (Günçeb & Mısırlısoya, 2018). The location and the type of site that the building sits on impacts the potential uses the building can have while still being environmentally sustainable. The current condition of the building is also considered as that needs to be preserved in a sustainable way that positively impacts the building and the community that it is located in. The environmental quality of the surrounding area and how the building impacts that is also an important consideration.

The “social” and “cultural” subcategories are intertwined. The “social subcategory focuses mostly on preserving or expanding upon the social meaning and spirit of the building, while still ensuring that there is enough social interest in the building after the adaptive reuse plan is implemented that the building does not get abandoned again (Günçeb & Mısırlısoya, 2018). The “cultural” subcategory builds on this information and also prioritizes maintaining or clearly respecting the cultural, religious, and historical significance the building has in its community (Günçeb & Mısırlısoya, 2018).

The fifth and final step of the process is deciding to what extent any functional changes are implemented in the new design for the building. By evaluating each of the first four steps a natural solution should arise. This step can result in the building being adapted in one of three ways. The first of which is adaption but having the building be used for the same purpose. If the use of the building is essential to the community’s livelihood, then maintaining the building’s

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original should be preferred. The second option when weighing any functional changes is to adapt the building for mixed use. This option should be considered if the ownership of the building is looking to draw in people of differing backgrounds and areas of the city. On the contrary, there may be issues with this because of the current architecture of the building limiting what can be repurposed. The final option when making decisions about any functional changes to the building is to adapt the building with a new use. This can be considered when the influencers of the buildings take limited action towards maintaining the original function of the building. Furthermore, this should be considered if the community has no desire or need to use the building in its original form.

After much consideration, as a group, we deemed that the best course of action would be to adapt the Our Lady of Mount Carmel Church with mixed use. We chose this solution because there is still a strong community of people who are wanting to support their church. Also, this solution would potentially draw in outside individuals to the area which in turn would support local businesses. By using this method we would support the needs and desires of the local community while also creating a new destination for the entire community to use and enjoy.

### **Mechanism for Implementation and Assessment**

Creating, implementing, and ultimately assessing successful adaptive reuses plans is deeply contingent on a multistep process as detailed in our flowchart. The first of those vital steps lies within the community which surrounds the buildings in question. By establishing the groups responsible for the interior redesign, this completes step one in the flowchart shown in figure 5. The users of the Our Lady of Mount Carmel Church have been identified as the Diocese of Worcester in addition to the original congregation. The Diocese of Worcester was an important distinction to make because not only are they the original user of the property, but they are the owner of it as well. By making contact with the diocese it increases the likelihood of real change occurring. If their approval is granted then ground can be broken on the project, however, without their approval, this cannot happen. The congregation is essential to the construction of this because their approval is necessary in order to create an effective community space. If the existing community does not support the final design then the solution will not fare favorably (Ball 1999).

In terms of the producers, specialists have been identified within each subsection. The main architects for this project have been identified as Handel Architects, located nearby in Boston, MA ("Architecture & Interior Design – Handel Architects"). They have a large amount of experience with adaptive reuse including work that they have done in San Francisco, Boston and even on Broadway. The work on Broadway specifically aligns the most with the Our Lady of Mount Carmel church. This is because it involves a building of similar age and architecture as well as a final design that mirrors what our final vision was ("Architecture & Interior Design – Handel Architects"). Having architects that can deliver upon a design that honors the existing structure as well as understanding the concept for the new structure is essential (Ball 1999).

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While architects like to work on new structures, William Hubner, an architect located out of Lexington, MA, has stated that repurposing historical properties can be more exciting for architects ("Historical Architecture and Design", 2018).

The interior of the building is just as important, in order to ensure the extended use of the building (Friedman 2014). If the interior is designed in a logical way it is more likely that the building will have a higher success rate than other buildings. To ensure that this building is built in the most effective way Bennett Leifer, a designer from New York City is the perfect fit for this building. He has a lot of experience with incorporating modern elements into the historic design. Simpson Gumpertz and Heger will be the primary engineers on this project because of their immense passion in regards to adaptive reuse. The engineers with this project will be focusing primarily on rehabilitating specific aspects of the building. These specific areas have not been identified yet, but this group will work towards identifying and fixing them.

Most historic buildings, like the Mount Carmel Church, require regular inspections to make sure they are still up to code. These regular inspections make it so that a process of strategic preventative maintenance can be undertaken (Mueller 1986). This will be taken care of by restoration experts such as Bond Brothers, a group located in Boston focusing on purely historic restoration. By preserving the past the future is enhanced and future generations can benefit from the beautiful architecture that still exists. It has been shown that these historic buildings are essential for positive economic growth within cities (Alter, 2018). These engineers will be accompanied by different specialists. These include specialists in historic churches, Italian culture, Worcester, Italian architecture and stone conservation. These individuals will help to ensure that when the building is restored it is done so with the careful guidance of these specialists.

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This project cannot happen without the generous donations of many investors. For this specific property, these have been identified as the parish involved in the church as well as some general funding organizations. These are primarily the Worcester Cultural Coalition, Preservation Worcester, the city of Worcester and the Our Lady of Mount Carmel preservation society. Each of these groups has a reason to be invested in the future of the church and have the ability to contribute financially to the project. To ensure the building is built to code the property will be seen by a series of regulators. These include the planning and local authorities as well as the city of Worcester and different federal regulations.

When considering what will be done to the church's physical character, there must be a synergy between the old architecture and the new functions. The exterior architecture of the building is inspired by Baroque Romanesque designs, as stated by The Worcester Preservation Society. The Mount Carmel Church has baroque domes similar to the architectural style of other Italian Catholic Churches. From a Catholic cultural standpoint, beautiful architecture symbolizes "reality as understood in the mind of God" (McNamara 2009). The preservation of its history and the cultural significance of the design is essential. As part of our plan, part of the church will be maintained as a religious area to honor its past. When considering the needs of the community, it is important to have a balanced plan. In a sense, this would justify new functions while maintaining legacy traditions and functions. These two functions cater to the existing community but also bring in a larger community. As a religious space and a venue, Mount Carmel would serve the original Italian Catholic communities as well as the general community of Worcester for generations to come.

When determining the potentials and limitations of the adaptive reuse plan for Our Lady of Mount Carmel Church it is important to acknowledge that ideal situation would be for the

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church to remain a church, and the adaptive reuse plan would be implemented if that could not happen. The community involved with the church is still so strong and passionate, so this means that a group representing their voice, such as the Mount Carmel Preservation Society would need plan a large, important role in the final adaptive reuse plan should the building not remain a church. After understanding this, we began to apply step four to Our Lady of Mount Carmel.

As a result being unable to see the inside of the building, have access to access to the building, or being able to discuss the physical state of the building with a knowledgeable developer or engineer associated with the building, we could not provide in depth plans regarding the “physical” subcategory. In regards to historical churches, in order to preserve the original architecture the outside appearance largely cannot be altered. As described by communities surveyed about the historical churches in their communities, the outside remaining as it was, but properly maintained is incredibly important to them (Ijla & Broström, 2015). In terms of concepts like accessibility, such things should be prioritized in the adaptive reuse plan, but we cannot make explicit recommendations because we lack the knowledge on the building in order to do so.

In terms of functionality of the building there are two routes that can be taken with the church: the first being that the current spatial organization is kept and the second being that the spatial organization is changed (Mine, 2013). Because the building is a church the majority of the space is large and open. This type of space can easily be turned into museums, concert venues, or large studio space (art or otherwise), and does not involve changing the original framework of the building (Mine, 3013). The second option would involving changing the space to fit a pre-decided function. For example, this would be like transforming a church into an office building, as inside that large open space would have to be split into smaller sections for specified

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purposes. In terms of Our Lady of Mount Carmel church, either of these courses of action could be taken; however, it is due to the social, cultural, and physical considerations that we have found the first course of action to fit better for Mount Carmel church.

The choice to refunction this church through adaptive reuse instead of demolishing the building and rebuilding another structure is well supported when environmental considerations are taken into account. The process of adaptive reuse eliminates the necessity of demolition and new construction, which are harmful to the environment (Yung & Chan, 2011). During the process of adaptive reuse, other changes can be made to the building to make it more energy efficient and reduce its negative impacts on the environment. Some of these alterations involve better insulating the building, in some cases because of the protections on the building insulation cannot be added, but there are still other things that can be done to improve the energy efficiency of buildings (Thornton, 2011). For example, sealants can be added, efforts can be taken to prevent drafts, windows can be weather-proofed, and roof leaks can be fixed (Thornton, 2011).

Finally, the social and cultural considerations involve the community of both the church and the wider community of Worcester. The church is a Roman Catholic and has strong ties with the Italian community in Worcester. The church still means a lot to the congregation, and their goal would be to still have it be a church. For this reason it is essential that social and cultural sustainability is prioritized above all other considerations for this adaptive reuse plan. In order for the building to be socially and culturally sustainable it needs to recognize what the church has meant to the community for the past 90 years and respect that. This would be done continuing to provide a place where the social aspect of religion can still be carried out, and forge a common feeling of inclusiveness to everyone involved in the project (Yung & Chan, 2011). For this

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reason, we believe that it is important that the adaptive reuse plan be built to include a social (venue), cultural, and religious space.

## **Conclusion and Recommendations**

Our plan is applicable to communities all around the world. We are hoping that this plan can be seen by and assist city and town planning boards, individuals and groups who wish to redevelop the land, and most importantly, communities that are concerned for their historical or sentimental buildings. We believe that the work we have done is a positive addition to a growing mentality of adaptive reuse. We hope to change minds, and provide a springboard for people to look deeper into investigating adaptive reuse, and how they can use our information and much more to solve a real-world problem.

The flow chart, although its purpose is to set a course of actions and research for individuals. One could view that as only being a superficial function. This flowchart, combined with our plan is just a hyper-specific example of a much broader topic, self-improvement. For instance, instead of recognizing the influencers of a property, perhaps the influencers are your everyday habits and decisions. Instead of the existing framework of a building, look at your own framework, your strengths and weaknesses, discover what you are lacking. Step three, conservation, learn about what your mind and body need in order to produce a balanced life, like nutrition, and exercise. Step four, potentials, do not set goals you will never attain, give yourself small goals that you can accomplish on a daily basis while working your way towards a greater goal of improving your daily life. There are many lessons to be learned from this experience, but one of the greatest is understanding how interconnected things can be. Do not try to only take away what a paper wants you to take away, try to apply yourself and your experiences to the paper. Though our journey was an arduous one, we have been repaid for our struggles. The outcome of this project has been most fruitful. Hopefully, this will leave a legacy of hard work, effort, and dedication for our group and our viewers to build upon.

## **Ethical Considerations**

Throughout our project, we have investigated some ethical aspects to adaptively reusing a building. For one, gentrification is a monumental issue for us. After speaking with Maggie Dewar, we realized how much more impactful this could be than what we imagined at the start of our project. We did not want to displace families with our project, so we needed to develop our plan in such a way as to avoid this issue. Another ethical dilemma was trying to walk the fine line that separated the Parish from the Diocese. The parish wanted to keep the church while the Diocese had decided they no longer wished to support it. This was a touchy subject for us, as we wanted to do what was best for both sides, but also keep the main structure intact. We also reason throughout this document that adaptive reuse is a more environmentally conscious and economically feasible choice.

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## ADAPTIVE REUSE: RESTORING PURPOSE

A handwritten signature in cursive script that reads "Joe-Yee-Yip".

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A handwritten signature in cursive script that reads "Mia Bucowich".

Executive Summary, Background, Step 1 in Solution and Mechanism, Editing

## Appendix

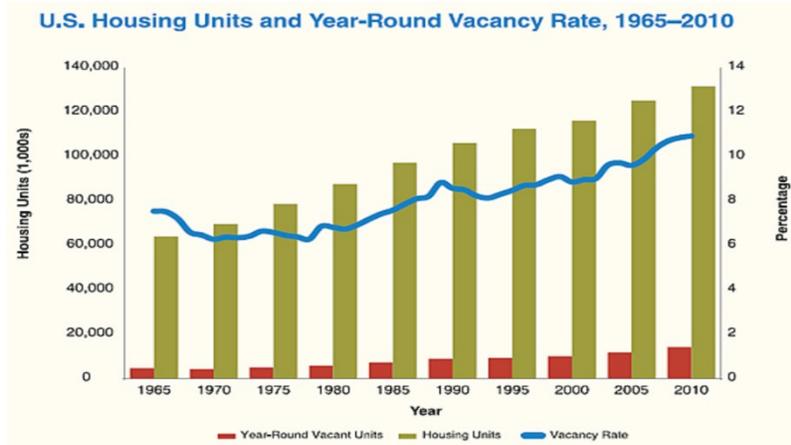


Figure 1; This diagram shows the increase in vacancy rate in residential housing in the United States from 1965 to 2010.

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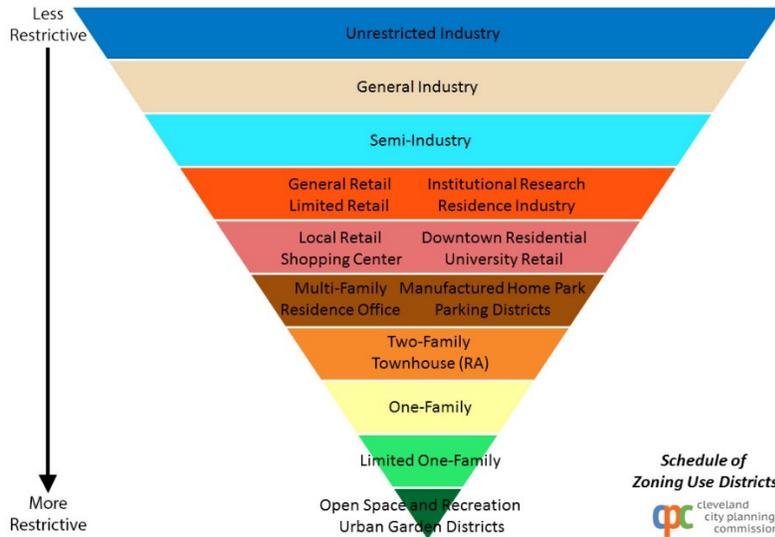


Figure 2; this is a diagram from the Cleveland CPC demonstrating all the types of zones for an area of the city, and how restrictive each is.

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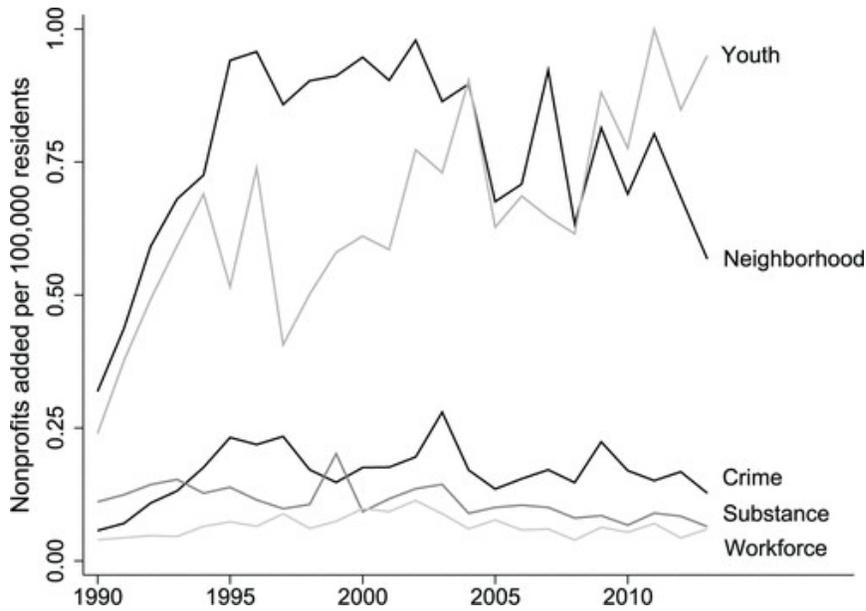


Figure 3; This graph represents the positive effect that nonprofits have on a community in terms of decrease crime and substance abuse and increasing the workforce.

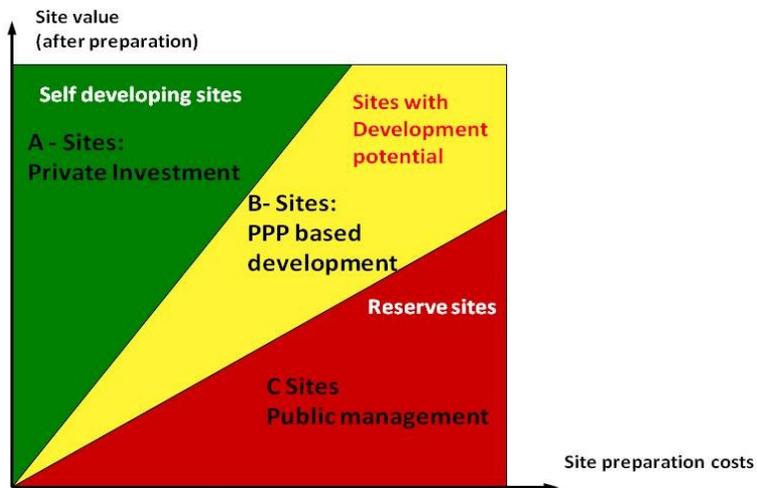


Figure 4; This figure breaks down the classes of sites and the levels of potential that results.

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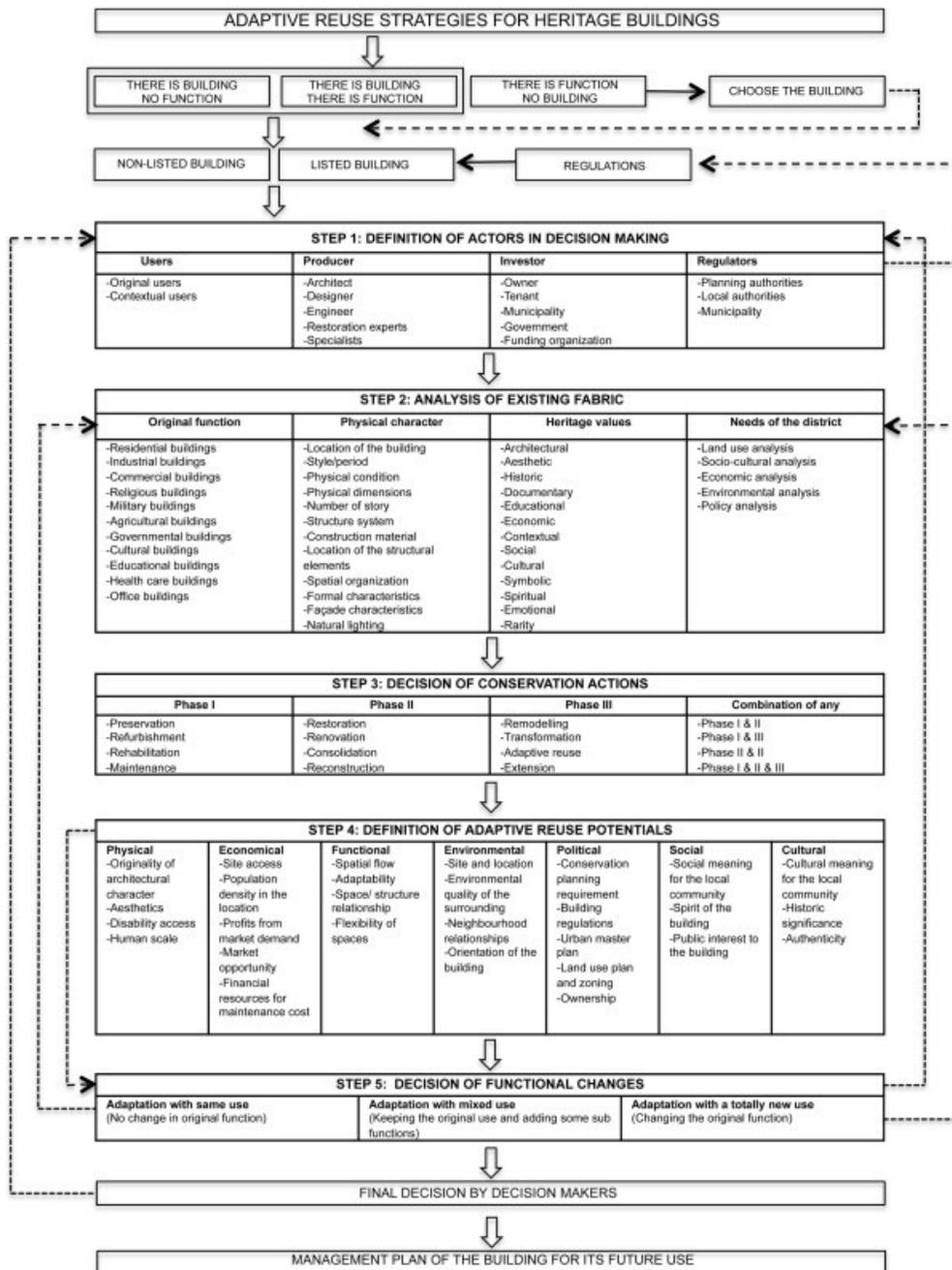


Figure 5; This flowchart demonstrates each of the steps that followed in order to create an effective adaptive reuse plan.