

An Interactive Qualifying Project submitted
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Sponsor: Duncan's Abbey Brewing - Justin DiNino, Owner

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Abstract

This project assessed multiple viable reuse scenarios for the conversion of a historic pump house in Tarrytown, New York by Duncan's Abbey Brewery. Complementary uses, accessibility, location and other site characteristics were analyzed and prioritized based on practicality. Site access, sustainability, and additional funding were reviewed and explored in order to create a plan for the reuse of the property. The results of this project were presented to Tarrytown community officials.

Executive Summary

The currently dormant Eastview Pumping Station in Tarrytown, NY has a rich history and potentially promising future. This project assessed multiple viable reuse scenarios that are compatible with Duncan's Abbey's future brewing space in the Eastview Station, while providing a framework for accessibility, sustainability, and community integration. Efforts were made within the project to provide thoughtful consideration of the historic nature of the site.

The sponsor of this IQP is Duncan's Abbey Brewery. Brewer-owner Justin DiNino has an appreciation for the history of the Eastview Station, as well as the Village of Tarrytown itself. Mr. DiNino envisions the character of the Eastview Station reflecting Duncan's Abbey's own locally-crafted beer. The pump house has laid vacant for multiple decades and now houses surplus municipal supplies for the Village; it needs a future that is as robust as its past. The goal of this project was to assess different uses of the space in the Eastview Pumping Station and present a plan for addressing challenges to redeveloping this building into something of value to the community and to Duncan's Abbey.

Methods implemented to achieve these goals included characterizing Tarrytown, SWOT analysis, and accessibility analysis. Objectives within this scope included generating a list of compatible uses and assessing those uses by SWOT analysis, diagramming parking and addressing issues related to access to the site, and finally, evaluating incorporation of sustainable technology into renovation of the building.

Based on our findings, we recommend:

1. That an adaptive reuse involving food service be included in the building.

A food service, whether it be a restaurant, cafe, or carryout option, will not only draw in customers from the recreational sites in proximity to the building, but it will also blend

seamlessly with the brewery in the building. Additionally, food service would serve as a point of congregation for the community, as well as a place for the historic aspects of the Village to be displayed and engaged with by members of the community.

2. That the Eastview Station tie in to the recreational opportunities available in the immediate area.

The Eastview Station is located at the convergence of multiple bike paths and on the banks of the Tarrytown Lakes. Duncan's Abbey and the Eastview Station can only benefit from catering to those who bicycle down these trails or explore the lakes by kayak. Supporting the needs of those taking advantage of the great outdoors will lead to more customers, more profit, and more people engaging with this building as it seeks to be a focal point in the community.

3. That emphasis in promotional materials be placed on the Eastview Station's proximity to the Saw Mill River Parkway.

Because this site is so easily accessible by car, the Eastview Station is a great destination option for many potential visitors who may not live in the immediate area surrounding Tarrytown. Emphasizing this aspect will draw in more customers (who then will enjoy their experience enough to return).

4. Securing the use of additional parking such as the lot across Neperan Road.

Because the site is so distant from both transit and walkable businesses and housing, parking is critical to the success of this adaptive reuse project. Securing the use of an additional parking lot, such as the NYDOT parking lot across Neperan Road, would be necessary to comply with Tarrytown's zoning regulations if a full-service restaurant, one of the preferred pairings with the brewery, was added to the pump house. Doing so would double the available parking spaces

from approximately 20 spaces to over 40 spaces. Other suggested site uses would benefit from additional parking as well.

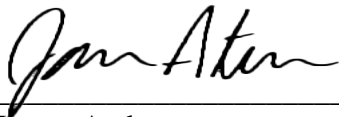
5. Developing or adopting an energy profile for the Eastview Pumping Station to set goals and expectations for the reduction of waste and energy use.

This energy profile will help to create a plan as to where money should be spent to reduce the most waste and energy. The effort to be sustainable and its implications on cost should be taken into consideration when doing an overall profit analysis, as sustainable efforts can sometimes impinge on a business' revenue.

Duncan's Abbey is the best choice for bringing the Eastview Pumping Station into the 21st century while still retaining its 19th-century roots. No matter the final adaptive reuse(s) chosen, the community will gain a revived focal point, a gathering place, and a hometown location to be proud of through the acquisition and renovation of the Eastview Pumping Station. The building has laid vacant for long enough; the time has come to begin giving it a future as vibrant as its past. Eastview can be a destination that hearkens not only to Tarrytown's historic aspects, but also to the evolving state of its modern culture.

Authorship

All members contributed equally to the Abstract, Introduction, Background and Recommendations sections, and all contributed to the overall editing of this paper. James Atchue was the original author of sections relating to sustainability and a supporting author to sections related to accessibility. Lauren Farris was the original author of sections relating to site visits and SWOT analysis and composed the recommendations section. Phillip Royal was the original author of sections related to site access and mitigation of cost.



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Chapter 1. Introduction

A derelict historic building sits on the edge of a reservoir in Westchester County. With no clear purpose or future in sight, the original 19th century wood beams rot behind boarded windows. Looking to expand his brewing operation while accomplishing meaningful preservation, Justin DiNino, owner of the brewery Duncan's Abbey, sponsored this project as a means to explore possible uses that could be paired with a brewery in the building.

The currently dormant Eastview Pumping Station in Tarrytown, NY has a rich history and potentially promising future. This project assessed multiple viable reuse scenarios that are compatible with Duncan's Abbey's future brewing space in the Eastview Station, while providing considerations for accessibility (transportation and parking), sustainability, and community integration. Efforts were made within the project to provide thoughtful consideration of the historic nature of the site. The final deliverable took the form of a presentation, a written assessment of findings, and a final report.

The Eastview Pump Station has sat on the bank of a village reservoir near the abutting town of Elmsford since 1888. The property is plentiful in tree cover, and a recreation trailhead empties from the dense forest beside the building. The pump house features high ceilings, expansive rooms, and an abundance of natural light. In its former life as a water treatment facility, its five large sand-filled tanks provided clean drinking water for the residents of the Village of Tarrytown.



Figure 1. The Eastview Pumping Station in Early February 2017. Photo courtesy of Justin DiNino.

Duncan's Abbey brewer-owner, Justin DiNino wishes to revitalize the Eastview Pumping Station because of its unique history in relation to the Village. The pump house has laid vacant for multiple decades and now houses surplus municipal supplies for the Village; it deserves a future that is as robust as its past. The goal of this project was to assess different uses of the space in the Eastview Pumping Station and present a plan for addressing challenges to redeveloping this building into something of value to the community and to Duncan's Abbey.

The next chapter gives more information about the sponsor, objective, and location of this project. The Methodology chapter then explains how our research and analysis were conducted, including use of isochrones and the SWOT analysis technique. The results of this project are presented in the fourth chapter, and these results informed the recommendations to our sponsor presented in the fifth chapter.

Chapter 2. Background

2.1. Duncan's Abbey

On a trip to Europe years ago, Duncan's Abbey brewery-owner and Worcester Polytechnic Institute (WPI) alum, Justin DiNino, fell in love with old-world-style abbey brewing. Mr. DiNino combined his passions for Tarrytown and engineering, and his newfound interest in beer-brewing to open Duncan's Abbey in 2013. Duncan's Abbey seeks to provide quality, local beer, and according to its website, Mr. DiNino is always looking to make an acquaintance and share a story or two along the way.¹

Duncan's Abbey brews are fashioned after the old-world Belgian style. The brewery produces tripels, quadrupels, and wild ales, often infused with local ingredients and flavors. In the fall of 2016, Duncan's Abbey featured a plum beer composed of locally-sourced plums. Duncan's Abbey sources their malts from New York and Wisconsin, their hops from Tarrytown itself, honey from Orange County, New York, and their yeast from a mixture of Belgian and American yeasts harvested from the Hudson Valley air.²

Duncan's Abbey can be classified as a craft brewery. Craft brewing, which is small-scale beer brewing (less than 6 million barrels per year),³ has long had a presence in the United States, but the practice rose to its current iteration and popularity fairly recently. Modern craft brewing arguably began in San Francisco with the opening of the Anchor Steam Brewing in 1975.⁴

Reasons for the growing microbrew market are numerous, but the magazine *Planning*, a

¹ Duncan's Abbey. "About". Duncansabbey.com. 2016.

² Duncan's Abbey. "Ingredients". Duncansabbey.com. 2016.

³ Petrillo, Nick. Craft Beer Production in the US Industry Report. IbisWorld. Aug 2016.

⁴ Best, A. (2015). Welcome to Beer Country. *Planning*, 81(2), 11.

publication for city development and planning professional circles, cites a few as particularly key. For one, craft breweries have relatively low startup costs,⁵ making opening a brewery a possibility for a larger subset of the population. Craft brewers also have the unique ability and capacity to create beers specific to a certain area or season, capturing local flavors and culture in a bottle. The way these brews promote local interests leads to breweries being more desirable to town administrators, according to *Planning*, leading some towns or cities to actually “court” these opportunities.⁶ A sturdy town-owned building with a historical accent that has fallen into disuse is prime space for repurposing into a brewery, and the stories these buildings tell are compelling focal points for the social spots they become. One example is Vault Brewing in Yardley, Pennsylvania, in which a historic bank building’s vault now holds value in a new way: it is used for aging and tapping of the beers the brewpub sells.⁷

2.2. Eastview Pumping Station

In 1887 Jay Gould and Tarrytown residents put forth a bond to fund a public works project which would later become known as the Tarrytown Lakes and pump house. With preexisting sources of water, water resources were scattered and water pressure was low, so demand for the project was high.⁸ In February 1876, Tarrytown suffered a fire in which 19 buildings were destroyed, and this damage could have been lessened given better access to water. This event among others fostered a growing concern for the village’s water supply.⁹

⁵ Ibid, 12.

⁶ Ibid, 12.

⁷ Ibid, 13.

⁸ Owens, 1970. *Hobbies Appraisal: Personal Interview for Tarrytown Lakes*, 30.

⁹ Rockland County Journal, 1876. *Tarrytown Fire*.

The reservoir began as a fraction of its present size to serve the modest needs of small but growing community. Fire prevention needed its own water supply on Orchard St, so locally levied taxes allowed the first reservoir to be constructed. However, Tarrytown's growing population also had needs of its own and in 1881 there were plans to further the expansion of the reservoir beyond its then 225,000 gallon capacity.¹⁰ Unfortunately, damage occurred to the reservoir's water supply when work crews were blasting for the construction of the Croton Aqueduct. This led to an emergency plan to build another aqueduct that resides under the Hilton Inn. The new aqueduct would become the Saw Mill River connection that filled the Tarrytown lakes; the higher elevation also dramatically increased the water pressure of the village's supply. The construction of the reservoir and waterway project would eventually cost \$425,000 (approximately \$9,000,000 adjusted for inflation)¹¹ and was completed in 1888.

Today the pump house no longer acts as a water pumping station; however, it once could produce enough water to supply Tarrytown with 800,000 gallons of water a day. During the operation of the Eastview Station, with two artesian wells and a 24-foot-high dam, the Village of Tarrytown had its own municipal water supply.¹² This system was used for about one hundred and twenty years until 1993, when the village's water supply was switched from the reservoirs to the Catskill Aqueduct. The change was necessitated as Tarrytown outgrew its reservoir supply and faced large costs to update the increasingly antiquated Eastview Pumping Station Water Treatment Plant. From 1993 to present day, the building and its capabilities have been abandoned as their uses were no longer needed. Today the structure stands in a cosmetically

¹⁰ Miller, R. (2006, June 05). How The Tarrytown Lakes Came To Be - River Journal Online.

¹¹ U.S. Bureau of Labor Statistics. (2017). CPI Inflation Calculator.

¹² Canning, Jeff, and Wally Buxton. 1975. *History of the Tarrytowns, from Ancient Times to the Present*. Harrison, New York: Harbor Hill Books, 148.

decrepit fashion and is unused other than as a storage space for the Village's Department of Transportation.¹³ Its original pumps, filters, and dam are still on the property only touched by the hands of time.

2.3. Tarrytown of the Past

Tarrytown, New York, is a village in the town of Greenburgh, in the county of Westchester, in the state of New York. A historic community slightly more than a half-hour's train ride from New York City, it manages to retain green spaces and a small-town feel. Its western border is the Hudson River, and many waterfront properties take full advantage of the scenic views.

Each era of Tarrytown has left its own unique mark on the village. Before colonialism took hold, a tribe of Native Americans known as the Weckquaesgeek grew standard crops of corn, beans, squash and tobacco on the lands that would become Tarrytown. Because the land was fertile, settlers from other parts of the world would come to call this land home.

In 1645, the first Dutch colonial residence was established in Tarrytown. The Dutch grew wheat as a crop. It is from this practice that the name of the village is possibly derived. As the story goes, the Dutch town was a "wheat" town, and since "terve" was a common word for wheat, so the verbal change from "terve" to "tarry" slowly permeated the vernacular until the village was referred to as Tarrytown.¹⁴ The more artful Washington Irving (a former resident of the village), took a different take in his The Legend of Sleepy Hollow:

¹³ Request for Proposals: Eastview Pump Station Facility, Village of Tarrytown, New York.

¹⁴ Irving, Washington. *The Legend of Sleepy Hollow*. 7-8.

There lies a small market town or rural port which by some is called Greenburgh, but which is more generally and properly known by the name of Tarry Town. This name was given, we are told, in former days, by the good housewives of the adjacent county, from the inveterate propensity of their husbands to linger about the village tavern on market days.¹⁵

No matter the name origin, the town exudes a certain historic charm. Tarrytown and its neighboring towns will always be a historical tourist attraction because of its presence in literary culture.

The Industrial Revolution didn't come to Tarrytown as quickly as it did to other towns east of the Hudson River.¹⁶ Changes began to occur when, in 1845, a railroad was built through the village¹⁷, giving more residents the opportunity to travel, as well as introducing an influx of new people and cultures. Various mill buildings also took hold in Tarrytown between 1868 and 1886, including a wagon and carriage factory, a shoe factory, and a flour mill. All provided sources of employment for the residents of Tarrytown in addition to being the main local sources of modern goods.

At the beginning of the 20th century Tarrytown was part of what was known as a "Millionaire's Colony."¹⁸ Many wealthy and successful families made their homes in the village during this time, building expansive and lavish estates. One such estate is Tappan Hill, formerly known as Hillcrest, which was built in 1892 by Captain William Casey. Tappan Hill is famous,

¹⁵ Irving, Washington. *The Legend of Sleepy Hollow*. 7-8.

¹⁶ Miller, Richard (Town Historian). *A Brief History of Tarrytown*. Village of Tarrytown. Tarrytowngov.com. 2005.

¹⁷ Ibid.

¹⁸ Ibid.

aside from its modern acclaim as a picturesque wedding venue, for being the home of author Mark Twain between 1902 and 1904. Another, possibly more influential, estate in Tarrytown is Kykuit, the home of the esteemed Rockefeller family. The Rockefeller influence is extensive throughout Tarrytown, as the family owned much of the land that is now Tarrytown and neighboring towns. The Rockefeller Archive Center (RAC) is a testament to their empire; it houses a plethora of documents regarding Rockefeller activity in the Tarrytown area, and the RAC maintains an aura of respect and reverence for the family. While the Rockefellers historically owned much of Tarrytown's land, modern day Tarrytown was dominated by new industry which provided many jobs and new influences within the village.

The General Motors Assembly Division operated in Tarrytown for much of the 20th century. The plant employed about 10,000 workers, many of whom lived in Tarrytown itself. End of shift at the plant was always apparent to the residents of Tarrytown because an influx of cars commuting away from the factory would overtake the streets, especially after the plant began hiring workers from out of town.¹⁹ When production jobs were transferred in the 1990's, the plant was closed.²⁰

2.4. Tarrytown of the Present

Tarrytown today is commonly referred to as a "bedroom community" because many of its residents live in the village in order to commute elsewhere to their workplace. The village

¹⁹ Miller, Richard (Town Historian). *A Brief History of Tarrytown*. Village of Tarrytown. Tarrytowngov.com. 2005.

²⁰ Ibid.

itself is home to approximately 11,560 residents as of the 2015 census (a population density of about 3,800 people per square mile).²¹

Many towns and cities look to the future and actively plan the direction their municipalities are taking. In this fashion in 2007, the Village of Tarrytown composed its Comprehensive Plan. This plan addressed the broad areas of land use, housing, environmental preservation, open space, community facilities and services, and transportation, circulation and parking. Through surveys and focus groups, residents communicated that they value Tarrytown's historic character, its "walkability," and its ethnic diversity. Because of those values, village residents prioritized addressing traffic concerns, preserving existing open spaces and maintaining the historical character of Tarrytown as goals important to the village.²²

One way that Tarrytown is working to maintain its historical character is revitalization and maintenance of historical buildings, which is most clearly seen in the Tarrytown Music Hall. Also built during the 1880s, the Music Hall has passed through multiple owners, multiple artistic influences, and multiple renovations. With each owner, different architectural features were layered on top of and in concert with each other, so that the theatre that stands today is a blend of the twelve decades its life encompasses. The ceilings of the theatre hall bear ornate design indicative of when the building was constructed; silhouettes on the sides of the hall echo the 1920s; the backstage area is decidedly modern with plain hardwood floors and fresh white paint.

²¹ U.S. Census Bureau. (2015). Population Estimates for Tarrytown, NY as of July 01, 2015. <http://www.census.gov/quickfacts/table/PST045215/3673176>.

²² Village of Tarrytown, NY. (2007). *Tarrytown Comprehensive Plan*, 1-2.



Figure 2. The Tarrytown Music Hall reflects different eras in design. Photo: Lauren Farris.



Figure 3. The main hall features ornately designed ceilings. Photo: Lauren Farris.



Figure 4. The Music Hall features a backstage, event space, and apartment that are newly renovated and painted to be more modern-looking. Photo: Lauren Farris.

Today, the theatre is still finding the balance between preserving its history and moving into the 21st century. In 2011, the Music Hall added an ADA-accessible bathroom to its main floor, a \$150,000 undertaking which required a structural addition to the building in the existing alleyway.²³ In 2014, the Music Hall underwent \$1.5 million in structural repairs that included pouring a modern foundation to replace its original rubble one, fire and safety escapes, and a new roof and paint for the building.²⁴ This main purpose of this facelift was to stabilize the building, but cosmetic changes incorporated the color scheme of the original Tarrytown Music Hall sign, which still hangs on the front of the building. Though improvements are continuously being made to improve the longevity of the building, the most prominent historical and design aspects remain untouched. Walking in the main entrance feels like stepping back in time with the old-style ticket windows and moody main theatre.

²³ River Journal Online. "Music Hall To Receive State Grant of \$400,000." Jan 26, 2012.

²⁴ "Structural Project." Tarrytown Music Hall. tarrytownmusichall.org. Accessed October 8, 2016.

Tarrytown today is also focused on sustainability. One initiative to adopt a sustainability model, Solarize Tarrytown, sought to replace the village's energy consumption with solar energy and bring solar panels to as many buildings as possible. Many government buildings in Tarrytown now have solar energy panels, including the Village Hall and abutting train station. The Tarrytown Music Hall recently received a grant and was able to put solar panels on its roof to provide "all shows powered by the sun."²⁵ As a result of the village's effort, almost 29 homes are now completely solar powered, with 175 more looking into the solar possibility.²⁶ In order to modernize and reintegrate the Eastview Pumping Station within Tarrytown, sustainability and solar initiatives should be evaluated as they are integral to the village's modern identity.

2.5. Adaptive Reuse

When a building is needed for either residential or commercial purposes, the choices are to construct a new structure or to repurpose an existing one. Similarly, when considering a property with a preexisting building from a construction perspective, a decision must be made to either demolish the existing structure and build a new one, or to reuse the existing structure. Adaptive reuse is a practice in construction in which the developing entity "leave[s] the basic structure and fabric of the building intact, and change[s] its use."²⁷ For example, a former mill building could be adaptively reused by putting apartment-style housing into the space.

As previously mentioned, adaptive reuse is not the only option in redeveloping a property. Another option is raw material recovery, in which key structural pieces are removed for reuse before demolishing the existing structure. Peter Bullen and Peter Love, working in the

²⁵ Main page. Tarrytown Music Hall. tarrytownmusichall.org.

²⁶ TarrytownEnvironmental.org. (2016.). Tarrytown Environmental Advisory Council.

²⁷ Langston, C. (2012). Validation of the adaptive reuse potential (ARP) model using iconCUR,105.

Department of Construction Management at Curtin University in Perth, Australia, found that oftentimes, buildings were demolished without even considering the opportunity for recovering residual structural life of the building.²⁸ Retrofitting a building is another alternative, in which a building's outdated technology is updated with more modern fittings and the original use is retained.²⁹ Adaptive reuse, however, is most appropriate when a building's original function becomes obsolete before its structural life expires.³⁰

When considering these redevelopment options, it is important to acknowledge the short-term and long-term value of the building.³¹ Short term value can be derived from the value of a building's current functions, whereas long term value is derived from a building's ability to meet the needs of its community over its structural lifetime. Adaptive reuse works to improve communities by seeking to maximize the long-term value a building has for its community, especially when a previous use becomes obsolete.

When it is determined that a building can have value for the community through a different use, other practical considerations are made to determine the effectiveness of adaptive reuse. According to Peter Bullen, considerations cover the spectrum of capital investment, asset condition, regulation, sustainability (environmental, economic, and social), costs, and resource consumption.³² These considerations are mainly targeted at developers and owners deciding whether adaptive reuse or demolition are their best options for a building.

²⁸ Bullen, P., & Love, P. (2011). A new future for the past: A model for adaptive reuse decision-making. *Built Environment Project and Asset Management*, 1(1), 37.

²⁹ Langston, C. (2012). Validation of the adaptive reuse potential (ARP) model using iconCUR, 106.

³⁰ Ibid.

³¹ Ibid.

³² Bullen, P., & Love, P. (2011). A new future for the past: A model for adaptive reuse decision-making. *Built Environment Project and Asset Management*, 1(1), 38.

Since Mr. DiNino is interested in maintaining much of the Eastview Pumping Station's current features in the process of turning the building into a brewery, the considerations in the previous section were most useful in assessing the strengths and pitfalls of the complementary uses for the brewery. The Eastview Pump Station has 11,000 square feet of space. For a small-scale brewery, less than half of this space should be sufficient for the entire brewing process. What is to be done with what remains? One objective of this project was assessing the merits of different uses in order to produce recommended complementary use scenarios. Other WPI projects have assessed adaptive reuse by collecting demographic data, researching building information and sustainability efforts, researching grounds and floor plans,³³ and analyzing parking considerations and spacing constraints.³⁴ These strategies were useful considerations in the Duncan's Abbey project.

2.6. Brewery Sustainability

In addition to being aware of general building sustainability, it is important to note the sustainability concerns a brewery specifically imposes. In the brewing process, heat is not only absorbed but produced, and the best way to handle that must be assessed. Gases emitted (for example, CO₂) during the fermentation process must also be accounted for in any brewery building.³⁵ Water that accrues waste (free atoms or molecules, bacteria, and other ingredient products) must also be dealt with before it is sent back to the village's water system. One brewer,

³³ McAlister, Angela, Benjamin Roy, and Michael Swanton. 2009. *Sustainable Redevelopment for 93 Grand* (Unpublished IQP).

³⁴ O'Brien, Michael, Jodi-Lee Smith, and Ryan Worsman. 2012. *Development of 32 Prescott Street at Gateway Park* (Unpublished MQP).

³⁵ Tokos, H., Pintarič, Z. N., & Krajnc, D. (2012;2011;). An integrated sustainability performance assessment and benchmarking of breweries. *Clean Technologies and Environmental Policy*, 14(2), 173-193.

Great Lakes Brewing Company in Cleveland, Ohio, makes self-sufficiency a brewery priority, finding alternate uses for brewing grains and composting as much waste as possible.³⁶

The manufacturing of beer produces spent grain, wastewater, and beer. This wastewater is then separated from solid brewing waste and treated before being released back into the water supply.³⁷ Best practices for treatment of water and reuse/disposal of solid wastes are considerations for any brewery, especially one that sits on the edge of a reservoir.

In the next chapter, the methods of research and analysis will be discussed. These methods will be applied in a way that takes consideration of the unique history of Tarrytown as well as the goals that have been put forth by our sponsor. Evaluating Tarrytown as it existed and as it exists forms the basis for how the reuse opportunity would fit into Tarrytown now and in the future.

³⁶ Unconventional Brewery Pours over Strategies; Brothers Push Sustainability in Cleveland. (2007). *Waste News*, 12(21), 22.

³⁷ Simate, G. S., Cluett, J., Iyuke, S. E., Musapatika, E. T., Ndlovu, S., Walubita, L. F., & Alvarez, A. E. (2011). The treatment of brewery wastewater for reuse: State of the art. *Desalination*, 273(2), 235-247.

Chapter 3. Methodology

Methods introduced in this section point to a goal of assessing different uses of the space in the Eastview Pumping Station and presenting a plan for addressing challenges to redeveloping this building into something of value to the community and to Duncan's Abbey. Ultimately, this should allow for best possible implementation of Mr. DiNino's vision of Duncan's Abbey into Eastview Pumping Station. Objectives within this scope include presenting and assessing compatible use pairings with the brewing space, addressing the issues related to access to the site, and finally evaluating incorporation of sustainable technology into adaptive reuse of the building.

3.1. Characterizing Tarrytown

In order to understand what would be practical and desirable for Duncan's Abbey at the Eastview Pumping Station, it was important to become familiar with Duncan's Abbey, its owner, and Tarrytown itself. What is the "feel" of Tarrytown? What makes Duncan's Abbey special? What about the Village could be influential in the building, and vice versa? In order to answer these questions, the team conducted an on-site visit to Tarrytown September 13th-14th, 2016. The team arrived on Tuesday afternoon and attended an event called "Paired" in which Hudson Valley restaurants and breweries were paired with each other to give samples of product that complemented each other. The team tasted most of the offerings, observed the attendees as they moved about the room, and spoke to different vendors, including Mr. DiNino. On Wednesday,

September 14th, the team, advisors and sponsor visited multiple sites around Tarrytown in order to acquaint themselves with the town's history, culture, and appearance. The itinerary is Appendix A.

3.2. Assessing Adaptive Reuses by SWOT Analysis

The Eastview Pumping Station is a large building, and based on information from Mr. DiNino, only part of it would be dedicated to being a brewery, as shown in Figure 5.

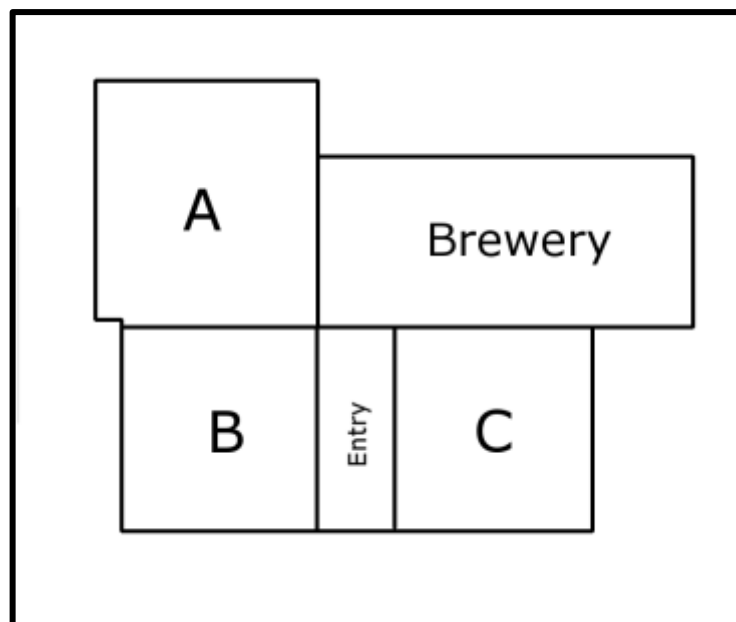


Figure 5. This is a general layout of the floorplan of the brewery. Spaces A, B, and C can be designated for a variety of uses as described in this chapter.

The remainder of the space not being used for brewing could be used in many ways, so the team generated a list of possibilities. From a list of possibilities, the options that seemed feasible based on their ability to blend with the brewery and location were chosen. The goal of conducting SWOT analysis was to classify these options (very feasible, probable, likely feasible but with challenges) from this list of options. The selection of adaptive reuses that would be most feasible on the property, fit best with the brewery, and advance Duncan's Abbey's goal of integrating and

celebrating Tarrytown's history and culture were analyzed by SWOT analysis. Results of the SWOT analysis then informed the class under which an option was categorized.

The project team's limitations in this idea-generation stage were limited by personal inexperience with small breweries and their places of business. Personal experiences with small towns and old towns largely informed the generation of ideas. In addition, a previous feasibility study, put forth in 2010 by Earl Everett Ferguson Architect, PLLC and the Tarrytown Lakes Committee, was studied to determine the state of the building as well as see other ideas that had been previously proposed for this site to analyze in our research.

SWOT Analysis is a model used to grant a preliminary understanding of an idea or decision.³⁸ The aim of SWOT Analysis is to facilitate strategic planning through identifying the Strengths, Weaknesses, Opportunities, and Threats (SWOT). Strengths are the internal virtues of a proposal that can contribute tangibly to the outcome or goal. Staff, assets and attributes can serve as strengths. Weaknesses are the internal limitations of a proposal that prevent or hinder the overall success of a project, like missing skills, lack of funding or any other possible disadvantage. Opportunities are external factors that help facilitate the achievement of objectives. Threats are external existential challenges to the project that jeopardize its success. Ultimately, the product of a SWOT analysis is a written framework that lays all of the most relevant ideas onto the table³⁹.

SWOT analysis forces the observer to take a serious look at the realities of a situation with an end goal of fully exploiting the strengths and opportunities and eliminating or addressing weaknesses and threats. Weighing the difference between the strength and weaknesses is critical

³⁸ Osita, I., R., I., & Justina, N. (2014). Organization's stability and productivity: The role of SWOT analysis an acronym for strength, weakness, opportunities and threat. *International Journal of Innovative and Applied Research*, 2(9), 23-32, 1-4.

³⁹ Ibid.

to ensure a level of success. Identifying opportunities at an early stage allows for a degree of foresight with implementation of the plan, while determining the level of threats can determine overall viability. Emphasis can be placed on individual portions of the analysis for action, such as strengths and opportunities, so that those points can be refined to degree that clearly exceeds weaknesses and threats. Strategies can also be implemented that act on reducing weaknesses and threats so that plans can be made to work on the strengths and opportunities.⁴⁰

In order to prioritize or classify the attractiveness of each option, the team conducted SWOT analysis with each option. The team developed a set of questions to answer for each use that would address the various internal factors (strengths and weaknesses) and external factors (opportunities and threats) involved with each adaptive reuse option. This list (Appendix B) was designed to be exhaustive and slightly overlap itself in order to promote thinking about each quality of the SWOT analysis in different ways. These questions were answered by observation and online research.

Based on the compiled strengths, weaknesses, opportunities and threats of each adaptive reuse option, three classes of options were made for presentation to Duncan's Abbey and the Village of Tarrytown. Class I consisted of high-strengths or low-threats options. Class II options had the possibility of success, but this success was not as prominent as for the options in Class I. Options in Class III had more threats than those in Class I or Class II, but were not excluded because they might be effectively incorporated into other options. All of these findings were reported in the Results of this paper and in a presentation composed for Duncan's Abbey to present to the Village of Tarrytown as possible uses for the Eastview Pumping Station along with a brewery.

⁴⁰ Ghanbari, H., Pour, M., & Barshod, A. (2012, October). Using SWOT analysis in tourism studies with system approach. *Advances in Environmental Biology*.

3.3. Accessibility Analysis

Site accessibility is another aspect that was explored. The project team used digital maps extensively to determine accessibility by evaluating travel times from major points within Tarrytown and adjacent community centers. Using Google's transportation application public interface (API), the project team generated custom isochrones, which are lines on diagrams or maps that relate times to spatial distances, based on traffic data. The isochrones presented in Section 4.1 allowed the project team to evaluate jobs and residences that are accessible through driving (i.e., give an idea of a potential customer base/range).

Land available for parking purposes was also examined. The students studied the space both in person and through maps to create a spatially consistent parking design that maximizes parking spaces while providing for the unique loading needs of Duncan's Abbey. Results from the previous adaptive reuse study regarding property were also taken into consideration. Digital maps, especially those with bike trails, facilitated the exploration of walking and biking options. From these metrics, it was possible to develop an expected area of service and the demographic base and economic base that Duncan's Abbey at the pump house will serve.

3.4. Sustainability Considerations

Sustainability in this project included considerations such as minimizing pollution, waste, and energy use. Efforts to make the adaptive reuse more sustainable serve dual goals of community integration as well as business viability. The assessment of considerations includes a synthesis of green concepts to consider during the renovation of the structure and green strategies during the operation of the facility. These concepts came from previously published

environmental studies as well as direct brewery case studies. Major areas of energy consumption have been identified such as equipment and building environment control. In addition, waste and pollution sources were categorized to understand their differences and ways to mitigate each output. The sustainability consideration include ways to reduce waste and overall energy while keeping costs down and reusing as much of the byproducts from the brewing process as possible.

Initially the considerations included the methods that the Village of Tarrytown had already put into place, such as the inclusion of solar energy panels on many public buildings. The Village itself has an extensive solar program that promotes community integration while reducing energy costs. Business partnerships that Duncan's Abbey could cultivate were taken into consideration in order to reduce waste output, such as in the case of recycling spent grains from the brewing process. Things that were not considered for this sustainability analysis were the output of the product, such as bottling beer, and how that waste could be reduced. A full cost-energy analysis is not included as it was identified to be outside the scope of the project goals. Lastly, energy sourcing methods besides solar energy were not researched because it would not have an effect on the sustainability considerations at this time.

3.5. Exploration of Mitigation of Cost

During the course of composing and justifying possible uses for the Eastview Pumping Station, our sponsor expressed an interest in exploring additional funding for the adaptive reuse. The property is owned by the Village, and does date back to the 19th century, so the team wondered if it would be possible to subsidize reinvigorating the property with outside funds. The goal was to answer these questions:

What funds are available locally and/or nationally for old/historic buildings?

What qualifies an entity for these funds?

Would the Eastview Pumping Station under Duncan's Abbey qualify for any of this funding?

To answer these questions, the team consulted different local, state, and national entities and their resources for seeking funding for different restoration projects. These organizations included the Hudson Valley Economic Development Corporation, New York State's Office of Preservation Assistance, and the National Registry of Historical Properties. The team researched tax credits, grants, and business development groups and analyzed the qualifications for specific opportunities with respect to Duncan's Abbey. Based on the requirements to qualify for each specific funding source, the team recommended or eliminated specific sources as options for funding.

3.6. Presentation of Findings

We constructed a PowerPoint presentation based on our findings. We presented these slides to Mr. DiNino and many Village trustees and citizens in Tarrytown on March 23, 2017. The presentation is shown in Appendix D. The goal of this method was to assist our sponsor in presenting possible ideas for the Eastview Station property to Tarrytown officials. Presenting ideas generated by the project team, a source outside of Duncan's Abbey, served the sponsor's ultimate goal of gaining community support to use the building for his brewing business.

Chapter 4. Results

Objectives completed within the scope of this chapter include assessing compatible uses with the brewing space, addressing the issues related to access to the site, and finally evaluating incorporation of sustainable technology into adaptive reuse of the building. This information is summarized in a presentation given to Village officials on March 23, 2017, which is attached as Appendix D.

4.1. Accessibility Analysis

One of the first components of site accessibility is “walkability”, the measure of ease by traveling on foot. The Eastview Pump Station has a number of limitations with walkability. Tarrytown’s reservoir trail, the primary link between the Eastview Station and other bike paths, lacks a substantial amount of lighting or pavement, key guidelines for walking suitability⁴¹. Furthermore, the distance from the Eastview Station to the edge of downtown Tarrytown via the Tarrytown Lake Extension is 1.2 miles, taking more than twenty minutes to traverse on foot⁴². The distance is nearly three times beyond the 0.4 mark that studies have shown to be the limit of most general purpose trips⁴³. Towards the west on the Old Saw Mill River Parkway stand a handful of large workplaces within 0.4 miles, including the Knicks Training Facility, a Consolidated Edison plant⁴⁴ and lastly the Regeneron Pharmaceutical Headquarters, employing

⁴¹Emory, J., & Crump, C. (2013). The WABSA Project (pp. 20-30, Rep.).

⁴²Google Maps. (n.d.). Retrieved from <https://www.google.com/maps/@41.0793052,-73.8487004,14.5z>

⁴³United States, Mass DOT. (n.d.). Who Walks and Why? Retrieved November 10, 2016, from <https://www.massdot.state.ma.us/Portals/17/docs/pedplan/03.PDF>

⁴⁴Google Maps. (2016).

nearly 1300 people⁴⁵. There is no residential housing within 0.4 miles of the Eastview Station.⁴⁶ Given the distance from downtown, the limited number of workplaces and a complete absence of close residential housing, “walkability” seems to be low.



Figure 6: A radius of 0.4 miles with a midpoint at the Eastview Pump Station superimposed over Google Maps.⁴⁷

⁴⁵ Regeneron. (2013, April 4). Regeneron Announces Expansion In New York's Hudson Valley [Press release].

⁴⁶ Google Maps. (2016).

⁴⁷ Google Maps. (2017).

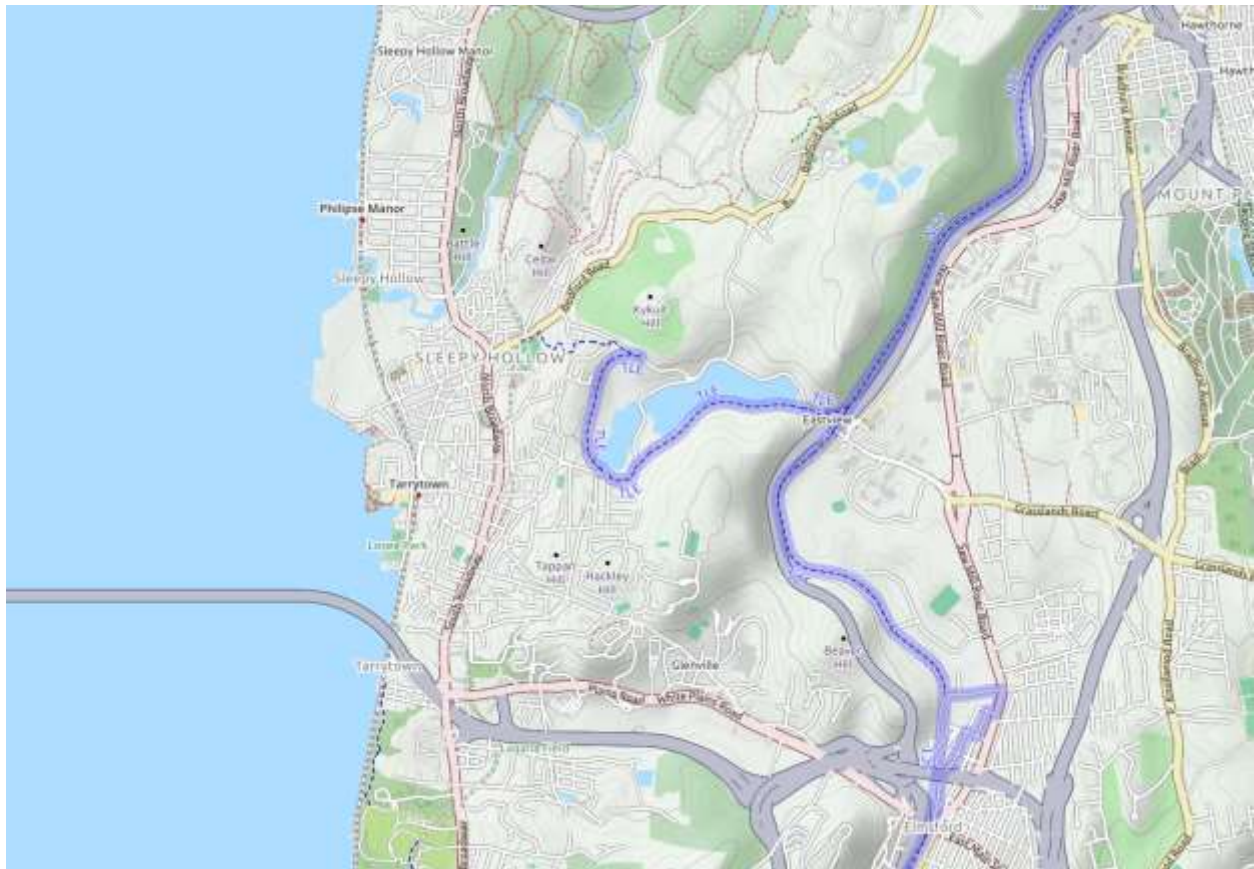


Figure 7. Highlighted in purple above are the North County Trail, South County Trail, and Tarrytown Lakes Extension bike trails.

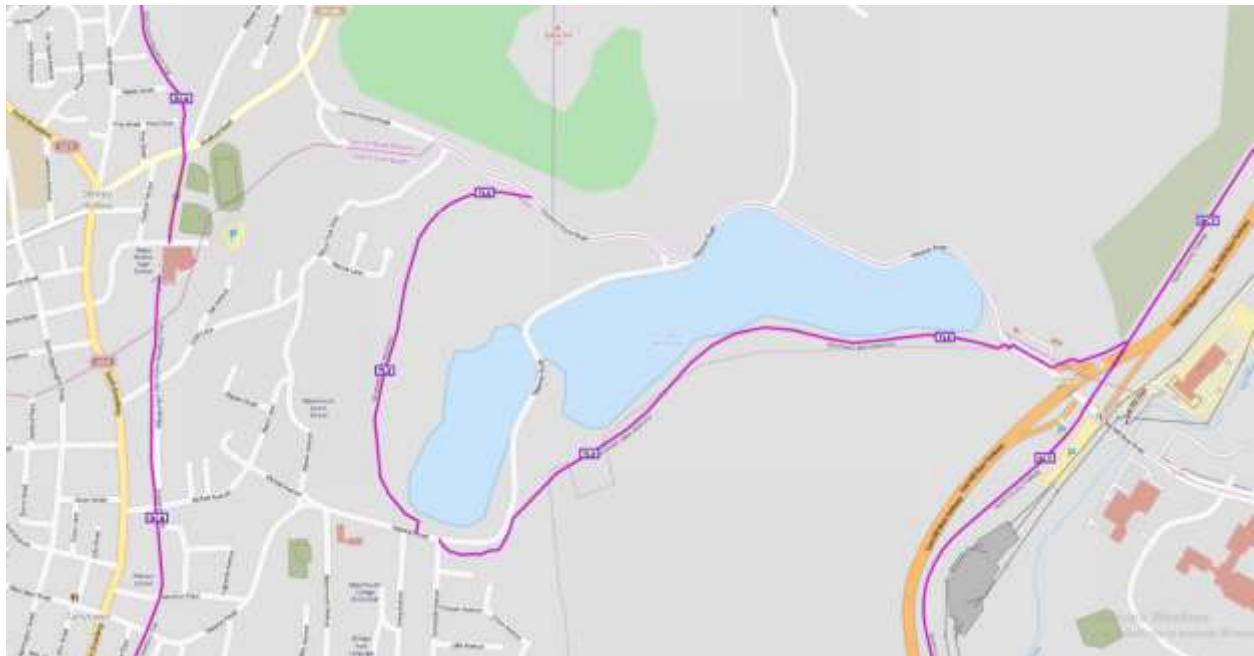


Figure 8. Here, highlighted in purple, is a closer view featuring the Tarrytown Lakes Extension and the Old Croton Aqueduct Trail to the west.

Ability to reach the site by bicycle is another aspect of site accessibility that has drawn consideration (see Figures 7 and 8 above). This component is much more of an opportunity for the Eastview Station as compared to walking. The Eastview Pumping Station is located on a junction of the North County Bikeway, a paved and largely grade-separated connection, spanning all the way from towns Elmsford in the south to Briarcliff Manor in the North.⁴⁸ Both towns boast substantial commercial and residential development within range of access point of the trail. The Tarrytown Lakes Extension also provides a link separated from mixed traffic to the edge of downtown Tarrytown.⁴⁹ Challenges are presented that reduce the accessibility of the Tarrytown lakes Extension however. The absence of lighting and pavement reduce utility⁵⁰ in addition to the gradient that cyclists face to reach the trailhead.⁵¹ Still, it would take only thirteen minutes to reach the center of Tarrytown from the Eastview station, 18 minutes to the center of Elmsford and 25 minutes from Briarcliff Manor.⁵² Research indicates that most cycling trips are less than two miles for leisure, but can be up to six miles, falling neatly within the range of destinations available on the current ends of the North County Trail.⁵³ The availability of separated bike trails to the Eastview Station and their proximity to significant amounts of homes and businesses suggests a significant level of bike accessibility.

Transit accessibility, an additional component of the accessibility of the site, is limited.

⁴⁸ Westchester.Gov. (2006). North County Trailway [Brochure]. Westchester County Department of Parks, Recreation and Conservation.

⁴⁹ Ibid.

⁵⁰ Google Maps. (2016). Retrieved from <https://www.google.com/maps/@41.0806585,-73.8487893,15z>

⁵¹ Google Maps. (n.d.). Retrieved from <https://www.google.com/maps/@41.1140913,-73.8534227,13z>

⁵² Ibid.

⁵³ Larson, J., El-Geneidy, A., & Yasmin, F. (n.d.). Beyond the Quarter Mile: Examining Travel Distances by Walking and Cycling, Montréal, Canada. 1-10. Retrieved November 10, 2016, from <http://tram.mcgill.ca/Research/Publications/Travel distance.pdf>

The Route 27 “Bee-Line” bus stops 1/2 mile away from the Eastview Station and operates four round trips daily⁵⁴. Low frequency and a long walking distance make transit seem to play a minimal factor in site accessibility.

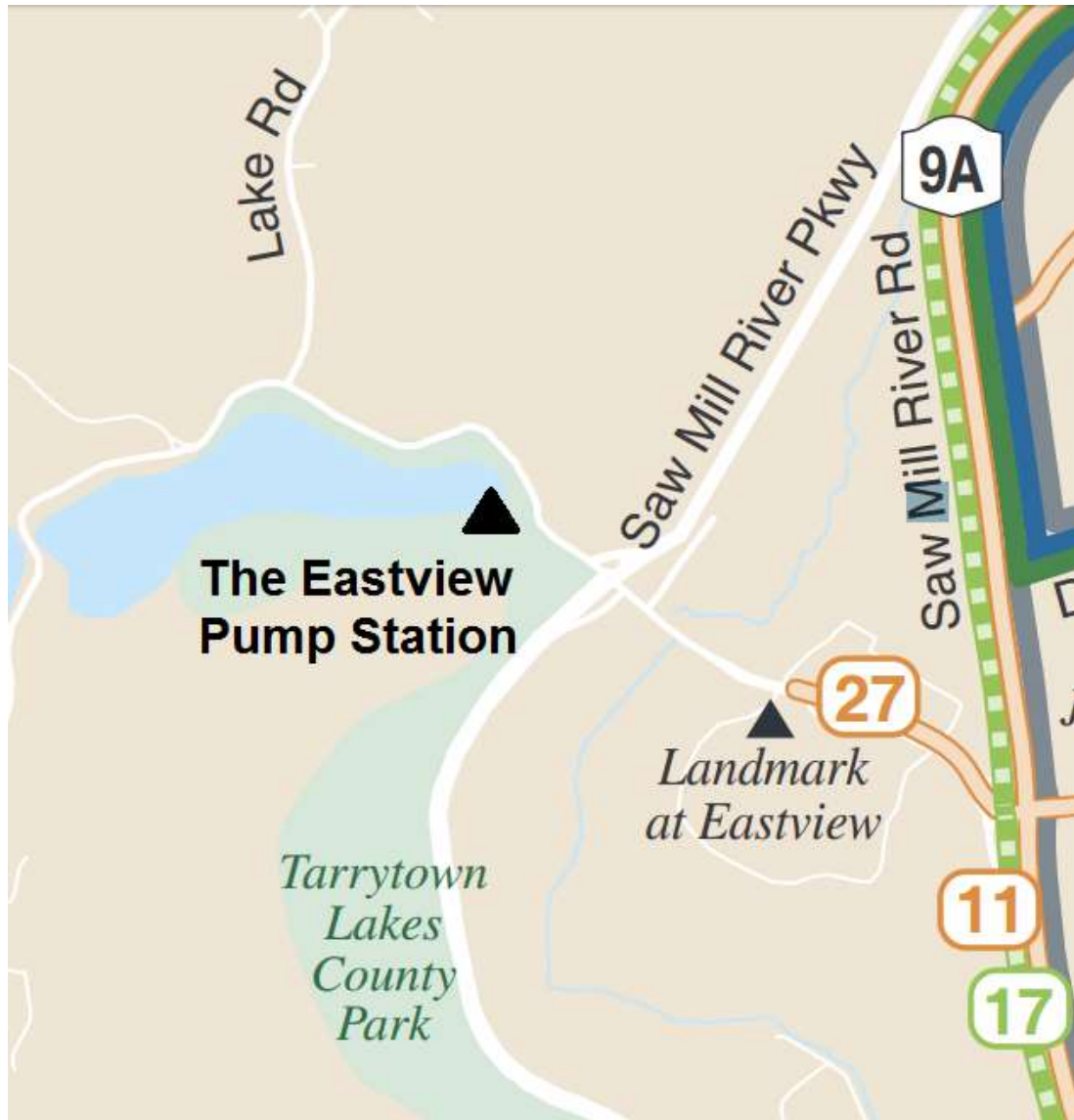


Figure 9. Route 27⁵⁵

⁵⁴ Ibid.

⁵⁵ Bee Line System. (2015). Bee-Line Route 27 [Brochure]. The Bee-Line System.

Auto accessibility will play a significant role in access to the site, given the accessibility challenges present in walking, cycling, and transit for the Eastview Station. To better demonstrate the auto accessibility, the project team used an Isochrone generated through an Application Program Interface API from information drawn from the Google Distance Matrix and Geocode Data. The isochrone maps show drive duration through three separate maps, a 5-minute (Figure 10), 10-minute (Figure 11), and 15-minute (Figure 12), driving duration. The maps have a shaded blue area which signifies the locations one could travel from to reach the Eastview Station for each duration. Using the isochrone maps the team has been able to conclude that the pump house is within reasonable driving distance to many outlying towns and populations. Tarrytown center, Elmsford, Greenburgh, and even sections of towns as far as New Castle have been identified within a 10-minute driving duration. Locations across the Hudson River are within a 15-minute driving duration to the pump house. The full completion of the Tappan Zee Bridge in 2018 should also decrease cross-river driving times.

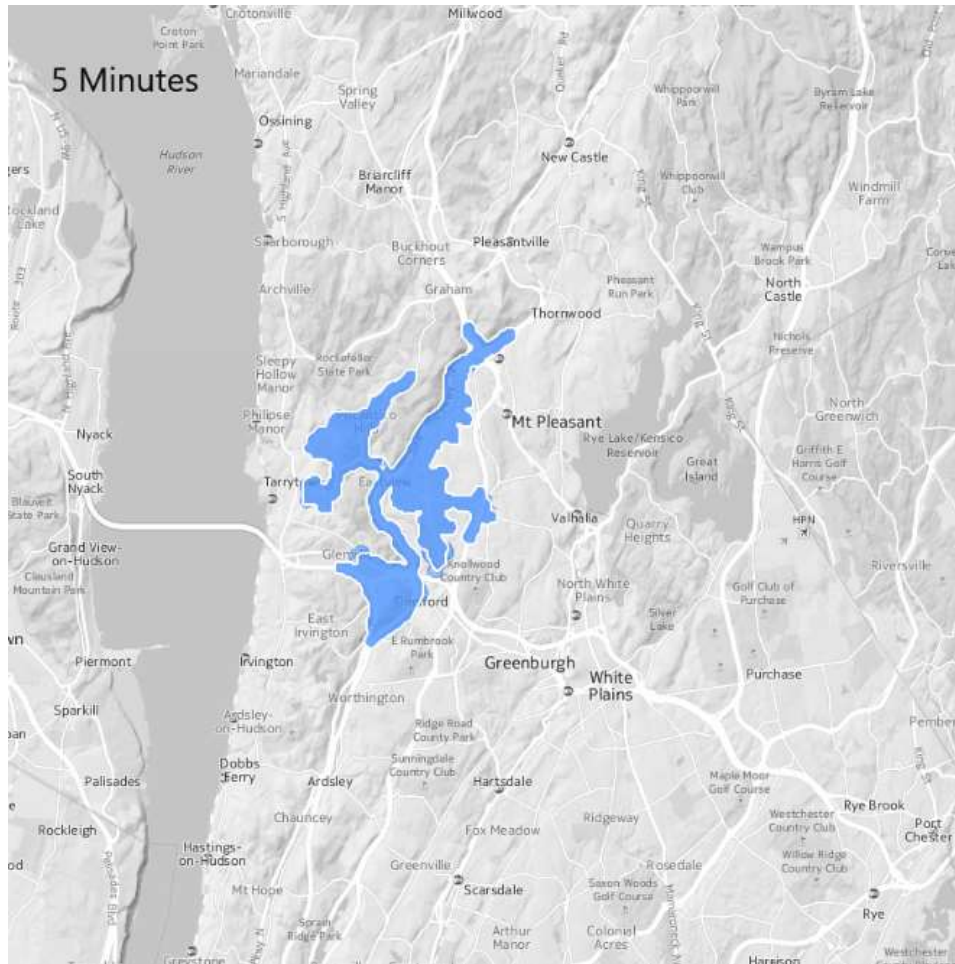


Figure 10. Five-minute travel time.

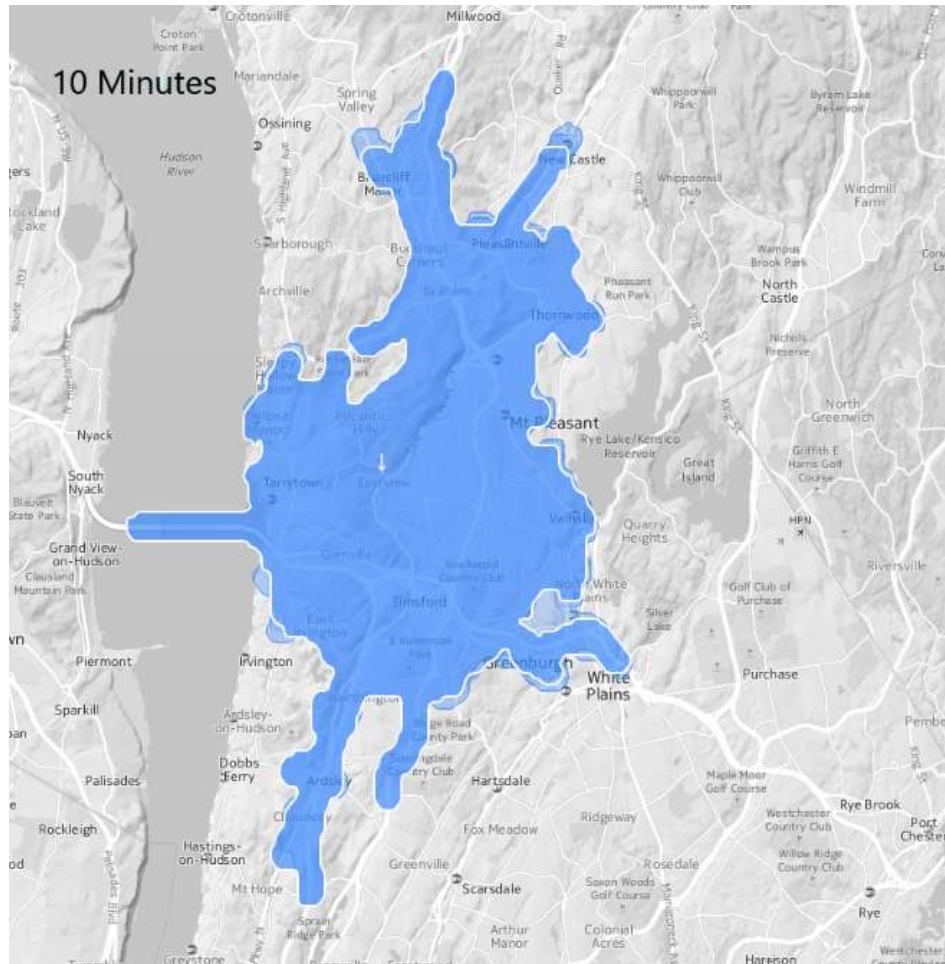


Figure 11. Ten minute travel time.

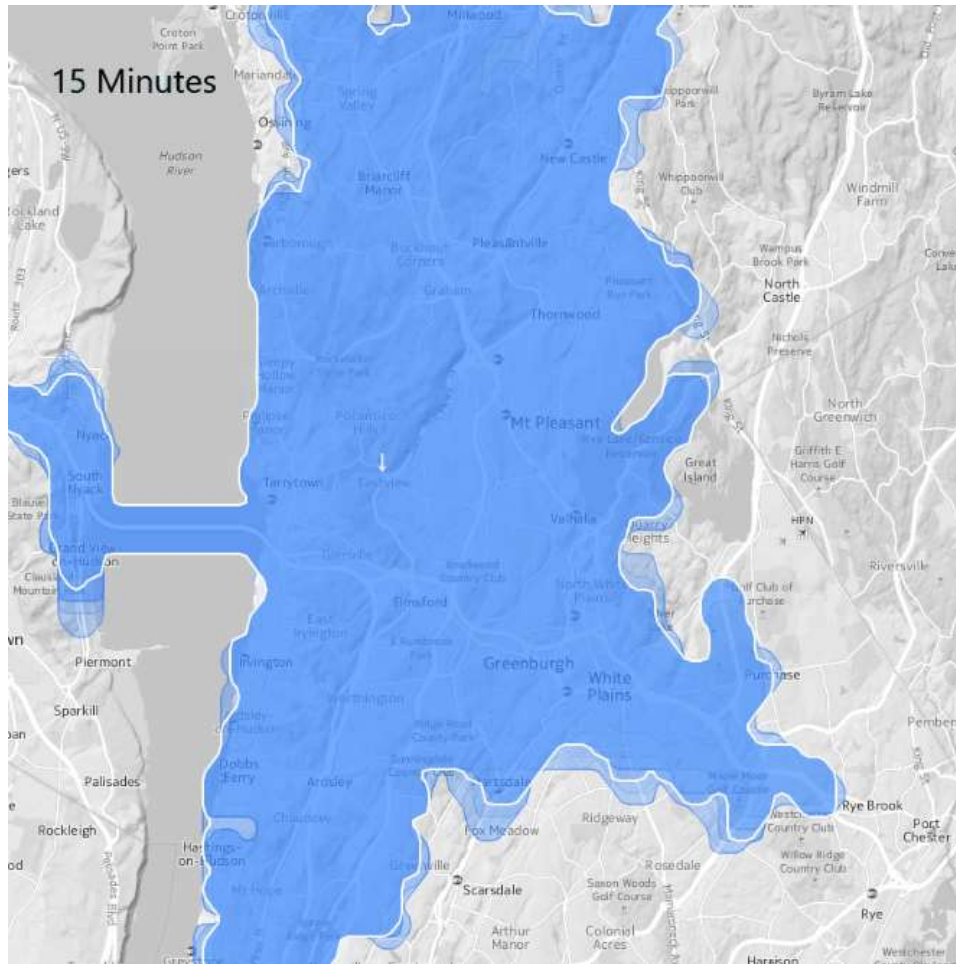


Figure 12. Fifteen minute travel time.

One conclusion drawn from these maps is that auto accessibility will not be hindered by drive times or traffic but rather parking accessibility; with so little space on the grounds for parking, other options will have to be explored to properly accommodate auto accessibility. In order to evaluate parking scenarios separate walking isochrone maps were generated to determine feasible parking distance as well as identify local areas where parking might be an option. This provided estimations of travel time to pre-existing parking and walkable areas such as the Department of Transportation (DOT) parking lot and the recreation path. The use of isochrone maps and other ARCGIS data should help evaluate the needs and solutions.

The Eastview Pumping Station presents a parking challenge. Village of Tarrytown's Zoning Code , in section 305-63-D1, calls for "1 space for each employee on shift, plus 1 space for each 3 seats or 1 space for each 100 square feet of gross floor area, whichever is greater".⁵⁶ Previously, an adaptive reuse study for the Eastview station suggested a 20-space parking lot immediately in front of the building, along with overflow parking in the 20-space New York Department of Transit (NYDOT) parking lot across the road.⁵⁷ However, upgrading the parking lot with road markings and pavement on the same footprint could yield substantially more parking spaces. Adding on-street parking would likely be challenging to provide because the modest size of the adjacent main road and the constraints on either side of the main road. Given that all adjacent non-reservoir properties within 500 feet of the site are owned either by the Rockefeller Trust, Westchester County or the State of New York, the NYDOT lot appears to be one option to gain more off-road parking.⁵⁸

⁵⁶ Village of Tarrytown, NY: Regulations Applicable to All Districts. (n.d.). Retrieved December 01, 2016, from <http://ecode360.com/10677954>

⁵⁷ Earl Everett Ferguson Architect, PLLC. 2010. *Eastview Pumping Station Adaptive Reuse*.

⁵⁸ Tax Map. (2012). Retrieved from <http://giswww.westchestergov.com/taxmaps/default.aspx?sMun=MtPleasant>

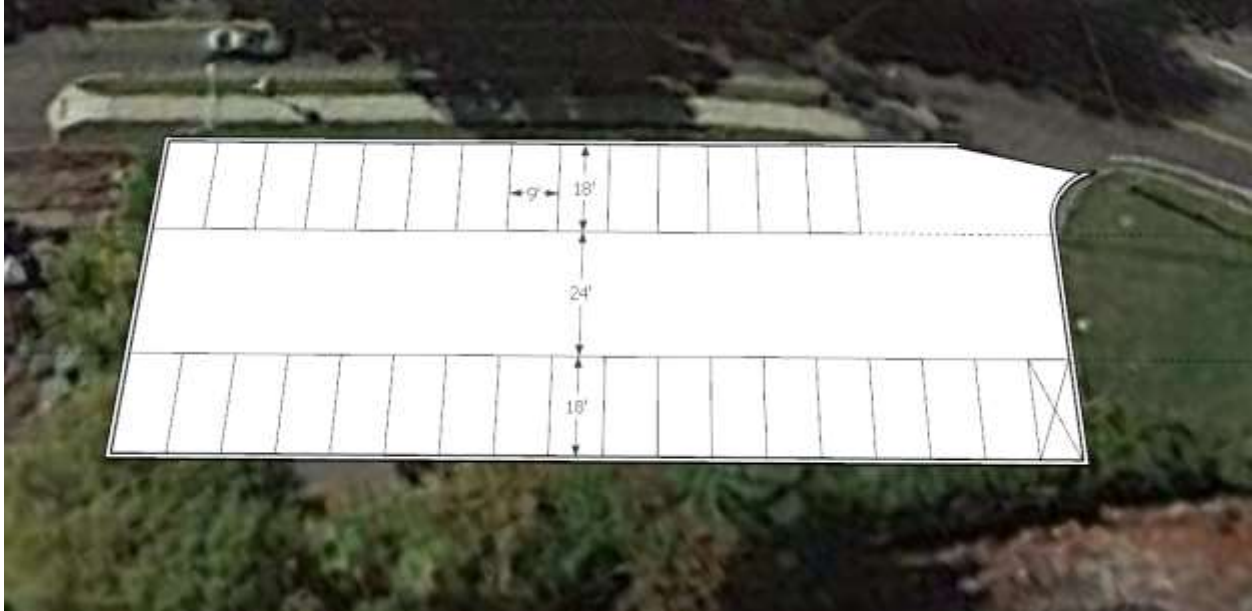


Figure 13. Diagram of suggested expansion to NYDOT lot with 30 spaces.

Mr. DiNino has also expressed the need for a loading zone large enough to facilitate the off-loading of a full size semi-trailer truck. To facilitate these concerns, the project team has completed two diagrams showing the changes that could be made to the NYDOT lot (Figure 13) and a planning option for the parking lot immediately in front of the building (Figure 14).

Changes made to the NYDOT lot could allow for up to 31 spaces in compliance with New York City government parking recommendations.⁵⁹

⁵⁹ New York City Department of Planning. (18 Jun 2007). Design Standards for Parking Lots.

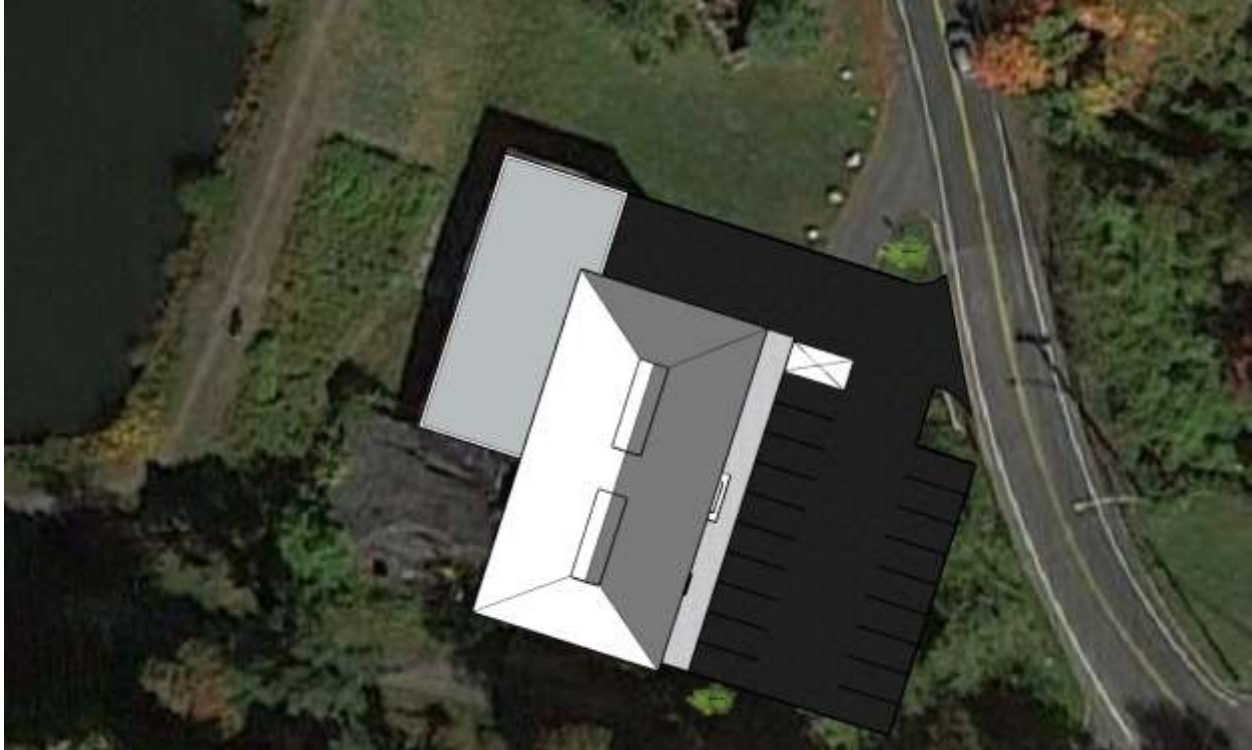


Figure 14. Diagram of the lot immediately in front of the property with an added loading area.

4.2. Analysis and Classification of Adaptive Reuse Options

By reviewing the previous feasibility study done for the Eastview Pumping Station, and by observing its dilapidated state in person, it became apparent that the building needs a new owner. The Village of Tarrytown currently owns the building and uses it to store surplus trash bins. The study recommended “mothballing” and stabilizing the building if it were to remain vacant. In addition, it recommended updates to the roof, HVAC, electrical, and water piping as well as indicated the need for new sewer connection.⁶⁰ Seven options were determined to be varying levels of viable: restaurant, nonintrusive exhibits, recreational rentals, custom brewing space, cafe, event space, and conference room. Ultimately, the Eastview Pumping Station has

⁶⁰Earl Everett Ferguson Architect, PLLC. 2010. *Eastview Pumping Station Adaptive Reuse*.

11,000 square feet of floor space, about half of which would be dedicated immediately to the brewing operation. There is therefore enough space in the building, theoretically, for more than one of these options to be implemented.



Figure 15. Classification of adaptive reuses into classes.

4.2.1. Restaurant

A restaurant was determined to be an attractive option because of how it blends with the brewing business, the location, and Duncan's Abbey's existing professional relationships.

Restaurants provide an opportunity for consumers to sit down for an extended period of time and truly absorb their outdoor and indoor surroundings. A 2002 study by Cornell University found that the average American indicated spending an hour in a restaurant for dinner was expected.⁶¹ This provides plenty of time for the average patron to appreciate their environment. In addition, restaurants are a very common choice for leisure entertainment. By including a restaurant, more

⁶¹ Kimes, S. E., Wirtz, J., & Noone, B. M. (2002). *How long should dinner take?* 233.

of the general population would be engaging with the space as opposed to if the building was completely dedicated to brewing.

The location of the property also makes this an attractive location for a restaurant. The property is located in very close proximity to the Saw Mill River Parkway, which makes the site a short journey from a very large surrounding radius. Because the site is so accessible by car, and because of the parking demand a restaurant imposes, we determined that the property would require more parking options than it currently has. This weakness, while a large one, is manageable with different off-site options, and was ultimately outweighed by the wider customer base that can engage with this property/building if the parking need was assuaged.

The existing fixtures and floor space made the restaurant option a top idea. The building largely looks frozen in time: much of the pumping station equipment and machinery that was there when Eastview closed operations looks untouched. Displaying or reusing these fixtures in a restaurant setting would assist Mr. DiNino in portraying the historic value of the property and community in the establishment.

Certain opportunities exist that make a restaurant at this location a viable option. Duncan's Abbey currently participates in many local expositions that display local breweries and restaurants. One, for example, is an event run by the Hudson Valley Craft Beer Week called Paired, in which restaurants pair with breweries to match food with brews and using local ingredients for both. Mr. DiNino, through this and other opportunities in Tarrytown and the Hudson Valley, has had the opportunity to work with different restaurants, and these connections very well could lead to a partnership in creating a restaurant in the Eastview Pumping Station. In addition, more and more people are making an effort to "get outside;" for example, the New York State Department of Environmental Conservation's website offers different options for

taking advantage of the great outdoors.⁶² The Pumping Station’s position on the edge of both the Tarrytown Lakes and the North & South County Trail bike path makes it a prime opportunity for recreationalists to take a break, enjoy the view and have a bite to eat.

4.2.2. Cafe

The concept of a cafe would be sort of a restaurant “lite”. Lighter fare, such as breads sausages and cheeses, would be offered, and hours for eating and spending time at the building would be more afternoon-centric than evening-centric as with the brewery. There would be a carryout option for Duncan’s Abbeys brews and any fare offered. Some of the aspects of the cafe could be integrated into the restaurant, such as point of sale for Duncan’s Abbey brews. Typically, the thought of a cafe brings to mind coffee and light snacks, so a challenge with this use would be blending that concept with the fact that it would be in the same building as a beer-brewing business. This would be a challenge to creating a cohesive location within the Eastview Pumping Station, but could also be resolved by being more of a brewpub-style cafe open in the afternoon/early evening.

4.2.3. Recreational Rentals

Offering recreational rentals (i.e. kayaks, bicycles) at this location was also determined to be a viable option based on the results of the SWOT analysis (Appendix C). In addition to capitalizing on the greater push for people to “get outside” and the location of two opportunities for people to enjoy the natural atmosphere, offering recreational rentals is a great way to engage a different demographic of visitor to the Eastview property: those who love the outdoors (but

⁶² New York State Department of Environmental Conservation. “Education.” Web.

may not have the equipment for the occasion). Based its website, a company called Hudson River Recreation currently offers kayak rentals from the property under direction of the Village, so offering this service when the property is privately owned would be just as viable. The project team has not located any bike rental locations near the bike path, so competition in this area would not be a concern. Outdoor recreation of this type, unfortunately, is a seasonal business in the Northeast, so one weakness to this option would be that it would only be used a fraction of the year. In addition, visitors traveling by car in order to pick up a rental would require long-term parking, which would further stress the need for parking on the property and in close proximity.

4.2.4. Wall Exhibits

Through SWOT analysis, small exhibitions were determined to be an attractive option because they are very easy to integrate into decor. In his vision for Duncan's Abbey at the Eastview Pumping Station, Mr. DiNino expressed a passion for emphasizing the history of the building and the Village of Tarrytown. People will be interacting with the space inside the building, no matter the specific use. This means the decor is a prime opportunity to engage visitors/customers with the history that Duncan's Abbey is eager to tell. This could take the form of small displays, most likely hung on the walls for viewing. This is such an attractive option to integrate because it works with any of the options presented in this paper and is unobtrusive. One opportunity that makes this a viable option is the historic feel of Tarrytown and the surrounding area, and another is the number of historical groups in the area, including the Historical Society of the Tarrytowns, the Westchester County Historical Society, and the Friends of the Ridge Historical Society, just to name a few. One way to showcase the history of the area could be to partner with these different groups to create different themed history displays that change every so often.

4.2.5. Custom Brewing Space

A custom brewing center/space is a business with a license to allow people to use its space/equipment to brew custom beer, wine, or cider. This idea was appealing because it advances Duncan's Abbey's mission of emphasizing brewing locally with local ingredients by mentoring others to do the same. The state regulatory environment is improving for custom brewing spaces; recently, the State of New York enacted a bill making the guidelines for opening a custom brewing space more feasible.⁶³ Including a custom brewing space within the Eastview Pumping station is practical because some space/setup/equipment could be transferred over to Duncan's Abbey's brewing space if/when Mr. DiNino wanted to expand his operation. A weakness of this option is that the upfront cost may outweigh the benefits or profit of having brewing space/equipment to grow into. One threat is that there are about 4 semi-local spaces that offer this service that keeps this from being a Class I option and makes it Class II option as there are a handful of similar spaces in the surrounding local community.

4.2.6. Event Space

Having a dedicated room for events to take place was also an option determined to have promise. The image here was of a small to medium event hall where one could host a reunion, small wedding, etc. This was a strong idea because if there is space in the building for it, it could be a useful room. This was, however, a weak idea because of competition with the brewery for space/noise. There is limited outdoor area for moderately-sized events to utilize, which also made this a weaker option. Threats to this use include a community that is a very saturated market for historically-inclined event spaces - manors, mansions, etc. This use could possibly

⁶³ New York (State). Legislature. Senate. Senate Bill S1227B. 2015-2016 Leg. Sess. New York State Senate.

work if it is not hurting the business and if there is physical space that does not have an initially-set purpose. Event space considerations could also be made with the restaurant option.

4.2.7. Conference Space

Implementing a dedicated conference room for outside entities to use into the Eastview Pump Station was another option explored in the team's analysis. While determined to be doable, the idea had one very strong threat: competition from very similar spaces; one part of the DaVinci meeting rooms chain, the other in Tarrytown Music Hall. If a room is finished but not fully purposed, it could make a decent private meeting room for groups who do not have such a space available to them.

4.3. Sustainability Considerations

Duncan's Abbey has many options to consider when addressing the idea of sustainability while crafting a quality brew; managing costs, energy consumption, greenhouse gas output, and reuse of materials can all be balanced to have an economic and sustainable outlook. Our research found that energy usage is typically the most important sustainability aspect of a brewery, because all of the processes depend upon energy in some form or another. We found the two main types of energy for breweries are natural gas (70% of energy requirement) and electricity (30% of energy requirement).⁶⁴ The more important factor to include is that natural gas, while being 70% of energy requirement in most breweries, actually only accounts for 20-30% of the total energy costs because of its lower cost-per-joule when compared to electricity, Eliminating

⁶⁴ Brewers Association. Energy Usage, GHG Reduction, Efficiency and Load Management Manual Brewers Association, June-July 2021. Web. 07 Dec. 2016.

costs in the energy segment comes from being mindful of electricity usage and trying to minimize electricity usage in every area. We found many breweries and factories take on "Energy Profiles" which are used to manage energy usage as well as make a guideline for efficiency. Energy profiles are often voluntary ventures that provide both a community accepted standard and a means to reduce overall energy. For example, Energy Star is an energy-efficiency program that is well recognized to homeowners and has proven effect upon lowering energy consumption. By following their guidelines and procedures a company can become communally accredited, such as through a program similar to Energy Star. Breweries typically lower their energy consumption in one of three ways: automation systems, change of process, and change of equipment.⁶⁵

Case studies done by the *Brewers Association* exemplify some of the ways breweries are able to reduce waste and energy. Among many cases, they outlined two in particular that stand out: a brewery in Kansas and a brewery in Virginia. The Boulevard Brewery in Kansas City was able to lower their energy and heating costs by implementing a zone control strategy that took advantage of the heat produced in the brewing process while automating their ventilation and heating systems.⁶⁶ Another example would be the Victory Brewery Company, which reduced its greenhouse gas output by recovering the natural gas burned to heat boiler. By doing this, Victory was able to circulate the heat throughout the building and brewing process.⁶⁷

Lastly, we found a change of equipment is by far the most prominent method of lowering energy consumption. Different types of equipment include lighting, air control/filtration for

⁶⁵ Brewers Association. Energy Usage, GHG Reduction, Efficiency and Load Management Manual Brewers Association, June-July 2021. Web. 07 Dec. 2016.

⁶⁶@boulevard_beer. "Sustainability – Boulevard Brewing Company." *Boulevard Brewing Company*. 07 Dec. 2016.

⁶⁷Barchet, Ron. "Archive | Victory for the Environment RSS Feed for This Section." *Victory Brewing Company*. N.p., June 2014. Web. 07 Dec. 2016.

boilers, HVAC, conveyors, and even refrigeration units. By using high-efficiency systems for lighting and HVAC breweries have seen up to a 15% reduction in energy use.⁶⁸ In addition to lowering overall output by being mindful of energy consumption, material and process consumption can bring Duncan's Abbey to a sustainable model while lowering costs.

Waste is also a major concern of breweries when assessing the overall sustainability footprint. Various areas of waste can be identified throughout the brewing process including solid, liquid, and energy waste. Solid waste is mainly in the form of spent grain which is the direct result of the brewing process, while liquid waste has a direct and indirect output from the brewing process. The direct output comes from the fermentation and maturation stages of the brewing process where leftover "sludge" from the bottom of the tanks has to be cleaned out and disposed of. The indirect outputs come from this cleaning process and the chemicals used in order to clean the tanks; this cleaning process can be broken down into two stages. Cleaning the majority of excess sludge from the tanks and disposing by conventional means, such as wastewater disposal is the first stage of liquid disposal. The second stage is the use of chemicals to clean the tanks which would be mixed with the remaining sludge. By separating these processes the direct and indirect liquid waste can be disposed of in separate methods which would both reduce disposal cost and environmental impact. Disposing of chemical waste is often the highest cost for breweries and would require a contract or partnership with a disposal company to schedule regular pickups. One way Duncan's Abbey can use its direct outputs could be setting up a partnership with a local farm to which it could give/sell spent grain.

Solid waste can be disposed of in cost effective and carbon-neutral ways; breweries have multiple existing methods to offset this waste. The cost-effective method of disposing of used

⁶⁸ Brewers Association. Energy Usage, GHG Reduction, Efficiency and Load Management Manual Brewers Association, June-July 2021. Web. 07 Dec. 2016.

grain is to sell or donate the waste to a local farm to be used as mixture for animal feed.

Duncan's Abbey can use this method to create business partnerships locally within the Village of Tarrytown.

4.4. Mitigation of Costs

Our research first explored tax credits as a funding option that are one means to gain some of the initial capital costs of the property. A 20% tax credit is available to structures that are either listed on the National Register of Historic Places or are otherwise certified historic structures.⁶⁹ The renovation must be certified by the National Park Service to meet the Secretary of the Interior's Standards for Rehabilitation to be eligible for the tax deduction.⁷⁰ Thereafter, the property must be used for five continuous years for an income-producing purpose.⁷¹ Adhering to the standards of the 20% credit may present some regulatory hurdles that complicate renovation to the Eastview Pumping Station.

The 10% Rehabilitation Tax Credit provides a much more relaxed set of standards. There is no requirement for the renovation to be certified by the National Park Service and it does not require the building to be listed in the National Register of Historic Buildings,⁷² which the Eastview Station currently is not. The building must actually be deemed to be non-historic in order to receive the 10% tax credit. Buildings deemed historic can only receive the 20% tax credit and the restrictions that come with it.⁷³

⁶⁹ National Park Service. (2012). Historic Preservation Tax Incentives [Pamphlet].

⁷⁰ Ibid.

⁷¹ Ibid.

⁷² Ibid.

⁷³ Ibid.

Grants in general were also explored as an option for additional funding. Many grants have some provision for applicants to be recognized or attempting to be recognized by a State or National Register of Historic Places. Many also require that the applicant be a Not-For-Profit (NFP) organization or municipal body. The State of New York's Parks Service provides some options for organizations seeking funding.⁷⁴ One of these options is the Environmental Protection Fund Grant Program for Parks, Preservation and Heritage (EPF), which seeks "to improve, protect, preserve, rehabilitate, restore or acquire properties listed on the State or National Registers of Historic Places" by evaluating how a project emphasizes or reimagines a property's historical, cultural, and natural significance.⁷⁵ Different grants have individualized rules for how funding can be used. The Cynthia Woods Mitchell Fund for Historic Interiors, as the name suggests, allows funding to be used on consultants, guest lectures, and historic furnishings plans, but actual construction or property acquisition activities are excluded from award eligibility.⁷⁶ Grants would be a viable option if the Village were planning to hold on to the property for an extended period of time, but as a for-profit business, Duncan's Abbey, as owner of the property, would not qualify for most of these grants.

Lastly, local economic and business development groups can be a source of non-direct income and interest. While they do not typically provide funding from the group itself, they do provide various researching avenues for funds from federal, state, and local governments.⁷⁷ The

⁷⁴ "Preservation Assistance Funding Resources." New York State Parks, Recreation and Historic Preservation. *Parks.ny.gov*. Nov 11, 2016.

⁷⁵ "Historic Preservation Grant Program." New York State Parks, Recreation and Historic Preservation. *Parks.ny.gov*. Nov 11, 2016.

⁷⁶ "Cynthia Woods Mitchell Fund for Historic Interiors: Guidelines & Eligibility." National Trust for Historic Preservation. *Savingplaces.org*. Nov 11, 2016.

⁷⁷ "Evaluating and Managing Economic Development Incentives." *Evaluating and Managing Economic Development Incentives / Government Finance Officers Association*. Government Finance Officers Association, Feb. 2014.

Hudson Valley Economic Development Corporation is an example of a development group that aims to bring success to businesses within Hudson Valley; they have a broad range of support from viable economic data to hosting local summits, one of which was a beer, wine, and spirits summit held this past summer.⁷⁸ Other incentives of joining a business development group include start-up groups, business advisement, utility incentives, and the possibility of meeting investors as well as partnership programs.⁷⁹ Joining a business development group brings more opportunity to expanding businesses and provides many resources that are just as important as direct funding. This is a viable option for Duncan's Abbey as the owner of this property and for any other business that would take residence within; networking with the local area would increase the Eastview Station's local visibility.

4.5. Presentation to the Village

A meeting was held with Tarrytown officials, Mr. DiNino and the project team. The goal of this meeting was for the project team to present its findings, and for Mr. DiNino to gauge interest from the Village in his vision. Our presentation of findings to various Village officials and Mr. DiNino was well-received. There was a question-and-answer period in which Mr. DiNino answered questions from those in attendance about his business model. Those in attendance expressed excitement over the possibility of the Eastview Pumping Station finding a new purpose. Next steps include talks between Mr. DiNino and the Village about Duncan's Abbey leasing the property.

⁷⁸ "4th Annual Hudson Valley Beer, Wine, Spirits & Cider Summit." *HVEDC*. Hudson Valley Economic Development Corporation.

⁷⁹ "Incentives | HVEDC." *HVEDC*. Hudson Valley Economic Development Corporation, n.d.

Chapter 5. Recommendations and Conclusions

Overall, the Eastview Pumping Station provides multiple opportunities for a successful adaptive reuse. Because it is in an accessible and prominent location within the Village of Tarrytown and the Hudson Valley area; because it has the ability to incorporate the historic character of the area; and because of the push for sustainability around its location; the Eastview Station has the potential to be very successful as a brewery and as any other service included within its walls.

We recommend an adaptive reuse involving food service be included in the building. Whether this means a restaurant or cafe makes its new home in the pump house or the building offers a point of sale for fare by local food artisans (for example, local breads, meats and cheeses) alongside Duncan's Abbey's brews, having food in the building will engage more customers with the pump house itself and with Duncan's Abbey. In a restaurant, cafe, or carryout setting, Duncan's Abbey's brews can be showcased against the backdrop of the building's historic character and the natural beauty of its location. Offering food in some capacity will also be a draw for cyclists coming off of the local bike trails to experience the Eastview Station (and Duncan's Abbey within it).

We also recommend that the Eastview Station tap in to the recreational opportunities available in the immediate area. Practices could include offering rentals of kayaks or bikes, or providing a bike rack, a place to refill water bottles, or a public bathroom. Duncan's Abbey at the Eastview Station can only benefit from the traffic of visitors coming off of the bike trail. Because the location of the station is on the beautiful Tarrytown Lakes, many customers may come for the outdoor attraction and then be interested by the rustic-looking building beside it and want to stop in for a bite or a pint.

In order to maintain the character of the building and make this building a location that exemplifies the historic character of Tarrytown, we recommend that decor be chosen based on the building and town's history. The Eastview Station still retains its original outer stonework; incorporating this aesthetic into the interior design will create a contiguous historic, rustic feel throughout the building. The Eastview Station still retains much of its pumping station outfit; incorporating these fixtures into the final building's design or decor will show reverence to the building's past and enrich the historic character of the building's future. Exploring opportunities to partner with historical societies locally and display them within the final building will help to enrich the engagement visitors have with the Eastview Station and Tarrytown's pasts. Residents of the village value the village's historic charm, so incorporating that charm into the building will further integrate the pump house into the community and make it a local place to catch up with a new or old friend, as the Duncan's Abbey brand seeks to do.

Accessibility results indicated that walking and transit are unlikely to play a significant role in transportation to and from the site. Promotions encouraging customers to use public transit or to walk are likely to fall flat because the site is so distant from both transit and walkable businesses and housing. However, the unique location of the site presents tremendous opportunities for bicycle use and a remarkably large catchment area for drivers. We recommend that emphasis in promotional materials should be placed on the remarkably short distance between the pump station and the Sawmill River Parkway exit. It should also be mentioned in promotional materials that there is only one street crossing between the pump station and the Northern County Bike Trail. The adapted site layout should also reflect these strengths. Adaptations could include paved space with bike racks abutting the bike trail.

Parking is critical to the success of the adaptive reuse project. On-site parking should be as substantial as spatial constraints allow. Securing the use of additional parking, such as the NYDOT parking lot across Neperan Road, would be necessary to comply with Tarrytown's zoning regulations if a full-service restaurant, one of the preferred pairings with the brewery, was added to the pump house. Doing so would double the available parking spaces from approximately 20 spaces to over 40 spaces. Other suggested site uses would benefit from additional parking as well.

Based on analysis of the existing sustainability framework within the village, we recommend developing or adopting an energy profile for the Eastview Pumping Station as the next step as it sets goals and expectations for the reduction of waste and energy use. This energy profile will help to create a plan as to where money should be spent to reduce the most waste and energy. Taking on a sustainable energy profile, carbon footprint, alternate energy sources, and reducing energy are the main goals, while reduction of costs is not necessarily a primary objective. The effort to be sustainable and its implications on cost should be taken into consideration when doing an overall profit analysis, as sustainability sometimes impedes the revenue process of a business. For breweries there is a finite line between being sustainable and being too sustainable, i.e. where profits dwindle because owners invest too much focus on methods of sustainability that may be more expensive than the profits they turn, rather than a balance between environment and product.

Duncan's Abbey is the best choice for bringing the Eastview Pumping Station into the 21st century while still retaining its 19th century roots. No matter the final adaptive reuse(s) chosen, the community will gain a revived focal point, a gathering place, and a hometown location to be proud of through the acquisition and renovation of the Eastview Pumping Station.

The building has laid vacant for long enough; the time has come to begin giving it a future as vibrant as its past. Eastview can be a destination that hearkens not only to Tarrytown's historic aspects, but also to the evolving state of its modern culture.

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Appendix A. Tarrytown Itinerary: September 14, 2016

Time	Activity
8:00 AM	Meet at Tarrytown Pastry Chef
8:30 AM	Access to the property with the Superintendent of Public Works. Tour the building and take a short walk along the nature trail nearby
10:00 AM	A tour of the Rockefeller Archive Center
12:00 PM	Informal meeting with the Village Administrator
12:45 PM	Lunch on Main Street.
2:00 PM	Walking tour of the "Hudson River Walk" and the waterfront properties. Information on the Tappan Zee Bridge Project. Drive by the old General Motors lot.
2:30 PM	Tarrytown Music Hall tour
3:30 PM	Quick stop into the ice cream shop on Main St; quick walking tour of Philipsberg Historical Manor, Old Dutch Church and Cemetery
4:00 PM	Washington Irving Church, Patriot's Park, and some of the Dutch Colonial homes still standing within the village (200+ years old)

Appendix B. SWOT Analysis Questions

1. How does the location makes this an/a im/practical use?
2. How does the existing structure makes this an/a im/practical use?
3. How does the surrounding environment make this an/a im/practical use?
4. How does the surrounding business environment make this an/a im/practical use?
5. Does Duncan's Abbey's background go along with this use?
6. Does Duncan's Abbey have the connections to make this use possible?
7. What makes Duncan's Abbey the choice for this use over the competition?
8. Does Duncan's Abbey have existing agreements/distribution relationships in this category?
9. How well does the space in the pump house suit this use?
10. How can the history of Tarrytown/the pump house be highlighted in this use?
11. How does parking relate to this use?
12. In what ways can existing fixtures in/on the site be used/repurposed in the redevelopment?
13. What does this use's business plan lack?
14. What is within control of the project/use that is a weakness to the use?
15. Is the location poor for the intended use?
16. How does location/business environment feed into the use's success?
17. What is the recent market environment for this type of use?
18. How would the use be perceived by the public? Would the use strengthen the community of Tarrytown?
19. How critical is timing to the success of this use?
20. Who are the existing competitors?
21. Are there opportunities/desires for collaboration?
22. How does the current + projected economical environment factor into the use?
23. How do demographics in the surrounding area factor into success of the use?
24. How does average income in the surrounding area factor into success of the use?

Appendix C. Individual SWOT Analyses

Restaurant

<i>Strengths</i>
Makes the property more generally used by the community- not just a "beer" place Location: easily accessible, esp. via Saw Mill River Parkway and from frequently used recreational path Building has existing fixtures that could be used in decor
<i>Weaknesses</i>
Location: parking would need to be more available
<i>Opportunities</i>
Partnership with other restaurants Increased tourism of local natural gems - lake, bike path
<i>Threats</i>
While still accessible, not as close to Main Street as others

Cafe

<i>Strengths</i>
Smaller demand for kitchen, saving square footage Convenient location Higher turnover - less parking concern
<i>Weaknesses</i>
Not in a heavily frequented area, so opportunist customers limited With point-of-sale, no distinct "prime time" vs restaurant
<i>Opportunities</i>

Relationships with other local artisans/food vendors
--

Recreational Rentals

<i>Strengths</i>
Direct proximity to reservoir and bike trail Already a current practice (kayaks) Uses the natural gifts of property to engage different demographics of visitors
<i>Weaknesses</i>
Purely seasonal business Long-term parking
<i>Opportunities</i>
“More than just a brewery” Greater national push to “get outside”

Wall Exhibits

<i>Strengths</i>
Emphasizes history of the building Emphasizes history of the community Easily integrable into decor
<i>Opportunities</i>
Partnership with different historical organizations in the area

Custom Brewing

<i>Strengths</i>
Similar materials to the brewing business Duncan's Abbey brewing could theoretically take over this space if/when the brewery grows
<i>Weaknesses</i>
Start up costs (equipment) may outweigh benefits of having the space to "grow" into
<i>Opportunities</i>
New state legislation supporting these spaces
<i>Threats</i>
Preexisting similar businesses local in all four directions of this location

Event Space

<i>Strengths</i>
Picturesque location Shuttle is a viable solution for event parking
<i>Weaknesses</i>
Limited outdoor space for events Square footage competing with brewing space at a certain size Brewing operation might cause noise interference
<i>Opportunities</i>

Duncan's Abbey has a number of existing relationships with local restaurateurs and has had some individuals express interest in moving their food operation to the pump house

Threats

Market in area for event spaces is saturated
Event spaces that do incorporate history have a more opulent story to tell with their décor

Conference Space

Strengths

Low staff requirement

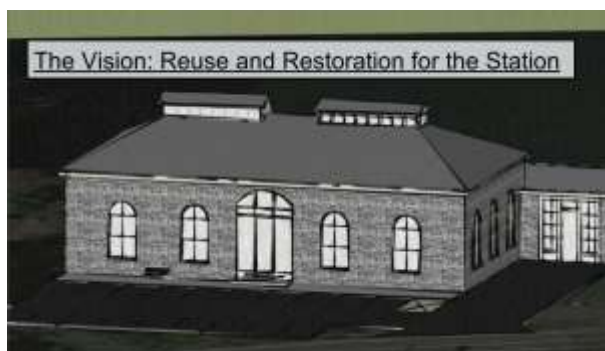
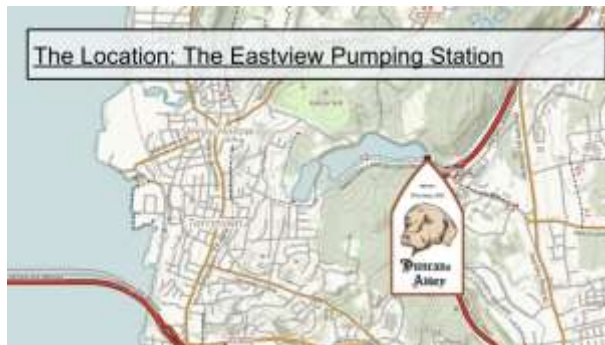
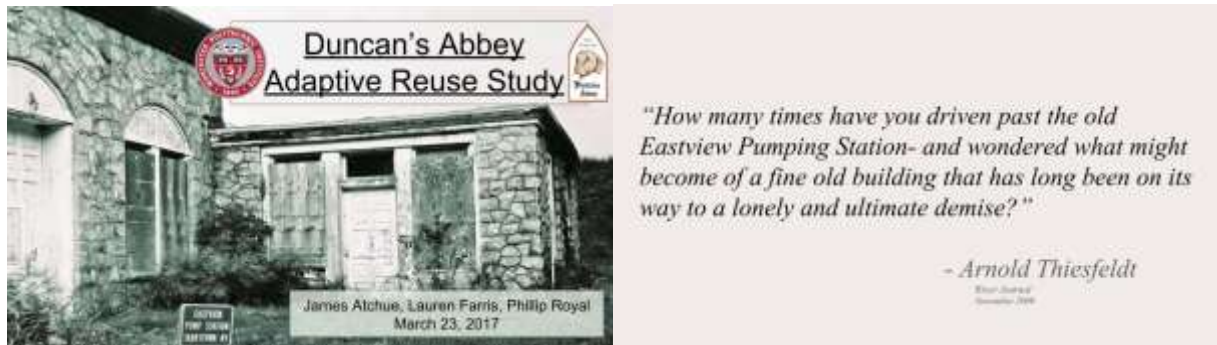
Weaknesses

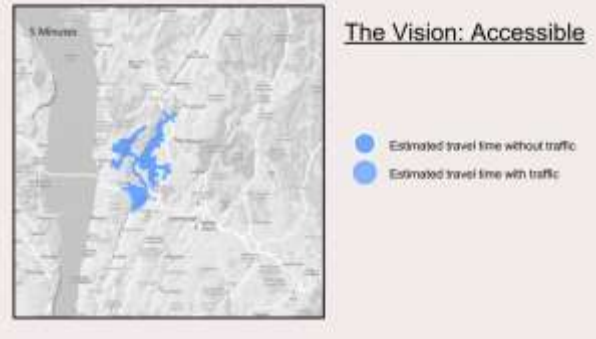
Use does not tie in as seamlessly with property/brewery
Not much of an income ~~use~~-potential

Threats

Not many pre-established local corporate locations
Already a fully-equipped rental business meeting space in town
Businesses tend to already have meeting space of their own
The Tarrytown Music Hall (historic) developed a similar space recently

Appendix D. PowerPoint Presentation





The Vision of a Brewery






General Building Layout

Adaptive Reuse Options

Class I



Class II



Class III



Class I

Class I: Restaurant



Strengths
Makes the property more generally used by the community, not just a "beer" place Location: easily accessible, esp. via Saw Mill River Parkway and from frequently used recreational path Building has existing features that could be used in decor
Weaknesses
Location: parking would need to be more available
Opportunities
Partnership with other restaurants Increased tourism of local natural gems - lake, bike path
Threats
While still accessible, not as close to Main Street as others

Class I: Recreational Rentals



Strengths
Direct proximity to reservoir and bike trail Already a current practice (kayaks) Uses the natural gifts of property to engage different demographics of visitors
Weaknesses
Purely seasonal business Long-term parking
Opportunities
"More than just a brewery" Greater national push to "get outside"

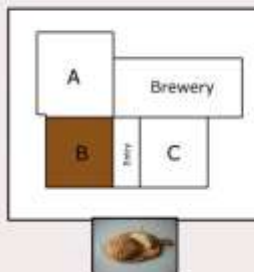
Class I: Exhibitions



Strengths
Emphasizes history of the building Emphasizes history of the community Easily integrable into decor
Opportunities
Partnership with different historical organizations in the area

Class II

Class II: Cafe



Strengths
Smaller demand for kitchen, saving square footage Convenient location Higher turnover - less parking concern
Weaknesses
Not in a heavily frequented area, so opportunist customers limited With point-of-sale, no distinct "prime time" vs restaurant
Opportunities
Relationships with other local artisans/food vendors

Class II: Custom Brewing



Strengths
Similar materials to the brewing business Could theoretically take over this space if/when the brewery grows
Weaknesses
Start up costs (equipment) may outweigh benefits of having the space to "grow" into
Opportunities
New state legislation supporting these spaces
Threats
Preexisting similar businesses local in all four directions of this location

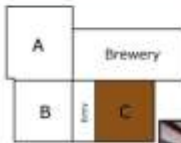
Class III

Class III: Event Space



Strengths
Picturesque location Shuttle is a viable solution for event parking
Weaknesses
Limited outdoor space for events Square footage competing with brewing space at a certain size Brewing operation might cause noise interference
Opportunities
Existing relationships with local restaurateurs
Threats
Market in area for event spaces is saturated Event spaces that do incorporate history have a more opulent story to tell with their décor

Class III: Conference Space



Strengths

Low staff requirement

Weaknesses

Use does not fit in as seamlessly with property/brewery
Not much income use potential

Threats

Not many pre-established local corporate locations
Already a fully-equipped rental business meeting space in town
Businesses tend to already have meeting space of their own
The Tarrytown Music Hall (historic) developed a similar space recently

Sustainability In Action: Solar



Sustainability In Action: Efficiency



Sustainability In Action: Materials Reuse



- Exchange used grain
- Capture & Reuse CO₂
- Recirculate & Reuse heat energy

