‘APT TO ADAPT’:
A STUDY ON RELOCATION OF HISTORIC STRUCTURES THREATENED BY SEA-LEVEL RISE

By

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To my teachers
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<td>Approx</td>
<td>Approximation.</td>
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<tr>
<td>CSX</td>
<td>Chessie-Seaboard Transportation.</td>
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<tr>
<td>FEMA</td>
<td>Federal Emergency Management Agency</td>
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<tr>
<td>HSR</td>
<td>Historic Structures Report</td>
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<td>LEED</td>
<td>Leadership in Energy and Environmental Design</td>
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<td>NRHP</td>
<td>National Register of Historic Places</td>
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<tr>
<td>S.A.L</td>
<td>Seaboard Air Line Railway Company</td>
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<tr>
<td>SOI</td>
<td>Secretary of Interiors</td>
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<tr>
<td>S.W</td>
<td>Southwest (direction)</td>
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<td>USGS</td>
<td>United States Geological Survey</td>
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Many of Florida’s most prominent cites as well as cultural heritage are located along the coast. Counties like Miami-Dade and Broward have substantial populations living just four feet above sea-level, than any other state, except for Louisiana.1 According to a report published by climate central, 23 out of the 25 cities at risk in FEMA’S 100-year costal floodplain, are located in the state of Florida.2

This study focuses on the relocation of historic structures, as an effective adaptation strategy, especially for vulnerable coastal sites, in the state of Florida. Impact of relocation on historically significant sites are analyzed, the findings are discussed in the context of Florida, and outcomes are recorded.

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The moving of historic structures is not favored by historic preservation specialists due in part to the issues of integrity and authenticity. This study shows relocation could be a challenging and expensive affair but when combined with good planning strategies and stakeholder support, it could help bring the community together, rehabilitate neglected cultural heritage and add value to the built environment of places, by preserving the past and building a sustainable future.
The purpose of this study is to analyze relocation projects and understand the implications of it on historic properties. As relocation might be the most suitable form of adaptation strategy especially for vulnerable coastal historic structures, since many of them might not be able to withstand the negative impacts caused by the rising seas and the changing climate.

**Climate Change and Sea-Level Rise**

“Climate change is no longer some far-off problem; it is happening here, it is happening now”.¹ -Barack Obama.

Climate change is a prevalent topic in the contemporary world. A lot of significant research from various fields, is taking place to better understand, and address this phenomena. Climate change itself is not a nascent process. It is a natural occurrence, it has been affecting the earth and our ecosystem for ages. Over the past century or more, however, human activities, have accelerated changing climates and sea level rise.

There is an imbalance in the rate of change of climate and temperatures all across the globe and the ability of the environment to adapt to the change. This disparity has a negative impact on the environment, heightening the effect of climate change, and increasing the vulnerability of various habitats. Wind pattern alterations, increasing global temperature, and escalating sea-levels all appear to have a direct

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correlation, with the adverse changes in global climate. According to anthropologist and author Susan. A. Crate, the negative impact of rising temperatures and increasing sea levels are affecting civilizations all over the planet. Siberia is encountering warmer winters and increasing desertification has been observed in villages of Sub-Saharan Africa. Melting of glaciers, in the high Andes region could be a vital cause for depleting fresh water resources in the region, as well as for the rising tides of the South Pacific Islands that result in frequent episodes of high tides, and increased flooding.

Research studies have shown that temperatures all across the planet have multiplied by one fold and sea-levels have risen by about eight inches over the past century. These numbers appear to amplify each year. According to World Resource Institute’s Christina Deconcini and Forbes Tompkins “Average annual sea-level rise between 1993 and 2011 was 78 percent higher than between 1961 and 1993. This swift sea-level rise makes the coastal regions of the world very vulnerable to adverse increased flooding, loss of land due to erosion, adulteration of soil, and loss of local flora and fauna. It also affects coastal settlements, and regions that become more susceptible to flooding and natural disasters. Residents of vulnerable areas are increasingly making the decision to move. An estimated 12 million people relocate all

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2 Susan A. Crate and Mark Nuttall, Ed., Introduction: Anthropology and Climate Change: From Encounters to Actions (Walnut Creek, CA: Left Coast Press, Inc., 2009), 11

3 Susan A. Crate and Mark Nuttall, Ed., Introduction: Anthropology and Climate Change: From Encounters to Actions (Walnut Creek, CA: Left Coast Press, Inc., 2009), 11

around the world due to sea-level rise. Islands on lowlands have a huge threat of being immersed in water in the near future.

According to the Intergovernmental Panel on Climate change the oceans are expected to rise by 11 to 38 inches by 2100, and this could inundate many cities in the United States. With a 23 feet rise in the ocean levels, of the world it would be enough to submerge non-coastal cities like London.

**Adaptation Strategies**

Adaptation is key to helping ensure coastal communities and areas are less susceptible and more resilient. Strategies for adapting the built environment must take into consideration historic buildings and other resources that often lend communities and regions their character and sense of place. Hard and soft stabilization of shores, building modifications and relocation of Structures are the effective adaptive strategies which could help preserve vulnerable Historic Structures.

**Conclusion**

Adaptive strategies depend on effective planning. There have been observations, which suggest that some of the new constructions have been careful about the climatic shifts, and thus are begin designed to withstand the pressure. Certain architects are coming up with designs of “Water Based Urban Development” and “Floating Cities”, which could help humans societies thrive in areas susceptible to the rising seas.

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Design of many historic buildings are not as adaptive to this shift, which makes them all the more vulnerable. Therefore, relocation appears to be a sustainable approach for ensuring the long-term survival of these significant structures. Relocation if used as a planning tool rather than a last resort then the entire process could be more sustainable, economical and efficient. It could also add value to the cultural fabric of a region and help in bringing the community together.

This study analyzes the impact of relocation on Historic Properties by examination of relocation projects in the state of Florida. A qualitative case study analysis is employed which inspects the process of relocation and rehabilitation of historic properties and identifies considerations that could help inform strategies and projects about relocating historic structures threatened by sea-level rise.

Analysis of relocation projects of historic structures, help discover various challenges which include the issue of integrity and authenticity of relocated structures, the feasibility of relocation methods based on the building materials and load of the structures, planning of suitable route to safely move structures with minimal damage, financial support of stakeholders and the willingness to preserve heritage resources by the government and local communities. The outcomes of the case study analysis are presented in the conclusion chapter. The conclusion chapter (Chapter 5), talks about the feasibility of relocation projects by exploring the positive impacts of relocation observed in the cases analyzed which are, creating a positive sense of space, bringing the community together and relocation used as an effective tool for strategic planning.

and development. All these observations could be utilized as a general framework to help preserve vulnerable historic properties on the coasts of Florida, in order to mitigate the threat of sea-level rise.
CHAPTER 2
LITERATURE REVIEW

Historic preservation focuses on creating sustainable environments by promoting the concept of reuse, use of renewable resources and increasing quality through energy efficiency, among other approaches. The topic of adaptive strategies due to sea-level rise is beginning to be discussed as part of historic preservation in the United States. Efforts to date have largely focused on managing areas affected by natural calamities like excessive flooding and hurricane disasters among others. Adaptive strategies could prove beneficial to historic properties since it could be used as an effective prevention method, for minimizing damage caused by short and long term flooding as well as help mitigate sea-level rise threats.

Sea-Level Rise- A threat to historical resources

Settlements throughout history, have often occurred near water sources. Bodies of water are frequently a resource for agriculture and transportation. Therefore, a lot of the major urban developments, cities and regional settlements all across the globe and in the United States of America have been near the coast. Many of these coastal regions are experiencing the negative impacts of sea-level rise. The Shismaref region of northern Alaska, for example has been facing the issue of excessive erosion causing some 600 residents to relocate to better, and safer lands.


As mentioned above, most of these regions are of high density and saturation with a plethora of various kinds of built environment. Many of these contribute to the historic and cultural heritage of the country. These important resources might be lost forever if the coastal regions of the country vanish. Here are some instance of negative impacts of Sea-Level Rise on vulnerable major historic cities and regions in the United States.

Charleston, South Carolina

The City of Charleston is located near the southern coast of South Carolina. It was the first community in the United States to establish a historic district in October 13th 1931, it has over 1400 historically significant buildings along with 77 National Historic Landmark properties. Charleston has been a hub of cultural and heritage resources in the country for a long time. For the past, few years the state of South Carolina, particularly the city of Charleston has been receiving heavy amount of rains, which has caused flooding. The effect of these frequent floods amplify with high tides in the region. On October of 2015, the city experienced two extreme episodes, which caused a lot of inconvenience in the entire region. From October 2nd until October 5th, within a duration of three days, Charleston received some 26 inches, of rain. This deluge, was followed by the fourth highest tides of the City at the end of the month. Several streets, houses and historical sites suffered due to heavy flooding. These

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events collectively impacted the high tide, which rose up to 8.7 feet above mean low water level in Charleston harbor.⁴

**Annapolis, Maryland**

Annapolis, Maryland is a historic east coast city containing “one of the largest collections of eighteenth-century buildings in the country”⁵. Located at the Chesapeake Bay area, is not only experiencing the impact of sea-level rise but also going through a phenomenon known as the “forbulge collapse”⁶ causing the land to slowly sink below sea level. The influence of these factors will increase the rate and amount of flooding in the area, threatening the historical buildings and monuments. With the rising threats of climate change relocation might prove to be the best bet to keep the heritage architecture of the region safe.

**Florida Topography**

Most of Florida is situated just at sea level and the entire state has a topography of elevated land mass running from the Northwestern region to the central region of the state. All the three sides of the peninsular state starting from the coastal regions in the north to the southern part of Florida all lie at sea-level. The lowest elevation of the state

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is at sea-level which is the height of the entire southern portion of Florida, which includes counties like Miami-Dade, and other highly saturated regions of the state. The highest peak of Florida is Britton Hill, Lakewood Park located in northern Walton County in the Panhandles which is 345 feet (105 meters) above sea-level the lowest elevation compared to the other states of the United States of America\(^7\). Due to climate change phenomena the sea levels around Florida are expected to rise over 6 meters in elevation,\(^8\) which could cause massive flooding and drown the entire southern portion of the state.


Figure 2-1. Florida Topographic Map, Reprinted from, USGS, Grim, Joe, USGS National Dataset.
Heritage Resources of Florida

Florida consists of various types of Historic resources, St. Augustine which dates back to the 16th century and is the oldest city of the United States of America, to the mid-century modern architecture of Sarasota, the history of the recent past, to the distinctive art deco architecture of South Beach Miami. There are totally 1700 properties and historic districts listed on the National Registrar of Historic Places in Florida. They are distributed through 66 of the state’s 67 counties. 42 of these are national historic landmarks.

Vulnerable Coastal Regions in Florida

About 40 percent of damage to housing, regions and settlements in the United States, due to sea-level rise, are located in the state of Florida; which has 1,197 Statute Miles coastline. Persistent flooding is observed in Miami Beach, after the passing of intense storms, especially on the lowland regions. There has been an increase in top wind speeds of Hurricanes which are expected to rise, due to the negative impacts of climate change, and global warming. This will create more powerful storm surges, causing massive flooding, and rainfall along with the rising seas.

Major Florida coastal urban regions like Miami, one of the prominent cities in the Atlantic coast, is experiencing an increasing density of housing, and will continue to do so over the future. It is going to put a lot of pressure on the coasts, and storms like 2017 Hurricane Irma would cause far more damage, due to the coastal real

estate development. Disaster management of these areas would be financially draining. Resiliency planning and effective adaptation strategies, like relocation could help protect the urban fabric of cites and also save millions of dollars.\textsuperscript{10}

Vulnerable Historic Resources

A majority of Florida’s Heritage is located on coastal regions. Four counties with the state’s largest number of historic properties registered with the NRHP are all coastal counties. The county with the most number of historic sites is Miami-Dade consisting of 177 historic properties listed on the NRHP, other counties with a large amount of listed Historic Properties are Volusia County containing 103 properties located on the east coast of the state, Hillsborough county with a total of 94 listed properties located on the west coast of the state and the fourth county with the most number of historic listings is Sarasota with a total of 93 Listed historic properties located on the western coast. All these counties are vulnerable to Sea-level Rise and storm surges. Relocation if used for certain important resources in the region could help preserve the Cultural Resources and help regenerate and develop the urban fabric of these regions. Lessons learned from the relocation projects studied could be applied to the suitable coastal heritage properties, which could be the most effective adaptive strategies for many of the vulnerable cultural resources of Florida.
Figure 2-5. Counties of Florida, Reprinted From: http://geology.com/county-map/florida-county-map.gif
Florida has some prominent historical and archeological sites, in the country. One of the country’s oldest cities, St. Augustine is located in Florida, a rise of one meter in sea-level will have a major impact on the historic resources of costal Florida. An estimated 16,000 archeological, and historical sites all around coastal Florida, are threatened due to Sea-Level Rise.\(^\text{11}\)

**St. Augustine, St. Johns County**

St. Augustine, Florida; a city which is more than 450 years old, still sustains some of the buildings of the first inhabitants of the area. It is a coastal low lying area, which has experienced flooding and storm surges throughout history. However over the past two decades the conditions have worsened. Downtown streets of St. Augustine, contains few of its most prominent historical structures built around the nineteenth-century, by oil-tycoon Henry Flagler. It often experiences, episodes of flooding on account of which during the hurricane seasons, it often stays closed. Experts predict that, over the next few years the low-lying regions of the historic town would probably need a pumping system to remove water.\(^\text{12}\)

**Miami-Dade County**

Miami-Dade County region is saturated with Cultural Resources, with over 170 properties and districts registered on the NRHP, which includes six national historic


landmarks. However this region of Florida is very vulnerable since most of the region is at or few inches above sea level, with a slight rise in the seas, many of the region could experience severe flooding. Persistent flooding is observed in Miami Beach, after the passing of intense storms especially on the lowland regions. City officials in Miami are seriously considering adaptive strategies to deal with natural disasters like the 2017 Hurricane Irma and excessive flooding because of Sea-Level Rise. Preservationists like Roderick Scott are promoting the idea of lifting the Art Deco architecture in South Beach region to help mitigate the threat of the rising seas. Proper planning strategy and effective adaptive strategy for historic properties could help reduce the impact of this irreversible phenomenon of Sea-Level Rise.

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Adaptation Strategies

According to The Union of Concerned Scientists adaptation is:

The process of adjustment to actual or expected climate and its effects. In human systems, adaptation seeks to moderate or avoid harm, or exploit beneficial opportunities.\(^{16}\)

There are several adaptive strategies that have been applied in order to keep built environments stable by making them more resilient towards the harmful impacts of nature. These main adaptive strategies include Stabilization of shore, lifting of structures and relocation of buildings.

Stabilization of Shore

This consists of two kinds of stabilization techniques the hard and soft method of stabilization. The former focuses on building of jetties, groins and breakwaters, which extend perpendicularly out towards the water; this widens the surface area of the shore and the impact of the waves get absorbed by these barrier systems, allowing the shoreline to be safe. The other form of hard stabilization includes, building of sea walls parallel to the shoreline so that the hard stone or concrete wall acts as a shield and protects the shoreline from erosion. The soft method targets either on nourishing the shoreline by increasing the sand cover and widening the surface area of the shore, or providing a suitable vegetation cover that absorbs the impact of the waves and help protect the built region.\(^{17}\)


Figure 2-8. Use of Fencing, Vegetation and Sand Dunes to Stabilize Shores, Reprinted from Scottish Natural Heritage*, http://www.snh.org.uk/publications/on-line/heritagemanagement/erosion/approxix_1.4.shtml (2000).
Building Modification

In certain cases instead of nourishing the shoreline, buildings are elevated with the help of wooden piles and by other means, this helps in keeping the structure stable by elevating it above the path of the fierce waves of the coast.¹⁸

Relocation

Another adaptive strategy focuses on the relocation of structures away from the low-lying coastal region. This protects the structures from destruction due to excessive flooding and/or damage due to the unstable, eroded land on which it sits.¹⁹

Few of these various kinds of strategies that include a large range of interventions from shielding the shoreline to completely moving away from low-lying areas have proven to be beneficial in the end. For instance, the sustainable stabilization with the application of dikes and levees in Netherlands have kept the ocean at bay for hundreds of years, allowing most of its population to live below sea level.²⁰ Along with that, experiments on soft stabilization projects like wetland restoration in Chesapeake Bay and the Southern San Francisco Bay are helping bolster natural ecosystems that help to absorb the energy of waves in order to keep a check on excessive flooding and protect developed urban areas as well as improve the quality of the natural

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environment. However, sea-level rise is a growing threat, it is estimated to increase in the future, making many of these adaptive strategies obsolete.²¹

Today, in the United States, preservation seeks to sensitively manage entire historic districts, and cities through local ordinances. This holistically, is about the community, and their own distinct characters, and values. Relation of heritage buildings with their surroundings are an important part of cultural identity, Hence adaptive strategies, like relocation of structures could affect the authenticity and integrity of the structures but with the rising threats of climate change and sea-level rise, relocation may be one of the few strategies for protecting, and stewarding historic buildings long-term.

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Relocation Methods

There are three common ways, in which buildings have been relocated in the past. Perhaps the least invasive is, moving the entire building as a whole, lifting it off its foundation, and then transporting it to a safe location with the help of animals (traditional Approach), or on heavy vehicles. Disassembling a structure and then reassembling it in the new location is another method practiced, where structures made up of wooden frame, stone, or other materials that can be recorded, disassembled to be reassembled again. After taking apart the pieces, materials and building components gathered are moved to a new location, and the building is reconstructed. The other way of preserving a structure is, to relocate it by breaking it into smaller chunks and moving the pieces to the new location and then joining the parts back together accordingly. Sometimes buildings do not need to be preserved as a whole, hence the most significant part of the building is separated, and then moved to a new location, and preserved in a new sustainable environment.

Relocation Trends in the 19th- Century

History of relocation, in the western world predates the Industrial Revolution. Nomadic tribes like the Vikings made replicas of buildings, rather than moving them on their newly explored land. L’Anse Aux Meadows in Newfoundland still has examples of this kind of architecture. After this, there have been many more examples of reconstructions of structures, from Log cabins in Finland, to Commonwealth Era churches in England. Present day America, consists of many such examples of fine reconstructions of various religious, residential and public architecture that had its origin
in France, England, Spain and elsewhere, but have become a major part of the country’s history.\textsuperscript{22}

The nineteenth-century was the era in the western world, where organized relocation of buildings started taking place. This coincided with the advent and growth of the Industrial Revolution. The technology became more sophisticated, and towns were transformed. This was the beginning of globalization, in which functionality, productivity, and the practical arts were the norms of society. Certain special societies, and their distinct architecture were considered rare and valuable heritage resources, worthy of preservation. Certain type of architecture had more significance, compared to their contemporary styles and some of them became a part of folk museums. These buildings were vernacular in nature, present only in certain regions, and were losing importance. Open-air folk museums became places to exhibit these exotic styles. The entire Scandinavian regions from Stockholm to Copenhagen, Arhus, Odense, Lillehammer and Reykjavik had folk museums. Folk museums grew from the Scandinavian region to all of Northern Europe, and are now present in various Northern European regions even today specially in, Germany, Belgium, Switzerland, Britain and Ireland.\textsuperscript{23}

The purpose of folk museums, were merely not the exhibition of arts, artifacts and architecture, but they were a representation of the past for future generations. This


concept of folk museums were not just limited to European countries, but this policy also helped promote various traditional types of art and architecture like, Japanese structures and African village architecture. These museums were made up of an amalgamation of all the unique styles of architecture. Many of these buildings were reconstructions, but some were traditional buildings that were relocated from various parts of the world to be exhibited in fairs like the Exposition Universelle, Paris 1889.24

Perhaps the best known open air museum is at Skansen, Stockholm. Founded by Arthur Hazelius in the 1870’s, this museum is an assembled representation of various kinds of architecture. It consist of collections of rural and farm architecture in an open-air setting overlooking the commercial, and institutional city center. A combination of educational and recreational resources were added on to the museum. The museum consists of relocated, and reconstructed structures on a 75-acre area containing around 150 buildings, craft complex, park, botanical garden, zoological gardens, zoo and restaurants. This unique outdoor museum has been popular since its creation, and remains a popular tourist destination, entertaining more than two million people annually.25

These museums consist of a variety of buildings with varied levels of authenticity and integrity ranging from a mere prop to an entire detailed reconstruction to a careful relocation of original buildings. This trend is still popular and structures like Norwegian


Stave church in Disney’s Epcot or the museum equivalent at Moesgård Manor near Arhus in Jutland, Denmark are some examples.

**Relocation Trends in the 20th-Century**

In the twentieth-century, significant architectural details were treated like precious artifacts by the rich and prosperous of the new world. Hence, not entire buildings, but parts of them would be relocated to be placed in another structure as an artifact in a museum, or in the renovation of villas and mansions. Staircases, chimneys, porches, windows and furniture of the old world were quiet popular among the rich. This was the time when preservation of cultural heritage was a social symbol. Rhode Island summer cottages were a combination of assembled elements or rooms shipped from other regions and recreated in-situ. There are a few instances where entire buildings were moved, for instance, building near James River close to Richmond, Virginia were disassembled shipped and then recreated by nostalgic, wealthy, tobacco businessmen. Similarly the relocation of Agecroft Hall, a half-timbered mansion moved from Lancashire, to be reassembled in the late 1920’s by T.C.Williams Jr., was not reassembled in the authentic manner. These recreated versions of the buildings were simplistic, and not authentic replications, but a mere symbol of identity for the owners.26

During the mid to late twentieth-century, when the world was at war certain buildings

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were relocated in order to preserve them, these kinds of relocation was authentic and integral and the structures were moved in a sensitive manner.\textsuperscript{27}

**Relocation Trends in the 21\textsuperscript{st}- Century**

Preservation in the twenty first-century is a field that helps provide character and identity to the broad picture of human civilization. It is very important to save cultural heritage in the most sensitive possible way and to maintain the authenticity and integrity of structures. Since they have become a source of education, rather than just a mere symbol of status. In the current environment, preservation is all about the local community with an international connection.

With a rapidly changing world, strategies for relocation could help sustain cultural heritage and with modern technology, this is possible with the minimum amount of damage to the physical form authenticity and integrity of historic buildings.

**Technological Advancement in the Practice of Relocation**

The moving of structures is a great technological feat for modern society. However, relocation has been a common practice for centuries. Technological advancement have helped broaden the scope of moving various kinds of buildings to different types of locations. The process of relocation is safe and accurate, due to the technological advancement. Systematic relocation of buildings in the United States were first observed in the 1800’s. Before Industrial Revolution buildings were disassembled, parts collected, and then reassembled in a new location. The advent of industrialization

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made technologies like lifting jacks, trolleys etc. a reality, and this made it possible to move heavy structures as one piece and transport them safely by using animal carts.28

Before the twentieth-century relocation was a labor intensive work. Since all the technology invented required a lot of manual labor, to complete the task. Moving of structures is a great technological feat for modern society. However, relocation has been a common practice for centuries. With modern machine based tools like the jack hammer, the diamond chainsaw and others it has become possible to cut, solid concrete foundations and move various kinds of buildings ranging from small to large and heavy structures. In the moving of the historic Sankatey lighthouse in Nantucket the strong foundation was carefully cut with the help of a diamond chainsaw machine and a mechanical jack hammer made it possible to move the large structure slowly and safely with minimal amount of damage.29 The evolution of technology has made a labor intensive process into a more machine driven task. This has made relocation projects more economical and less time consuming than before.

**Cape Hatteras Move**

Protecting one of the most dangerous parts of the Atlantic coast, Cape Hatteras is a historically significant light house. “Graveyard of the Atlantic” 30 is the name of the region where the lighthouse is located due to the thousands of shipwrecks which occur,

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In the area because of the Labrador Current from Canada called “Virginia Drift” which when collides with the Gulf Stream creates a sandbar 12 mile long. The lighthouse was vulnerable to soil erosion caused by changing levels of the sea and was hence moved away from the shore in 1999. Cape Hatteras located in North Carolina has had a lighthouse since 1803. With time and natural factors like wind erosion, the sandstone was worn and damaged. The decision was made by Congress to replace it with a new 198 feet tall lighthouse build by Dexter Stetson. The inauguration of the new Cape Hatteras lighthouse took place in December of 1870.

The new lighthouse was built on a hard, compact bed of sand with the foundation placed six feet below. Three layers of thick yellow pine timber was laid as the base of the foundation. On top of it was a plinth made up of granite and brick. The timber was placed below fresh water and held in place by the base tower. The fresh water helped preserve the strength of the timber by “underwater logging”. Wood generally decays when in contact with water and oxygen together (i.e. in a scenario when it is partially submerged), however if the wood stay under freshwater completely it does not get a lot of oxygen to react with and hence remains preserved, in an air tight underwater environment.

As per National Park Service, The safest and most sustainable method of preservation for the lighthouse with “floating foundation”, was moving it away from the

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32 Cheryl Shelton and Bruce Roberts. "A Beacon For All Mariners: The Lights of Hatteras have flashed for almost two centuries" Moving Hatteras: Relocating Cape Hatteras Light Station to Safety, (Morehead City, NC: Lighthouse Publications, 1999), 3.
shoreline. As the timber foundation was built on shallow and compact sand with freshwater due to the change in shoreline patterns caused because of climate change, the foundation is prone to be damaged by infiltration of the salty sea water, which would lead to soil erosion, and also rot the wood foundation. Saline water infiltrated the base of the foundation on December 1994. The decision was made to move the light house. The relocation took place in 1999.\textsuperscript{33} The lighthouse and all surrounding buildings were moved 2900 feet to the southwest away from the shoreline. The new location placed the lighthouse at a height of 1600 feet above sea level and the same distance from the shoreline as it was in the 1800’s when it was first placed on the site. The lighthouse consisted of an ornate iron fence to keep out animals like horses, cattle and other farm animals roaming the island, this fence was moved before the relocation of the actual lighthouse along with cisterns; underground tanks for water storage, brick oil storage, sidewalks, other associated buildings around the tower, and the Principal and Double Keeper’s quarters The main building was moved in the end as a whole by lifting it from it foundation and placing it on a safe spot.\textsuperscript{34}

As previously noted the lighthouse is tall and heavy. The process of moving had to be well planned, and carried out step by step. The first part was securing the structure and making sure that it stays strong and stable during the move. Bracing was used to secure the chimneys, plinth, doorways, windows and other structural supports.

\textsuperscript{33} Cheryl Shelton and Bruce Roberts. “A Beacon For All Mariners: The Lights of Hatteras have flashed for almost two centuries” \textit{Moving Hatteras: Relocating Cape Hatteras Light Station to Safety}, (Morehead City, NC: Lighthouse Publications, 1999), 3.

The inner staircase was removed and restored after the move. The next part was to create a clean and leveled path, which was compacted and Proof rolled (i.e. addition of rubber tires or roller dollies) to support steel beam mats and roll beams to carry the structure to the new spot.\textsuperscript{35}

To move the entire lighthouse, the structure was to be lifted off its foundation, and then carried to the new location. In order to carry this out the base of the foundation had to be supported by structural beams and hydraulic jacks. The four feet deep water trench around the timber foundation had to be pumped out. After draining the water temporary reinforcement replaced the granite stone layer above the timber mat foundation. This was done by breaking the stone plinth into small pieces two square foot of an area at a time. The 3/8 inch diamond cable saw was used to cut the foundation and heavy duty hydraulic stone cutting chain saw core drills and busters were used to break the stone into smaller pieces. \textsuperscript{36}

After removing the stone layer the timber mat foundation was exposed. Due to the contact with water for several decades the surface of the timbre mat became springy and was unstable to hold the temporary supports on its own, thus steel beams were placed on top of the foundation to provide a sturdy support to the base of the lighthouse. Shore beams supporting the tower base placed on the timber foundation supported the main steel beams consisting of double flange beams welded together with an integrated hydraulic jack system. To avoid any kind of vibration and movement


of the structure during the move the base was made more stable by placing cross-beams between the main beams and base of the lighthouse.37

The use of the hydraulic jacks were to raise the building and detach it from its foundation. This was done by creating tension in the support systems by applying a downward force on the support beams, which in turn helped in lifting the heavy structure up six feet above ground level. A system of hydraulic jacks were installed under the base and all of them helped in raising the structure up uniformly to keep it leveled and thus stable and also helped in the uniform transfer of loads. Once the structure was raised six feet above, the position of the jacks were locked after which “shoring” and “cribbing” were provided below the main beams. While the lighthouse reinforced by other supporting beams, its supporting hydraulics jacks were carefully removed from the base, and roller dollies were added below the main beams to help slide the structure forward slowly and steadily. The pressure applied was spread in a uniform manner to keep the structure stable.38

Finally push jacks were installed and turned on which applied lateral force between the main and roll beams pushing the structure forward. The push jacks helped move the structure five feet forward with every push. This process was continued till the entire length of the steel beam mats rollers, after which they were moved in front of tower so that it could be rolled again. Till it reached its new spot. Concluding the end of the move and preserving the Cape Hatteras Lighthouse. This case study helped


analyze the entire process of relocating a structure and offered some insights on the methods and technologies used to make the entire concept a reality.\textsuperscript{39}

Since this move happened in 1999, it was machine dominated as compared to more labor intensive work which would have been more time consuming and expensive. The use of sophisticated equipment like diamond saw and hydraulic double flanged beams made the job safe and caused minimal damage to the structure. Advancement in technology has had a major role to play in making relocation a safer, sustainable, economical and reliable method of preserving vulnerable cultural heritage.

\textsuperscript{39} Cheryl Shelton and Bruce Roberts. "The Move Process 1999 In Brief" \textit{Moving Hatteras: Relocating Cape Hatteras Light Station to Safety}, (Morehead City, NC: Lighthouse Publications, 1999), 12.
Figure 2-11. Diagram of Reinforcement of Structure in Lieu of the Move. Reprinted from Shelton-Roberts, Cheryl, and Roberts Bruce. “Moving Hatteras: Relocating Cape Hatteras Light Station to Safety”, North Carolina, 1999, pp. 7.
Figure 2-12. Diagram of Temporary Braced Support below the Base of the lighthouse. Reprinted from Shelton-Roberts, Cheryl, and Roberts Bruce. “Moving Hatteras: Relocating Cape Hatteras Light Station to Safety”, North Carolina, 1999, pp. 9.

Conclusion

The changing climate and the rising seas is going to make low-lying coastal regions of Florida vulnerable and this could threaten the plethora of historic properties on the coastal region of the state. Many of the adaptive measure could protect the built environment for a temporary period. Many historic structures might not be able to withstand the impact caused by regular storm surge and excessive flooding and to preserve them for the long-run relocation might be the most sustainable adaptation strategy.

With all the technological advances and the invention of sophisticated tools, relocation is still a challenging task, and throughout history has been used as a last resort to solve various preservation issues, but in today’s times the scope of relocating various kinds of buildings in various locations with safety and precision have become a possibility. This has made it a more economic and sustainable endeavor. In certain instances relocation seems to be a cheaper and more viable option for preserving structures as compared to reconstruction. After analyzing two case studies, the outcomes show that the process of relocation if used as an effective planning tool to help mitigate threats of natural disaster could prove to be more economical than disaster management and repair done after the occurrence of natural calamities. Observations made in the case studies could be applied as general guidelines to help preserve historic properties in the threatened coastal regions of the state.
CHAPTER 3
RESEARCH METHODOLOGY

The research method used is qualitative. Through document analysis like HSR and NR nomination form, newspaper articles along with personal interviews the author has studied actual relocation projects. The case studies focus on the historic, architectural and social significance of the structures moved, the need to relocate the structure and sustainable adaptation of the buildings. Method of relocation is the next part of the analysis, from the planning to the execution. Focusing on the actual move, time taken to implement and finish each project and the cost involved. The case studies also investigates the type of building moved, the renovation and sustainable adaptation of the buildings, and the issue of integrity and authenticity which is evaluated based on the Secretary of Interiors Standard of Integrity. Finally the present condition of the buildings are studied, and the relationship of each structures with their neighborhood and the community is explored.

The criteria to choose these case studies were that they were locally situated, they were both on the national registrar, both the projects were different from each other and were adapted in different ways and both of them had a different process and method of relocation based on environmental conditions and feasibility of the project.

Qualitative Research

This study is grounded in a qualitative approach. “Qualitative” research gives importance to the analysis, processes, methods, and consequences which cannot be quantitatively examined, monitored, or measured. Qualitative research studies the social context of the subject matter. Each qualitative study makes a distinct connection between the researchers with the object of analysis. Investigation of the subject could
differ depending on the situational constraints. Hence this process focuses on the value and quality of the enquiry rather than direct quantitative results.¹

**Case Study Development**

According to Scholar Helen Simons, Case Study is an:

In-depth exploration from multiple perspectives of the complexity and uniqueness of a particular project, policy, institution, programme or system in a ‘real life’ context. It is research-based, inclusive of different methods and is evidence-led. The primary purpose is to generate in-depth understanding of a specific topic, programme, policy, institution or system to generate knowledge and/or inform policy development, professional practice and civil or community action.²

With this thesis, case study analysis offers a holistic view of the process, method and reason for the relocation of historic structures. While these factors shared in common by the case studies, each presented a different set of challenges and a different approach to addressing these challenges. Exploring these different projects and approaches led to a richer understanding of the relocation process.

**Criteria for Selection**

The criteria for selecting the case studies included, among others:

- Florida examples where the researcher had access to materials and stakeholders involved in the relocation process.
- Variety of project types in terms of the scale, one relocation project was a part of a large scale rehabilitation project for the urban development of a region, whereas the other project was a small scale relocation of a historic property for adaptive re-use purpose.


The purpose of relocation was different in each case, one was to clean a brownfield area and the other was to prevent a historical property to be demolished due to neglect of value.

Varied methods of relocation, since one project focused on relocation on the same site with the help of heavy vehicles and roller dollies and the other had to be transported to another site by floating the structure on a steady barge both the projects gave an insight on the different kinds of relocation methods which could be applied to other projects of similar scale and situation.

Lastly both projects were listed in the National Registrar, however due to change of location one of the project was removed from the list, this provided insights on the criteria of integrity and authenticity and raised question on sustainable adaptive strategies for historic buildings.

With location a critical aspect of determining “integrity”, preservation specialists often consider relocation a last resort. Many relocation projects, especially ones dealing with smaller locally significant structures are rarely well documented. So researching about them could be a challenging task, since one has to sometime solely rely on interviews with professionals, designers and contractors, involved in the projects. Documentation in the forms of photographs and site drawings are essential and could provide valuable insights about the project.

Content Analysis

The framework of study is divided into five major parts and four sub-parts:

- **Introduction**: This part is a general description of the Structures to be moved containing information about the location and the type of building.

- **History and significance**: Talks about the value and importance of the structure as a historic landmark and gives an idea about its history from its construction to its present day condition.

- **Character defining features**: Is a descriptive portion which explains about the physical features of the structure, it also talks about the significant architectural attributes of the building which adds to the historical significance of the structures.

- **Project overview**: This point leads to the relocation approach, it provides the background of the relocation project by giving information about the planning of
the project and role of the community and stakeholders that helped in the execution of the project.

- **Relocation approach**: This point explains the entire process of relocation and is broken into four sub-parts:
  
  - **Project planning**: Describes the strategic planning done before the process of relocation, it provides insights on the pre-planning stage of the project, which is done after research and site surveys in order to determine the method, route and execution techniques to be used.
  
  - **Technical approach and challenges**: The relocation process is explained in this section, which gives information about the structural framing of the building and the appropriate technology used to relocate it, this portion also talks about the site and various challenges faced in order to successfully complete the task of relocation.
  
  - **Rehabilitation and adaptive use**: The adaptive re-use and the present condition of the building is discussed in this portion. The role of the building in the urban context is analyzed and sustainable rehabilitation methods used are documented.
  
  - **Schedule and cost**: The cost incurred and the amount of time taken to complete the project is observed in this portion to get a clear idea of the feasibility of relocation projects depending on factors like scale, building type, relocation method used and site challenges.

- **Assessment of integrity**: “Integrity is the ability of a property to convey its significance.”³ This is an important aspect in terms of management of Cultural resources. The Department of Interiors have a set of seven criteria to evaluate a property based on the assessment of integrity. The case studies were analyzed in terms of the seven criteria of integrity.
  
  - **Location** which is vital to understand the relationship of the building with its associated property.
  
  - **Design** of the building which evaluates the authentic physical attributes of the architecture, which makes the building significant.
  
  - **Setting** differs from location as this evaluates the character of the location at which the historic structure stands. It looks at the relationship of the historic structure with its environment.

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- **Materials** criteria evaluates the authenticity of the architectural ornamentation of the building and the original materials and their present condition.

- **Workmanship** is the authentic physical evidence of original craftsmanship, significant to a particular, culture, period or community.

- **Feeling** evaluates the holistic composition of a historic structure with all its original physical attributes, combined with the authentic setting and location, all of which add to its significance as a cultural resource worthy of preservation.

- **Association** is the evaluation of the historic property in terms of association to a particular event, person or period of significance.

**Category of Sources**

Archival documents both academic and non-academic as well as interviews form, the source of the content of the Case Studies. The live case studies were made by reading academic, nonacademic journals and articles like newspaper clippings, sanborn maps, GIS Data and NR nomination form and HSR. Along with the mentioned, conducting interviews of various professionals, like preservationist, historians, architect and owner also helped the researcher to analyze the case studies. The methods combined together helped gather information regarding the project background, history, impact of the relocation projects and also provided insights on the technical process of each relocation project studied.

**Interviews**

The chosen case studies had a number of professionals involved to carry out the project, some of them were interviewed which helped get a holistic view of the projects.

The Historian interviewed, helped in figuring out the significance of the historic structures and the evolution and changes it went through over time. The interview with,
The Architect helped understand the process of relocation and gave a holistic picture of the project planning and sustainable rehabilitation.

Preservationist, provided the information about the feasibility of the project, the schedule and time it took to complete it, the challenges faced and identified financial support which helped complete the specific relocation projects.

The interview of present owner helped, in determining the outcome of the project and the relationship of the project with the community and also helped study the development of urban spaces after the completion of the project.

**Conclusion**

The two case studies selected are the move of the Gainesville Train Depot, Gainesville, Florida. The Gainesville Train Depot is now a part of the Depot Park which is a social gathering spot which consists of outdoor event spaces, an eatery and an adult beverage joint. This space has grown to be a vibrant urban vista, which entertains people of all ages and is also visited for its educational value, since the Gainesville Train Depot provides information about the local history of the city. The relocation of the Gainesville Depot was a small part of the bigger rehabilitation and wetland restoration project, it was a vital part of the sustainable adaptive strategy of the place.

Relocation of Capen House, Winter Park, Florida was a one of a kind restoration for the community of Winter-Park, since the building was cut into smaller parts and relocated to the new Polasek Museum site by floating the parts to the other side, a method used for the first time in the Winter Park region in order to preserve the house of a significant individual who was a prominent figure in the history of Winter Park. Both the projects are located in central Florida away from the coastal vulnerable sites, however the method of relocation used are different from each other. Hence the lessons
learned from these projects could be applied to various vulnerable coastal heritage which would help preserve the cultural resources and mitigate the threat of the Rising Seas.
CHAPTER 4
CASE STUDY

This chapter is the documentation of two relocation projects of Florida’s cultural heritage, for the purpose of analysis and to understand the role of relocation. One of the project is of regional importance and is part of a larger scale city planning and development whereas the other is a locally important historic structure. Both the projects were rehabilitation and adaptive re-use projects, of which relocation was an important part.

Gainesville Train Depot, Gainesville a historically significant yet neglected structure was revived to be an urban space for outdoor events and gatherings known as Gainesville Depot Park. This project was part of a city redevelopment program, which became an important factor of growth of its neighborhood. Capen-Showalters House, Winter Park was a preservation and re-use project of a locally significant historic property which faced the risk of demolition. The house was relocated by splitting it into two parts and floating it across a water body. This project received a lot of attention from the local media, which gave it publicity and helped raise funds for its rehabilitation. At present the structure is located at the Polasek Museum on the empty plot to the east of the museum and is locally famous for conducting various kinds of events like weddings, exhibitions, educational meetings, etc. Apart from that the building is also used as an office space.

Both the relocation projects are different from each other, in scale and significance. They also had to overcome significant challenges of their own. Both the projects are studied separately based on a general set of criteria, which include the historical significance, the reason for relocation, the methods of relocation, the project
planning, cost involved and the outcome on completion of the projects. The issue of authenticity and integrity has been the most significant part of all preservation projects in the country. Both the case studies would be evaluated on the SOI criteria for evaluation of historic properties and the conclusion would be discussed in the context of vulnerable coastal properties in Florida and relocation as a planning tool rather than a last resort for disaster management.

**Train Depot, Gainesville, Florida**

The Gainesville Florida Train Depot is located at 203 Southeast Depot Avenue, one half-block east of Main Street and nine blocks south of Alachua County Courthouse in Gainesville, Florida. It was built by Seaboard Air Line Railroad Company in 1907. It replaced a gable roofed building present on the same site which functioned as a depot since 1884.

The building is a wooden framed elongated structure, placed on the northern side of a 32 Acre land facing the main entrance towards Southeast Depot Avenue. The Gainesville Train Depot consists of three rectangular portions which combine together to form the entire structure, the three components are arranged in a pattern starting with the Passenger Depot on the east, The Freight Depot in the middle followed by the Platform on the west. The Gainesville Depot does not function as a train depot since the mid-twentieth-century, however the portions of the train tracks are restored and run on the southern side of the building.

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1 Murray Laurie, “Setting”, National Registrar of Historic Places-Nomination Form, 3

The larger site was remade into a recreational park, called the “Gainesville Depot Park”, it comprises of Gainesville Train Depot on the north, a playground on the south-east corner of the Gainesville Train Depot and the rest of the space is filled with walking trails, open green spaces with local vegetation and water catchment areas.

Out of the many phases of the Depot Park project, Relocation of the depot building was one of the integral part of programme. It was a necessary and effective solution which helped clean and restore the site.

**History and Significance**

The Gainesville Train Depot was the main source of transportation in the late nineteenth to the early twentieth-century. Gainesville was planned to be an important station in Florida for trade and commerce. The Florida Railroad was to pass through Gainesville, since many agricultural lands were located in and around the City. The idea of making Gainesville a trade and commerce hub was promoted by Senator David Levy Yulee, owner of Cotton Wood plantation located 25 miles west of Gainesville near Archer, Florida.

The Depot was originally owned by Florida Railway and Navigation Company, which became a part of Florida Central and Peninsular. The building was then purchased by the Seaboard Air Line Railroad in 1900. This was when the old Depot was replaced by the current building in the August of 1907. As reported by the Gainesville *Daily Sun*, when the construction of the Depot was over it was a pretty self-sufficient depot with all the basic amenities like lavatories and toilets as well as impressive features like wide sheltered porticos for travelers. The track was located on the south side of the structure, making it more convenient for travelers and for the shipping of goods. The existing freight building was joined with the newly constructed passenger
section a few years' later in the early twentieth-century. A new passenger station was built on S.W 6th Street by S.A.L in 1936, moving the railway services to the new spot. However the building remained the S.A.L railroad office until 1948. Baird Hardware Company, in the 1950 to 1967 leased the building for their plumbing and electric division. The building was used as a storage for appliances by the Voyles Appliance Company in the 1970’s. During this time the passenger section was used as a television repair shop. During all this the building did not go through major changes and the integrity of the building remained intact, although there were signs of some damage and poor maintenance the overall condition was not bad. When the Seaboard Airline Board became a part of CSX Railroad Company, a portion of the building was bought by Florida Department of Transportation in 1987.

Historically the site on which the depot stands was the industrial hub of Gainesville with cotton mills, local gas works, sawmills, wholesale grocery warehouses, oil tanks surrounding it. In 1909 Gainesville electric plant was established near the site. Over the years the development of the area was neglected as many of the shops and mills present were abandoned, this area remained an underdeveloped region of Gainesville until City Redevelopment Proposal which helped re-develop and revive the area.

The City of Gainesville initially wanted to demolish the building because the road in front of the building now known as Southeast Depot Avenue was supposed to be widened in lieu of a transportation development of the City. In 1976, with a change in government, the scope of redevelopment program changed and it was decided to focus on the entire area which meant development of transportation along with rehabilitation
of the historic structure of the Gainesville Train Depot. The rehabilitation plan of Depot building was approved as a part of this new approach.

Character Defining Features

As it survived, the Gainesville Train Depot is a good example of a typical prototype of railways station built in the early twentieth-century. This one story building has three main parts.

Freight; constructed in the year 1860, it is the oldest part of the depot. This section is an elongated rectangular space measuring 25 feet wide by almost 180 feet long. The building in the 1800’s consisted of three 25 x 50 feet parts. The east section functioned as the Passenger Depot and the west section was the freight portion. The interior of the Passenger Depot is cladded with wooden wall and ceiling boards with the help of tongue and groove joints, this is an authentic feature which is well preserved. The ceiling was textured and ornamented up to the first 18 feet, this portion became freight office in 1910, after the new passenger depot was constructed.\(^3\)

The Passenger Depot of the building was constructed in 1910 on the east side of the Freight section. Covered with a hip roof, the building is 44 feet x 50 feet in plan. The size of the 2,200 square feet building is enhanced by the 8 feet deep over hang making it look larger than its original size. The presence of cut studs and evident interior modifications show that the building originally had a wood floor framing section. Distinct features like rafters and exterior sidings continue around all four sides. The interior finish includes beaded board, soffits, overhangs supported by sculpted brackets. This

\(^3\) Bender and Associates, Architects, P.A. Key West, Florida “Item: Site Improvement-General Description” Historic Structure Report-Historic Depot Building, (Key West, FL: Bender and Associates), 64.
area seems to be the most ornate space with simplistic yet decorative details as compared to the freight section and the platform.

The third section of the Gainesville Train Depot is the open-air platform added in 1922. The Platform consists of a post and beam wood framing support system and is covered with hip roof. This space is unique due to its open nature and broad cantilevered overhangs. Proportionally the roof with the overhangs is a prominent feature of this section due to its large scale. The structure of the platform consists of three, 6 feet x 8 feet columns on the southern and northern façade, forming the primary support system of the hip roof which is 30 feet wide in dimension. The columns run in a rhythm of 1-1-2 spacing from building face at distances of 11-feet 1-inch, 11-feet 4-inch and 22-feet 4-inch. Diagonal Bracing is observed which helps support the overhang, they extent out of the face of the column and are attached to a 2-feet x 6-feet plate. Three braces extend from the corner column supporting sides of the hip and one diagonal to the rafter. The gable roof cover is supported by means of timber posts and brackets connected to the posts for extra support. Flooring is made up of timbre joists 2-inch x 12-inch in dimension.

The most significant feature of the entire Depot is the roof. The roof on the two sides of the freight station consists of the Passenger Depot and Platform area are hip roofs and the roof in the center is a gable one. Deep roof overhangs extending out up to 8 feet from the exterior walls of the structure and are supported with a combination of decorative and simplistic wooden brackets. This was probably done to protect the structure from the harsh rays of the sun and provide shading and was used as an outdoor waiting area.
Certain parts of the building were modified. In 1922 with the construction of the platform the buildings were detached from its brick wall foundation system and placed on a concrete slab 20-30 feet north of the original location. The openings seemed to be modified as well. Out of the six doors present in the passenger depot area three based on their, casing detail and size 3 feet x7 feet and 1 inch (typical to the time period) seemed to be authentic and the others were later additions. However other than the modifications of the openings and the floor area, the building retained the majority of its character.

**Project Overview**

According to the Preservationist who nominated the Depot building to the National Registrar of Historic Places, during the 1970’s-1980’s the Gainesville Train Depot had no proper function and was mostly used for storage. The building suffered from differed maintenance. Located at an industrial area with no specific function, the building had been ignored. Focusing on the historic significance of the structure the owner in 1976, this was when the owner decided to put the building on the NRHP (National Registrar of Historic Places). At first the idea was not supported by the City of Gainesville. However a change in the government in the 1976 helped the Depot gain attention. It became part of a large urban redevelopment program for the former industrial area where the depot sat. In 1996 the building was nominated to the National Register and the site was acquired by the City of Gainesville. The inception of the rehabilitation project happened in 2009.⁴

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Relocation Approach

In order to renovate the area it was important to remediate the site, which was deemed a “brown field”. The building was temporarily moved in order to clean the site as well as install a retention pond that serves as the “focal point” of the public space, now known as the Depot Park. Wetlands were preserved and natural trails restored.

Project planning: The 32 acre property and its rehabilitation project was divided into three zones. The first zone is on the north end of the site and is considered the historic interpretation zone, The rehabilitated Depot and train tracks are located in this zone, the rehabilitation of the area complied with the Secretary of Interiors standards, the next zone was the interpretive historic depot plaza, which is an open area with playground and seating facilities for social gatherings. The third one is the most prominent section and covers more than half the site is the open landscape region with water catchment area.

The planning of the rehabilitation project was broken down to two major parts and then under them were various sub-parts which combined together, formed the Gainesville Depot Park- Rehabilitation project.

The first part was that of Land Reclamation and Wetland Restoration. This part had sub-parts starting with site survey which included archeological survey, in order to identify any historical artifacts which could be recovered and preserved, relocation of train depot to the southernmost tip of the site, was the next step followed by cleaning the site which was termed a Brownfield area contaminated by oil and harmful chemicals. The definition of Brownfield by the United States Environment Protection Agency is as follows:
With certain legal exclusions and additions, the term "brownfield site" means real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties both improves and protects the environment.⁵

After the site was cleaned it had to be replanted with vegetation and to make it sustainable local flora were chosen. The plantation apart from being local had to be ones which could survive in non-domestic conditions and did not need the special care of irrigation, this helped reduce the cost of the project. Next phase included creating catchment areas which could harvest rainwater and help make the site more environmentally sustainable and aesthetically pleasing. Creating parking spaces and pedestrian walkways was the next phase.

After the site reclamation the depot building was bought back to its original location and rehabilitated according to LEED standards and guidelines provided by the Secretary of Interiors for historic properties.

Documentation and research was an integral part of the project, the project involved people from different fields because site inspection and research on the historic depot building was deemed necessary by the experts. Hence the site was surveyed and documented with the help of various specialist including archeologist, since archeological survey was a major part of the planning phase of the project.

**Technical approach and challenges:** To facilitate relocation the building was cut into four main blocks which consisted of the Passenger Depot, two parts of the Freight Section and the semi-open Platform. The building was then lifted from its current

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concrete slab base and placed on 10-inch x 10-inch pressure-treated wooden girders, which supported the 2-inch x 12-inch timbre joists of the building.

The building has two chimneys, one located near the 1910 Passenger Depot space, towards the center and the other chimney located on the Depot (constructed in 1860) 18 feet away from the east end centered on the ridge. The chimneys had access holes for stoves to tap into. Before the move both the chimney were cut short of the floor, secured with extra protection, the older chimney of 1860 was held up by contemporary framing about 8 feet above the floor. And the chimney built in 1913 near the Passenger Depot was supported by steel beam installed by the professional movers placing the support three feet above the bottom of the walls. The brick from the base of the chimney were stored on the steel beam and were restored to their original position after the building was placed on its foundation. 6

After the site reclamation and wetland restoration when the building was to be moved back to its original position, it was decided to place it on to its 1860 location which was 20 to 30 feet away from its previous location, this helped facilitate the widening of the Southeast Depot Avenue. The building was restored on brick wall foundation on which it stood in the 1860’s.

The site at present is a fine design of open green spaces with water catchment areas which function as ponds to add to the aesthetic value of the site and to give it a “swampy” look which is could be related to the swamps of Central Florida. Today the

Depot Park hosts the Gainesville Train Depot and is made up of lush green rehabilitated land full of local species of plants. It also consists of a food store and an adult beverage store rehabilitated in the enclosed Passenger depot and Freight office spaces of the Gainesville Train Depot building, the open-air platform has been converted to a gathering and event space for various social activities.

Upon an interview with the Project Architect of Depot Park, the most challenging issue of any rehabilitation project according to him depends on the political scenario and the funding sources of the project\textsuperscript{7}. If these two are handled then the entire project becomes easier to carry out. Gainesville Train Depot Rehabilitation project was an expensive affair but after the successful completion of it, it became a revenue generating medium which brought value to the urban fabric. The entire area developed because of the project. In the 1970’s the local government wanted to tear it down to widen the road networks for better transportation systems, at that time Gainesville Train Depot renovation was viewed as an unnecessary expense but with the re-election and a changed committee the building was looked at from a different prospective, this made it easier to get grants for the project and help preserve an important part of the local history.

**Rehabilitation and adaptive use:** The goal of adaptive use of the building was to rehabilitate it in a sustainable manner. The design was to help restore the historic integrity of the structure and make it a self-sustaining unit and environmentally friendly to achieve LEED accreditation. Analyzing the present condition of the building,

\textsuperscript{7} Ar. Bert Bender, “Project Planning and Rehabilitation of Gainesville Train Depot”, Phone and Electronic Mail (E-Mail) conversation, Interview by Anulekha Chakraborty, October, 2017.
comparing it to the historical research a proposal was made to design a recreational facility with gathering spaces eatery and beverage joint.

Many historical buildings tend to be sustainable in nature. The Depot is one such example. To minimize the use of mechanical systems, only the enclosed Passenger Depot area was air-conditioned, because it was redesigned to be a food store and hence artificial cooling was necessary for this space. The other spaces were not artificially cooled but they did rely on the passive features of the buildings original design. The interior spaces stayed cool and shaded because of the large-scaled roof with an overhang of 8 feet, this roof feature protected the walls from rays of the sun and provided shaded space which were used as outdoor gathering area.

Apart from the food store the Depot building has a wine shop and the open-air platform is converted to a gathering spot. Most of the interior additions like the wall partitions, HVAC fittings and equipment, plumbing fixtures and interior furniture used are temporary in nature and could be removed with minimal damage. The partitions are also kept transparent so that historic features of the buildings could be visible and appreciated.

**Schedule and cost:** The entire project from Land reclamation, relocation, renovation to adaptive re-use started in 2009 and was completed by 2016. The cost of the project in total was about $3 million (Approx.) which included building renovation and construction cost of 2,600,000 $, along with Building Design fee of 335,000$ and site design fee of 119,000$.

**Assessment of Integrity**

The Train Depot building is on the National Registrar of Historic Places and
Thus it was important to keep the authenticity and integrity of the building. The building was rehabilitated in a sustainable manner by Bender Associates and it was LEED certified. Objectives for rehabilitation were as follows:

1. The renewal of National Register Nomination Form and the creation of Historic Structures Report (HSR) in order to document the historical and significant facts about the building.

2. To comply with Secretary of Interior’s Standards for Rehabilitation and the U.S Green Building Council’s recommendations for LEED certification.

3. Restore the original features of the building to the most significant period of its lifetime (1860 to 1930).

4. Design a sustainable and green building, with minimal additions and reversible changes.

5. Design separate mechanical systems for two zones, the Passenger Depot, and the Freight office depot portion of the original building. This ensures minimal damage and maximize individual climate control.

6. Sensitive and sustainable site restoration taking into consideration the historic fabric remains intact.

7. Brownfield restoration was advised and retrieval of archeological resources was suggested.

8. Consultation was deemed necessary with a professional archeologist for a through site survey.

Upon evaluating the project based on the criteria set by the Secretary of Interiors this was the final outcome:

1. Location- The location of the site is the original and the relocation of the structure helped put it on to its original location on which the old building stood in 1860 based on the Sanborn maps data. Due to the redevelopment of transportation networks in Gainesville, the roads were being widened all across the city Southeast Depot Avenue was modified as well. In order to preserve the Gainesville Train Depot

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8 Bender and Associates, Architects, “Resilient Design in Gainesville Depot”. (Key West, FL: Bender and Associates), 6.
building it was decided to move it back to its original location, thus restoring its integrity.

2. **Design-** Thorough research and extra care was taken in order to restore the original look of the building as well as maintain the original features of the depot.

3. **Setting-** Setting of the site was restored due to the site reclamation which took place before the rehabilitation of the building and was an important part of the entire project.

4. **Materials-** In-kind, repair and replacement was followed with all the original materials kept intact and proposal of replacing the later added materials with ones which match or closely resemble the old materials were made in order to maintain the integrity of the Depot building.

5. **Workmanship-** Though this building is pretty simplistic in design the details of few spaces like the passenger depot has some intricate workmanship which could be viewed on the ornamented brackets and other details, which were all preserved.

6. **Feeling-** In terms of feeling, the architecture itself provides the feel of a depot. Memorialization of the site zone containing the depot building was done, the building was revised and placed on top of brick foundation. The railway track on the north side of the building was restored. Apart from the restoration of the building and the associated site elements, new added features like the ornate gate made of metal showcasing the name of the building in a particular type of font which is associated with trains and engines was designed to be used and all these elements combined together were responsible for the feel of the depot.

7. **Association-** The criteria of association for this site is the preservation of the significant architectural style of Train Depots built by Seaboard transportation, all their railway stations had a distinct style of architecture, which on its own is worthy of preservation. Apart from that the building along with the restored site, helps associate the city of Gainesville with the advent of globalization era in the United States, which showcased an advancement in technology and the improvement in transportation with the inception of the railway networks and systems, the railways was once an important part of transportation in the country a trend, which is reduced in the modern world.9

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Figure 4-4. Gainesville Depot Park, Site Map, Reprinted from Depot Park Official Website Site Map" [https://www.depotpark.org]
Figure 4-5. Freight Section Relocation, Reprinted from Bender& Associates, Architects, P.A, “General view of Freight Depot. The building has been cut into 4 portions and moved offsite”. HSR.pdf (June, 2009), pp. 62.


**Capen House**

Currently located at 633 Osceola Ave, Winter Park-Florida. This project is the fine example of preservation of local heritage with the help of relocation. This house was split into half and floated to the other side, onto its new site, where it sits today. This project turned out to be a successful endeavor and with help of preservationists, academics and contractors the building was saved and it is now a local public space which is used for various kinds of events like weddings, community meetings as well as educational gathering by Rollins College, Winter park and University of Central Florida, Orlando.  

**History and Significance**

The house was built in the late nineteenth-century when a merchant named James Seymour Capen reached Winter Park by rail in 1885. He and his ten family members were all set to start a new and prosperous life in the Sunshine State. The Capen house has entertained several wealthy families including the Capens, the Showalters and the Jennings (a locally famous dentist), among all the families Capen and Showalters have had the most amount of influence on the house. Since Capens where the builders of the house and Showalter Family made a number of significant changes to the house in the 1920’s by renovating it and adding several features like the enclosed porches and fireplaces, and installing a stucco finish to the vernacular structure.  

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The house is significant to the local history of the community since James Seymour Capen was one of the alderman present the night when Winter Park was declared to be a city. He also helped fund important institutions such as Rollins College and was the founder of the Dinky Line Railroad.\textsuperscript{12}

**Character Defining Features**

The house originally built in the 1800’s was a high-end wooden farm house, with simple design features. It is a two-story structure with an L-shaped plan and a gable roof. The first floor of the house consists of public and semi-public spaces like the front porch connecting the front yard to the entrance of the house. The upstairs had more of the private spaces such as bedrooms. The renovation of the house by the Showalters Family in the mid-twentieth-century, made it look more like a Victorian style house, with Juliet windows on the second story decorated with ornamental brackets supporting the cast iron railing of the balconies. The first floor windows were converted from simple casement to customized windows with arched shaped fixed glass fans which allowed more light on to the interior spaces. The entrance of the house was updated as well with the porch converted to a closed foyer with a huge window in the front of the building as well as a prominent entrance with gable roof leading to the front door of the house. The backyard of the Capen house facing the waterbed had a pool and a small cabin.

Figure 4-9. Capen Family House, 1885, Reprinted from Albin Polasek Museum, Sculpture Garden, “Preservation Capen: History on the move”, pdf. (April, 2014), pp. 3.

Figure 4-10. Capen-Showalters House, 1940's, Reprinted from Albin Polasek Museum, Sculpture Garden, “Preservation Capen: History on the move”, pdf. (April, 2014), pp. 3.
Project Overview

In the year 2013 the Capen House site was bought by a couple, who were interested in the site and the pool but wanted to demolish the house and construct a new one. At the same time the Polasek museum was in need for a new building to be added on to the east side of the property which would be a multi-purpose space for admin offices, events and exhibitions. Capen house turned out to be a perfect fit. The house was donated to the museum and it was decided to be moved in 2013.

Relocation Approach

The Polasek Museum was located almost diagonally opposite the site of Capen House. The building could not be moved by road because the height of the building was a major obstacle in the process. The time to relocate the building was short hence the most feasible way to relocate it was to split the house into two parts and float it to the other site on a barge. This type of relocation was the first in Winter Park and hence garnered a lot of publicity and attention by the local media.13

Unlike The Train Depot, Relocation of the building in this context was the highlight of the project rather than a tool used for a rehabilitation project.

Project planning: The relocation project of the Capen House had three phases only. Preparing the structure to be moved, floating the structure to the new site and preparing the site and the building for re-use.

The phase of preparing the structure had to be done with precaution. Since it was decided to float the structure over water it had to be made sure that the building

was tightly secured and braced thoroughly to keep the elements stiff and stable so that it could be moved through the water body. The site on which the building was located had a tapering edge near the water. The building oriented any which way would not be able to pass through the tapering edge, if it was not divided into two different parts and floated individually.

The decision was taken to split the building into two asymmetrical parts. The bigger part on the west side was moved first, followed by the smaller eastern part. After both the parts were relocated they were reassembled and the house was oriented the same way it was in the original site. According to the Executive Director of the Polasek Museum commented about the reattachment of the Capen House which is attached well from the outside, however traces of the split could still be seen from the inside.\textsuperscript{14}

\textbf{Technical approach and challenges:} As mentioned before the building had to be split into two asymmetrical parts to carefully pass through the tapering edge of the site. The first phase of the project was to split the house and shore and stabilize the split ends.

Next phase was to lift it up from its base and move it across the pool to reach the edge of the site, this was done by placing the base of the building on two main I-beams above the main I-beams were cross beams placed perpendicular to the I beams. The parts of the building were moved across the pool by moving them on a track of steel beams, which were placed on the pool after covering it.

\textsuperscript{14} Debbie Komanski (Executive Director, Polasek Museum), “Rehabilitation and Adaptive Re-Use of Capen House”, Phone Interviewed by Anulekha Chakraborty, October, 2017.
Upon reaching the edge of the site the pieces one by one were transported to the other side onto the new site. The pieces were floated by placing them on wheeled dollies below which was the large flat barge which was stabilized and sturdy. It was made sure that the building stays as still as possible during the move, it was slowly floated to the other site on the barge. Still placed on the dollies the pieces were joined and then oriented the right way and then placed on the new foundation.

Apart from the challenging site the projects most significant challenge was the time crux and gathering of funds. The project was to be completed in a short span of two months, which also included the collection of funds. The building did not get a federal fund and had to completely rely on donations collected. The publicity of the project helped get the donations on time and relocate the building to its new site to be preserved and re-used.

**Rehabilitation and adaptive re-use:** This project had lesser amount of research done beforehand compared to the Train Depot, there were no officials HSR made. HSR would have given a more holistic picture of the changes (natural deterioration to manmade alterations) that took place in the building over its lifespan. Since the building was in good shape and had good integrity when it was moved, the new owners and the contractor were able to preserve and renovated the house without damaging authentic physical features of the site already present.

When the rehabilitation plan was made, special attention was given to the exterior integrity of the site, and it was renovated and made to look almost like the way it was intended to look. The site was also oriented the way it was on the old site. Interiors were supposed to be used for activities the upper floors were used for admin offices and
the lower floors for exhibitions, events and conferences. Changes made to the interiors were only done to comply with the building codes like fire code because of which the sprinklers were installed and the kitchen was converted to a pantry with only storage facilities. The entire project was completed by 2016 and it became locally popular. It has also generated revenue for the museum which is a non-profit organization. The money generated is used to sustain the house and the museum.
Figure 4-11. Map of Current Site at Polasek museum, Reprinted from “Google Maps”. https://www.google.com/maps/place/The+Capen+House/@28.5965268,-81.3440595,295m/data=!3m1!1e3!4m5!3m4!1s0x88e7701ce4336f19:0xe70ae1080c564ac2!8m2!3d28.5964772!4d-81.3432002 (November, 2017).

Figure 4-12. Graphical Representation of Relocation Process, Reprinted from, Frank Roark, Polasek Museum and Sculpture, Staff Researcher.

Figure 4-15. Capen house on Old Site (before Relocation) 2013, Reprinted from Albin Polasek Museum, Sculpture Garden, “Preservation Capen: History on the move”, pdf. (April, 2014), pp. 3.

Schedule and cost: The project started in 2013, the building was moved on to the new site in two months by the beginning of 2014. After the relocation the rehabilitation and renovation of the project was completely over by 2016.

The cost of the entire project was 1 million dollars (approx.) which included 400,000 dollars for Moving the House the money for this was raised in two months. New foundation and utilities cost another 400,000 dollars for Restoring the Structure, including interior finishes and furnishings. 200,000 dollars were spent for Landscape, including new parking area, and ADA (Americans with Disability Act) – walkways and dock.

Assessment of Integrity

Capen House was listed in the National Registrar of Historic Places until it was moved to a new location. The house has seen some amount of renovation but most are environmentally sustainable. The contractor kept a portion of the exterior exposed to show the detail of craftsmanship of the yester years.

The Capen House Project is evaluated in this section based on the standards set by The Secretary of Interiors to determine the Integrity and Authenticity of Capen House:

1. Location- The location of the site has completely changed but since it is moved in the same community and the orientation of the house has been kept the same which is facing the water body, hence this is an evident change.

2. Design- As mentioned before in order to preserve the building, it had to be rehabilitated and for this reason certain sustainable changes were made in the interior portion of the house, however the exterior façade still maintains its authentic identity.

3. Setting- The setting of the site feels authentic, since the Museum site is a large plot, the Capen House is located a little away from the main museum towards the east, which is a secluded spot and it gives the impression of the setting of the House in the old site where it was the only main structure, the major difference is the lack of the guest house and swimming pool in front of the house, that added to the integrity of it.
Hence the change location affects the setting of the building but due to sensitive rehabilitation, the setting does is not drastically changed.

4. Materials- Materials of the house are for the most part authentic in nature, the original doors and windows are restored.

5. Workmanship- The workmanship is well preserved. According to the newspaper article by Orlando Sentinel, the contractor planned to keep some part of the wood frame exposed to display the workmanship of the nineteenth-century.

6. Feeling- The feeling of the house has changed to a certain extent due to renovation, however the other factors of integrity especially physical authenticity, helps in giving the feel of the historic structure.

7. Association- Capen House belonged to the merchant James Seymour Capen and the new site where the building sits is the Polasek Museum, Polasek was a local artist who had close relationship with the Capen Family, since he was married to James Capen’s niece Charlotte Capen Eckhart. Not having children of his own Polasek was very affectionate towards his wife’s kids and made sculptures of them and their mother Charlotte. These sculptures are still present at the Polasek museum, the new location of the site on which the house stands today. This was found because of a diligent researcher who during the relocation process happen to search information on Charlotte Polasek, after finding out her maiden name. This find gave a new insight to the story of the House and its owner, so even if the association of the house with the new site due to the move is not exactly the same compared to the old location, however it has helped unravel more about the owner and his extended family.\(^\text{15}\)

Table 4-1. Comparative Analysis of Case Studies based on Integrity and Authenticity.

<table>
<thead>
<tr>
<th>Guidelines for Integrity, SOI</th>
<th>Train Depot, Gainesville</th>
<th>Capen-Showalters’ House</th>
</tr>
</thead>
<tbody>
<tr>
<td>001 Location</td>
<td>Not altered and integrity is maintained</td>
<td>Moved to new site so integrity of original site is lost.</td>
</tr>
<tr>
<td>002 Design</td>
<td>Restored to the most significant time period. (Eugene Emmanuel’s Scrape)</td>
<td>Preservation and Rehabilitation of house with slight changes in the interiors (Part of William Morris’s Anti-Scrape.)</td>
</tr>
<tr>
<td>003 Setting</td>
<td>Is Maintained due to well researched HSR.</td>
<td>Almost authentic but not entirely, lack of associate structures.</td>
</tr>
<tr>
<td>004 Materials</td>
<td>Efforts made to restore authentic and replace duplicate with accurate replicas</td>
<td>Authentic material is preserved for the most part especially on the exterior.</td>
</tr>
<tr>
<td>005 Workmanship</td>
<td>Kept Intact with minimal damage.</td>
<td>Kept Intact and some exposed for viewing.</td>
</tr>
<tr>
<td>006 Feeling</td>
<td>Traces of railway stations is seen, but is more of a park.</td>
<td>The feeling is more evident in this example.</td>
</tr>
<tr>
<td>007 Association</td>
<td>Association to Gainesville Train Depot is evident because of the building as well as site rehabilitation</td>
<td>Association is evident but new identity is discovered which now has become a part of the narrative</td>
</tr>
</tbody>
</table>
Conclusion

After analyzing both the case studies the outcomes of both have been positive and in certain cases the challenges identified turned out to be benefits in the end.

The Gainesville Depot Park helped in revitalization on an urban level. Usually when a building is relocated it adapts to the new environment and becomes a part of it but the interesting thing about this project is that this is a fine example that shows how careful and sensitive redevelopment of one site can actually change the fabric of an entire neighborhood.

The building and the redevelopment project of the site has helped completely transform the area, this was a neglected part of the town with industrial warehouses and derelict structures, but now it’s a vibrant urban space which is developing and seems to grow in the next few years to be an urban center. A proposed Cade Museum is under construction which will be ready by 2018, this museum is for inventors and inventions and would attract a lot of young curious minds in the years to come.

Capen-Showalters House on the new site has influenced the environment of the Museum site at the same time has become an integral part of the new site. As the social history and the connections of the owners of the house and museum have helped understand their relationship with each other as well as their significance in the local area of Winter Park.

This space is now used by the community for various events due to the publicity the relocation project received from the local media due to its relocation method and most important the gathering of funds in a short span of time. Hence this house adds to the revenue of the non-profit organization of the Polasek Museum and help it sustain itself. It also is a fine example of the architecture of the place during the nineteenth and
the twentieth-century which preserves the heritage of the local community and also add value by providing a space to gather for social, educational and recreational events.  

These two examples show that the effectiveness of relocation. However relocation projects to successfully preserve the cultural fabric, certain things should be kept in mind they are:

**Identification of endangered cultural resource:** It is important to study and analyze the historic heritage and their value to the society. Certain buildings are iconic in character and stand out to be a valuable cultural resource. However some other buildings might not be significant on their own but collectively add more value to the cultural heritage of a place. This initial identification will then help in determining the steps to be taken in order to preserve the heritage of an entire region.

**The effectiveness of relocation:** It is important to brainstorm and discuss various options and select the best possible method of preserving heritage. In certain scenarios it becomes absolutely necessary to relocate structures in order to save them. All of this depends on the local community and the political scenario of the region. Money spent on resources that have value will be considered a positive investment rather than an unnecessary expense. Hence it becomes important to have a strategic plan of preserving heritage in the best possible manner

**Generating funds, importance of documentation and project planning:** If relocation is deemed necessary, for a particular historic property. It is very important to do a survey and document the building, site and the surrounding area. This will

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16 Debbie Komanski (Executive Director, Polasek Museum), "Rehabilitation and Adaptive Re-Use of Capen House", Phone Interviewed by Anulekha Chakraborty, October, 2017.
determine the logistics of moving the building. Geotechnical reports and surveys could be prepared, travel routes could be established based on height and or width required for transport. Using all the collected data the method of relocation could be determined. This will then help the project be more feasible and economical in nature. The extensive survey and documentation will also generate funding for the project. Since the value of preserving it could be analyzed and the historical impact it has on the region could be observed.
Sea level rise is threatening heritage sites globally, the impact of it is going to increase in the future. In Florida many of the state’s historical and cultural resources lie along the 1,197 Statute Miles coastline and most of the area is at sea-level, an estimated 6 feet rise in the sea-level in the future might cause many of the coastal region along with the entire southern Florida to be underwater, relocation of certain historically significant buildings might be the most effective adaptation strategy to preserve the cultural heritage of the state. Relocation is currently an accepted adaptation strategy. However there are many challenges and perhaps opportunities in the relocation of historic structures. The recent relocation of Gainesville Train Depot and Capen house offer some insight into the challenges and potential opportunities of relocating historic buildings. The outcomes of the case studies are discussed below.

**Case Study Outcomes**

Both the case studies chosen are relocation projects but are very different from each other and both helped provide various different insights to the practice of relocation. Relocation projects are expensive and costly, hence have always been used as a last resort. Relocation concerning historic properties have also been very few due to this reason and the reason of integrity. Since Historic preservation today gives a lot of importance to the location and environment of the structure, this becomes a major challenge which needs to be tackled sensitively in order to relocate historic properties.

The most important insights that the two relocation projects provided are:
Community and Stakeholder Support

Since Historic Preservation is for and by the community, the support of people and the willingness of governments to save cultural heritage is very crucial for any relocation projects. If the entire community supports and promotes preservation, it would be an easier task to find stakeholders who could invest into such projects as a community service or the entire community could gather funds by contributing in their own way to make the relocation project feasible.

The preservation of Gainesville Train Depot was thought to be an unnecessary expense by the local government in the 1970’s, tearing it down to widen the road networks and improve transportation was the thought that was being promoted. In the subsequent election, when the government was replaced, the new government had a different prospective to develop the neglected industrial area around the Gainesville Train Depot, by making it a vibrant community space. Prior to that the Gainesville Train Depot was listed in the National Registrar of Historic Places and the land was acquired by the government. The relocation of the Gainesville Train Depot in order to clean the brownfield site was then approved by the local authorities and funds were made available in the form of grants. Thus this building was preserved and the project was successful.

The restoration of Capen House was made possible entirely by the support of the local community. The owners of the Capen House site were interested in acquiring the land and building a new house, hence the decision to move Capen House was taken in order to preserve it. With the help of preservationist, academics and other supporters, Polasek Museum site was found and the timing seemed right, because the museum owners wanted another building in their property, so instead of investing on new
construction, they thought of acquiring Capen House, which turned out to be a cheaper and a more sustainable option. The entire relocation project right from gathering of funds, planning and execution was finished in a short duration of two months, this was possible due to the funds generated because of the local community support. This project got a lot of publicity from the local media, which drew more attention to the preservation of it and hence collecting the huge sum of money for the relocation of the building was made possible.

Both the projects became success stories due to the amount of support they received from the government and community, and this support helped bring the people together to fight for a common cause in order to improve the value of living.

**Research and Documentation prior to Relocation**

As mentioned before Historic Preservation in the country gives a lot of importance to integrity and authenticity of the historic structure, hence prior documentation of the buildings help maintain the integrity and safeguard the authenticity of the building. The Gainesville Train Depot building was rehabilitated to host shops and gathering places, and the adaptation was done in a sensitive and sustainable manner keeping the historic fabric of the building intact, this was made possible due to the well documented Historic Structures Report, which gave the architect and engineer a clear idea of the authentic physical characteristic of the building. Along with documentation research and surveys have also helped the project. An archeological site survey helped locate the original spot on which the Gainesville Train Depot use to be when it was made in the nineteenth-century.

The Capen house relocation project was not as well funded as the Gainesville Train Depot, hence lacked the official documentation privileges, but however due to the
media publicity mentioned, it helped increase curiosity about the project and the building, and research was done privately by the academics, preservationist and also the staff of Polasek Museum. Upon research performed by a researcher on the Polasek Family links between the Seymour and Polasek was discovered which helped in understanding the history ties of the influential people of Winter Park, thus improved the understanding of the History of the community.

**Planning of the Relocation Project**

Efficient Strategic Planning has proved to be beneficial for both the case studies. After documentation, planning of the project helps make the project economical, efficient and feasible. Once relocation of a particular structure is decided, planning helps to decide the best possible way to relocate the building depending on its size, shape, material, foundation type and site conditions. After the relocation method is fixed, the route of transfer is planned. The best possible route is selected depending on the factors like adequate space in terms of wideness of the road (if it is moved by land) and the height of the objects surrounding it (buildings, trees, etc.), the density of traffic on the route, the layout of the route, mostly straight routes with minimal to no slope is preferred so as to move the building safely, the stability of the route is another factor, if the building is moved on a bridge it is important to know if the bridge could carry the amount of load put by the building and the vehicle on which it sits.

The Gainesville Train Depot was moved on site, by placing parts of the structure on wheeled dollies which was then dragged by a heavy vehicle. Since the site of Gainesville Train Depot is over 30 acres in area, in order to clean the site the building was moved at the southernmost corner of the site. Moving the building in one piece is the fastest and most efficient way to relocate buildings, but upon site survey and
documentation. The Gainesville Train Depot was found to be large in size and hence it was not possible to move the entire structure all together and hence it was decided to divide them into smaller chunks and separate the three part building into four chunks and move each one safely. The planning made the relocation process of the Gainesville train depot, hassle-free.

Relocation of Capen House was a much more challenging feat when compared to the Gainesville Train Depot, primarily because of the site conditions. The Capen house was located near a water body on a strip of land which was pizza-shaped, the broader end of the site faced the street and the site tapered down towards the water body. The reason to float the building through the water body was that the building on the whole was too large to be moved by the road route, which was not wide enough to help the process. Hence it was decided to float the building. Due to the tapering nature of the site, the building had to be cut into two parts and floated to the other site by carefully placing each of the parts one after the other on a huge barge. Pre-planning of the route of relocation helped the project and made it successful to preserve the building with minimal damage. The process of relocation is a creative endeavor, since there are number of ways a structure could be moved, strategic planning of the project makes the process cost effective.

**Building Types, Materials and Technological Advancement**

The process of Relocation has made a huge progress over time due to technological advances, due to modern day equipment and machines different types of buildings and materials could be moved. In both the projects the building framing and material were very similar, both were wooden frame structure, they were moved in a very stable and careful manner with the help of modern day technology. The relocation
of Cape Hatters Light house was more challenging in terms of the physical move because it was made up of heavier materials like stone, hence more sophisticated modern technology like I-Beams with rollers and hydraulic jacks, etc. was used to relocate the structure, hence relocation today has a wider scope than in the past due to the improvement in technological field of relocation.

Creation of a New Sense of Space

Relocation and rehabilitation of spaces as seen in both the case studies could be a very positive thing, which adds value and creates a new sense of space. Gainesville Train Depot was rehabilitated to The Gainesville Depot Park, the once neglected industrial region of Gainesville was revived with the help of the Depot Park into a vibrant urban space and the influence of is seen on the entire urban region since the road in front of the Gainesville Depot Park is named Southeast Depot Avenue. This rehabilitation project not only helped preserve the historic fabric of Gainesville but also helped create a new sense of space, since the entire region is now a recreational spot for the community and it is growing to be a more vibrant space, the Cade Museum is being built on the south-west side of the building, which would be a museum for science and technology, this place is become an educational hub since many school trips are conducted to the site to better familiarize students with the history of the region.

The Relocation and Capen House to the Polasek Museum site and the rehabilitation of it, has benefited not just the museum, but also the community, it is now a space where many private events take place like weddings, exhibitions, parties and educational meets. Due to its lush green backyard facing the water body, it is a perfect spot to host large public gatherings and the spacious ground floor provides to spaces for more intimate private affairs like meetings, conferences or art exhibitions. The
upstairs of the two-story building is used as office spaces for the administration of the museum. Both these projects have turned derelict or unused historic buildings into revenue generating medium which has helped bring the community together and shape the urban fabric of the region.

**Future Research**

Relocation might soon be a feasible adaptation strategy to save historic fabric of a region from sea-level rise. The lessons learnt from these case studies could be applied to various buildings located in the vulnerable coasts of Florida and with the help of proper planning, disasters could be averted instead of being managed. Adaptation strategies for historic districts have not yet fully been researched or developed, this make it difficult in times of natural calamities, when buildings are renovated and cultural fabric is managed after a disaster, this often leads to the loss of many valuable cultural resources, since a lot of them are not be susceptible to withstand the negative impacts of calamities. Hence planning beforehand to help safeguard significant historic structures could bring the community together and add value to the standard of living.

Hence the most important question for further research is “What to save?” This is a decision which needs to be taken by the community and the government, once the decision is made it would become easier to help gather support and financial aid to make these projects practical. Since every Community and elected government have different opinions and perspectives about history and what is deemed significant to be saved, documentation of important historic structures becomes vital, so that even if all of the historic buildings cannot be saved they could be recorded with the help of modern digital technologies and could be preserved virtually.
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BIOGRAPHICAL SKETCH

Anulekha Chakraborty has an undergraduate degree in Bachelor of Architecture, from Institute of Design Environment and Architecture, India. After working for about a year and a half in the field of architecture in India, she decided to get a graduate degree in Historic Preservation, from school of Design, Construction and Planning at the University of Florida. She has actively been involved with the Envision Heritage initiative created and managed by Morris Hylton (Director of Historic Preservation Program at University of Florida).

The Envision Heritage group explores emerging technologies which could be used as a tool for documenting historic and cultural resources. She has attended the intensive summer workshop at the Preservation Institute Nantucket, where she gained knowledge about various digital documentation technologies like laser scanning and photogrammetry. Due to her background in architecture her future goal is to work as a Preservation Architect and rehabilitate, reconstruct as well as revitalize historic structures for the sustainable growth of urban and regional areas.