THE SUSTAINABLE FUTURE OF TOURISM POST-COVID-19 IN VENICE

Submitted by:

Madison Di Vico
Martin McCormack
Lucas Micheels
Lauren Revene
Joseph Sorrenti

December 11th, 2020

(BetterChoise, 2020)

WPI

SMARTDEST

CITIES AS MOBILITY HUBS:
TACKLING SOCIAL EXCLUSION THROUGH
'SMART' CITIZEN ENGAGEMENT

Venice Project Center

Project Advisors:

Professor Fabio Carrera
Professor Jennifer deWinter

December 11, 2020

ve20.tourism@gmail.com
https://sites.google.com/view/tourism-in-venice

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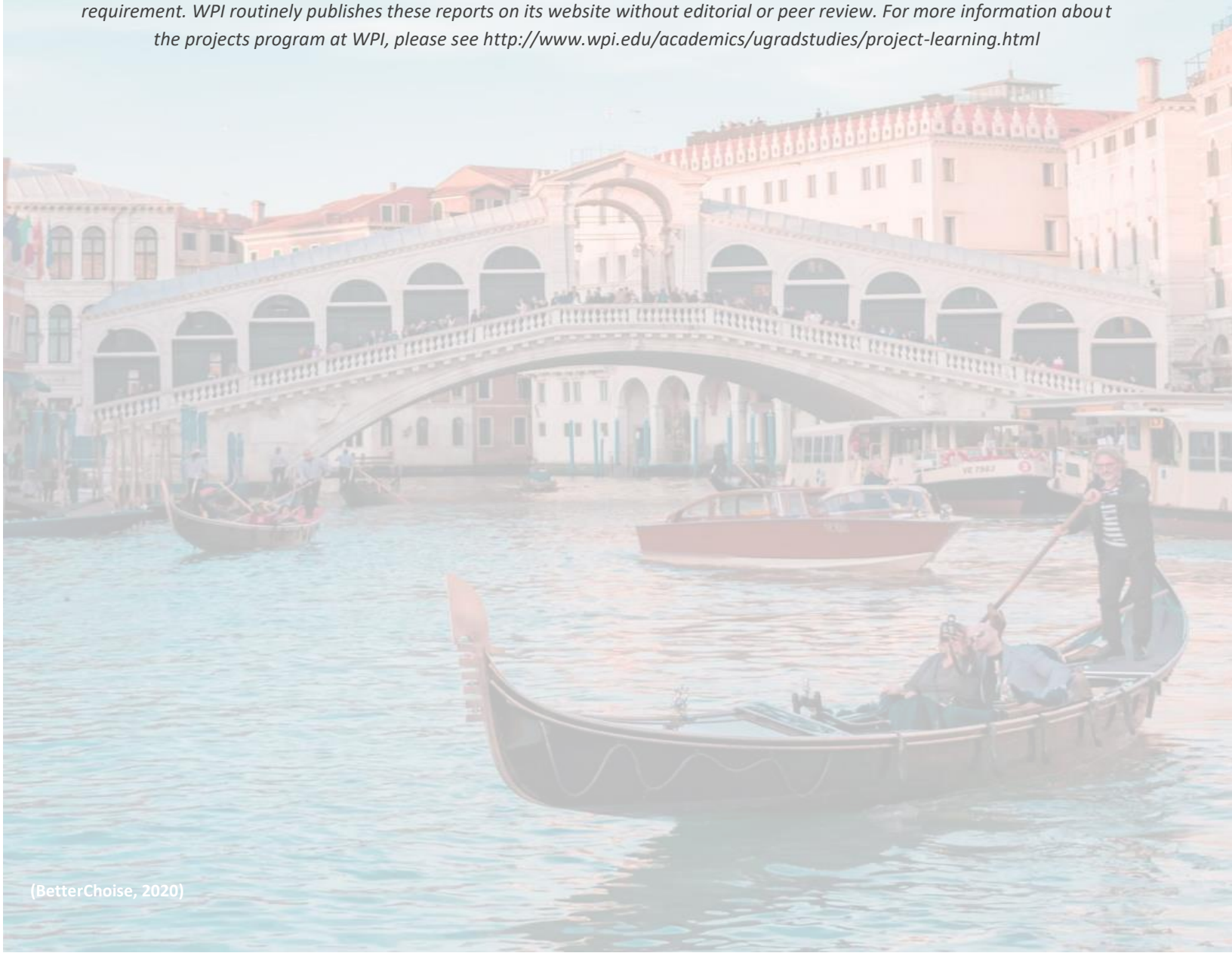

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AUTHORSHIP

This comprehensive report was written collectively by Madison Di Vico, Lauren Revene, Martin McCormack, Lucas Micheels, and Joseph Sorrenti. It was edited by our advisors: Fabio Carrera and Jennifer deWinter. Joeseph Sorrenti and Martin McCormack gathered the essential background knowledge; Lauren Revene and Madison Di Vico focused on the visual aspects and planning for the City Labs Events; and Lucas Micheels worked on the data scraping and organization of the data bases. Finally, the written portion was broken up, assigned to individual team members, and thoroughly edited by the entire team as well as our advisors.

(BetterChoise, 2020)

ABSTRACT

The purpose of this project was to analyze the effects of tourism on the economy, environment and culture in Venice while considering the future of tourism post-COVID-19 in order to contribute to the SmartDest project in creating new policies for sustainable tourism. In order to accomplish this goal, we constructed timelines of Local, International, Political, and COVID-19 events that have impacted tourism. We also contributed to the planning of the City Labs Events, which will be used to discuss the future of sustainable tourism. Our contribution to these events included the organization of an invitation list of 142 stakeholders involved in the tourism industry in Venice as well as the design of an invitation and newsletter advertising some of the key ideas that SmartDest has been working on. The information gathered from the timelines, City Labs Events, and updated Venice Dashboard will help contribute to the creation of policies for sustainable tourism.

(BetterChoise, 2020)

EXECUTIVE SUMMARY

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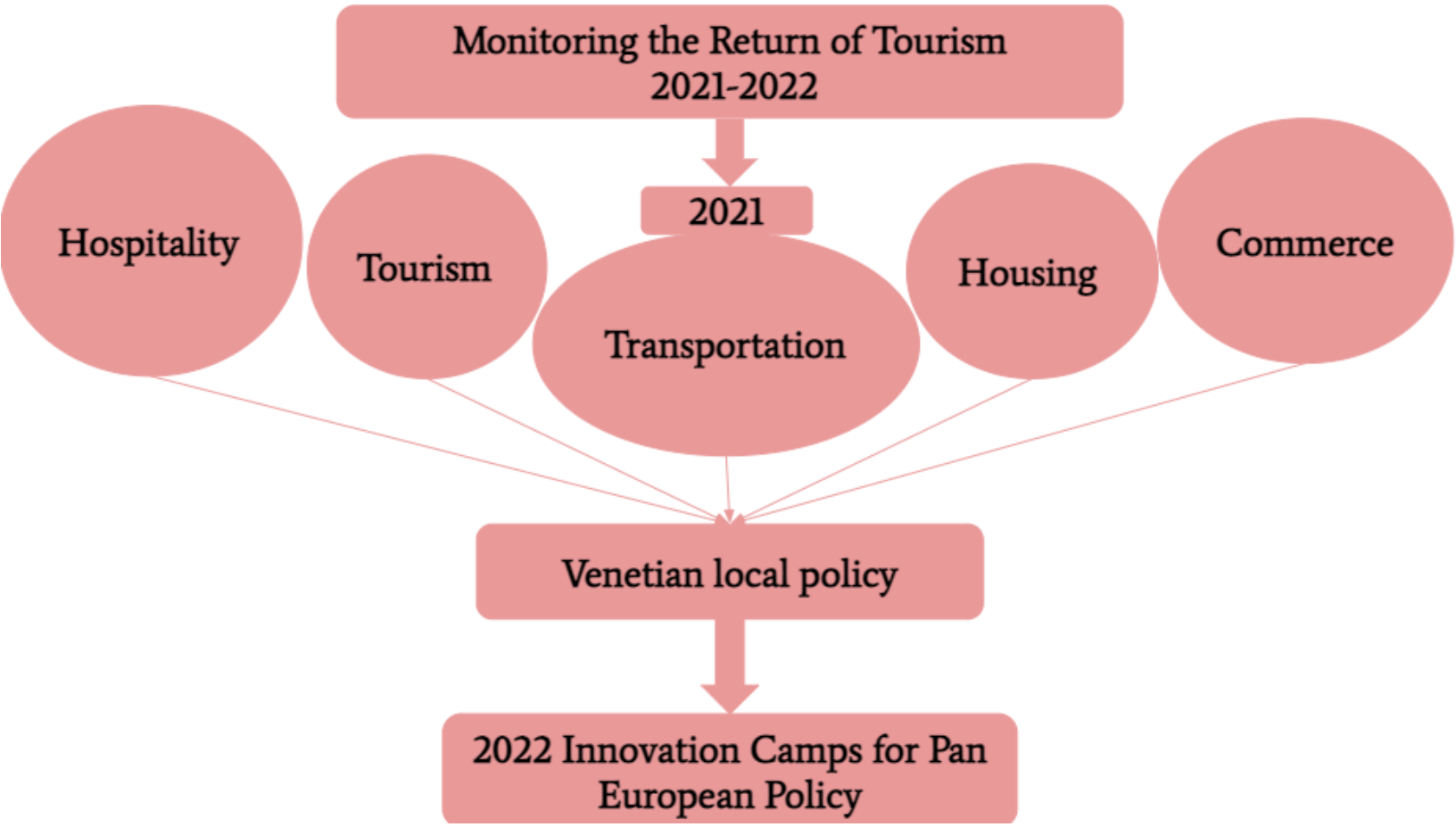

Figure 1: The 3 Year Timeline of The SmartDest Project

The picturesque city of Venice is a destination well-known for its architectural and cultural allure, aspects of which include but are not limited to glass blowing, culinary arts, canal structure, and absence of vehicles. This unique lifestyle attracted roughly 26 to 30 million tourists annually prior to COVID-19. For decades prior to COVID, the number of tourist beds available in Italy consistently increased; between 1997 and 2019, the number of tourist beds available increased from 12,995 to 59,373, a 357% increase over 22 years. This roughly 16% annual climb did not come without consequences. From 2000 to 2020, the resident population dropped from 76,007 to 51,550. As of 2019, there were more tourist beds available than residents. As a result, UNESCO gave Venice a deadline of 2021 to mitigate the environmental effects of tourism on the city or risk officially adding it to the endangered list. However, these trends rapidly changed when COVID-19 spread across the world. In February of 2020 Venice was placed under lockdown to combat the influx of victims that plagued the nation.

As a means to remedy the damage to tourism and local businesses, the SmartDest Project had chosen to sponsor a proposal from SerenDPT that focuses on solutions to

issues of dependency and deterioration of Venetian life. The goal was to analyze tourism and the effects that it had on the economy, environment and culture in Venice as well as to create policy to usher in sustainable tourism. In doing this we worked to supply SerenDPT with pre-COVID socioeconomic trends regarding tourism; to aid in the development of a tool to automatically collect real-time tourism data; and engage with stakeholders in tourism and plan an event for stakeholders to meet and discuss sustainable tourism.

The individual stakeholders all have problems specific to their discipline and with varying severity. To help rally effort towards their cause, many of the stakeholders are members of associations and organizations in Venice. Local to Venice there are approximately fifteen main organizations that are routinely involved in tourism along with over one hundred associations also linked to tourism.

In order to help these stakeholders, develop a more sustainable tourist experience in Venice, we first had to analyze pre-COVID socioeconomic data. Through timelines categorized into local events, international events, policies and law, political power, tourist beds and residential population. This research proved the fragility of the tourism industry, making it evident that it needed to be monitored. This led our team to renovate and repurpose the Venice Dashboard.

Designing the new dashboard moved it from a tourist focused program to a researcher and policy maker oriented one. Our design presents data found from websites and API's (application programming interface) which will be displayed in real time. The data will be displayed in various forms such as interactive maps, bar and line graphs and charts. All information presented in real time will also now be stored in spreadsheets. In doing this the functionality of the website increases, as researchers will have a one stop spot for all socio-economic tourist data.

The needs of the stakeholders are also discussed in order to increase the practical value of this project. As per the SmartDest Grant, we organized multiple stakeholder events to be conducted in Venice with the goal of discussing tourist related issues to help officials and administrators make policy. We organized the events into 5 groups each of which will have members from associations discussing issues in their industry. The grouping is as such: hospitality, tourism, transportation, housing, and commerce associations. Topics of these events will discuss ways to support tourism as well as Venetian citizens. We hope that this work will be beneficial to the grants goal of upgrading pan-European policy, influencing the issues of mobilization and exclusion brought on by tourism.

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GLOSSARY OF ABBREVIATIONS AND ACRONYMS

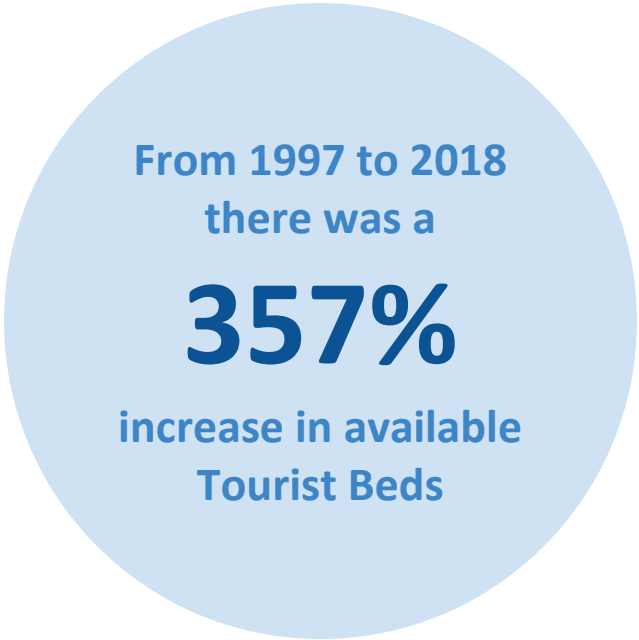
COVID/ COVID-19: SARS-CoV-2
UNESCO: United Nations Educational, Scientific and Cultural Organization
EU: European Union
MOSE: Modulo Sperimentale Elettromeccanico (Experimental Electromechanical Module)
UNWTO: United Nations World Tourism Organization
API: Application Programming Interface
CEO: Chief Executive Officer
CMO: Chief Marketing Officer

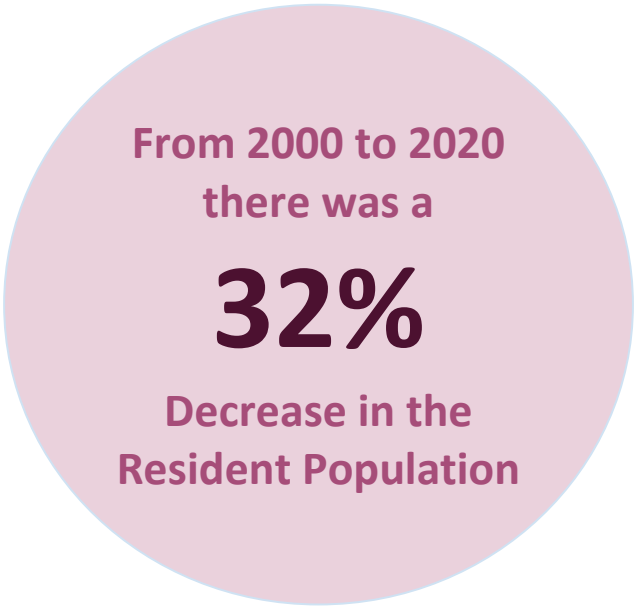
(BetterChoise, 2020)

INTRODUCTION

(BetterChoise, 2020)

The picturesque city of Venice is a destination well-known for its architectural and cultural allure, aspects of which include but are not limited to glass blowing, culinary arts, canal structure, and absence of vehicles. This unique lifestyle attracted roughly **26 to 30 million tourists annually prior to COVID-19** (Warren, 2020). For decades prior to COVID, the number of tourist beds available in Italy consistently increased; between 1997 and 2019, **the number of tourist beds available increased** from 12,995 to 59,373, a **357% increase over 22 years or approximately a 16% annual increase** (Kasia, 2020). Yet as tourism rose, the resident population was simultaneously declining - from 2000 to 2020, **the resident population dropped from 76,007 to 51,550** (OCIO, 2020). As of 2019, there were more tourist beds available than residents. As a result, UNESCO gave Venice a deadline of 2021 to mitigate the environmental effects of tourism on the city or risk officially adding it to the endangered list. It is possible, however, that this forecast could change as a result of COVID-19.





Despite the presence of tourism since the Middle Ages, Venice began to actively encourage it in the 1950s to combat their economic and demographic crisis. While the residential population reached its peak and steadily declined in the 1950s, tourism rose; with it came many economic benefits for a large portion of the population and the straining of limitations on urban planning and sustainability in Venice (Singh, et al., 2005). This imbalance, still prominent today, must be addressed to improve the quality of life of local Venetians as well as the wellbeing of the local economy and the cityscape.

In February 2020, Venice was placed under lockdown due to the COVID-19 global pandemic, completely halting tourism in Venice. The streets contained little to no life in comparison to the years prior, and businesses were forced to temporarily close if they were not considered an “essential business”. At one point, Venetians were even restricted to the point where they could not leave their immediate neighborhood aside from in emergency situations (Italy: Venice in Times of COVID-19, 2020). As of November 2020, tourists are slowly returning to Venice, yet only from certain areas permitted by Venetian officials. Despite this improvement, it is predicted that Venice will not fully recover from this pandemic until at least 2022 (Kasia, 2020).

To mitigate the damage to tourism and local businesses caused by the COVID-19 pandemic, the SmartDest Grant has chosen to sponsor a proposal from SerenDPT focusing on solutions to issues of dependency and deterioration of Venetian quality of life (SmartDest, 2020). Our key focus is the improvement of economic and cultural impacts on the Venetian social, political, and economic landscape, which

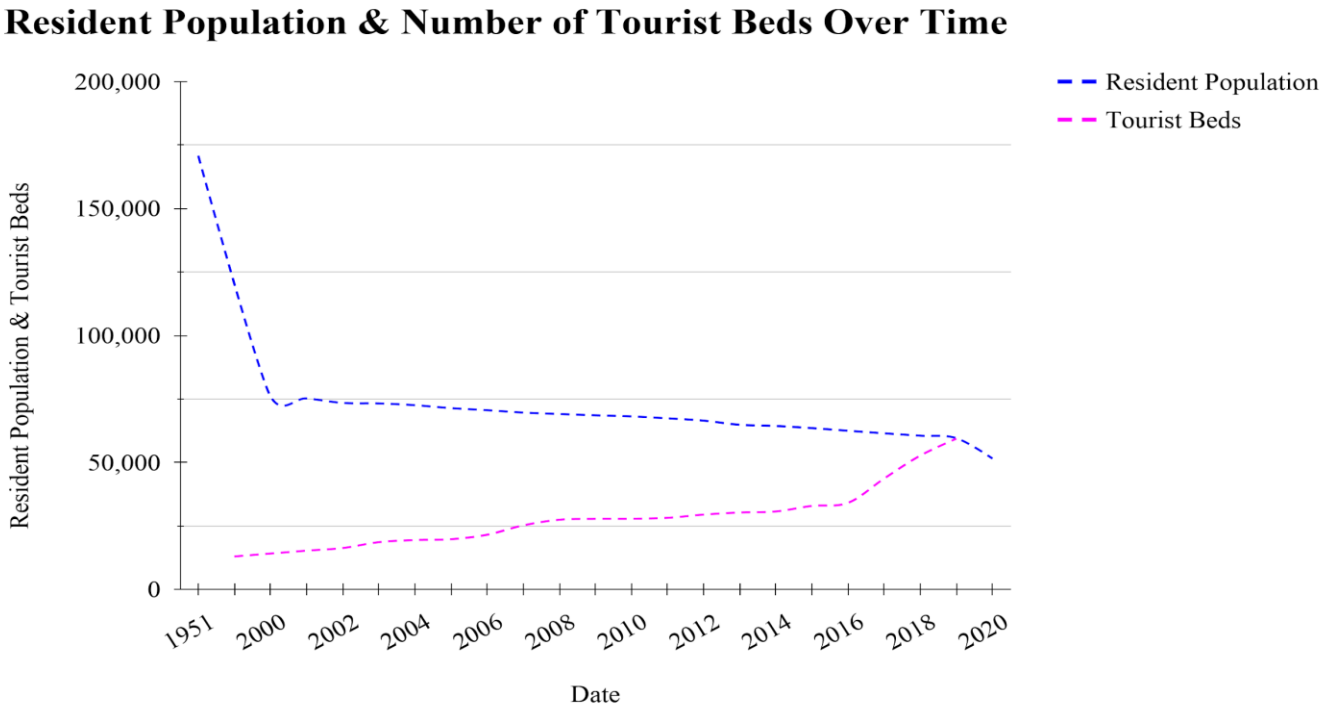


Figure 2: Resident Population and Tourist Beds vs. Time Graph

The blue dotted line represents the resident population from 1951 to 2020. The pink dotted line represents the number of tourist beds from 1997 to 2019. Data Obtained from (OCIO, 2020)

we term as creating more ‘sustainable tourism’.

The goal of this project was to analyze the effects that tourism had on the economy, environment, and culture in Venice as well as consider the future of tourism post-COVID-19 in order to contribute to the SmartDest project in creating new policies for sustainable tourism. To that end, the primary objectives of this project were to present pre-COVID socioeconomic trends regarding tourism; engage with stakeholders in tourism and plan an event for stakeholders to meet and discuss sustainable tourism; and to aid in the development of a tool to automatically collect real-time tourism data.
We hope that this assessment will contribute to a better understanding of how tourism and the local economy can find a stronger and more sustainable path forward.

Figure 3: St. Mark’s Square Emptied Due to the COVID-19 Pandemic (DepositPhotos, 2020)

BACKGROUND

(BetterChoise, 2020)

Tourists are Changing the Culture of The Historic City of Venice

Venice's roots date back to the period just after the fall of the Roman Empire. At this time, the Germanic invasion forced many people into the lagoon where native fishermen and salt workers dwelled. While the mainland swiftly succumbed to the invasion, the power of the Veneto-Byzantine civilization was placed in the islands of the Lagoon. When the city rose, the Venetians saw it in a divine nature, being equally grounded in religious, civic and mercantile life. Today, there are still outskirts of the city that are hidden away from the heavy number of tourists. In this area, it is common to see children playing in the piazza. College-aged residents interested in architecture and urban planning can enroll in the University of Ca' Foscari (Foot & Cosgrove, 2020). In the 14th century, Venetians began hiding their faces during Carnival in order to forget the class struggle, making it a day where all people could shed social rules and roles. But even this tradition has become overrun with tourists who have heard the rumors of the extravagant festival.

Figure 4: The Venice Carnival (Venice Carnival, 2020)

As a tourist, you are subject to a different culture than that of the native Venetians. In fact, tourists tend to distort the traditional views of Venetian culture. In 2009, Venetian natives held a fake funeral for the city which was designed to shed light on the deterioration of the city. They made a mockery of the city, calling it "Veniceland" and handing out tickets and such like an amusement park. This did accomplish its goal, as public officials began to talk with the local residents. Peter Debrine, head of the World Heritage and Sustainable Tourism Program at UNESCO stated that, "the people who live in Venice need to come together and begin a dialogue with each other. Everyone needs to come together in a way that benefits the economy but does not damage the heritage of the site, the outstanding universal value." Local citizens like Matteo Secchi, the spokesperson for Venessia, showed similar concerns by making a comment on the Veniceland idea. They fear that people will come during the day, visit the sites and attractions then leave the city at night like an amusement park closing until the next day (Mack, 2012).

The impact that tourism has on Venice is worsening, and may, at some time, hit a point that is unsustainable for the health and wellbeing of the city. A term known as the "tourism paradox" explains, "a phenomenon where the tourism industry destroys the natural and cultural environment in a destination that is necessary for tourism

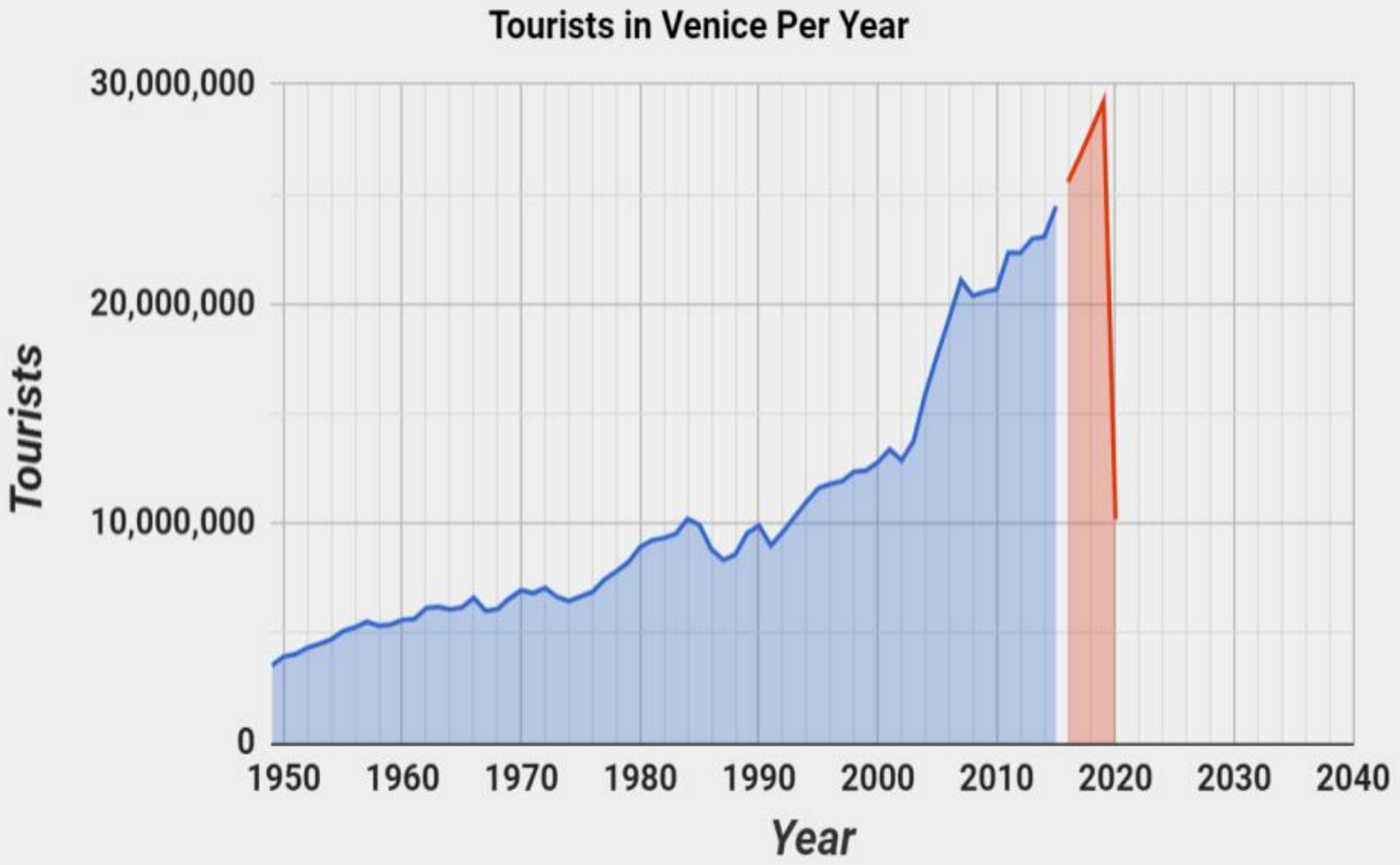


Figure 5: Tourists Per Year Timeline with COVID-19 Estimated Projection (Carrera, 2020)

activities" (Arikan, 2016). The diminishing culture and beauty in Venice could lead to a decrease in the overall percentage of tourist visits per year. Without a creative balance in economic options, this loss of tourism could drastically affect the Venetian economy. Although this is a possibility for Venice's future, a unique situation has arisen in recent months that could prove to be beneficial to the city -- the COVID-19 pandemic.

Figure 6: St. Mark's Square Pre-COVID-19 (Could slow travel help Venice's over tourism woes?, 2018)

An Opportunity to Bring Back Tourism in a Controlled Manner

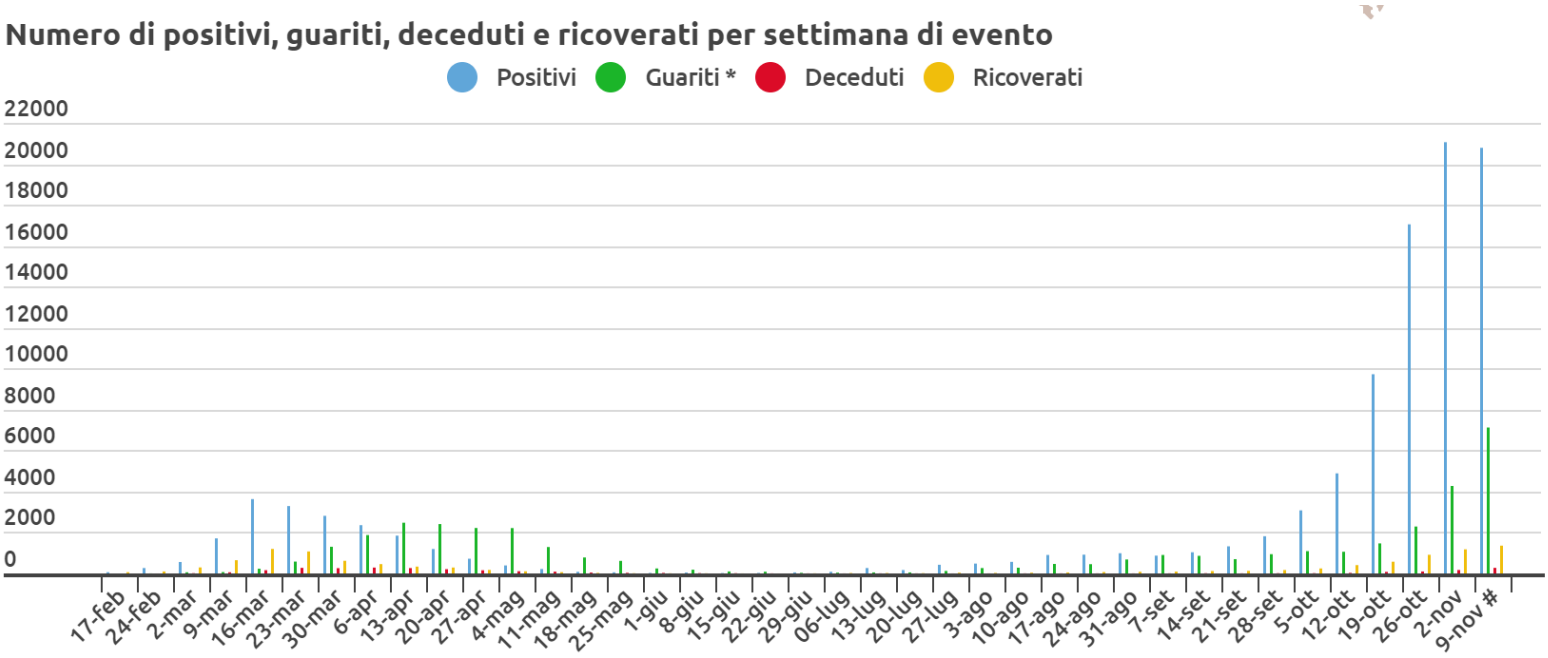


Figure 7: The COVID-19 Case Statistics in The Region of Veneto

The COVID-19 pandemic of 2020 brought all tourism and travel to a standstill across the globe. As of September 2020, travel restrictions began to decrease in severity and allow essential and non-essential travel from EU countries (U.S. Mission Italy, 2020). As of November 2020, however, predictions for a second wave have increased, causing many neighborhoods to retract into lock down. The number of cases, as seen in figure 9, change on a daily basis, causing uncertainty as to when tourists will fully be allowed back in Venice. This pandemic has caused economic hardship to all of Italy, with approximately 3 million residents left without income. **The Italian government is providing an "emergency income" as a part of a 25-billion-euro package.** Each resident in need was given anywhere between **200 to 300 Euros,** depending on each individual's situation. The number of unemployed or underemployed Venetians is rapidly changing due to the progressing "phases" in Venice as an attempt to bring residents back to work and tourists back to the city. Businesses, however, are not likely to retain the number of tourists they used

to have anytime soon. Studies have predicted that **the number of both Italian and foreign tourists will have dropped 65.1% from 2019 to 2020** (Statista, 2020).

A city whose survival is dependent on tourism has been abandoned by tourism for months due to this pandemic. The people of Venice need, now more than ever, solutions to their economic dependency on tourism. City officials have been presenting ideas such as **tourist fees or an "access tax" of 10.25€, limiting the number of tourists in the city per day, as well as not allowing cruise ships to dock in Venice.** While these ideas may seem enticing, they will likely be unsuccessful in fixing the issue of over-tourism in the long run (Kasia, 2020). In an attempt to analyze whether these suggestions for sustainable tourism would be effective, a **Systems Thinking (ST) epistemological approach** was used in a recent study Professor Francesco Gonella and research fellow Silvio Cristiano at the **Università Ca' Foscari**. This approach uses stock and flow symbols to create a systemic diagram, shown in figure 9**,** that represents the "dynamics and threats of a tourist city

As of April 2020,

3 million

residents have no income due to COVID-19

The Italian Government are providing Residents in need between

200 to 500 Euros

by means of a conceptual elaboration of the related system, encompassing urban (local) life, economy, and resilience in the presence of uncertainties and hazards, such as for example the recent Covid-19 pandemic" (Cristiano, 2020). Through a detailed analysis using this chart as well as other techniques to analyze tourist destinations, it was determined that the suggestions made by city officials are unlikely to be beneficial to Venice in the long run. The tourist tax would have a prominent impact on the residents of Venice because if friends or family visited for holidays or other special occasions, they would be required to pay this tourist tax each instance. The relocation of cruise ships is also unlikely to benefit Venice because, according to the systemic diagram, relocating cruise ships would simply add new inflows of tourists through transportation services (Cristiano, 2020).

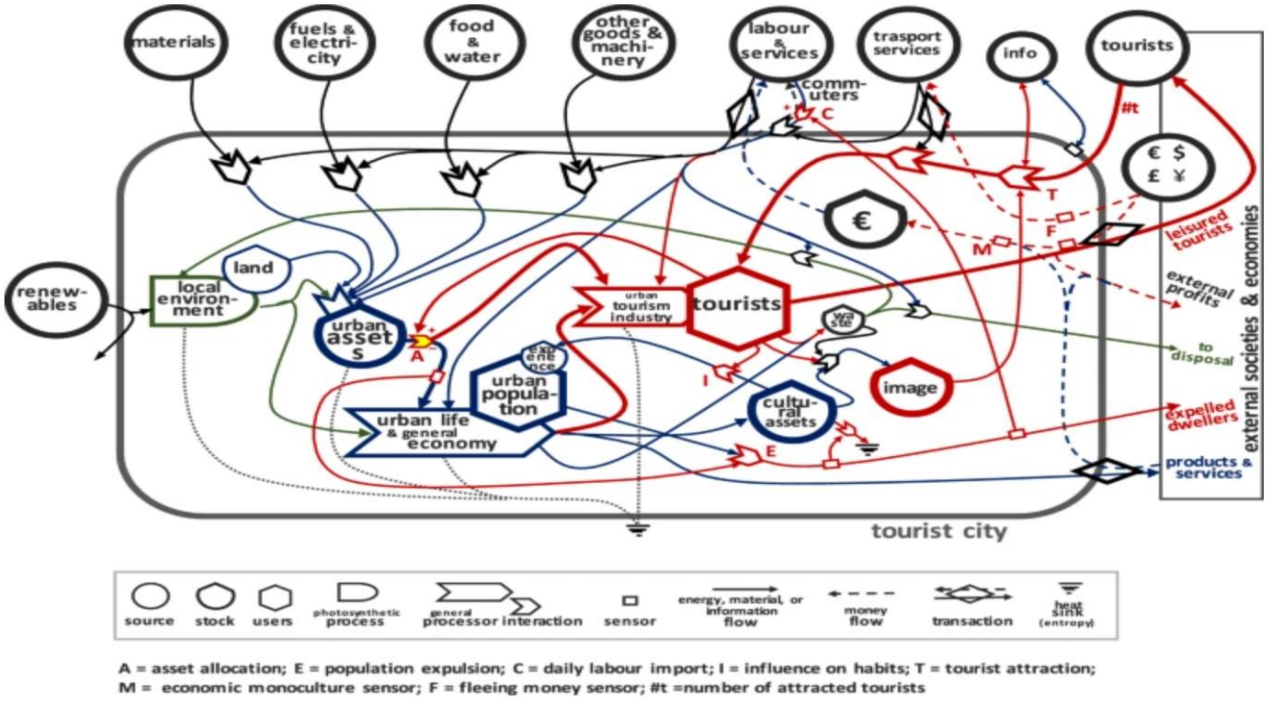


Figure 8: Systemic Diagram to Represent the Dynamics and Trends of Tourism in a City (Cristiano, 2020)

In order to use this pandemic as a way to bring back tourism in a more sustainable manner, city officials must instead focus on becoming less dependent on tourism. For example, **students in Venice have been in need of more housing** since tourists tend to take up more than half of the available housing in Venice (Kasia, 2020). When COVID-19 first began and tourists vacated the city, **city officials, apartment owners, and the Università Ca' Foscari decided that renting the apartments traditionally used for tourists to students instead may help**. The research study at the Università Ca' Foscari concluded that this attempt to help students and apartment owners during the pandemic may be the first step in finding solutions to become less dependent tourism (Cristiano, 2020).

Figure 9: The Università Ca' Foscari (Università Ca' Foscari Venezia, 2020)

SmartDest: Horizon 2020 Project

The European Union (EU) has realized that enhancing their global competitiveness means investing heavily in the future of the union, and is therefore focusing on smart, sustainable, and inclusive growth and employment. The rise of tourism in Europe tends to have adverse effects on urban areas. The European Union developed a grant program called EU Horizons 2020, which sponsors research and innovation grants to tackle concerns facing cities throughout the EU. One of these grants is the SmartDest Grant, which seeks to remedy the rapidly growing tourist populations in Amsterdam, Barcelona, Edinburgh, Jerusalem, Lisbon, Ljubljana, Turin, Venice, and Vienna. SmartDest's mission is to come up with creative solutions to aid in the conflicts produced by tourists in urban areas. By the end of the grant timeframe, SmartDest plans to recommend policies regarding social exclusion. They will do this by organizing CityLab events in the 8 case study cities to identify ways of overcoming social exclusion and recommend policy to maximize the effect. The grant also intends to gather thorough research on how tourism creates social imbalances and how different governing authorities, regulations and contextual factors create variations on the effects. Overall, the hope is to mitigate the effects of tourism throughout the countries involved in the EU to create more sustainable ways for tourists to explore (SmartDest, 2020). The COVID-19 pandemic has halted tourism, leaving these once overcrowded cities quiet and empty; this presents a unique opportunity for the SmartDest Project to reintroduce tourism in a more sustainable manner across these 8 case study cities.

SMARTDEST

CITIES AS MOBILITY HUBS:
TACKLING SOCIAL EXCLUSION THROUGH
'SMART' CITIZEN ENGAGEMENT

Figure 10: The SmartDest Project Logo (SmartDest, 2020)

For the city of Venice in particular, SerenDPT has latched onto a benefit organization created to develop better work life and creative economies as well as solve the city's problems from within (SerenDPT, 2020). A part of this collaboration, research and analysis of data will aid in creating solutions for more sustainable tourism in the future. Tourist hotspots around Venice including St Mark's Square, the Grand Canal, Ponte di Rialto, Murano and Burano are locations of interest.

Figure 11: The 8 Case Study Cities (SmartDest, 2020)

Stakeholders in Venice Involved in The Tourism Industry

In the city of Venice, stakeholders have personal concerns with tourism in the city. These stakeholders are often part of organizations that represent the interests of specific types of businesses or citizen groups. These associations address issues that affect their members, lobby the government for redress, and inform the public on such information. In the city of Venice, **approximately fifteen organizations exist that are heavily involved in the tourism industry;** they are described in more detail in the Addendum. There are over one hundred other associations also involved in the tourism industry (also listed in the Addendum).

These associations serve as representatives for the vast number of stakeholders in the tourism industry in Venice, working to solve problems and create a better Venice. Tourist organizations focus on ensuring the rights of tourists while traveling, economic organizations create ways of sustainable income that doesn't negatively affect any participant and homeowner organizations protect the culture and livelihood of the Venetian residents.

Figure 12: The Fifteen Primary Stakeholders

1. Comune di Venezia Turismo
2. SET
3. ConfTurismo
4. Associazione Veneziana Albergatori
5. Ente Bilaterale sul turismo Venezia
6. Associazione OTS Turismo Sostenibile
7. Confcommercio Turismo Venezia
8. SKIFT
9. ABBAV
10. SKAL
11. OCIO
12. Assemblea Sociale Per la Casa
13. Sindacato unione Inquilini
14. Camera di Commercio Venezia-Rovigo
15. NO Profit organization list.

OUR CONTRIBUTIONS TO THE SMARTDEST PROJECT

(BetterChoise, 2020)

Analysis of Pre-COVID Socioeconomic Data Regarding Tourism

In order for our project to allow for a complete assessment of the conditions of tourism in Venice, we compiled and organized existing socioeconomic data. We collected information from sources including our sponsors, databases that hold national economic statistics, articles, and other research reports. The information found was initially organized into a spreadsheet with the event, date, and a description for each. This data was then put into organized timelines for easy visualization.

After producing numerous renditions of our timelines, we concluded that creating different timelines for each category was the most beneficial. The first timeline was an interactive one -- using a software created by knight lab we used our excel sheet containing all events to produce a timeline. This rendition, in a brief time, malfunctioned locking us out of the timeline. We then produced a timeline that showed different grouped events organized by color. This timeline didn't allow for enough information to be displayed at a time so we continued exploring different options.

The technological difficulties that we had with producing a timeline led us to the decision to simplify the operation and create handmade drafts, which were manually formatted into appealing and organized digital timelines. We decided to separate the events into various categories: local events, international events, policies and law, political power, and a tourist beds and residential population vs time graph. This allowed us to display the information in an organized manner to emphasize the changes and trends within tourism before COVID-19, giving us a better idea of what tourism looked like before the pandemic.

We took this information and used it to create various interactive timelines that displayed the changes in tourism (Appendix A). These timelines allow viewers to analyze how the tourism industry was affected by different events including COVID-19. Knowing what affected tourism in Venice before the pandemic will allow for a better understanding of what tourism will affect tourism post-COVID, which will be helpful in reintroducing tourism in a more sustainable manner post-COVID.

User instructions for the Interactive Feature: Each event has a hyperlink within a google presentation slide, leading the viewer to the website with more information about the event. To view the interactive feature of the timeline, please see our team's website, click on "Files" where you will be directed to our google drive file containing the google presentation titled "VE20-TOUR: Project Infographics". This presentation consists of the important infographics created during this project, including the timelines. On the timeline slides, the user can click on any box containing event information. Each of these boxes have hyperlink that direct the user to more information on the event they clicked on. For quicker access to the interactive timelines, click the link in Appendix A to be directed to the google presentation.

Figure 13 is one of the interactive timelines that our team developed. Each timeline is color coded by category. In this case, Local Events are pink. Each of these local events have had some effect on tourism. For example, the high tides on March 24th, 2008 can be compared to a graph of tourists in Venice per year in figure 14. These high tides caused the worst flooding in Venice in 20 years. In figure 14, there is an arrow pointing to 2008, where it is clear that there was a 9.1% decrease in the number of tourists the next years. The flood along with the 2008 financial crisis are the primary causes of this drop in tourism.

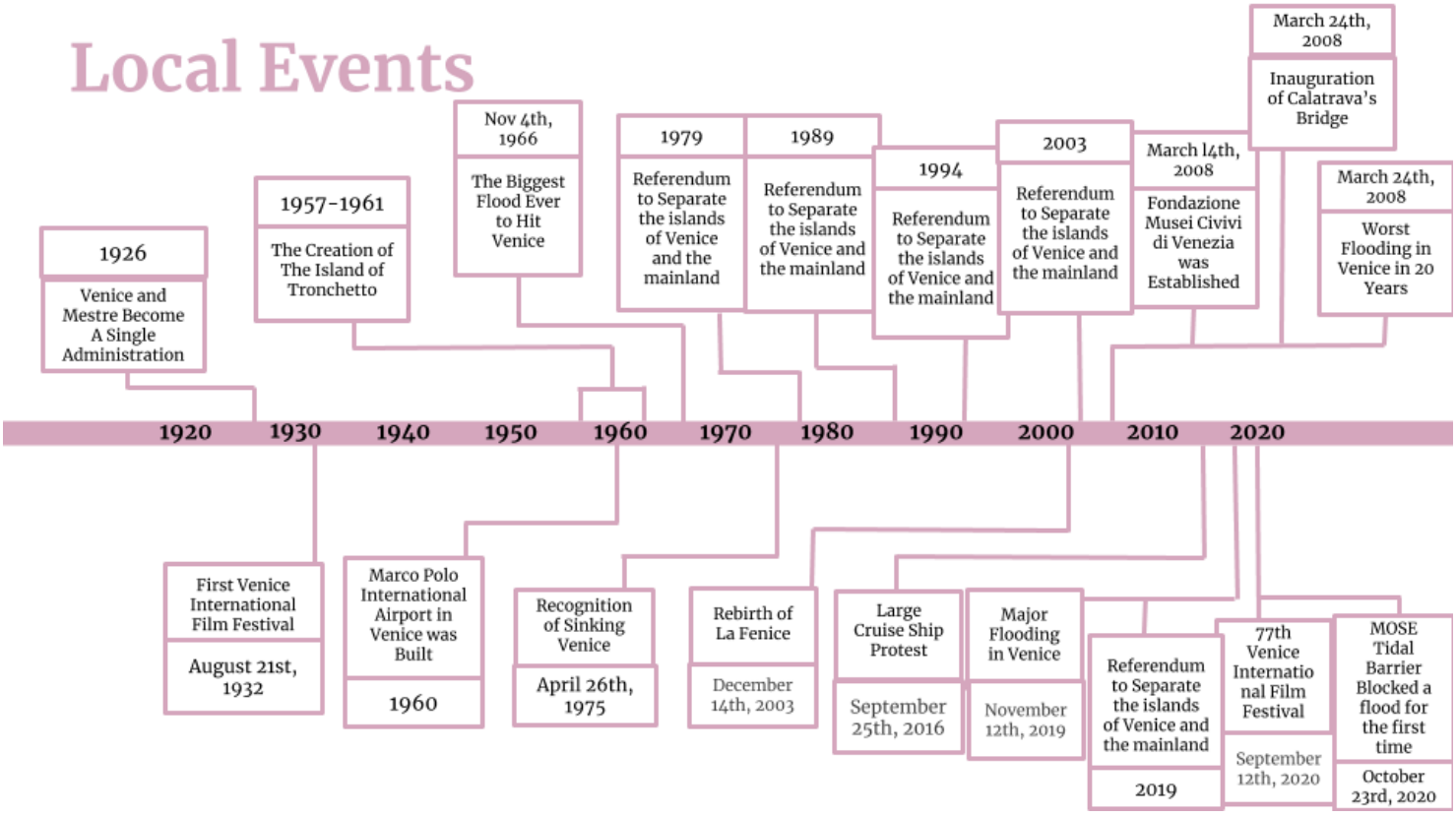


Figure 13: The Local Events Timeline

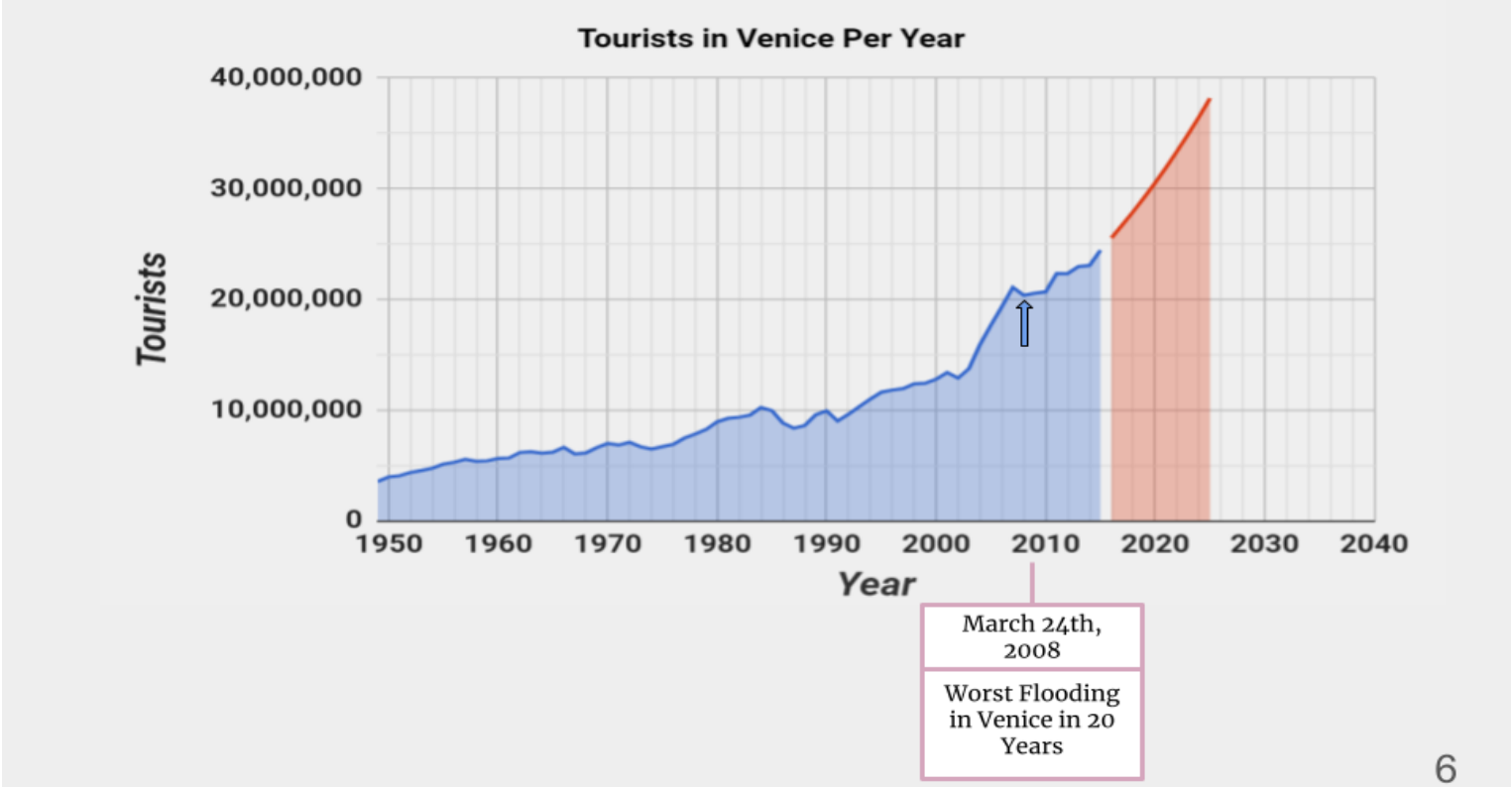


Figure 14: A graph of tourists per year to illustrate the effects on tourism from the flooding of 2008

Figure 15 is another interactive timeline that we created -- in this case we made international events blue. An example of an international event that had a significant impact on tourism in Venice is the Attack on the World Trade Center in New York City on September 11th, 2001. This event caused mass hysteria in airports around the world and led to a dip in the number of tourists visiting Venice per year. This decrease in tourism can be seen on the tourists per year graph in figure 16.

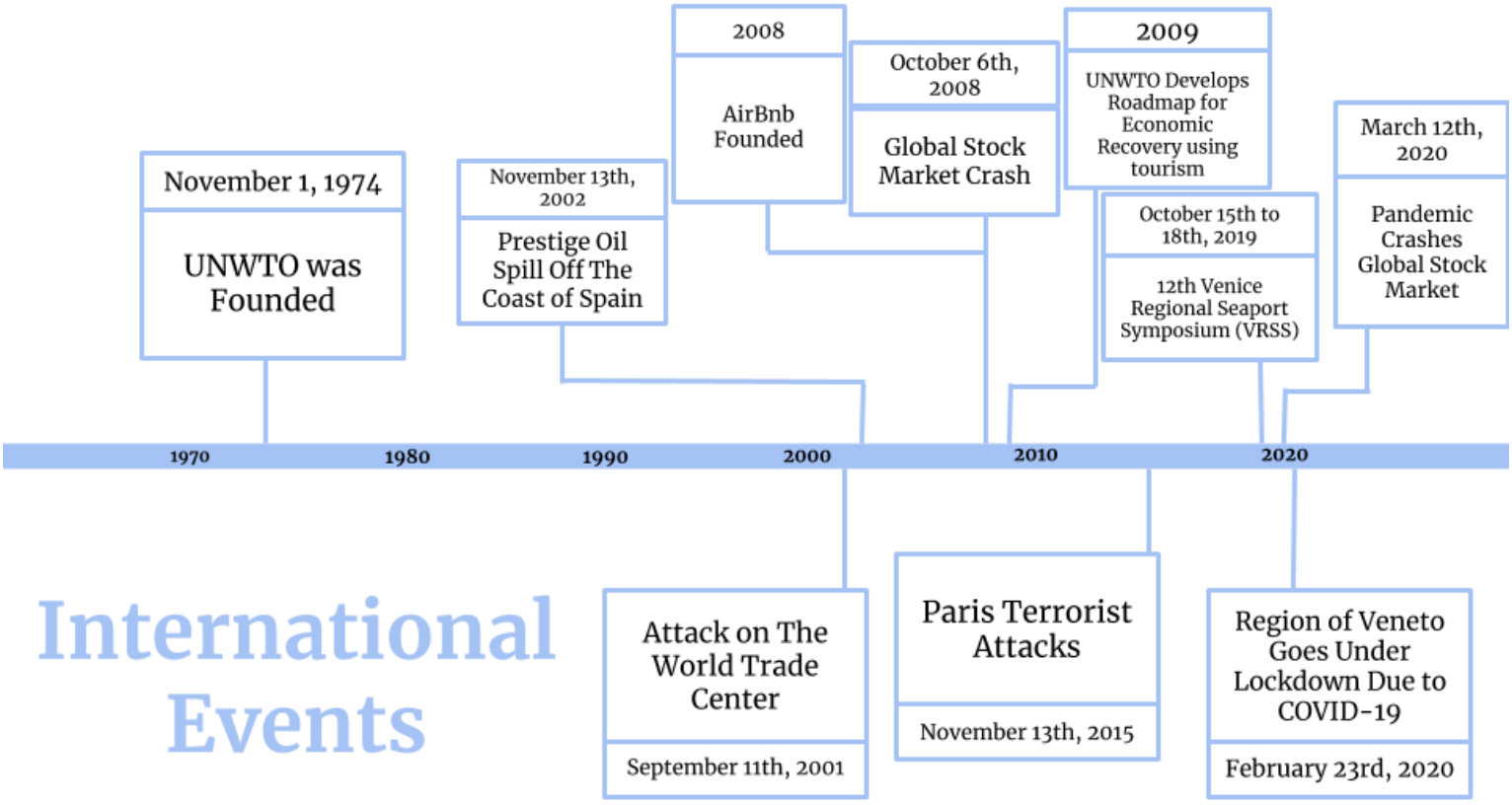


Figure 15: International Events Timeline

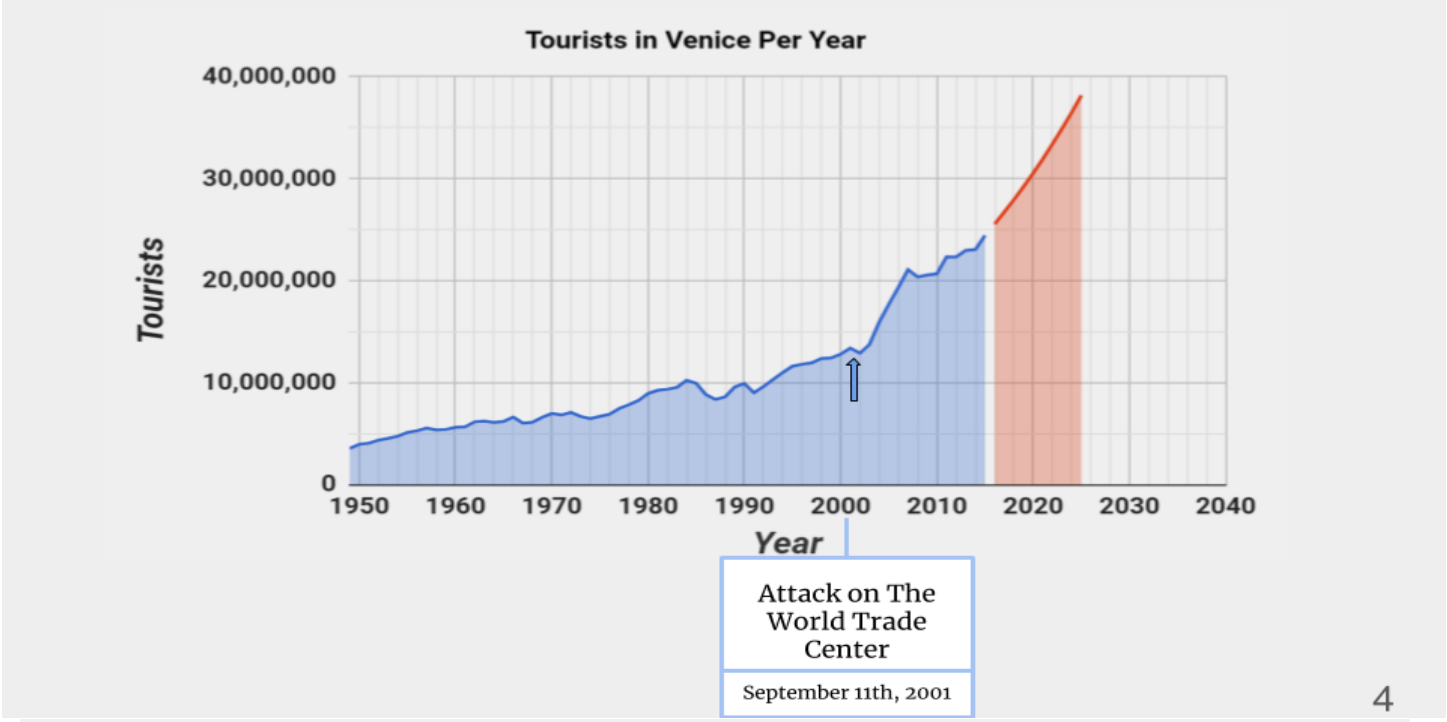


Figure 16: A graph of tourists per year to illustrate the effects on tourism from the 9/11 Attack on The World Trade Center

We also created a policies and law timeline (green) as well as a political powers timeline (purple) in figures 17 and 18, respectively. The political power timeline was created primarily to compare the political party in charge to the laws that were created. These laws can be compared to the tourists per year graph, in figure 19, to see how the law directly impacted tourism. For example, in 2002, Law L. 33/2002 was created to relax rental regulations. This law allowed for the creation of more tourist beds and is responsible for the beginning of the large-scale spike in tourism that occurred from 2002 to 2008, as seen in figure 19.

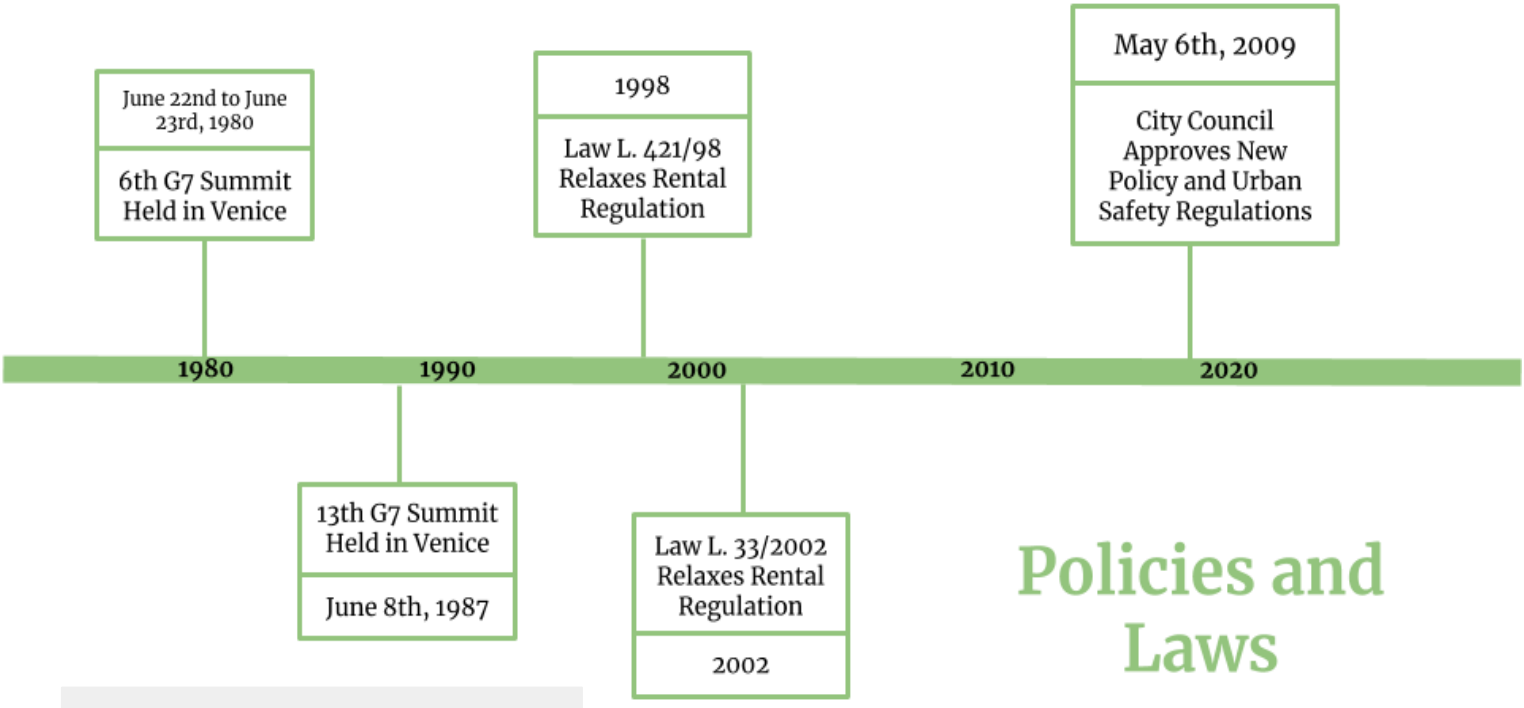


Figure 17: Policies and Law Timeline

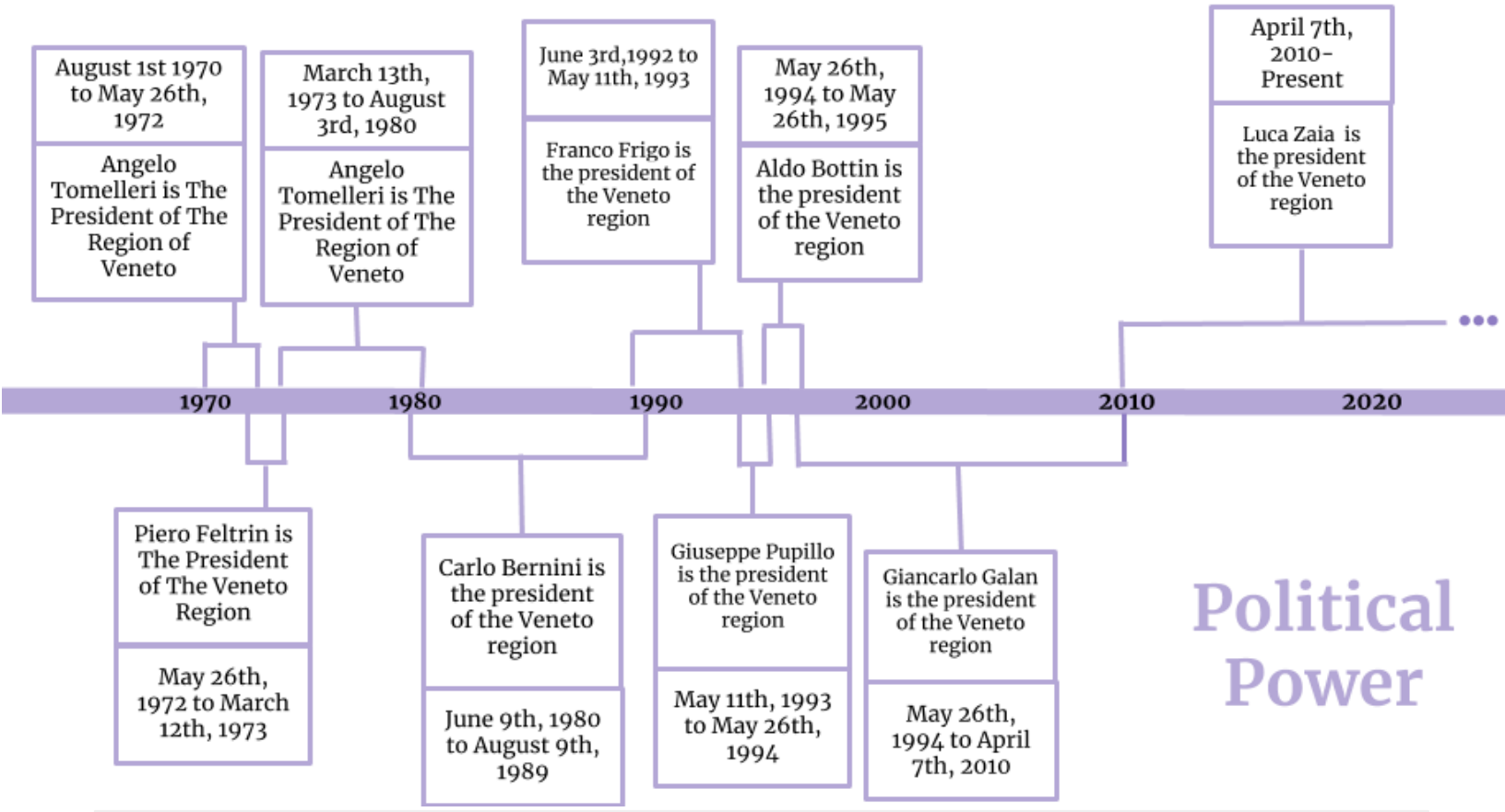


Figure 18: The Political Powers Timeline

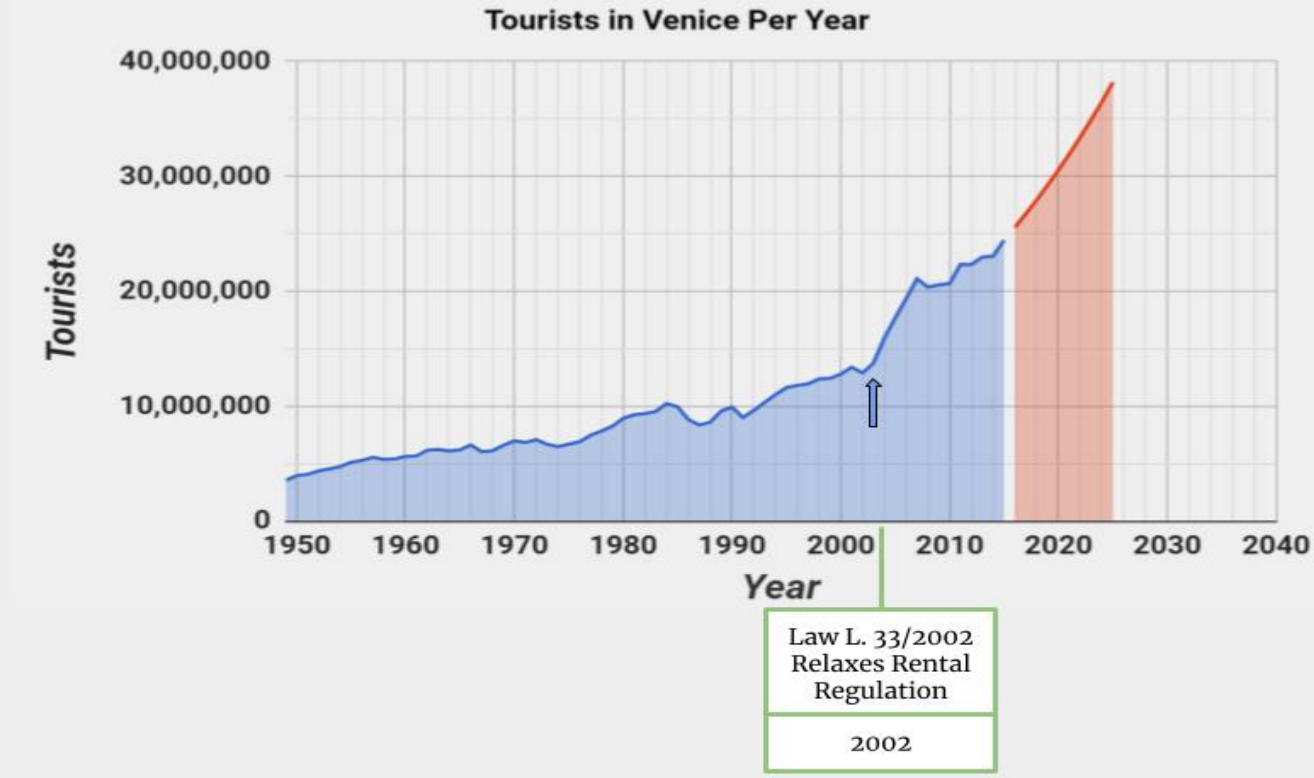


Figure 19: A graph of tourists per year to illustrate the effects on tourism from the relaxed rental regulations

The next timeline, figure 20, includes important dates throughout 2020 regarding COVID-19. On February 23, 2020, the Region of Veneto went under lockdown due to the COVID-19 pandemic, shutting down all tourism in Venice. With approximately 80% of shops completely or somewhat reliant on tourism, the loss of tourists took a large toll on Venetians (Gorowara,2013). Approximately one month after the lock down, on March 11th and March 22nd, 2020, restaurants, bars, factories, and non-essential businesses were closed to prevent further spread of COVID-19. Referring back to figure 7 from the background section of this booklet, the number of positive (blue), healed (green), deceased (red), and hospitalized (yellow) cases are displayed from February 2020 to November 2020. We can compare figure 7 to the timeline below, figure 20. The following months after the Region of Veneto first shut down, the number of COVID-19 cases slowly decreased. Around June 2020, Italy, along with many other European countries, began to allow European tourists to visit due to the significant decline in COVID cases. There were still many countries, however, that were not allowed to travel to Italy due to their high number of cases.

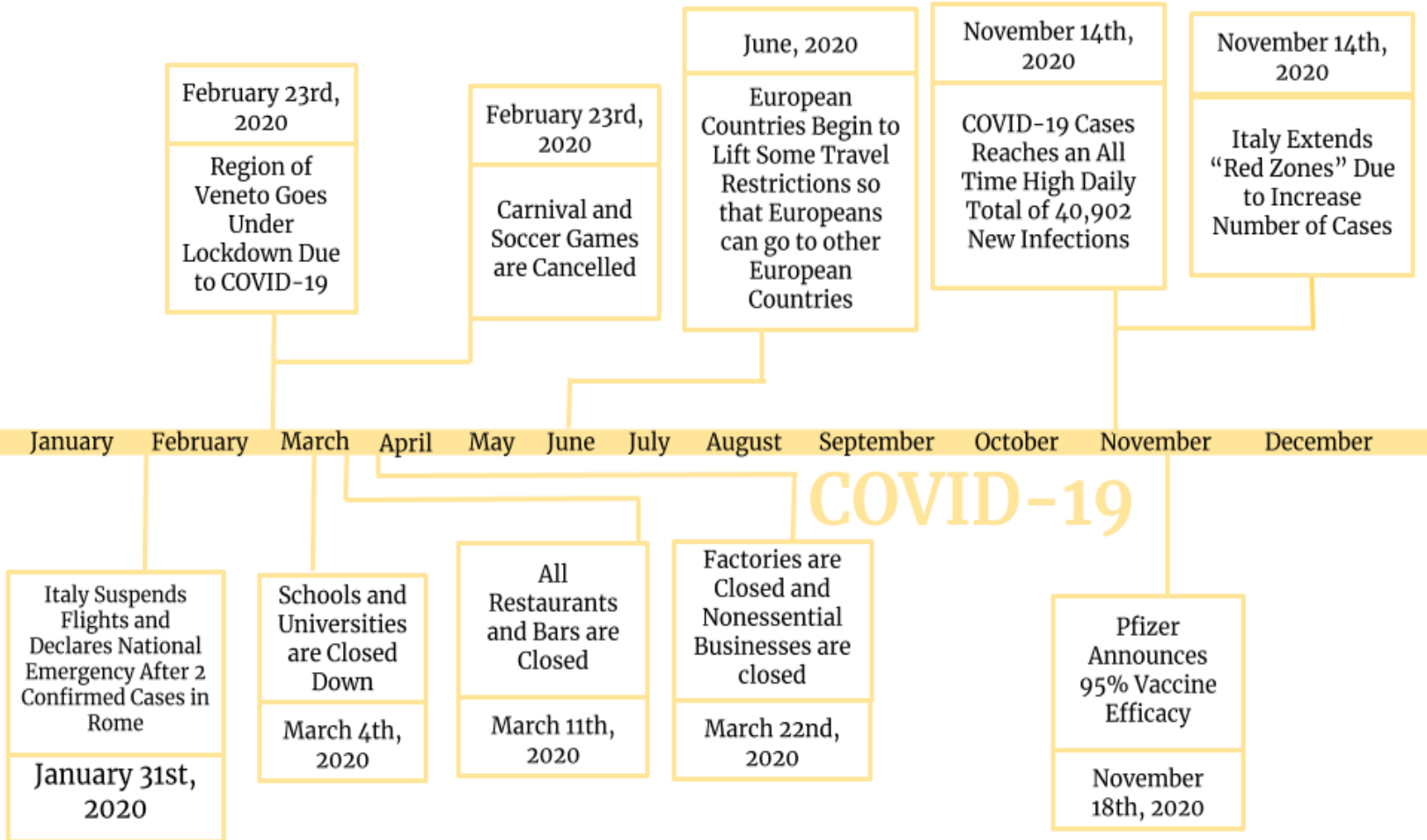


Figure 20: The COVID-19 Timeline

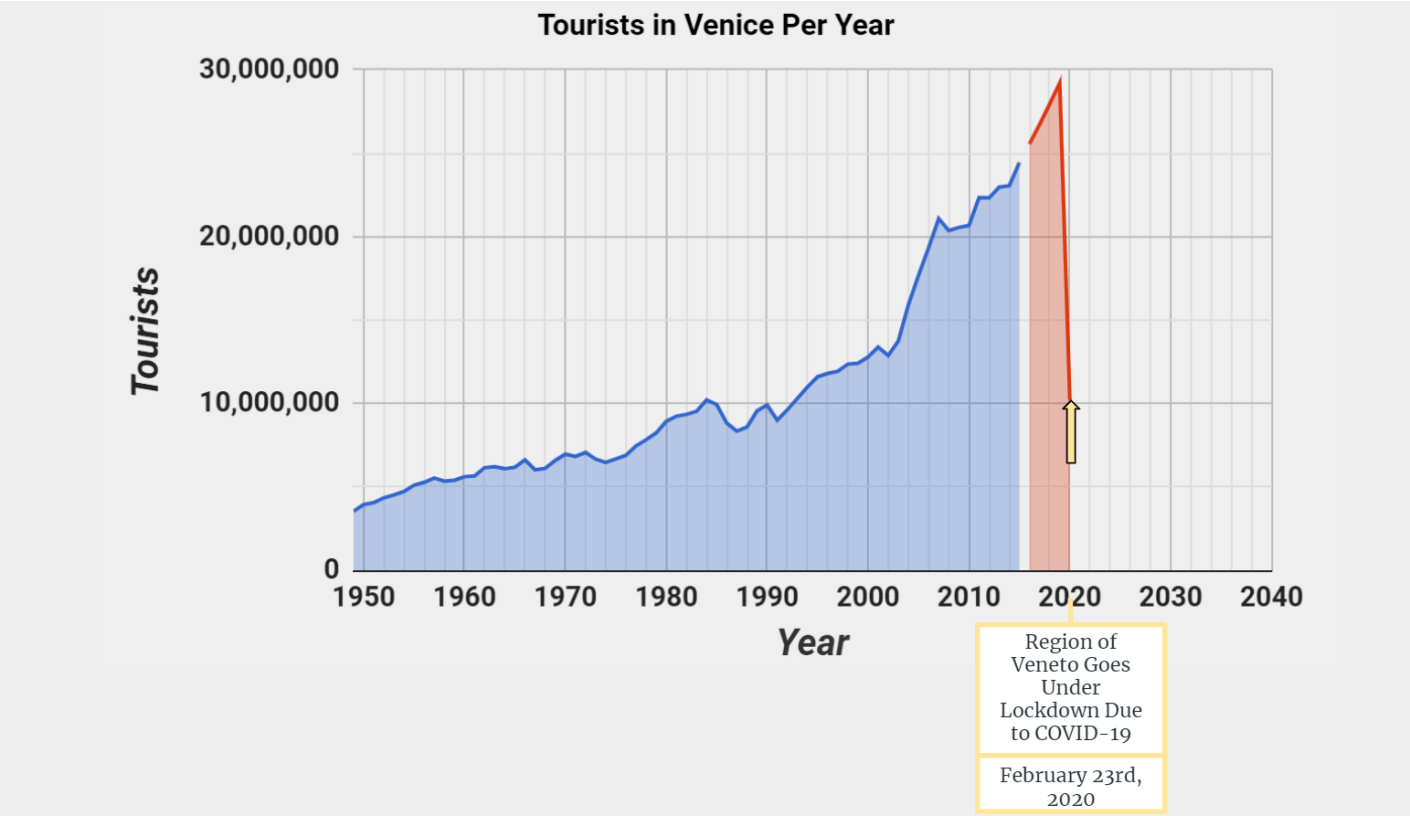


Figure 21: A Graph of Estimated Drop in Tourists due to COVID-19 to Illustrate Effect on Tourism

Although it looked like tourism may return, COVID-19 cases in Venice began to rise from September to October. In the beginning of November, Covid-19 cases reached an all-time daily high in The Region of Veneto with 40,902 new infections. This caused Italy to put some neighborhoods into lockdown once again . Pfizer, however, announced on November 18th, 2020 that they have had 95% success with a new vaccine. This vaccine is what many people have been patiently waiting for and may help reduce the spread of COVID-19 and bring tourism back to Venice.

The research and analysis that had to be done for the creation of the timelines has given us the information required to effectively update the Venice Dashboard and assist in the planning of the CityLab events. These timelines will also assist future WPI students, stakeholders, and contributors to the SmartDest project in analyzing the effects major events have on tourism. They may be able to use information to manage the return of tourism and create sustainable tourism in the future.

The Updated Venice Dashboard Stores and Displays Real Time Data

The Venice Dashboard was designed by WPI students with the help of SmartDest to display real time data for tourists to use during their visits. The old Venice Dashboard can be seen in figure 22. The SmartDest Project team, in charge of The Venice Dashboard, decided that the Dashboard needed to be updated. Due to many years of WPI students updating the Dashboard, it is now scattered with over 5 different types of coding languages. At the start of the project, the dashboard included

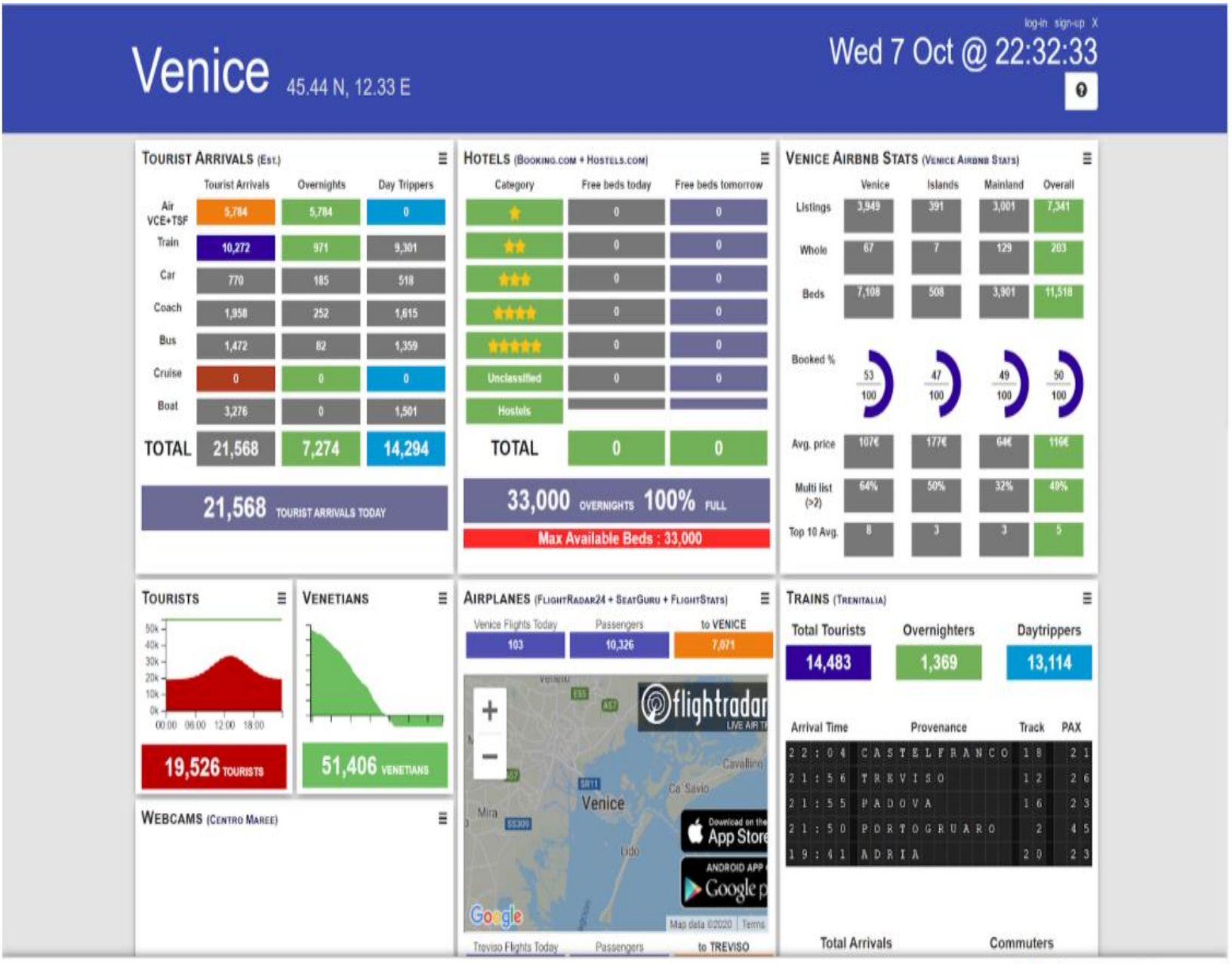


Figure 22: The previous Venice Dashboard (PlaceKnowledge Dashboard, 2020)

information specific to tourist travel (Appendix B). There were tabs that showed current statistics of tourist arrivals and their method of entry, with transportation options ranging from plane to boat. Specifically, an airplane tab or figure 23, showed the number of flights to Venice and the number of travelers going to the city of Venice (Lagoon City) or Treviso (near mainland city). Another category in the previous dashboard was important environmental information. These two windows showed the air quality and tide level, figure 24, both relevant information when planning a trip to Venice as poor conditions

Our team was tasked with updating this dashboard in order to contribute to the SmartDest project. We assisted in updating the webpage so that the interface works efficiently and is more user friendly. We planned to update the dashboard by creating a mockup of the visuals for the overall website, as well as visuals for the individual widgets that will be displayed. Furthermore, the dashboard outline that

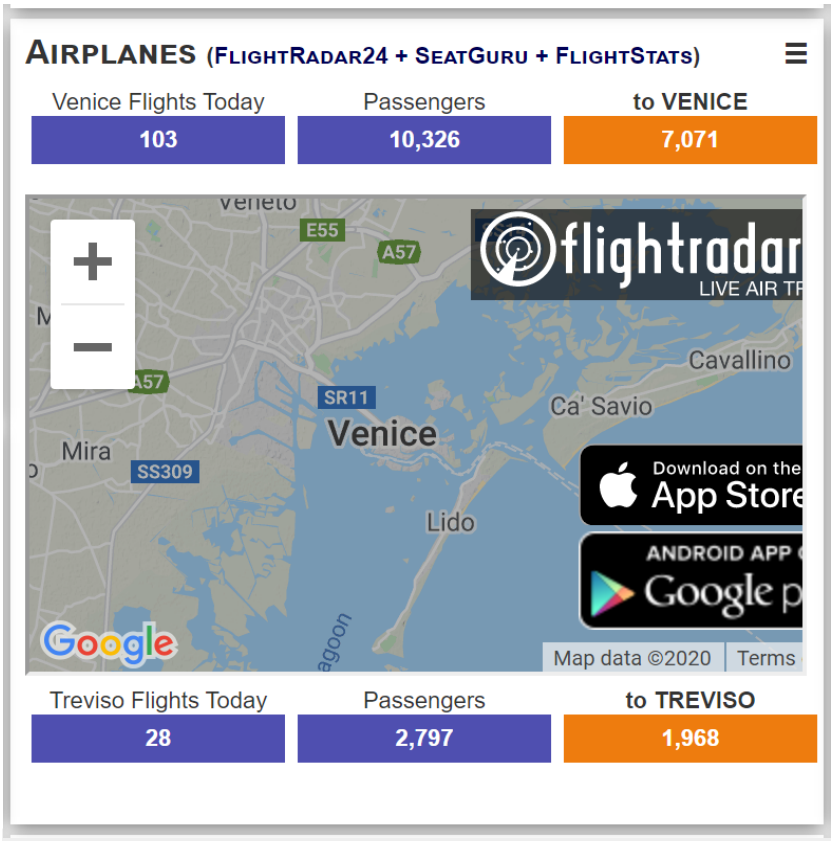
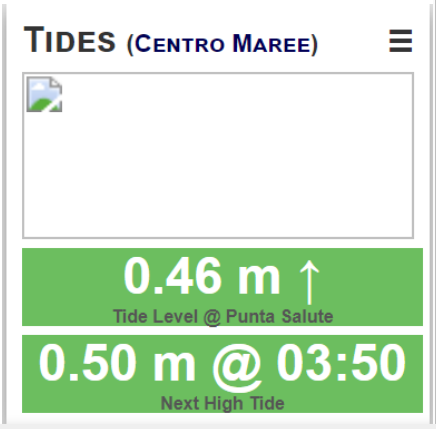


Figure 23: The airplane widget on the previous Venice Dashboard (PlaceKnowledge Dashboard, 2020)



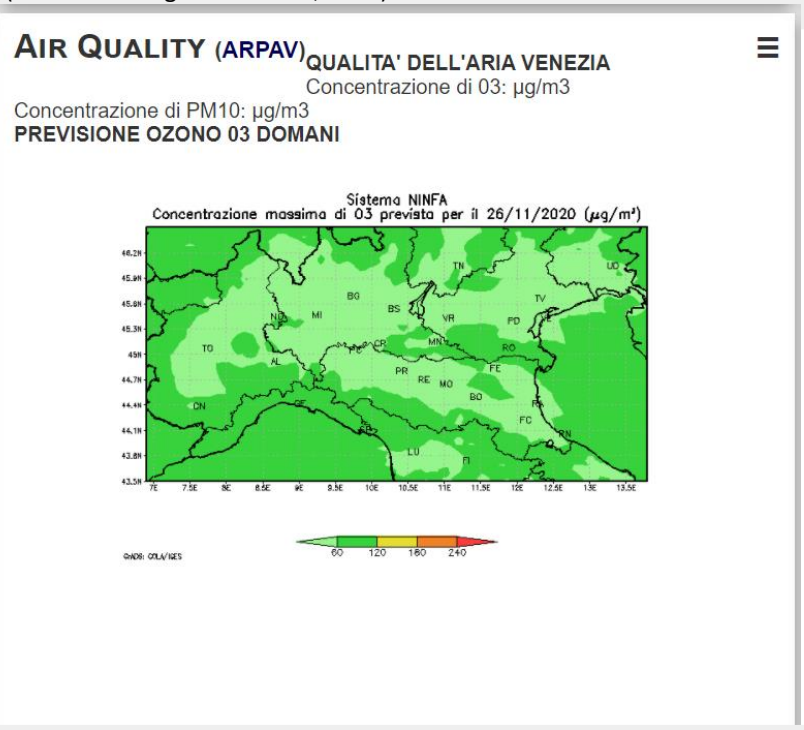


Figure 24: The air quality and tides widgets on the Venice Dashboard (PlaceKnowledge Dashboard, 2020)

we were tasked to design serves to assist those working on the SmartDest project, future WPI students, City Officials, and the stakeholders involved in tourism in Venice rather than solely focusing on tourists as a consumer base.

We began by creating numerous design options illustrating our preferred dashboard appearance as well as preferred range of function. After receiving feedback on our dashboard appearance designs, we settled on simplicity, as observed in figure 25. This new and improved dashboard not only has a more modern look, but it is far more organized and adapted for ease of use. Each type of widget was organized into categories, which were then placed at the top bar of the dashboard.

When opening the dashboard, the user firsts notices the default screen as seen in figure 25. There will be four default widgets that the user can choose to keep or remove from their customizable dashboard. If they wish to remove the widget, they can click the top right button, the '-' sign, on the widget.

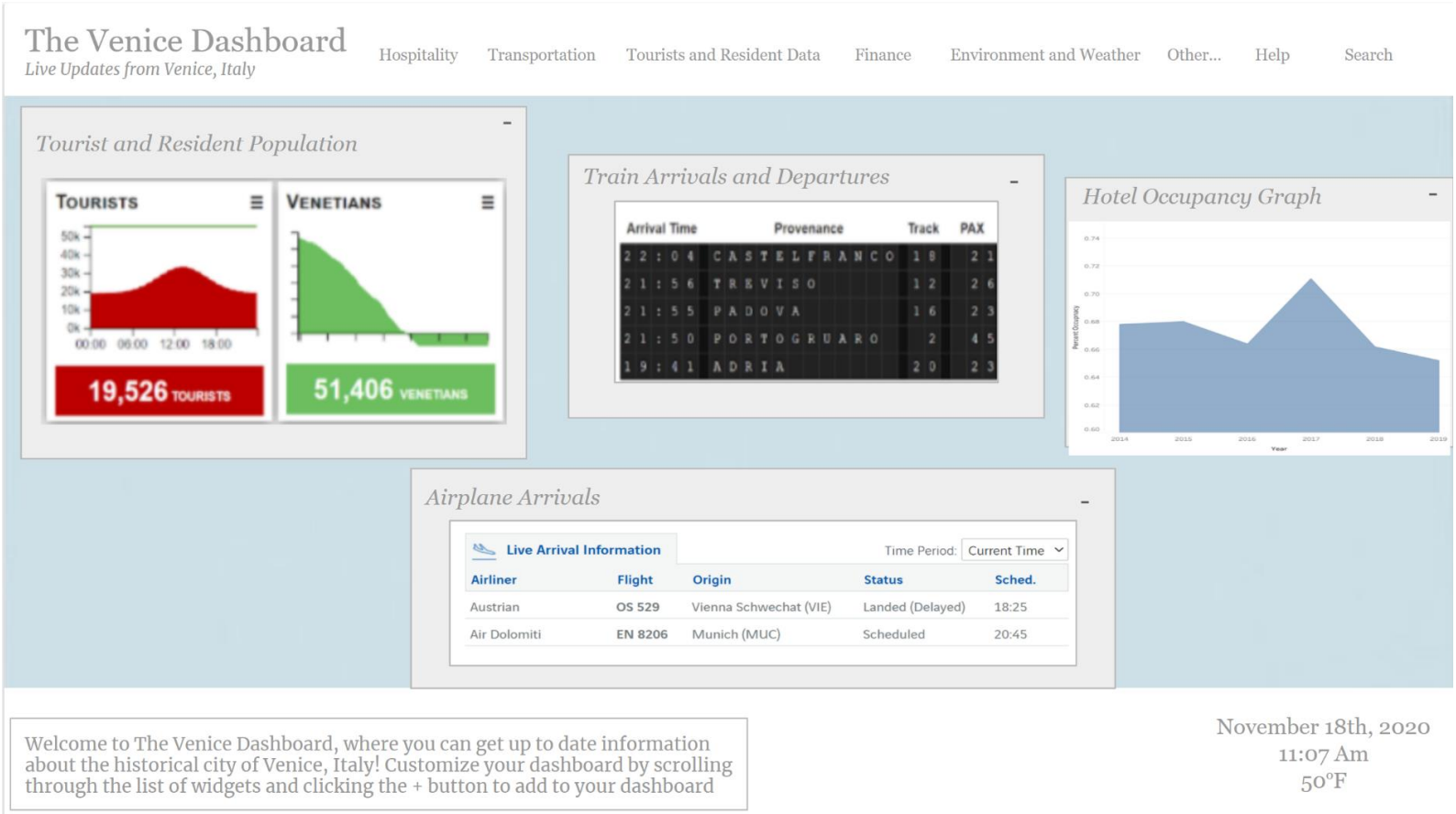


Figure 25: Our Recommendation for The Visuals of The New Venice Dashboard

The location of this button is indicated on figure 26 below. Additionally, the user can adjust the size of the widgets by clicking and dragging any of the four corners of a widget. They may also change the location of the widget by clicking and dragging one of the four sides of the widgets.

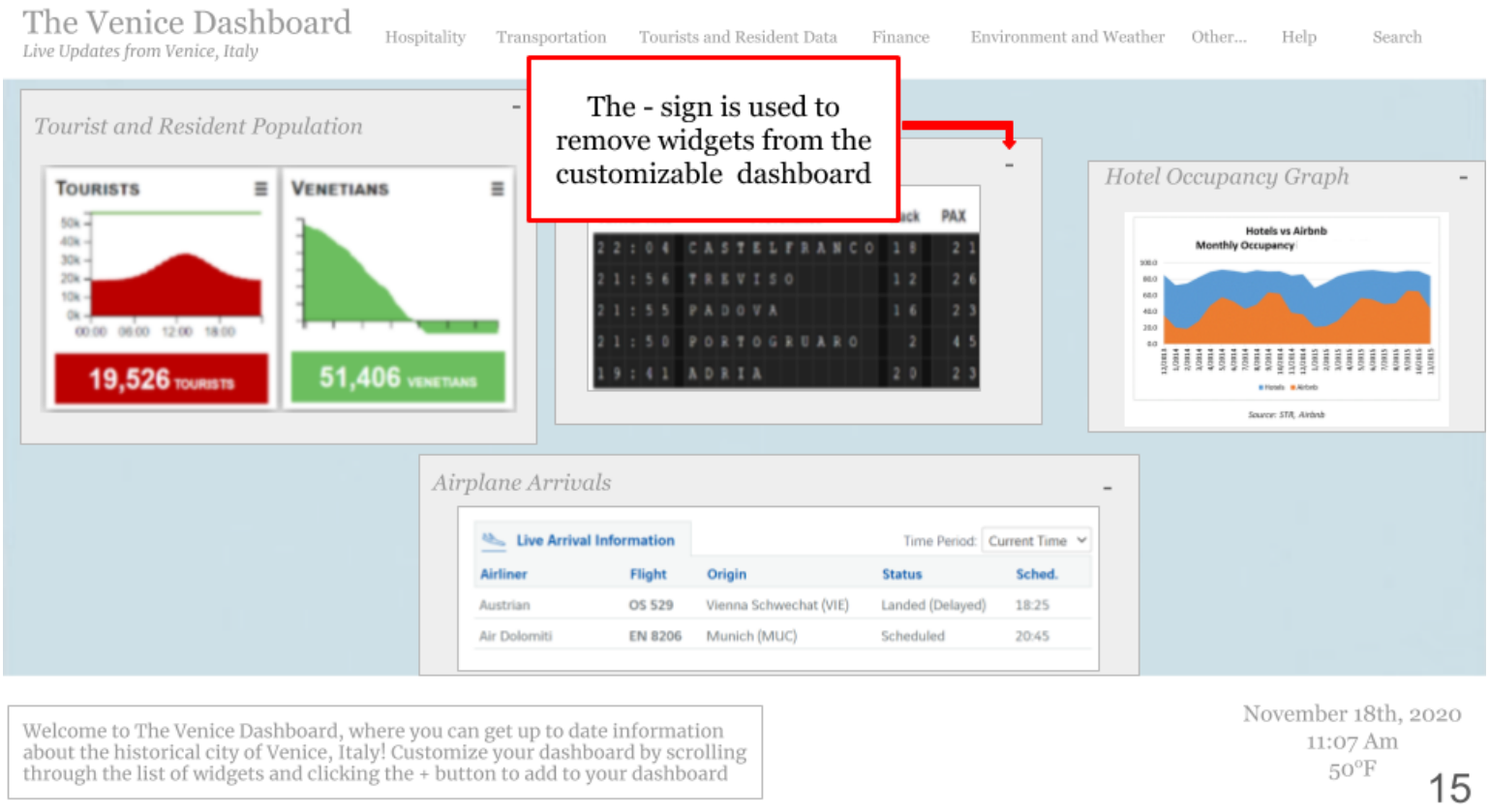


Figure 26: A user has the ability to remove a widgets on the updated Dashboard

The tabs in the top bar of the page have the capability of redirecting the user to a page of widgets within the category of their choosing. Figure 27 is an example of a user's choice to click on the 'Hospitality' tab in the top bar. When the user hovers their cursor over the tab, a list of subcategories will drop down. In this case, the three subcategories are, 'Hotel', 'Airbnb', and 'Real Estate'. In this example, the user chooses to click on the 'Hotel' tab. This will direct them to the page of widgets seen in figure 27.

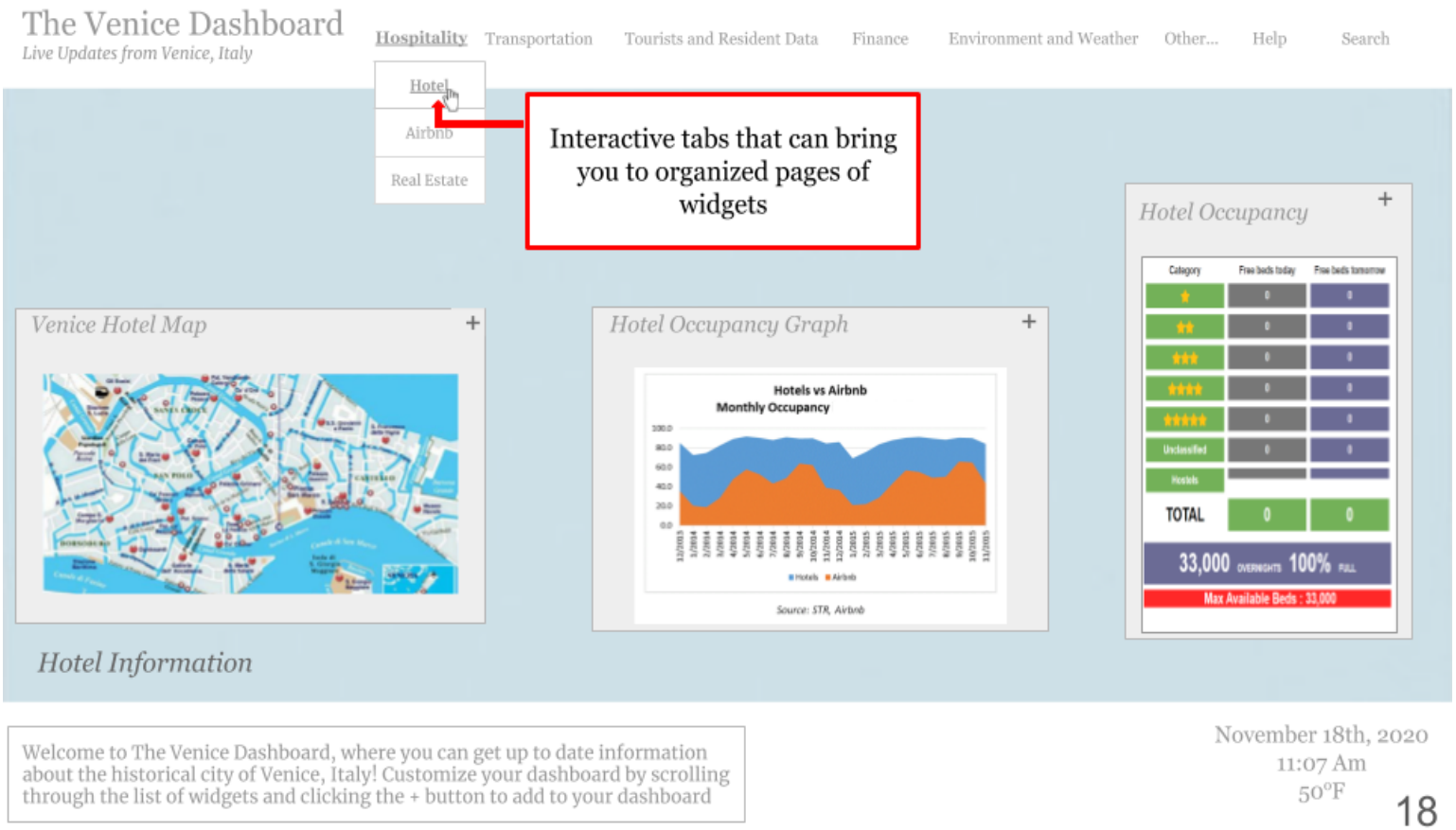


Figure 27: An example of a user choosing the "Hotel" option to find a widget on the Venice Dashboard

The user can then choose to add the widget to their custom dashboard by clicking the '+' button in the top right corner of each widget, as see in figure 28. In addition to this hotel page, we have created pages for each category and subcategory listed in the top bar. The subcategories of transportation include: 'Train', 'Airplane', 'Cruise Ship', and 'Traffic'. There are no subcategories for any of the other categories. The help button will direct the user to a page describing how to use the customizable dashboard, as it is described in this booklet. The search button will allow the user to search for specific widgets. If there are many widgets for one category, there will be a scroll bar on the right side of the page. Just the blue portion of the screen will scroll, while the top and bottom bars remain unchanged. Finally, if the user wishes to return to their customized dashboard, they can click 'The Venice Dashboard' button in the top left corner of the page, as seen in figure 39. corner of the page, as seen in figure 29. For visuals detailing each category and subcategory webpage, please see Appendix C.

In addition to updating the visuals and organization of The Venice Dashboard, we were also able to find APIs and other sources of information where data can be

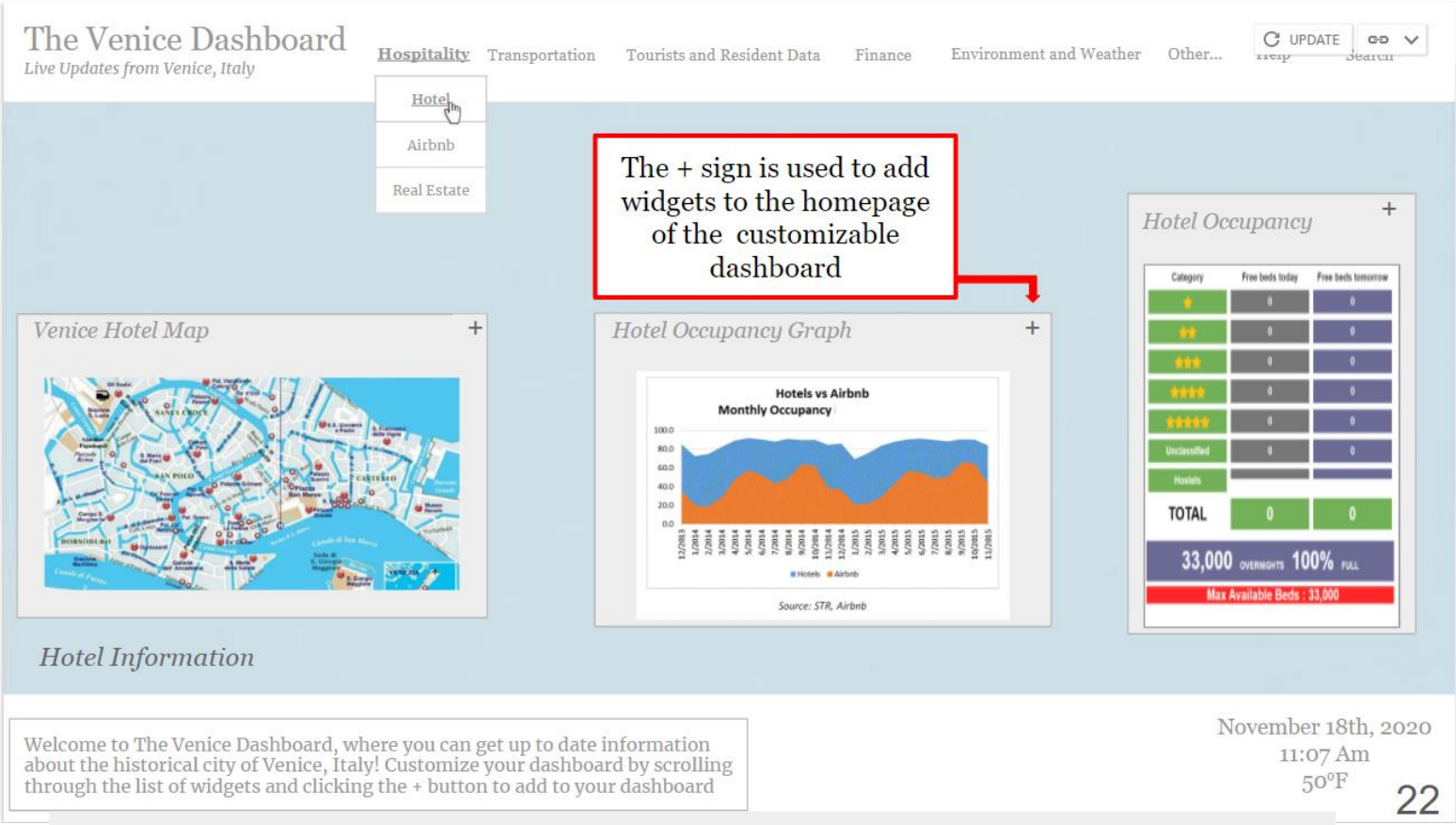


Figure 28: A User can Add a Widget to Their Personal Dashboard

retrieved in real time and posted on the website. These APIs allowed for the creation of widgets that display the hotel information, AirBnB availability, train departures and arrivals, marine and pedestrian traffic, and much more information about Venice. Each source of information is updated frequently, allowing for a quicker collection of data rather than the alternative of relying on yearly reports through the Venetian government. With the frequency of new information, trends can be spotted much earlier and analyzed more thoroughly to determine potential benefit or harm to sustainable tourism.

The old dashboard was composed of numerous coding languages, presenting a challenge for future maintenance if data sources were no longer operational. This prompted a restructuring of the dashboard using the singular coding language of Javascript, allowing for easier maintenance and easier crafting of new widgets. The creation of this backbone template for the website can also be used in the other seven case study cities to effectively monitor tourism.

The most useful feature of the new dashboard in terms of analysis is the ability to take the real-time data and store it for future analysis after being displayed. The previous dashboard did not have this capability; with this feature, past data is much more accessible, organized, and gives stakeholders another tool to analyze trends in tourism much later and correlate the trends with other aspects of society.

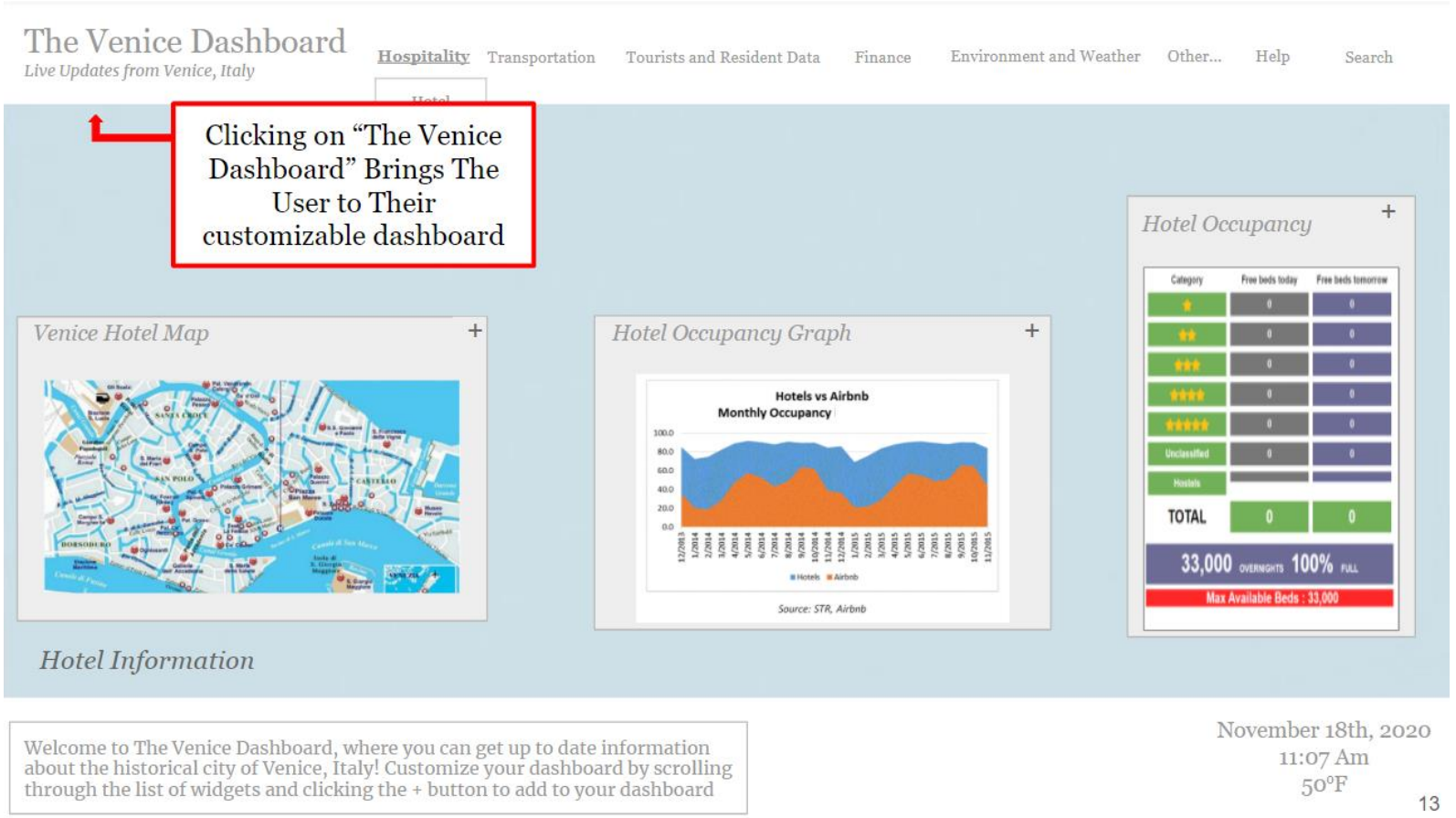


Figure 29: The user can click "The Venice Dashboard" to return to their custom dashboard

The CityLab Events will Gather Stakeholders to Discuss Sustainable Tourism in Preparation for the Innovation Camps

The Sponsors for the SmartDest grant, EU Horizon, will be hosting Innovation Camps to bring together the eight case study cities to discuss the future of sustainable tourism across Europe. Venice, being one of the eight case study cities, will be hosting a series of CityLab Events to bring together the stakeholders involved in the tourism industry in order to determine their ideas and goals for sustainable tourism.

In order to aid the SmartDest Project with engaging with stakeholders and planning events for them, we had to create a contact list, design invitations, and come up with topic and event ideas for the CityLab Events. We started off with fifteen original stakeholders given to us by SerenDPT. Originally, we had planned to take these stakeholders and organize them into a matrix to show the relationships. The matrix was planned to be used to invite stakeholders to the events; those that were closely related would be invited to the same event. The matrix however, proved to be an unnecessary and time-consuming aspect of the event planning so it was scrapped.

We instead did further research on the stakeholders involved in the tourism industry in Venice and created a master list. We were able to gather approximately 140 associations and organizations involved in tourism. On this list, we included information such as the address, phone number, email, website and a description of the association itself. This will be handed over to the people working on the

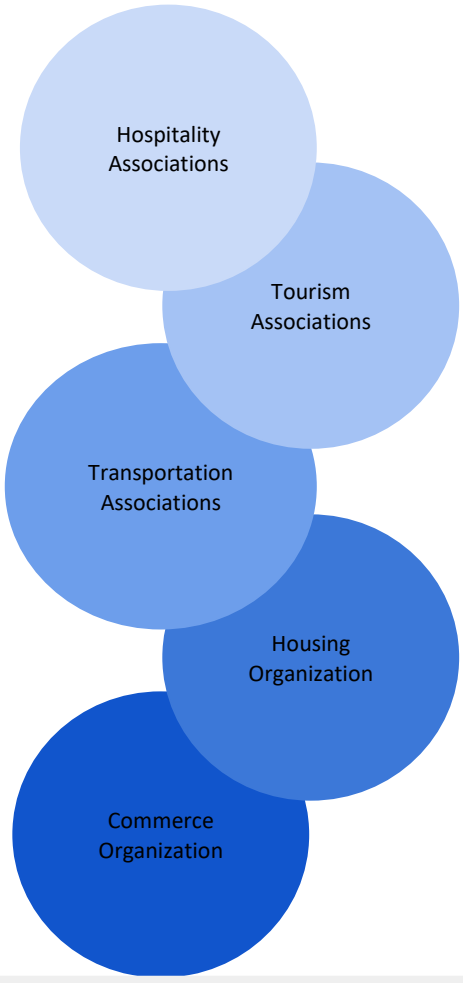


Figure 30: The 5 Association Categories for The City Labs Events

SmartDest Project to be further organized into stakeholder categories and used as a contact list to invite additional stakeholders to the CityLab Events.

These CityLab Events will likely be hosted virtually during the summer of 2021, due to the COVID-19 pandemic. Our team was tasked with creating the categories of stakeholder associations that will be invited to the events, gathering their contact information, and creating an invitation to the event. See the Addendum section for the list and explanation of the fifteen primary stakeholders.

With the help of those working on the CityLab Events, our team has created a list containing the five primary categories of stakeholder associations. These categories are listed in figure 30.

The five groups will be used as the five main themes for the series of City Lab Events held in Venice. At each event, stakeholders involved in that category will meet to discuss topics related to their sector in the tourism industry. For example, commerce organizations will gather for a CityLab Event and discuss ways to create varying sources of income. These events will be used to create policy on the local level. By 2022, the ideas collected at these events will be brought to the Innovation Camps that connects all eight case study cities in the hopes of creating Pan-European policies for sustainable tourism.

In order to keep the stakeholders engaged during these events, we have considered topic ideas to be discussed. To come up with this list, our group brainstormed issues that these categories may be faced with due to tourism. These topic ideas are shown in figure 31.

Hospitality Associations

Discuss ways to efficiently host tourists

Tourism Associations

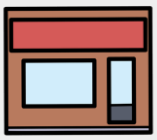
Discuss ways to collaborate within to maintain the flow of tourism

Transportation Organizations

Discuss ways to decrease tourist pollution and traffic

Housing Associations

Discuss ways to ensure residents have sufficient housing accommodations



Commerce Organizations

Discuss ways to increase local income and find alternative income sources

Figure 31: Topic Ideas for the 5 City Lab Events

We also designed invitation templates to be sent out to the stakeholders at a later date by people working for the SmartDest Project, seen in figure 32. The template took many forms before landing on our final design. In the end, we created a formal invitation that includes SmartDest and CityLab without having them be the main focus of the design.

Figure 32: Invitation for The City Lab Events

CONCLUSION AND RECOMMENDATIONS

(BetterChoise, 2020)

The city of Venice has great appeal to tourists for all its heritage, individuality, and landscape. For these reasons Venice hosts a large population of tourists yearly. In fact, the number of tourists that came to Venice, prior to COVID-19, surpassed the residential population, causing large disparity in the culture of the city and promoting rapid deterioration and exclusionism. This pattern changed with the introduction of COVID-19. The 65.1% decrease in the number of tourists caused the SmartDest grant to switch focus from monitoring tourist-resident interactions to re-introducing tourists to the city of Venice in a more sustainable manner.

To help stakeholders in Venice with creating policy we followed the guidance of our sponsors at SerenDPT. In order to analyze past tourist trends the Venice Dashboard needed to be updated. We designed the new Dashboard to be used by researchers or police makers, rather than for tourists. In this new format, the user has the ability to view past and present data in Venice. This will allow for easy analysis of trends proving the fragility of tourism. Furthermore, our creation of the CityLab Events will bring together stakeholders and capacitate new ideas for the management of tourism in the future.

Our recommendation to future WPI students would be to maintain upkeep on the new Venice Dashboard, making sure it uses a mainline coding language and gathers information from functioning websites to display. In the coming years COVID-19 statistics can be added, as data was limited to us during the pandemic. Additionally, new events can continue to be added to the timeline to further show how events and actions impact tourism. For those who worked alongside us at SerenDPT and future IQP groups of WPI, it would be beneficial to create ways for stakeholders and citizens to add comments in a section of the dashboard from their point of view. This will allow for social data to be represented more instantly to complement the steady flow of rapid tourist data.

We also advise future teams to develop a program to analyze recent trends and use them to predict future trends. This would allow researchers and in turn, officials to be proactive and make policy before an event occurs. Both ideas would more accurately allow for the analysis of socioeconomic trends as they use past, current and future data giving the larger picture to prevent future issues. As the SmartDest Grant receives funding until 2022, the next couple research teams from WPI should continue to aid the project in their goal to create sustainable tourism across Europe. In 2021 they may have the ability to help at the planned CityLab events, and in 2022 help present those ideas at the Innovation Camps to the other case study cities. All these efforts will help usher in a new era of sustainable tourism for all of Europe.

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APPENDICES

(BetterChoise. 2020)

Appendix A: Interactive Timelines

We collected information on various events and organized them into timeline categories of international events, local events, policy and law, political powers, and COVID-19. Within each timeline, if the viewer wants to learn more information about a specific event, they can follow the user instructions in this paper to use the interactive features of the timeline. Along with this we created two graphical timelines to display the rise and fall in the population and tourist beds and the total number of tourists per year. These show the effects of outside events on tourism in Venice.

For quick access to the interactive timeline, click the link below.

https://docs.google.com/presentation/d/1uDT9LRa7_eBJcuhcs8RZwSvlM8M73v0nCFcKmP5eqqs/edit#slide=id.gac38d1d6ce_0_149

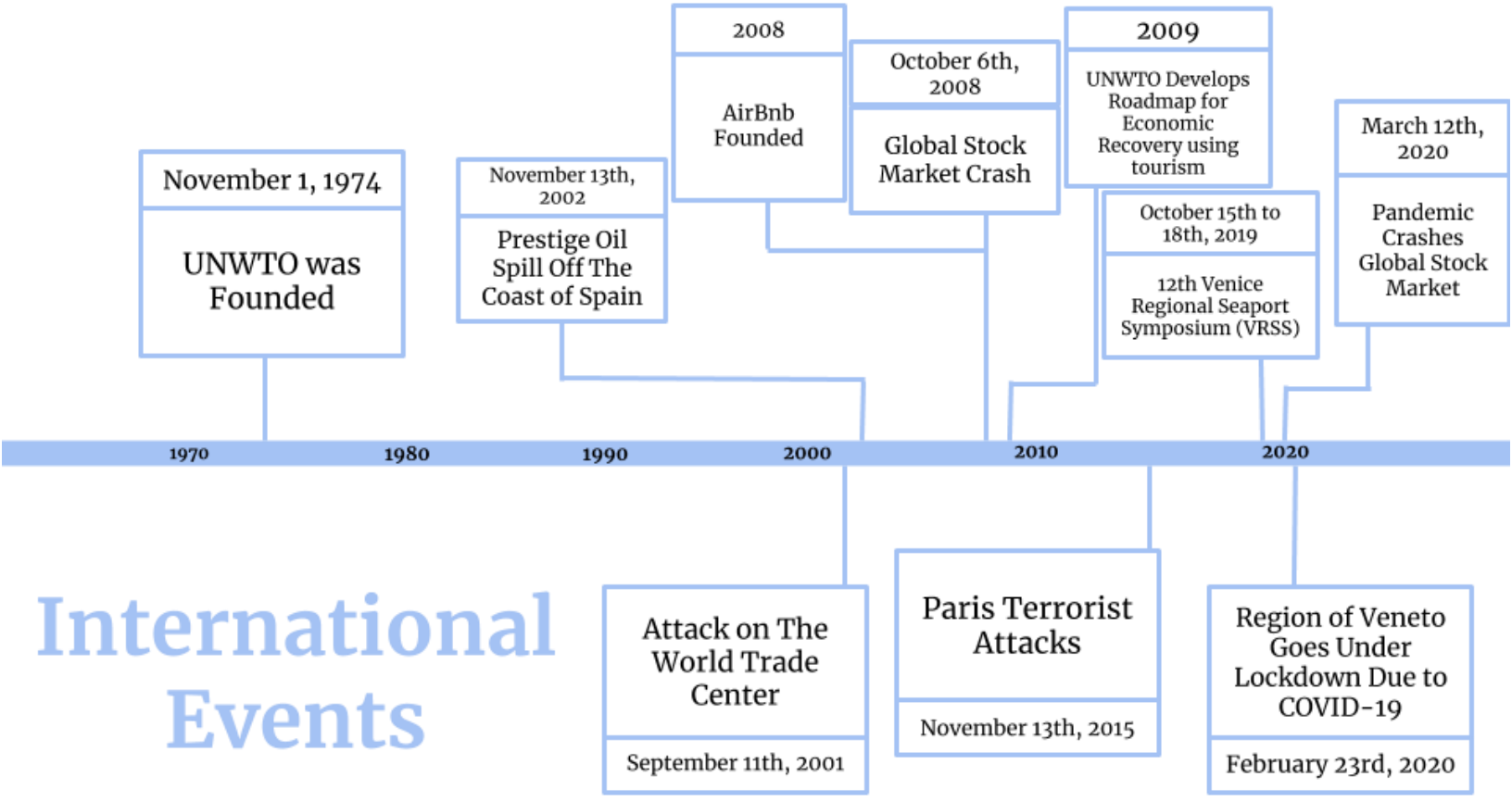

Figure 15: International Events Timeline

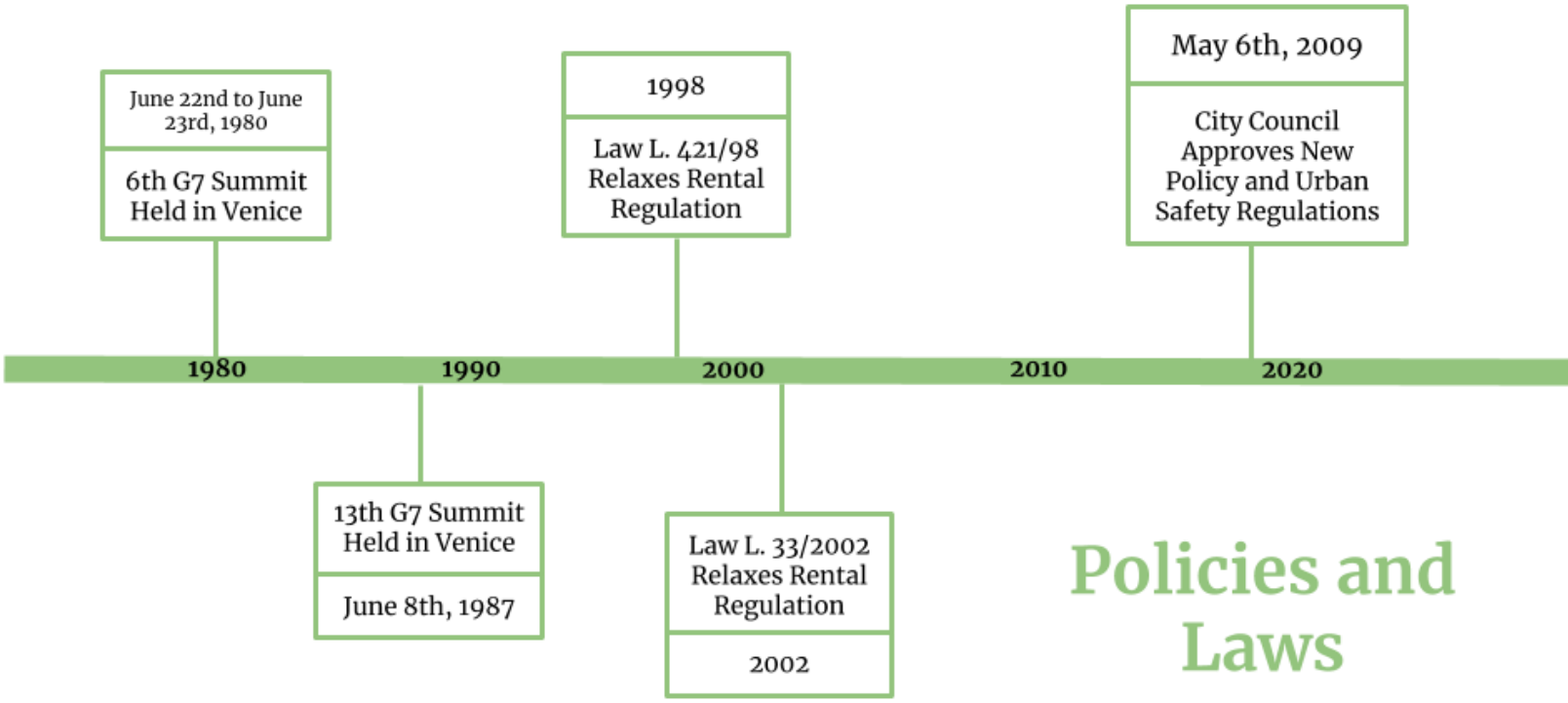

Figure 17 : Policies and Law Timeline

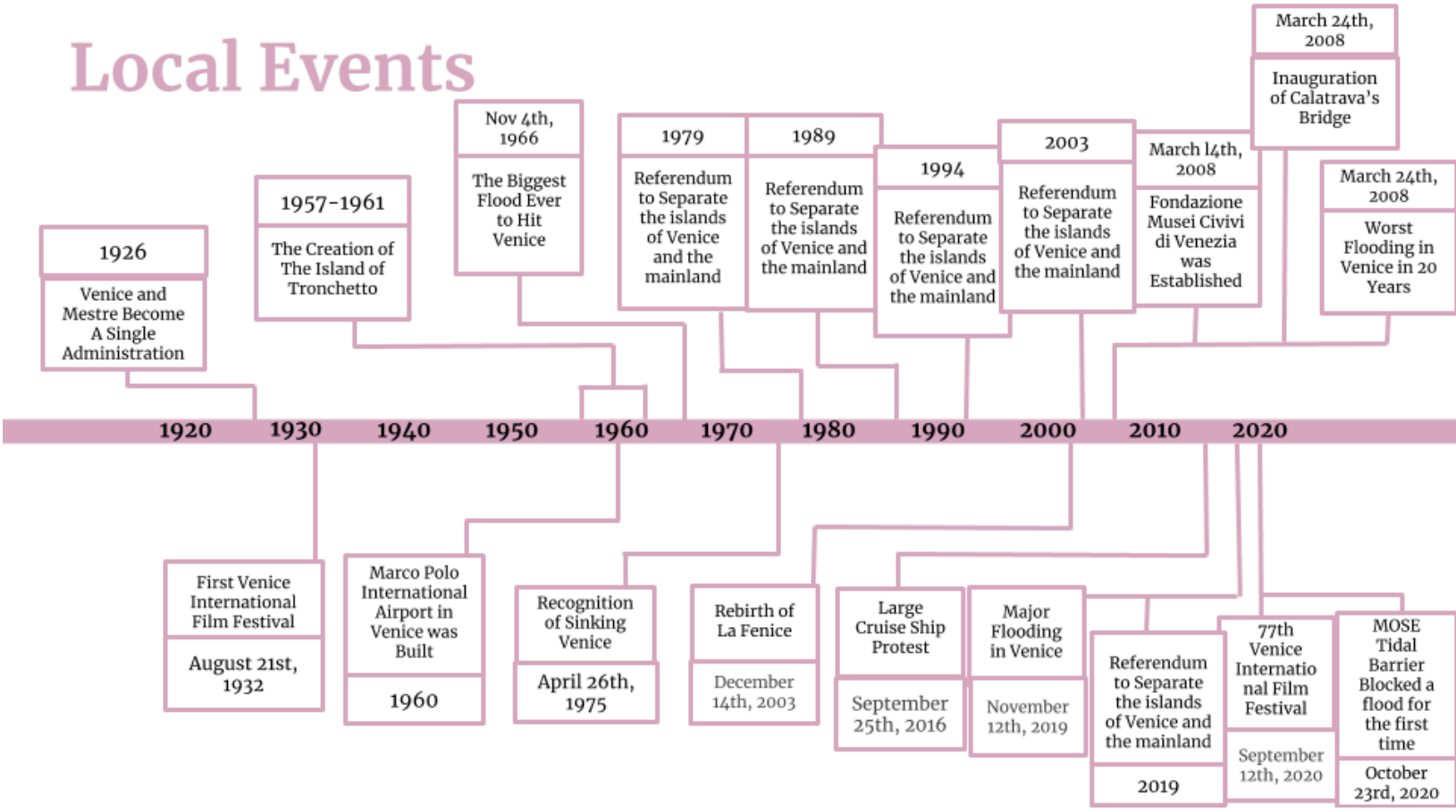

Figure 13: Local Events Timeline

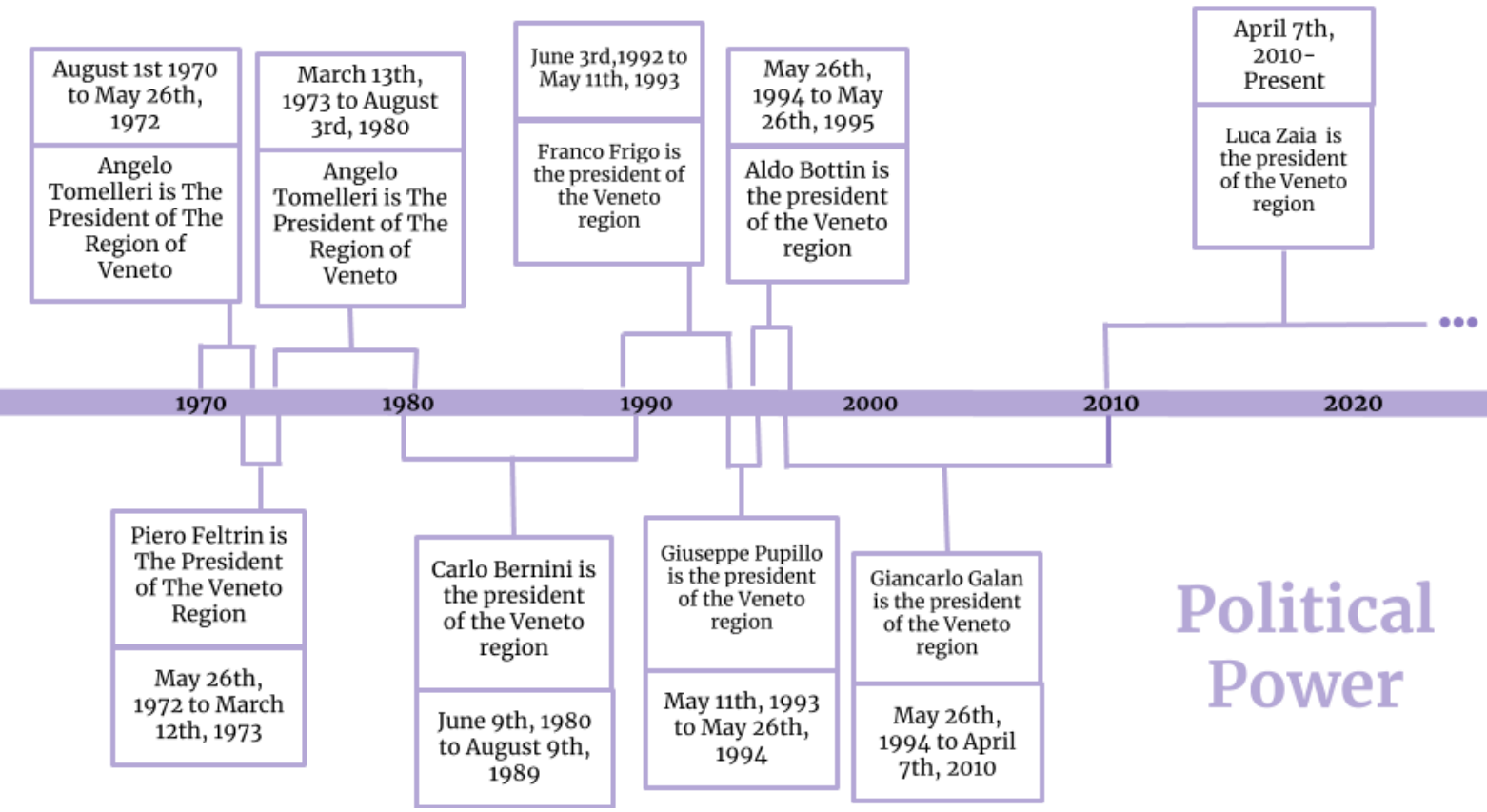

Figure 18: Political Powers Timeline

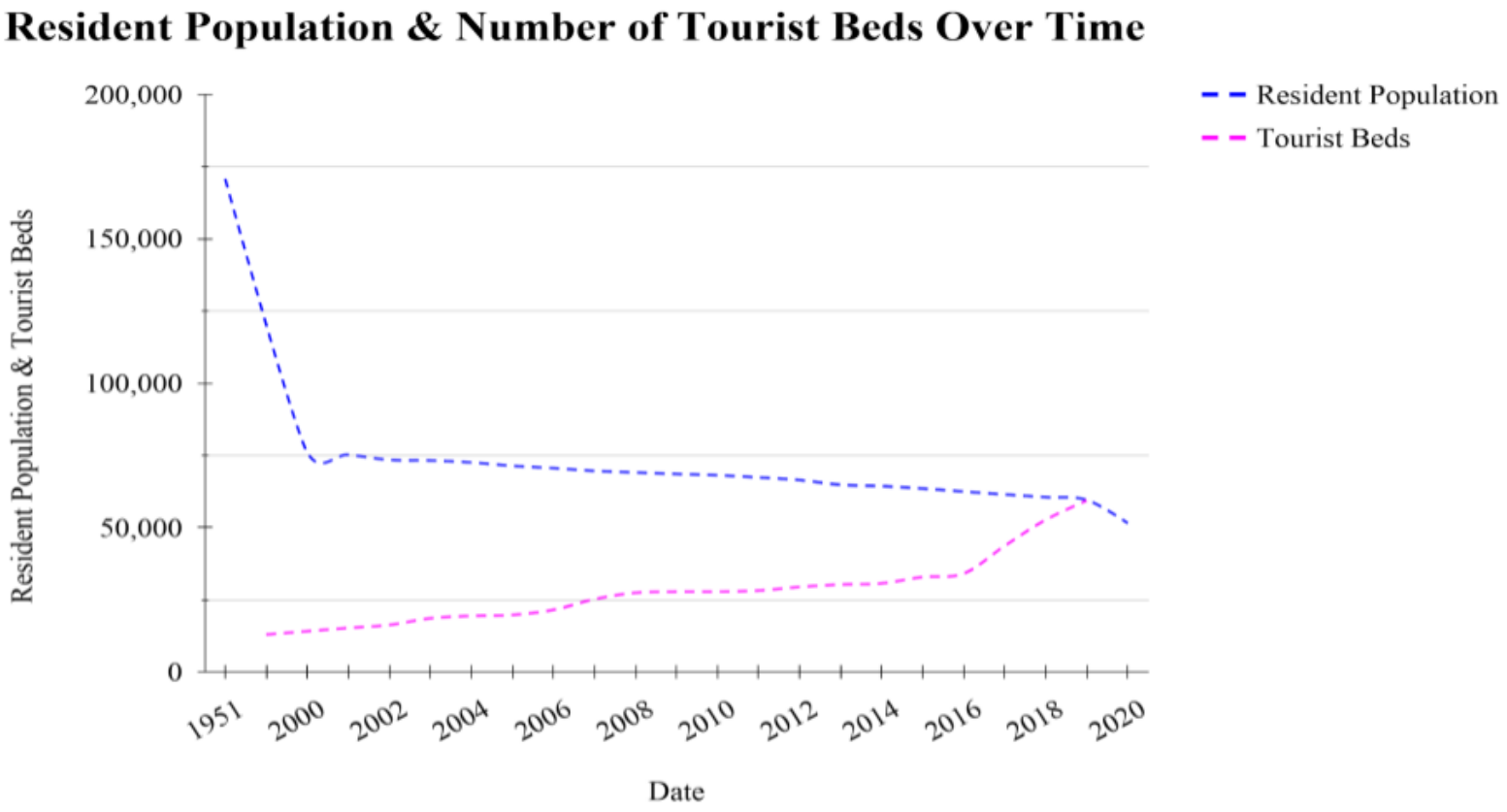

Figure 2: Resident Population and Tourist Beds vs. Time Graph

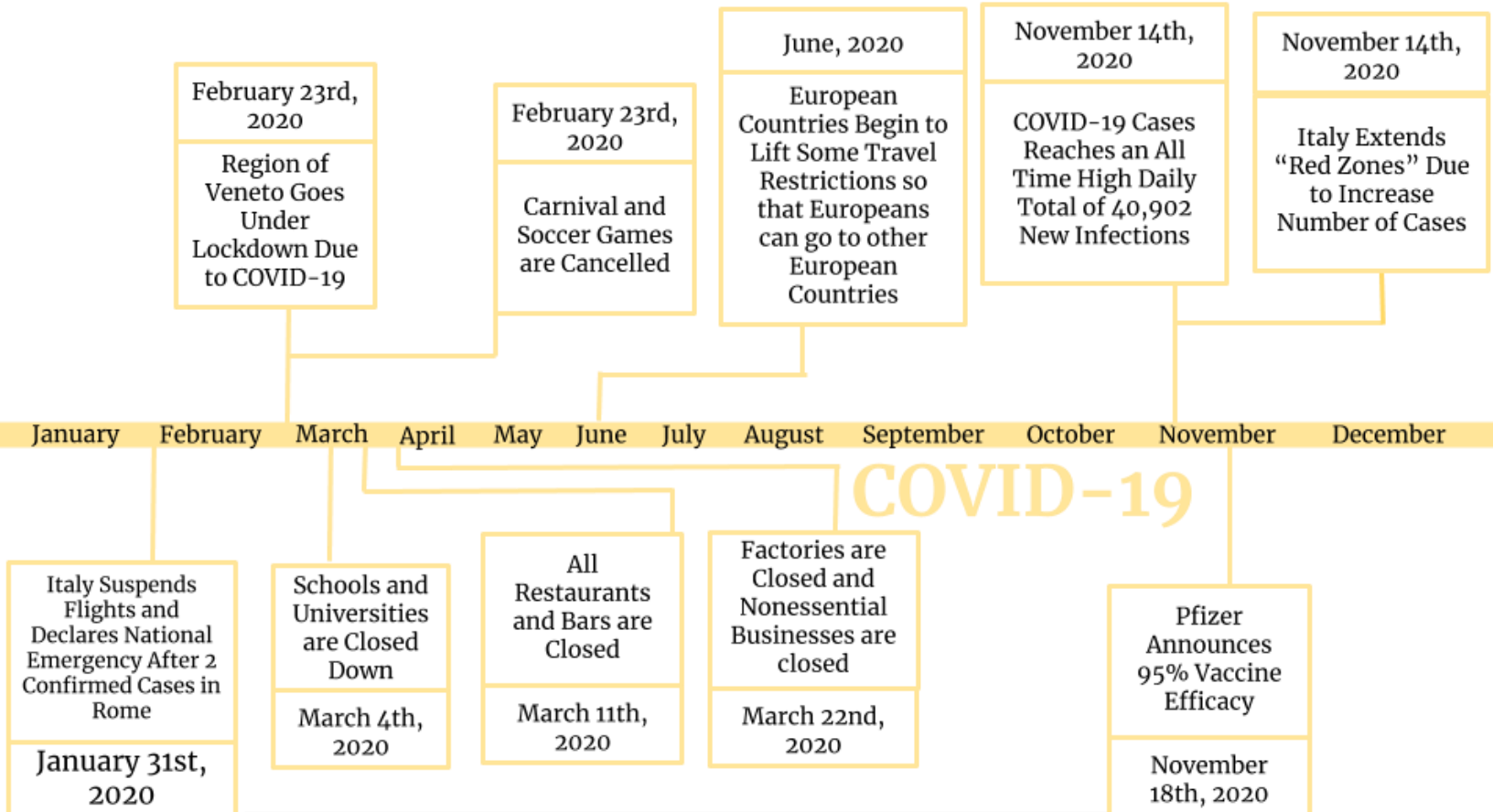

Figure 20: COVID-19 Timeline

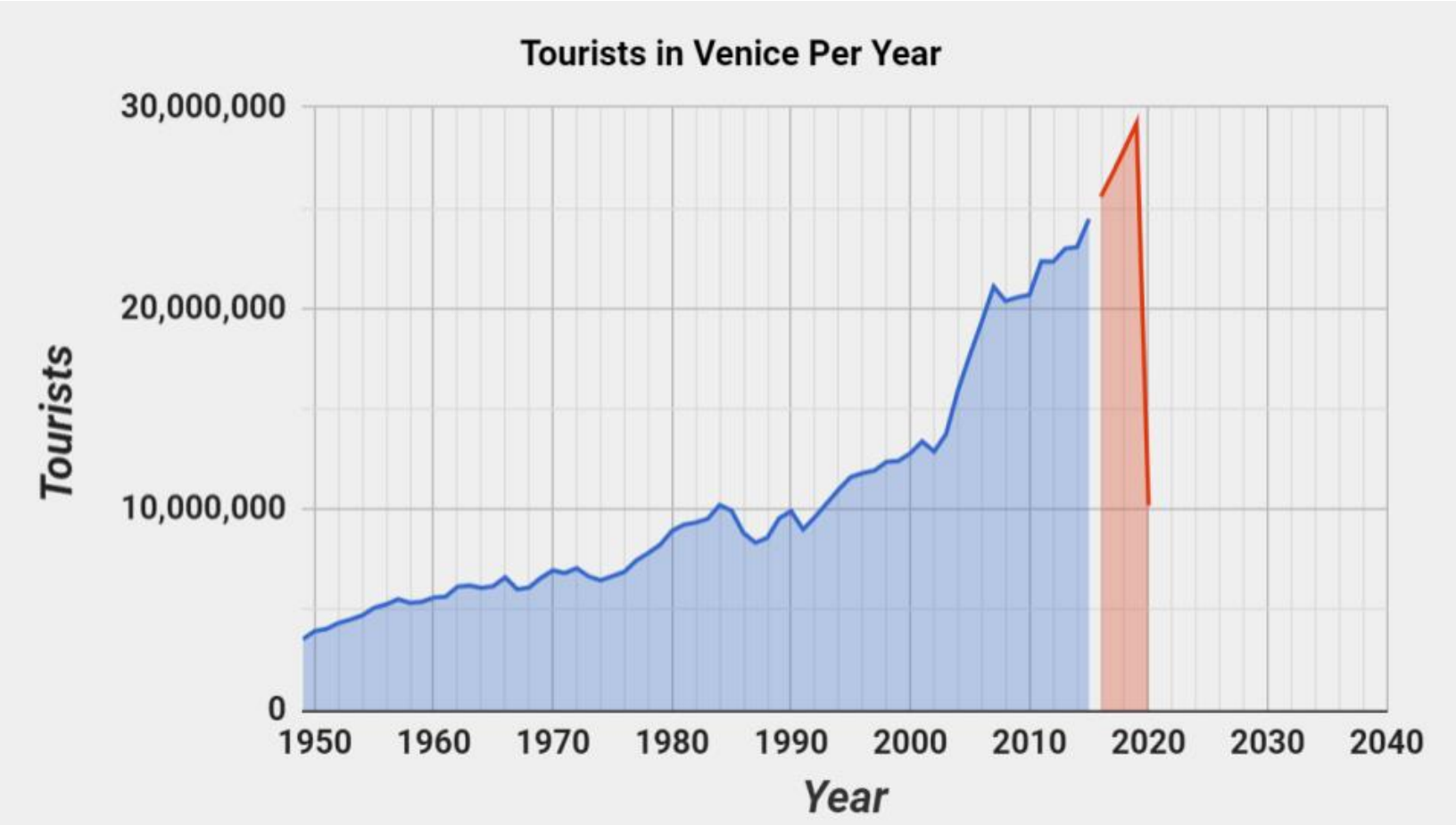

Figure 5: Tourists Per Year Timeline with COVID-19 Estimated Projection

Appendix B: Old Venice Dashboard

This is the current Venice Dashboard. Many of the widgets are not functioning correctly, either presenting incorrect data or no data at all. SerenDPT is working to create an entirely new dashboard based off the old one with widgets that will correctly provide and store tourism data in Venice. Our team assisted SerenDPT in improving the visuals of the Venice Dashboard as well as recommend new widgets pertaining to COVID data.

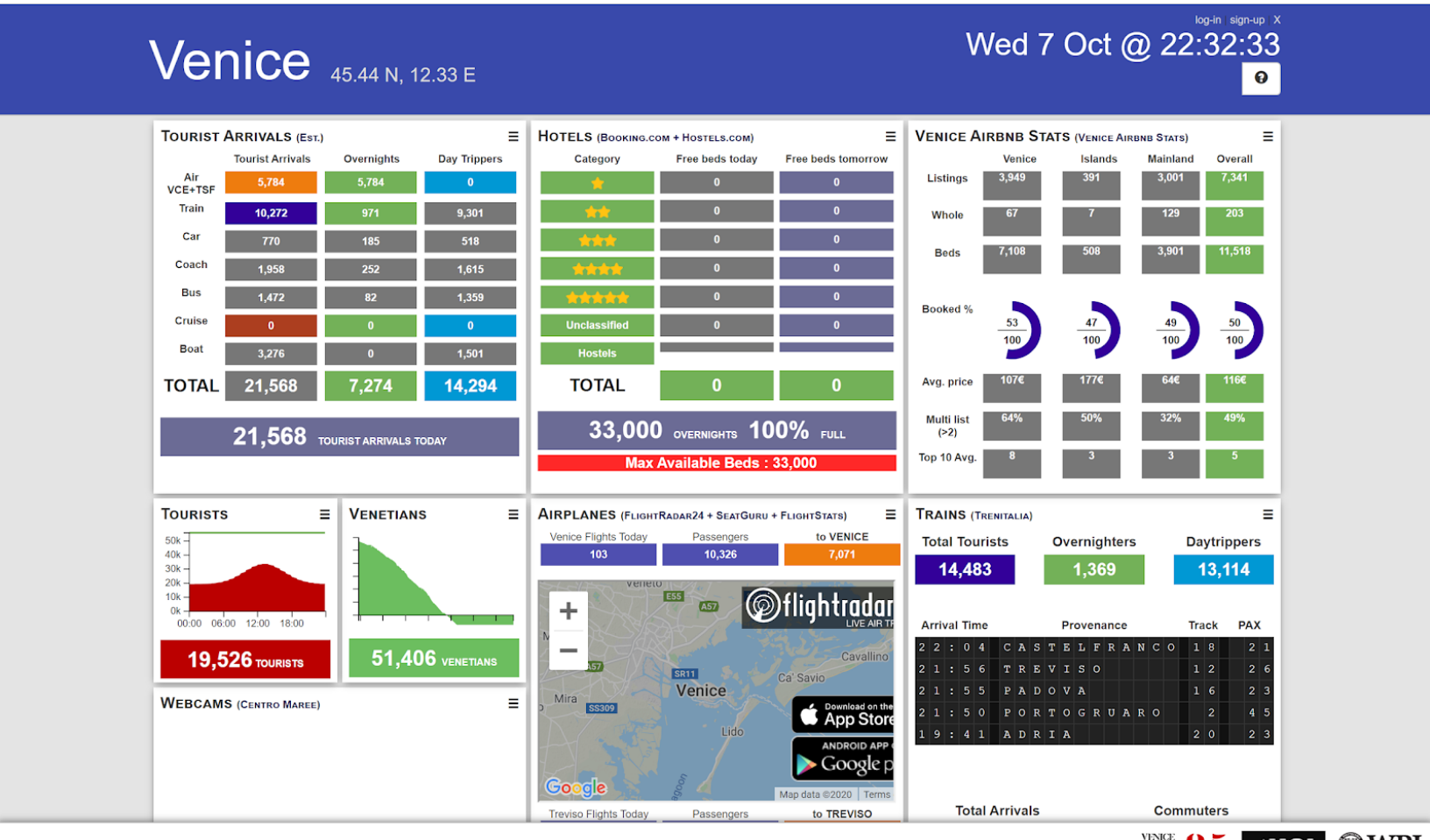

Figure 22: The Previous Venice Dashboard

Appendix C: Updated Venice Dashboard Design

Our job was to assist in the design of the new Venice Dashboard. This is our design for each page of the dashboard. We organized the widgets into categories and subcategories to make them easier for the user to find.

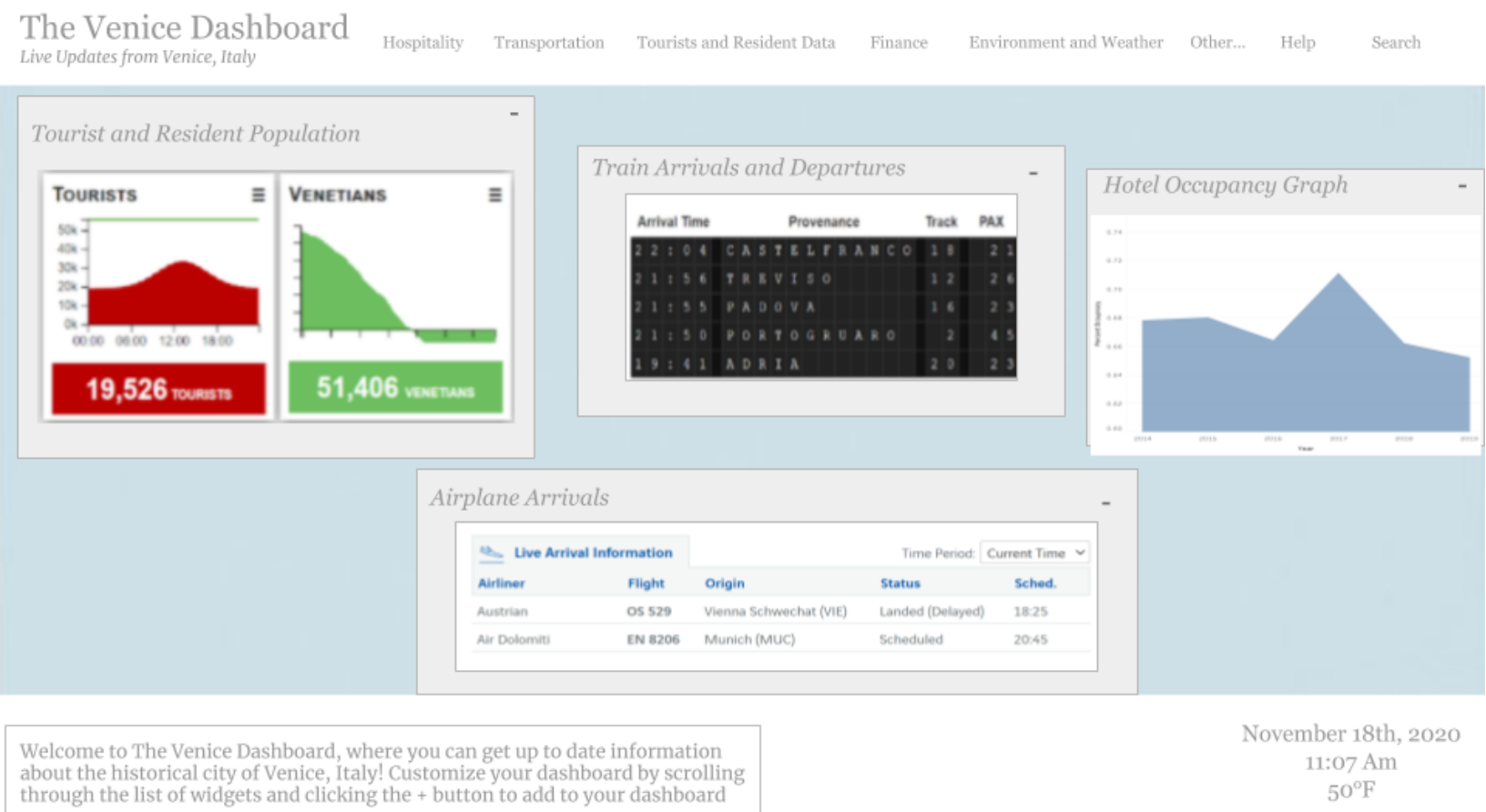

Figure 25: Our Recommendation for The Design of The Updated Venice Dashboard

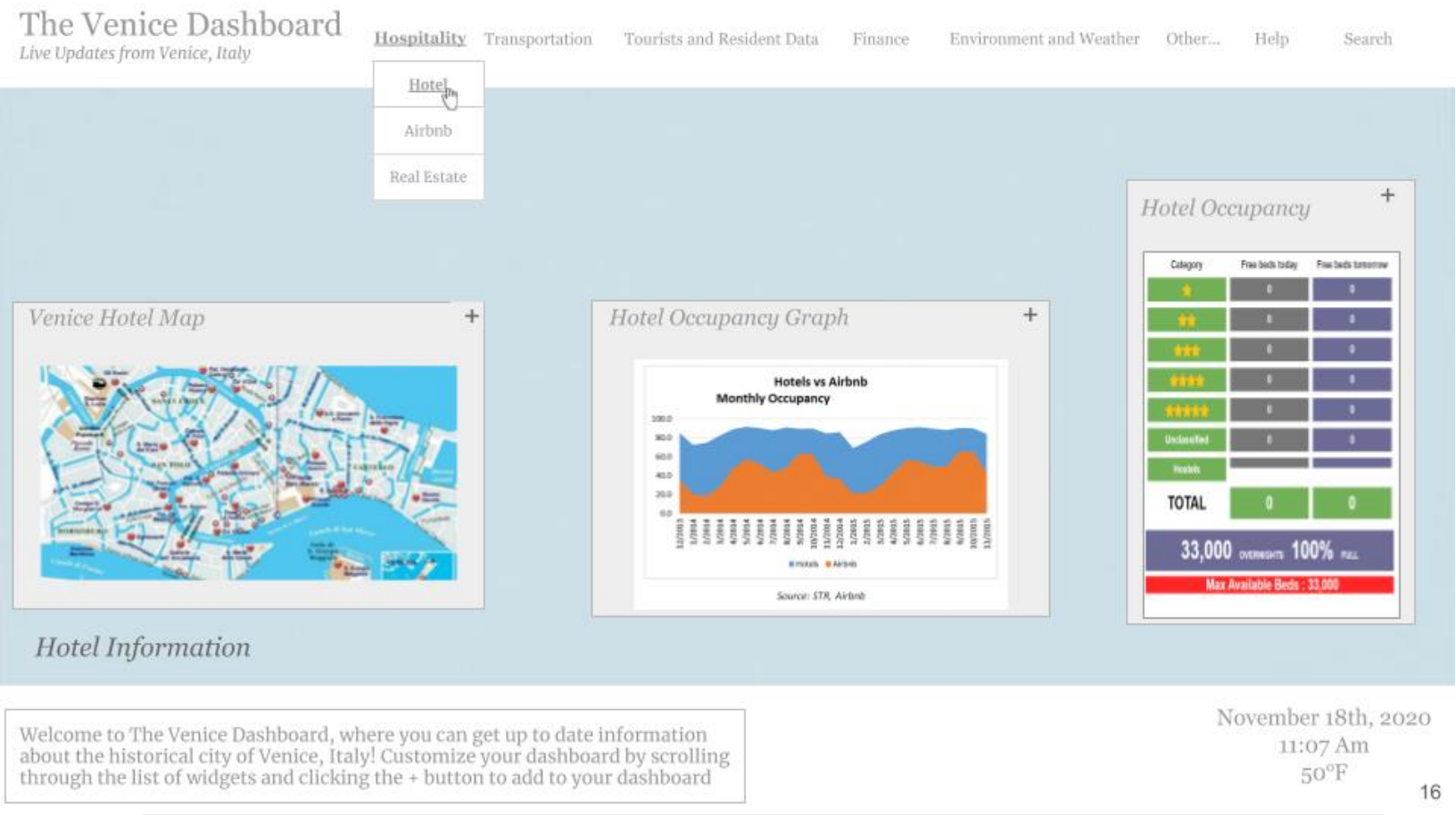

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Figure 33: The Hospitality Category and Hotel Subcategory Page on The New Dashboard

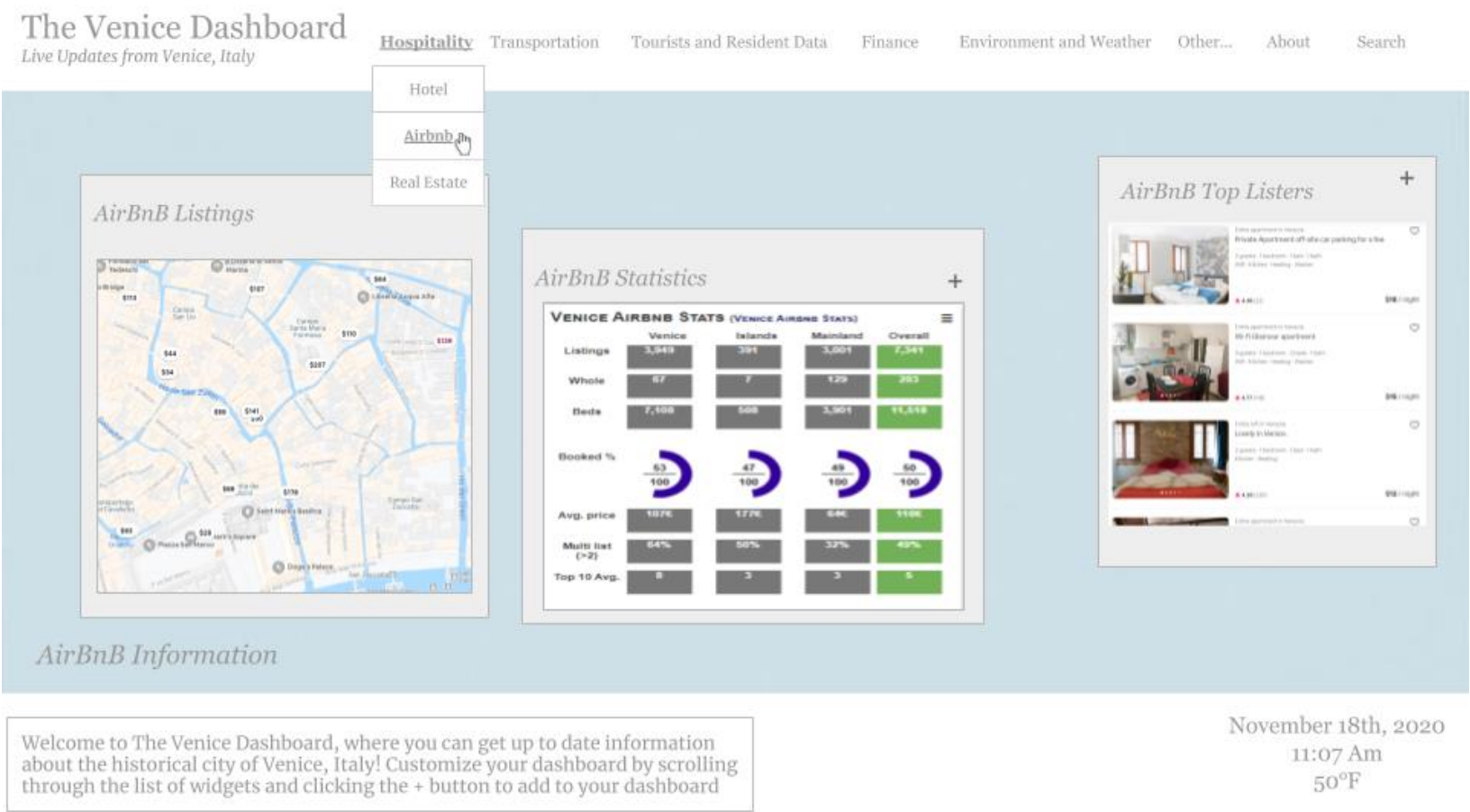

Figure 34: The Hospitality Category and AirBnb Subcategory Page on The New Dashboard

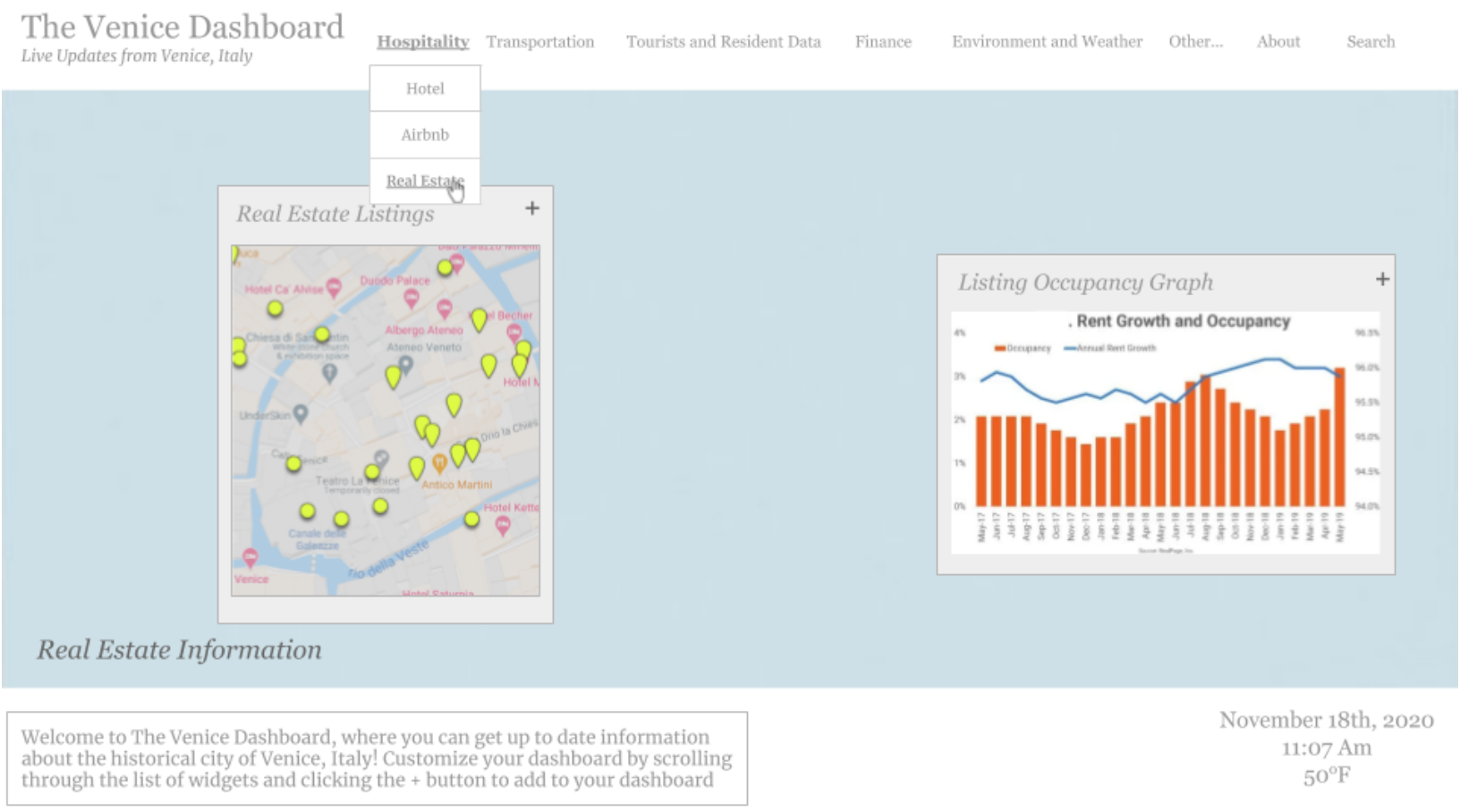

Figure 35: The Hospitality Category and Real Estate Subcategory Page on The New Dashboard

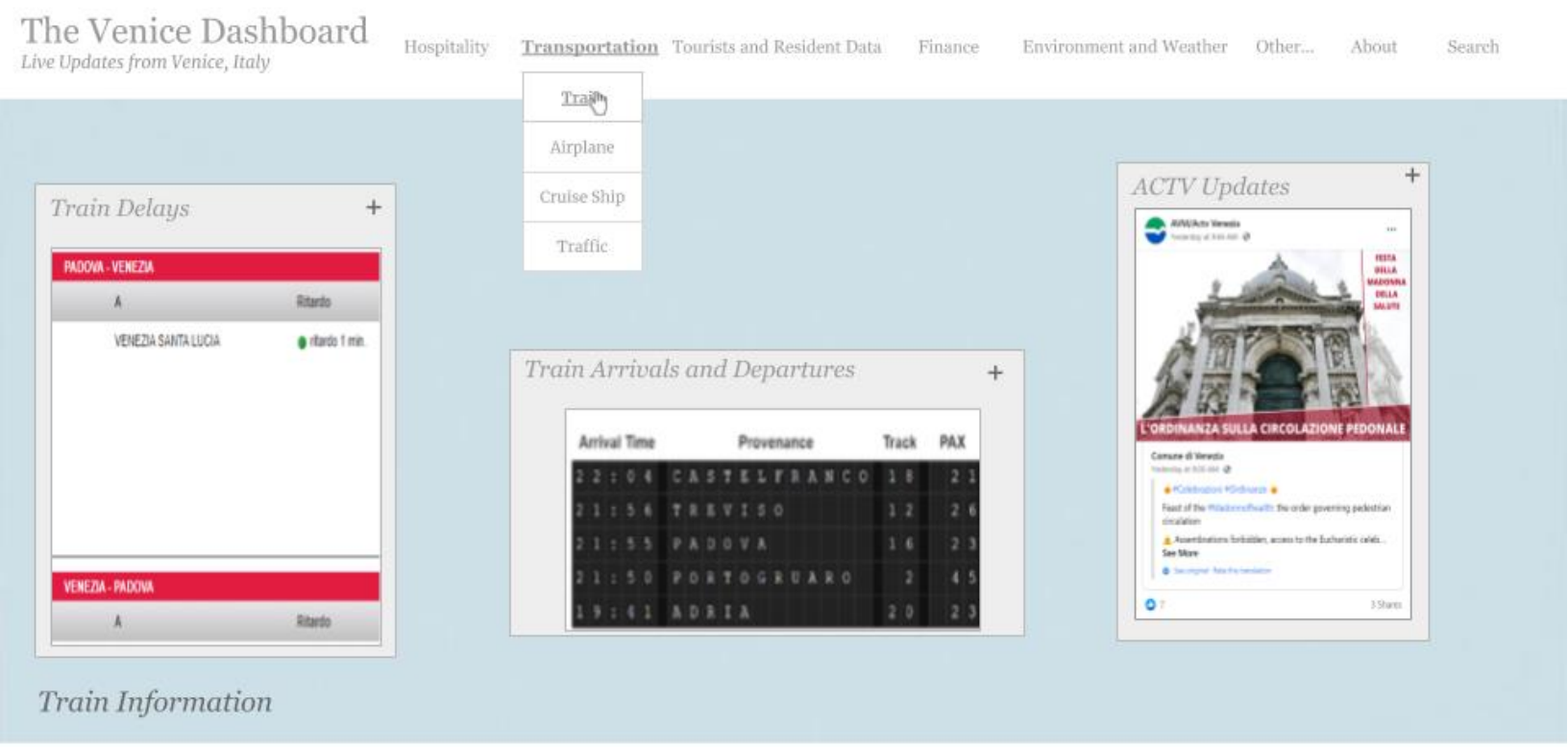

Figure 36: The Transportation Category and Train Subcategory Page on The New Dashboard

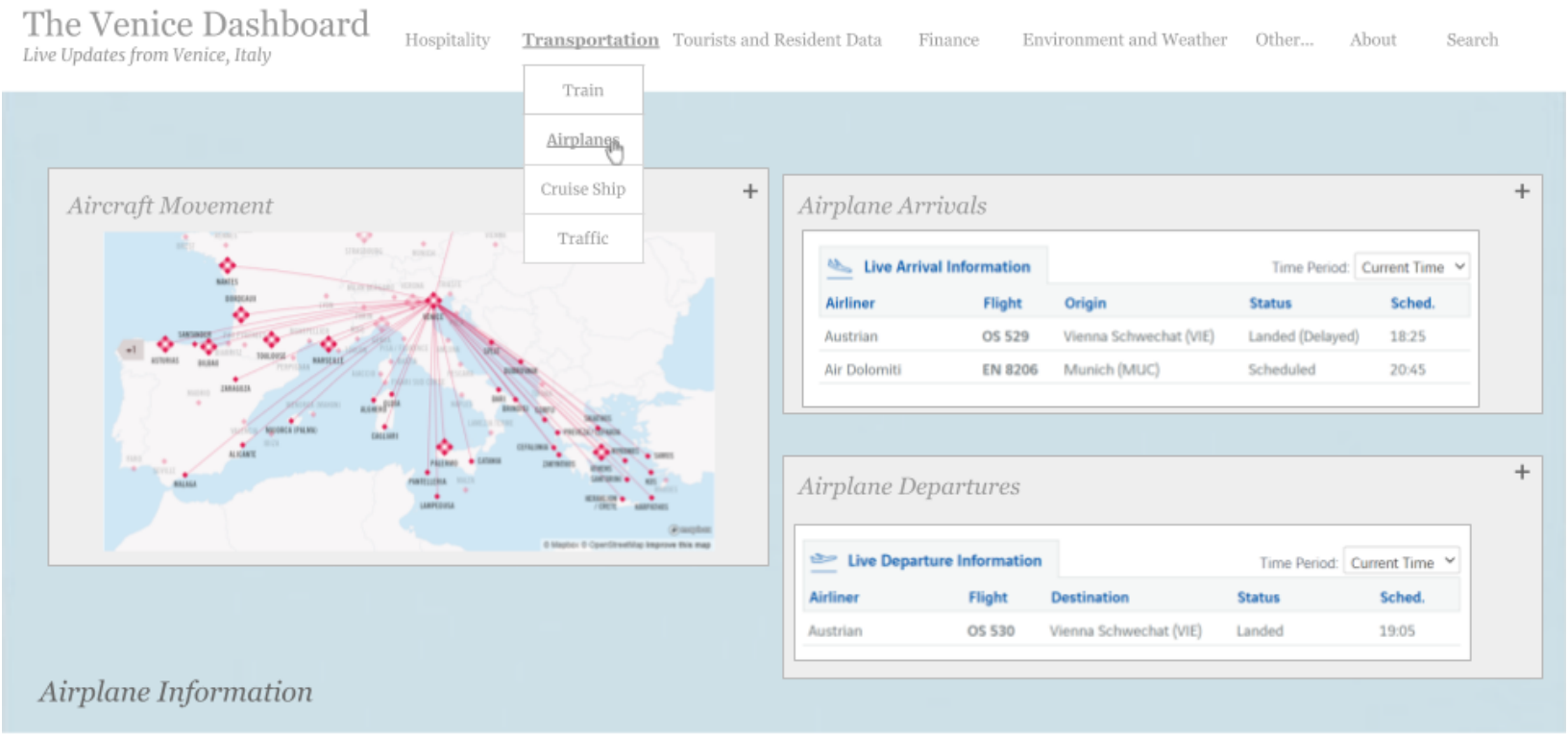

Figure 37: The Transportation Category and Airplane Subcategory Page on The New Dashboard

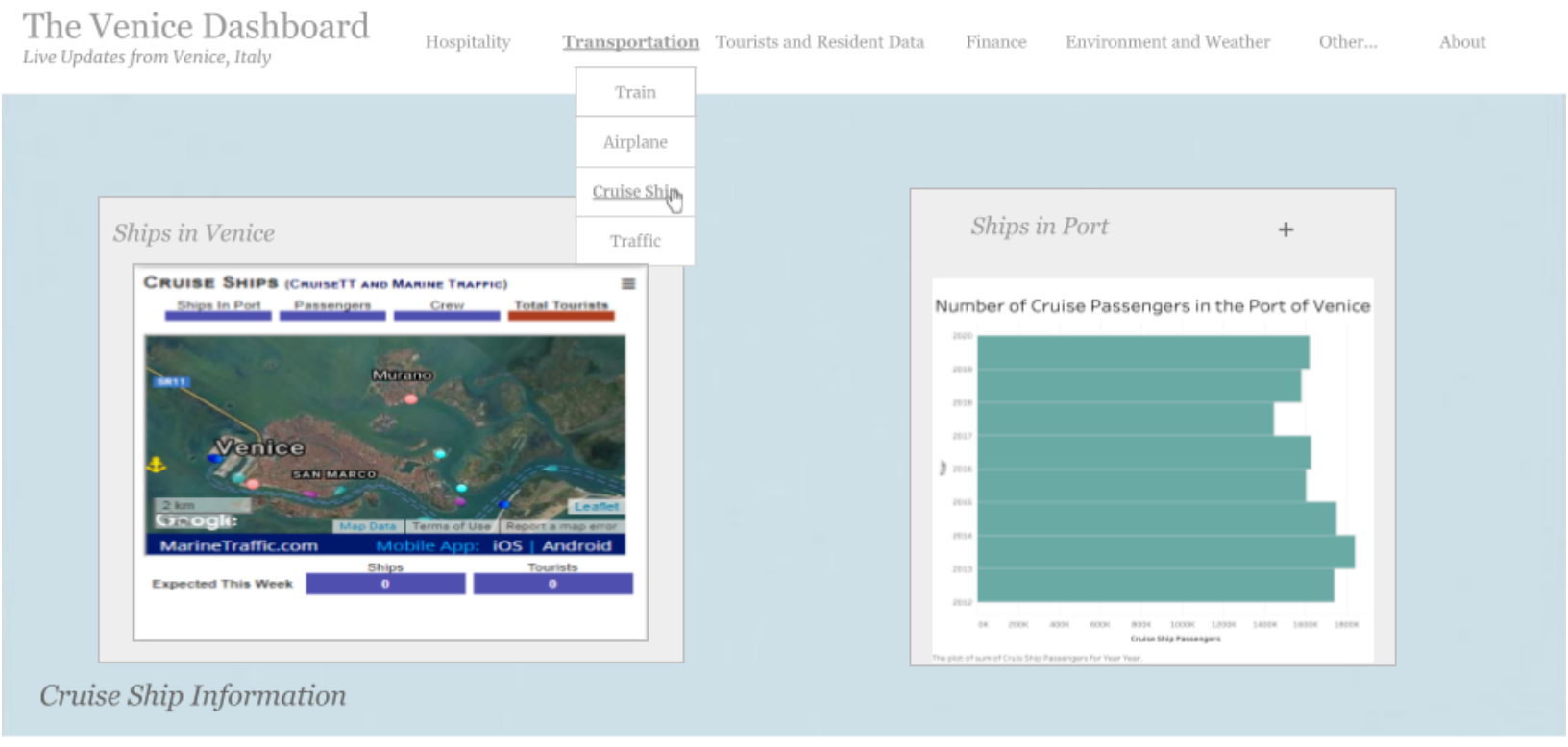

Figure 38: The Transportation Category and Cruise Ship Subcategory Page on The New Dashboard

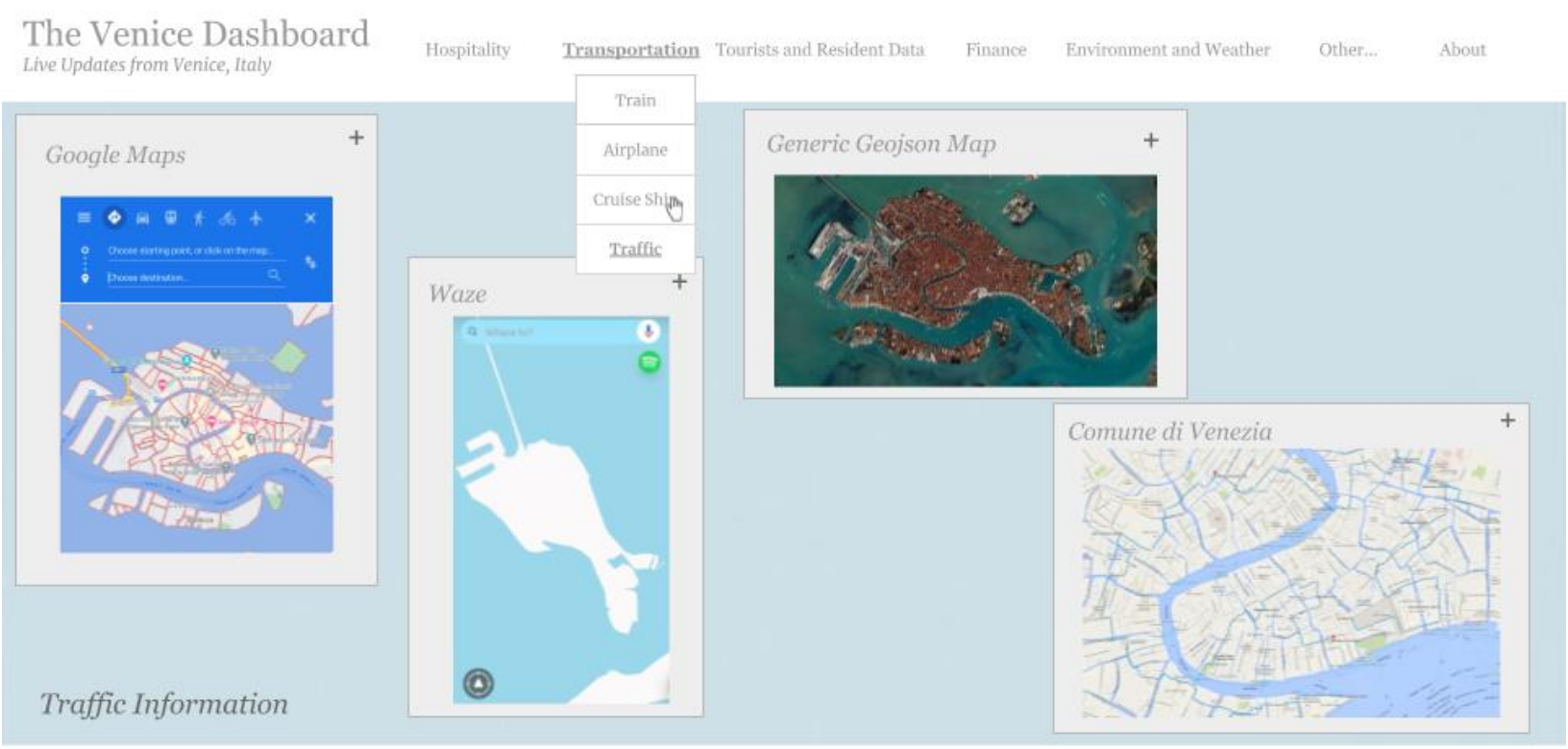

Figure 39: The Transportation Category and Traffic Subcategory Page on The New Dashboard

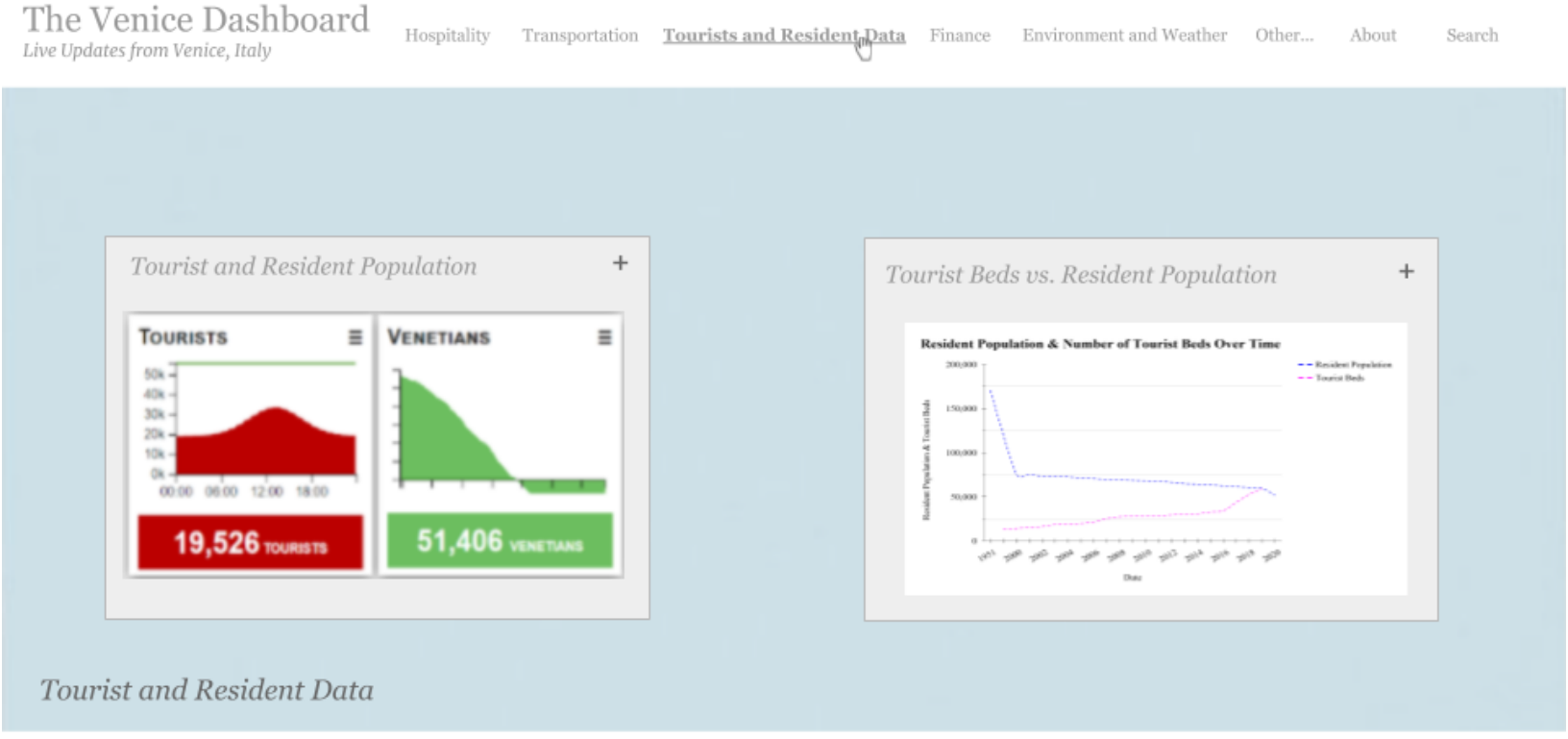

Figure 40: The Tourists and Resident Data Page on The New Dashboard

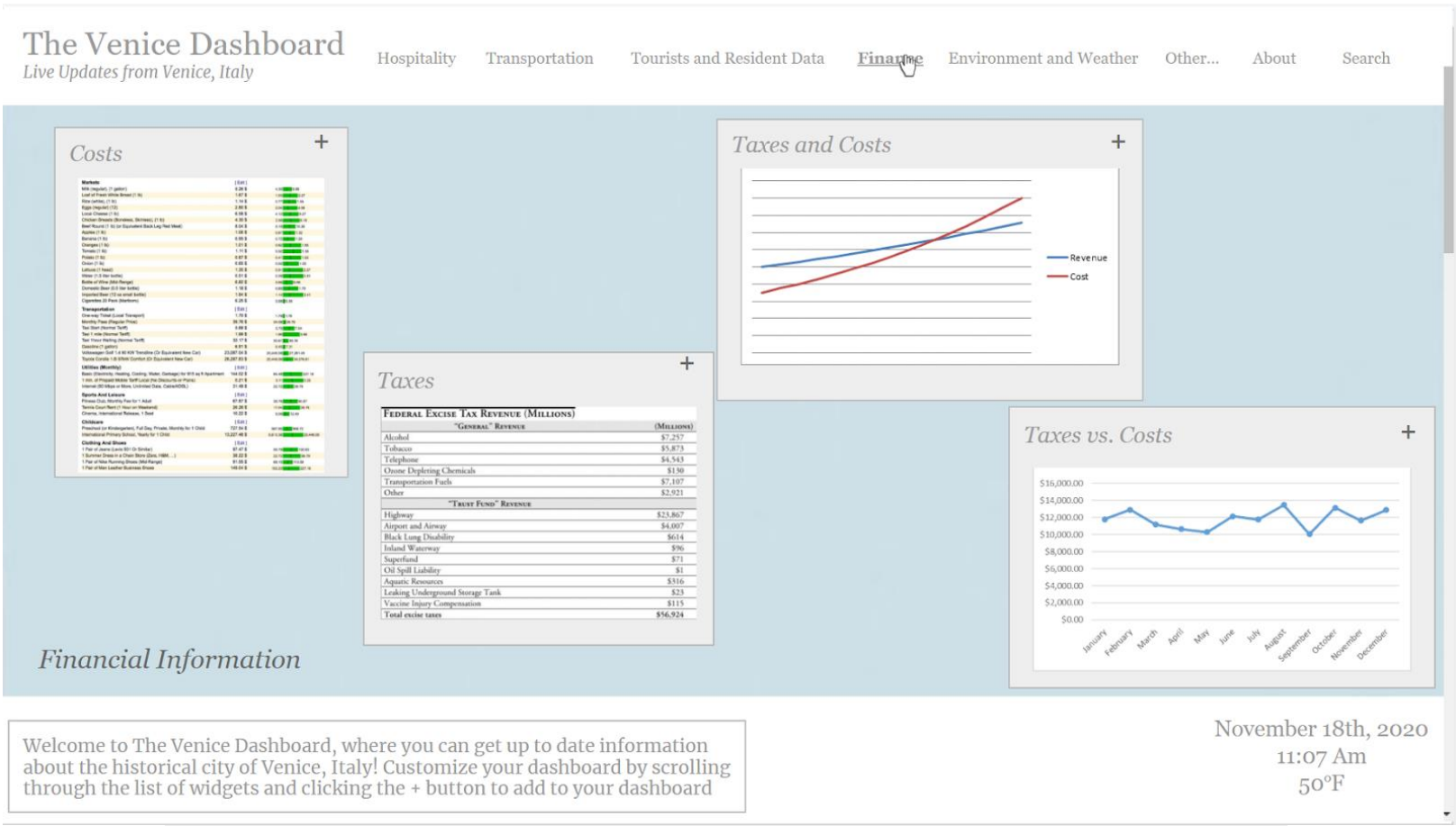

Figure 41: Page 1 of The Finance Page on The New Dashboard

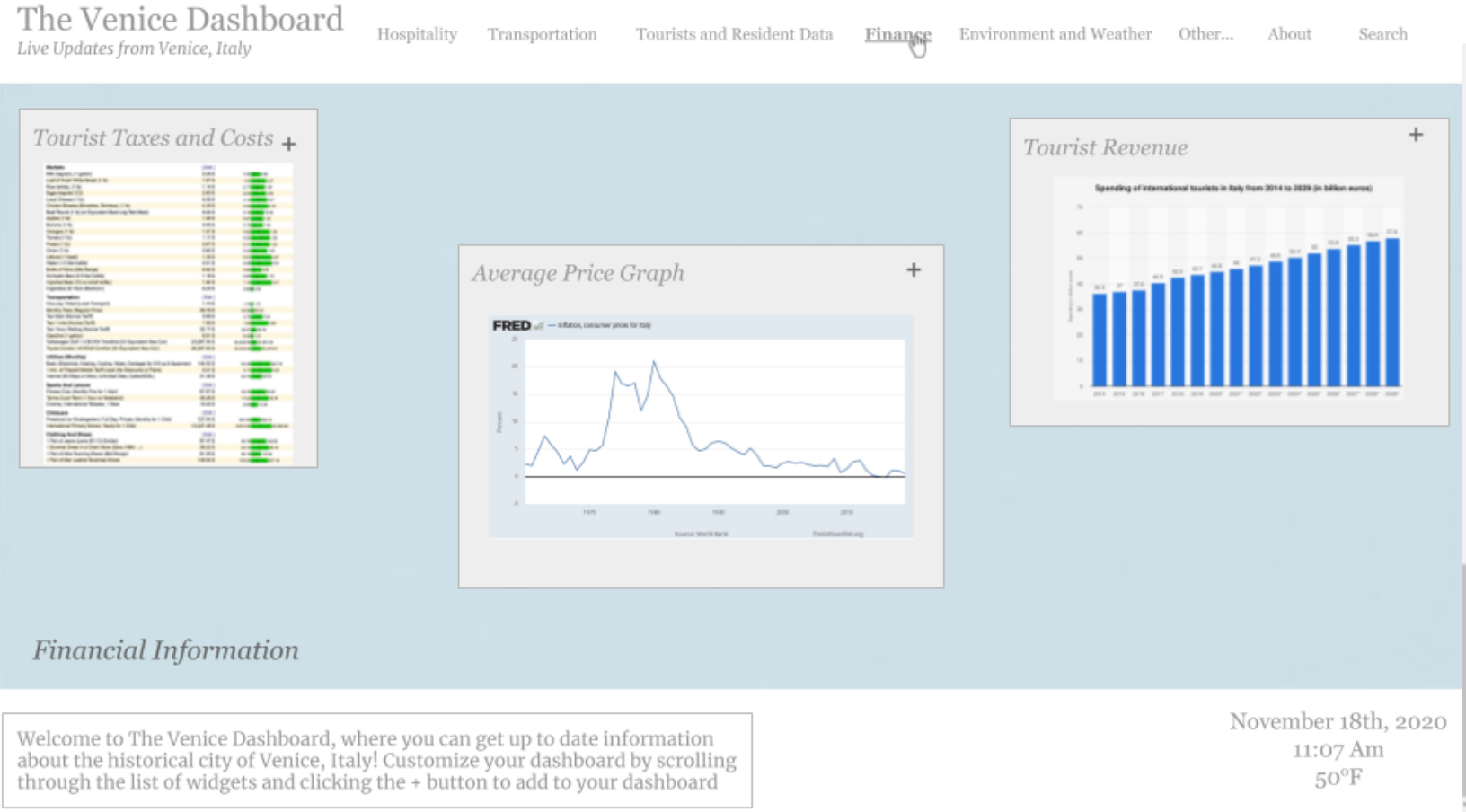

Figure 42: Page 2 of The Finance Page on The New Dashboard

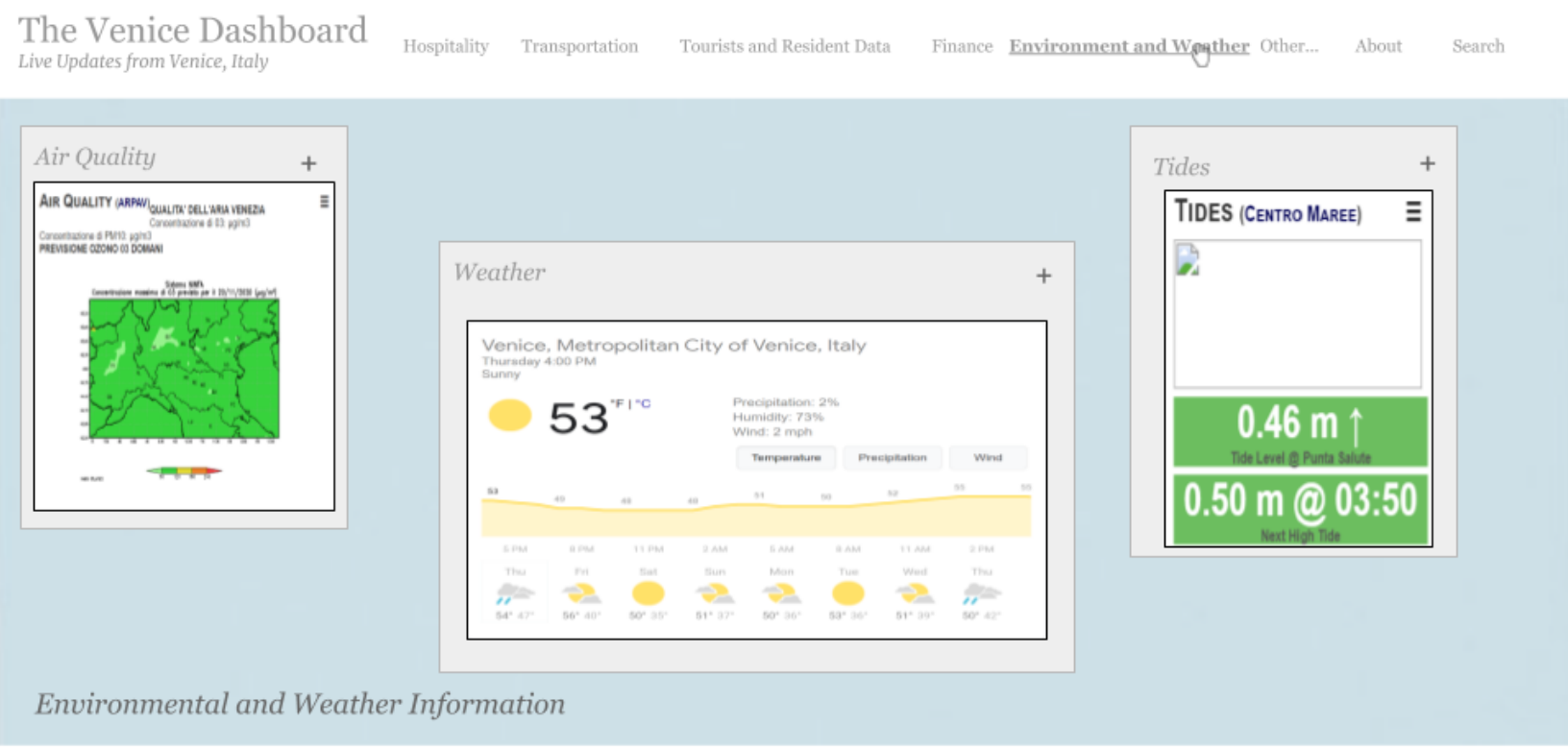

Figure 43: The Environment and Weather Page on The New Dashboard

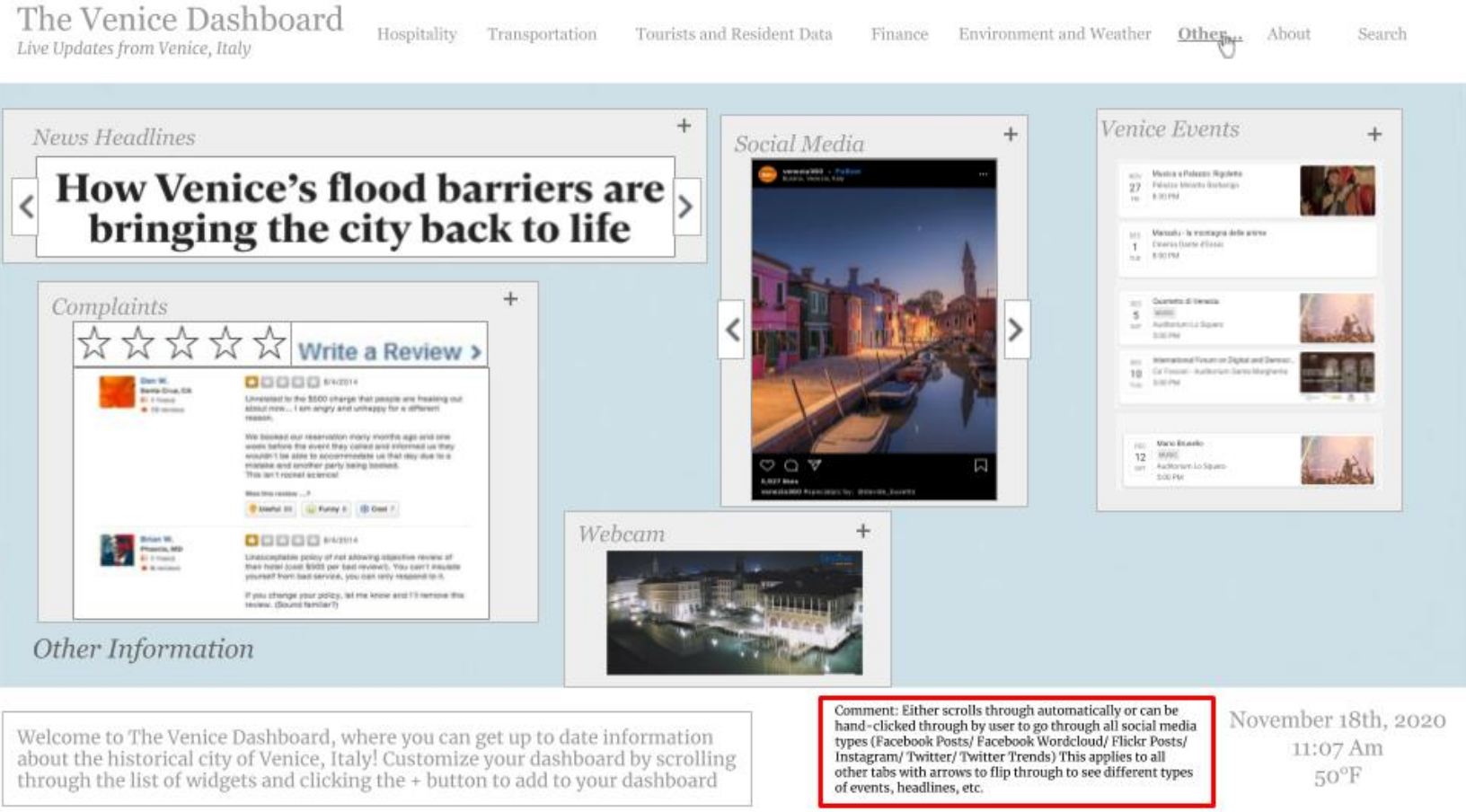

Figure 44: The Other Page on The New Dashboard

Appendix D: Invitation for City Labs

This is our design for the invitation templates that we were in charge of making as a part of aiding with the CityLab Events.

This will be used by the people working for the SmartDest Project at a later date to invite stakeholders to the CityLab Events.

Figure 32: Invitation to The City Labs Events

ADDENDUM

(BetterChoise. 2020)

The 15 Primary Stakeholders Involved in The Tourism Industry in Venice

Comune di Venezia Turismo

The Comune di Venzia Turismo represents tourism through the city of Venice. This association includes an array of online services to assist both tourists and residents in navigating the city of Venice. Their website is a hub for all the information one would need if traveling to Venice. It includes information on news and events, governing parties, live updates on the COVID-19 pandemic, projects they are working on to improve the city, and specific information sections for both residents and tourists (*Attività e progetti per il Turismo a Venezia* 2020). They are also in charge of the projects and actions taken regarding tourism in Venice. These include projects that focus on sustainable tourism and how it relates to the history, culture, and geography of Venice (*Attività e progetti per il Turismo a Venezia* 2020).

Figure 45: Logo for Comune di Venezia Turismo (*Attività e progetti per il Turismo a Venezia* 2020).

Sud Europa di Fronte alla Turistificazio

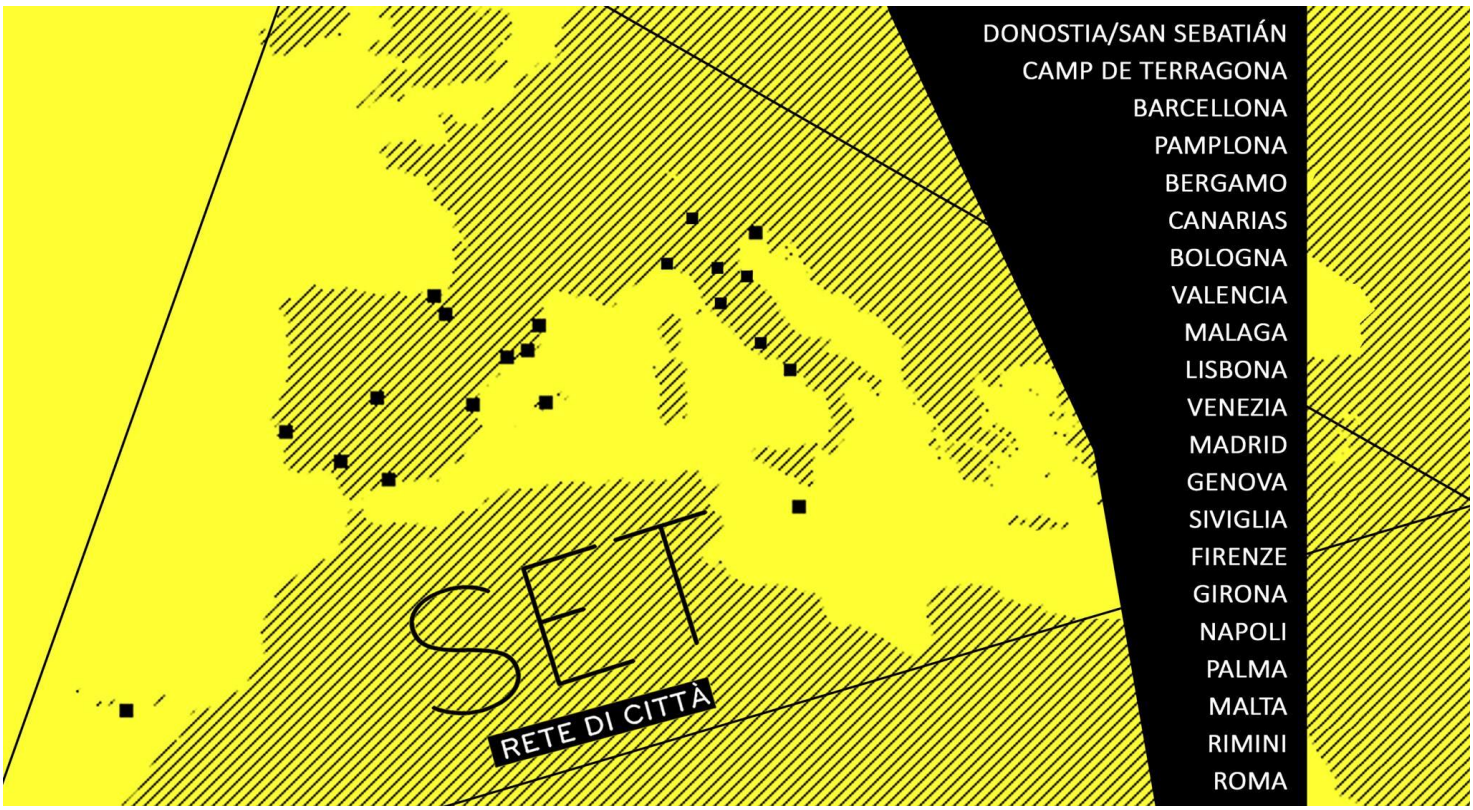

Figure 46: Logo for Sud Europa di Fronte all Turistificazio (SET, 2020)

Sud Europa di Fronte alla Turistificazione (SET) is an association focused on bringing awareness to the issue of tourism. The goal of this group is to "promote at an international level a critical reflection on tourism and a coordination of alternative analyzes and practices" (Nasce, 2020).

This association runs a Facebook group that has over two thousand members and is actively working towards their goal by posting relevant articles, news updates, and recent protests regarding over tourism in Europe (SET, 2020).

ConfTurismo

ConfTurismo is in its 7th year of business since its new statute and functional structure. This group expresses the concerns of the tourism businesses and professions that are part of the Confcommercio Imprese for Italy. In layman terms, this is the association for the tourism sector of Venice. Confturismo also has a major role in the study and definition of new policies for developing tourism (ConfTurism, 2020).

Figure 47: Logo for ConfTurismo (ConfTurismo, 2020)

Associazione Veneziana Albergatori

Figure 48: Logo for Associzione Veneziana Albergatori (*Federalberghi Venezia, 2020*).

The Associazione Veneziana Albergatori is the local Venice chapter to the Federalberghi Venezia. The Associazione Veneziana Albergatori, the Venetian Hoteliers Association, was founded in 1948 as a localized version of the Federalberghi Venezia to represent hotels and other accommodation facilities in the city of Venice. They are the largest representative association for accommodations in the area (*Federalberghi Venezia, 2020*). The Association is in charge of settling disputes, representing and protecting its members, and providing consultancy services to its members. They also raise awareness for tourism related issues, social and economic problems through campaigns, and other activities. In more recent years the Association has opened a “study center” the goal of which is to address the environmental problems tourism has created (*Federalberghi Venezia, 2020*).

Ente Bilaterale sul turismo Venezia

The Ente Bilaterale sul turismo Venezia is an organization which closely observes socioeconomic and environmental trends and their impact on the resident venetian population. This also pushes for actions to be taken in favor of the residents of Venice as without residents, the City will be no more than another amusement park (Lenassi, et al., 2013).

Figure 49: Logo for Ente Bilaterale sul turismo Venezia (Lenassi, et al., 2013)

Associazione OTS Turismo Sostenibile

The Associazione OTS Turismo Sostenibile is an association that represents businesses that aim to create methods for sustainable tourism. The association is in its second year of operations and closely looks at the World Travel Organization and its definition of sustainable tourism. The OTS also is primarily focused on businesses that operate in the Venice Lagoon which recognize their economic, social and environmental impacts (*Associazione OTS, 2020)*

Figure 50: Logo for Associazione OTS Turismo Sostenibile (*Associazione OTS, 2020)*

Confcommercio Turismo Venezia

The Confcommercio Turismo Venezia is an organization that protects union workers within the trade, tourism and service industries, covering a large number of businesses that regard tourism in Venice.

The group caters towards the protection of economic, social and moral interests of the workers in the service sector (*FIAVET - Confcommercio Unione Venezia, 2020).*

Figure 51: Logo for Confcommercio Turismo Venezia (*FIAVET - Confcommercio Unione Venezia, 2020).*

SKIFT- Tourism global data

Skift finds trends for global CEOs and CMOs across sectors of travel, dining and wellness. They are able to do this through a combination of news, research, conferences, and marketing services. Since launching in August 2012, they have now become the biggest business intelligence brand. After raising 2.5 million from seed investors and venture groups, they are now a multi-product, multi-platform, profitable and fast-growing company. Their underlying premise is to document and help the travel industry understand how traveler behavior is changing (Travel News, 2020).

Figure 52: Logo for SKIFT-Tourism Global Data (Travel News, 2020)

ABBAV- HOST community Venice

ABBAV brings together managers of bed and breakfasts, tourist rentals, guest houses, and other forms of alternative accommodation making it the largest host community in Veneto. The association was founded in 2003 in order to network between operators in this new industry in Venice. Their mission is to spread family tourism by delivering high quality consulting, services, assistance and professional skills. ABBAV is a point of reference not only for operators, but also for the institutions that it works with to protect and promote tourism. This association is working right now to help recover for the COVID-19 pandemic (L'Associazione degli host del Veneto, 2020).

Figure 53: Logo for ABBAV-Host Community Venice (L'Associazione degli host del Veneto, 2020

SKAL_ Tourism association

Figure 54: Logo for SKAL-Tourism Association (Skal Venezia, 2020)

Skal international Venice was founded in 1952. It is a part of Skal International, which is the only professional organization that promotes global tourism and friendship. This association is a part of the World Tourism Organization or UNWTO. It is one of the largest and oldest tourism associations after being founded in Paris in 1932. Skal international Venice is led by its president Lorenza Lain and 1st vice president Piergiorgio Baroldi. A part of this association is Young Skal Venezia, which is a sector of people aged 18 to 29 that is for starting a professional career in the tourism sector. This allows for access to trade fairs, workshops and other professional events. It gives young people looking to get involved in the tourism industry great networking opportunities. There are 9 clubs with over 450 members part of this Skal international Venice, as it is very active in this area (Skal Venezia, 2020).

Osservatorio Civico Indipendente sulla Casa

Figure 55: Logo for OCIO (OCIO, 2020)

Osservatorio Civico Indipendente sulla Casa (OCIO), is a tool created in 2018 that collects and displays data, materials, and other useful information regarding the housing issue in Venice. A group of Venetian associations, residents, and researchers meet to analyze both public residential housing as well as tourist housing (OCIO, 2020). Prior to the creation of this website, a home observatory group had already existed from the mid-90s to 2012. This group's primary goal was to collect and organize information pertaining to the housing issue in Venice. OCIO used this information as well as more up to date information to create visual representations that can be viewed by all Venetians and any other person interested in the information. The information gathered is for both the historic city as well as the islands (OCIO, 2020).

Assemblea Sociale Per la Casa

Assemblea Sociale Per la Casa (ASC) is an association of Venice residents that squat abandoned buildings that have been vacant for years in an effort to give people in need of housing Venice a place to live. Furthermore, this association is trying to bring awareness to the affordable housing issue in Venice. The Venetian authorities tend to turn a blind eye to this because there are over 600 empty buildings in the city that the city cannot maintain (Venice – ParticipationMatters with ASC, 2020). This association has a Facebook group with just under two thousand members to keep people informed of the housing issue (ASC, 2020).

Figure 56: Logo for Comune di Venezia Turismo (ASC, 2020).

Sindacato unione Inquilini

The Sindacato unione Inquilini is a tenant's union that represents the right for housing amongst Venetians. The non-profit, voluntary association was established in Florence. They provide tenants of buildings with the resources they need to navigate various housing issues including poor building maintenance, uncontrolled rent increase, evictions, etc (*sito notizie casa* 2009). Their goal is to provide every individual with their right to a home in their fight for social solidarity.

Figure 57: Logo for Comune di Venezia Turismo (*sito notizie casa* 2009).

Camera di Commercio Venezia-Rovigo

The Chamber of Commerce in Venice-Rovigo is everything business in Venice. The conglomeration produces economic data including prices of agricultural products in Rovigo, petroleum products and building construction prices. They also offer information for current companies, prospective companies, and regular citizens. To these groups they offer information guiding what they should do, informing them of what they can currently do, and what they need such as paperwork and forms (*Attività e progetti per il Turismo a Venezia, 2020)*.

CAMERA DI COMMERCIO
VENEZIA ROVIGO

Figure 58: Logo for Camera di Commercio Venezia-Robigo (*Attività e progetti per il Turismo a Venezia, 2020)*

NO Profit Organization List- Venice

Figure 59: Logo for NO Profit Organization List Venice (Associazioni No profit, 2020)

The no profit tab on the website, Citta metropolitana di Venezia has two sub-categories. The first is the associations that make no profit, followed by the foundations of similar criteria. As is the case for certain associations and foundations, if the website is hosted on the servers in the Metropolitan City of Venice then there is an asterisk to denote such. The lists range from religious organizations to sailing clubs. This would allow someone to find a group that they themself feel part of and support them. If you were to click on the name in the list on the website you would be redirected to the website of whatever association or foundation clicked on (Associazioni No profit, 2020) .

The Technical Details of The New Venice Dashboard

Data Collection

Through data collection for the Dashboard, there are two sources of real time data utilized: APIs and web elements. APIs, known as Application Programming Interfaces, are downloadable sets of updated information where the data collection code for the Dashboard can pick specific elements in the data set to display. APIs are beneficial as there is little to no code changes unlike websites, meaning data can be retrieved even if a website is down. On the other hand, they often come with a hefty price tag. Web elements are individual pieces of code on websites where data is extracted from another source. In order to retrieve this data, we used programs such as Octoparse and WebHarvy to extract desired elements from websites and format the data into spreadsheets for the Dashboard to easily select specific data points. Web elements can be extracted for free, but as a website updates, the code updates and must be revisited to make sure that the proper data is extracted. Extracting data straight from a website is also dependent on the website being online and maintained. A third data source used by the Dashboard are live maps for widgets such as the flight radar, where the code can be directly pulled from the application website and embedded into the Dashboard so the map is directly displayed with very little work needed.

Data Storage

One of the most useful features of the newly designed Dashboard is the storage of data that has been previously displayed. On the old Dashboard, while data was shown and updated, the data that was extracted and displayed was no longer utilized. With the new Dashboard design, the data that is displayed is then organized and stored, allowing for access later. This creates another source of data that is more in depth than the yearly reports, as the data updated in real time gives more data points for visuals. The abundance of data points can be analyzed further against other data to identify trends and major influencers on tourism. Since the code can be easily changed and utilized by the seven other case study cities, the other cities will be able to use these data storage capabilities to further monitor tourism in their cities.