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Mapping Music Cities: A Case Study of the Musical Landscape of San Antonio

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Abstract

The live music sector represents the core of the activities generating revenue for many musicians, an incubator for assessing audience tastes, and a cultural staple for each community. Because of the significance of this industry's span, many cities around the world have committed resources to conduct studies to reveal the value and impact of their live music sector. Assessing an impact study for the live music economy has been the focus of consulting groups such as Music Canada as well as funding partners, cultural and economic development councils, and guilds in cities, states, or countries. However, mapping the scale and scope of a musical landscape and related businesses is rarely if ever conducted as part of such studies. Thus, the author provides a mapping framework contributing to the academic literature and presents a new option for organizations and focus groups dedicated to assessing the impact of the ever-growing live music sector and industry. Location intelligence, which is also known as geographic information system (GIS) is used here to capture, store, manipulate, analyze, manage, and present music-centric geographic data in a case study mapping the musical landscape of San Antonio.

Keywords: music cities, GIS, mapping music, musical cultural assets, location intelligence, mapping framework, San Antonio, economic impact studies

Introduction

The live music sector represents the core of the activities generating revenue for many musicians, an incubator for assessing audience tastes, and a cultural staple for each community. Because of the significance of this industry's span, many cities around the world have committed resources to conduct studies to reveal the value of their live music sector. The urban studies expert Graeme Evans (2005, 959) explains that cities

are experiencing a “culture-led regeneration” that is manifesting itself in a variety of “projects and landscapes created and imposed on those communities.” However, much of the driving force behind cultural district development is the belief that the arts are a primary tool for urban revitalization (Brooks and Kushner 2001, 4). Indeed, cities have been implementing cultural district designations since the 1980s as a means to reshape neighborhoods (Noonan 2013).

But it is only within the past ten years that cities have dedicated means to assess the impact of their art and music economies (Baker 2016). Consulting groups such as Music Canada have been at the forefront of such studies partnering with advocacy groups, cultural committees reporting to city leaders, economic development councils, and guilds in cities, states, or countries. In June 2015, Music Canada commissioned *Mastering of a Music City*, the first global industry report examining twenty-seven music cities.¹ It has since become a reference guide for any group interested in producing an economic impact study for their musical city. In addition, many recent studies have emerged treating the topic of music cities (or regions) and how they profit from their music economies and cultural assets (Raines and Brown 2007; Bendix 2015; Simons 2015; Florida 2015; Baker 2016 and 2017; Raine 2016; Seman and Carroll 2017).

However, mapping the scale and scope of a musical landscape and related businesses is rarely if ever conducted as part of such studies. This article intends to provide a mapping framework in a case study format that accounts for the music-centric landscape of a city. The value of this article is multidisciplinary and has strategic implications in several fields of study including, but not limited to, popular music studies and musicology (Cohen 2012; Wienhold and Robinson 2017), music and urban geography (Krimms 2007), urban studies (Markusen 2006; Blessi et al. 2012), cultural geography (Carney 1998; Hudson 2006; Gunderman and Harty 2017), ethnomusicology (Lu 2011; Savage and Brown 2014), tourism (Bahair and Elliott-White 1999), arts management (Brooks and Kushner 2001), music entrepreneurship, music consumption, and marketing. It means to fill a need in the academic literature treating the live music sector with a visualization framework for mapping a musical landscape revealing its insights and challenges.

This case study for the city of San Antonio explains how location intelligence can be useful extracting insightful trends from analyzing layers of data inherent to a city’s musical landscape. Location Intelligence,

which is also known as geographic information system (GIS) is used here to capture, store, manipulate, analyze, manage, and present music-centric geographic data for the City of San Antonio (Clark 1999). GIS offers a way to map cultural assets in a dynamic format, thus providing a visualization tool that can be updated easily as well as a powerful mean for processing large sets of data. The reader may access the interactive map application displaying music-related data for this case study at <https://arcg.is/0HD5O4>.²

Mapping Music and the Musical Landscape

The first mention of a “musical landscape” can be found in Richard Crawford’s 1993 book *The American Musical Landscape: The Business of Musicianship from Billings to Gershwin*. However, Crawford’s idea of a musical landscape did not pertain to a physical manifestation. It is only more recently that studies identified musical landscape with urban geography, although those studies are scarce and scattered across several disciplines. For example, Cohen (2012) explored the relationship between music and material urban environments by drawing on ethnographic research conducted with rock and hip-hop musicians in Liverpool, a port city situated on the northwest coast of England, within the wider Merseyside. In her research, Cohen introduces “conceptual mapping,” which are hand-drawn maps as a means of research pertaining to the concept of musical landscape.

Another creative and captivating means of “mapping music” can be seen in an ethnomusicological study bridging the gap between musicology and psychology by Savage and Brown (2014). In this particular work, the authors analyzed 259 traditional group songs from twelve indigenous peoples of Taiwan. Using a mapping methodology, they were able to identify five major “cantogroups”, the frequencies of which varied across the twelve groups. Ultimately, from this information, Savage and Brown were able to create musical maps of Taiwan. Going a step further, Gunderman and Harty (2017) focused their study on the memorialization of the Grateful Dead on the cultural landscape of the United States through the naming of businesses. They asked business owners why they chose to reference the band in the naming process and then documented the geographical locations of these businesses on a map of the United States using GIS. But not all studies claiming to be mapping music are doing so on a physical or interactive map. As an example, the report released by the Moshito Music

Conference and Exhibition *Mapping of the South African Live Music Circuit 2010* does not in fact present any visual map per se, at least none that has been published.³

It is only most recently that a couple of studies have emerged applying GIS to music-related activities pertaining to city-level asset mapping. The first study is the excellent *Cultural Asset Mapping Project* (CAMP) report released in 2018 and created for the city of Austin's Cultural Division of its Economic Development Department.⁴ CAMP visited each of Austin's ten Council Districts asking participants to map places that had cultural and creative value to them. It compiled a directory of over three thousand points depicting cultural assets such as theaters, museums, music venues, recording studios, and local landmarks into an online interactive map. However, the study did not go into a great deal of depth with respect to Austin's music industry. It only identified music/bars/clubs and recording studios leaving out many relevant music-related activities and businesses, such as music production companies, music nonprofits, music schools, and festivals. The second study that was released recently is the fascinating and forward-thinking economic impact study that was produced for the Boston Symphony Orchestra by economist Stephen Sheppard.⁵ In his report released March 2018, Sheppard applies GIS to the ticket purchases of the symphony to reveal the source of its audience. By using the home address of each patron, Sheppard was able to consolidate this data and produce a map showing precisely where patrons of the orchestra came from with a further breakdown of attendance to some of the orchestra's staple events (i.e., the Tanglewood Music Festival and the Fourth of July Celebration Concert).

This brief literature review points out how researchers have implemented GIS and mapping techniques to reveal trends and patterns relevant to their studies. However, none of those studies is exclusively dedicated to mapping the musical landscape of a city. This is the aim of the present case study.

Case Study Framework

This section explains how the case study aiming to map the musical landscape of San Antonio is framed. First, a few paragraphs provide the reader with some necessary background information about San Antonio, setting up the context of the case study. Next, the objectives are succinctly

stated. Finally, the mechanics of location intelligence are described, data treatment is explained, and the implementation of the study delineated.

San Antonio

San Antonio, located in the southwestern part of Texas, is the seventh most populous city in the United States with an excess of 1.5 million residents and is one of the top-ten fastest growing cities in the country.⁶ It is also the most widely visited city in Texas and the home of the Alamo. San Antonio is known as “Military City” and hosts seven military bases and forts.⁷

The city has a vibrant and eclectic music scene and hosts the largest Tejano Conjunto Music Festival.⁸ It also produces a two-week long Fiesta parade each spring⁹ and is home to the Texas Music Educators Association (TMEA) Conference, the largest music education conference in the United States.¹⁰ San Antonio is a festive town with alcohol consumption surpassing \$611 million in 2017.¹¹

The city is divided into ten council districts. Most of the corporations in the city are largely concentrated along its highway system. In addition, parking outside of the downtown area is mostly free. From a socio-economic perspective, the areas experiencing fast-paced growth are the North and Northwest part of San Antonio, mostly within Districts 8 (+33.6%) and 9 (+36.7%) (see Figures 1 and 2). Those two areas of growth also have the highest median household income (Figure 3).

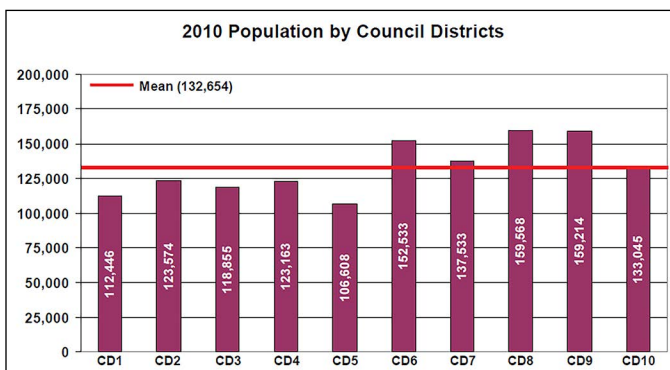


Figure 1. San Antonio’s population by council districts in 2010 (Source: Department of Planning and Community Development for the City of San Antonio).

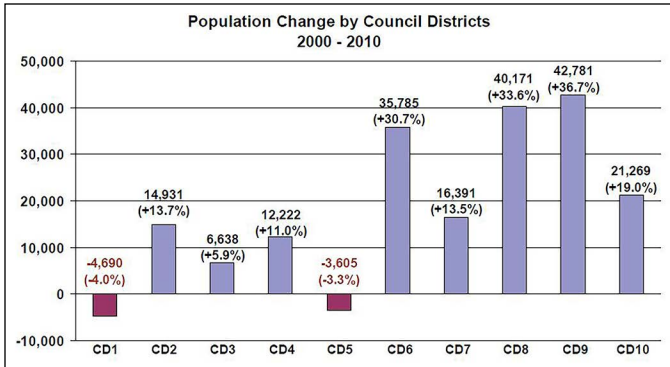


Figure 2. San Antonio's population change by council districts from 2000 to 2010 (Source: Department of Planning and Community Development for the City of San Antonio).

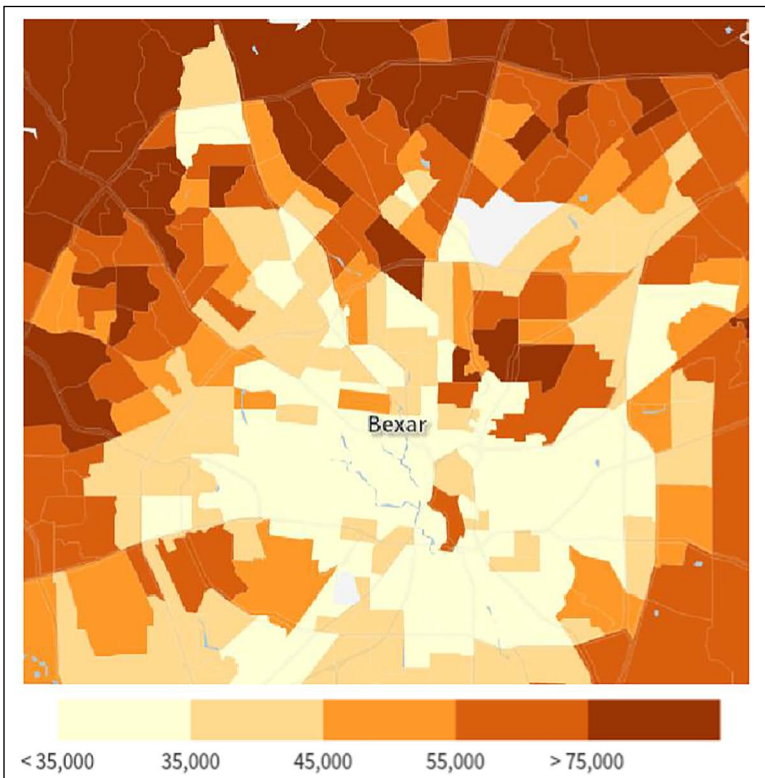


Figure 3. Household income distribution in San Antonio (Source: U.S. Census Bureau).

Objectives

The main objectives of this case study are:

1. To explain how useful location intelligence can be extracting insightful trends from analyzing layers of data inherent in a city's music economy
2. To map the scale and scope of the musical landscape of San Antonio
3. To reveal trends and challenges idiomatic to San Antonio and more specifically:
 - a. To assess how and where San Antonio's music economy is growing
 - b. To test if alcohol sales correlate with music-related activities in the city
 - c. To suggest results that could impact policy and efforts to further grow the music economy of San Antonio
4. To propose a framework for further studies

Location Intelligence

Location intelligence is the tool employed to meet the objectives of this case study. It is an interactive mapping methodology that is based on geographic information system (GIS) that can process location data. In other words, the methodology captures latitudes and longitudes. It is also designed to store, manipulate, analyze, manage, and represent spatial or geographic data. The methodology allows users to create map overlay¹² and projections (see Figure 4). Location intelligence also encompasses specific location data (e.g., the address of a music venue based on a latitude and longitude) or boundary data also known as polygons (e.g., delimit areas such as districts) (see Figure 5).

Data

Data collection was essential in building this case study. Indeed, it encapsulates nine layers and 8,825 fields of data. The data collected include music-related as well as non-music-related data. In most instances, information gathered to generate the geographic data needed to represent the music-related activities of the city included the name, address, zip code, type of activity, as well as the date of incorporation. The data were collected by the author and his research assistants between January 2017 and February 2018. The data collection was intended to be as complete and comprehensive as possible. To help assure that the data collected were

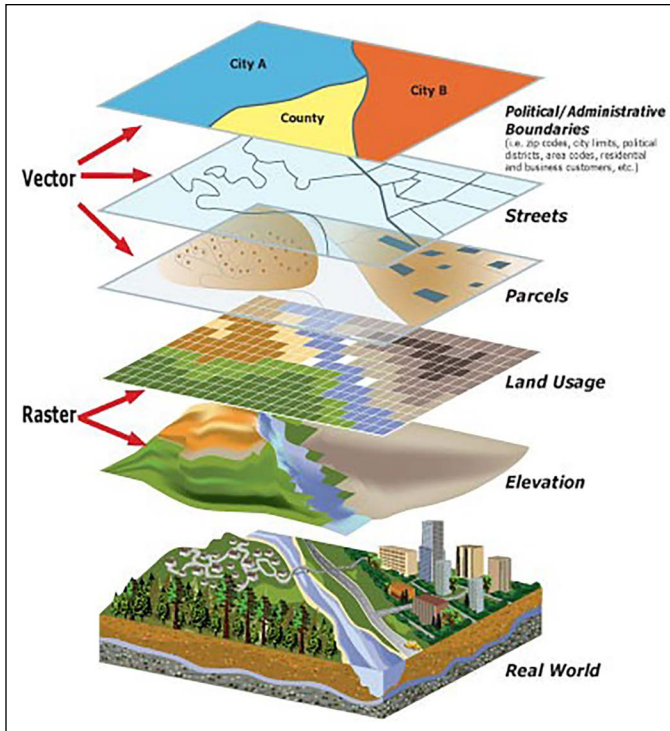


Figure 4. Example of map (Source: <http://cms.sbcounty.gov/lus/Planning/ZoningOverlayMaps.aspx>).

complete enough for this study, the application was made public to receive feedback from the community. News media helped disseminate it.¹³ Please note that the author does not intend to continue updating the application past the writing of this article and there are no current plans to continue this study. This is partly due to 1) the cost of the GIS software license, and 2) the labor cost of research assistants. Also, since the writing of this case study, several new venues, festivals, and music businesses have entered the San Antonio market, while others have divested. Those are not represented in the application at <https://arcg.is/0HD5O4>.

The music-related data (followed by the number of data points under parenthesis) are comprised of five layers of geographic information:

1. Music Venues/Clubs/Bars (303) (includes both spaces that present music as their primary activity as well as

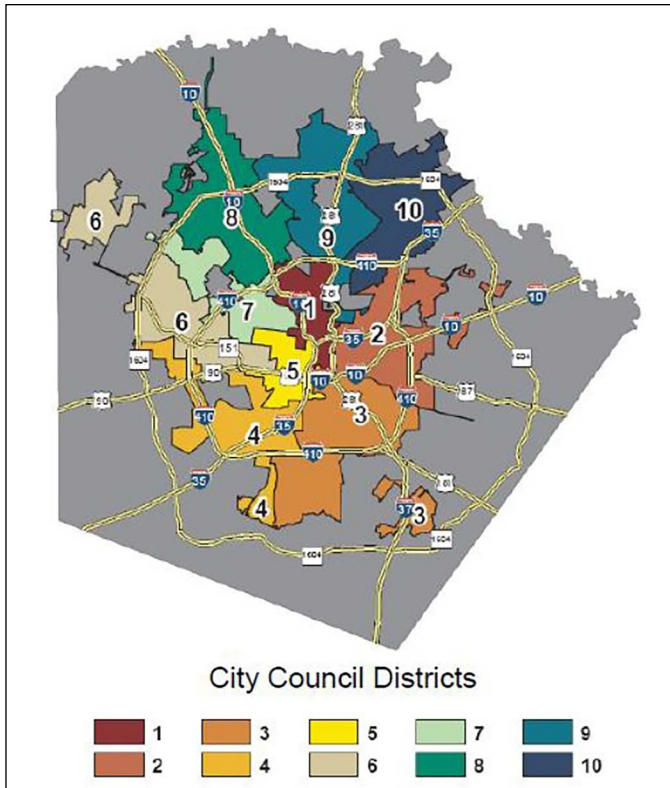


Figure 5. City council districts boundaries (Source: Department of Planning and Community Development for the City of San Antonio).

- spaces presenting music as their secondary activity) (see Figure 6)
2. Music Festivals (27) (includes only recurring festivals) (see Figure 7)
 3. Music-Related Businesses (272) (i.e., recording studios, music stores, production companies, etc.) (see Figure 8)
 4. Music Nonprofits (113) (see Figure 9)
 5. Music-centric Educational Organizations (59) (e.g., includes nonprofit and as well as for-profit music schools, after-school programs, music charter schools, and universities with strong music programs) (see Figure 10)

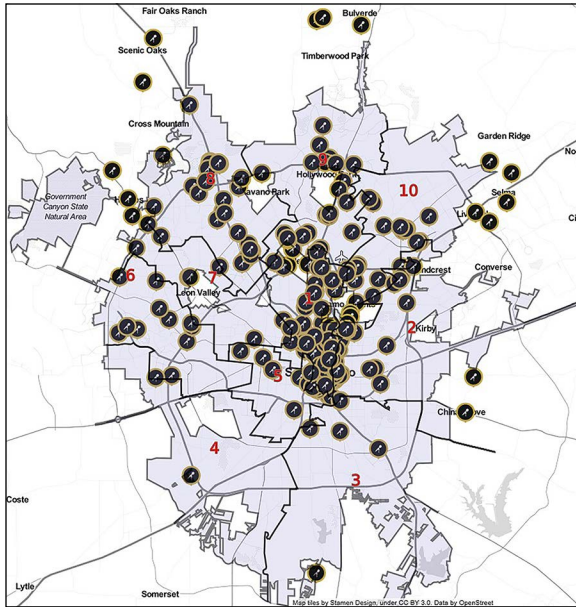


Figure 6. Music venues/bar/clubs.

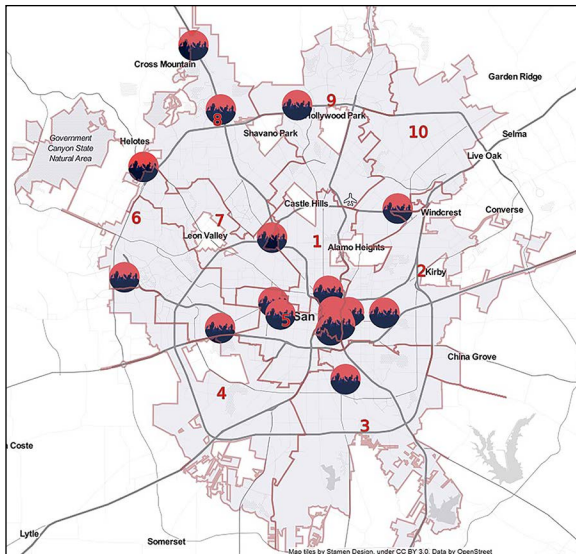


Figure 7. Music festivals.

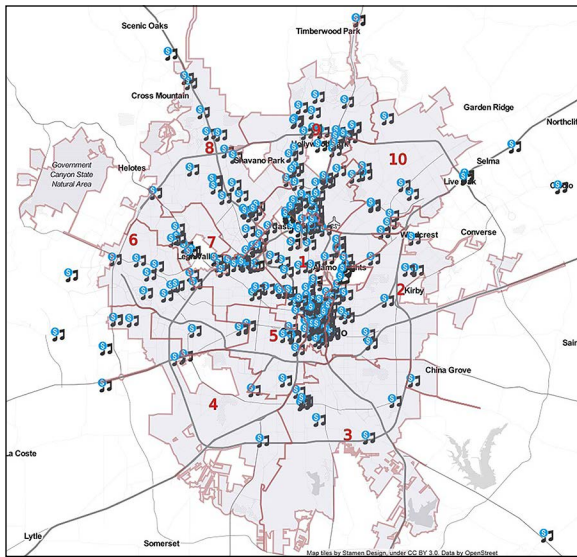


Figure 8. Music-related businesses.

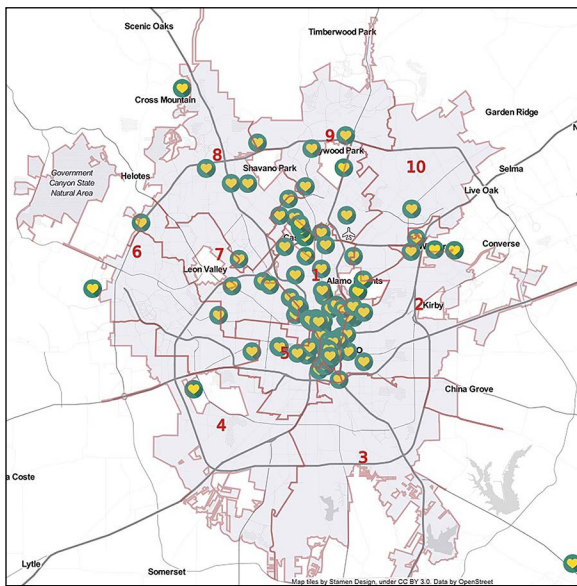


Figure 9. Music nonprofits.

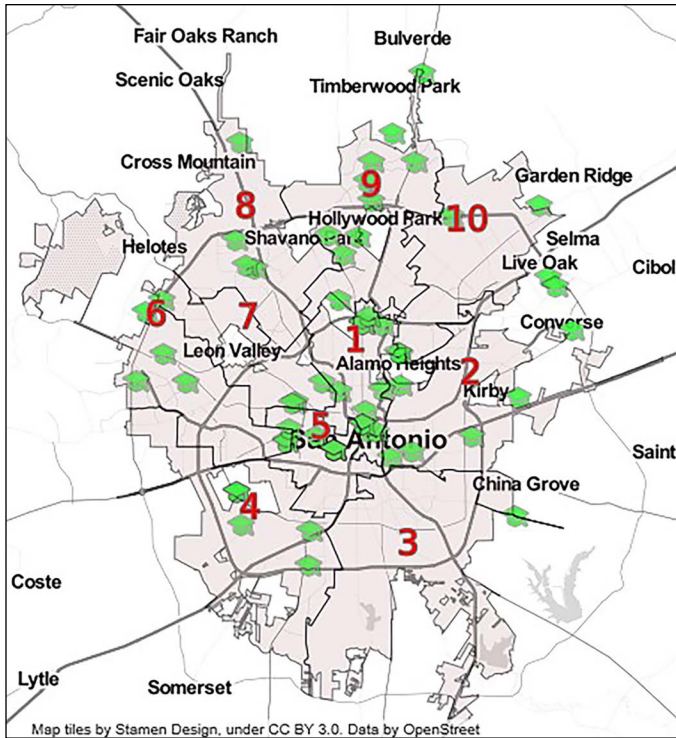


Figure 10. Music-centric educational organizations.

The music-related data used in this case study were collected from the following sources:

- The Texas Music Office¹⁴
- Local Event Aggregators¹⁵
- The Texas Music Educators Association¹⁶
- The City of San Antonio’s Department of Arts and Culture¹⁷
- The San Antonio Sound Garden (SASG) San Antonio Music Industry Study¹⁸
- Word of Mouth, Referrals, Networking, and Social Media

In addition to music industry specific data, the following data were gathered:

- Boundary Data for the ten districts were imported from the City of San Antonio's Website¹⁹ (see Figures 5)
- Paid Parking Garages and Surface Lots (159) were available from The City of San Antonio's Department of Arts and Culture²⁰ (see Figure 11)
- Monthly Alcohol Sales Data from July 2016 to August 2017 (7,892) were provided by the Texas Comptroller's Office²¹ (see Figure 12)
- Socio-Economic Data were imported from the U.S. Census Bureau's website and the Department of Planning and Community Development for the City of San Antonio Census Study²² (see Figures 1, 2, and 3)

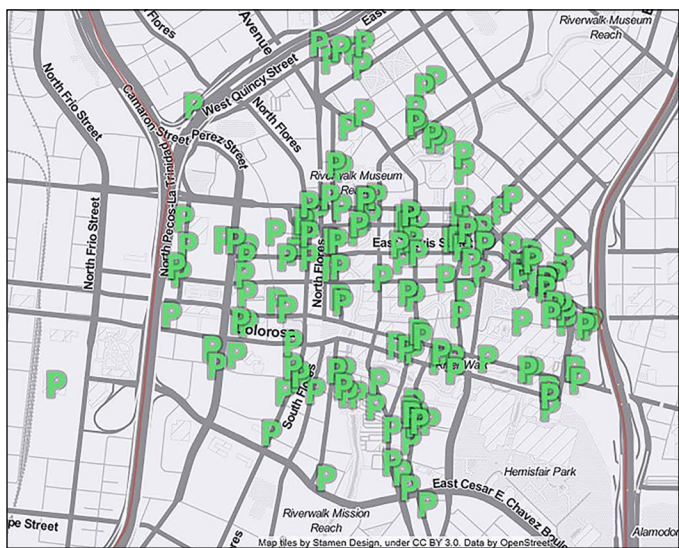


Figure 11. San Antonio downtown parking and surface lots.

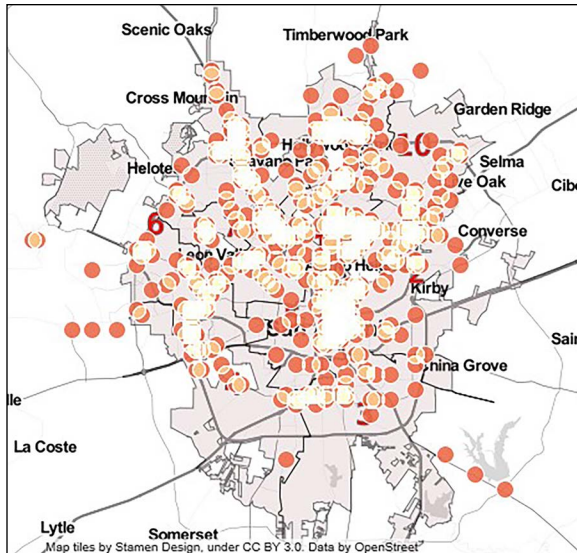


Figure 12. Alcohol sales in February 2017.

Implementation

The initial step in building this case study was to collect data with corresponding geographic information and then use push pins on a physical map to capture the city’s music venues, music festivals, music-related businesses, music nonprofits, and downtown parking garages and surface lots (Figure 13). This initial step has been very useful to notice and correct errors due to batch conversions of 774 data points related to music-related activities and 8,051 to non-music-related activities. Converting individual addresses into latitudes and longitudes is laborious work. Fortunately, batch geocoders are applications that can generate coordinates for large sets of addresses. Those geocoder applications often require an application key. That key can be obtained at no cost from the Mapquest or Google Map developers page.

Once the addresses for each layer of data were geocoded, the data were imported one layer at a time into the location intelligence platform. Carto²³ and ArcGIS developed by ESRI²⁴ are the two leading GIS proprietary software packages. Both platforms were applied in realizing this case study. They offer online interactive base maps that can be shared via email or social media, can function as self-standing web applications, and can be embedded into a website. However, Carto has an animation feature that

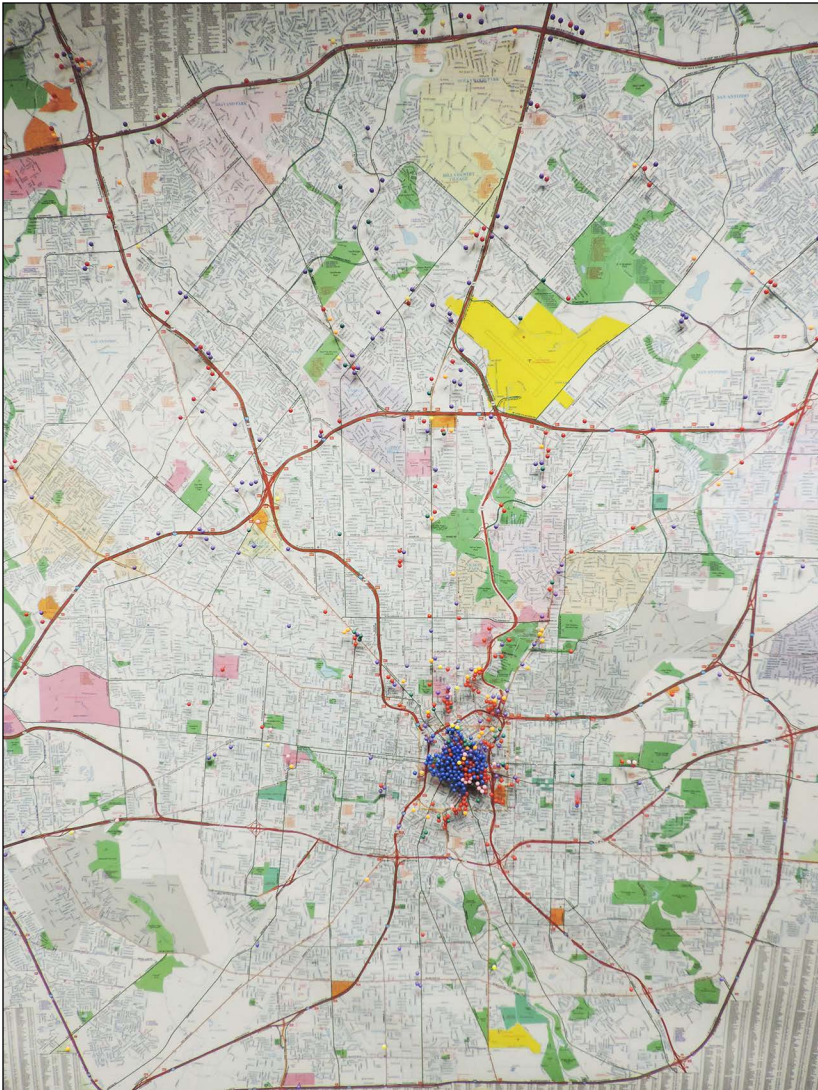


Figure 13. Physical map of San Antonio with push pins indicating the location of music venues, music festivals, music-related businesses, music nonprofits, and downtown parking garages and surface lots.

can plot data based on time series.²⁵ A temporal (dates) or numerical dimension is needed to animate GIS data. This feature was useful to animate the alcohol sales data (monthly sales for twelve months) while overlaying the other eight layers against it to test for correlation (see Figure 12). The animation feature is not available in the application published with this case study due to the software license cost. However, a GIF animation showing the correlation between alcohol and music-related activities is available [here](#).²⁶ Also, each layer of data has been isolated (not aggregated with other layers), which facilitates the visualization and analysis process. Indeed, avoiding aggregating layers of data limits the clutter within the visualization output. This allows the user to then overlay different map combinations in real time (see Figure 14).

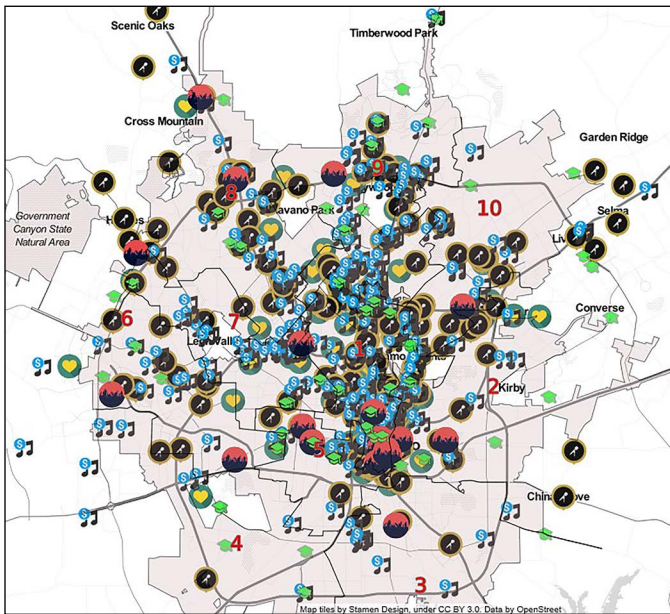


Figure 14. Map overlay of music venues, music festivals, music nonprofits, music-related businesses, music education organizations, and districts. This map shows that the musical landscape of San Antonio is concentrated downtown and along Interstate 10 and U.S. Route 281.

After the data are imported into the GIS software, the layers can be organized and symbols for each layer chosen (e.g., in Figure 8, dollar

signs with musical notes illustrate the music-related business data layer). Also, as mentioned, temporal data can be animated at this point with the intention to illustrate trends (e.g., monthly alcohol sales as seen in Figure 12 and incorporation dates for any of the music-related cultural assets illustrated in Figures 6 through 10). In addition, many optional features are available within the GIS platforms such as heat maps as well as aggregate and transparency options. Finally, pop-ups can be configured for each specific location within the application (see Figure 15).

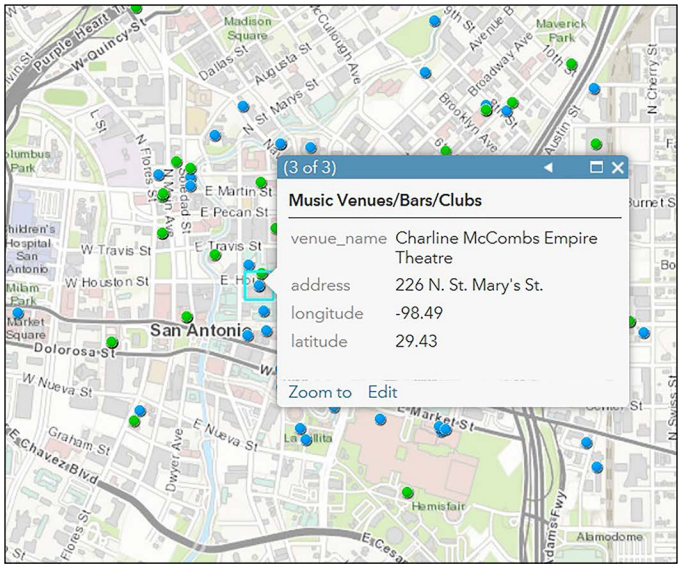


Figure 15. Example of a pop-up menu tied to geocoded data.

Case Study Analysis

Up to this point, we have covered the objectives of the case study, some background on San Antonio, and an explanation on how to implement the data. Next, a detailed analysis of the case study is proposed. First, the analysis starts with an interpretation of the visual output:

1. The GIS data inform us that San Antonio's music-related activities are mostly concentrated downtown within District 1 and along highways, especially Interstate 10 and U.S. Route 281 (see Figure 14). When zooming within the application, one can see that most

of the downtown venues are located on St. Mary's Street also known as the St. Mary's Strip. San Antonio does not currently hold a cultural district designation. This stretch of music venues would make the St. Mary's Strip a perfect candidate for such designation.

2. The largest concentration of paid parking is located in District 1 (see Figure 7). Parking in most instances is free in other districts. That is especially significant in Districts 6, 7, 8, 9, and 10. These are the most populous districts in San Antonio that have experienced the most growth in the past twenty years (see Figures 1 and 2) and are also the wealthiest (Figure 3). In those districts, abundance of parking, rapid growth, and wealth have certainly shown strong correlation. These three variables have also been essential in driving the proliferation of music venues and other entertainment options to the north and northwest part of the city.
3. In addition, music assets are disproportionately distributed across San Antonio (see Figure 14). Many fewer venues, festivals, and music-business related activities are represented in the southern and eastern part of the city in Districts 2, 3, and 4. Those are the poorest districts in the city. According to the data, the most negative implication is the lack of music education offered in those areas (see Figure 10). Thus, we can see that the lack of music education strongly correlates with lower numbers of overall music assets (Figure 14). Also, coming as a surprise, music nonprofits in those same areas are mostly nonexistent (Figure 9). This does not imply that music organizations are not highly engaged in the poorest part of the city—as they certainly are—but rather that their offices tend to be located in more affluent areas.
4. Music festivals are not as concentrated as the other music-related activities in San Antonio (see Figure 7). With many large open and enclosed spaces and free parking outside of District 1, festival promoters are pushing their ventures towards the outskirts of town. However, the southern and eastern portions of the city are still largely left out.
5. All music-related activities in San Antonio are very much correlated with each other, which portrays a highly interdependent music economy.

Next, the data were animated and revealed several dynamic trends:

1. Using incorporation dates as a mean to animate the GIS data, we learn that the music-centric cultural assets of San Antonio are growing towards the northwest part of town along I-10 towards

the La Cantera shopping outlet and the University of Texas at San Antonio's (UTSA) Main Campus (District 8), and north along U.S. Route 281 towards and past Loop 1604 and the wealthy Stone Oak area (District 9). Also, some initial growth is captured spurring along I-35, the highway that leads towards Austin in the south corridor of district 10 (see Figure 16). Please note: using incorporation dates has its limitation and is a rather crude measure considering that each location can have its ups and downs, new owners or investment. However, it has been a helpful tool to assess where more recent establishments have been appearing in the city. The red arrows in Figure 16 indicate where the newest music-centric cultural assets are proliferating.

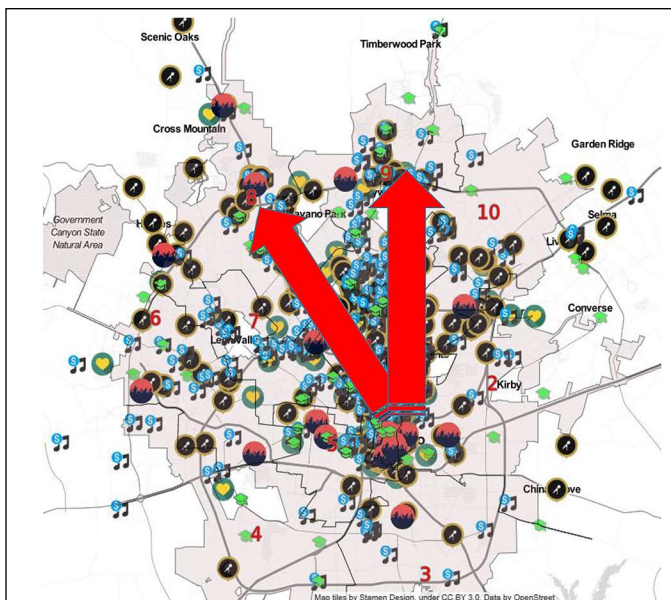


Figure 16. Map illustrating the growth trajectory of San Antonio's musical landscape.

2. Moreover, the analysis shows a strong correlation between the industry growth direction and the higher income areas in Districts 8 and 9. Indeed, both areas of growth are some of the wealthier in San Antonio and include some of the largest employers in the city including the energy company Valero, the military bank and insurance company USAA, UTSA, the broadcasting and

outdoor advertisement company Clear Channel, and the Medical Center, which is a medical hub of hospitals and medical research facilities.²⁷

3. In addition, the GIS data display a strong interdependence between music-centric educational organizations and other music-related activities in the city (Figure 15).
4. Finally, alcohol sales correlate significantly with music-related activities in San Antonio. This supports the argument that the beverage industry largely fuels the live music economy of the city (Figure 12).²⁸

Discussion and Conclusion

The main objectives of this case study have been met thanks to the use of location intelligence. Indeed, mapping the scale and scope of the musical landscape of San Antonio was accomplished and an interactive application was created. Nine layers and 8,825 fields of data were collected, manipulated, and analyzed successfully. The GIS analysis of this data informed us that the music-centric cultural assets of San Antonio are growing towards the north and northwest part of the city. Also, some growth has been captured spurring northeast of the city along the highway leading towards Austin. The analysis also revealed that musical assets are disproportionately distributed across the city largely omitting the south and east parts of town. Finally, a strong correlation is revealed between alcohol sales and music-related activities across the city implying that alcohol sales largely fund the live music economy of San Antonio. Thus, the study provides several impactful trends that can be used to inform policy makers.

Reproducing a similar study could benefit departments of arts and culture, tourism bureaus, and music programs. Some of the main goals and benefits of such a study mapping cultural assets are:

1. To identify creative ecosystems and cultural concentrations that exist, are emerging, or have potential to emerge.
2. To inform strategic investment in cities' cultural and creative infrastructure.
3. To encourage cultural district planning and guide conversations on cultural district designation and formation.
4. To help guide the development of place-based strategies and partnerships that preserve, cultivate, and grow creative ecosystems.
5. To expand on creative placemaking goals to support thriving in place to ensure future community-driven efforts to support local

- arts and culture, allow communities to avoid displacement.
6. To build community capacity and empower community organizing efforts to understand and articulate the needs of their cultural landscape as they pursue place-based solutions.
 7. To complement music economic impact studies with a spatial and dynamic element.

(Adapted from the *CAMP Report 2018*)²⁹

In addition, this study has implications across many disciplines and hopefully can serve as reference for studies ranging from urban geography to music consumption. Thus, location intelligence is a fascinating methodology that has many potential applications in the entertainment industries.

However, there are several limitations to using location intelligence. Because it is based on location data and latitudes and longitudes, many on-line businesses and music companies operated from a home office are not captured by this methodology. Another significant drawback is that GIS does not show causality. Indeed, GIS does not imply cause and effect, but only correlation, which is the interdependence of various qualities (and data sets). Thus, for example, answering whether there is any evidence that the diversification of entertainment options contributes to urban development is not possible if using GIS by itself. However, it is possible to infer causality using GIS in conjunction with Agent-Based Modeling (ABM).³⁰ ABM models the causality of individuals or objects in time and space. Thus, a synergy exists between ABM and GIS. However, as of this writing, there is no such study related to music or music cities combining the two methodologies. In an interview by Artz (2013), Kevin Johnson, an expert spatial analyst, explains how ABM works:

Conceptually, in ABM you give instructions to virtual agents that allow the agents to interact with each other and their environment. Agents can be people, wildlife, tanks, cars, or any discrete object. From the resulting decisions and actions of the agents, patterns are created in time and space. Unlike many other modeling techniques that quantify and then re-create the patterns, agent-based models explore the causes of the patterns. (Artz 2013)

Johnson is also the editor of the book *Agent Analyst: Agent-Based Modeling in ArcGIS*, which gives detailed instructions on how to best integrate GIS and ABM using the open source software Agent Analyst.³¹ But, it is beyond the scope of the present study to combine both methodologies. Despite the lack of causality and limitations related to geographic data, GIS can be a powerful tool that can identify the source of an audience based on its tickets sales, animate music consumption showing trends, inform entrepreneurs of potential opportunities, and enhance music impact studies by adding a strong visual and interactive element.

Location intelligence offers a powerful visualization tool and a means to treat large sets of specific and boundary data alike that can be applied to the music industry. It informs researchers of areas of density and can infer correlation. In addition, layers of data can be used to create interactive map overlays and projections that can be shared online. Location intelligence provides an additional dynamic tool for those interested in crafting studies with a location data component. There is especially much potential for future research applying GIS to music consumption, ticket sales, and music marketing.

Endnotes

1. <https://musiccanada.com/>.
2. <https://arcg.is/0HD5O4>.
3. <http://www.concertssa.co.za/wp-content/uploads/2015/03/moshito-mmimo-mapping-sa-live-music-circuit-2010.pdf>.
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