Neighborhood Parks in Downtown Austin:

Analysis of Open Space Availability and Residential Growth

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CRP 386: Introduction to Geographic Information Systems
EXECUTIVE SUMMARY

In downtown Austin there is currently a significant increase in the number of residential units being built while new parks and open space that specifically serve the downtown residential area do not appear to be a consideration. The issue of the quality and amount of park and open space per capita is becoming increasingly important as the population of downtown is rapidly expanding. Mayor Will Wynn has a goal of 25,000 downtown residents by the year 2015 and a report from the Downtown Commission regarding the possibility of achieving this goal makes no mention of increasing parks and open space. One of the benefits to living in a dense urban area is convenience to amenities and services, including spaces for rest and recreation. In this study I analyzed current and projected population growth and looked at the current amount of park space that serves Census Tract 11 in downtown Austin and determined that there is not enough park space, per the national standard set by the National Recreation and Park Association, to meet the mayor’s 2015 population goal. I identified approximately 30 acres of parcels within Tract 11 that are appropriate for development into new parks, and also identified blocks within a smaller study area that need streetscape improvements in order to provide better connectivity between residential developments and existing parks. Parks and open space are vital amenities to a community and should be highly considered when deliberately increasing population and density in important area like downtown Austin.

INTRODUCTION

Many cities around the country are struggling with how to make their downtowns economically viable in order to draw in new businesses and residents. High rise, mixed use developments are quickly changing the skylines of cities as developers strive to make their developments attractive to potential buyers. The changing demographics in America, with a growing percentage of singles, married couples without children and empty nesters, are driving the demand for higher density living within walking distance of daily necessities. With so much focus placed on bringing residents to downtown areas and building up a supply of restaurants, retail, grocery stores and coffee shops, open space provisions are often overlooked and when they are included as part of a development, they are usually in the form of plazas in front of the building that lack a feeling of “publicness”. The plaza is too close to the development for the general public to feel welcome to use the space if they are not a resident, worker or client of the building (Banerjee, 2001). Parks and open space are garnering more attention as an important factor in the success of urban areas in general, but more careful consideration needs to be paid to the benefits of park space in redeveloping of downtowns and making them more attractive to residents, businesses and visitors alike.

Development Pressures and Open Space

Parks and open space do not in themselves generate much revenue, certainly not as much as mixed use developments, but they do contribute to the overall quality of life and character that can make downtown living even more attractive. Downtown parks within walking distance of residential developments can also increase the value of these
developments, countering the argument that parks cost more than they pay (Lerner & Poole, 1999). City parks and open space have been found to improve physical and psychological health, provide environmental benefits and create stronger, closer knit communities. With so many high rise towers going up all over the country, isolated systems in themselves, an increase in the quantity and quality of park space in downtown areas will serve to draw people into communal spaces and spark physical personal interaction.

Growth pressure in cities is coupled with a growing need for environmental protection. The Urban Land Institute (ULI) published a brochure in 2002 that counters many myths regarding compatibility of the environment and development. The ULI found that projects that include green features tend to achieve premium pricing and faster selling and leasing of units than conventional developments. Additionally, land use regulations and zoning often inhibit rather than promote protection of green spaces. Regulations that disallow dense development must be scrutinized as density and infill development are essential to protecting existing park space and allowing room for growth of parks and open space (O'Neill, 2002).

Benefits and Accessibility of Parks and Open Space

There have been many studies conducted on the benefits of urban park space, from environmental benefits to economic benefits. The Trust for Public Land published a report in 2003 that outlined numerous advantages to revitalizing existing and creating new park space in cities. Access to park space contributes to public health by promoting exercise, and a study conducted by the Center for Disease Control showed that improved access to green spaces appropriate for physical activity led to a 25.6 percent increase in the number of people exercising three or more days a week. Property values have also been shown to increase due to the attractiveness of living near green space; an increase in property value leads to an increase in property taxes, which can be adequate to pay for the debt incurred from creation of the park space. Park space in cities is also attractive for corporations looking to relocate, providing quality of life benefits for its employees and generating additional revenue for the city. An increase in park space, specifically an increase in the number of trees, contributes to removing air pollution, generating oxygen and controlling soil erosion. And access to parks and recreational opportunities has been shown to reduce criminal activity, especially in low income neighborhoods (Sherer, 2003). The numerous benefits of city park space make a very good argument for cities to scrutinize their available park inventory and accessibility for all residents.

Studies have shown that the amount of park space, especially the amount of park space within walking distance of homes, in American cities is very inadequate. The Trust for Public Land also looked at access to park space in large metropolitan areas and found that only 30% of Los Angeles residents live within walking distance of a park. Atlanta does not have any public parks larger than 1/3 of a square mile. And while New York City as a whole has adequate park space, over half of the city’s 59 community districts have less than 1.5 acres of parks per 1000 residents. Even in cities that have enough park space per capita, measured against the national standard of 10 acres per 1000 residents, there are
still many neighborhoods within those cities that do not have easy access to parks and open space (Sherer, 2003). City planning departments not only should be looking at the amount of park space available for existing residents in existing residential developments, but the amount of park space required when building new developments for new or relocated residents.

**Downtown Livability**

Downtowns specifically have been analyzed in terms of criteria for livability, and adequate park space is definitely on the list. A paper prepared in 1999 for the Brookings Institution discusses the need for small neighborhood parks in downtowns with increasing downtown density, and notes that the challenge will be finding adequate spaces, as increasing density means decreasing vacant parcels (Moulton, 1999). An additional paper prepared for the Brookings Institution in 2005, that discusses steps to downtown revitalization, includes creating a strategy for parks and open space an essential part of developing public infrastructure to enhance downtown livability (Leinberger, 2005).

Revitalizing downtown areas in the 21st century largely means increasing density and converting vacant or underused parcels such as parking lots. A two acre parcel in the middle of Boston’s financial district was successfully converted from a concrete parking garage to a downtown park with a lawn, benches, café and sculpture garden. The park with all of its amenities provides a much needed center for the district. People and businesses are drawn to the area because of the park, something a parking garage does not achieve. Similar turnarounds have occurred in spaces such as New York’s Bryant Park and Washington D.C.’s Meridian Hill Park, and these turnarounds can be used as examples for revitalization of downtown parks and underutilized parcels around the country (Lerner & Poole, 1999).

**Austin, Texas: A Case Study in Park Space and Downtown Revitalization**

Austin, Texas has always promoted itself as an outdoor city, with an extensive park and trail system surrounding Town Lake just south of downtown and numerous parks and greenbelts located throughout the city. The city is experiencing tremendous expansion in the number of available housing units in the downtown area, with nearly a dozen high rises newly completed or under construction. An area once overrun with surface parking lots, parking garages and other underutilized parcels is now seeing mixed use residential towers spring up in these locations. However, the number and quality of neighborhood-level parks and public spaces in the downtown area is lacking, and with the large increase in residents that is anticipated this is problem that needs to be addressed quickly. The population of downtown Austin, defined as Census Tracts 7 and 11 by the city, per the 2000 Census was 3,855 with 62% of the population residing in Tract 11 (Downtown Austin 2000 Census Residential Demographic Profile, 2000). The majority of the new development post 2000 is occurring in Census Tract 11, which is the focus area for this report. The boundaries for Census Tracts 7 and 11 and their corresponding 2000 populations are shown in Figure 1.
Figure 1. Downtown Census Tracts

Downtown Census Tracts

Austin, Texas

Produced by: Sara Hammerschmidt
December 13, 2008
Data Sources: CAPCOG, City of Austin, Census 2000 TIGER/Line Data
New developments in Census Tract 11, completed between 2000 and 2011, are estimated to add 5,030 new residents in the area based on full occupancy of units and using the average household size of 1.46 from Tract 11 in the 2000 Census. This will bring the total number of residents in Tract 11 to 7,416 (Census, 2000). A summary of the new developments, the number of units and the estimated residents can be found in Table 1. In addition to the currently expanding population (between 2000 and 2011, Census Tract 11 will more than double in size), in 2006 the current mayor of Austin, Will Wynn, publicly stated his goal of 25,000 residents living downtown by the year 2015 (Downtown's Tall Order: Where can we Put 20,000 new residents?, 2006) and the Downtown Commission has done studies regarding necessary zoning and land use changes needed to achieve this goal (City of Austin Downtown Commission, 2006). Using the assumption that the 2000 population split between Tract 7 and Tract 11 will continue, there will be 15,500 people living in Tract 11 if the mayor achieves his goal. Based on the park space standard of 10 acres per 1000 residents set by the National Recreation and Park Association, there will need to be 155 acres of walkable and accessible park space for Census Tract 11 by 2015 (Neighborhood Parks Council, 2007). The downtown Census Tracts do have the benefit of close proximity to some of Austin’s best city parks that are used by all residents of the city – Zilker Park, Town Lake Trail and Auditorium Shores. While these are not parks serving solely the neighborhoods they are located in, they should still be considered towards the 155 acres needed as they are relatively accessible from downtown. These three parks make up 183 acres of open space. With an estimated total City of Austin population of 853,691 by the year 2015, the downtown population of 25,000 accounting for 3 percent of this population, these city parks proportionately contribute 5.3 acres (3 percent) to the downtown residents (City of Austin - Spatial Analysis Group - Demographics, 2008).

This study will examine the current amount of accessible park space to Census Tract 11 determine the amount of potential shortage of this amenity versus the need of 150.7 acres due to planned residential growth, which is especially critical as any remaining vacant parcels will likely be considered for residential developments rather than open space provisions. A balance of residential development with various amenities – parks, safety, character, investment potential and easy accessibility to daily needs – is necessary to ensure a successful and livable downtown.
### Table 1. Census Tract 11 Residential Developments 2000 through 2011

<table>
<thead>
<tr>
<th>Project Name</th>
<th>Number of Stories</th>
<th>Number of Units</th>
<th>Year Built</th>
<th>Estimated Residents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gables West Avenue</td>
<td>4</td>
<td>239</td>
<td>2000</td>
<td>349</td>
</tr>
<tr>
<td>Nokonah Condominiums</td>
<td>11</td>
<td>95</td>
<td>2002</td>
<td>139</td>
</tr>
<tr>
<td>Plaza Lofts</td>
<td>12</td>
<td>60</td>
<td>2002</td>
<td>88</td>
</tr>
<tr>
<td>404 Rio Grande</td>
<td>4</td>
<td>140</td>
<td>2003</td>
<td>205</td>
</tr>
<tr>
<td>Austin City Lofts</td>
<td>14</td>
<td>82</td>
<td>2003</td>
<td>120</td>
</tr>
<tr>
<td>AMLI Downtown</td>
<td>5</td>
<td>220</td>
<td>2004</td>
<td>322</td>
</tr>
<tr>
<td>The 5 Fifty Five</td>
<td>31</td>
<td>99</td>
<td>2004</td>
<td>145</td>
</tr>
<tr>
<td>Milago</td>
<td>13</td>
<td>240</td>
<td>2006</td>
<td>351</td>
</tr>
<tr>
<td>AMLI Block 22</td>
<td>18</td>
<td>231</td>
<td>2006</td>
<td>338</td>
</tr>
<tr>
<td>Red River Flats</td>
<td>4</td>
<td>122</td>
<td>2007</td>
<td>179</td>
</tr>
<tr>
<td>Austin 360</td>
<td>44</td>
<td>432</td>
<td>2008</td>
<td>631</td>
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<td>The Monarch</td>
<td>29</td>
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<td>2008</td>
<td>446</td>
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<tr>
<td>The Shore</td>
<td>23</td>
<td>192</td>
<td>2008</td>
<td>281</td>
</tr>
<tr>
<td>Legacy on the Lake</td>
<td>31</td>
<td>187</td>
<td>2009</td>
<td>274</td>
</tr>
<tr>
<td>721 Congress</td>
<td>7</td>
<td>16</td>
<td>2009</td>
<td>24</td>
</tr>
<tr>
<td>The Ashton</td>
<td>36</td>
<td>259</td>
<td>2009</td>
<td>379</td>
</tr>
<tr>
<td>The Austonian</td>
<td>56</td>
<td>188</td>
<td>2010</td>
<td>275</td>
</tr>
<tr>
<td>Four Seasons Residences</td>
<td>30</td>
<td>166</td>
<td>2010</td>
<td>243</td>
</tr>
<tr>
<td>W Hotel and Residences</td>
<td>36</td>
<td>165</td>
<td>2011</td>
<td>241</td>
</tr>
</tbody>
</table>

**Total** 19 Projects 5,030 Residents

Source: Downtown Austin Alliance, austintowers.net
PROBLEM STATEMENT AND RESEARCH QUESTIONS

This project will look at Census Tract 11 in downtown Austin and identify existing parks and open space in and accessible from the area to determine if the amount of existing park space is adequate for the projected number of residents. The hypothesis of this study is that there is not enough neighborhood level park space within and walkable from Census Tract 11 to meet the needs of the growing downtown residential population.

Additionally, by conducting spatial analysis on new residential developments and location of parks, the area of the tract with the largest projected number of residents will be selected and connectivity between these developments and parks will be examined. Even if enough park space exists, if there is not a safe and attractive way for residents to access the parks the spaces will not be well used.

The research questions considered are:

- How much park space is within walking distance (1/4 mile) of Census Tract 11 residential developments?
- Is there enough park space, in acres per capita based on the national standard of 10 acres per 1000 people, within and walkable from Census Tract 11 to support the current (2008 including units under construction) and projected (2015) population?
- Where are appropriate locations for new parks within Census Tract 11, based on the current use of parcels (undeveloped or parking lots)?
- Where can connectivity be improved between residential developments and existing parks, in terms of streetscape and sidewalks?

By conducting spatial analysis with data related to residential development locations, estimated residential growth and existing park space, the hypothesis and research questions can be tested and answered.

METHODOLOGY

The methodology used for this study is based on determining existing population and population growth for the downtown study area and analyzing this growth in reference to available park space within the area. The study area was originally chosen to be the area bounded by IH-35 to the east, Rio Grande Street to the west, 12th Street to the north and Cesar Chavez Street to the south, as this is the area typically referred to as downtown. After obtaining Census Tract information, I expanded this area to include all of Census Tract 11. I needed the following types of data to conduct my analysis:
Data Types

Demographic Data
I used data from Census 2000 for the City of Austin to determine the study area and the population of the study area in 2000. The boundaries of the Census Tracts were inspected to determine the appropriate tract for the study area, and the blocks and population were used to calculate population density (residents per acre in 2000).

Downtown Residences
I compiled a database of residential developments, both existing and under construction, within Census Tract 11 using information from the Downtown Austin Alliance (DAA) and austintowers.net. I obtained information on the development address, year built, number of floors and number of units, and used visual inspection to determine the Census Block that each development is located in. I used the average household size for Census Tract 11 from the 2000 Census to estimate the number of residents in each development based on the number of units.

Parks Inventory
I downloaded parks data from the City of Austin, Travis County and the State of Texas to determine the parks located within or adjacent to Census Tract 11. There are no county and state parks located in this area but are several city parks to be used in the analysis.

Land Use
In order to determine appropriate locations for new parks within Census Tract 11, I needed land use data for the area. The land use data from the City of Austin was last updated in 2003, so I also downloaded aerial photographs from 2008 from the Capital Area Council of Governments (CAPCOG). I determined locations of undeveloped and parking parcels from the layer downloaded from the city and compared the results to the aerial photographs to find out if the land use had changed between 2003 and 2008. Appropriate locations included corner lots to promote accessibility, undeveloped parcels, parcels adjacent to existing green space and surface parking lots.

Reference Data
Several other layers (street centerlines, lakes and creeks) were downloaded from the City of Austin and the Capital Area Council of Governments to be used as reference data in the maps.

Preparing Data for Analysis
In order to make comprehensive maps of the study area, I needed to prepare the data that I downloaded using various methods that are summarized below.
In order to determine the study area, I downloaded the Census Blocks and Census Tracts from the 2000 Census from Geography Network. I projected these layers as “State Plane Texas Central 1983” and added the layers to ArcMap. I also downloaded the ‘Street Centerlines’ shapefile from the City of Austin GIS database and added that layer to ArcMap. I visually inspected the ‘Census Tract 2000’ layer overlaid with the ‘Street Centerlines’ layer in order to determine which Census Tract corresponded with the downtown area and decided that Census Tract 11 should be the study area. I used “Select by Features” to isolate Tract 11 and export to a new layer (“Tract 11”) and used the “Clip” tool to clip the ‘Census Block 2000’ layer to the ‘Tract 11’ layer.

Population Density in 2000

I joined the 2000 Census SF1 table that I downloaded from Geography Network to the ‘Tract 11’ layer and calculated the area of each Census block in acres. I used symbology to normalize population over area to determine the density of each Census block for the 2000 population.

Location of Residential Developments

I created an address locator in ArcCatalog of the type “US Streets with Zone” using the ‘str_address’ layer from the City of Austin to match the addresses in my database of developments that are existing and under construction to locations on the map. I added the database and the address locator to ArcMap in order to geocode the addresses, performed batch geocoding and corrected any incorrect entries using interactive rematch and my knowledge of the area. I used symbology to differentiate between developments built before 2000 and in 2000 and beyond.

Population Density in 2011

I made an assumption that, since the population of downtown Austin is obviously growing, the 2000 population will remain as a baseline upon which to add the estimated population for the new developments. Using the database I created based on data from the Downtown Austin Alliance (DAA) and austintowers.net, I joined the data to the layer containing SF1 data and Census block information. I added a field to calculate the total 2011 population by Census block by adding the 2000 population to the incremental population for new developments built in 2000 and beyond. I used symbology to normalize 2011 population over area to determine the density of each Census block for the 2000 population.

Parks inventory for City of Austin, Travis County and State of Texas parks

I downloaded parks data for the City of Austin, Travis County and the State of Texas and determined that the only parks that are in or adjacent to Census Tract 11 are city parks. I overlaid the parks data on the location of residential developments layer and created a ¼
mile buffer around the residential developments. I manually selected the parks that lie within the ¼ mile buffer, making the assumption that a resident will not walk across IH-35 or cross Town Lake to access a park. I exported the parks that lie within or are accessible from Tract 11 to a new layer to compare the amount of park space to the number of residents expected to be living downtown by 2011.

Underutilized Parcels

In order to suggest locations for potential new parks, I obtained the Land Use 2003 layer from the City of Austin and clipped the layer to the Tract 11 study area. I selected only undeveloped parcels or parcels designated as parking and exported those parcels to a new layer. I then overlaid aerial photographs from CAPCOG taken in 2008 to manually determine if any of the parking or undeveloped parcels have changed land use between 2003 and 2008, which is very possible due to the current amount of development in Downtown Austin.

Detailed Study Area

I selected an area to analyze in depth and to make suggestions for connectivity improvements to existing parks. I found that seven developments within the area bounded by Nueces Street on the west, Congress Avenue on the east, Cesar Chavez on the south and 6th Street on the north make up nearly 50% of the estimated new population of Tract 11. I exported these seven developments to a separate layer. All of these developments were built post 2002 or are currently under construction and should have adequate streetscapes per the Downtown Design Guidelines that were established in 2000 (City of Austin - Downtown Austin Design Guidelines, 2000). I digitized new corridors using the Drawing toolbar between these developments and parks within ¼ mile to note where improvements in the streetscape (trees, lighting, wider sidewalks and street furniture) could help create a feeling of connectivity between the residences and park space.

FINDINGS

The following series of maps represent the findings of my research questions and will be discussed in greater detail in the Analysis section.


Austin, Texas

Map produced by: Sara Hammerschmidt
December 13, 2008
Data Sources: CAPCOG, City of Austin, Census 2000 TIGER/Line Data
Map 2: Location of Downtown Residences

Location of Downtown Residences

Austin, Texas

Produced by: Sara Hammerschmidt
December 13, 2008
Data Sources: CAPCOG, City of Austin,
Census 2000 TIGER/Line Data, DAA, austin-towers.net


Austin, Texas

New Developments
Estimated Population
- 24 - 150
- 151 - 300
- 301 - 450
- 451 - 631

Streets
- Town Lake
- Census Tract 11

Produced by: Sara Hammerschmidt
December 13, 2008
Data Sources: CAPCOG, City of Austin,
Census 2000 TIGER/Line Data, DAA, austin.towers.net
Map 4: Census Tract 11 Population Density (2011)

Census Tract 11 Population Density (2011)

Austin, Texas

Study Area - Census Tract 11

Residents per Acre

- 0
- 1-15
- 16 - 40
- 41 - 90
- 91 - 240

Produced by: Sara Hammerschmidt
December 13, 2008
Data Sources: CAPCOG, City of Austin, Census 2000 TIGER/Line Data, DAA, austin-trends.net
Map 5: Parks Within and Accessible from Tract 11

Austin, Texas

Produced by: Sara Hammerschmidt
December 13, 2008
Data Sources CAPCOG, City of Austin,
Census 2000 TIGER/Line Data, DAA, austin.towers.net
Underutilized Parcels within Tract 11

*Austin, Texas*
Map 7: Detailed Study Area within Tract 11

Austin, Texas

Produced by: Sara Hammerschmidt
December 13, 2008
Data Sources: CAPCOG, City of Austin, Census 2000, TIGER/Line Data, DAA, austin-towers.net
Suggested Block Improvements for Connectivity to Parks

Austin, Texas

Produced by: Sara Hammerschmidt
December 13, 2008

Data Sources: CAPCOG, City of Austin,
Census 2000 TIGER/Line Data, DAA, austinroads.net
ANALYSIS

Estimated Population and Growth of Census Tract 11

Census Tract 11, which had 2,386 residents in 2000, is estimated to have 7,416 residents upon completion in 2011 of all current construction. That is growth of over 200% in just over a decade and will fulfill half of Mayor Will Wynn’s goal of 20,000 downtown residents (an estimated 15,500 in Tract 11).

In 2000, the density of Tract 11 (shown in Map 1) was 3.5 residents per acre (the area of the Tract being 667.5 acres). With all of the new development, the density in 2011 (shown in Map 4) will increase to 11.1 residents per acre. As shown in Map 2 the majority of the existing developments are located in the northern half of the Census Tract. Density has intensified along the southern portion of Tract 11, along 2nd Street and West 4th and 5th Streets as shown in Maps 2 and 3. The increase in density, which is likely to increase even further with construction of additional residential development towers, is putting great pressure on the existing parks in and around Tract 11.

Parks Per Capita in Census Tract 11

The City of Austin parks that are located within or walkable from Census Tract 11 developments are shown in Map 5. The population of 7,416 that is estimated to live in Census Tract 11 by 2011 will require 74 acres of park space according to the national standard of 10 acres per 1000 residents. The total area of the directly accessible parks is 91 acres, or enough to support 9,100 downtown residents. While this is more than enough park space to support the number of residents expected to live in Census Tract 11 by 2011, it is lacking in the amount needed to support the 15,500 residents expected by 2015. The share of Zilker Park, Town Lake Trail and Auditorium Shores for the expected Tract 11 residents in 2015 is 5.3 acres and the current accessible park space is 91 acres, making the difference between needed in 2015 (155 acres) and currently available (96.3 acres) to be 58.7 acres.

Potential Locations for New Parks

A large portion of the 667.5 acres in Census Tract 11 is already developed but there are still a significant number of surface parking lots and some undeveloped parcels that could be considered for new park space. The 2003 Land Use Map from the City of Austin was compared to 2008 aerial photographs from CAPCOG to determine if parcels designated as undeveloped or parking in 2003 still have the same use in 2008. Map 6 shows the inventory of these parcels that could be adequate for new park space, using the criteria of surface parking or undeveloped land use, and corner lots to facilitate easy accessibility or adjacency to existing green spaces. The total area of these parcels is 30.5 acres, nearly 80% of which are surface parking lots. The development of these parcels into green spaces would contribute greatly towards the needed parks, but additional parcels for residential development are also needed to meet the population goal. However, any
additional acreage gained for parks will help increase the attractiveness of downtown living.

**Connectivity Improvements for Detailed Study Area**

While generating new parks may not be immediately achievable due to the needed balance between using vacant parcels for both residential development and open space, there are interventions that could be made in the short term to improve access and use of the existing parks in Census Tract 11. Through analyzing the location of the new developments in Maps 2 and 3, I found that there are seven developments within a five block by five block area, bounded by Nueces Street on the west, Congress Avenue on the east, Cesar Chavez on the south and 6th Street on the north, that make up nearly 50% of the estimated new population of Tract 11. These developments and the detailed study area are shown in Map 6. In 2000, the City of Austin implemented the Downtown Austin Design Guidelines as a way to address quality of life issues and business viability in the downtown area. These guidelines contain recommendations for the streetscape in front of new construction, including street trees, lighting, street furniture and sidewalk width. I made the assumption that the blocks surrounding the new developments, shown in Map 7, will have adequate streetscapes due to the Design Guidelines. However, there are many blocks that will need improvement in these areas in order to have improved visual connectivity between the developments and the parks, which are also denoted in Map 7. Ensuring a continuous visual connection, through the use of materials and lighting, will help promote the use of existing parks by providing a safe and attractive corridor of access.

**Caveats and Future Analysis**

There have been tremendous changes to the Census Tract 11 population since the 2000 Census and as the downtown area is projected to grow for the next several years, it will continue to be difficult to obtain accurate population data. The City of Austin provides population estimates but not by Census Tract so the population data I obtained and estimated comes from various sources, including websites that track downtown developments.

Additionally the planned downtown residential developments are continuously changing, making it difficult to estimate future population based on new properties. The data I provided is a snapshot of developments currently under construction but it can be assumed that more will be built that, upon completion, will add to the inventory of downtown residences, bringing the Mayor’s goal of 20,000 residents by 2015 within reach.

Census Tract 11 was analyzed as a whole and the location of new developments may put intense pressure on the parks that are located within walking distance of those developments. Additional analysis should be done, when determining appropriate vacant parcels to develop into new parks, to determine the specific blocks within the Census
Tract that are underserved in terms of park space and select vacant parcels for redevelopment that are in walking distance of those blocks.

CONCLUSION

Through spatial analysis I was able to determine that the amount of park space that is available to the residents of Census Tract 11 is not sufficient to meet the national open space standard of 10 acres per 1000 residents, based on the estimated projected population of 15,500 residents in this Census Tract by 2015. One of the benefits of living in the downtown area is the relative proximity to the large parks utilized by the entire city, but there are additional benefits involved in access and proximity to neighborhood parks within the Census Tract. These neighborhood parks contribute to a sense of community within the downtown area, which is an important element to shaping downtown into a desirable place to live.

Due to the limited amount of vacant land in Census Tract 11 and the need to build new residential developments in this area, the additional need of 58.7 acres to support the 2015 population does not appear to be achievable. Instead, improving visual connectivity to green spaces through improved streetscapes and wider sidewalks and improving the quality of the existing green spaces will serve to promote the use of these spaces. In 2007 the City of Austin Parks and Recreation Department started imposing a parkland dedication impact fee of approximately $650 per unit on new downtown developments with the goal of improving open space (Austin takes another look at how it pays for parks, 2007); if it is not possible to create enough new parks to support the expected 2015 population due to limited land availability, it is critical to instead use this revenue to improve the quality of and access to the existing downtown parks. There are many ways to make downtown living attractive to people, and paying attention to improving amenities such as park space is one of the most important.
REFERENCES

Data Sources

*Census Tracts, Census Blocks and Population Data:*

*Streets, Creeks, Parks, Land Use:*

*Aerial Photographs, Lakes:*

*Travis County Index Map:*

*Downtown Residential Developments Information:*


Works Cited

http://www.impactfees.com/pdfs_all/Austin%20takes%20another%20look%20at%20how%20it%20pays%20for%20parks.pdf


APPENDIX

Sources:

*Census Tracts, Census Blocks and Population Data:*

*Streets, Creeks:*
City of Austin: ftp://coageoid01.ci.austin.tx.us/GIS-Data/Regional/coa_gis

*Lakes:*
Capital Area Council of Governments:
http://www.lib.uwaterloo.ca/locations/umd/digital/citation.html

Projection and Datum:

NAD 1983 State Plane Texas Central FIPS 4203 (feet)

Steps:

- I downloaded Census Tract, Census Block and SF1 data from the Geography Network Census Data repository
- Using ArcCatalog I used the Project tool to re-projected the Census Tract and Census Block layers as “State Plane Texas Central 1983” and added them to ArcMap
- I downloaded ‘Street Centerlines’ from the City of Austin and added that layer to ArcMap
- I visually inspected the ‘Census Tract 2000’ layer with ‘Street Centerlines’ overlaid to determine the appropriate Census Tract to use (Tract 11)
- I used “Select by Features” to isolate Tract 11 and exported it to a new layer (‘Study Area – Census Tract 11’)
- I used the “Clip” tool to clip the ‘Census Block 2000’ layer to the ‘Study Area – Census Tract 11’ layer
- I added a field to the attribute table of ‘Study Area – Census Tract 11’ in order to calculate the area of each block to determine density
- The area of each block is in square feet so I added another field to the attribute table to convert the area into acres
- I added the 2000 Census SF1 table to ArcMap and joined the table using the STFID field to ‘Study Area – Census Tract 11’
- I used symbology to normalize population over area in acres to determine density by Census Block for 2000 population
Map 2: Location of Downtown Residences

Sources:

*Census Tracts, Census Blocks and Population Data:*

*Streets:*
City of Austin: ftp://coageoid01.ci.austin.tx.us/GIS-Data/Regional/coa_gis

*Lakes:*
Capital Area Council of Governments:
http://www.lib.uwaterloo.ca/locations/umd/digital/citation.html

*Address Verification:*
http://maps.google.com

*Projection and Datum:*
NAD 1983 State Plane Texas Central FIPS 4203 (feet)

Steps:
- I used the Population Density 2000 map as the base map and added the database of downtown residences to the map
- In ArcCatalog, I created a new address locator using the ‘str_address’ layer from the City of Austin as the reference as the type “US Streets and Zones”
- I added the Address Locator to ArcMap in order to geocode the addresses
- I performed batch geocoding by right clicking on the Excel table and selecting “Geocode Addresses”
- I used interactive rematch to correct unmatched entries by changing the street names in the database to match the ‘str_address’ layer
- I symbolized the residential developments to differentiate between residences built before 2000 and between 2000 and 2011

Sources:

Census Tracts, Census Blocks and Population Data:

Streets:
City of Austin: ftp://coageoid01.ci.austin.tx.us/GIS-Data/Regional/coa_gis

Lakes:
Capital Area Council of Governments:
http://www.lib.uwaterloo.ca/locations/umd/digital/citation.html

Development Locations:
Downtown Austin Alliance: http://www.downtownaustin.com
AustinTowers.net: http://www.austintowers.net/
Google maps: http://maps.google.com

Projection and Datum:

NAD 1983 State Plane Texas Central FIPS 4203 (feet)

Steps:

- I used the Location of Downtown Residences as the base map and selected by attributes the developments built between 2000 and 2011
- I exported the selection to a new layer and symbolized the layer in terms of estimated population of the new developments
Map 4: Census Tract 11 Population Density (2011)

Sources:

*Census Tracts, Census Blocks and Population Data:*

*Streets:*
City of Austin: ftp://coageoid01.ci.austin.tx.us/GIS-Data/Regional/coa_gis

*Lakes:*
Capital Area Council of Governments:
http://www.lib.uwaterloo.ca/locations/umd/digital/citation.html

*Development Locations:*
Downtown Austin Alliance: http://www.downtownaustin.com
AustinTowers.net: http://www.austintowers.net/
Google maps: http://maps.google.com

Projection and Datum:

NAD 1983 State Plane Texas Central FIPS 4203 (feet)

Steps:
- I used the Population Density 2000 map as the base map and added a new field for population of new developments by Census block to the joined SF1 data/Census Tract layer
- I added another new field to sum the 2000 and the incremental population in order to determine the estimated 2011 population
- I used symbology to normalize population over area in acres to determine density by Census Block for 2011 population
Map 5: Parks Within and Accessible from Tract 11

Sources:

Census Tracts, Census Blocks and Population Data:
Streets, Parks:
City of Austin: ftp://coageoid01.ci.austin.tx.us/GIS-Data/Regional/coa_gis
Lakes:
Development Locations:
Downtown Austin Alliance: http://www.downtownaustin.com
AustinTowers.net: http://www.austintowers.net/
Google maps: http://maps.google.com

Projection and Datum:
NAD 1983 State Plane Texas Central FIPS 4203 (feet)

Steps:
- I used the Location of Downtown Residences as the base map
- I downloaded the parks layers from the City of Austin, Travis County and State of Texas
- I added these layers to the ArcMap document and overlaid these layers on the Tract 11 study area; I determined that county and state parks do not fall within this area so removed those layers from the map document
- I created a ¼ mile buffer with the buffer tool using the Location of Downtown Residences shape file as the input
- I used the Select Features tool to manually select all parks that fall within Tract 11 and the ¼ mile buffer area (with the exception of Shoal Creek), making the assumption that IH-35 and Town Lake are barriers that will not be crossed
- Shoal Creek is a trail park that extends through North Austin, and I only wanted the portion that touches Tract 11; I used the editor toolbar to draw a new feature around the portion of Shoal Creek that I wanted to use and made that feature a new layer; I clipped Shoal Creek to that layer using the City of Austin parks layer as the input; I recalculated the area using “Calculate Geometry” in the attribute table of the Shoal Creek layer
- I dissolved the two parks layers (one without Shoal Creek and one with Shoal Creek) into a new layer of all parks accessible from Tract 11
- I calculated the total area of park space using the Statistics tool in order to compare this with the residential growth expected in 2011 and 2015
Map 6: Underutilized Parcels within Tract 11

Sources:

*Census Tracts, Census Blocks and Population Data:*

*Streets, Parks, Land Use:*
City of Austin: ftp://coageoid01.ci.austin.tx.us/GIS-Data/Regional/coa_gis

*Lakes:*
Capital Area Council of Governments:
http://www.lib.uwaterloo.ca/locations/umd/digital/citation.html

*Development Locations:*
Downtown Austin Alliance: http://www.downtownaustin.com
AustinTowers.net: http://www.austintowers.net/

*Google maps:*
http://maps.google.com

*Projection and Datum:*
NAD 1983 State Plane Texas Central FIPS 4203 (feet)

Steps:

- I used the Location of Downtown Residences as the base map
- I added the Land Use 2003 layer from the City of Austin
- I used the Clip tool to clip this layer to the Tract 11 study area and used Select by Attributes to isolate underutilized parcels (Undeveloped – code 900; and Parking – code 850)
- I symbolized the clipped land use layer to differentiate between undeveloped parcels and parcels used for parking
- I dissolved the Tract 11 study area layer using the Dissolve tool in order to show just the boundary of the tract
- I overlaid aerial photographs taking in 2008 that I downloaded from CAPCOG and carefully analyzed the current (2008) land use of the parcels designated as surface parking lots and undeveloped in 2003
- I used the Select Features tool to select parcels that still appear to be surface parking or undeveloped and are located on a corner or are adjacent to existing parkland and exported those parcels to a new layer; the corner location will ensure the new park is publicly accessible
- I calculated the total area of these prospective open space parcels using the Statistics tool to compare to the amount of park space needed in 2011 and by 2015 to support the residential growth
Map 7: Analysis of Detailed Study Area

Sources:

*Census Tracts, Census Blocks and Population Data:*

*Streets, Parks:*
City of Austin: ftp://coageoid01.ci.austin.tx.us/GIS-Data/Regional/koa_gis

*Lakes:*
Capital Area Council of Governments:
http://www.lib.uwaterloo.ca/locations/umd/digital/citation.html

*Development Locations:*
Downtown Austin Alliance: http://www.downtownaustin.com
AustinTowers.net: http://www.austintowers.net/
Google maps: http://maps.google.com

*Projection and Datum:*
NAD 1983 State Plane Texas Central FIPS 4203 (feet)

Steps:
- I used the Size of New Developments as the base map and analyzed the location and size of developments built from 2000 – 2011. I found that seven developments within the area bounded by Nueces Street on the west, Congress Avenue on the east, Cesar Chavez on the south and 6th Street on the north make up nearly 50% of the estimated new population of Tract 11.
- I used the Select Features tool to select these seven developments and exported them to a new layer.
Map 8: Suggested Block Improvements for Connectivity to Parks

Sources:

Census Tracts, Census Blocks and Population Data:

Streets, Parks:
City of Austin: ftp://coageoid01.ci.austin.tx.us/GIS-Data/Regional/coa_gis

Lakes:
Capital Area Council of Governments:
http://www.lib.uwaterloo.ca/locations/umd/digital/citation.html

Development Locations:
Downtown Austin Alliance: http://www.downtownaustin.com
AustinTowers.net: http://www.austintowers.net/
Google maps: http://maps.google.com

Projection and Datum:
NAD 1983 State Plane Texas Central FIPS 4203 (feet)

Steps:

- I used the Detailed Study Area as the base map and created a ¼ mile buffer using the buffer tool around the seven residential developments in the study area in order to determine which parks to include in connectivity improvements
- I made the assumption that these developments will have adequate streetscapes for creating connectivity along the blocks that they border
- I used the Create New Features tool on the Editor toolbar and the aerial photos to draw building footprints for the new developments and used the Drawing Toolbar to draw lines that define the blocks assumed to have adequate streetscape due to the new developments
- I used the Drawing Toolbar to draw lines that define the blocks that need streetscape improvements in order to create continuous connectivity between the developments and parks