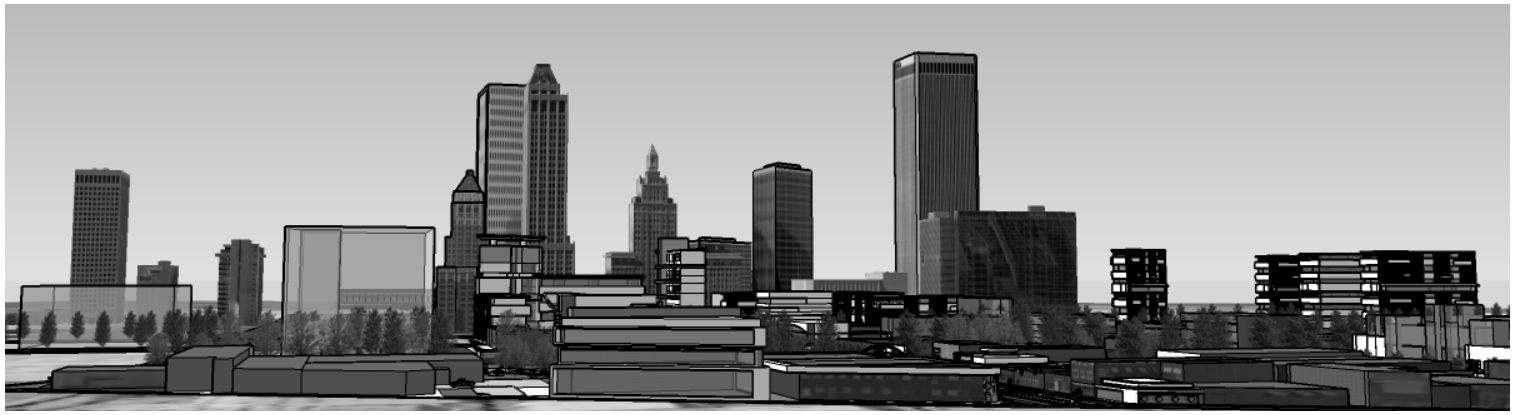
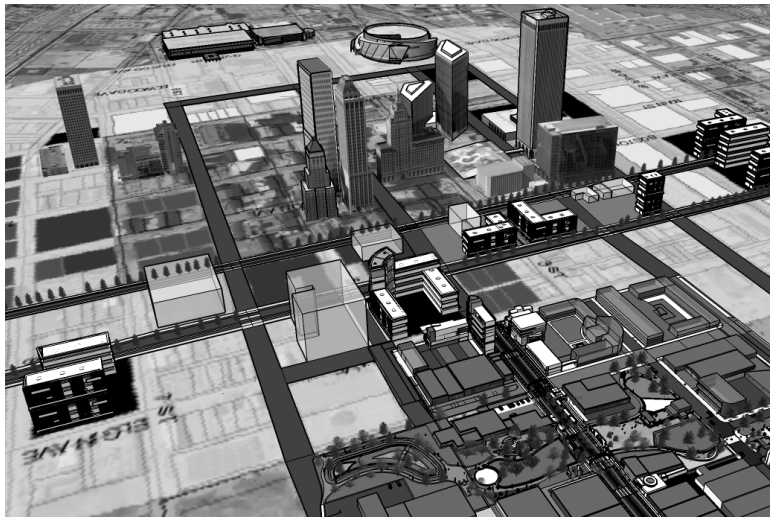
HOW DOWNTOWN CAN SAVE TULSA





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THE UNIVERSITY OF OKLAHOMA

GRADUATE COLLEGE

HOW DOWNTOWN CAN SAVE TULSA FROM SPRAWL

A PROFESSIONAL PROJECT

SUBMITTED TO THE GRADUATE FACULTY

In partial fulfillment of the requirement for the

Degree of

MASTER OF SCIENCE IN ARCHITECTURAL URBAN STUDIES

BY

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PREFACE

The Placemaking Conference on April 2013 and the same conference on March 25th in 2015 influenced me greatly. Understanding of content from both events were based on the importance of making a place livable and the necessity of creating a walkable community. Speakers talked about three main subjects including,

> Public Health Perspective

> Economical Sustainability

> Environmental Problems

THREE FUNCTIONS OF SPACE

According to Ellen Dunham-Jones, a Professor of Architecture and Urban design at Georgia Technical University and one of the speakers on April 2013 at The Placemaking Conference, sociologists classify an urban area into three space functions: home, work, and community space. The first two spaces are self-explanatory: people eat, sleep, and spend non-work and non-play time at home.[1] People labor in a workplace, generally to earn money to sustain themselves and their families. In a community space, people perform leisure activities, which may be doing nothing more than sitting in pleasant surroundings reading, daydreaming, or visiting with friends. Restaurants, shopping malls, and public commons such as parks, walking trail, gardens, plazas are considered community spaces.

1. http://iqc.ou.edu/conference, https://www.ted.com/talks/ellen_dunham_jones_retrofitting_suburbia?language=en

THE CONCEPT OF A WALKABLE DOWNTOWN

On April 3rd 2013 at the Placemaking Conference Jeff Speck, an Urban Planner and the author of Walkable City: How Downtown Can Save America One Step at a Time, he explained why fixing downtown should be the first step to create a walkable city. This report adapts his approach to ask an essential question, "How the Downtown Can Save Tulsa?"

The positive impacts of a walkable downtown are based on two important reasons including public health improvement, economical development and environmental preservation. The first reason is that downtown belongs to every citizen and is part of public space for everyone. The second reason is that downtown creates the image of the city and sometimes even beyond that it represents the state and third it is easier to change a town and create a sort of density in downtown blocks because the existing development and size of the downtown blocks. In Tulsa the size of a downtown block is 300'*300' feet. The size of the block is also a factor to implement walkability. As a matter of fact by doubling the size of the blocks planners will cause more pedestrian accidents.

Speck also explained about a desirable size for a block is related to the size of a downtown. In Portland, here blocks are 200'*200' feet, it is based on a 10 minute-walking distance. By looking at that example the size of the block in the downtown area is almost sufficient but the problem for creating a walkable downtown is the width of the streets.

Mr. Speck in his book, explains four major steps to improve walkability in any town provides:

A. Provide reason to walk
B. Make walking safe
C. Make walking comfortable
D. Make walking interesting.[1]

In this project I followed the same steps to achieve walkability in the downtown area. In recommendation I will explain how to implement these steps in Downtown Tulsa with three examples for each step.

1. http://www.okc.gov/planning/resources/okcspeckfinal.pdf

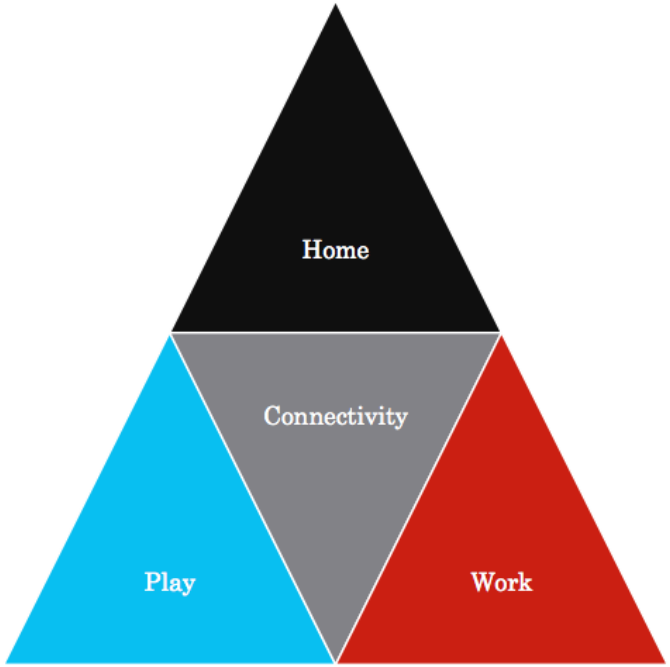


Figure 1. Three Functions

In the existing downtown area there are many offices and community places such as restaurants, bars and churches. Expanding mixed-use development in downtown will create a strong connection between home, work and play. Therefore, creating connectivity in downtown Tulsa is very important because of three reasons:

1. Reducing the negative impact on climate change while minimizing driving distance.

2. Increasing afford ability for citizens with minimizing the need for spending money on gas. According to Ellen Dunham-Jones in Atlanta 32% of the households income is used on car transit and it refers to Tulsa which is a car oriented town as well. [1]

3. Improving public health by developing walkability between the homes, offices and the third place.

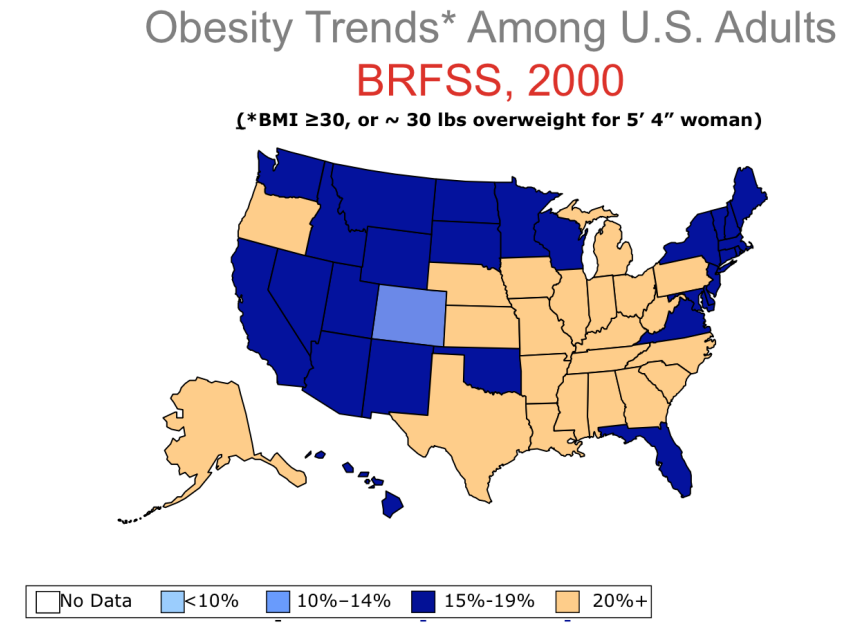
The purpose is to design a mixed use development in the downtown area in order to create a walkable community within an area that has workplace density and numerous attractions. Designing mixed used development in Downtown area in order to create a walkable numerous attractions.

1. https://www.ted.com/talks/ellen_dunham_jones_retrofitting_suburbia?language=en

Figure 2. Sprawl Impacts

At a presentations given by epidemiologists like Dr. Richard Jackson who is a former professor of Environmental Health Sciences at the Fielding School of Public Health at the University of California at Los Angeles (UCLA) and Dr. Karen Lee from Global Health and a built environment advisor at New York City , these experts on the wisdom of shrinking urban sprawl described how the negative impacts of living in the suburbs and the health issues it can cause its residents, convinced the audience about why living in walkable towns actually save people from obesity and chronic disease as such as, heart diseases and diabetes. On April 3, 2013 at the Placemaking Conference at the University of Oklahoma, Dr. Jackson focused on the growing health problem among children resulting from their inactivity as a result of the large distances between home, work place and leisure places and the amount of time traveling to and from these location visa automobile. [1]

1. Source: Lee Karen Lee MD. Presentation at the 2015, IQC_Placemaking Conference, March 26, 2015 Pdf/ ActiveDesignWebinar/KR_Webinar_3_Intro_Slides.pdf



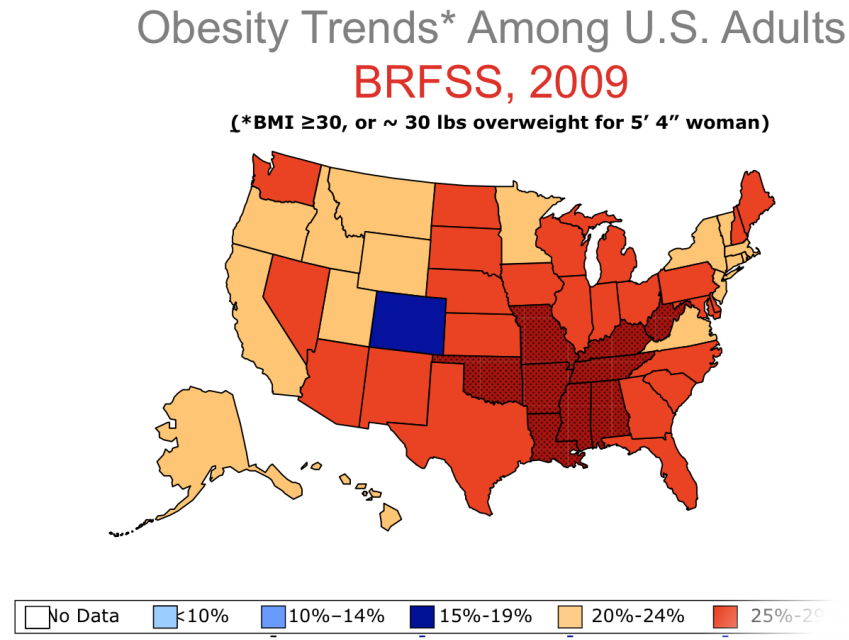


Figure 3.

Source: U.S. Centers for Disease Control and Prevention (CDC)

Jackson implied that America's romance with cars since World War II and the existence of the country's coast-to-coast and city-to-city highway system has encouraged suburban growth to the detriment of the nation's cities and of the citizen's health.

On March 25, 2015, Dr. Karen Lee talked about the same subject and in her slides she has shown the growing population who have obesity and diabetes, Based on the United States Centers for Disease Control and Prevention (CDC), she explained about the costs attributable to obesity in the U.S. which is estimated to be $147 Billion per year and by 2030. If obesity trends continue, 86% of adults will be overweight or obese and that costs $860-$950 billion per year.[1]

1.Source: Lee Karen Lee MD. Presentation at the 2015, IQC_Placemaking Conference, March 26, 2015 Pdf/ActiveDesignWebinar/KR_Webinar_3_Intro_Slides.pdf

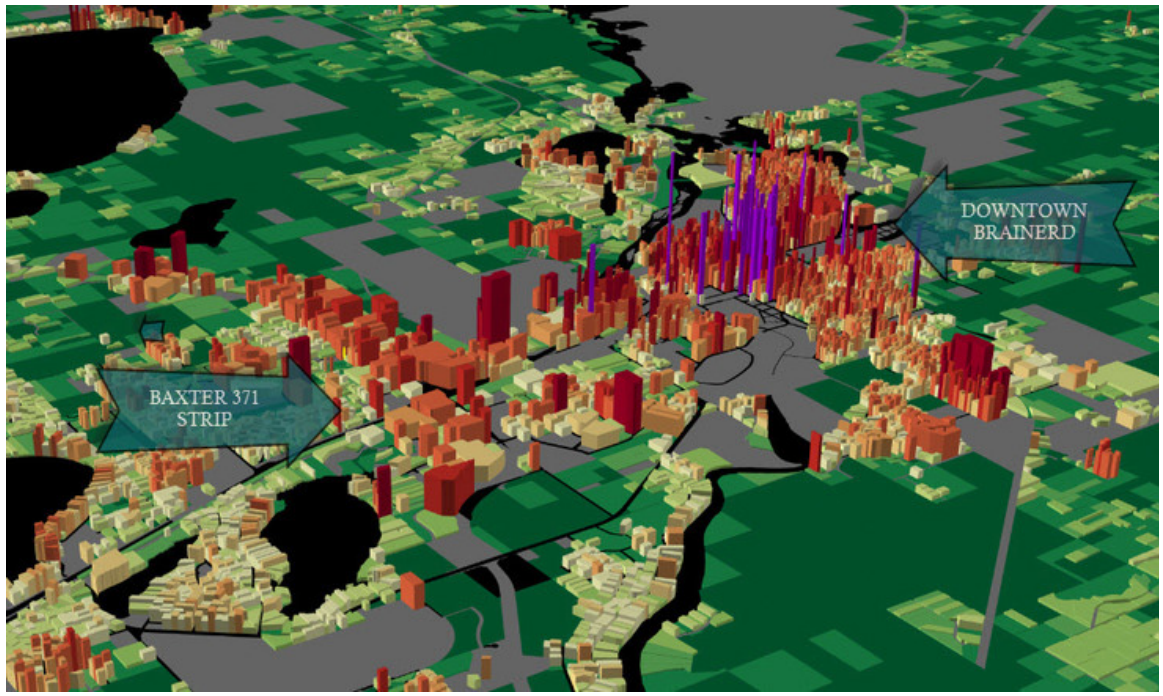


Figure 4. Density creates wealth

On March 25, 2015, Chuck Marohn, the engineer and planner from the non-profit foundation called Strong Towns a spoke at the Placemaking Conference about the financial advantage of pre World War II development in American towns which is known as traditional growth versus sprawl. His point was that the traditional growth in an American town will produce much higher economical revenue for the towns. However, continuing to sprawl can guide the towns toward to economic bankruptcies. He gave the example of the sleepy small town of Brainerd, which neighbors Metropolitan metropolis the Minneapolis St. Paul. This is where Highway 371 used to run through Brainerd similar to thousands of cities around the country that once saw highway-oriented development as its salvation that didn't work well.[1] Those places on the edge of the town are now the ones in steep decline, with high vacancy rates and rapidly falling property values. In contrast, the core neighborhoods of Brainerd and its downtown built before the auto experiment are holding their value, despite disinvestment and decades of neglect from the city.

1.Charles Marohn Presentation at the 2015, Placemaking Conference, March 26
http://www.strongtowns.org/

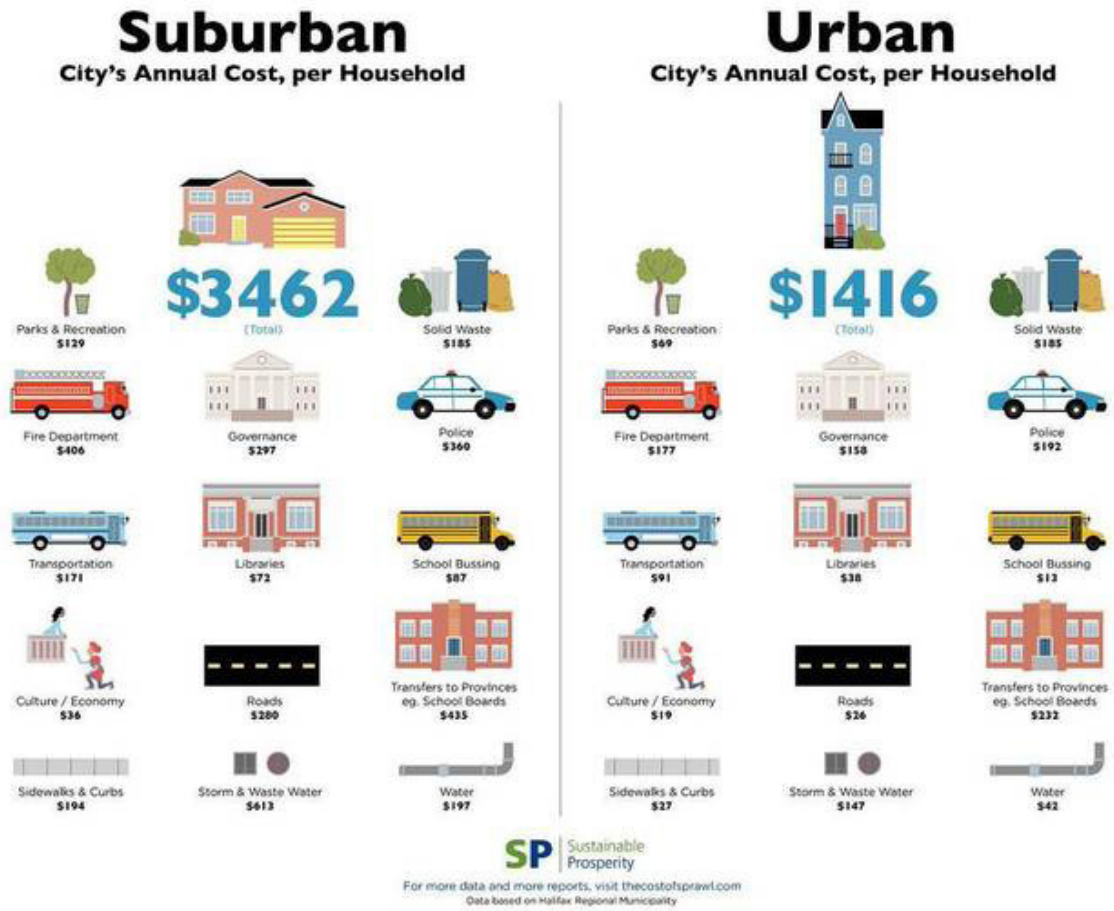


Figure 5. Urban Sprawl vas Compact Cities

1. http://www.treehugger.com/urban-design/new-studies-measure-true-cost-sprawl-and-its-more-you-think.html

According to Lloyd Alter studies who is an architect, and the author of Tree Hugger magazine, the annual infrastructure costs of suburban cities are actually higher than the costs in urban cities.[1] The most expensive part of suburban development is the road system, which is subsidized by the federal government. For this reason and the fact that parking is often and subsidized the price for the average suburban home is obviously cheaper. Hidden costs are also overlooked, as for instance air pollution, climate change emissions, noise, delay from traffic congestion, and losses and injury from collisions. These costs are estimated to be around $27 billion per year. The following map highlights this issue. New development with higher density and public transit could save billions of dollars every year. In addition to the hidden costs mentioned above, personal issues are affected as well. Suburban households drive approximately three times more than urban households, which has impacts on household budgets, family stress, and personal health. Hence, the connection between sprawl and car dependency is obvious. The following map illustrates this interdependency (add map car dependency). However, sprawl offers many benefits which are summarized in the following map following table.

THE ENVIRONMENTAL PERSPECTIVE

EPA DEFINITION OF ENVIRONMENTAL JUSTICE RELATED

Based on Environmental Justice The Arkansas River Paradigm:

"Environmental Justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to development, implementation, and enforcement of environmental laws, regulations, and policies."[1]

Reductions will take place only if the next generation of emissions control technology significantly reduces emissions.

As suburbia grows, political support for higher gasoline taxes and greater urban subsidies for public transit will both fall. The United States is unlikely to reduce its greenhouse gas production through higher carbon taxes and greater public transit infrastructure investments.

1. (http://www.epa.gov/sustainability/).

Figure 7 Walkable Cities, Paris and Rome.

RECOMMENDATIONS:

A WALKABLE DOWNTOWN VISION

A. MAKE A REASON TO WALK:

1. Create a Site Analysis in order to understand the existing situation in downtown.
2. Study the Market of the area to understand an economical reason to growth.
3. Identify and Target the site plan options to change the growth in Downtown Tulsa.

B. MAKE WALKING SAFE:

Two street design scenarios are created for this project; South Detroit Avenue and South Cincinnati Avenue where located on the main streets in downtown:

1. Continuous street trees the main streets and avenues.

2. Two way streets for both streets. According to Walkable City book two-way streets reduce the chance of the accidents for pedestrian and reduce the speed of the vehicles.

3. This report recommend the continuous street parking on both S Detroit and S Cincinnati.

C. MAKE WALKING COMFORTABLE:

1. Add no more exposed surface parking lots and try to utilize those spaces in downtown.

2. Creating a desirable ratio between the height of the buildings and the streets width chance to commute.

D. MAKING WALKING INTERESTING

There are three steps for making walking interesting:

1. Increase the chance of social interaction by improving the quality of public spaces such as sidewalks, parks, local business and streets patios (retails)

2. Significant Architecture design that creates an iconic image and the sense of unity between each street buildings development or even he the whole district. The population between 1000 to 5000 people create an urban district.

3. Have car free events during a year and improve the walkability culture in downtown Tulsa.

Figure 8. Tulsa 6th Street

OU Institute for Quality Communities (IQC) published a blog about biking, walking and transit use across the use on January 27th, 2015 based on American Community Survey estimated by US Census that shows Oklahoma City and Tulsa are near to bottom of the walkable cities. Another study that have done with League of American Bicyclists in 2013 showed that only 0.2% of the population in Tulsa was biking to work, 1.8% people walked, 80.5% drove alone, 1.4% used public transportation alone and 2.8% had no car. Based on the same studies in Austin TX 1.4% of population biked, 2.4% walked 73.7% drove alone, 4.2% used public transit and 4.2 had no vehicle. Houston TX is another comparable city for Tulsa. In Houston 0.8% of population biked, 2.42 walked 75.5 drove alone, 3.2 used public transit and 3.2 had no vehicles

1. http://iqc.ou.edu/2015/01/27/modeshare2013/

Houston TX is another comparable city for Tulsa. In Houston 0.8% of population biked, 2.42 walked 75.5 drove alone, 3.2 used public transit and 3.2 had no vehicle.[1]

DESIGN METHODOLOGY:

1. SITE ANALYSIS

2. WALKABILITY STUDIES

3. MARKET ANALYSIS

4. PRO FORMA SCENARIOS

5. THE SPACE LIST

6. BLOCK DESIGN OPTIONS

7. MASS DESIGN OPTIONS

8. STREET DESIGN SCENARIOS

9. ARCHITECTURAL DESIGN

1. http://iqc.ou.edu/2015/01/27/modeshare2013/

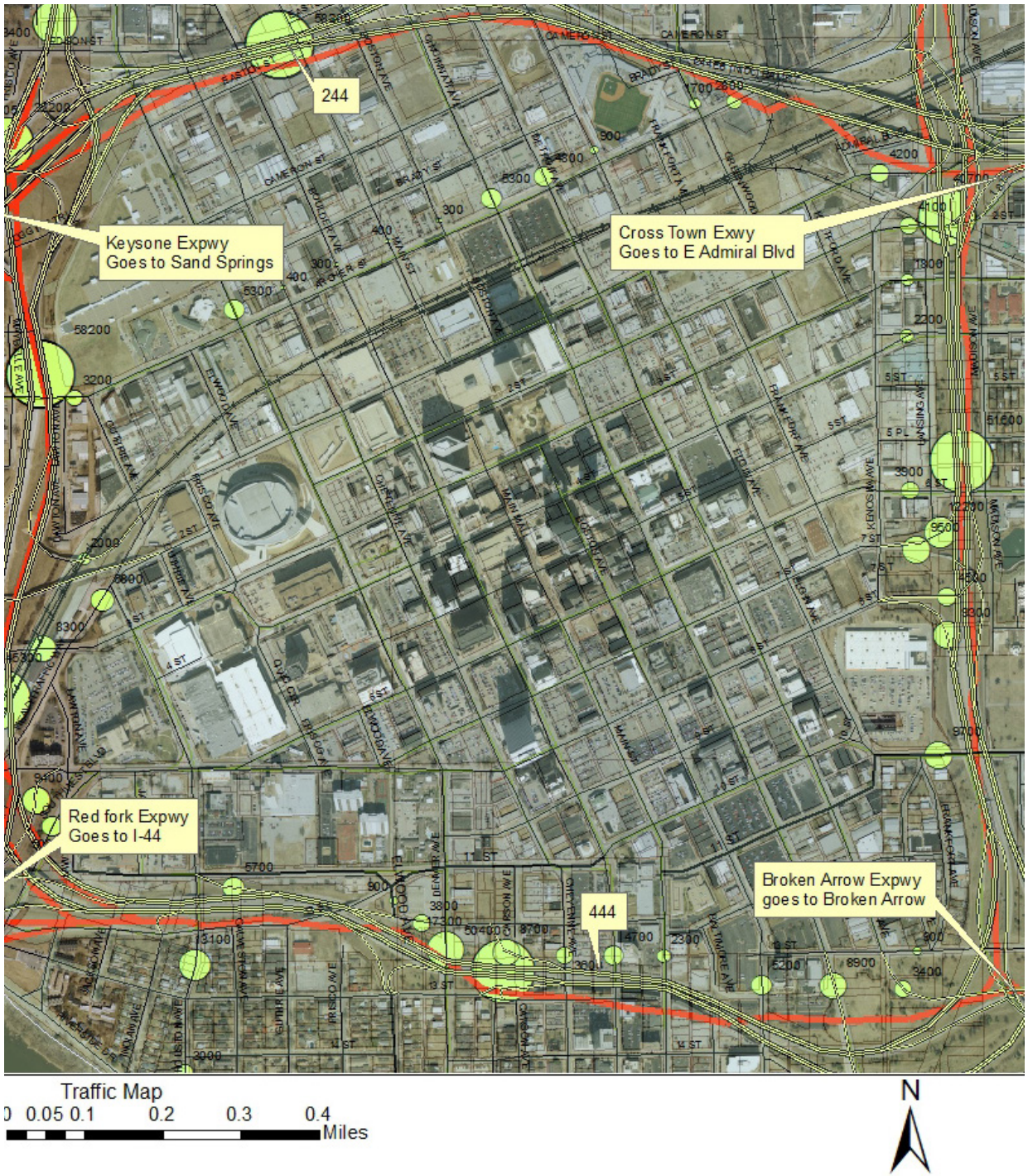


Figure 9. Traffic Map.

According to an indicative hierarchical scale from Urban Design Street and Square, Cliff Moughtin, any urban community is defined by human population. For example,

Over 50,000 The town
25,000_50,000 Urban district
5,000_10,000 The neighborhood
2,000_3,000…A local urban community

Based on Census 2010 the total population in the downtown area is estimated 4000 people, but the day-time population is estimated to be 36000. Therefore, downtown Tulsa is an urban district during a day and it changes to be a local urban community at night.

Figure 9 shows traffic counts for 24 hours period. From Northeast of downtown area Cross Town expressway leads to East Admiral Boulevard.

In the Northwest side of the loop, Keysone expressway goes all the way to Sand Springs. From South-west of the site, Red-fork expressway joints with I-40 highway and, in South-east of the downtown, Broken Arrow expressway leads all the way the Broken Arrow area.

1. Moughtin, Cliff. 2003. Urban design: street and square.

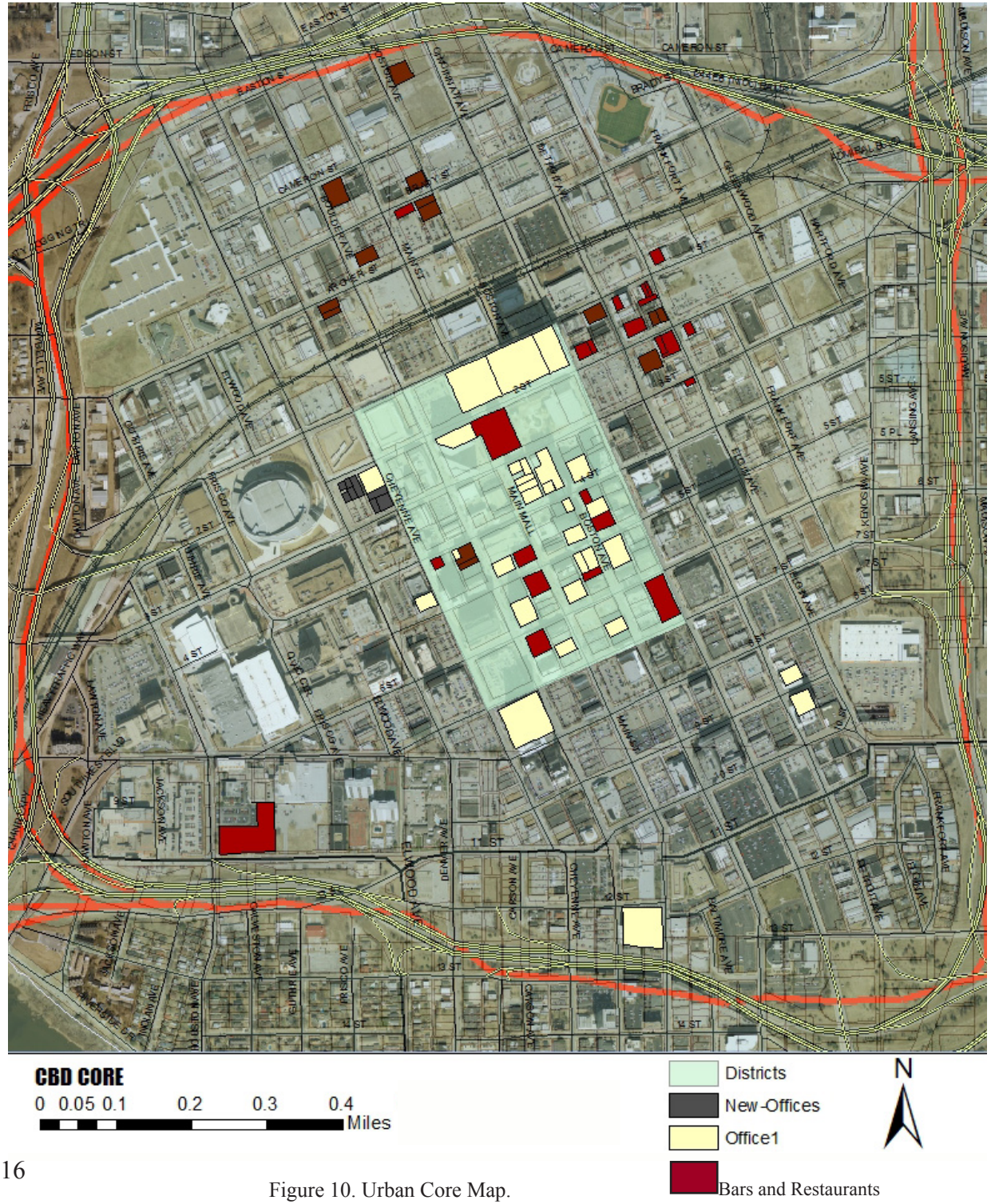


Figure 10. Urban Core Map.

The major traffic as shown on a previous map with the yellow points, is from the North of downtown on I-244 expressway with approximately 58,300 vehicles per day. After that, the highest number of cars with 58,200 vehicles are passing the West part of the loop which is located between Keysone and Red Fork expressways. Then from East side of the loop, Cherokee expressway carries 51,600 cars and 5,0400 vehicles cross on Oklahoma 51 expressway from South of downtown per day.

Figure 10 demonstrates the office buildings class A with yellow color and the restaurants and bars around offices with red color. The transparent rectangular shows the connection between the work place and the third place and it shapes a walkable area in the center of downtown area which is define an urban core as known as Central Business District (CBD) area.[1]

1. http://www.incog.org/Mapping_GIS_Resources/mapping_main.html http://incog.maps.arcgis.com/apps/PublicGallery/map.html?appid=1a8472e4977843388265fe1a973b3c9d&webmap=710c9600be594232870b64f1ed4d11e7

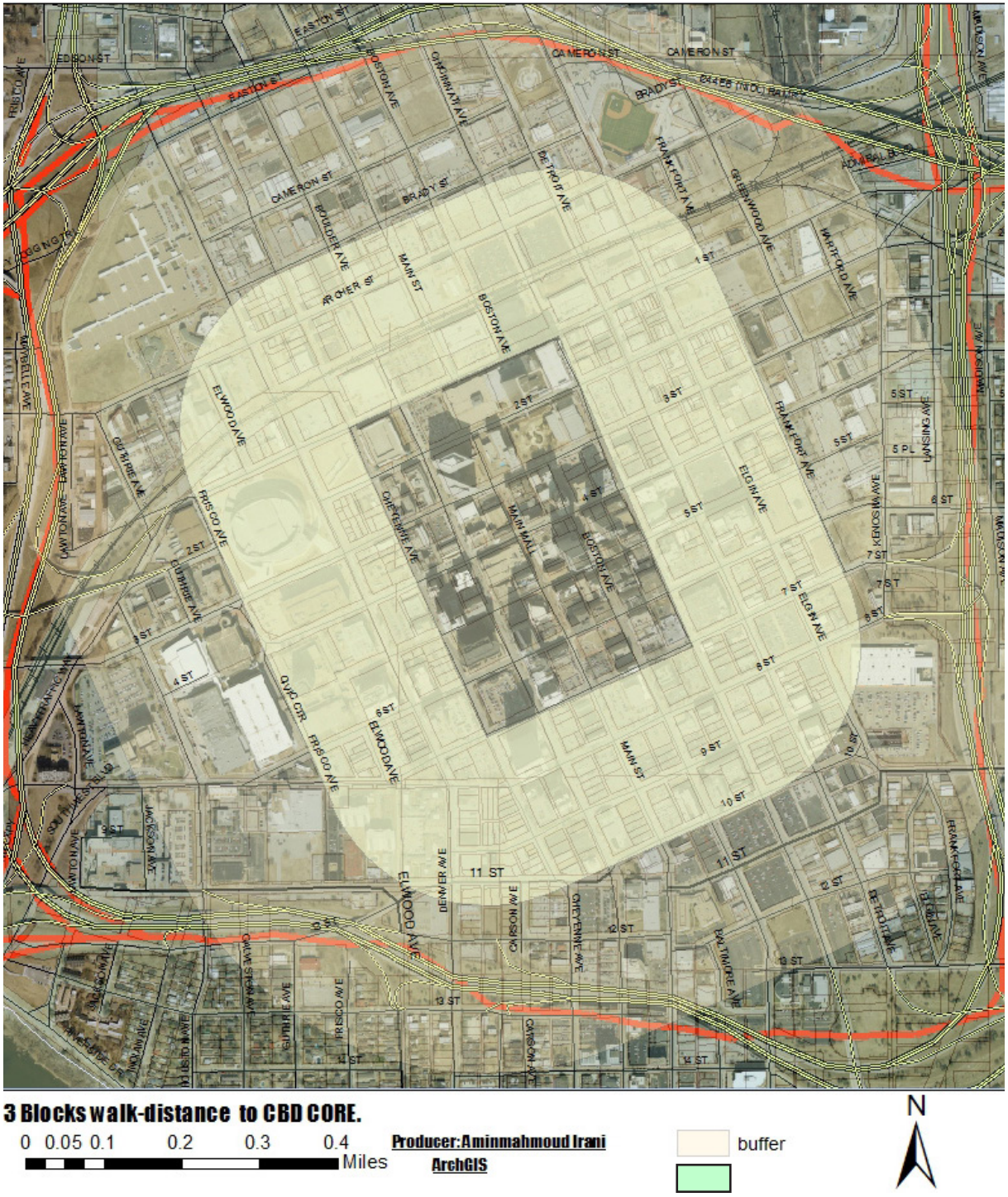


Figure 11. Walkablity Studies

Figure 11 demonstrates a walkable distance in Downtown Tulsa. The maximum walkable distance which shown with the bright transparent color on the map is about six blocks inside of inter dispersal loop. A downtown's block is about 300'x 300' square and a six block walkable distance is based on approximately 20 minutes walking. However, a desirable walking distance is about 10 minutes or three downtown's blocks that is shown with the yellow color on map. As a matter of fact, a walkable distance is relative to many parameters, such as, the weather conditions, the sun, shade, the temperature which are all related to the environmental conditions, then the age of a person who walks, weight and general health conditions.

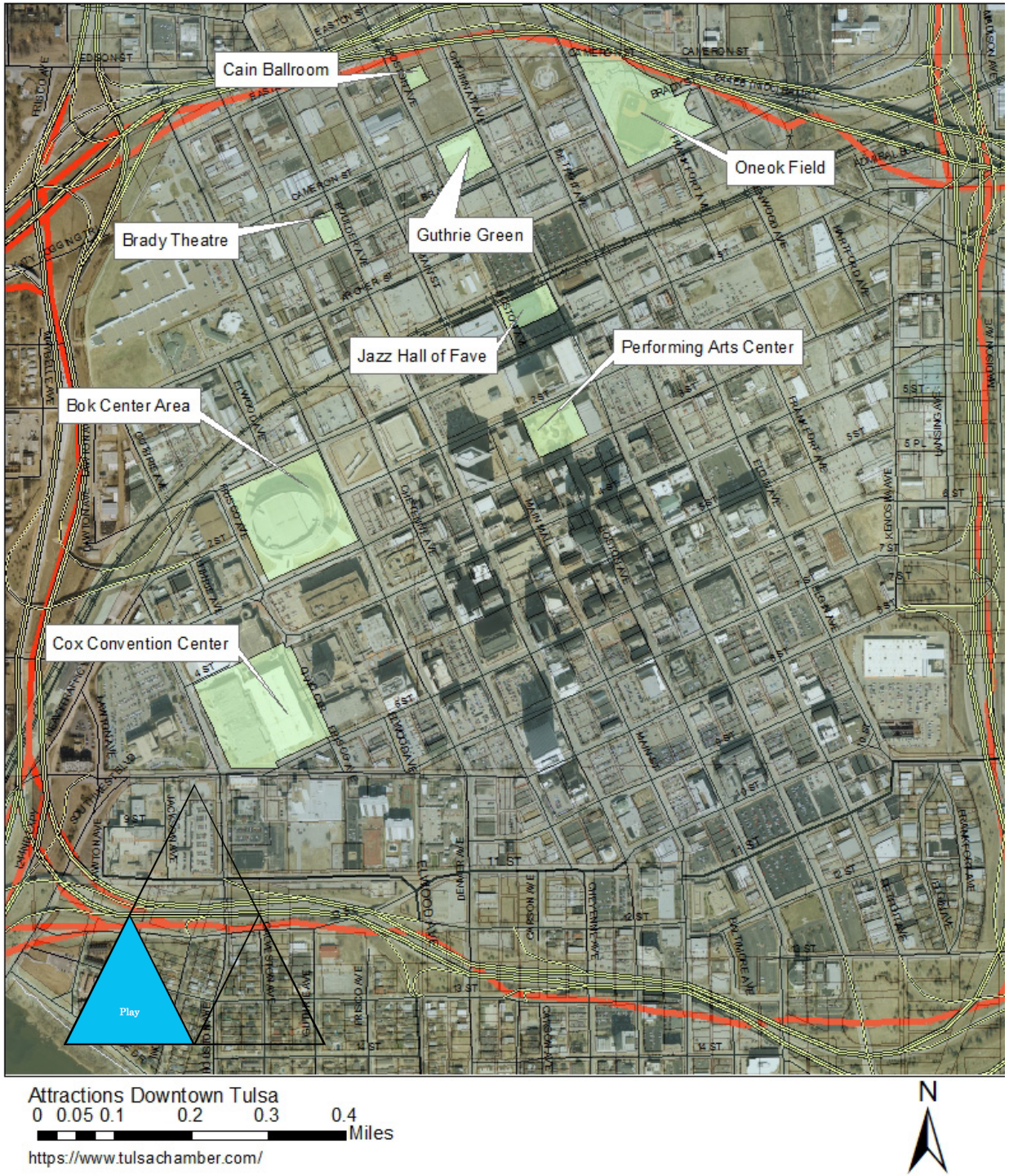


Figure 12. Attraction landmarks

ATTRACTIONS

The buildings that pointed on figure 12 are the existing attractive destinations which are functioning as the third place and they are attracting many people to Downtown Tulsa. For example, one of the most attractive building is the Bank of Oklahoma Center which is located on the West side of the loop, only one block away from CBD area designed by César Pelli, who is an Argentine American architect, to accommodate arena football, hockey, concerts with a 19,999 seat. Based on Pollster data in 2013 the BOK Center was ranked 13th for ticket sale in the nation.[1]

Brady Theater is another attractive landmark which is located at the corner of West Brady Street and North Boulder Avenue, with a 4,200 person seating capacity. It brings many people who are living inside and the outside downtown.

In terms of walkable distance, Cain's Ballroom and ONEOK baseball filled has the maximum distance from CBD which is three blocks distance (1200 feet) or approximately 15 minutes walk.

1. http://en.wikipedia.org/wiki/BOK_Center Inside the BOK Center" (PDF). Tulsa World. 2007. Retrieved August 30, 2008.

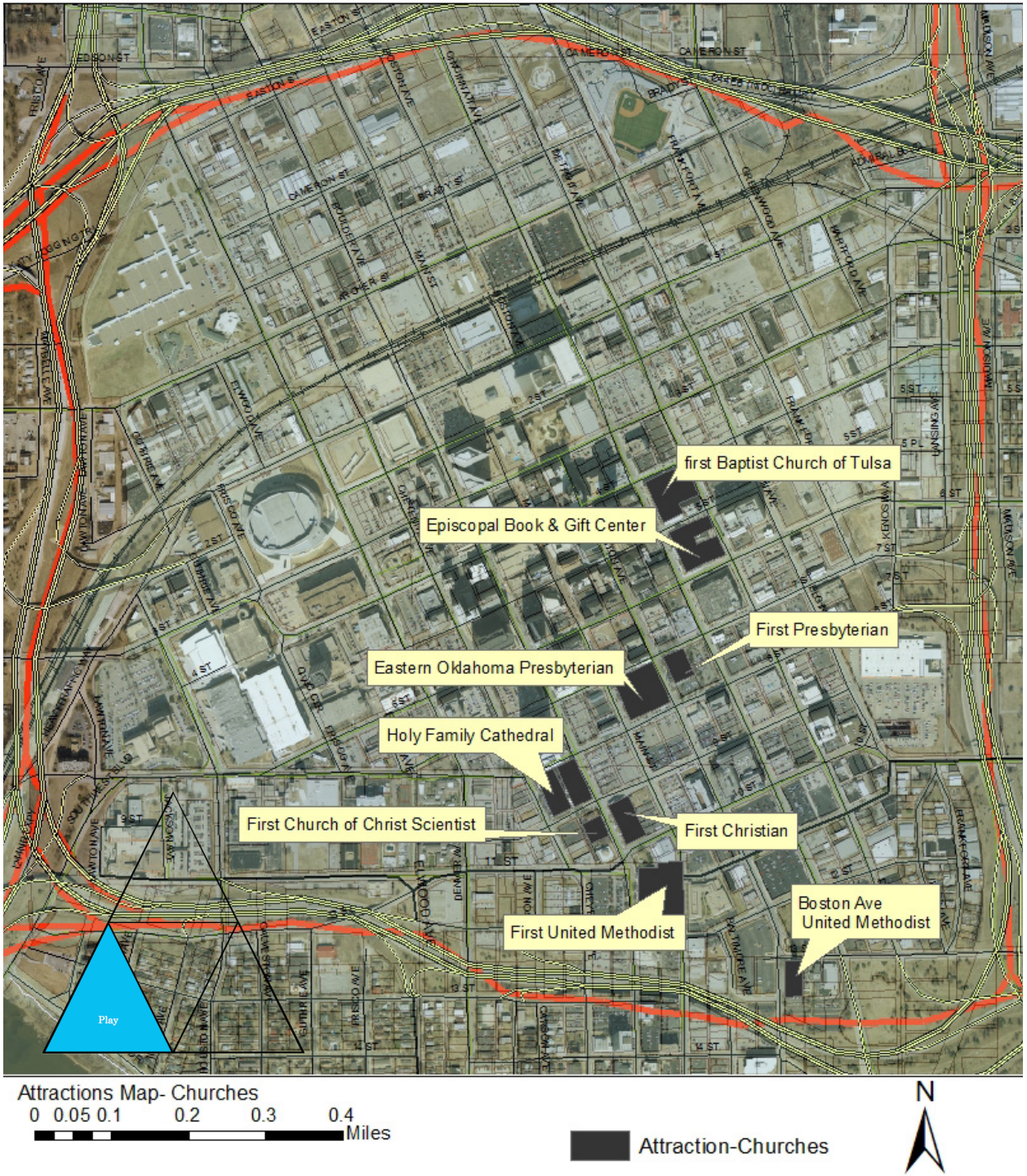
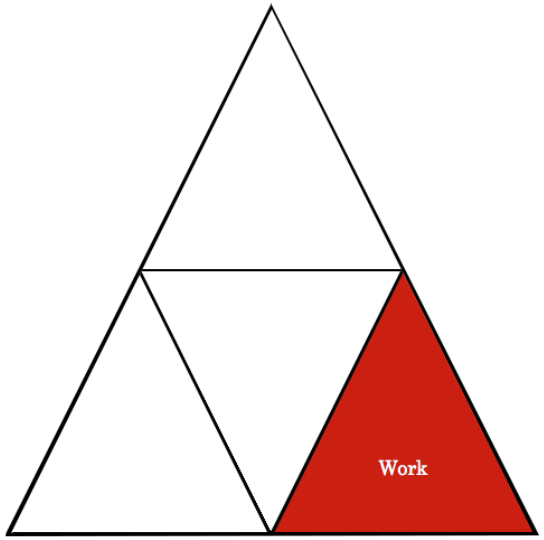


Figure 13. Churches Map

Figure 13 demonstrates that the churches in Downtown Tulsa are located in South and East side of CBD area well known are the Church District. The religious buildings as known as the place to worship another third place and they are enumerated as architectural landmarks as well.

Art Deco was the first truly 20th century style. It upheld the importance of craftsmanship, but benefitted from the industrialized world of the early 20th Century, mass production and the growing impact of the machine. It was the age of the Motor Car and the elegant transatlantic liner, filled with promise, fueled by prosperity and driven by technology. Art Deco was a sumptuous style – luxurious, elegant, and dramatic. Purely decorative, thoroughly modern, it had very distinct characteristics: repeating or overlapping images – chevrons, zigzags, and lightning bolts – arranged in geometric patterns. Streamlined forms, bold colors and exotic motifs – flora and fauna, young maidens and fountains – became the principles of a new and dynamic design.



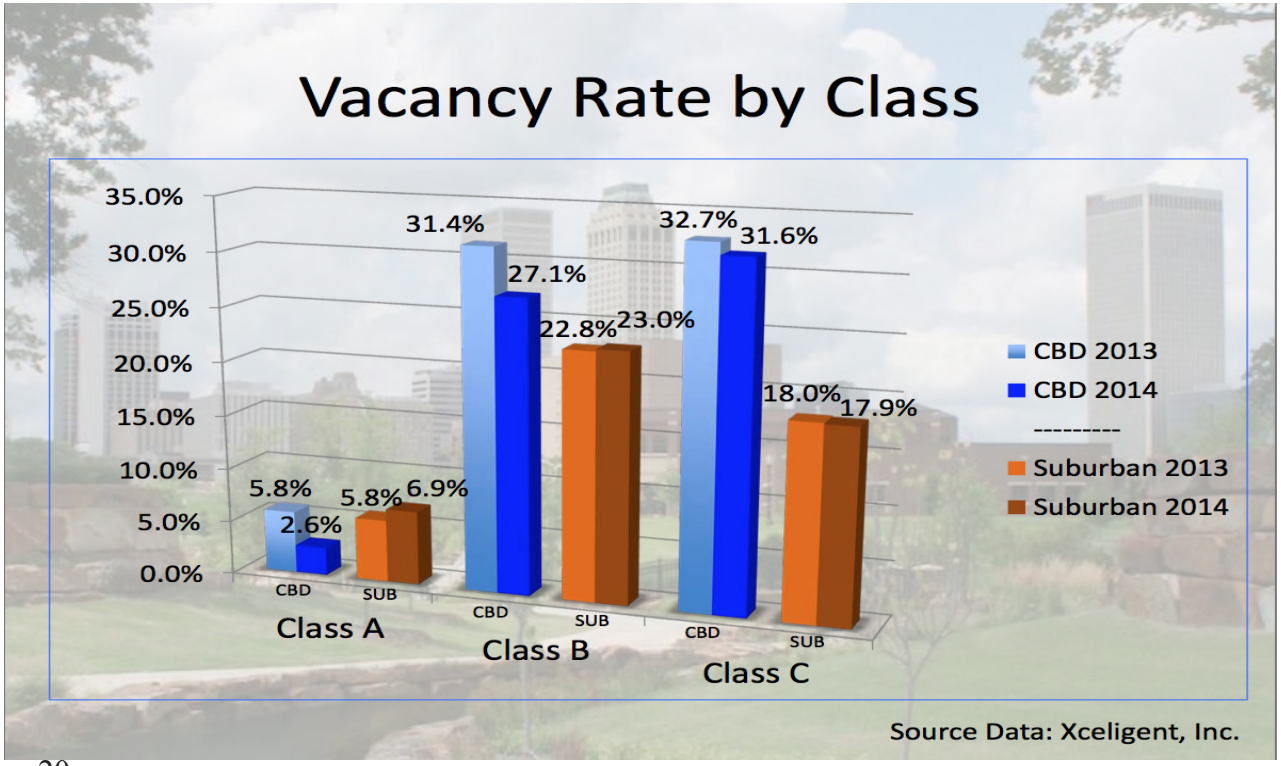


Figure 14. Office market studies

MARKET ANALYSIS
OFFICE BUILDINGS

With almost no multi-tenant building construction, occupancy levels for all classes changed little, representing stability in the office market.

The CBD occupancy levels increased in Classes A, B & C with a total of. 4.9% increase. Suburban occupancy levels fell for each building class for a total decrease of 4.3%, offsetting the CBD increase. The overall market to occupancy thus decreased by 0.8%. For the Central Business District, CBD, which contains 7,812,870 square feet of Class A-C buildings, Class A rents rose by 5.2% reflecting an increase in Class A occupancy levels. Class B dropped slightly by 3.5% and Class C rose 4.3% for an overall up tick of 3.8% from one year ago. CBD lease rates have remained consistent over the past several years along with stable occupancy levels.[1]

1. Tulsa Office Vancancy-Rate- 2013 and 2014. Source: Xceligent, Inc, URL, http://www.xceligent.com/

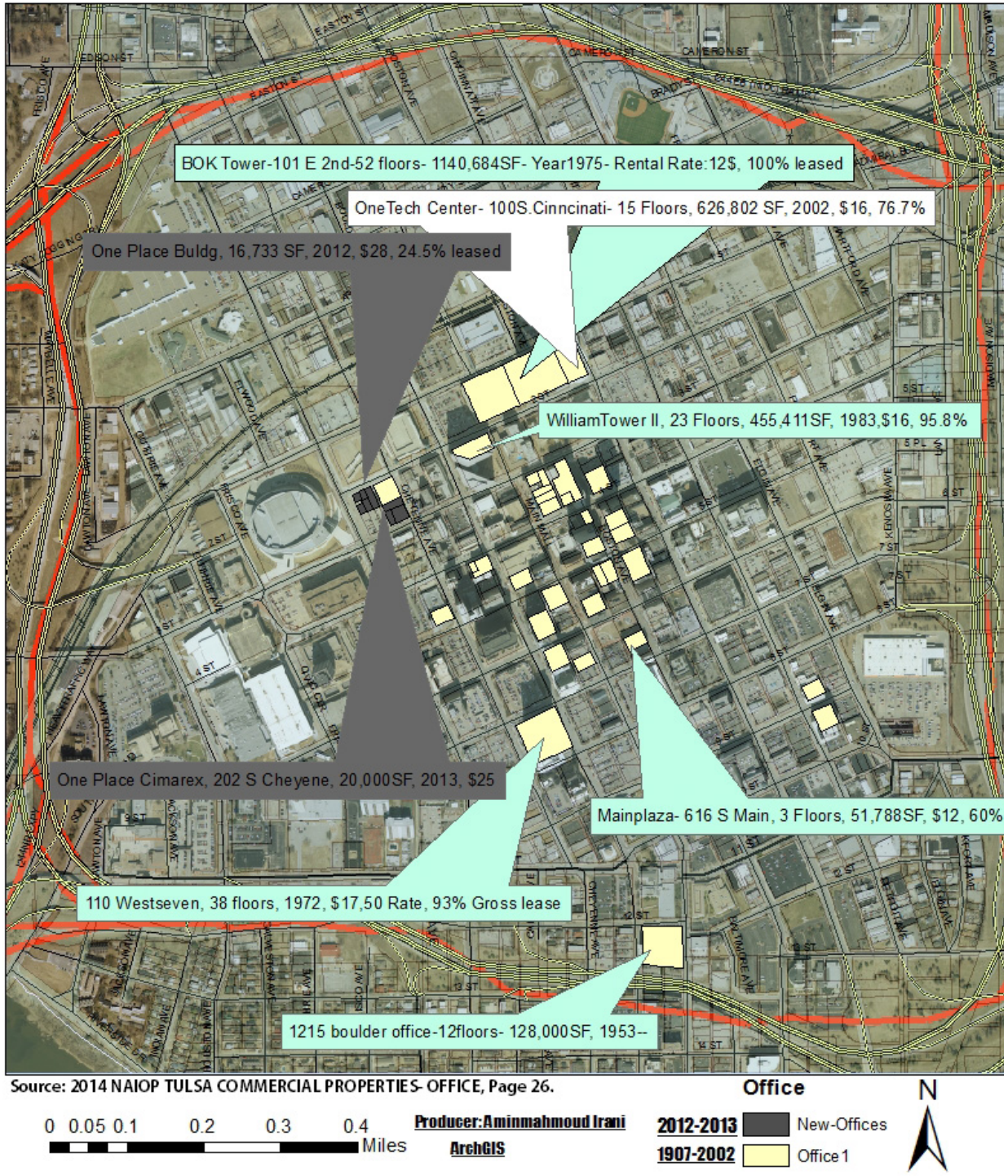


Figure 15. Office Building Class A price.

MARKET ANALYSIS
OFFICE BUILDINGS CLASS A

According to GBRE Oklahoma Tulsa office Market Studies in 2014 the occupancy rate for class A office buildings in CBD area is estimated 98%.[1]

According to Berkshire Medical Plaza Income & Expense Analysis for Office Building Class A that have estimated by Kevin Anderson who is working for the Real Estate Consultants in Tulsa, in April 12, 2012:

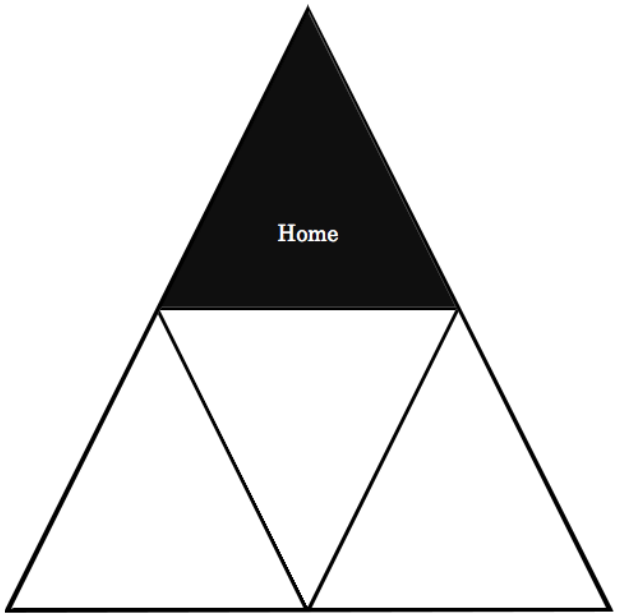
Total Maintenance:$3.01
Total Utilities: $1.33
Total Taxes: $1.39
Total Operating: $7.00
Net Income: $4.94

In different studies, CBRE estimated downtown Tulsa occupancy rate is 97.5% for class A office building. [2]

South Tulsa Occupancy 92%
Central Tulsa Occupancy 92%
East Tulsa Occupancy 93%
Broken Arrow Occupancy 93%
Tulsa Class A Suburban Occupancy 91.5%

1. Tulsa Office MarketView H2 2014, http://www.cbre.us/o/tulsa/Pages/market-reports.aspx

2. Tulsa Office Market 2009, http://s3.amazonaws.com/zanran_storage/www.cbre.com/ContentPages/236041085.pdf



The Central Business District continues to be an attractive location for new housing development, with new multifamily units under construction as well as the redevelopment of former office space into mixed-use projects featuring multifamily units. Notable projects include the proposed Brady District Flats and the redevelopment of several older buildings into the mixed-use area to be known as East Village.

The market should continue to expand as the strengthening of the local economy drives the demand for multifamily housing in the downtown area. The CBD market has the lowest vacancy rate of 3.9 percent due to a limited supply of apartments in the area and high demand.

HISTORICAL AND PLANNED CBD HOUSING DEVELOPMENTS SINCE 2009 (Rentals)

Based on analysis of data provided by CBRE.

2009-2013	Age	# Units	Occ.	AVG SF	AVG Rent	AVG Rent/SF	Rental Type	STATUS
The Mayo	2009	76	100%	1,180	$ 1,998	$ 1.69	Market Rate	Completed
Mayo 420	2009	67	100%	1,081	$ 1,396	$ 1.29	Market Rate	Completed
Metro At Brady Arts	2011	75	97%	1,082	$ 1,451	$ 1.34	Market Rate	Completed
GreenArch	2013	70	97%	950	$ 1,029	$ 1.08	HUD Financing	Completed
Riverbend Gardens	2013	40	N.A.	N.A.	N.A.	N.A.	LITC	Completed
Total		328						
Average Per Year		**82**						

2014	Age	Units	Occ.	AVG SF	AVG Rent	AVG Rent/SF	Rental Type	STATUS
East End Village	2014	83	TBD	TBD	TBD	TBD	LITC	In Process
Denver Y Lofts	2014	82	TBD	TBD	TBD	TBD	LITC	In Process
Vandever Lofts	2014	40	N.A.	N.A.	N.A.	N.A.	Market Rate	Completed
Flats on Archer	2014	61	TBD	TBD	TBD	TBD	LITC	May or May not occur
Harrington Building	2014	24	TBD	TBD	TBD	TBD	Market Rate	In Process
First Street Lofts	2014	23	TBD	TBD	TBD	TBD	Market Rate	May get new owner
TOTAL PROPOSED	2014	**313**						

2015	Age	Units	Occ.	AVG SF	AVG Rent	AVG Rent/SF	Rental Type	STATUS
Hartford Commons	2015	162	TBD	TBD	TBD	TBD	HUD Financing	Construction Documents Being Finalized
Kanbar 111 W. 5th	2015	90	TBD	TBD	TBD	TBD	NA	In Initial Planning Stage
Kanbar Adams Hotel	2015	56	TBD	TBD	TBD	TBD	NA	In Initial Planning Stage
Kanbar Transok	2015	37	TBD	TBD	TBD	TBD	NA	In Initial Planning Stage
Coliseum Redevelopment	2015	36	TBD	TBD	TBD	TBD	NA	In Initial Planning Stage
TOTAL PROPOSED	2015	**381**						

Figure 16. Housing Market Studies

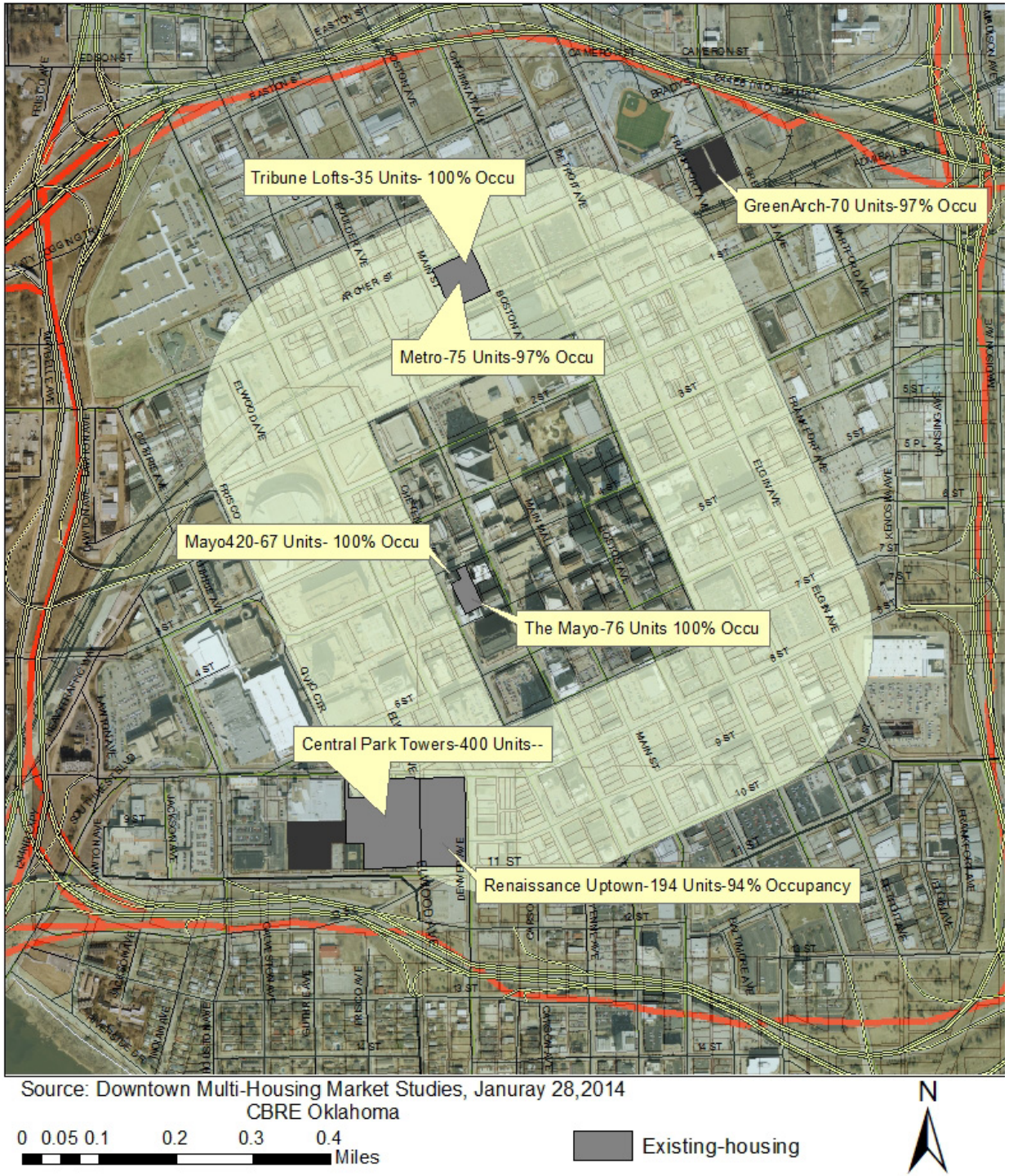


Figure 17. Existing Housing Market Studies.

There are 17,823 vacant housing units in Tulsa. The Central market has the largest number of vacant homes with 5,826 followed by the South sub-market with 4,796 homes. The CBD has the lowest number of vacant units at 568 units.[1]

Based on primary research, some of the existing housing projects such as, Green Arch, Tribune Lofts, The Metro and Renaissance a have zero vacancy rate, and that shows there is high demand for housing development in downtown Tulsa specifically close to CBD area.

Figure 17 shows almost all of the existing housing are built in desirable walkable distance to Central Business area.

Comparative Housing Analysis

The city of Tulsa housing market has approximately 170,200 households, of which 92,774, or 54.5 percent, are owner-occupied. The percentage of owner-occupied households in Tulsa is less than the national percentage of owner-occupied households at 66.3 percent. The average age of Tulsa homes is 42 years old, which is just older than the national average of 39 years. The median size of Tulsa homes, at 1,441 square feet, is slightly smaller than the national median size of 1,548 square feet. Although the median size of Tulsa homes is smaller than the national average, Tulsa resident enjoy a

1. Tulsa Multifamily marketView H2, 2014, http://www.cbre.us/o/tulsa/Pages/market-reports.aspx

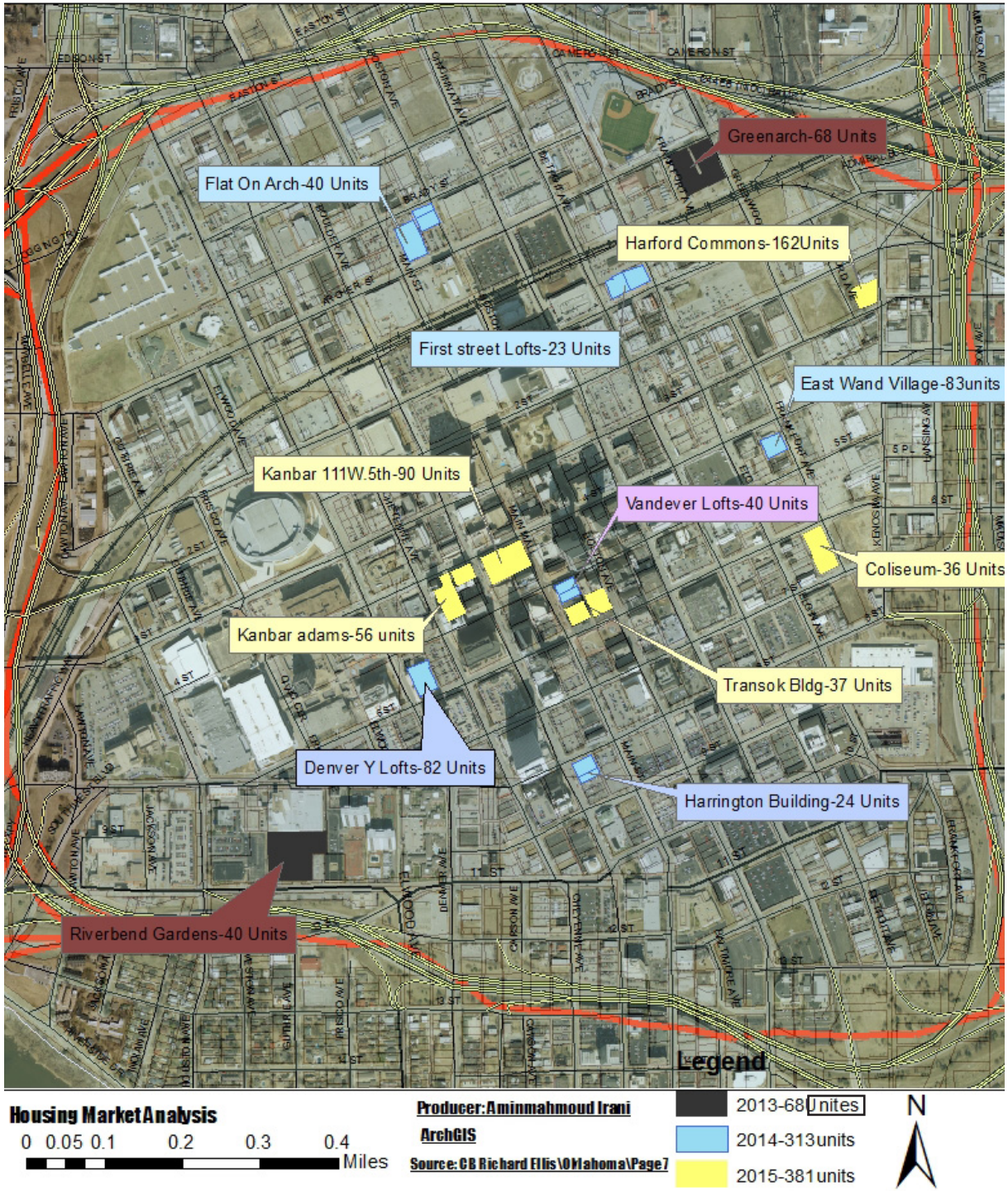


Figure 18. Housing Development.

Low cost of living, including property taxes that are 51.1 percent less than the national average. Tulsa also has a lower percentage of condominiums, 5.0 percent, than the national average of 9.7 percent, which is typical of medium and smaller cities.

ANALYSIS HOUSING UNITS

The CBD sub-market has the greatest percentage of renters at 62.9 percent; the number of renters in the CBD is predicted to increase slightly through 2014. The East, South, Central and West sub-markets all have similar percentages of renters, ranging from 40.1 percent to 43.5 percent. The North sub-market has the lowest percentage of renters at 36.6 percent.

The percentage of renters in all sub-markets is predicted to increase through 2014. The West sub-market is forecasted to experience the largest growth in percentage of renters from 41.8 percent renters in 2009 to 43.1 percent renters in 2014 while the South sub-market is predicted to experience the smallest increase in the percentage of renters of 0.4 percent.[1]

1. Tulsa Multifamily marketView H2, 2014, http://www.cbre.us/o/tulsa/Pages/market-reports.aspx

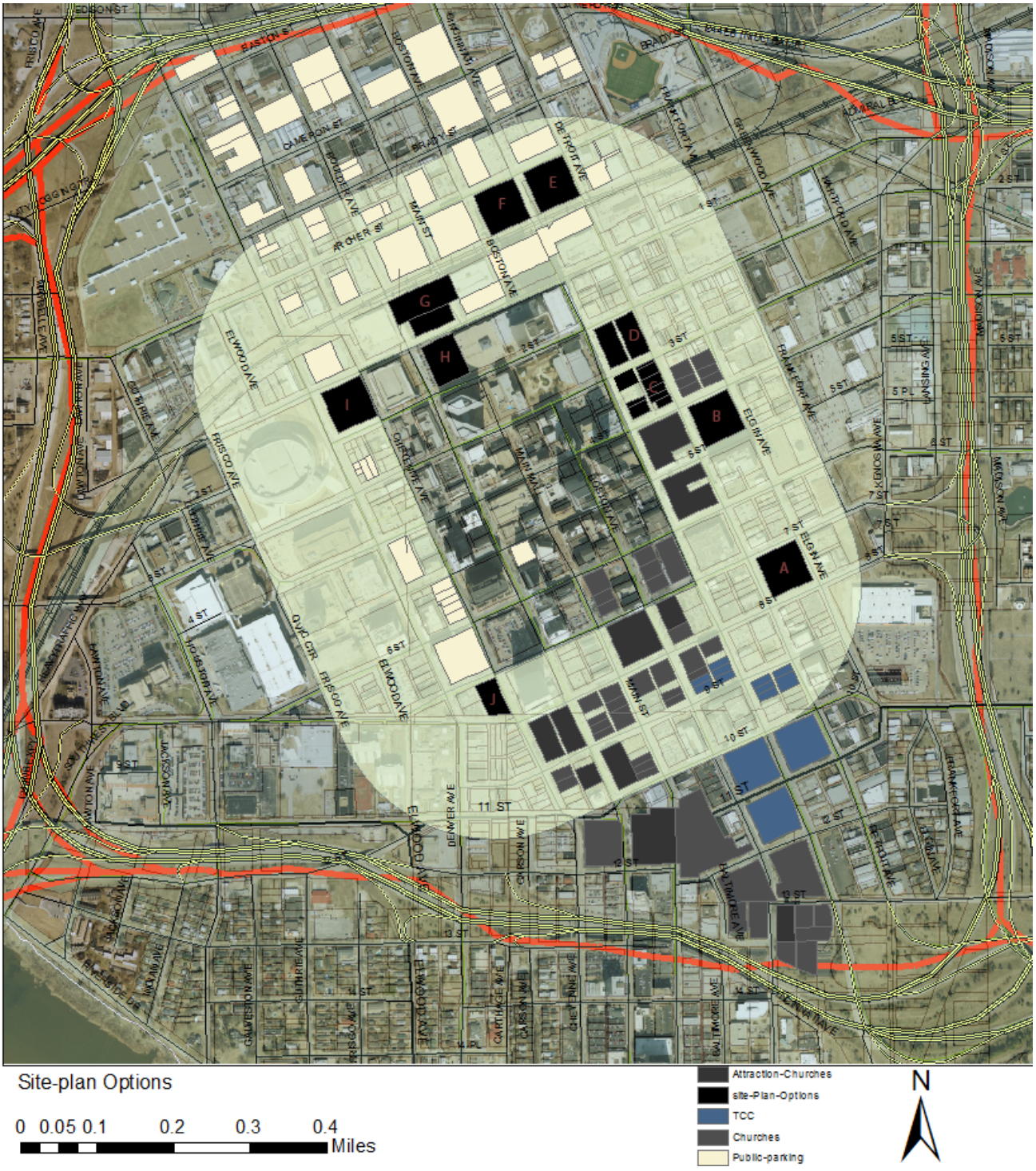


Figure 19. Site-plan Options

SUMMARY OF PARKING STUDIES

According to the Walker Parking Consultants Studies in 2007, the observed peak weekday parking occupancy for entire area was approximately 61%.[1]

Total Parking spaces 26252.
Only 16,014 spaces are actually used.
10,235 spaces are not used.
Around 256,000 square feet of land are wasted on parking lots and parking spaces that are poorly utilized in Downtown Tulsa.

TARGETED SITE-PLANS & PROPERTY VALUES

Figure 19 has established by geographic information system (GIS) which is created to illustrate numerical data as geographic information. This map is the most important figure for this research it demonstrates several parameters such as parking space ownerships based on uses, the targeted site-plans and the property values. This research shows that 1,110,000 square feet parking surfaces are related to Churches, 1,530,000 square parking surfaces are using as the public parking and 360,000 square feet of the parking surfaces are owned by Tulsa Community College.

1. November 15, Downtown Tulsa Parking Study 2007, http://www.walkerparking.com/ gws_rd=ssl#q=TPA+PARKING+STUDY+Tulsa+

PHYSICAL INPUTS

Prototype Name	Mixed-used	(enter name of building)
Project City/State	Tulsa, OK	(enter name of city/state or project)
Site area	90,000	square feet
	2.07	acres
Site gross-to-net ratio	100%	(enter percentage)
Landscaping or open space	10%	(enter percentage)
Building height (stories)	7	stories
Maximum FAR		FAR
Under-build	95%	(enter percentage)

Parking Configuration

Checks

Underground Parking	0.00	(maximum number of levels to test)
	0.00	actual underground levels after factoring underbuild
Surface or Structured Parking	1.00	(number of levels)
Internal Parking (Tuck Under or Sandwich)	0.00	(number of levels)

Percent of Building Use

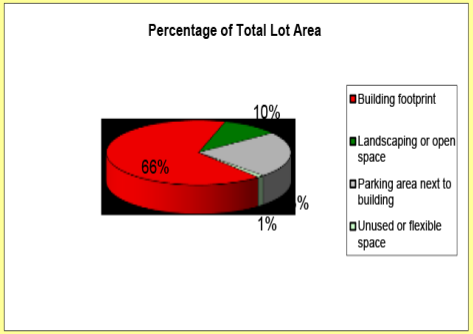
Market-Rate Residential	30%	(enter percentage)
Affordable Residential	0%	(enter percentage)
Retail	5%	(enter percentage)
Office	65%	(enter percentage)
Industrial	0%	(enter percentage)
Public	0%	(enter percentage)
	100%	
Is the residential owner or renter? (type 'NONE' if no residential)	rental	(type 'RENTER', 'OWNER' or 'NONE')

Average residential unit size or gross square footage per employee by sector

Market-Rate Residential (Unit Size)	950	square feet
Affordable Residential (Unit Size)	600	square feet
Retail	1,021	square feet
Office	416	square feet
Industrial	1,865	square feet
Public	500	square feet

PHYSICAL OUTPUTS

Building footprint	59,218	square feet
Landscaping or open space	9,000	square feet
Parking area next to building	20,693	square feet
Unused or flexible space	1,089	square feet
Useable FAR	4.38	
Percent of Maximum FAR	N/A	
Useable building total	393,798	square feet



	Gross Square Feet	Net Square Feet	Total Dwelling Units	Total Jobs	DU/acre	Jobs/acre
Market-Rate Residential	118,140	94,512	99.4859324		48	
Affordable Residential	0	0	0		0	
Retail	19,690	15,752		15		7
Office	255,969	204,775		492		238
Industrial	0	0		0		0
Public	0	0		0		0
Internal Parking	0	0				
Total	393,798	315,039	99.5	507.7	48.2	245.7

Return on Investment	**2.4%**
Internal Rate of Return	**N/A**

Annual Property Tax Revenue =	**$**	**129,072**
Annual Sales Tax Revenue =	**$**	**103,963**

Total Subsidy =	**$**	**-**

01/15/1015 Scenarios1

Tulsa, OK

Building Summary		
Lot area (sf)	90,000	sf
Lot area (acres)	2.07	acre
Height	7	stories
Usable FAR	2.36	
Residential units/acre	87	/acre
Avg. unit size (sf)	950	
Employees/acre	-	/acre

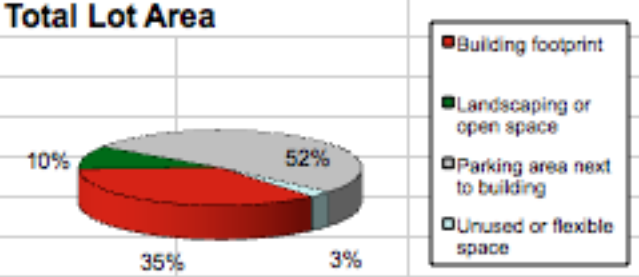
Financial Summary			
Average unit sale price		$142,500	
Average cost/sf		$150	/sf
Average unit rent		$950	/month
Average rent (sf/month)	$	1.00	/sf
Retail rent (sf/year)	$	12.00	/sf
Office rent (sf/year)	$	18.00	/sf
Estimated land value		$0.00	/sf
Estimated land value		$0	/acre
Total project costs		$25,808,936	

Construction Costs *		
Residential	$100	/sf
Retail	$70	/sf
Office	$80	/sf

** includes building costs with tenant improvements; does not include parking costs*

Parking and Open Space Summary	
Residential parking/unit	1.00
Retail parking/ksf	-
Office parking/ksf	-
Total parking spaces	179
Open space (%)	10%

% Total Lot Area



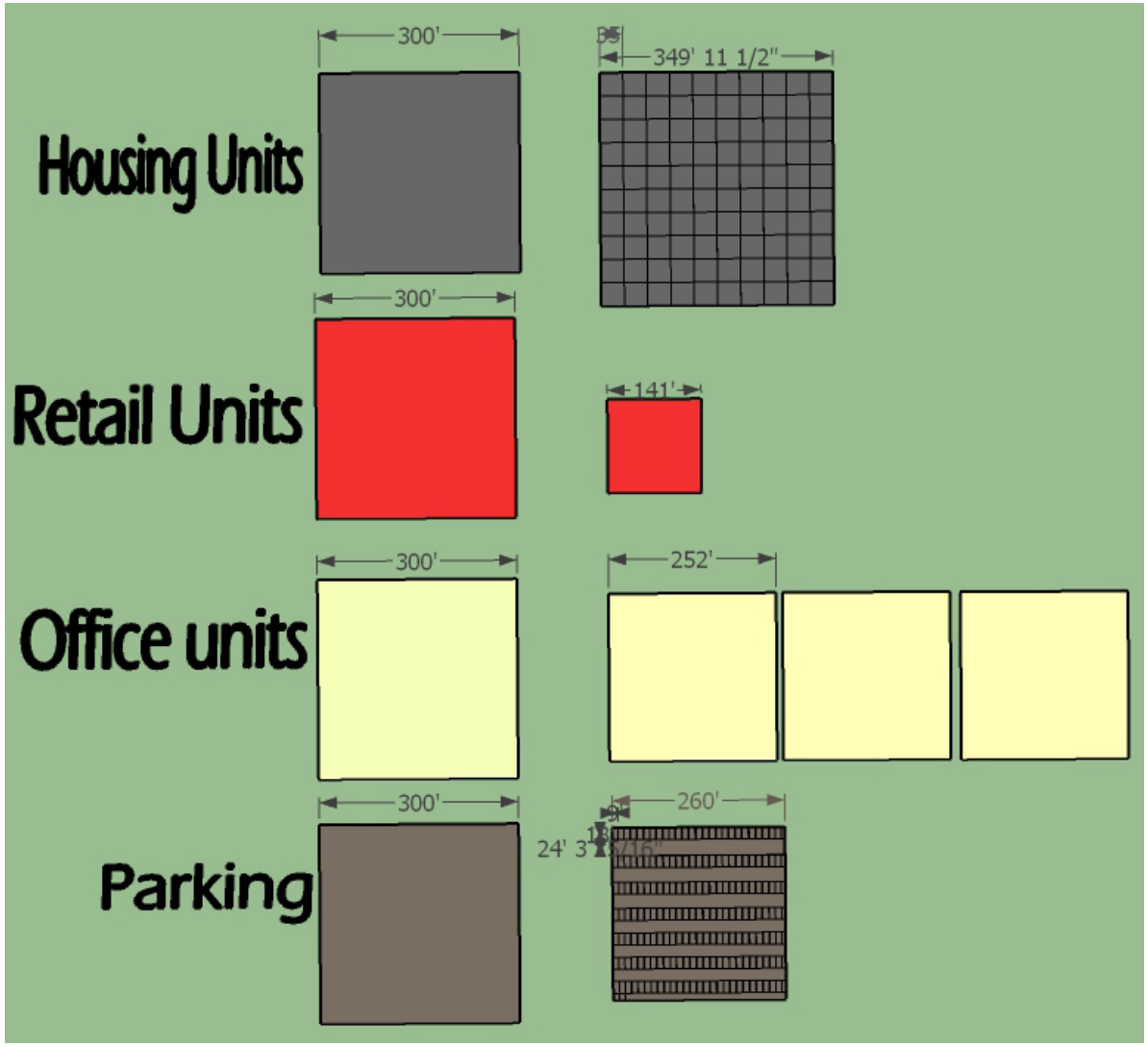


Figure 21. Space-list.

PRO FORMAS AND THE SPACE LIST

After experimenting 12 with the different pro formas for office buildings, retails, housing units and eventually for mixed use buildings including all those types of buildings in a downtown block which is approximately 90,000 square feet and getting feedback from Patrick Fox an urban designer and a developer of GreenArch in downtown area.[1] For the design studies is as follows:

118,114 Square Feet of housing or 100 housing units

25,600 square feet Office buildings

20,000 Square Feet Retail

.8 Parking spaces per dwelling unit square.

1.http://www.pfoxarchitects.com/index.php/commercial/utica-place

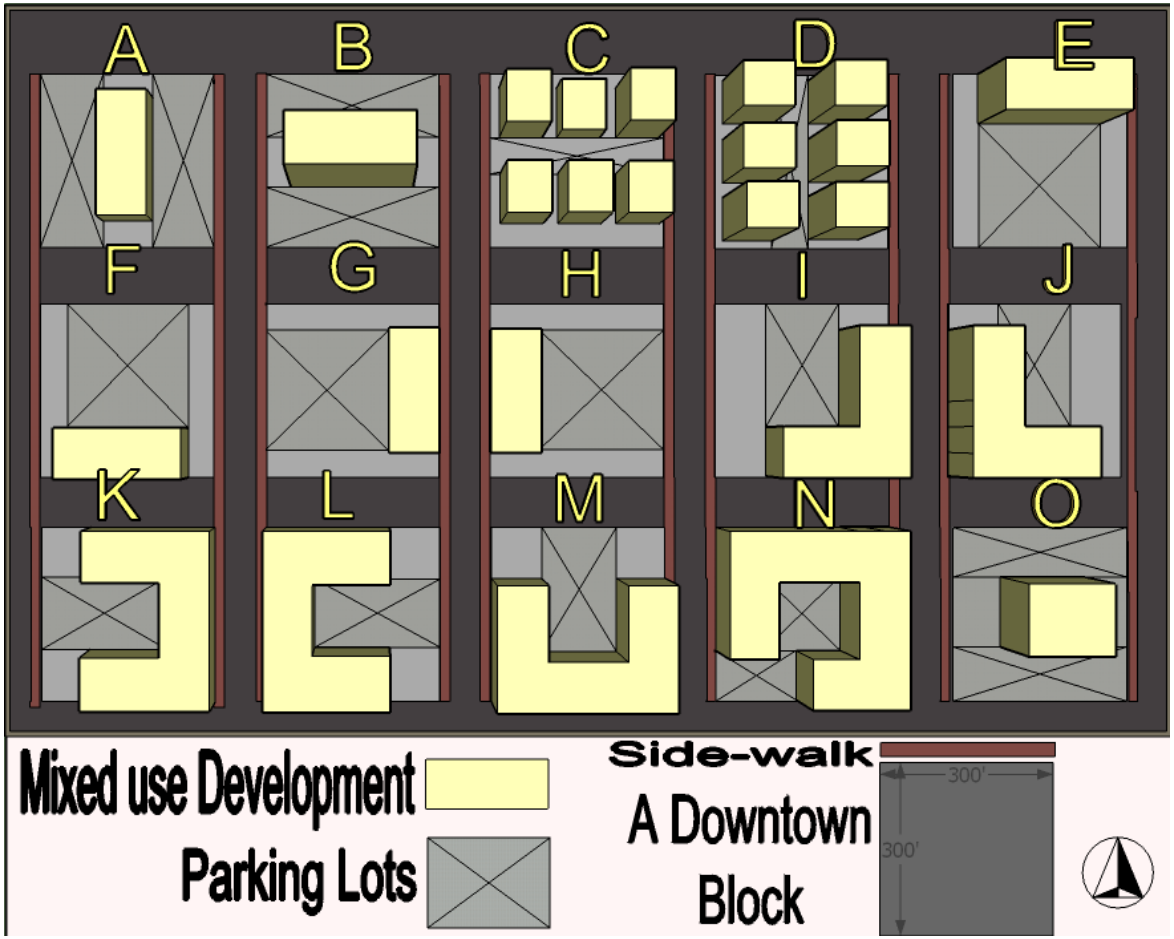
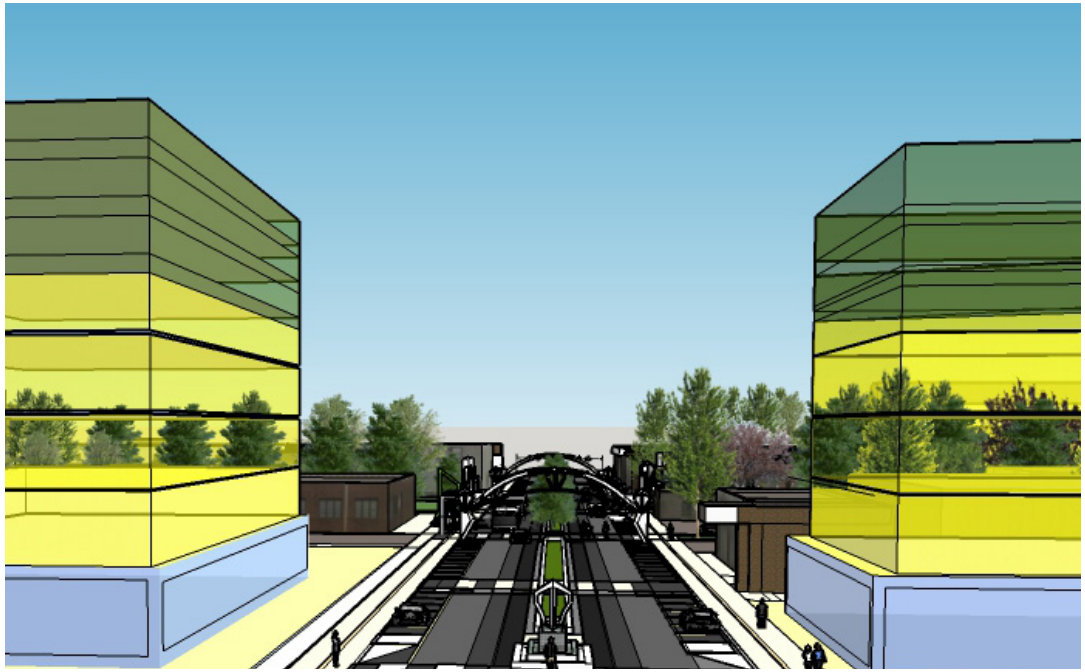


Figure 22. Block Design Options

BLOCK DESIGN OPTIONS

Figure 22 demonstrates fifteen different types of block layouts and it also reveals the relationship between the form of mixed -use development, the parking spaces and streets in the plan view. The analysis shows, how the buildings are setting back from the streets, the more they lose their connections with the street. In other words, in the position that the buildings sacrifices a huge space in front of the street to respond their parking needs, they have noting to offer the streets but parking spaces and it causes several problems including, the cars in front of the building may block the view of buildings and human activities around the facade from which is harmful for business. The second problem is that vehicles can disturb pedestrians who pass on the sidewalks third problem is that the huge parking surfaces destroys the sense of inclosed space for pedestrians.



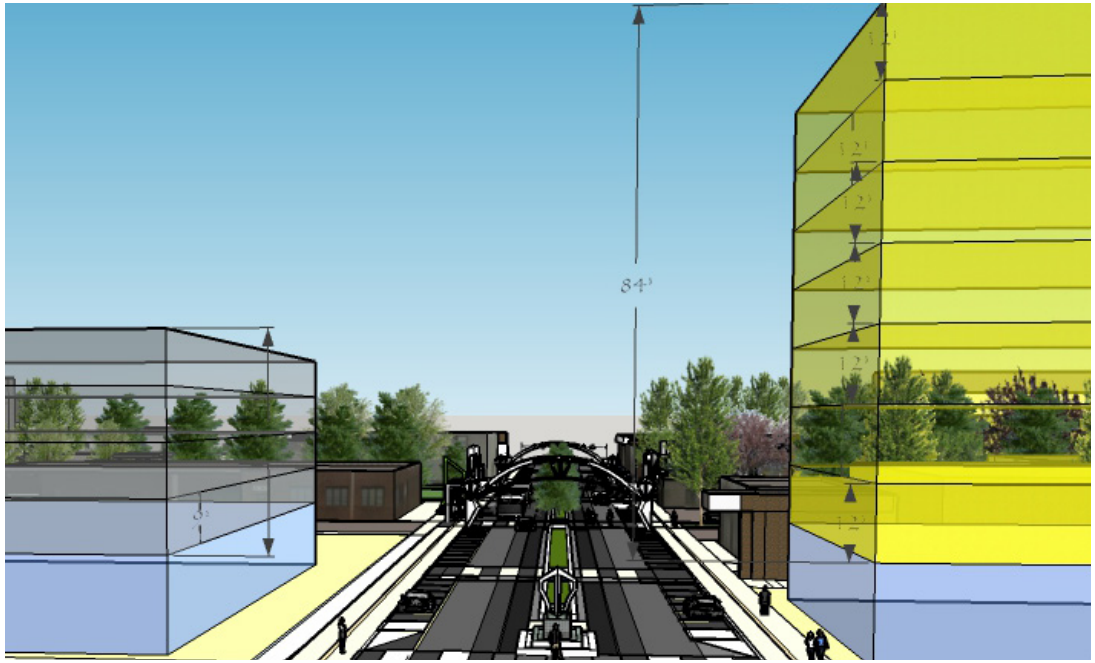


Figure 24-25 Mass Design Options

MASS DESIGN OPTIONS

Figure 24 and 25 are showing the perspective views of G and H (the "I" shape development) blocks from the pervious figure. In both illustrations, the blue color represents the retail space, the yellow color demonstrates office buildings and the Green color shows the housing unites. Figure 24 demonstrates a symmetric form of development, an equal mixed-use development including, retail for the base floor, office buildings in the middle and housing units on top on each side of the street. Figure 25 proposes a separated form of development which is designed with office buildings on one side, and housing units development on the other side of a street.

Each floor for office building is 12' high, the height for a single apartment unit is about 10' and the retail floor is 14' high as well. For the retail development, this research is proposing, a local food market, ethnic restaurants with street patio spaces, the boutique showrooms, local stores, fitness centers and basically any function that increases the chance of social interaction. The development should make walking interesting.

For office building this report targets local business such as oil companies, Law firms, architecture firms and real estate business however for housing development this report does not target a specific group of people, such as young professional or the older people. Therefore based on the health impact, economical consequences and environmental reasons the report strongly courage all group of people to live in downtown Tulsa in order to

Figure 25. Deco Style buildings

Figure 26. Contemporary Style.

create a heather, weather and cleaner life.

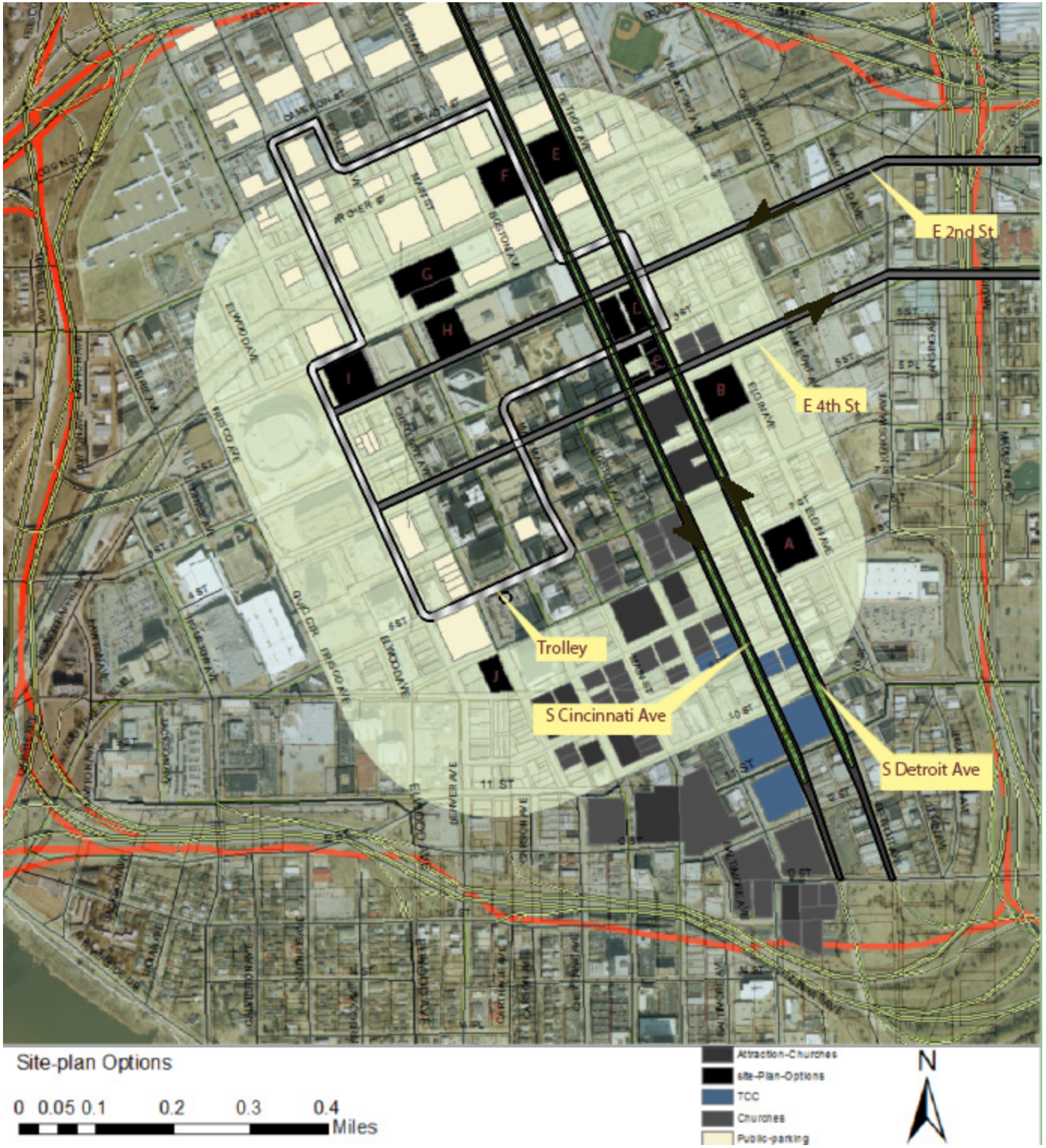
Different Architecture Typologies

Art Deco is a style that was developed to describe a modernist movement that came out of the 1925 International Exposition of Modern Industrial and Decorative Art in Paris. It combines austere shapes and styling of modern technology with patterns and icons from the Far East, ancient Greece and Rome, Africa, India, and Mayan and Aztec cultures.

Chicago style or Chicago School of Architecture is a style created by active architects at the turn of the 20th century lead by Louis Sullivan. They were promoting the use of new technologies and steel-frame construction for commercial buildings, combined with neoclassical elements such as arches and columns.

Neo-gothic is an architectural movement that began in the late 1740th in England but grew rapidly in the early 19th century. Its a style sought to revive medieval Gothic architecture, in contrast to the neoclassical styles, and it displays features derived from the original Gothic architecture style, including decorative patterns, finials, scalloping, lancet windows, hood mouldings, and label stops.

Contemporary style is characterized by the use of clean lines with a casual atmosphere, open spaces, neutral colors, and elements and materials inspired by nature. It combines new elements with those from styles like functionalism and minimalist architecture.



STREET DESIGN SCENARIOS

Based on the recommendations explained on page 16, creating the proper balances or a reason to walk is not enough to make Downtown Tulsa walkable. In this section, this research is focusing on street visions, in order to make a walking experience safe and comfortable. The average width of a street in downtown is approximately 80' and from a perspective that is too much distance to cross form one side of the street to another side street comfortably, especially for children and the elderly people. According to Gil Penalosa who is one of the most famous international urbanists from the city of Bogota and he is the founder of 8-80 cities, a public street must be safe to walk or to bike for an 8 years old child or the 80 years person.[1] A street with a two-way traffic lane can easily handle 10,000 vehicles, so crossing the street with more than two lane can be perceived as a dangerous experience by an 8 years child. According to the online traffic map form the Indian Nations Council Governments which is established in 1967 as known as INCOG website, the South Detroit Avenue which is a 4 lane street handles 3400 vehicles per day and the South Cincinnati street with the same number of the lanes carries 8,900 cars for a day. The street scenarioes are proposing the complete street design for S Detroit Avenue, and S Cincinnati Avenue.

1. http://www.8-80cities.org/

Figure 27. Street-Design, Option A

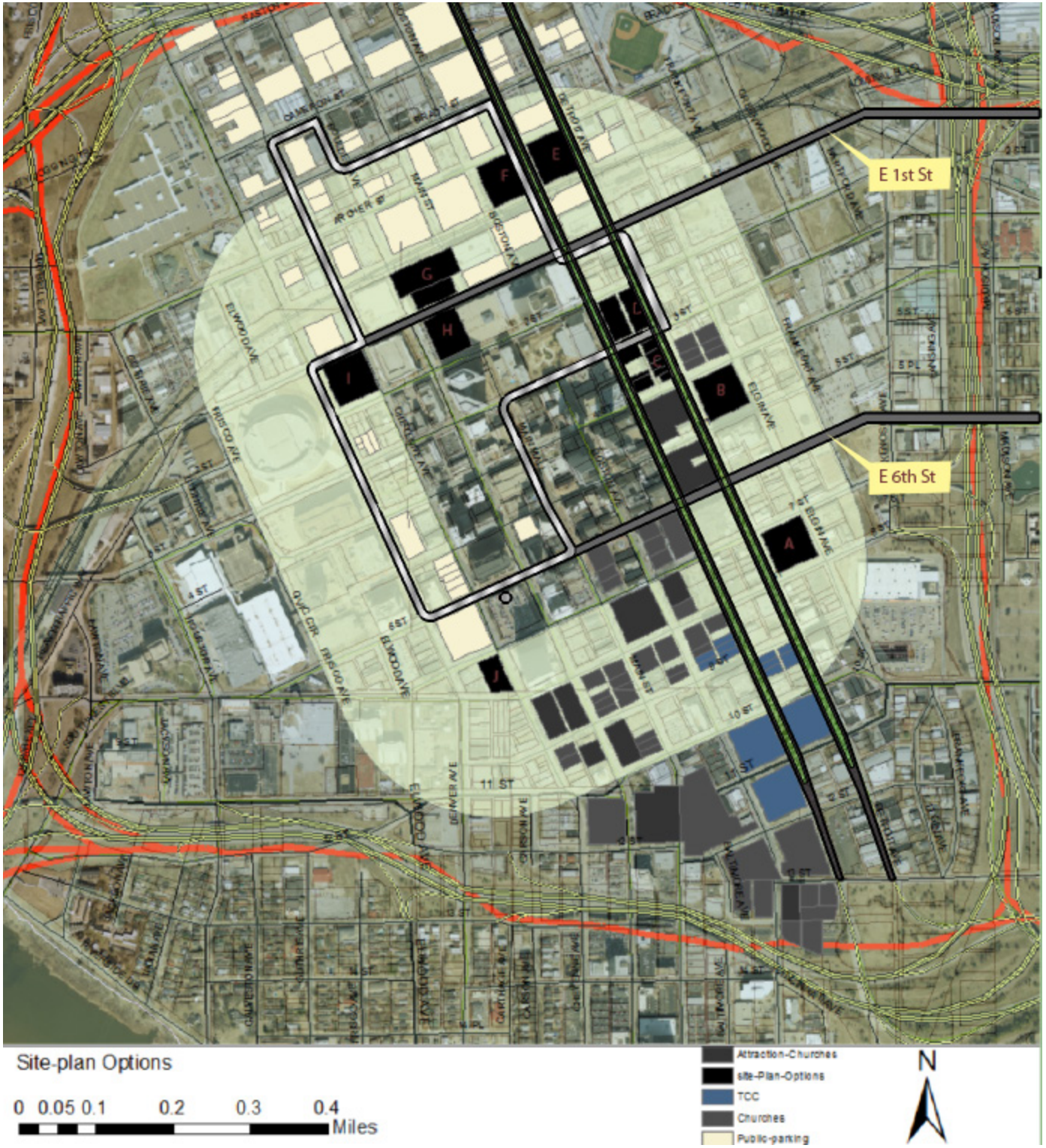


Figure28. Street-Design, Option B

WHAT ARE COMPLETE STREETS?

According to Smart Growth America website, complete streets are streets for public uses and they are designed to enable safe access for all users, including pedestrians, bicyclists, motorists and transit riders of all ages and abilities. Complete streets should make it easy to cross the street, walk to shops, and bicycle to work.[1]

They allow buses to be on time and make it safe for people to walk and use public transportation.

There are several steps to make complete streets in downtown Tulsa:

1. Changing the traffic pattern which means changing S Detroit Ave and S Cincinnati Ave from one way street to two ways street which forces the vehicles to reduce their speed and be aware about the traffic that is coming from in front of them that makes walking safe for the pedestrians who are crossing the streets.

2. Planting the continuous street trees along S Detroit Ave and S Cincinnati Ave which are producing the shade for pedestrians that makes walking more comfortable while the trees create visual barriers for drivers to slow their speed.

1.http://www.smartgrowthamerica.org/complete-streets complete-streets-fundamentals/complete-streets-faq

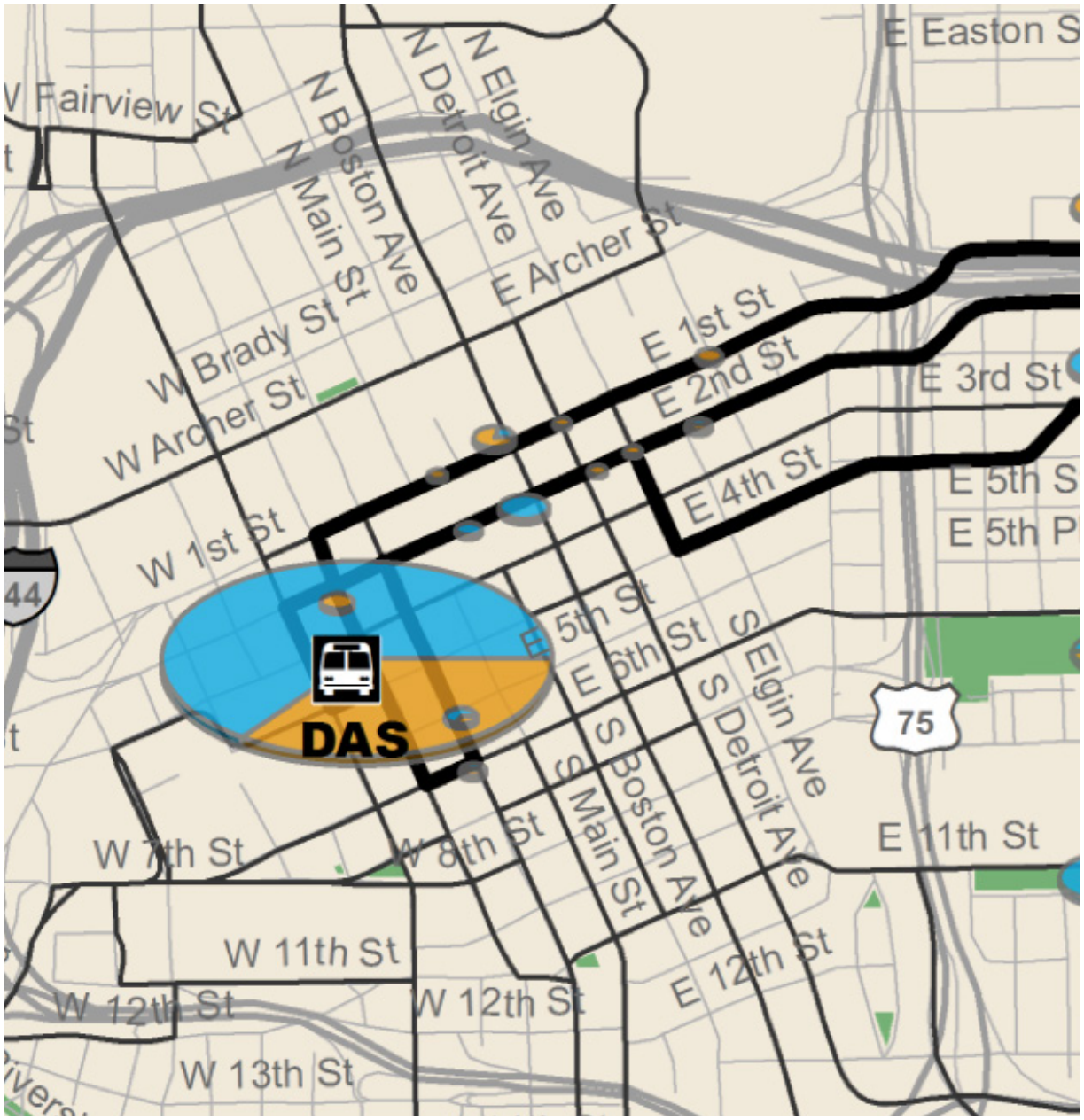


Figure 29. BRT, INCOG Transit Plan.

3. Adding street parking along the both Avenues that slows the vehicles traffic and it separates the streets from the side walks physically which creates the sense of security for pedestrians who are walking on the sidewalk.

4. Connecting the South Detroit and the South Cincinnati streets to active public transportation. There is no reason to avoid connecting those streets with the existing public transit plans which one is a trolley plan that goes through the first street and 6th street and another is BRT master-plan provided by INCOG and it connects the second street and 4th street, it continues all the way to Quincy Ave. (Check the Street Design Scenarios). If the service becomes active it gives the entire public including people who do not use cars for any reason such as the age limitation, health condition or financial consequence an equal

4. Connecting the streets to active public transportation in order to make walking experience more comfortable. In the first scenario the report proposed connecting the 2nd and the 4th streets to the existing bus rapid transit (BRT) plan which represented by INCOG. The plan is suggested making a connection between the 2nd and the 4th streets to Peoria street as it shown in figure X. For more information please check the link below:

http://www.fastforwardplan.org/

http://www.okhistory.org/shpo/architsurveys/ILSofdowntownTulsa.pdf

Figure 30. Traditional Development Tulsa

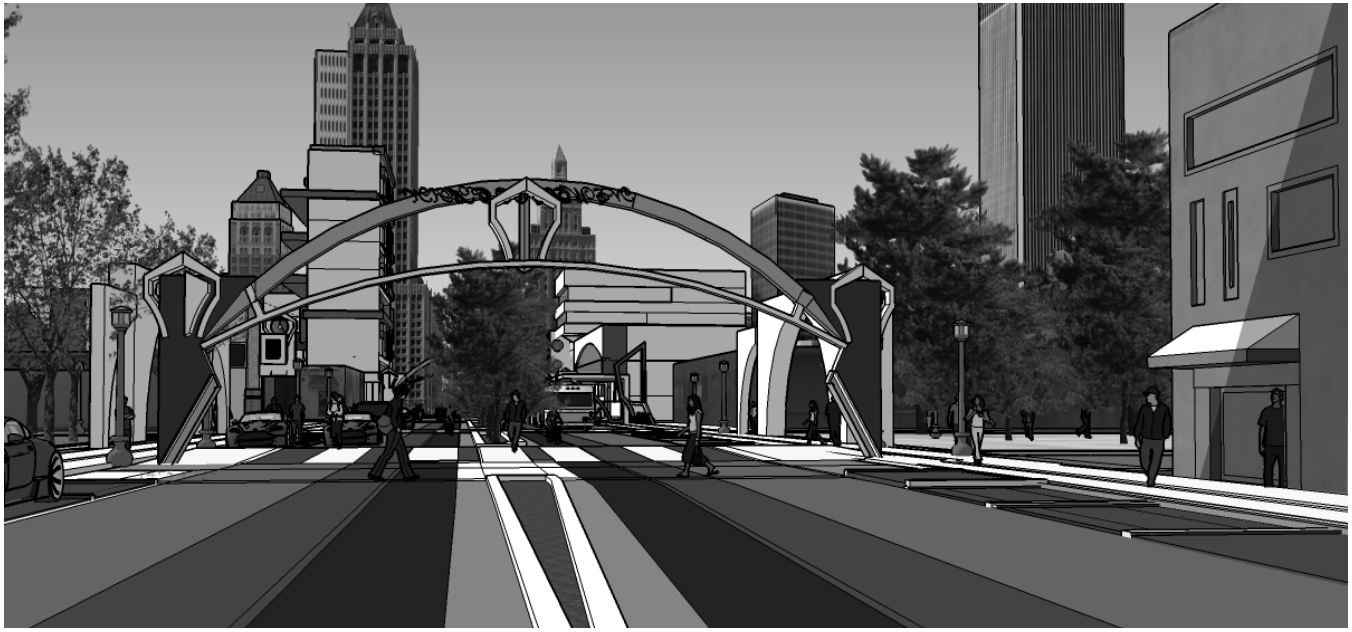


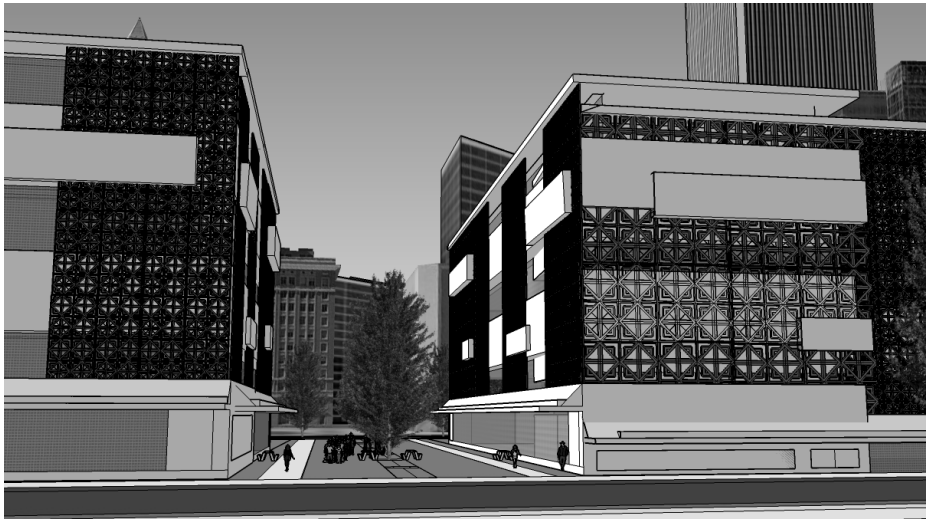
Figure 31. New Development. 4th Street Design

In second street design scenario this research recommends making connection between the 1st street, the 6th street to existing Trolley plan which is proposed by Tulsa Regional Chamber. For more information please check the next page:

http://www.trolleymap.com/

CONCLUSION

In the end this report has responded the most important question which is how the development of downtown can save Tulsa from sprawl growth symptoms that are negatively generating an impact on public health, regional economy and local environment. The key answer is related to make downtown Tulsa a walkable place which leads to a healthier, wealthier and cleaner town for everyone in this area. Based on what is established this report targets three groups of the audience that are any person between the age of 8 to 80 should know that living in urban area will help him or her to live longer, it saves his or her money and it saves his or her city for the next generation. Based on this study the planners and engineers from City of Tulsa should understand the differences between designing a road and designing a street and how this knowledge impacts people's life in Tulsa. Finally based Pro formas scenarios the return on investment for this project which is a mixed use development with 30% housing, 5% retail and 65% office unites is estimated 2.4% for less than 4 years. Based on the market analysis the average cost of a downtown block is estimated



Figures 32-33, Third Steet and Cinncinati Ave Design options 1:2 Ratio

$2,500,000 which is relatively cheap. This research predicts that the land cost for a downtown block will significantly increase after the renovating of the existing buildings become completed and this report strongly encourages the developers to invest on mixed development in downtown Tulsa.

Design based on the desirable Ratio:

The study ratio of height to width fot a street is not a new subject, as a matter of fact, the architects and urban planners from ancient cities such as Rome; Florence experimented; it for centuries to build their urban areas in order to create the sense of enclosure of their pedestrians. “When buildings physically define public spaces particularly through proportions between height and width in an area to create places that are comfortable to pedestrians.” That term is determined by the City of Ottawa. Back to today’s information based on Multidimensional Framework for Walkable Thoroughfare Design journal, published on Tuesday, January 30, 2007 by Transportation Research Board of the National Academies written by co-writers such as, Fredrich C. Dock from Mohaddes Associate in Minneapolis, Brain S. Bochner from Texas A&M and Ellen Greenberg from Congress for the New Urbanism in Oakland California the desirable Ratio between the height of buildings and the width of street in as it clarified on figure 31 in a typical street is between 1:2 and 1:3. At a minor street the ratio decrease between the minimum 1:1 and the maximum 1:2. However, the ratio in public squares the minimum ratio is 1:4 and the maximum ratio is about 1:6. Therefore, the space ratio beyond 1 to 6 is going to be uncomfortable for a human sense and humans and animals have in common about sense of enclosure. They tend to have a clear vision from the space in front of them and the same time they would to be protected from behind.[1]

1. http://www.smartgrowthamerica.org/complete-streets/complete-streets-fundamentals/complete-streets-faq

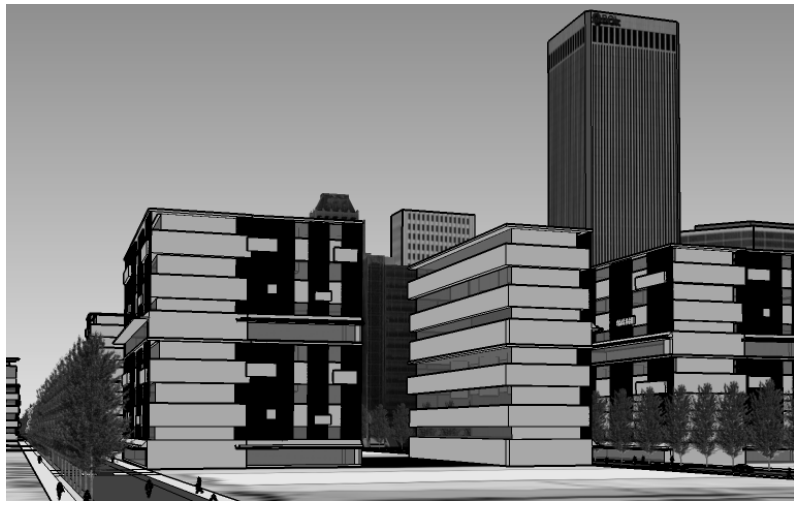


Figure 33. Cincinnati Ave design option

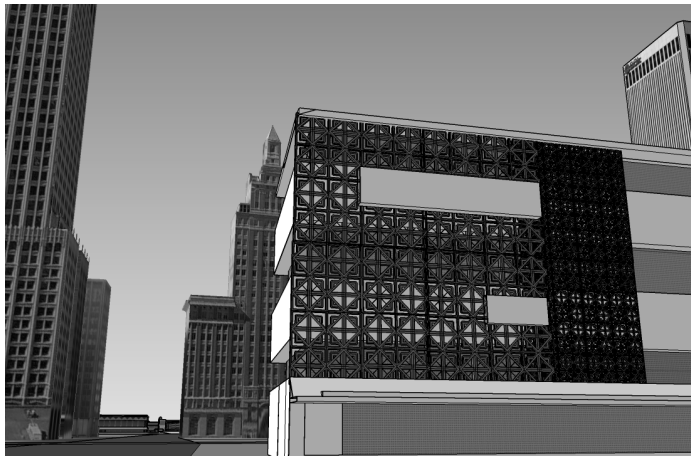


Figure 34. Design patterns

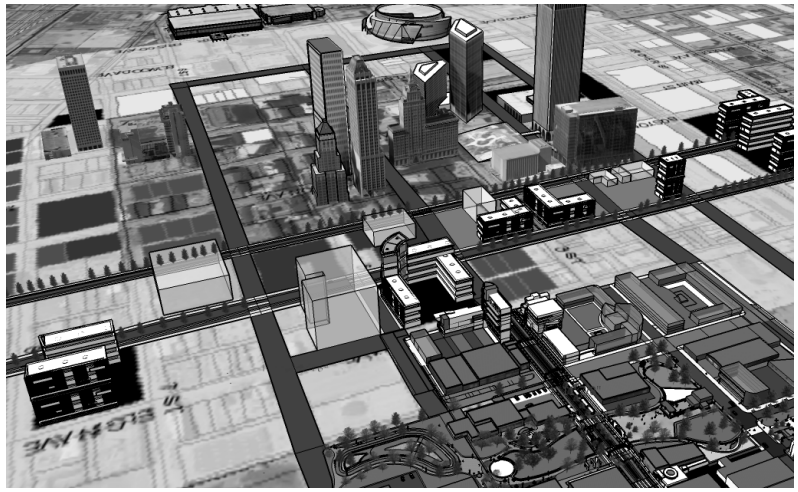


Figure 35. Urban vision

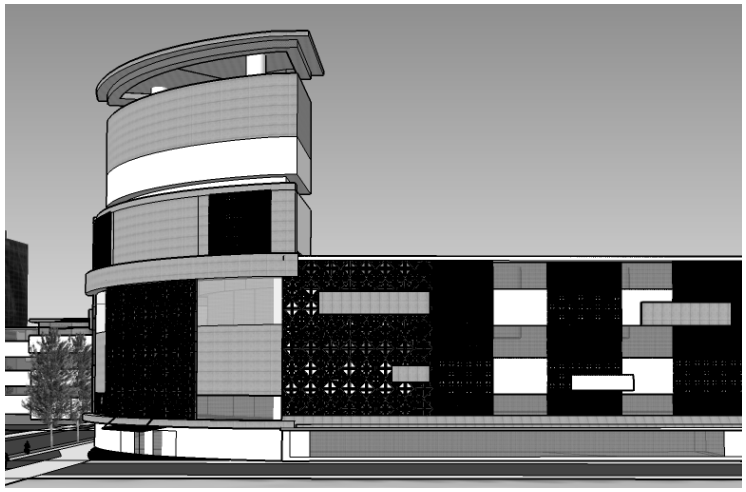


Figure 36. 4th Street. New development.

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