

Fall 2011

## A Baseline for Downtown Transit-Oriented Development: Planning for Success in the Loyola Corridor

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A Baseline for Downtown Transit-Oriented Development:  
Planning for Success in the Loyola Corridor

A Thesis

Submitted to the Graduate Faculty of the  
University of New Orleans  
In partial fulfillment of the  
Requirements for the degree of

Master of Urban and Regional Planning  
Transportation Planning

by

Peter D. Bennett

B.A. Lawrence University, 2008

December, 2011

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## **Acknowledgements**

I would like to thank John Renne for his help over the last two years. His encouragement helped me move forward on a topic of real world relevance, while his expertise on Transit-Oriented Development guided me to resources and context. I would also like to thank the other members of my thesis committee, Patrick Haughey and Kurt Weigle, for their thoughtful comments.

Jim Amdal at the University of New Orleans compiled other resources and data for this thesis. The beginnings of this process were the work of the Land Use and Transportation Planning class in the spring of 2010.

Lastly, I would like to thank all of my family and friends for their support and thoughtful debates.

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## List of Abbreviations

BID	Business Improvement District
CBD	Central Business District (New Orleans neighborhood)
DDD	Downtown Development District
FAR	Floor Area Ratio
GIS	Geographic Information Systems
LBCS	Land Based Classification Standards
PUD	Planned Unit Development
RTA	New Orleans Regional Transit Authority
SF	Square Feet
TIGER	Transportation Investment Generating Economic Recovery (Federal Program)
TOD	Transit-Oriented Development
UPT	New Orleans Union Passenger Terminal

## **Abstract**

Transit-Oriented Development (TOD) in downtown areas is a distinct form of new development, creating walkable districts and 24-hour neighborhoods. A new streetcar on Loyola Avenue in the New Orleans Central Business District was planned to encourage new development in the area. By analyzing the current land uses and values, projections of future change predict over \$500 million in added value. For this development to become a successful TOD, policies must encourage uses that generate ridership and increase walkability. Although the Loyola corridor has many historic attributes of a transit-oriented downtown, it currently lacks neighborhood identity. The new development associated with the Loyola streetcar has the potential to become a downtown TOD.

**Keywords:** Transit-Oriented Development, New Orleans Central Business District, Loyola Avenue, Streetcar, Land Use, Land Value, Pedestrian Infrastructure.

# Chapter 1: Introduction

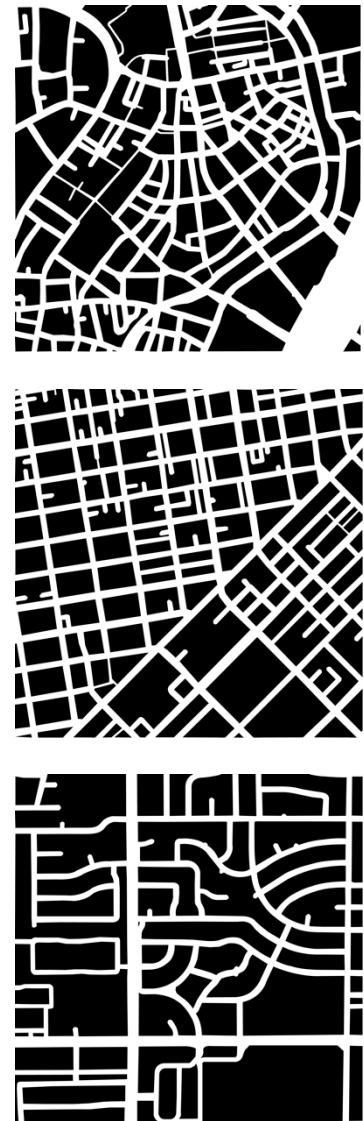
## Overview

Cities are shaped by the current modes of transportation used during their development. Walking and horseback, electric railways, and automobiles all lead to distinct urban forms built to accommodate that mode (see Figure 1) (Vuchic, 2007). In many cities, elements of all of these forms are present, conveying the city's history like tree rings. In other cities, older forms have been altered or obliterated by more recent development. Distinct urban forms can be advantageous in planning for some modes of transportation, but can also be inefficient and inequitable in the context of other modes.

This thesis concerns the urban form and function of American downtowns. These areas have unique transportation and land use characteristics that require special attention in planning. Although downtowns have traditionally been a hub for transportation and a concentration of activities, many have transformed into transit-poor areas with a monoculture of land uses. A key planning concept that could revitalize downtowns is Transit-Oriented Development (TOD), but it must be defined in the context of downtowns. Secondly, the theories behind TOD will be put to practice in the Central Business District (CBD) of New Orleans. Using quantitative land use and transportation data, as well as qualitative intelligence on the area, a new streetcar line will be evaluated for its impact on development.

TOD is a practice of planning the built environment to compliment transit services through land uses and designs that generate ridership. These ideas draw upon historical urban patterns around transit stations in the late 19<sup>th</sup> and early 20<sup>th</sup> centuries, patterns that fell out of favor with the rise of the automobile. Highway construction and separating uses dominated urban planning for the vast majority of new development after World War II in the United States, creating suburban areas that are often referred to as sprawl (Duany, Plater-Zyberk, & Speck, 2000). The transportation implications of sprawl are longer trip distances and automobile dependence, two phenomena that TOD directly attempts to address.

Common applications of TOD arose around existing transit stations with little development, historic towns, and new stations in undeveloped locations (Hondorp, 2002). Station area planning focused on a tiered approach where distance from transit dictated the uses and intensities that were built. Applications of station area planning are omnipresent in most new rail development projects, and are the most common form of TOD (see Figure 2). Corridor-based approaches are also part of the TOD paradigm, using regulations and incentives to develop the station areas along an entire transit route. The Rosslyn-Ballston, VA corridor outside of Washington, DC is a premier example of a TOD corridor (see Figure 3).



**Figure 1: Urban Transportation Forms: The Walking City, Transit City, and Automobile City (from top) (Source: Author).**

Downtowns provide a unique setting for TOD. In many aspects, they are the original form of this development, with many regional transportation modes concentrating in the area of high density, mixed uses (Bertolini & Spit, 1998). But downtowns are distinct from the station area planning that has dominated the work of TOD theorists. Transit is only one component of the land uses in the area; economic drivers and historical patterns play a prominent role in the spatial arrangement of businesses and residences. These concentrations of land uses are polynucleated, and are less concerned with maintaining a neighborhood or human scale than their counterparts in the urban periphery. Other modes of transportation also require special consideration in downtowns, with railroads, highways, and ports often concentrating in these areas. Lastly, downtowns feature larger distances than suburban stations, requiring considerations of travel within the area by transit, not just travel to the area.

One of the cornerstones of the argument for TOD in any setting is the impact that transit has on property values. The historical TODs were near stations where the wealthy could live and commute to the downtown by rail (see Figure 4). These areas featured higher priced properties in the past and still do today. Stations with parking or little development near them do not lead to large increases in property value (Wambalaba & Goodwill, 2004). In downtowns, the property value argument for transit is evident in many of the cities that built new rail in the last thirty years. These modern systems have transformed uninviting urban areas into hip, mixed-use neighborhoods with an identity tied to the new transit (Center for Transit-Oriented Development, 2011). In Portland, Washington, Minneapolis, and San Diego, a generation of city-dwellers has flocked to new, transit-rich neighborhoods (see Figure 5).

The CBD of New Orleans is a prime example of the challenges and opportunities of TOD in a downtown setting. The area has a history of transit and mixed-use development, but has become more automobile-oriented in recent decades. There are active planning efforts and investments being made to change the character of this area. These initiatives can be evaluated for their success in the future by setting a baseline today.

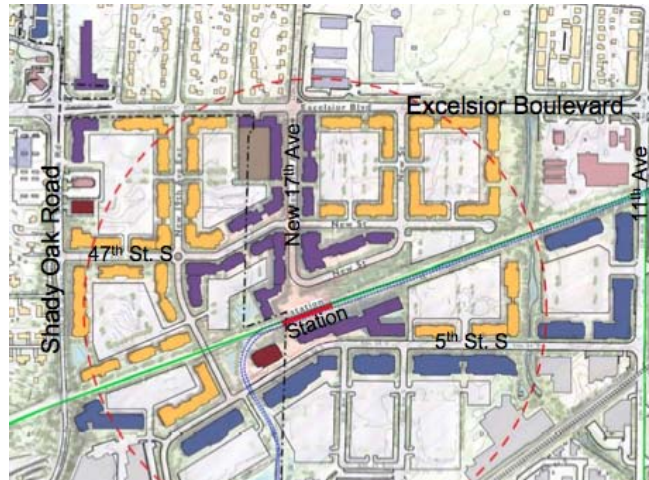


Figure 2: Suburban Station Area Planning in Minnesota (Hennepin County, 2008).



Figure 3: Rosslyn-Ballston Corridor in Virginia (Fairfax County Department of Planning and Zoning, 2005).

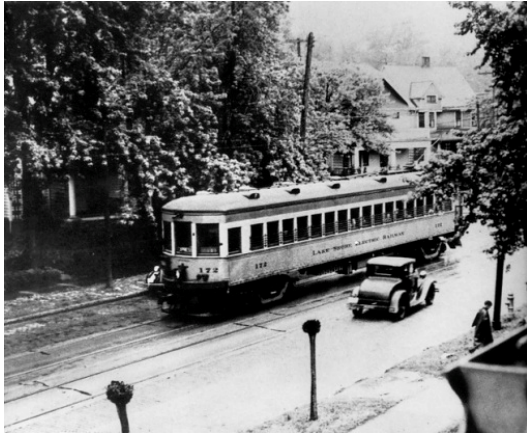


Figure 4: Streetcar suburb in Ohio (Melzer, 2010).



Figure 5: Modern streetcar and Transit-Oriented Development in Portland, OR (Portland Streetcar, Inc., 2011).

## Streetcar Expansion

In February 2010, the New Orleans Regional Transit Authority (RTA) was awarded a \$45 million grant to build a new streetcar line from the New Orleans Union Passenger Terminal (UPT) to Canal Street along Loyola Avenue and Elk Place (U.S. Department of Transportation, 2010). The grant was awarded to attract development and redevelopment of the properties along Loyola Avenue, and to improve transit options in the area. This funding was provided as part of the Transportation Investment Generating Economic Recovery (TIGER) component of the 2009 stimulus.

The Loyola streetcar expansion is part of a larger plan to reintroduce streetcars into downtown New Orleans. Although the city once featured over a dozen lines, this number was once reduced to one, the St. Charles streetcar. The Riverfront streetcar opened in 1988, and the Canal streetcar was rebuilt in 2004. In the years after Hurricane Katrina, the RTA has proposed a plan for three new streetcar lines, all in the vicinity of downtown (Donze, 2009). The Loyola streetcar is one of the new lines, joined by a Rampart Street and St. Claude Avenue extension with a spur along Elysian Fields Avenue, and a Convention Center loop that connects to the Riverfront (see Figure 6). In 2011, the Rampart/St. Claude streetcar was funded through municipal bonds and reserves held by the RTA (Donze, 2011). The Convention Center loop remains unfunded.



Figure 6: New Orleans CBD/French Quarter Streetcar Program. Loyola in blue, Rampart/St. Claude in yellow, Convention Center in purple (New Orleans Regional Transit Authority, 2011).

## Study Area

The Loyola streetcar will run through an area of New Orleans that has no singular identity. It is contained in the neighborhood defined for official purposes as the Central Business District (CBD). Within the CBD, there are areas known as the Warehouse/Arts, Financial, Medical, and Sports/Entertainment districts, but none of these fully contain or define the streetcar route. This area is defined by a lack of identity in comparison to its neighbors. In the discussions and planning process surrounding the streetcar, the area has been referred to as the “Loyola corridor.” This term is apt for use in this thesis as it engenders the concept of Transit-Oriented Development.



Figure 7: Loyola Corridor Study Area

For data collection purposes, the study area is bordered by Calliope Street, South Claiborne Avenue, Canal Street, and St. Charles Avenue (see Figure 7). These were chosen as identifiable linear barriers and corridors that surround the entire area; the actual impact area of the streetcar may not follow these boundaries. One location outside of the study area that may be significantly impacted by the new streetcar is Central City, across the Pontchartrain Expressway from the Union Passenger Terminal. This overhead expressway serves as a prominent barrier, and as a result development is quite different on each side. Public housing and community development are the prominent issues facing this Central City area. The planning for these issues will determine if TOD occurs in this location, but any current forecast is unclear. Focusing on the CBD study area isolates an area with a single identity, and can yield conclusions that apply throughout.

## Research Questions

The research goals of this thesis can be broken into two categories: theoretical and applied. The theoretical goals are defined by the first set of research questions below, and are investigated in the literature review. The second set of research questions apply this theoretical background to the study area in New Orleans, and use original research and analysis to answer them.

### *Question 1: How is Transit-Oriented Development defined within the context of a downtown environment?*

Academic literature has strived to define and characterize Transit-Oriented Development, but it is often a context dependent phenomenon. Downtowns are a unique location for transportation and land use, and can vary greatly from city to city. Urban typologies can be used to better define what can be considered a downtown, and what TOD solutions are applicable to these typologies.

***Question 1a: What are the transportation characteristics of a downtown environment?***

The development of cities concurrently with modes of transportation has been well documented, leading to unique urban forms with their own transportation challenges. Downtowns often serve as a hub for regional modes. In downtowns of a certain size, a singular transportation hub does not exist, and a polynucleated form arises. Pedestrian travel is often used to traverse downtowns, but transit systems also serve these purposes. These characteristics of the transportation environment help inform the context that TOD has in downtowns.

***Question 1b: What are the land use characteristics of a downtown environment?***

Like transportation, land uses in downtowns are a product of the historic development of the city, but they often change based on current trends. Downtowns can include residential neighborhoods, business centers, industrial areas, or all three, and are often repurposed from one to the next over time. Land uses cluster and compliment each other, but in large downtowns, there can be several of these clusters. Downtowns are often defined by their intensity of uses as well, with higher density often being their defining characteristic.

***Question 2: What does Transit-Oriented Development mean within the context of downtown New Orleans?***

Downtown New Orleans features characteristics of the urban typologies explored in the theoretical research questions, but also requires other considerations. The area, like much of the city, developed in relation to historic streetcar systems, making it an original example of Transit-Oriented Development. However, parts of downtown, such as the Loyola corridor, no longer feature many of the historical characteristics of TOD. These research questions use applied, analytical methods to determine what elements of TOD will be and should be present in the Loyola corridor.

***Question 2a: What is the current state of the urban environment in the Loyola corridor?***

With any transit infrastructure project, a baseline must be set in order to measure the impact the investment will have. Information gathered on the current development in the area and the current transportation infrastructure can be used to make predictions about future changes, and will be a valuable resource for comparison after the streetcar is built. Examples of the kind of baseline data collected include land use, land value, density, zoning, sidewalk quality, paving, accessibility, and transit routes.

***Question 2b: What changes in property value, land use, and infrastructure can be forecasted?***

Change is a term that can suggest either theoretical concepts or concrete occurrences. Although this thesis will focus on measurable changes in the land use and transportation environment of the area, there are also broader changes in the planning paradigm that must be explored. Forecasts in planning involve employing typical patterns and models to determine what is likely to occur. To answer this research question, the changes in

property value, land use, and infrastructure will be studied. Future planning efforts and new development proposals in the area will help paint a fuller picture of the character of these changes.

***Question 2c: What areas are susceptible to change? Where and how do the impacts of the transportation investment dissipate?***

Some parcels will be more likely to change due to the new streetcar line than others. For example, an office skyscraper occupied by a major corporation is unlikely to change, but vacant buildings and parking lots are considered more susceptible for new development or redevelopment. Within the study area, distance and barriers are likely to affect how much development occurs, so a spatial context will be used. There are both quantitative and qualitative measures for this analysis. Whatever patterns are observed can be used to better describe the size and shape of the Loyola corridor<sup>1</sup>.

***Question 2d: Could the area become an “urban downtown” Transit-Oriented Development? What obstacles for development are there?***

American downtowns have seen both losses in population and jobs and a recent return to residential character (Dittmar & Poticha, 2004). Across the country, these older downtowns have attracted new residents for their entertainment and cultural character. In New Orleans, however, the story requires a different lens. Some areas of the downtown have always been a cultural draw for residents; others were transformed into a business core. One neighborhood, the Warehouse District, best resembles the recent redevelopment of residential downtowns. This neighborhood is adjacent to the study area. There are specific typologies and case studies that illustrate downtown redevelopment in other cities; they have been described as “urban downtown” Transit-Oriented Development (Dittmar & Poticha, 2004). Analysis of the stakeholders, landowners, and planning efforts will help determine if any suitable transformation should also be anticipated.

## **Methodology Overview**

Data analysis tools and qualitative assessment will be used to answer the research questions. Using these methods, forecasting tools, and expertise from stakeholders and planners familiar with the area, descriptions of possible change and new development can be formed. This is a brief overview of the methodology used in this thesis, a detailed description of the process is found in Chapter 3.

### ***Land Use Survey***

The built environment in the study area was surveyed by the researcher in person. A technique was developed using a modified version of the Land Based Classification Standards (LBCS)

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<sup>1</sup> A goal of this thesis is to better describe geographically an area that currently lacks a distinct character. The term “Loyola corridor” is used to refer to an area of future development, and is different from the boundaries of the study area. The measure of susceptibility to change helps better define its shape.



developed by the American Planning Association (American Planning Association, 2011). Additional information on vacancy, height, and multiple uses was also recorded. **Research Questions: 2a, 2b.**

### *Property Value Database*

Information from the Orleans Parish Assessor's database was used to determine an approximation of the property values in the study area (Orleans Parish Assessor's Office, 2009). There were some oddities and gaps in the data, which were accounted for in the model. These values need to be considered in the context of when the property was last assessed, the land use of the property, recent sales, and other outside information. This information is a useful tool in showing the total value of the area, the areas of investment, and the uses with lower values. These numbers in context will also help create a baseline for future values. **Research Questions: 2a, 2b.**

### *Accessibility Analysis*

Accessibility is a measure of the number of opportunities a person has within a certain distance from where they are (Hanson, 2004). High accessibility is important for Transit-Oriented Development because transit riders typically walk to and from the station to jobs, housing, and shopping. Walk Score<sup>®</sup> is an online application that uses mapping and proximity analysis to determine the accessibility (on a 0-to-100 scale) of any address in American cities (Front Seat, 2011). Scores are available throughout the study area, and show distinct variation. This data can be used to demonstrate what locations would be considered more accessible. **Research Questions: 2a, 2d.**

### *Pedestrian and Bicycle Infrastructure Analysis*

Successful TODs are often described as high quality spaces for walking and biking in addition to their transit connectivity. Pedestrian-friendly design of the station areas is included in the federal funding for the Loyola streetcar, but the infrastructure of the entire area plays an important role. A method of evaluating intersections and street segments was developed in 2009 for the Greater New Orleans Pedestrian and Bicycle Program (Renne, Fields, & Maret, 2009). This technique provides a quick way to quantify the assets and detractors of the infrastructure. A modified version of this tool was used to identify locations where infrastructure improvements would do the most to improve pedestrian and bicycle travel in the area. **Research Questions: 2a, 2d.**

### *GIS Database Creation*

The data gathered on land use, land value, walkability, and infrastructure were assembled in a Geographic Information System (GIS) database. The interactions between these systems of the built environment are shown using maps, and analytical tools are used to assess the state of the current land use and transportation. **Research Questions: 2b, 2c.**

### *Susceptibility to Change*

Quantitative indicators and qualitative knowledge can be used to determine the likelihood for a change in land use or use intensity (City of Austin, 2010). Using the indicators in the GIS database, as well as knowledge based on stakeholders input in the area, the land in the study area

was evaluated for its susceptibility to change. Discussions of ownership, reported developments, and historical issues help paint a full picture of the possibilities of future development in the area. **Research Question: 2c.**

### ***Review of Planning Efforts***

There have been several planning efforts in New Orleans that project a vision for the Loyola corridor. The planning completed by the RTA and the Regional Planning Commission (RPC) in applying for the TIGER grant and preparing for construction will offer a specific, technical overview of the project. More broadly, the *New Orleans Master Plan and Comprehensive Zoning Ordinance* is a long-term plan for the city that contains many concepts for the Loyola corridor (City of New Orleans, 2010). Lastly, the Downtown Development District (DDD) has completed a study of the area in terms of urban design, and offers recommendations for the future development of the area (Downtown Development District, 2008). **Research Questions: 2b, 2d.**

### ***Review Positions of Stakeholders***

The announcement of the TIGER funding for the streetcar was coupled with lots of discussion of development in the area. Surface parking and empty buildings were often mentioned as prime locations for redevelopment. In the time since then, several announcements of new developments have been made, and others have been suggested. These developers, as well as current business owners, planners, and community members have been interviewed and spoken on their visions for the corridor (Amdal, 2011). Reviewing these statements helps determine what planning efforts would be most important to the success of their projects and visions for the area. **Research Question: 1a, 1b, 2b.**

**Table 1: Summary of Research Questions and Methods**

<b>Research Question</b>	<b>Literature Review</b>	<b>Land Use Survey</b>	<b>Property Value Database</b>	<b>Accessibility Analysis</b>	<b>Ped/Bike Analysis</b>	<b>GIS Database</b>	<b>Susceptibility to Change</b>	<b>Planning Efforts</b>	<b>Positions Stakeholders</b>	<b>Policy Implications</b>
1a	•								•	•
1b	•								•	•
2a		•	•	•	•					
2b		•	•			•		•	•	
2c						•	•			
2d				•	•			•		

**Table 2: Primary Sources for Each Method**

<b>Method</b>	<b>Source</b>
<b>Literature Review</b>	Academic literature and case studies.
<b>Land Use Survey</b>	Conducted by the researcher.
<b>Property Value Database</b>	Orleans Parish Assessor’s Office.
<b>Accessibility Analysis</b>	Walkscore®.
<b>Ped/Bike Analysis</b>	Conducted by the researcher.
<b>GIS Database</b>	City of New Orleans, Downtown Development District.
<b>Susceptibility to Change</b>	Land Use Survey.
<b>Planning Efforts</b>	Master Plan and CZO, Downtown Development District.
<b>Positions of Stakeholders</b>	Amdal, 2011.
<b>Policy Implications</b>	Summary by the researcher.

## Chapter 2: Literature Review

### Introduction

This chapter will begin with a background of the study area before moving on to the theoretical basis for the ideas of downtown Transit-Oriented Development. By reviewing the core tenets of TOD, the special case of the downtown can be examined for similarities and differences. This first part of the literature review helps answer the first research question. The remainder of the chapter provides the background ideas behind transit investment, neighborhoods, and change. These ideas help form the basis for the methodology developed in Chapter 3.

### Study Area History

The New Orleans Central Business District (CBD) was first settled as the plantation of Jean Baptiste LeMoyne de Bienville. After passing between several landowners, it was eventually settled as a subdivision known as Faubourg St. Marie in the late 18<sup>th</sup> century. After the Louisiana Purchase, American newcomers settled the area. During this period, the land nearest to the river developed as the main business center of the city (New Orleans Community Data Center, 2002).

Business and transportation continued to drive the development of the CBD. Several railroads and the New Basin Canal and turning basin at Tivoli Circle (now Lee Circle) moved goods through the area, drawing new construction away from the riverfront. The port activities also increased throughout the 19<sup>th</sup> century. The turn of the century saw the construction of many skyscrapers in the area, as well as the introduction of a dense system of streetcars (New Orleans Community Data Center, 2002).

During the business boom of the riverside portion of the CBD, a significant neighborhood formed around South Rampart Street. Predominantly black and working class, the area known at the time as uptown was a residential and commercial neighborhood that fostered some of the key roots of jazz music. Most famously, Louis Armstrong grew up playing on the streets and in the businesses of the area (Practicum in Urban Planning, 2003).

The automobile age arrived in New Orleans to the detriment of the neighborhoods around South Rampart Street. The New Basin Canal was filled in to build the Pontchartrain Expressway, and Loyola Avenue was widened to its present arrangement, absorbing an older row of blocks (Fields, 2004). National and local highway planners proposed a number of transformations for the city, including several elevated highways, and wide

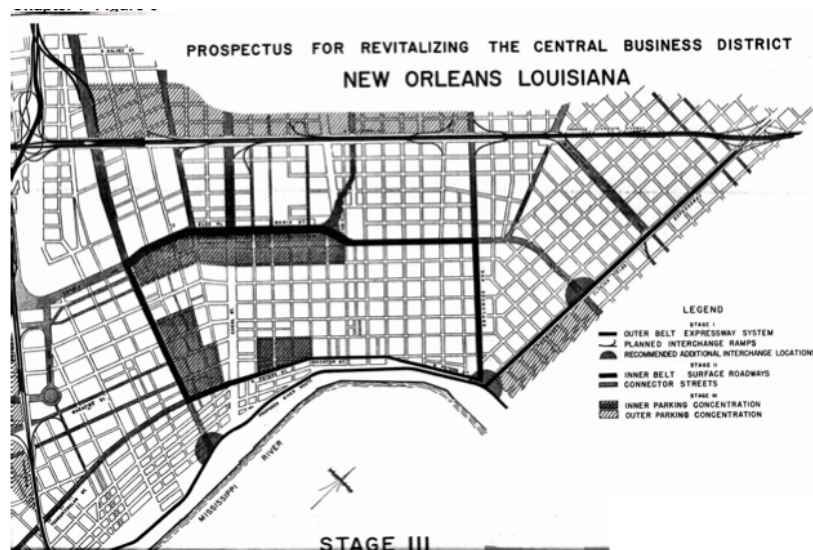


Figure 8: 1950's plan for downtown New Orleans. Shaded areas were designated for "parking concentration" (City of New Orleans Planning Commission, 1957).

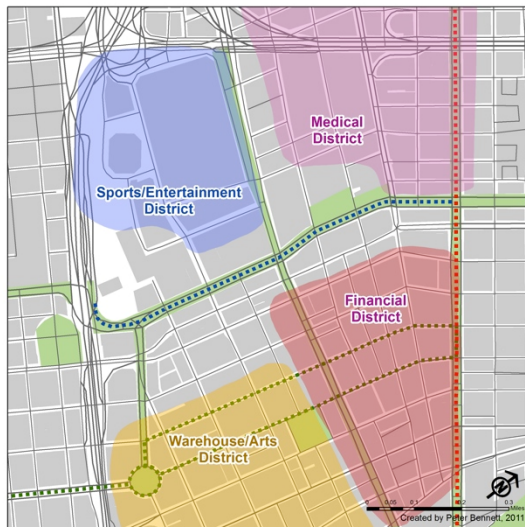
swaths of surface parking (see Figure 8). Urban renewal practices brought the demise of several more neighborhood blocks with the construction of the Civic Center complex on Loyola Avenue, including City Hall, a courthouse, a park, and a library. Modern skyscrapers sprung up in the area during the oil boom of the 1970s, while suburban exodus led to downtown workers commuting predominantly by automobile, requiring parking.

In recent decades, the Warehouse District neighborhood, adjacent to the study area, demonstrated a return to downtown residential opportunities. Old industrial and commercial buildings from the business boom of the 19<sup>th</sup> century were renovated as restaurants, galleries, condominiums, and apartments. These development patterns have extended into the study area in part, but diminish within a couple blocks of St. Charles Avenue.

Hurricane Katrina brought both direct and long-term change to some parts of the Loyola corridor. Stories from the Superdome, City Hall, and Union Passenger Terminal during the immediate aftermath of the storm were well publicized, but do not leave an impact today. Although flooding was minimal in the area, storm damage and neglect have left many large buildings in the area unused, such as the Hyatt hotel and Charity hospital. Planning and new development has targeted some of these properties, but there remain some significant unsolved problems.

There are remnants of each period of history in the CBD today. The historic street grid of Faubourg St. Marie remains intact outside of a few modern superblocks, preserving the streetcar-friendly urban design. The area lakeside of Loyola Avenue is more complicated, containing some larger barriers and missing connections. A few buildings from the jazz history of the area remain, protected by historic preservation yet sitting vacant (Practicum in Urban Planning, 2003; Mowbray, 2011). The modernist restructuring of the area and oil boom development may be the most visible remnant; the area is characterized by large roads, parking, and towers. Context-

sensitive solutions will be necessary to integrate these histories into a new vision for the area.



**Figure 9: Districts bordering the Loyola corridor.**

The history of the Loyola corridor also suggests the changing identities of the area over time. In the formative years and during the development of jazz, the neighborhood had a name, Faubourg St. Marie, and served as a distinct destination. In subsequent years, both of these characteristics have disappeared, redefining the area by what it is not. The Warehouse/Arts District, Financial District, Canal Street corridor, Medical District, and Sports/Entertainment District all border the Loyola corridor at the fringes, but lack connections to it and through it to each other (see Figure 9). Urban theorists define this phenomenon as the “lost space” that develops along borders (Fields, 2004).

With this history as context, the Regional Transit Authority applied for and won \$45 million in federal funding to build the Loyola streetcar. This application cited connectivity and new investment as the primary benefits of the project (U.S. Department of Transportation, 2010).

After planning and engineering was completed, ground was broken in June, 2011. The streetcar is expected to be operational by the middle of 2012.

## Transit Oriented Development

Transit-Oriented Development (TOD) has been occurring as long as there has been transit, and New Orleans offers one of the best examples of this phenomenon. The St. Charles streetcar was opened and operated initially by land developers hoping to attract residents to suburbs further Uptown and the town of Carrollton (Campanella, 2008). Because streetcar riders populated these new neighborhoods, businesses located close to the route to draw in customers. The clustering of businesses and residential land uses around transit in this manner established itself worldwide as the prototypical form of urban development in the age of transit.

The first incarnation of TOD in the United States was the streetcar suburbs. As transit speeds increased, new land became available for development, but only within walking distance of the routes (Muller, 2004). Because transit was built radially from city centers, the result was a hand-and-fingers urban shape that is still noticeable in older eastern cities (see Figure 10) (Newman & Kenworthy, 1999). The towns that developed around stations featured a town center serving local commercial uses, while many residents commuted to jobs in the central city.

The automobile allowed for development that broke free of this model. It was not as important to live close to transportation opportunities because the automobile reached further and was always available (Newman & Kenworthy, 1999). New development was able to be less dense, and to separate uses horizontally. Both of these characteristics make transit a less viable mode of transportation.

TOD returned to the planning paradigm concurrently and analogously with the “smart growth” and New Urbanism movements (Hondorp, 2002). These movements endorsed new ideas that diverged from automobile suburbia by recalling the town planning principles of the past. TOD used these same urban design elements to create compact communities close to transit access. Although the New Urbanists were more focused on the community and design aspects of town planning, the connection to transit was still an underlying principle.

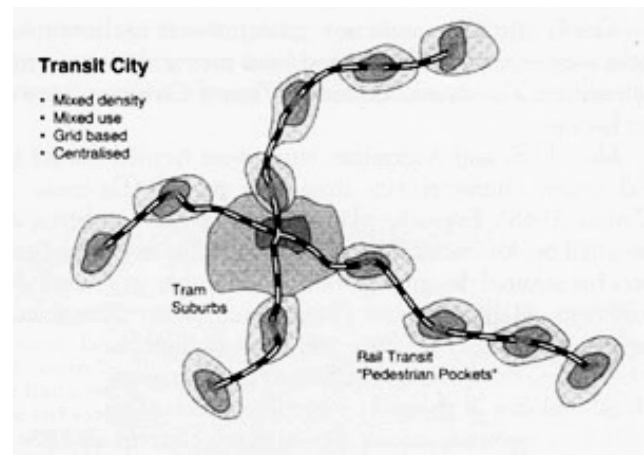


Figure 10: Transit induced "hub and spokes" urban shape (Newman & Kenworthy, 1999).

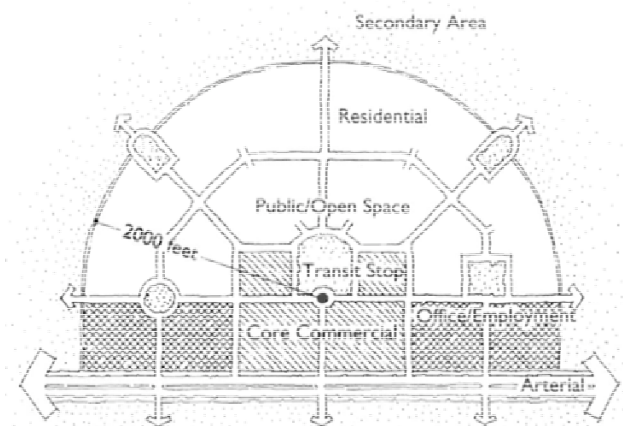


Figure 11: A New Urbanist design for TOD (Calthorpe, 1993).

Peter Calthorpe, a New Urbanist, defined TOD:

A Transit-Oriented Development is a mixed-use community within an average 2,000-foot walking distance of a transit stop and core commercial area. TODs mix residential, retail, office, open space, and public uses in a walkable environment, making it convenient for residents and employees to travel by transit, bicycle, foot, or car. (Calthorpe, 1993, p. 56)

In practice, this definition holds for the early TODs that were built, even when they did not have an overt New Urbanist design (see Figure 11). The location of a TOD is singularly dependent on having transit access; suburban redevelopment, urban infill, and new growth areas were the most common places where suitable rail stations were located. These nascent ideas failed to truly capture the types and locations of transit, focusing mostly on the station areas (Calthorpe, 1993). Transit-Adjacent Development (TAD) was the antithesis of these ideas, where development occurred near transit, but failed to generate ridership or create place.

The 1990s saw the popularization of TOD in policies and in practice. New transportation and air quality legislation was passed that placed importance on increasing transit ridership and reducing ambient pollution (Cervero, 1993). States also contributed by passing infrastructure requirements for growth, strengthening the connection between land use and transportation.

There are numerous benefits cited by proponents of TOD. The urban design enhances mobility for residents and provides ready access to transit (Hondorp, 2002). While density alone has only a slight impact on reducing driving or increasing transit ridership, TODs have a much more profound impact (Committee for the Study on the Relationships Among Development Patterns, Vehicle Miles Traveled, and Energy Consumption, 2009; Ewing & Cervero, 2001; Renne, 2005). In areas that developed as TODs, transit mode share rose, even while regional mode shares dropped dramatically. In fact, Vehicle Miles Traveled (VMT) has emerged as one of the most common performance indicators for TOD (Austin, et al., 2010).

The environmental impacts of TOD are a direct result of the travel behavior of residents. In Chicago, neighborhoods near transit have been shown to contribute about half the greenhouse emissions of the city average (Haas, Miknaitis, Cooper, Young, & Benedict, 2010). The reduction in automobile travel can also have air quality and public health impacts.

Many of TODs more qualitative benefits relate to the social issues of the times. Returning to the town-planning paradigm was a deliberate rejection of the suburbs, a pattern that was seen as lacking human interaction (Hondorp, 2002). Public safety and community gatherings are both byproducts of the town centers found in TODs. An additional social and economic benefit of TOD is neighborhood revitalization. Existing urban areas developed as TODs can benefit from the new mix of uses, jobs, and housing. Because these developments are in high demand, a property value premium has been seen for both new and existing buildings (Cervero et. al., 2004).

## **Downtowns and TOD**

Much of the early advancement in TOD was done in new developments, but the practice has also had success in urban redevelopment. Downtowns bring a few natural advantages to TOD. These areas typically offer access to all of the modes of travel for the region, including modes that depend on large numbers of people, such as taxis (Dunphy, 2003). These modes are coordinated and accessible through many pedestrian connections. Additionally, downtowns feature higher

densities, and high land prices make parking only available at a premium. The disincentive for automobiles leads to the highest transit mode shares in the region.

The land uses that attract people to downtowns have changed dramatically in recent decades. Once a hub for various activities, many cities became dominated by office and commercial uses as shopping, entertainment, and residences moved further out. The most recent paradigm in downtown revitalization involves bringing a mix of uses back. In the commercial context, pedestrian malls, festival marketplaces, indoor malls, and main streets have drawn shopping into downtowns by competing directly with suburban malls, and by offering a distinctly urban experience (Robertson, 1997; Faulk, 2006). Retail uses have often clustered around transit in order to capture customers; these new concepts have also incorporated transit access into their success.

Business Improvement Districts (BID) are a planning tool that has contributed to the success of downtown commercial activity. BID organizations have the ability to use tax revenues from a geographic area for activities that promote and improve the business environment (Gopal, 2003; Mitchell, 2001). They have had success in creating an identity for downtown areas, publicizing the opportunities, and allaying fears of safety (Gopal, 2003; Ward, 2007). BIDs have not been as successful in development of new businesses, or altering the mix of businesses (Gopal, 2003).

Housing has also seen a resurgence in American downtowns. Often through adaptive reuse of historic buildings, apartment and condominium homes have led the transformation of other primary uses into housing (LeRoy & Sonstelie, 1983; Ford, 2003). Transit has served as the catalyst for residential downtown districts traditionally, and has become an element of many redevelopments.

Downtown TOD requires a different set of ideas and techniques than those of traditional town centers. Even Calthorpe's highest density variant, the Urban TOD, is based on a single node on a transit line (see Figure 11) (Calthorpe, 1993). This is only applicable on a macro scale, treating the entire district as a single transfer point (Dittmar & Poticha, 2004). Instead, downtowns must be treated as the employment and cultural centers of the region, with transit to support these functions. In downtowns, the impact of transit nodes can extend further into a central "station district," while transit service can be complimented and constrained by the infrastructure configuration of development (Bertolini & Spit, 1998). Taller buildings built to the street edge increase densities and pedestrian amenities, but can constrict space needed for the transit line. Redevelopment of the areas around hub railway stations in many European cities has resulted in unique plans to coordinate land uses while accommodating the transit service and infrastructure (Bertolini & Spit, 1998).

Planning for a more transit-oriented downtown area requires less retrofit than the suburban examples of TOD. The areas are typically endowed with a highly permeable street grid and high levels of pedestrian travel. Downtowns are built at higher densities, sometimes substantially mixed use. The existing buildings are often incorporated as well, due to their urban character and historic characteristics. These advantages lead to downtown TOD using much of the existing urban design, but other challenges exist. Cities that have lacked transit often have an overabundance of parking, incentivizing driving and degrading the pedestrian environment. Downtowns can also be dominated by one land use, often offices, making the areas shut down



after work hours. Lastly, the act of bringing new transit modes into the downtown area is likely to be expensive and complicated.

## **Transit and Property Value**

Transportation can have both positive and negative impacts on property values. While proximity allows for greater access and mobility, the mode itself may cause nuisances to residences and businesses nearby. Visually, the impact of transportation on urban areas can be seen in the clusters of activity, and the undesirable locations. Public transportation has found itself on both sides of this divide, creating desirable transit-oriented neighborhoods, but sometimes taking the form of disruptive trains and buses.

In a summary of studies, it was found in most cases that transit added a value premium to the property in close proximity (Parsons Brinckerhoff, 2001; Diaz, 1999). Although the impact is reliant on many characteristics of the transit and property, values dropped in absolute and relative terms over distances up to a mile from transit. In two cases, commuter rail in California and Massachusetts, there was a discount on properties within 300-400 feet from the heavy rail right-of-way.

Other negative impacts of transit did not materialize in property values. In some cities, where transit had traditionally served lower-income neighborhoods, lower values were observed, but attributed to the existing characteristics of the area (Diaz, 1999). Interestingly, one station in Atlanta featured the “wrong-side-of-the-tracks” phenomena, where transit had a positive effect on property values on one side, and a negative effect on the other (Diaz, 1999; Cervero, 2003).

For rail transit modes that are not heavy rail, the impact on property values is strongly positive. Light rail and streetcars are two modes that have seen significant reintroduction into American cities. These new systems have changed the built environment around them, often as a downtown TOD (Golem & Smith-Heimer, 2010). This transformation often led to entirely new context for property values; a warehouse and luxury condominiums are entirely different categories of use and value. In a sample of new light rail and streetcar systems, property value change ranged from modest growth (0% – 9%) to major shifts (32% - 167%), depending on the land use (Golem & Smith-Heimer, 2010). Office and retail uses showed the greatest impacts, more than doubling the value at the higher end.

A pattern emerges in the land value premiums associated with transit. The areas that exhibit the greatest change initially, or have existing premiums from transit, are locations that fit the description of TOD. New neighborhoods that are built to integrate with new transit, as well as older areas built along existing lines, have premiums higher than less transit-oriented areas (Cervero, 2003). Stations with Park-and-Ride facilities only, or areas with little commercial and residential land uses, show little or no increase in property value from transit.

## **Susceptibility to Change**

Scholarly research on land use change focuses mostly on the patterns of undeveloped land becoming suburban and urban. These works study the environmental impacts of urbanization, and its contributions to climate change. The transformation of existing urban areas is often the concern of economic development studies (Hutton, 2004; Porter, 1997). Changing land uses in central cities is a function of the economic and social forces that can differ from traditional growth scenarios.

Urban neighborhoods that are most susceptible to Transit-Oriented Development feature many of the natural advantages discussed earlier, such as transit access and historic buildings. In comparison to the existing demographics, these areas tend to experience an influx of higher income residents and higher housing costs (Pollack, Bluestone, & Billingham, 2010). This gentrification effect is somewhat inevitable, but displacement and other negative unintended consequences are not. Through planning and policy tools, some TODs have seen remarkable change without a loss of diversity.

The city of Austin, TX codified a set of indicators to broadly predict what areas of the urban area will experience new development, redevelopment, change of use, or intensification of use (City of Austin, 2010). These indicators were used in a comprehensive planning effort, and were primarily used to show district-level growth. Although the indicators are only quantitative (see Table 3), they attempt to consider many disparate qualities in conjunction. The aggregation of the indicators resulted in a map that demonstrates competing goals of outward growth, infill development, and ecosystem preservation (Figure 12).

**Table 3: City of Austin Susceptibility to Change Indicators**

<b>Indicator</b>	<b>Least Susceptible</b>	<b>Most Susceptible</b>	<b>Data Type</b>
Owner Occupancy	All owner-occupied	All not owner occupied or not residential	Percentage
Land Status	Developed, or constraints	Undeveloped, no constraints	Several distinct levels
Improvement to Land Ratio	Above 1.5	Zero or not commercial	Ratio
Zoning and Overlay Districts	Historic or conservation district	Base/overlay districts that effect change	Several distinct levels
Projected Growth in Employment	Low growth in jobs/acre	High growth in jobs/acre	Amount
Water Service	Outside impact fee area, or in Drinking Water Protection Zone.	Currently served by water system.	Yes or no binary
Transit Corridors	Not well served by transit	Well served by transit.	Uses distances and frequencies
Road Access	Worst road access	Best road access	Density of arterial roadways.
Property Violations	No property violations	Most property violations	Amount
Year Built	Newer	Older or undeveloped	Year
Development Cases	Developed or areas without cases	Areas with development cases	Yes or no binary

Land use change in urban downtowns is distinct from the changes seen in new development. Built roads, water access, and development are typically already present, but infrastructure still plays a role. Highways and heavy rail lines can be undesirable neighbors for some land uses, while providing easy access for others. The issues of owner occupancy, zoning, conservation status, and year built are also unique in downtowns, or not applicable altogether.

## Pedestrian and Bicycle Design in TODs

The transportation impacts of TOD reach further than just transit ridership. Residents of these developments have lower levels of overall automobile ownership, and are almost twice as likely to make a trip by walking or biking (1000 Friends of Oregon, 1997; Renne, 2005).

Pedestrian and transit-oriented designs share many similarities because every transit rider is also a pedestrian. The urban form of developments that support transit ridership feature high densities and mixed-uses, both features that lead to more walking trips (Frank & Pivo, 1995; Messenger & Ewing, 1996).

Design of the pedestrian environment also leads to higher pedestrian travel in TODs, and in turn impacts the success of the development. At the largest scale, the block size of TODs tends to be smaller than their suburban counterparts, allowing for more connectivity and direct access. Locations with smaller blocks in the Seattle area were shown to have higher pedestrian volumes (Moudon, 1997). Distance is also a major factor in the decision to walk to a transit station with most trips not exceeding half a mile, and some averages much lower, depending on mode and urban environment (Loutzenheiser, 1997; O'Sullivan & Morrall, 1996). Walking distances are greater for light rail stations than bus stops, demonstrating the attractiveness of this mode. Downtowns that predominantly feature office uses feature lower pedestrian volumes, and lower distances traveled to transit by walking (Loutzenheiser, 1997).

The close relationship between transit and pedestrian travel has translated into a set of design principles that are considered the best practices for new TODs (Calthorpe Associates, 1992). Beyond the densities, uses, and street network design that support these modes, the physical quality of the sidewalks, crossings, and other elements plays a crucial role. Sidewalks that offer ample space for many pedestrians, buffers from traffic, and include street-oriented buildings are featured in municipal guidelines for TODs, as well as accepted engineering principles (City of Portland, 1998; Transportation Authority of Marin, 2007; Ewing, 1996). Crossings are treated in a similar manner, with short distances and traffic calming features. Extra attention is paid at transit stops, where high volumes of pedestrians can be expected. Lastly, nonessential pedestrian design elements are recommended to foster a vibrant and enjoyable environment. Street furniture, special pavements, and signage can engender a sense of place to a TOD (Ewing, 1996).

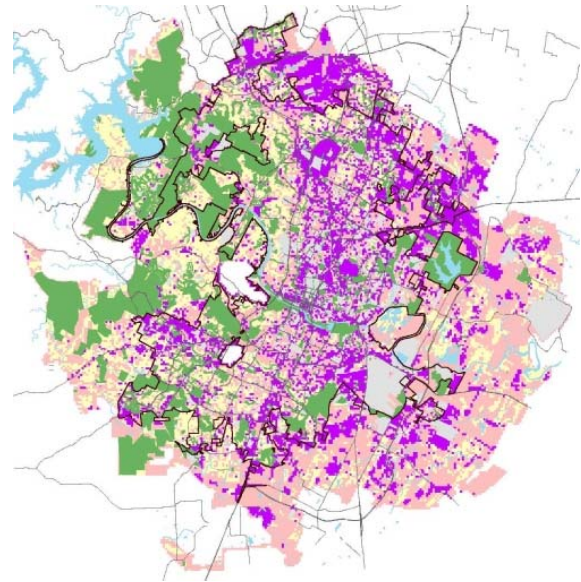


Figure 12: Austin susceptibility to change results: Most in purple, least in yellow, conservation in green (City of Austin, 2010).

## Regulatory Tools for TOD

Transit-Oriented Development is a unique form of new development, and often requires a different policy framework than the existing conditions. In formative examples, a complete set of regulations often needed to be written, adding time and costs to the projects. Forming TOD policies from scratch has been uncertain and idiosyncratic in practice, but with ever increasing examples, some themes have emerged (Greenburg, 2004).

Zoning often lies at the core of any barrier to TOD implementation. Higher densities and mixed uses may not be permitted under normal circumstances, and other restrictions may be placed on desired integration with transit facilities. Although new zoning practices, such as form-based codes and performance zoning, may successfully allow TOD, most developments face traditional Euclidian zoning (Parolek, Parolek, & Crawford, 2008). Within the context of most local zoning, the Planned Unit Development (PUD) is a common tool for TOD, allowing for single approval of an entire project based on a master plan (Greenburg, 2004).

The PUD process is a successful tool for new TOD development, but may be impractical in infill and downtown locations. Integration with existing development and other planning districts in place require working within the existing framework. Some municipalities have, however, enacted policies that make TOD easier. Mixed-use zoning categories are a simple example, requiring no additional review (Greenburg, 2004). Minimum densities are another option, a policy that directly leads to one of the requirements for TOD.

Design review is another planning tool for encouraging TOD. Typically implemented as a district with identifiable character or historical significance, these regulations require the appearance and form of any new buildings to meet certain specifications (Greenburg, 2004). In Portland's Pearl District, new construction was encouraged to orient pedestrian access conveniently, front the sidewalk, and preserve historic structures through renovation (Portland Development Corporation, 2001). Design review does require some oversight from a public agency, but is more comprehensive and easier to approve than case-by-case variances.

One regulatory change that often accompanies TOD is the pedestrian design guidelines described previously. Sidewalks, intersections, building orientation, and street networks required for TOD are often prohibited in municipal standards. Additionally, standards may be needed that are distinct from surrounding areas. Although Complete Streets and other policies ease this process, developers of TODs often need approval for the pedestrian design of their projects (National Complete Streets Coalition, 2011).

Parking requirements for new development are often mandated by municipalities at higher than necessary levels for TOD (Cevero, Adkins, & Sullivan, 2010). This can add costs to new construction, and prevent a project from achieving higher densities. Automobile ownership, and thus demand for parking, is lower in TODs than for households in other areas (Evans & Pratt, 2007; Renne, 2005). Appropriately, some cities have reduced parking requirements with proximity to transit, and even implemented a parking maximum (Ellis, 2005; Shoup, 2005). Barring these changes, developers must apply for exceptions to parking requirements, or include oversized parking structures in their buildings. (Miller, 2010)

The most comprehensive solution to these regulatory challenges is a set of policies specific to TOD. Many municipalities have implemented these policies through an overlay zone. Using a set

of geographic boundaries, these zones allow for higher densities, flexible site planning, reduced parking, and separate requirements for setbacks, lot coverage, and height (State of Massachusetts, 2007; City of Fort Collins, n.d.; Bragado, 1998). The development of the Pearl District in Portland, Oregon is the most extensive example of a TOD policy, encompassing an overlay zone, master plan, street design guidelines, and tax incentives (Arrington, 2009; Portland Development Corporation, 2001).

From specific exceptions to comprehensive policies, these tools must be evaluated for appropriateness in any new TOD project. Regulations in one area may not make sense for another. While TOD remains an exception to the norm, inappropriate zoning and unsuitable design requirements will pose a significant hurdle to implementation.

## **Creative Class and Neighborhoods**

The demand for TOD nationwide and in New Orleans is derived from changing preferences in the real estate market. Younger new homebuyers and empty nesters are driving a shift away from drivable suburban housing and towards walkable urbanism (Leinberger, 2009). According to one estimate, these developments accounted for only five percent of the supply of new construction, but made up thirty percent of the demand. Additionally, in a market where housing is not a lucrative investment, the Urban Land Institute still identified TOD as the best bet for future projects (Miller, 2010).

From a regional perspective, one explanation for this shift is a matter of workforce geographic preference. A generation of younger workers referred to as the creative class have made an impact on many urban areas, and have become a key component to many economic development strategies (Florida, 2002). The creative class is attracted to cities where other creative people live, places with urban amenities, and places that stimulate their own creativity. This new reality is different from previous generations, where available jobs played a central role in deciding where to live. In the examples and descriptions of creative cities, many of their characteristic features are similar to the principles of TOD.

New Orleans is no stranger to the creative class, with several prominent universities, rich culture, urbanism, and many activities for young people. A study conducted by the Downtown Development District (DDD) evaluated the region and downtown area's potential for attracting the creative class<sup>2</sup> (RDA Global Inc., 2010). Access to public transit was the single most important amenity cited by survey respondents when choosing a residence, with 73.5% selecting it. In comparison to other creative cities, New Orleans featured one of the lowest transit riderships, and participants were critical of the efficiency of the system. The downtown area was also described as lacking amenities, particularly late at night.

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<sup>2</sup> Creative class members were surveyed nationally in Houston, New Orleans, San Francisco, Detroit, and Austin – cities often cited as being creative. Respondents were chosen in these locations based on their profession – biotechnology, health and life sciences, digital media, and arts-based businesses.

## Chapter 3: Methodology

### Introduction

The methodology of this thesis is designed to address the four parts of the second research question: What does Transit-Oriented Development mean within the context of downtown New Orleans? Land use and land value were addressed using a spatial approach, and analysis is done on this information on a parcel-by-parcel basis. Infrastructure analysis was done using insight from street design best practices, and is an important measure of the obstacles to walkable TOD. Projections of future land value and plans for new development help show where and what will change as a result of the new streetcar investment.

### Land Use Survey

A survey of the land uses in the area was completed during the summer of 2010 by the researcher. This survey used observable characteristics of each building and lot in the survey area to determine the use, vacancy, and height of each one. The information collected helps show what uses characterize different parts of the area, and what locations are dominated by underperforming uses.

**Table 4: Land Use Classification Categories**

<b>Division</b>	<b>Category</b>	<b>Description</b>
Residential	Household	Permanent residence.
	Transient	Hotel, guest house, etc.
Commercial	Office	All offices including doctors.
	Shopping	Selling goods or services.
	Restaurant	Serving food.
Industrial	Industrial	Warehouse, manufacturing, waste services.
Public Use	School/Library	Schools and libraries, NOT museums.
	Health Care	Hospitals and clinics, NOT doctor's offices.
	Fire/Police	Fire, police.
	Utility	Water, sewer, power, etc.
	Government	Jail, courthouse, city hall, post office, etc.
Transportation	Transportation	Stations, right-of-ways.
	Surface Parking	Unenclosed surface lots.
	Structured Parking	Parking structures including enclosed parking.
Other	Mass Assembly of People	Museums, arenas, churches, theaters, etc.
	Parks/Open Space/Recreation	Sports facilities EXCEPT spectator venues.
	Vacant	Empty land without any discernable use.

The method for differentiating the uses was developed from the Land Based Classification Standards (LBCS) published by the American Planning Association (American Planning Association, 2011). The LBCS Activity dimension was used because it describes the actual activity taking place on the property using observable characteristics. Other dimensions, such as Structure and Function, used other details, such as what economic industry it serves, or did not describe the desired characteristics. Within the Activity dimension, there are nine major divisions

(as shown in Table 4), and many further differentiations within each division. Based on these categories, and knowledge of the area, 17 land use categories that were chosen for the survey.

Land use classification was done based on appearance and indicators outside and through the windows of the buildings. Most land uses were evident by visual inspection, with vacant buildings posing the greatest difficulty. In adjacent neighborhoods, such as the Warehouse District, many buildings have been repurposed for different land uses. For this reason, the land use survey of the vacant parcels may have little impact on the findings. For example, vacant grain storage facility may easily be redeveloped as an office building.

Vacancy was assigned to each property as a binary variable separate from the land use. This characteristic was also determined by visual inspection. Empty stores, broken windows, and for sale signs were all indicators of vacancy. Any property without clear evidence of vacancy was assumed to be not vacant. It is important to note the differences between vacant properties: some have been abandoned for years; others are renovated and are likely to be not vacant within months. This was not recorded in the land use survey because of the subjective judgments required, but knowledge of new development in the area is incorporated later in the methodology.

A separate land use was recorded for the ground floor and for the upper floors. This was done to determine the amount and location of mixed-use development was in the area. Most upper story land uses could be determined by visual inspection, including doorbells and directories on the first story, but sometimes residences and offices were difficult to differentiate. Other limitations were buildings with more than two uses, and building with parking structures built into the lower stories. Although these are important qualities to the land use character of the area, the study required a level of abstraction that could not accommodate all possible configurations.

When the data was synthesized, two additional land uses were determined to represent the mixed-use parcels. When the first floor and upper floor uses were different, a third “overall use” was assigned. Although any mix of uses would be considered, only two basic types were present (see Table 5). Although first floor parking was recorded separate from the upper floor uses, these arrangements did not merit an overall use different from the upper floor use.

**Table 5: Mixed-Use Classification Categories**

<b>Division</b>	<b>Category</b>	<b>Description</b>
Mixed-Use	Commercial	Shopping/Office, Restaurant/Office, or Shopping/Restaurant.
	Commercial/Residential	Household or Transient AND Shopping or Office or Restaurant.

The final piece of information gathered during the land use survey was the number of stories. This was achieved by counting windows or design elements from a good vantage point or comparing windowless buildings to their neighbors. Large open spaces like warehouses were usually one story regardless of height.

## **Property Value Database**

The value of the land and buildings in the study area was collected both spatially, and in a working database. Collecting this data by lot, or parcel, allows for differences in value due to distance and land use to be shown. The process of creating the database required careful inspection of the information, and some transformations and abstractions.

Property values for the study area were estimated from the Orleans Parish Assessor's Office database of assessed values (Orleans Parish Assessor's Office, 2009). The process of assessing property is distinct from the actual market value of property, making the data collected an estimate of this information. Many of the parcels in the area have not been sold or reassessed in many years, making their values in the database incongruous with the true amount they might be worth.

The Assessor's database includes data for land value, improvement value, and total value. These values are meant to represent ten percent of the fair market value of the property, which is the number that the millage tax rate is applied to. It was important to inspect the data collected carefully to ensure that the results were not off by a factor of ten. The data was sent as a bulk spreadsheet by the Assessor in August 2010, and thus represents the values for that year. Additional values missing from the spreadsheet were retrieved from the Assessor's website.

Land assembly for larger buildings has led to many irregularities in the Assessor's database that were addressed on a case-by-case basis. This process took place using Geographic Information Systems (GIS) software, which is explained in more detail later. Often, the value of the building was listed for one lot, with the remaining lots showing a value of zero. In these cases, the lots were merged together with the complete value information. Condominiums posed the opposite problem, with many separate entries for the same lot. Each condominium had a fraction of the land, improvement, and total value listed, so when merging these entries, the numbers were summed.

Parcels containing multiple land uses required the greatest abstraction. There is no way to know which use is more valuable, so the value for the land was divided proportionally by area between the uses. For improvement values, the same process was used unless one of the uses was not a structure, such as parking. Across the study area, the assessor data recorded only a land value for parking lots, despite this land use being somewhat of an improvement.

## **Accessibility Analysis**

A transportation system can be evaluated in terms of both mobility and accessibility for an individual. While mobility measures the maximum distance a person is able to travel in a length of time, accessibility measures the number of opportunities available within a certain distance (Hanson, 2004). Places built for mobility may lack amenities within walking distance and feature inhospitable pedestrian environments. High accessibility does not guarantee good pedestrian design, but it is an important factor in the decisions and behaviors of an individual.



Walk Score<sup>®</sup> is an online application that uses business and amenity location databases to generate an overall measure of “walkability” for any point. A weighting algorithm based on walking research is used for groceries, restaurants, shopping, coffee shops, banks, parks, schools, books, and entertainment (Front Seat, 2011). Grocery stores receive the heaviest weight because they lead to walking and are the most common destination in surveys. The second part of the Walk Score<sup>®</sup> methodology is the distance decay function. This function assigns the full weighted value for amenities close to the point, with diminishing scores moving further away. The function is a smooth curve, and assigns scores to any amenity within a mile and a half of the location (see Figure 13).

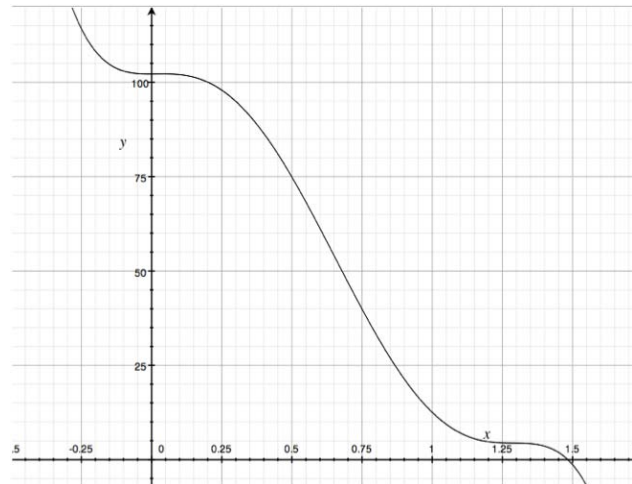


Figure 13: Walk Score<sup>®</sup> distance decay function (Front Seat, 2011).

In addition to accessibility, there are two pedestrian friendliness metrics included in the Walk Score<sup>®</sup>. Intersection density and block length are both academically accepted measures of good urban design for pedestrians, and are easily integrated into the methodology. A location can receive up to a ten percent deduction for poor pedestrian design. Although this thesis uses other measures for pedestrian and bicycle infrastructure, it is helpful to have these metrics included in the Walk Score<sup>®</sup>.

## Pedestrian and Bicycle Infrastructure Analysis

The quality of the pedestrian and bicycle infrastructure in an area has a profound impact on the likelihood that people travel using those modes. Additionally, successful Transit-Oriented Developments almost exclusively feature high quality infrastructure for walking and biking. The research and practice of designing this infrastructure has developed into a well-nuanced field, and has culminated in many government policies, such as Complete Streets (National Complete Streets Coalition, 2011). Metrics of quality design are based on engineering principles, and can be used in the field to evaluate existing conditions.

Existing audit tools and a roadway design training course influenced the development of this infrastructure analysis methodology. A method of evaluating intersections and street segments was developed in 2009 for the Greater New Orleans Pedestrian and Bicycle Program (Renne, Fields, & Maret, 2009). This technique provides a quick way to quantify the assets and detractors of the

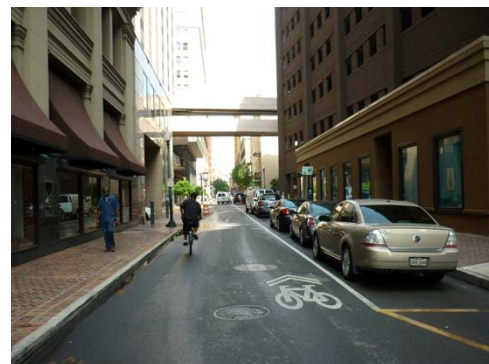


Figure 14: A bike lane (above), and a shared lane marking (below).

infrastructure. A review of the current practices, standards, and innovations in street design was held as a three-day course in April 2011 by Michael Moule and Michael Ronkin (Moule & Ronkin, 2011). Only a few metrics were chosen to evaluate the current infrastructure, but these measures are good predictors and detractors of walking and biking (see Table 6).

On the most basic level, the simple presence of infrastructure was recorded. Sidewalks are present on most blocks, but not all; the broken links in the network are an important indicator. There are bike lanes and shared lane markings in the study area; their presence was also recorded (see Figure 14). Pedestrian infrastructure at intersections is most commonly painted crosswalks and ramps. At each intersection, the number of missing curb-to-curb crosswalks was recorded, and the number of missing ramps without reasonable alternatives. For example, a curb that one must step off is lacking a ramp, but it is not necessary for a corner to have two ramps when one ramp is properly located (see Figure 15).

The safety and comfort of the pedestrian is an important factor in the success of a sidewalk segment. Streets without buildings along the sidewalk, or furnishings and plantings next to the roadway, are less hospitable and enjoyable for the pedestrian (see Figure 16) (Moule & Ronkin, 2011). To create a simple methodology, each intersection-to-intersection was rated for these elements in one of three categories. For building frontage and street furnishings, the approximate percentage of the length where it was present was evaluated. These segments could have the features all or mostly present, about half present, or minimally or not present at all. Another segment feature that contributes to pedestrian safety and comfort is on-street parking between the travel lanes and the sidewalk. If parking was allowed anywhere on the segment, it was said to have on-street parking.

The final infrastructure analysis performed was a yes or no question: is there a traffic-calming feature present? There are many different kinds of traffic-calming in the engineering lexicon, with a great variety of impacts on the behavior of motor vehicles (Fehr & Peers, 2008). These techniques have been proven as some of the most effective for improving pedestrian safety. Traffic-calming can be achieved using one feature, or a combination of several, with varying severity. For each segment and intersection, the presence of any distinct traffic-calming feature was recorded (see Figure 17).



**Figure 15: A ramp serving both crosswalks well (top), a missing ramp because the ramp is poorly positioned for one crossing (middle), a corner with no ramps (bottom).**



**Figure 16: Street frontage and furnishings (above), no frontage or furnishings (below).**



**Figure 17: A curb bulb-out, an example of pedestrian friendly design and mild traffic-calming.**

**Table 6: Summary of Pedestrian and Bicycle Infrastructure Analysis**

<b>Target Location</b>	<b>Question</b>	<b>Possible Responses</b>
Intersections	How many curb-to-curb crossings lack a crosswalk?	Zero and above.
	How many crossings lack a properly located ramp?	Zero and above.
Segments	Is there a sidewalk/bike lane/shared lane marking?	Yes; No.
	How much of the segment features buildings with close proximity street frontage?	All or mostly; About half; Minimal or not at all.
	How much of the segment features furnishings, plantings, or other items between the pedestrian and the street?	All or mostly; About half; Minimal or not at all.
	Is there on-street parking allowed?	Yes; No.
Both	Is there a traffic-calming feature present?	Yes; No.

## **GIS Database Creation**

All of the information above was compiled in a Geographic Information Systems (GIS) database. Using this mapping software allowed for quantitative calculations and transformations of the data, in addition to a number of spatial analysis functions. Most importantly, using GIS allows for the researcher and reader to visually understand and make conclusions about the area.

A base map for the survey and database creation was made using layers publically available from the United States Geographic Survey, the Louisiana Geographic Information Center, and the City of New Orleans (United States Geological Survey, 2010; Louisiana Geographic Information Center, 2010; City of New Orleans, 2010). Aerial imagery and parcel line layers helped ground truth the information gathered by hand, but significant edits and updates were necessary. There were often discrepancies due to new construction, historic land assembly, and assessment parcel boundaries. The researcher merged parcels, split parcels, and created new parcels based on the information and situation. For this reason, two slightly different shapefiles<sup>3</sup> for property were used for land use and value, but attributes for each one were shared through a spatial join. The result is a complete set of shapefiles for the study area (see Table 7).

Current zoning data for each parcel was retrieved from the New Orleans City Planning Commission website (City of New Orleans, 2011). Without considering conditional uses, the zoning for the entire study area falls into the CBD-1 through CBD-7 categories, a special designation for this part of the city. The information used in the database from the zoning documents were the Floor Area Ratio (FAR) for mixed-uses. Although it is an abstraction, this information was used as a stand-in for the height and density possible on a property. In reality, the zoning has many more restrictions, such as setbacks, parking requirements, and measured heights, which impact the development possibilities. For this application, the abstraction is

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<sup>3</sup> A shapefile is a basic file type in GIS that can store information in a table and associate it with lines, points, or polygons.

acceptable because FAR is an important factor in development, does increase and decrease with actual height and density, and offers enough detail for a broad and long-term forecast.

The shapefiles for blocks, sidewalks, streets, and intersections were created from scratch by the researcher. Because these layers were used to show data schematically, rather than represent the real world exactly, each was drawn with straight lines and single points.

**Table 7: Shapefiles in the GIS Database**

<b>Type</b>	<b>Name</b>	<b>Primary Fields</b>	<b>Calculated Fields</b>
Polygon	Land Use	First Floor Use <sup>a</sup> , Upper Floor Use <sup>a</sup> , Overall Use <sup>a</sup> , Vacancy <sup>a</sup> , Number of Stories <sup>a</sup> , Land Area, Maximum FAR <sup>b</sup>	FAR Available, Bldg. SF Available, Value per Land Area, Improvement Value per Bldg. SF, Value of SF Available, Distance from Streetcar
	Land Value	Land Value <sup>c</sup> , Improvement Value <sup>c</sup> , Total Value <sup>c</sup>	Land Value per Land Area, Improvement Value per Bldg. SF
	Blocks	Percent of Block for Each Land Use <sup>a</sup> , Percent of Block Vacant <sup>a</sup>	Average Improvement Value per Bldg. Area, Average Value per Land Area
Line	Sidewalks	Sidewalk Present <sup>d</sup> , Frontage Rating <sup>d</sup> , Furnishings Rating <sup>d</sup> , Street Parking <sup>d</sup>	Unsheltered Segments
	Streets	Number of Travel Lanes <sup>d</sup> , Bike Facilities <sup>d</sup> , Traffic-Calming <sup>d</sup>	
Point	Intersections	Crosswalks Missing <sup>d</sup> , Ramps Missing <sup>d</sup> , Traffic-Calming <sup>d</sup> , Walk Score <sup>®e</sup>	Intersections with Barriers

Sources: <sup>a</sup> Land Use Survey, <sup>b</sup> City of New Orleans, <sup>c</sup> Orleans Parish Assessor's Office, <sup>d</sup> Infrastructure Survey, <sup>e</sup> Front Seat.

A series of calculations and algorithms were used to determine development potential and make a forecast of future values (see Table 8). This model determines a value for each parcel and applies this value to several scenarios for development. The value per square foot of the land and buildings in the area were calculated on a parcel level, as well as a block-by-block average. With these land and building values for any location, the future value could be calculated, no matter what currently exists. These numbers were used to assign each land use a value per square foot, and a total value.

The scenarios for future development were based on adding density in locations susceptible to change. Floor Area Ratio (FAR) was available from the land use survey and zoning documents, making this an appropriate gauge of current and future development. Parcels without buildings were assigned a hypothetical future FAR, while vacant buildings values were based on their current height. The final calculation in Table 8 shows how values were applied to future development, yielding a forecast for increase in property values.

The value of the unused FAR is not an accurate depiction of development potential on its own; it is only relevant to land uses that can or will redevelop. Additionally, a level of development to

the maximum FAR is probably unrealistic. For these reasons, several factors were considered in a susceptibility to change analysis that will be discussed below. The quantitative measures of susceptibility were applied in the GIS database.

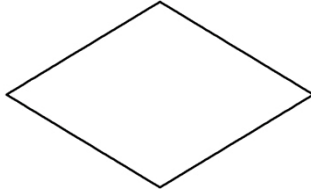
An alternate method for determining the value of new development involved estimates from the New Orleans Downtown Development District (Jungbacker, 2011). Using a worth method<sup>4</sup> for determining the value per building square foot, the DDD has estimates for new development that are significantly higher than the current assessed values. These values were also applied to the projections for new square footage in various development scenarios.

The results of the Pedestrian and Bicycle Infrastructure Survey were also included in the database. These layers did not need as many transformations. To summarize a few separate infrastructure issues, such as sidewalks segments that offer no shelter on either side, a few new fields were created to show these locations.

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<sup>4</sup> The worth method is described as representing what a bank would say is the value of a property if someone wanted a loan on it. This can also represent the value to the city for taxation.

**Table 8: GIS Database Calculations by Layer**

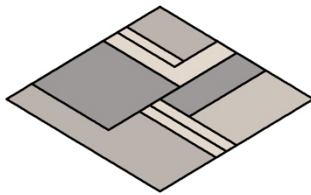


### Block Layer

Values joined and summarized from the Value Layer.  
 Land Area and Stories joined and summarized from the Land Use Layer.  
 All calculations made from lots with buildings only.

$$\frac{\sum \text{Land Value}}{\sum \text{Land Area}} = \text{Block Average Land Value} = \mathbf{BAvgLandV}$$

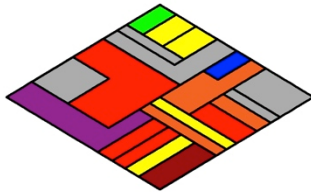
$$\frac{\sum \text{Improvement Value}}{\sum \text{Land Area} \times \text{Stories}} = \text{Block Average Building SF Value} = \mathbf{BAvgImpV}$$



### Value Layer

$$\frac{\text{Improvement Value}}{\text{Value Parcel Area}} = \mathbf{IVperSF}$$

$$\frac{\text{Land Value}}{\text{Value Parcel Area}} = \mathbf{LVperSF}$$



### Land Use Layer

Each lot is joined with the Value polygon it falls inside to obtain a value for  $\mathbf{IVperSF}$  and  $\mathbf{LVperSF}$ .  
 Each lot is joined with the Block polygon it falls inside to obtain a value for  $\mathbf{BAvgLandV}$  and  $\mathbf{BAvgImpV}$ .

**For lots with a positive improvement value:**

$$\frac{\text{Improvement Value}}{\text{Land Area} \times \text{Stories}} = \text{Value per Building SF}$$

**For lots with a building, but only a land value:**

$$\frac{\text{Land Value}}{\text{Land Area} \times \text{Stories}} - \mathbf{BAvgLandV} = \text{Value per Building SF}$$

**For lots with no buildings:**

$$\mathbf{BAvgImpV} = \text{Value per Building SF}$$

**To Calculate Potential Value Available:**

$$(\text{FAR or Stories}) \times \text{Land Area} \times \text{Value per Building SF} = \text{Value Available}$$

## Susceptibility to Change Analysis

The City of Austin’s susceptibility to change indicators were discussed in the literature review chapter (City of Austin, 2010). This list served as the inspiration for the measures used for the Loyola corridor, but the specific details were different. The decisions to use, alter, or not use each indicator was made on a contextual basis, examining the nature of the corridor and the data available. Additionally, many indicators for susceptibility to change are only valid for regional growth scenarios at the urban fringe. Table 9 shows the implementation or reason for exclusion for each of the indicators identified by the City of Austin.

**Table 9: Implementation of Susceptibility Indicators**

<b>Indicator</b>	<b>Implementation (indicators used in grey)</b>
Owner Occupancy	Little relevance, mostly useful for detached residential uses.
Land Status	Surface parking and vacant buildings are most susceptible.
Improvement to Land Ratio	Land values often contain the improvement value as well (see Table 7). Examined at a per SF basis using block averages.
Zoning and Overlay Districts	CBD current zoning requirements for FAR used.
Projected Growth in Employment	No data.
Water Service	Urban fringe growth issue.
Transit Corridors	Distance from the Loyola, St. Charles, and Canal Streetcars. Bus service currently runs on almost every street.
Road Access	Urban fringe growth issue.
Property Violations	No data.
Year Built	Age in this area is not a factor in redevelopment, and older buildings are historic and add character.
Development Cases	Urban fringe growth issue.

Source: (City of Austin, 2010)

The most significant application of the susceptibility to change analysis was limiting it to surface parking and vacant land uses. This decision was made for two reasons: the prevalence of these uses, and the quality of the active uses. Overall, 38.5 percent of all land area in the study area is either parking or vacant, and much of it nearest to Loyola Avenue. The land uses that are not parking or vacant take many forms, but are generally land uses that are suitable for TOD. Large office towers, mixed-use mid-rise buildings, stadiums, government buildings, and hospitals make up the majority of the active uses. The low-rise active uses in the area are businesses and residences that are dense and urban, and reflect the historic character of New Orleans neighborhoods. These two categories of active uses are unlikely to redevelop into something different, and are excluded from susceptibility to change analysis.

Improvement to land ratio is an important measure of the value of development on a parcel. Larger, higher quality buildings will be worth a greater portion of the total value, while land with no buildings will have a ratio of zero. This measure implies that the most improved lots are also least susceptible to change. Although this is certainly true for the parking and vacant uses mentioned above, it should not be assumed for some of the active uses. The raw assessor’s data



for land and improvement value were unusable for this ratio because many lots only had a land value. Using the process described in Table 8, block averages were used in some cases.

There are no zoning or overlay districts in the study area that severely impinge future development like comparable zoning on the fringes, such as wildlife protection or agricultural zones. The FAR requirements for the CBD zones were used in earlier calculations. Although only a rough measure, these limits to height help keep any forecasts for change within the visions for the area. It is also important to note that the study area is within the jurisdiction of the Downtown Development District (DDD), which has several incentive programs for development<sup>5</sup> (Downtown Development District, 2009). Although these programs do not impact any measure of susceptibility to change, they do encourage change that is consistent and urban in design. These and other incentives will be discussed in detail in the recommendations chapter.

Lastly, the proximity to transit has a significant impact on the property values as a TOD develops, as discussed in the literature review chapter. The study area contains two current streetcar lines, the St. Charles and Canal lines, which should add some incentives for new development. The area also contains numerous bus routes, and is a hub for a significant portion of the regional bus services, but the connection between bus services and development is less clear. The most important transit proximity value is the distance to the new Loyola streetcar, so some of the forecasts, such as the projected economic impact of the new infrastructure, uses this line only for susceptibility. The transit impact is noticeable within a mile of a station, and should decay with distance in a similar fashion to the accessibility analysis for walking, so a similar function was used (see Figure 13), a linear decay over a mile and a quarter. The furthest parcel from the streetcar was about 0.4 miles, giving the entire study area over 50% of the full impact of the streetcar.

In the City of Austin report, each indicator was given equal weight and layered onto a map. In this thesis, the measures of susceptibility were sometimes used independently or in different combinations for different analysis, so no overall susceptibility measure was created. Land use was treated as a binary variable, isolating parking and vacant buildings. Independently, distance to transit was applied when value impacts were desired. Lastly, zoning was used to determine the levels of future development possible.

## **Review of Planning Efforts**

The planning processes that impact the Loyola corridor provide insight into the vision that decision makers and community members have for the area. Since Hurricane Katrina, there have been numerous planning efforts on a citywide and regional scale, but not all are relevant to future development in the Loyola corridor. Although there was significant damage to some of the properties in the area, recovery is only a part of the planning challenges of the area. The planning efforts that were chosen to represent the future visions were the *New Orleans Master Plan*, the *Lafayette Square Upper CBD Height Survey*, and the RTA's documentation for the streetcar expansion (City of New Orleans, 2010; Downtown Development District, 2008; New Orleans Regional Transit Authority, 2010). Additionally, parts of *Louisiana Speaks* and the *Connect*

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<sup>5</sup> These programs include façade improvement, sidewalk enhancement, graffiti removal, and street banners.

series were used to review regional transportation visions that impact the Loyola corridor (Urban Design Associates, 2006; Center for Planning Excellence, 2011).

These planning efforts only impacted the quantitative aspects of this thesis when comparing their specific land use recommendation maps with the information used in the GIS database. Specifically, the zoning and height recommendations were consistent with the current zoning of the area, and consistent with modeling higher future development densities. The forecast results for economic development and ridership of the new streetcar can also be compared to the results of this thesis. Lastly, the technical details of the streetcar construction will be analyzed in the context of the overall transportation infrastructure.

Qualitatively, planning in the area sets a vision of a transformed urban neighborhood centered around the streetcar. This concept is the driving force behind the development projections mentioned above, but is also an urban design and transportation vision. The extent to which the current built environment demonstrates this vision will be evaluated, as well as the tools available to encourage an urban neighborhood. Any further policy recommendations made will be based on the goals of these planning efforts, and the goals of successful TOD.

## **Positions of Stakeholders**

Although planning demonstrates a vision for the Loyola corridor, there are other key stakeholders that are integral to making it happen. Private finances, government policies, and community positions will be the motivations behind any real changes. Many of these positions were gathered from websites and news articles, but personal knowledge and interviews also played a key role. A series of interviews compiled by James Amdal on regional opportunities for passenger rail includes many of the stakeholders in the Loyola corridor due to its location adjacent to the New Orleans Union Passenger Terminal (Amdal, 2011). These primary and secondary sources help frame the planning and forecasts in the rest of the thesis, and help guide the policy recommendations.

In the process of gathering information on new development, a list of all possible projects and their status will give a needed comparison to the value forecasts in this thesis. Many of these new construction projects directly target some of the least valuable property in the study area, confirming some of the susceptibility metrics discussed above. Each project can be evaluated for its significance in a transit-oriented neighborhood, but also any shortcoming or barriers it may create. The design and uses of these development projects can singularly contribute to the success of the entire area.

Reviewing the stakeholders' positions on the changes they hope to see will help reveal any additional planning that might be needed. TODs are often helped through policies on infrastructure, streetscapes, building codes, and government investments. Stakeholders may wish for changes beyond their immediate influence, a role that could be played by planning policies.

## Chapter 4: Results and Analysis

### Introduction

The results of the research methods described in Chapter 3 are presented and analyzed in Chapter 4. Much of the presentation of this data is done in the form of maps and tables. Using first-hand knowledge, stakeholder positions, and planning documents, the interpretations of these results add meaning and context to the data. The raw data and graphical presentation of this data is a valuable tool for explaining the study area, and can be used to arrive at the policy implications discussed in Chapter 5.

### Land Use Analysis

The Loyola study area features a large variety of land uses, representing different periods of development and redevelopment. Many of the buildings correspond to districts and neighborhoods that border the Loyola corridor, creating a physical connection to areas outside. These districts were discussed in the literature review, and can be seen in the results of the land use survey (see Figure 20). The coverage and vacancy of these land uses can be found in Table 10.

**Table 10: Land Use Area and Vacancy**

<b>Overall Use</b>	<b>Percent of Study Area</b>	<b>Percent Vacant</b>
Residential - Housing	2.5	16.4
Residential - Lodging	3.9	58.6
Mixed Use - Commercial/Residential	4.3	22.0
Mixed Use - Commercial	4.3	27.2
Commercial - Restaurant	0.4	0.0
Commercial - Retail	5.1	54.1
Commercial - Office	11.2	11.8
Industrial	1.1	62.3
School/Library	2.0	45.7
Fire/Police	0.3	0.0
Government	5.9	0.0
Health Care	12.8	58.5
Stadium/Theater/Church	9.8	6.1
Utilities	1.5	0.0
Parking - Surface	18.9	0.0
Parking - Structured	12.5	1.3
Transportation	0.3	0.0
Open Space	2.3	0.0
Vacant Land	0.8	100.0
<b>All Uses</b>	<b>100.0</b>	<b>19.6</b>

### ***Mixed Use and Commercial Use***

On the river side of Loyola Avenue closest to Canal Street, there is a concentration of mixed uses. These are the tallest buildings in the study area, and are made up predominantly of offices

and hotels. First floor retail in these buildings adds to the streetscape and amenities available. Further from Canal Street, the land uses are mixed horizontally rather than vertically, reflecting the low-rise, small lot character of this area. The surface parking along the river side of Loyola Avenue is broken up by occasional office buildings, while the uses on the other side of the street offer a more consistent street façade. Large government buildings, office towers, and hospitals make these blocks less mixed in use. The land uses closest to Claiborne Avenue are the major sports venues for the city, and a concentration of medical buildings. These form the largest lots in the area, often composing the entire block.

### **Residential Use**

Residential uses are largely absent from the study area; much of the CBD has not recently been considered a residential neighborhood. Single unit townhomes and small condominium buildings occupy the smaller residential lots, while some large older buildings have been retrofitted with residences, similar in nature to the warehouse district development. Some of the taller towers also contain residences, but hotels are typically more common. One new development, 930 Poydras, and several renovations represent a renewed interest in residential uses in the downtown area.

### **Other Uses**

The study area has some history of industrial uses, but they are largely absent today. Some of the small manufacturing and warehousing buildings remain, but they are almost all vacant. There is a public library and a vacant high school in the area, two fire stations, and various government buildings. The City Hall, courthouses, Federal Reserve, and central post office are all government uses with many weekday employees. Three vacant theaters exist along Canal Street, a legacy of a major theater district. Plans for these theaters indicate a return to entertainment uses, rather than redevelopment as another use, similar to the Civic Lofts.

### **Surface Parking**

One of the most noticeable land uses in the Loyola corridor is the surface parking lots (see Figure 18). There are multiple entire blocks of parking closest to Loyola Avenue, dotted with a few isolated residences and businesses, many vacant. The surface parking lots are sometimes broken into several independent operations based on the historic lot lines in the area. Although the blocks closest to Loyola Avenue are almost exclusively used for surface parking, it is also readily present between buildings in the blocks towards the river. These lots break



Figure 18: Locations of surface parking in the study area.

up the street frontage in many cases, but are less visible overall. A smaller concentration of surface parking is located by the hospitals along Canal Street and Claiborne Avenue.

### **Structured Parking**

The downtown core and sports venues are the most common locations for parking structures. Many office buildings and hotels have structured parking built into the base of the building, sometimes taking up many of the bottom stories. These downtown ramps can be quite hidden, leaving room for shops and lobbies on the first story. A few stand-alone ramps are scattered throughout, and the sports venues have significant parking built into their complex.

### **Building Height**

The results of the building height survey further demonstrate the identities of different parts of the study area (Figure 21). Buildings above 20 stories are scattered across the area, somewhat clustered around Poydras Street. Interestingly, the downtown core near Canal Street features a mix of heights, many under 10 stories, but very little open space. Shorter buildings populate the upriver portions of St. Charles Avenue, Carondelet, and Baronne Streets. The wide swaths of surface parking are clearly visible.

### **Block Typologies**

Each block can be characterized in part by the majority land use. These typologies show more clearly the patterns observed above: a downtown core, mixed-use neighborhood, surface parking, and major government and health care complexes (Figure 22). Blocks with over 25 percent vacancy are also highlighted; these blocks may change drastically in land use with redevelopment.

These block typologies confirm the established districts that border the study area, and the struggling area in between. These areas fall roughly into four quadrants, shown in Figure 19. On the river side, the mixed uses of the warehouse district and office towers of the financial district dominate the blocks up to Baronne street (quadrants 1 and 2). The sports stadiums in quadrant 3 define the character of the area, with some complementary uses, such as hotels, located nearby. Health care uses are most common in quadrant 4, with the blocks along Loyola occupied by public buildings and a park.

The two block wide strip between these quadrants currently lacks an identity, yet is poised to become the Loyola corridor. The vacant blocks near Canal Street feature historic theaters and other

buildings that are under renovation. The remainder of the corridor is dominated by surface parking, along with the Entergy Center, and the vacant Plaza Tower.

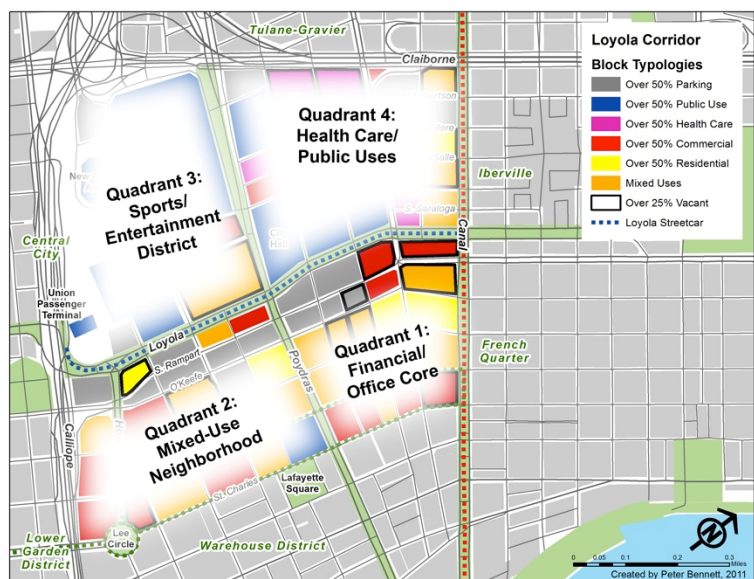


Figure 19: Study area character quadrants.

## ***Discussion***

Land use analysis of the Loyola corridor helps describe the current conditions in the area. These uses illuminate what activities and functions the built environment caters to, and what is currently missing. This information helps answer the research questions concerning present day development.

The areas immediately adjacent to the Loyola corridor feature land uses that already attract people to the area. These land uses also benefit from variety, with the offices, neighborhoods, public uses, and entertainment activities serving different populations at different times. Despite this variety, they are somewhat segregated from each other. For example, the offices close after work, leaving some blocks of the city empty of people. The hospitals, sports stadia, and government buildings are also inactive for large amounts of time.

There is opportunity for infill development in conjunction with the current land uses in the area. Vacant land uses can be entire blocks, or one small property. Vacant buildings are often remnants of a previous era of downtown New Orleans – structures that have been successfully renovated in nearby locations.

The most noticeable land use characteristic of the Loyola corridor is the parking corridor along Loyola Avenue. These areas are more difficult and unpleasant for pedestrians, and may contribute to the separation of land uses discussed above. This use is not complimentary with the future rail line on Loyola Avenue, and will either redevelop or hinder the project's success.

Figure 20: Land Use Survey.

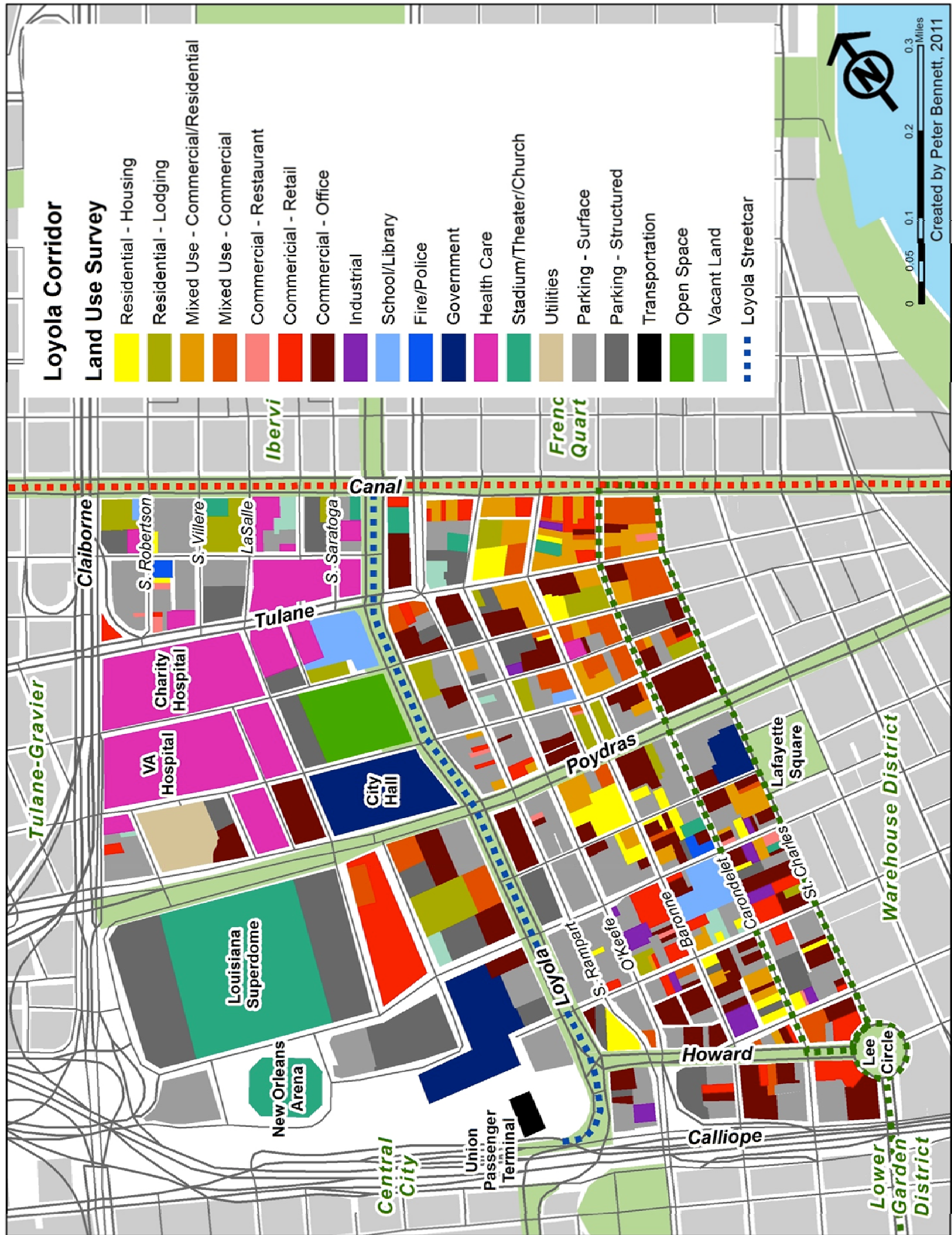


Figure 21: Building Height.

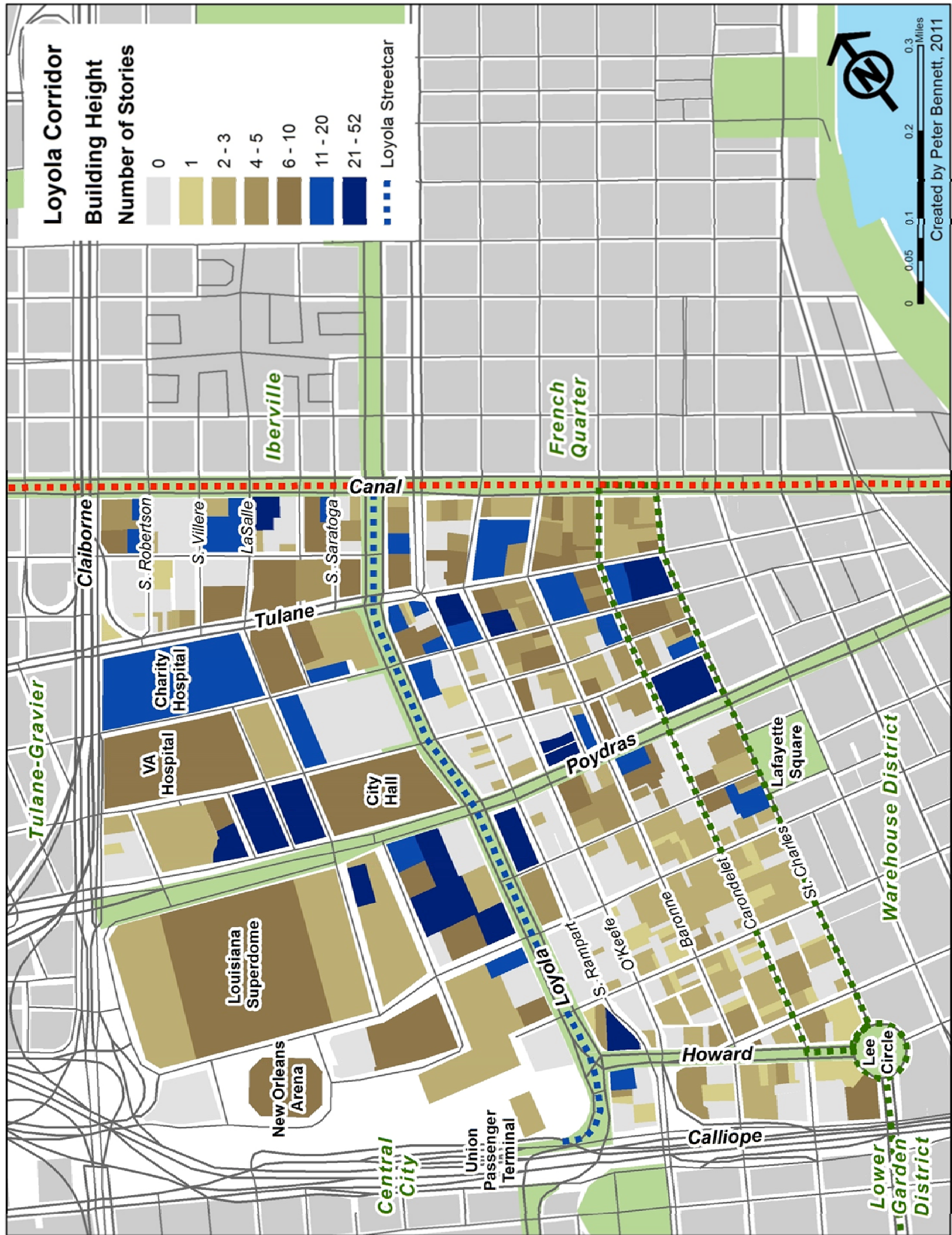
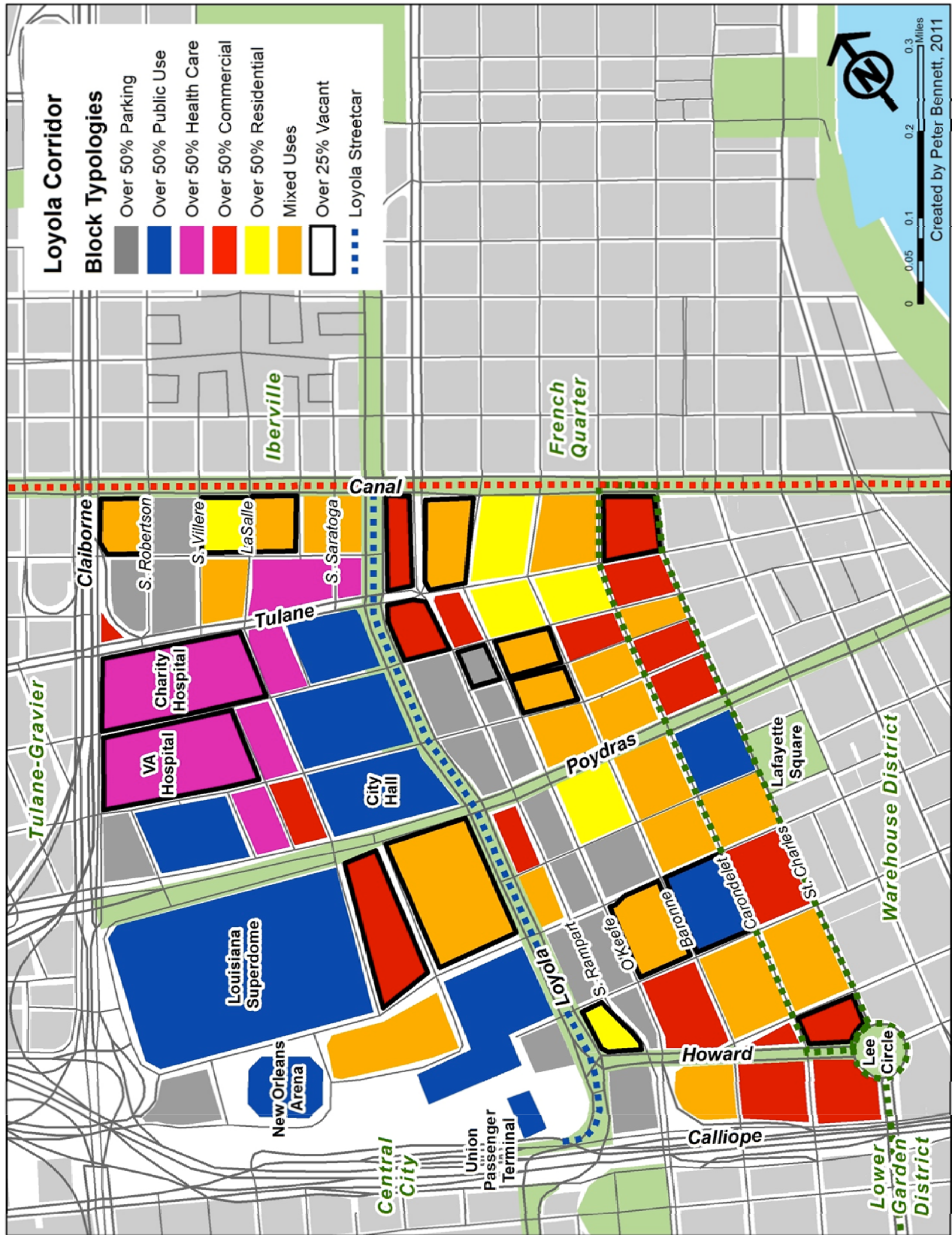




Figure 22: Block Typologies.



## **Property Value Analysis**

The property values used in this thesis are based on the assessed value for the land and improvements to the land in the Orleans Parish Assessor's database (Orleans Parish Assessor's Office, 2009). Each assessed value has been multiplied by ten to obtain an estimate of the actual market value of each parcel, per the methodology. There are some reasons to question the accuracy of these estimates. Many parcels have not been assessed in a long time, and vast changes to the buildings have not been recorded. For example, a lot with a new building may not have any improvement value listed. Also, for some parcels, such as government buildings and sports stadiums, the value may be based on other information or arrangements than the actual worth of the property. The listed value of \$189,700 for the Superdome is clearly not the actual value of the property. Throughout the analysis, because of missing values and old assessments, the numbers appeared to the researcher as a very low estimate of actual value. With this in mind, the analysis and projections are based on these numbers, and thus should be considered a conservative estimate of value.

To determine what land in the area is the most valuable, the total value of each parcel was divided by its area (Figure 23). These values ranged from \$0 to \$1,810 per land square foot. A pattern emerges that shows the taller buildings from the building height map holding the most value per land area. The lots with no value data are removed from the map, but some other parcels had a value of zero recorded. When these parcels could not be associated with a neighboring lot, they remained zero. Although this does not impact the aggregation and forecasts later, they skew the first category displayed on the map.

To correct for the height difference in parcel values, the total values were also normalized by the number of stories (Figure 24). This gives an approximation for the value per square foot of the buildings in the study area, ranging from \$0 to \$494 per square foot. The taller buildings are less pronounced as they have many stories. This shows a more even spread of values throughout the study area, with the highest values located in the low-rise area between Baronne Street and St. Charles Avenue. Because these land uses are a mix of historic buildings, including offices, residences, and stores, their value per square foot is expected to be high. The taller buildings closer to Canal Street are also in the higher value per square foot categories.

A final value map shows the approximations for value per square foot used in the forecasting analysis (Figure 25). As described in the methodology, this uses the actual improvement values where present, and block averages to extrapolate other values. The patterns are similar to the previous map, with the areas covered by parking now showing values. Surface parking often received a higher than average value per square foot because it was primarily composed of land values. Often, the land value of the parking was higher than the neighboring buildings, suggesting that the current use is only speculation for future development. If these areas do develop, the values used here are appropriate.

## ***Discussion***

Examining land and building value helps answer the research questions about current development and future change. The patterns reflect the historic development and investment in the CBD. Both land use and location play a role in the values associated with the parcels in the area. When predicting future development patterns, these patterns may persist, but new conditions also apply.

The comparative nature of the land value analysis may be more insightful than the actual numbers. Mapping the values shows where real estate is in high demand, and where little investment has occurred. The patterns that emerge are the overall higher value for high-density development, and a value premium per square foot for real estate near Canal Street and St. Charles Avenue.

A new streetcar on Loyola Avenue may result in land values closer to those seen along St. Charles Avenue, but those values are based on an established line over one hundred years old. The new development will also include new construction, which may offer a different value per square foot. Despite some of these differences, the surface parking lots that currently line the corridor have some of the lowest values in the CBD. Redevelopment is likely to target these areas, delivering the added value promised by the new streetcar.

Figure 23: Total Value per Land SF.

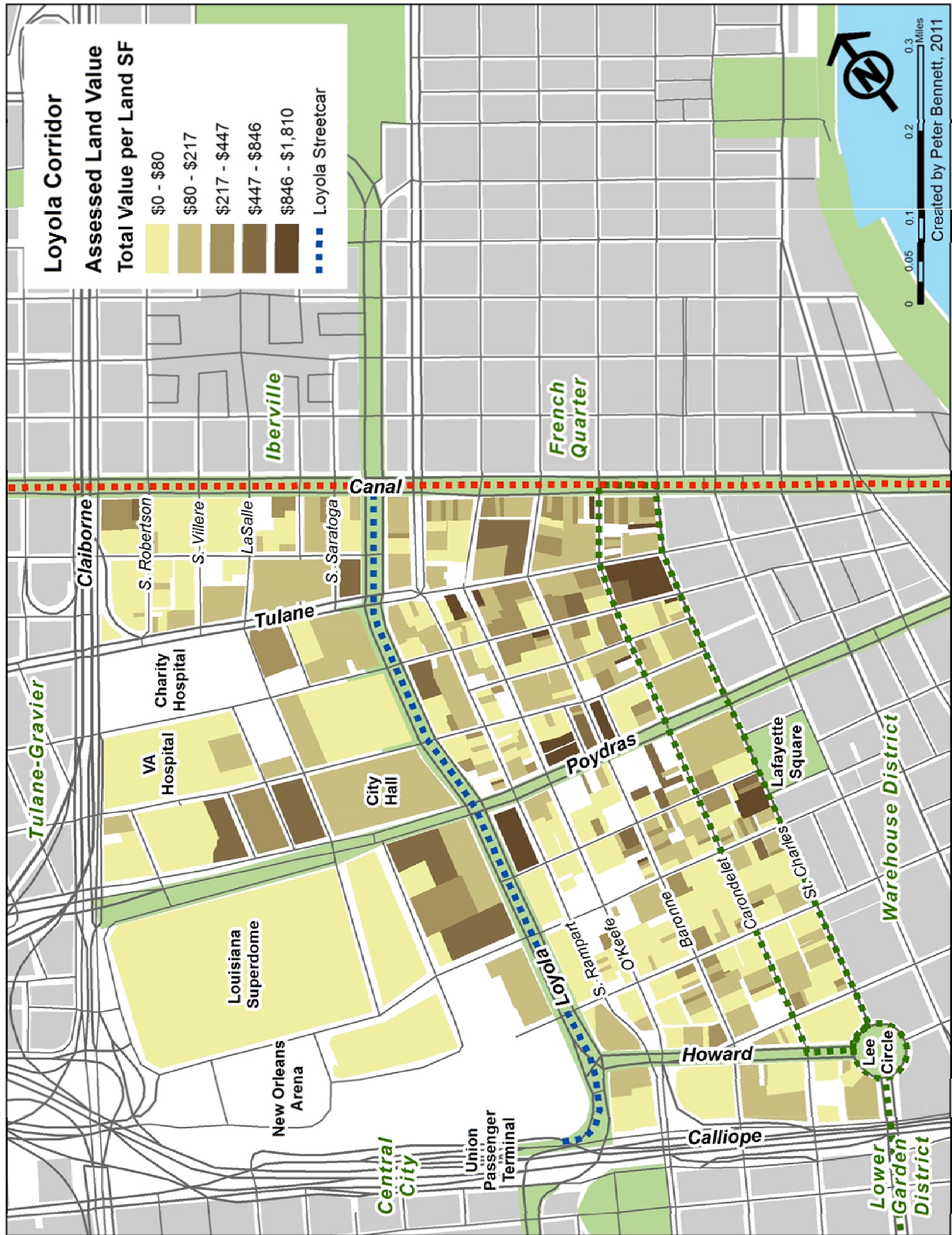
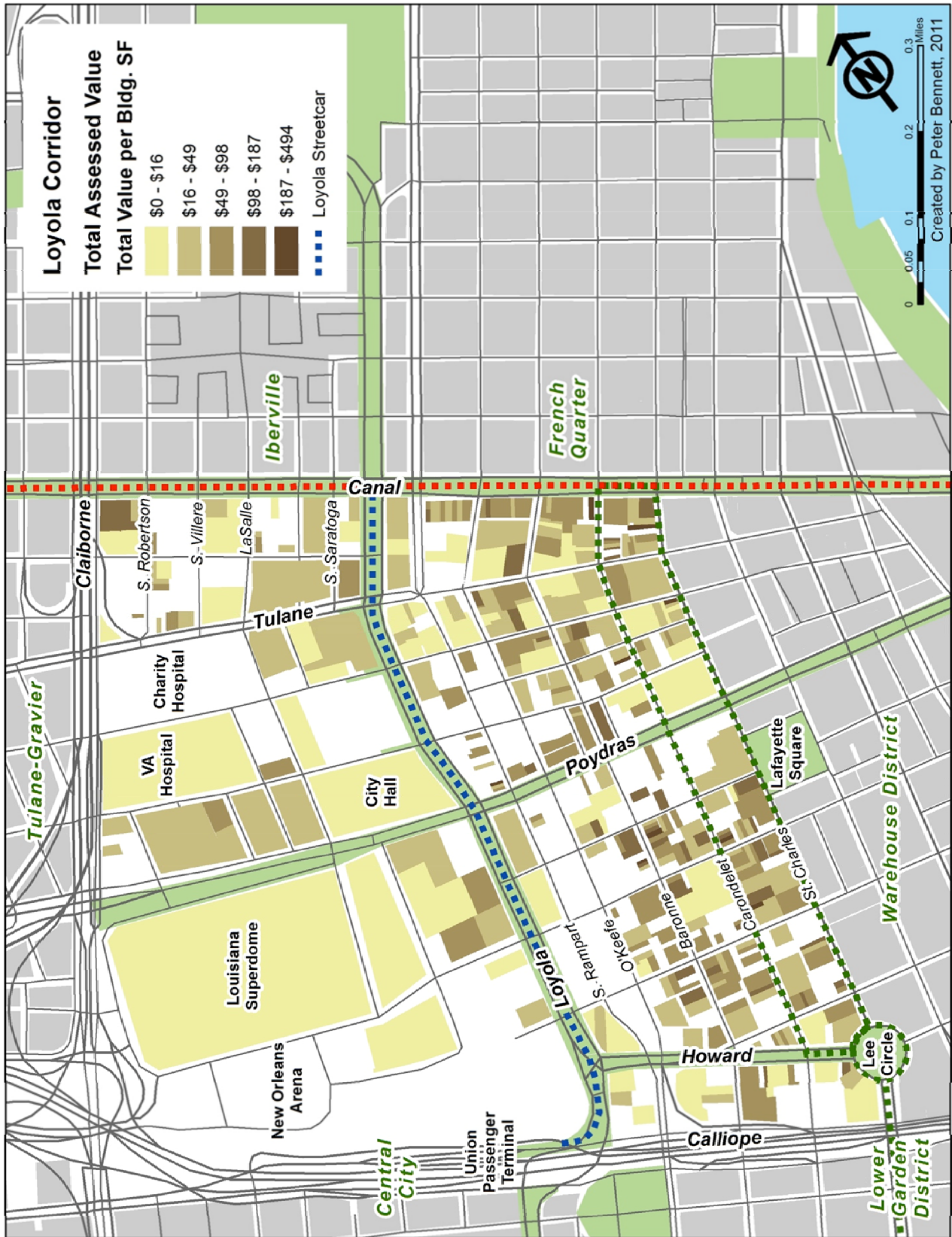


Figure 24: Total Value per Building SF.





## **Property Value Forecasts**

The property values generated to represent the current price per square foot in the area were used to determine the value of potential new development in the study area. This was done by using an estimate of several Floor Area Ratios (FAR) available on specific parcels. The parcels and coefficients of these values were determined using several measures of susceptibility to change. The results are a rough estimate of the value available in the area today if more development was present. This additional value in future years could generate funding for TOD incentives.

### ***Susceptibility to Change***

The major decision in determining the susceptibility to change was which parcels would be included. Because of the nature of the current building uses, only vacant buildings were included in the analysis. The reason for this is that the active uses, such as small offices, skyscrapers, and condominium buildings, are compatible with TOD. There are few unsuitable uses, such as gas stations or strip malls. The active uses, no matter how tall or dense, are mostly uses that espouse the character of the area, and should be expected and encouraged to stay.

In addition to vacant buildings, surface parking was targeted in the value forecasts. This use is incongruous with TOD and has a high development potential. In combination, these two categories along make up 38.5 percent of the study area (Figure 26). If these parcels did develop or redevelop, it could dramatically change the neighborhood. Although it is an abstraction to ignore the possibility of change to other uses, narrowing the focus to vacancy and surface parking still allows for significant impacts. The active land uses, such as offices and hotels, may transform themselves, particularly if TOD takes hold, but these changes are much harder to predict.

A second component to susceptibility to change is the distance from the Loyola streetcar, and the average distance from all three streetcar lines in the area (Figure 27). In the second map, the lighter colored parcels represent locations where residents could easily walk to all three streetcars in the area, offering the highest possible amount of transit access. These distances were used to gauge how much of the value falls into the influence of a rail transit amenity. Because the impact of the transit dissipated over 1.25 miles, all of the parcels in the area were assigned an impact of over 50%. By representing the parcels closer to the streetcar with a greater percentage, the increased chance of development near transit is included in the analysis.

The final susceptibility indicator examined by the researcher was improvement to land ratio (Figure 28). As mentioned in Chapter 3, a ratio above 1.5 was considered less susceptible in Austin, TX. This implies that the building on a site is valued at least 1.5 times the land it sits on. This cutoff does not appear to be a good metric for the Loyola corridor, as many of the ratios are a factor of ten or more higher than 1.5. No comparable cutoff could be found for New Orleans or the CBD. Additionally, 46 percent of the parcels were missing one or both values in the ratio. Finally, most of the parcels with a true improvement to land ratio of zero are parking lots, already included in the analysis. For these reasons, improvement to land ratio did not factor into the property value analysis.





Figure 27: Distance from the Loyola streetcar and all streetcars.

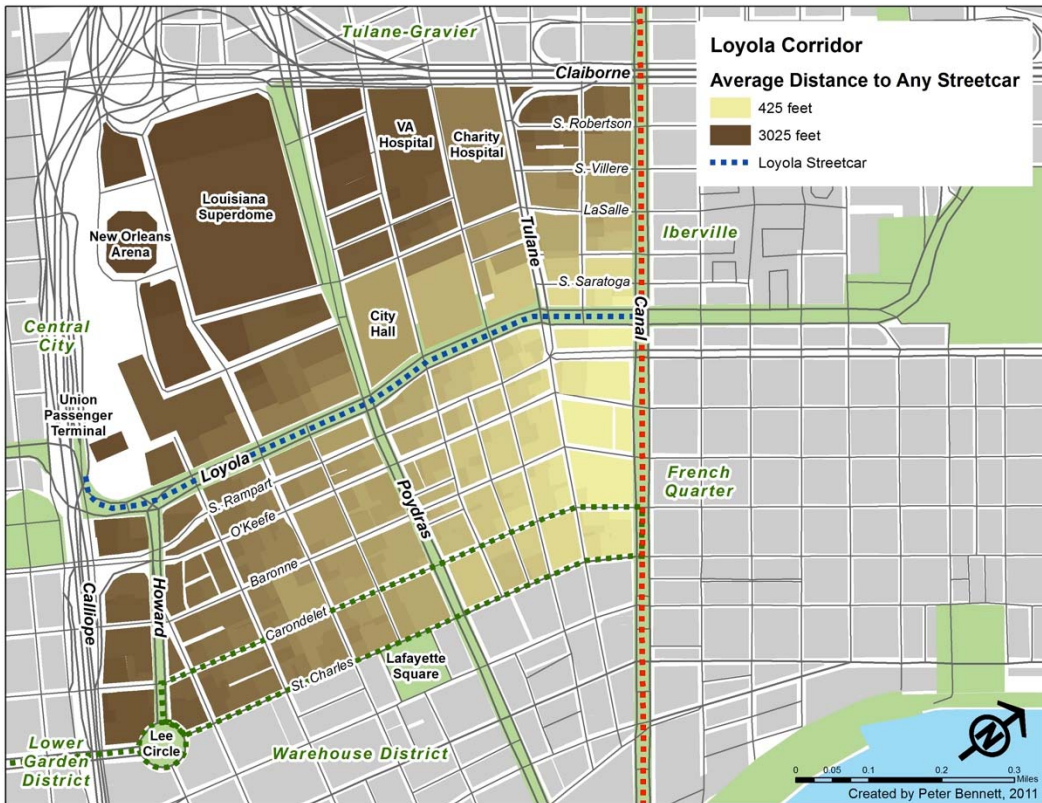
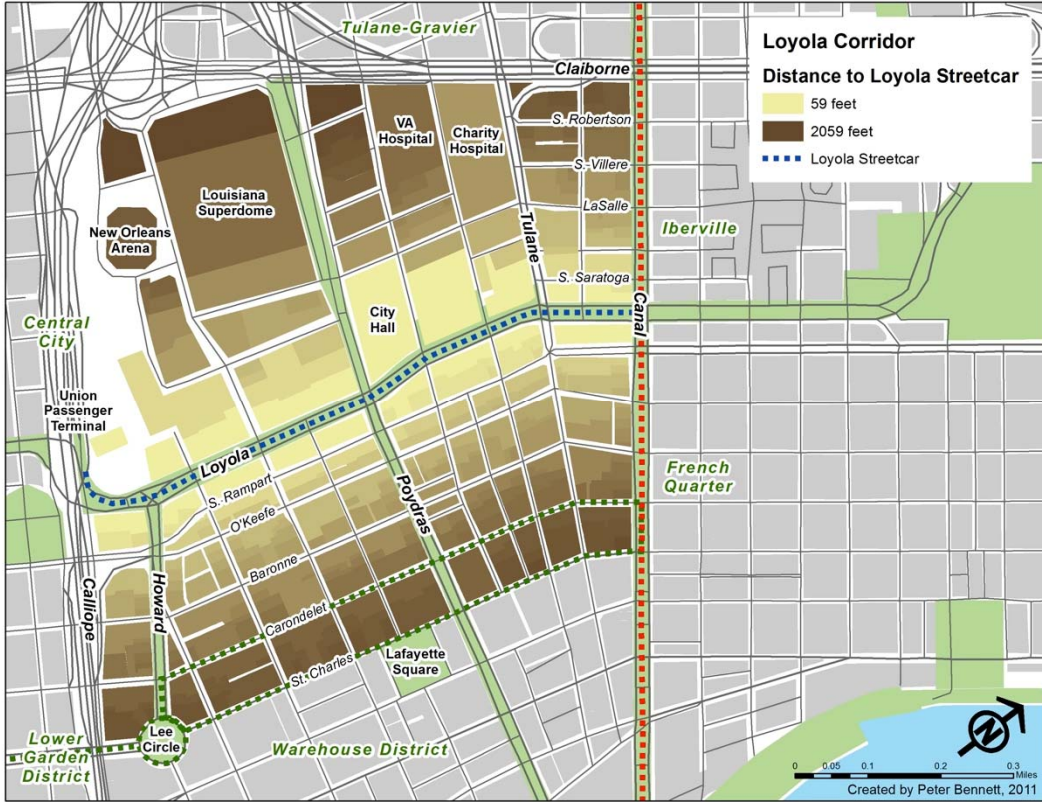
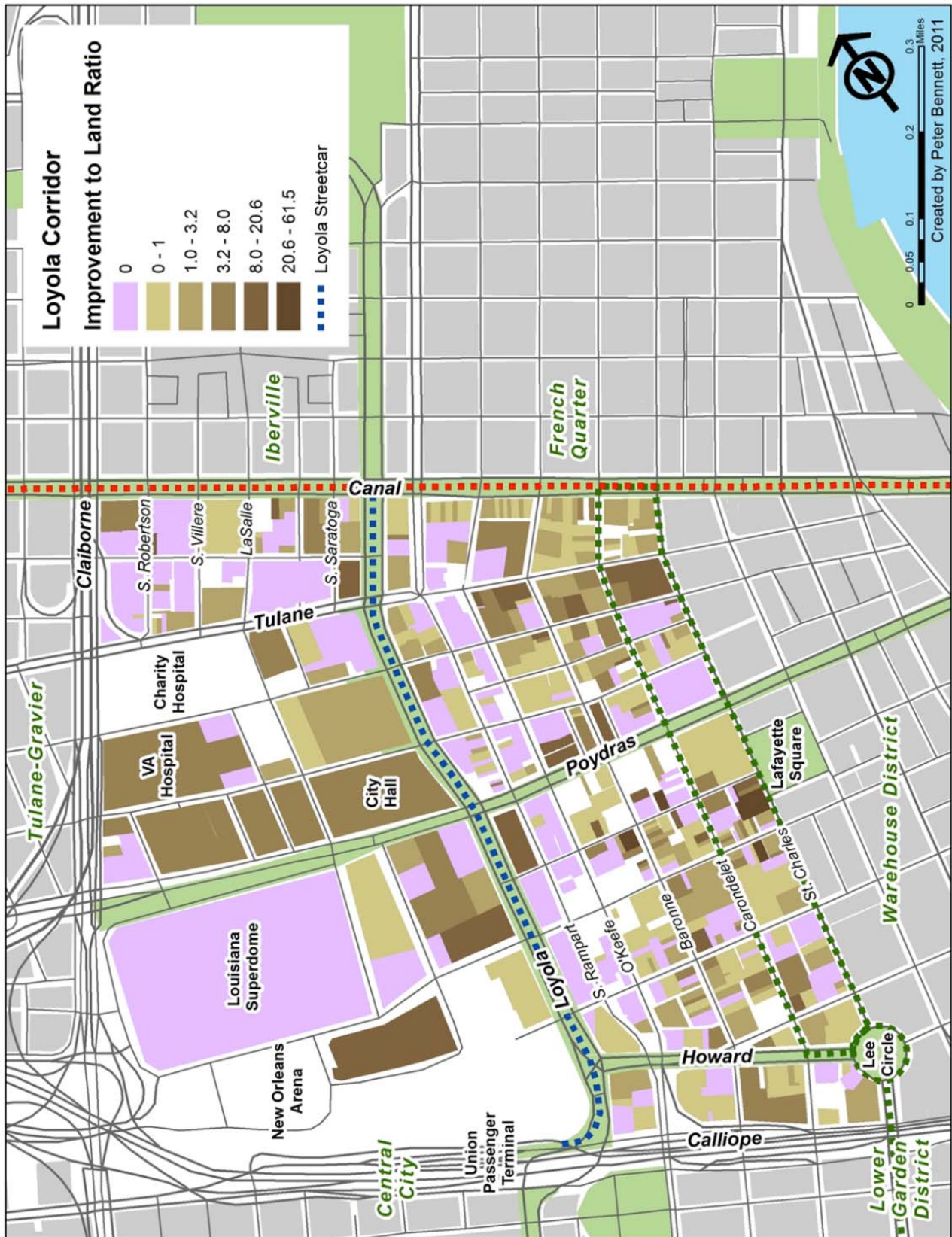


Figure 28: Improvement to Land Ratio.



### ***FAR and Development Projections***

Three development scenarios were explored using different Floor Area Ratio (FAR) to represent the level of build-out in the study area. The first uses the maximum FAR allowable for mixed-uses in the city zoning code. Although the maximum in the downtown core of the CBD is 14, many of the buildings have been built taller as a variance, many clearly higher than a FAR of 14. The less built up neighborhood parts of the study area features a FAR of 6, allowing for slightly more dense development than is already present. The development forecasts were based on the value of the current vacant structures, and the maximum FAR of the surface parking.

The three scenarios ranged from approximately half the maximum build-out to the maximum FAR allowable. Each one used a FAR and square foot estimate based on the number of stories of the vacant structures, but used the zoning code to assign this same information to surface parking. Table 11 shows a summary of each of the scenarios. The half and maximum FAR scenarios are meant to represent a range of possibilities, and are easy to visualize (see Figure 29). The third scenario used the average FAR for buildings currently in each zone. A full listing of the average and maximum FAR used for these scenarios is shown in Table 12. It is important to note that the Average FAR in the CBD-5 zone is higher than the maximum due to some tall buildings. This zone also contains some of the surface parking along Loyola, so the average FAR scenario may lead to higher values in some categories.

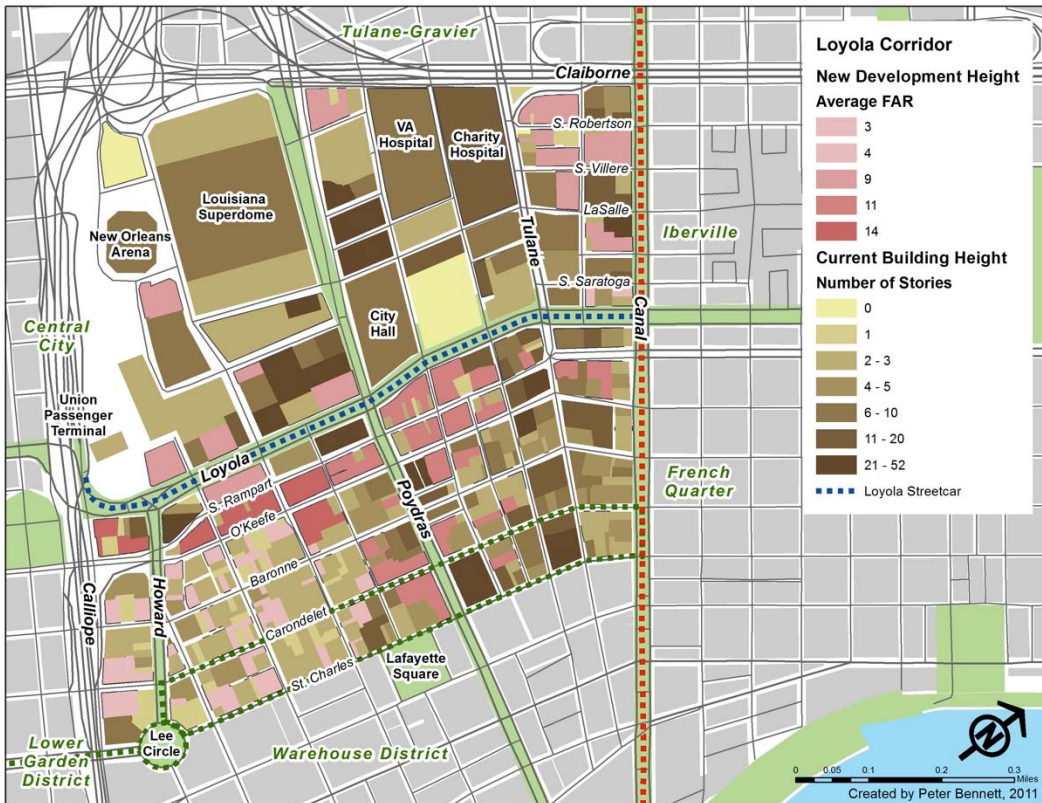
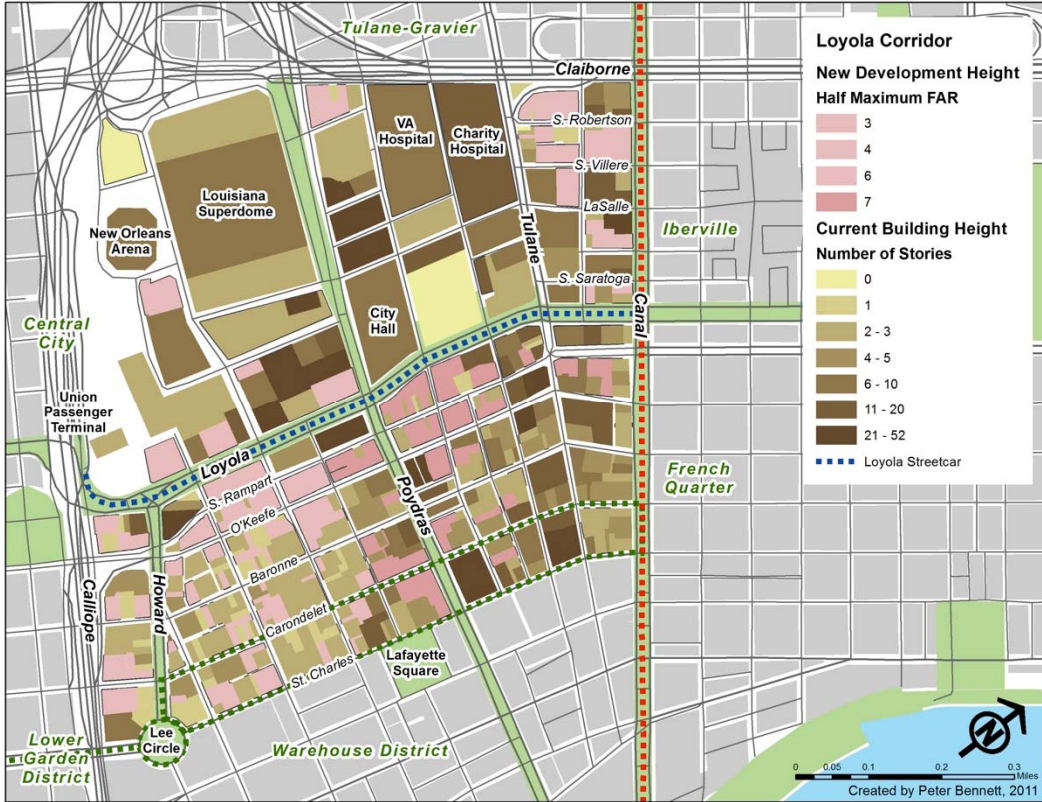
**Table 11: Build-Out Scenarios**

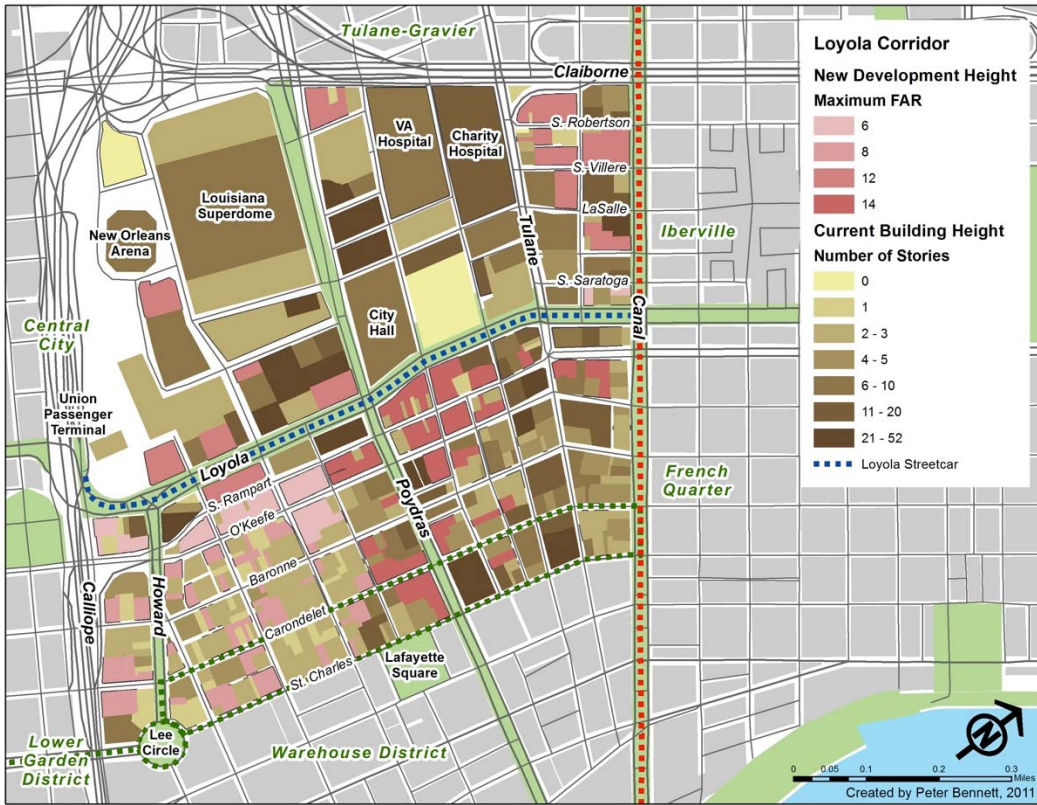
<b>Scenario Name</b>	<b>Vacant Buildings</b>	<b>Surface Parking</b>	<b>Lowest FAR</b>	<b>Highest FAR</b>
Half Max FAR	Half FAR of current structure	Half of Max FAR	3	7
Average Current FAR	FAR of current structure	Average FAR for the zone	3	14
Max FAR	FAR of current structure	Max FAR	6	14

**Table 12: FAR for Build-Out by Zone**

<b>Zone</b>	<b>Current Highest FAR</b>	<b>Current Average FAR</b>	<b>Zoned Max FAR</b>
CBD-1	52	11	14
CBD-2	28	9	12
CBD-3	7	4	6
CBD-5	44	14	6
CBD-7	11	3	8

Figure 29: Three Build-Out Scenarios: Half Max FAR (top), Average FAR (bottom), Max FAR (next page).





### ***Property Value Results***

By examining the land value and improvement value per square foot, a pattern of location and land use within the study area emerges (Table 13). Distances from transit were sorted into four categories of equal size and approximate equal number. Land uses were condensed into their broader divisions (see Table 4 and Table 5), with the transportation category containing the surface parking.

Land closer to the Loyola streetcar line is more valuable than the average land value further away, dropping from \$57 to \$45 per square foot (Figure 30). This can be partially explained by the lack of buildings closer to Loyola Avenue. Parcels without buildings often have land values that reflect When an improved property is assessed, the share for land and improvement value is not always clear, possibly leading to a lower assessment for the land underneath. Additionally, for surface parking lots, the land value includes any speculative value the lots may have for future development. Examining the improvement value per building square foot also shows this pattern, with the buildings further from the Loyola streetcar being valued higher. The improvement values also show more variation, rising from \$6 to \$17 per building square foot.

The patterns are different when all streetcar lines are considered (see Figure 27). Land value per square foot drops more precipitously, from \$70 to \$24 (Figure 31). This demonstrates the relationship between the existing transit in the area, and the property value premiums paid for transit proximity. Improvement values are highest between 1,000 and 1,500 feet from transit, a category including many of the high value properties around Poydras Street.

Lastly, each land use in the study area had a different land and building value. The land values did not show as much variation as the building values, with residential, commercial, and other uses featuring higher land values. These values correspond roughly with the locations they are most common, the areas closer to transit discussed previously. Building values are highest for industrial, mixed-use, and commercial properties. Interestingly, residential-only properties are relatively low in value per square foot. Although the transportation category, mostly surface parking, features an average land value, the improvement value is almost nothing.

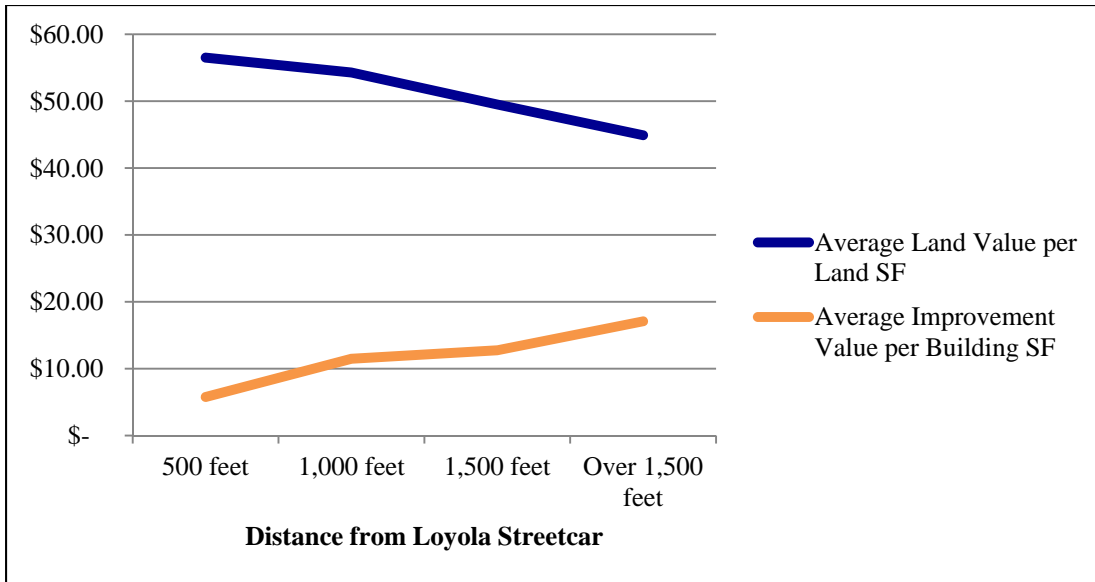


Figure 30: Average value by distance from the Loyola streetcar.

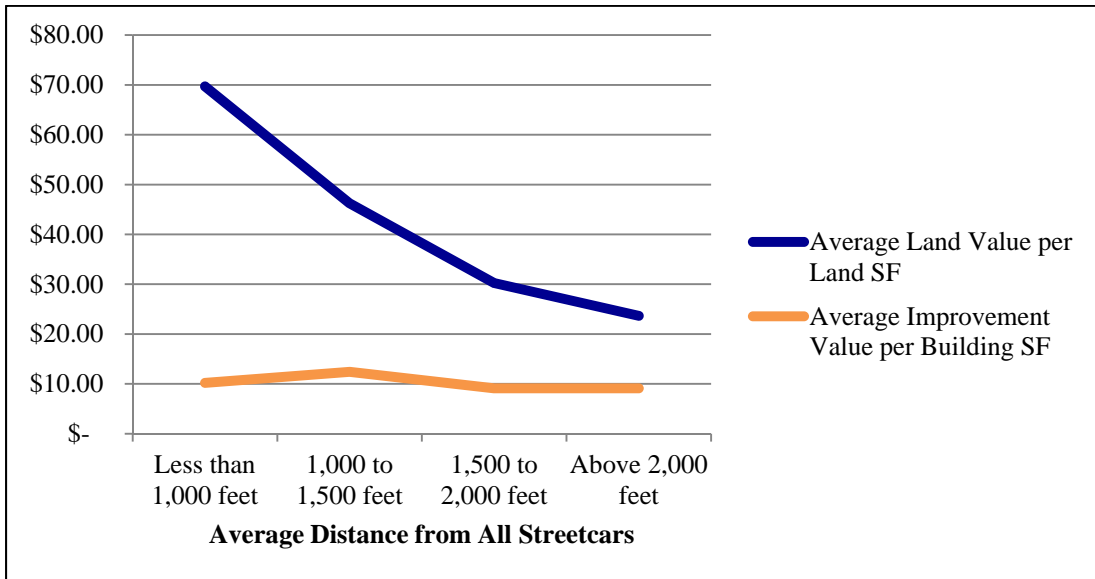


Figure 31: Average value by average distance from any streetcar.

**Table 13: Value per SF for Land and Buildings**

	<b>Average Land Value per Land SF</b>	<b>Average Improvement Value per Building SF</b>
Value per SF	\$52.49	\$10.80
<b>Value by Distance from Loyola Streetcar</b>		
Within 500 feet	\$56.51	\$5.78
500 - 1,000 feet	\$54.30	\$11.49
1,000 - 1,500 feet	\$49.50	\$12.76
Above 1,500 feet	\$44.91	\$17.09
<b>Value by Average Distance from Streetcar</b>		
Within 1,000 feet	\$69.70	\$10.21
1,000 to 1,500 feet	\$46.22	\$12.40
1,500 to 2,000 feet	\$30.23	\$9.10
Above 2,000 feet	\$23.66	\$9.11
<b>Value by Land Use</b>		
Residential	\$67.18	\$9.10
Mixed Use	\$64.47	\$18.93
Commercial	\$59.04	\$21.83
Industrial	\$48.55	\$40.15
Public Use	\$27.81	\$8.81
Transportation	\$47.01	\$0.93
Other	\$63.70	\$5.21

The development scenarios result in the addition of millions of square feet of buildings to the study area (see Table 14). The existing square footage of vacant buildings is totaled, in addition to the amount added to current surface parking. These numbers are also compared to the total square footage present today. The three scenarios range from an addition of 19 to 38 million square feet, the upper end adding more than half the current amount of 67 million square feet. It is important to note that the current averages fall close to the maximum FAR scenario, showing that a high level of development would not be incongruous with the existing buildings.



**Table 14: Square Footage Available Scenarios (in millions)**

	Development Scenario			Current Total SF
	Half of Max FAR	Average Current FAR	Max FAR	
SF Available	19.16	34.61	38.33	66.84
<b>SF by Distance from Loyola Streetcar</b>				
Within 500 feet	7.35	14.51	14.70	20.03
500 - 1,000 feet	5.55	10.38	11.09	20.86
1,000 - 1,500 feet	5.71	8.90	11.42	23.92
Above 1,500 feet	0.56	0.82	1.11	2.04
<b>SF by Average Distance from Streetcar</b>				
Within 1,000 feet	4.48	7.45	8.97	19.32
1,000 to 1,500 feet	9.35	17.90	18.70	23.63
1,500 to 2,000 feet	4.56	8.11	9.12	12.95
Above 2,000 feet	0.77	1.16	1.54	10.95
<b>SF by Land Use</b>				
Residential	2.74	5.49	5.49	8.85
Mixed Use	0.72	1.43	1.43	8.61
Commercial	0.91	1.81	1.81	15.64
Industrial	0.04	0.08	0.08	0.24
Public Use	4.10	8.20	8.20	17.61
Transportation	10.02	16.62	20.04	6.80
Other	0.64	0.97	1.28	9.08

The most additional building square footage would be added within 500 feet of the Loyola streetcar, a prime location for TOD. This is based on where unused FAR currently exists, not where development will be built due to market potential. This is likely due to the prevalence of surface parking in the area. Only the range further than 1,500 feet from the streetcar would see little new development, a result of fewer parcels, and what land uses were already present. When considering all streetcar lines, new development added the most square feet within an average of 1,000 to 1,500 feet. The category within 1,000 feet focuses on the downtown core near Canal Street, an area that is already well developed.

The majority of the new square footage would be located on surface parking lots, as shown in the large numbers in the transportation land use category. These new building could be of any use, and are likely to not become only parking garages, shifting these square feet into other land use categories. The public use and residential categories contain the most available square feet in currently vacant buildings. These categories include hospitals, hotels, and a few residential skyscrapers, the most common large vacant use.

The current square footage in the area shows an even split in terms of transit distance and use. There are significant amounts of active square footage in all distance ranges, with the tall buildings along Poydras contributing to a slight peak in the 1,000 to 1,500 feet from any streetcar

category. Unsurprisingly, commercial and public uses are the most common in the area, followed by a mix of several others. The current mixed use character of the study area is an asset to TOD, and should be strengthened with any TOD.

After applying different values per square foot to the numbers in Table 14 based on the methodology and the susceptibility to change, total values for the new development were summarized (Table 15). Depending on the level of development, around \$300 to \$600 million could be added to the existing \$1.4 billion in property value.

**Table 15: Property Value Available Scenarios (in millions)**

	Development Scenario			Current Total Value
	Half of Max FAR	Average Current FAR	Max FAR	
Value Available	\$309.93	\$546.20	\$619.86	\$1,369.41
Value Impact - Loyola	\$278.90	\$497.31	\$557.81	\$1,213.02
Value Impact - All	\$252.14	\$444.84	\$504.29	\$1,144.05
<b>Value by Distance from Loyola Streetcar</b>				
Within 500 feet	\$170.98	\$343.75	\$341.97	\$478.75
500 - 1,000 feet	\$35.25	\$56.42	\$70.50	\$407.27
1,000 - 1,500 feet	\$92.38	\$128.91	\$184.75	\$432.40
Above 1,500 feet	\$11.32	\$17.12	\$22.63	\$50.98
<b>Value by Average Distance from Streetcar</b>				
Within 1,000 feet	\$98.11	\$159.90	\$196.21	\$635.66
1,000 to 1,500 feet	\$134.43	\$272.59	\$268.87	\$509.78
1,500 to 2,000 feet	\$73.62	\$108.07	\$147.25	\$176.44
Above 2,000 feet	\$3.76	\$5.65	\$7.53	\$47.53
<b>Value by Land Use</b>				
Residential	\$23.99	\$47.98	\$47.98	\$191.41
Mixed Use	\$9.65	\$19.29	\$19.29	\$290.00
Commercial	\$9.30	\$18.60	\$18.60	\$429.31
Industrial	\$0.47	\$0.95	\$0.95	\$8.87
Public Use	\$8.20	\$16.39	\$16.39	\$193.85
Transportation	\$247.96	\$427.45	\$495.91	\$219.89
Other	\$10.37	\$15.55	\$20.74	\$36.07

A multiplier was applied to the total values for new development to estimate what portion was impacted by the presence of transit. Distances from zero feet to a mile and a quarter, a distance derived from transit proximity literature and accessibility studies, were assigned a linear value from 1 to 0<sup>6</sup>. This value was multiplied by the projected value for each parcel. The Loyola

<sup>6</sup> For example, a parcel 0.5 miles from the streetcar would have a multiplier of 0.6 because  $(1.25 - 0.5)/1.25 = 0.6$ . A parcel immediately adjacent has a multiplier of 1, and any location further than 1.25 miles is not included.

streetcar had an impact on almost all of the development in each scenario, and all transit followed closely behind. The discrepancy between these numbers can be explained by the fact that it is harder for a parcel to be close to all three lines at once, leading to a slightly lower multiplier. The impact of transit on property values is shown in these values, and is further illustrated using several distance categories.

The majority of the value added occurred within 500 feet of the Loyola streetcar, ranging from \$171 to \$344 million. High added value was also projected for the properties between 1,000 and 1,500 feet. These two distance categories correspond with large portions of surface parking and the vacant hospitals. When considering all streetcar lines, there is significant development within the first three categories – up to 2,000 feet. The properties with the best transit access, within 1,000 feet, did not see the highest added value because there is less parking and vacancy in this area.

Transportation, as a land use, was by far the use where the greatest added value was located, ranging from \$248 to \$496 million. This is primarily composed of surface parking, and is likely to develop as a mix of other uses. In each scenario, the next use adding value was residential, but at the range of \$24 to \$48 million. The breakdown of current property value by land use shows value in the commercial and mixed-use categories, with several others closely behind. Industrial uses were the one category with very little current value, and little projected development.

These projected development scenarios represent a transformation that will not happen in a short period of time. In many successful downtown redevelopments, the some parcels remain unchanged many years into the future. These projections do, however, fall in line with the scale and value of notable redevelopment projects that have already been announced, indicating that much of this development could occur in a 5 to 10 year period. These projects will be discussed in detail later in the results.

***DDD Estimates of New Development***

The New Orleans Downtown Development District (DDD) provided estimates for the value of new development that are significantly different from the numbers from the Assessor’s Office (Table 16) (Jungbacker, 2011). These are an accurate portrayal of what new buildings in downtown New Orleans are worth today, rather than a result of historical assessments. From a real estate perspective, these values are what developers, business organizations, and the city government expect from new construction. They range from \$154.29 to \$222.75 per square foot for different land uses, and average out at \$174.04. Because the future scenarios are likely a mix of different land uses, this average was used for development on current parking lots.

**Table 16: DDD Estimates of Worth of New Development**

<b>Land Use</b>	<b>Value per Square Foot</b>
Residential	\$154.29
Retail	\$222.75
Office	\$160.44
Hotel	\$158.67
<b>Average</b>	<b>\$174.04</b>

When applying the DDD estimates to the forecasts for square footage (Table 17), the results for added value are an order of magnitude larger than the Assessor data method. The value added ranges from \$3.3 billion to \$6.7 billion across the three scenarios. With \$1.3 billion to \$2.6 billion being added within 500 feet of the Loyola streetcar, these numbers are closer to the expectations of the project planners and the DDD for the new transit investment. The projects already announced within this distance will be discussed later in this chapter.

**Table 17: Value of Development Scenarios Using DDD Estimates (in millions)**

	Development Scenario		
	Half of Max FAR	Average Current FAR	Max FAR
Value Available	\$3,335.45	\$6,023.08	\$6,670.90
Value Impact - Loyola	\$3,001.56	\$5,483.93	\$6,003.11
Value Impact - All	\$2,713.58	\$4,905.35	\$5,427.17
<b>Value by Distance from Loyola Streetcar</b>			
Within 500 feet	\$1,278.95	\$2,524.66	\$2,557.91
500 - 1,000 feet	\$965.47	\$1,806.31	\$1,930.93
1,000 - 1,500 feet	\$994.18	\$1,549.08	\$1,988.37
Above 1,500 feet	\$96.85	\$143.03	\$193.69
<b>Value by Average Distance from Streetcar</b>			
Within 1,000 feet	\$780.27	\$1,296.56	\$1,560.53
1,000 to 1,500 feet	\$1,627.56	\$3,114.52	\$3,255.12
1,500 to 2,000 feet	\$793.48	\$1,410.79	\$1,586.96
Above 2,000 feet	\$134.14	\$201.21	\$268.28
<b>Value by Land Use</b>			
Residential	\$477.34	\$954.68	\$954.68
Mixed Use	\$124.46	\$248.92	\$248.92
Commercial	\$157.86	\$315.71	\$315.71
Industrial	\$7.26	\$14.52	\$14.52
Public Use	\$713.73	\$1,427.46	\$1,427.46
Transportation	\$1,743.82	\$2,892.54	\$3,487.65
Other	\$110.98	\$169.24	\$221.95

## Infrastructure Analysis

The streets, sidewalks, and intersections in the CBD can range in quality greatly for pedestrians. There are safe and appealing locations that exhibit the vibrant street life that New Orleans is known for, but also desolate, dangerous landscapes. The gaps in this network of infrastructure could be a major limitation for any potential TOD around the Loyola corridor.

### *Intersections*

Crosswalks and ramps are two indicators of a safe and inviting intersection, but by no means the only variables. Engineers have developed hundreds of pedestrian-friendly designs, but these two elements are the most basic. Additionally, many of the ramps in the area are crumbling, and crosswalks are faded or paved over. The results of the infrastructure survey only show the locations where these elements are missing, but these cases are thus the most serious gaps, and indicate larger areas where attention should be paid.

The majority of the intersections in the study area are not missing any crosswalks (see Figure 33). The intersections with four corners at right angles are the best designed for pedestrian crossing, and are most likely to have all crosswalks present. The area above Loyola Avenue features many of the intersections that are missing at least one crosswalk. Interestingly, the intersections along the Claiborne and Calliope borders are all missing at least one crosswalk. These pedestrian barriers are places where a crosswalk could be most important. Loyola Avenue, the widest street in the area, did have almost all crosswalks present, but many of the intersections use indirect routes across turn lanes for pedestrian traffic. These crossings are inconvenient and can leave pedestrians stranded in scary locations. Lafayette Street has a series of intersections that are missing all of their crosswalks. This street features an older brick ring pattern in the pavement, but this design no longer helps the pedestrian or acts as a crosswalk (Figure 32). The street leads to a popular pocket park on Loyola Avenue, and workers in the CBD were observed negotiating busy traffic at these intersections through significant hazard.



**Figure 32: Older brick patterns on Lafayette Street.**

Intersections missing ramps show some of the same patterns as the crosswalks (see Figure 34). The streets above Loyola Avenue are often missing ramps, while the crossings on Loyola are well outfitted. Many of the intersections in the older downtown core are missing ramps because of the age and material of their sidewalks.

Figure 33: Number of missing crosswalks.



Figure 34: Number of missing ramps.



## **Sidewalks**

Sidewalks were present on almost all of the segments, but offered different levels of safety and comfort for pedestrians. Many New Orleans sidewalks have become cracked and deformed over years of use, a characteristic that can pose significant barriers to some disabilities. Although the sidewalks in the study area are no exception, the quality of the pavement does not seem to be a major barrier for pedestrian use. Instead, the buildings fronting the sidewalks and the protection from street traffic were chosen to represent the quality of the pedestrian experience. These characteristics were chosen based on observations during weekday hours where many pedestrians traversed suboptimal sidewalks, yet avoided unprotected ones.

The sidewalks without building frontage were located primarily in the areas identified as surface parking earlier (Figure 35). Pedestrians were less common on these blocks, and many walking to and from their cars would travel through the lot instead. Most of the downtown core, medical district, and building clusters along Poydras Street had good street frontage, and often featured wider plaza-like sidewalks. The mixed-use blocks between St. Charles Avenue and Baronne Street had the most street interaction with first floor businesses, and were safe and inviting even where parking lots broke up the streetscape.

Trees, plantings, light poles, and other decorative elements can offer a feeling of protection to pedestrians from moving traffic, while street parking can also contribute to a safer and more inviting sidewalk. There are sidewalks throughout the study area that do not offer any protection to pedestrians (Figure 36). In the downtown area, there was often no room for furnishings. Parking was provided on some of these blocks, but many sidewalks without parking or furnishings existed in this well-traveled area. The best sidewalk protection was featured along some pedestrian corridors, such as St. Charles Avenue, Baronne Street, and Howard Avenue. The most treacherous sidewalks were those without any protection or frontage, which again were located in the areas dominated by surface parking.



Figure 35: Sidewalk frontage.

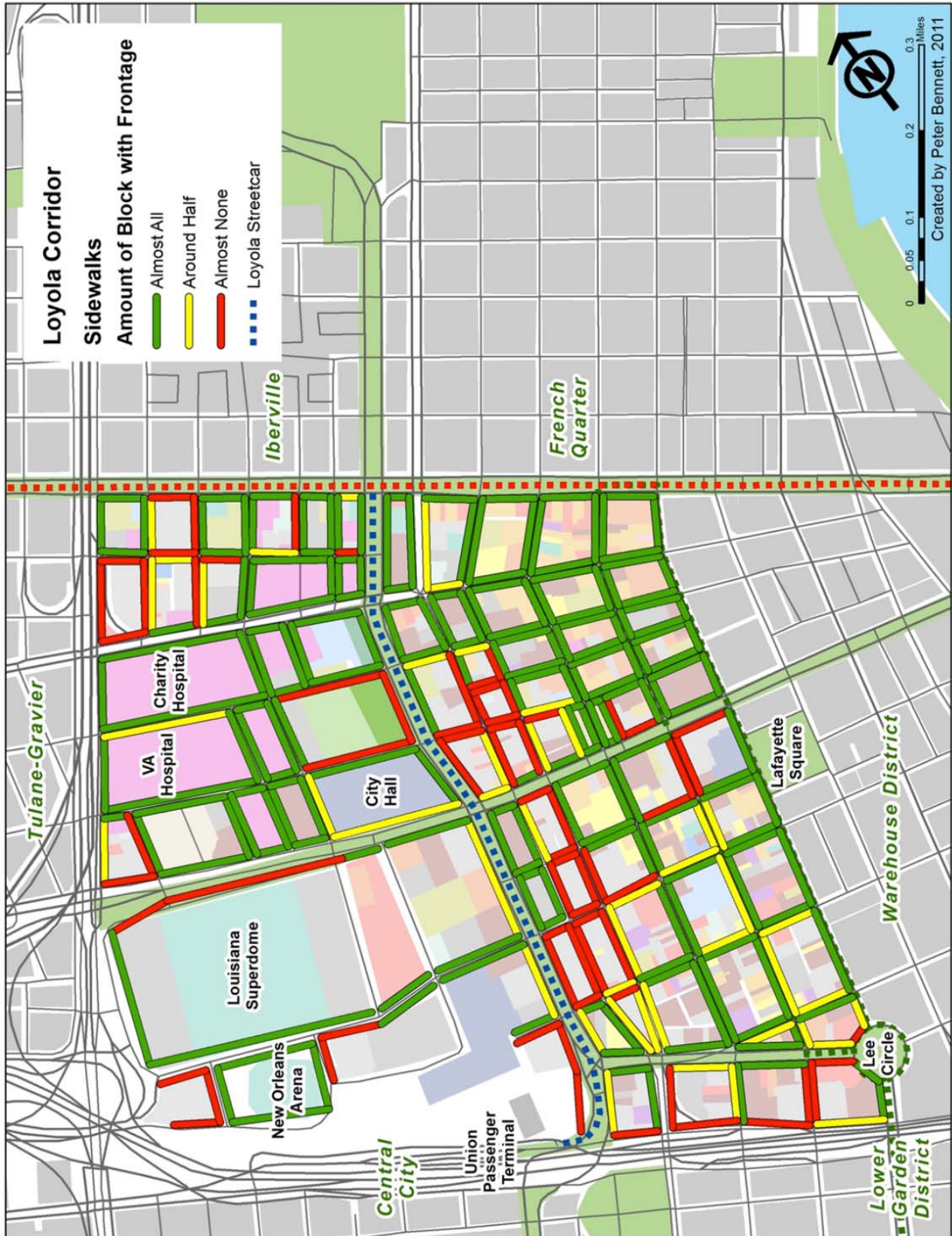
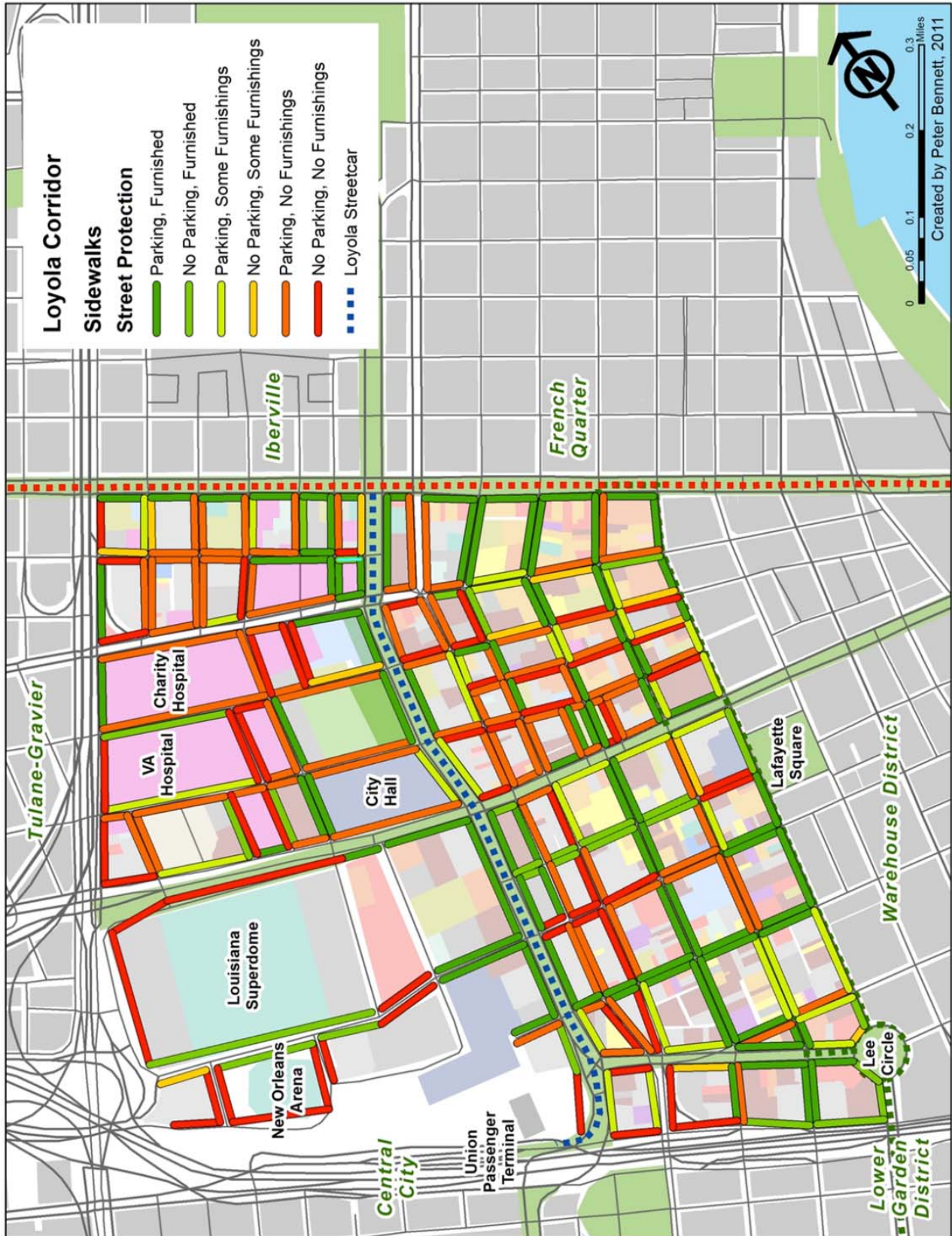


Figure 36: Sidewalk protection.



## Traffic Calming

Traffic calming techniques can help neighborhoods provide a safe and inviting pedestrian and bicycle environment. Using roadway design, vehicular traffic can be kept at safe speeds, and alerted to the facilities for non-motorized modes. In TOD, pedestrian travel is essential to the success of the transit because it is how riders get to and from their destinations.

In the Loyola corridor, the streets are largely lacking in traffic calming. Three designs were observed, all relatively minor in the spectrum available: curb extensions, textured pavements, and bike facilities. Curb extensions (see Figure 37) act to slow traffic, reduce crossing distance, and in some locations in the CBD, create pedestrian plazas. In Figure 39, the intersections along Canal Street and St. Charles Avenue feature curb extensions, and are two of the most vibrant and safest designed streets for pedestrians.

Textured pavements can also reduce vehicle speeds, but they were ineffective in their limited implementation in the CBD. There is some older brickwork along Lafayette Street, but it is largely unnoticeable to automobiles (Figure 38). The brick pattern suggests that they are replacements for crosswalks, which are not painted. These intersections were observed to be inhospitable to pedestrians, despite fairly frequent use. Users were seen running to avoid traffic that was not slowing.

Bike facilities can act as a mild traffic calming measure because they narrow some travel lanes, but their primary role is for bicycle traffic. Bike lanes are used on some blocks of Common and Gravier Streets, interspersed with shared lane markings. Loyola Avenue and Poydras Street also feature shared lane markings, but their placement and the lane width is unsafe and impractical for cyclists due to lane positioning (Moule & Ronkin, 2011).

Traffic calming is not necessary or desired in all locations. For example, there are very few locations where any vertical deflection<sup>7</sup> would be appropriate in the CBD. Each street and intersection is different, and many of these measures should be considered in conjunction with the frontage and parking analysis. There are, however, some intersections and streets that are poorly designed for pedestrian travel. Traffic calming is an effective solution for these locations.

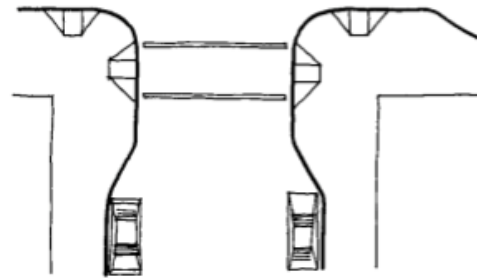


Figure 37: Curb extensions (City of Portland, 1998).

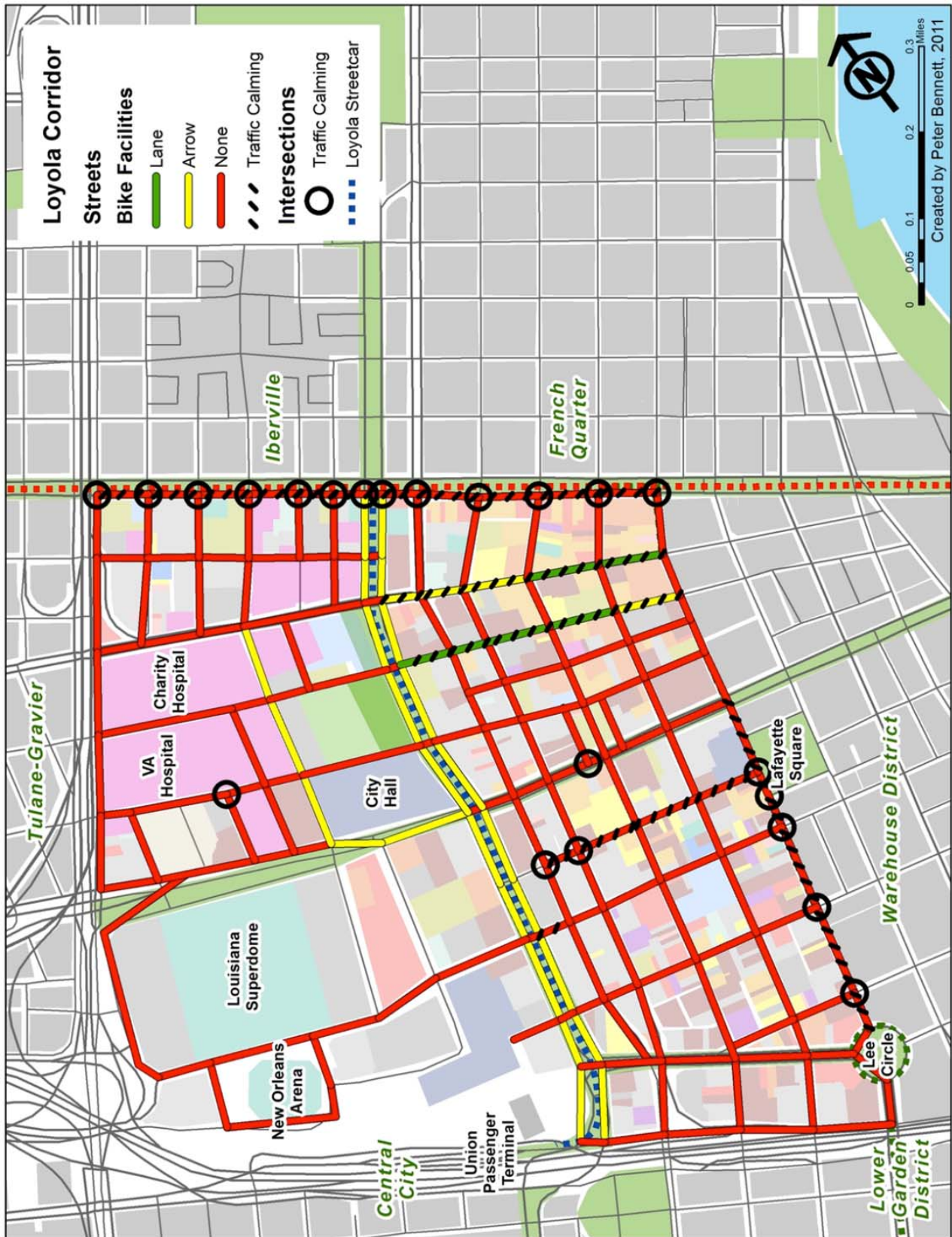


Figure 38: Brickwork along Lafayette Street.

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<sup>7</sup> Devices such as speed bumps or speed tables, where traffic is calmed by changes in pavement height. Horizontal deflection calms traffic by forcing vehicles to steer to avoid a device.

Figure 39: Traffic calming and bike facilities.



## **Accessibility**

The infrastructure analysis maps demonstrate the locations of missing design elements, but also show a street grid of variation. A historic pattern exists on the riverside of Loyola Avenue, with small block sizes and high intersection density. The grid had been altered by more recent development in the rest of the study area. The Superdome, government complexes, and large hospitals all were built by removing street segments and altering others. Some of these streets do still exist as plazas, but most are nonexistent. These larger blocks and missing connections can make pedestrian travel more difficult and less enjoyable.

The street grid is one factor in the differences in accessibility in the study area, but the distribution of businesses and other amenities plays a more significant role. The Walk Score<sup>®</sup> of each intersection (Figure 40) demonstrates which locations have a significant variety of opportunities in walking distance. As a downtown area, even the lowest scores of 71 are considered walkable, but the scores in the high 90s are deemed a “walkers paradise” (Front Seat, 2011).

Similar to the transit distance maps, accessibility diminishes gradually with distance from Canal Street and St. Charles Avenue. On the riverside of Loyola Avenue, the blocks around Howard Avenue are the lowest scoring, an area with fewer active businesses. On the other side, the intersections around the Superdome and near Claiborne Avenue are the least accessible. By definition, sports stadiums must take up a great deal of area, making distances to amenities greater. Despite this fact, the stadium area still lacks any commercial district that is oriented towards large events, such as bar and restaurant districts seen in other cities. Vacant hospitals, parking, and expressways contribute to low accessibility elsewhere along Claiborne Avenue.

Figure 40: Walk Score® for each intersection.



## Future Development

The announcement of the new streetcar has increased speculation about what development may follow, including several confirmed projects underway. These projects add to other development opportunities that stem from the overall recovery of the city from Hurricane Katrina, and previous redevelopment efforts of vacant properties. This list was adapted from a report by James Amdal at the University of New Orleans (Amdal, 2011).

Several projects are in progress or planning phases relating to the Louisiana Superdome and surrounding complex. The stadium itself is being renovated in preparation for future major sporting events, and the public spaces around it are also being improved. A nearby office tower and former mall are also part of the master plan for a sports entertainment complex to compliment the two stadiums.

Two major hotels are planning renovations and expansions along Loyola Avenue: the Hyatt and the Holiday Inn. Both plans include more conference spaces, aimed at attracting meetings and travelers. The Hyatt has been closed since Hurricane Katrina, but renovation is already underway. There is another vacant hotel in the close vicinity of Loyola Avenue, previously a Ramada, which has not been discussed for future development.

At the Canal Street end of the future streetcar line, a cluster of theaters sits vacant or are being renovated. Once a center for entertainment in the city, the Saenger, Orpheum, Joy, and Loews-State theaters are all currently not operating. The first two have active redevelopment efforts in place, but the future is less certain for the others. For comparison purposes, another former theater in the study area, the Civic, was successfully converted into condominiums.

Former office buildings along Loyola Avenue have struggled to find tenants, stood vacant, and been the subject of many redevelopment proposals. The Saratoga Building, Rault Center, Maritime Building, Texaco Building, New Orleans Exchange Centre, and the Oil and Gas Building are all older high-rise office buildings in a cluster near Loyola and Tulane Avenue.

There have been many promising proposals for these properties, several with projects in progress. Interestingly, many of the proposals involve more mixed-use development for the area, specifically an increase in residences.

A major portion of the land use in the study area is devoted to health care, but the vacant buildings have no definite redevelopment plans. Across Claiborne Avenue and Canal Street from the existing hospitals, the LSU/VA hospitals, BioInnovation Center, and Louisiana Cancer Research Center are being built. Reuse of the existing VA and Charity hospitals has not yet been decided in the planning efforts. The fate of these buildings will have a measurable impact on the character and viability of much of the area above Loyola Avenue.



Figure 41: The South Market District (The Domain Companies, 2010).

Two new developments have been announced that best engender the goals of TOD in the Loyola corridor, a grocery and a mixed-use development. The old Sewell Cadillac building is being renovated as a Rouses grocery store, and several of the surface parking lots nearby are to be redeveloped as the South Market District, a multi-building commercial and residential project (see Figure 41). This project is specifically sited to take advantage of the new streetcar line, and includes a pedestrian friendly design for travel to and from the station. The decision to go forward with this development was made immediately after the streetcar was announced.

The developments planned for the Loyola corridor are projects that bring hundreds of millions of dollars of investment to the area in construction, and should raise property values in the manner seen in the analysis above (Amdal, 2011). The mixed-use projects range from around \$10 million for minor renovations to \$185 for the South Market District, and several hundred million for the sports and hotel developments (Amdal, 2011). Table 18 shows a summary of some of the projects mentioned above. There are many more separate development projects in the area, but these were major projects that coincide with the announcement of the streetcar, and representative of the property value results.

**Table 18: Featured Developments in the Loyola Corridor**

<b>Type</b>	<b>Name</b>	<b>Description</b>	<b>Investment</b>
Sports/ Entertainment	Benson Tower/New Orleans Center	Office tower and sports/entertainment complex.	\$12.5 million
	Superdome Renovations	Changes to the building itself.	\$85 million
	Superdome Surroundings	Champions Square, Lasalle Street, and public space.	\$43.5 million
Grocery	Rouses	Urban grocery store.	\$11 million
Hotel	Holiday Inn	Upgrades and possible new conference center.	\$24 million
	Hyatt Hotel	Renovation and new conference center.	\$243 million
Mixed-Use	Maritime Building	Ground floor retail and residential.	\$38 million
	South Market District	Ground floor retail and residential.	\$185 million
	Texaco Building	Ground floor retail and residential.	\$25 million
Residential	234 Loyola and the Rault Center	Apartments and Condominiums.	\$30 million
	Saratoga Building	Market rate apartments.	\$42 million
Theater	Orpheum Theater	Historic theater.	\$10 million
	Saenger Theater	Historic theater.	\$38.8 million



## Chapter 5: Conclusions and Policy Implications

### Current State of the Loyola Corridor

Transit-Oriented Development can dramatically change the landscape of an urban area. When planning for this transformation, it is important to set a baseline for comparison. Many of the innovative incentives and policies for TOD rely on using a baseline, and additionally, these comparisons can be used to gauge success. The results of this thesis include a baseline for land use, property values, and transportation infrastructure.

The urban environment of the Loyola corridor is a product of several eras in the history of New Orleans. Older neighborhood buildings coexist with historic warehouses, office towers, and parking lots. Much of the current development already reflects the character of TOD, but not all. The transportation infrastructure is a traditional urban street grid that is well suited for TOD, but has been oriented towards automobile travel at the expense of other modes.

Development is most successful in downtown districts with an established identity. The core downtown office buildings lie at one end of the corridor, but become more inconsistent at the fringes. Lakeside of Loyola Avenue, sports, government, and health care land uses have established centers of activity, but are lacking connections to each other and to the streetcar corridor. The Warehouse District has had success as a mixed-use, mid-rise neighborhood that is partially residential and rich with amenities. Anchored by an existing streetcar line, this type of development integrates well with transit. Baronne Street currently serves as the boundary for the Warehouse District.

The blocks between these districts are lacking an identity as much as they lack physical development. The dominant use, surface parking, is responsible for much of this. The parking is primarily used during office hours and for special events. The parking was assembled on a lot-by-lot basis, and a few older buildings remain. These blocks have the lowest value in the corridor, and are perceived as a speculative use for valuable downtown real estate.

Another factor in the lack of neighborhood identity in the Loyola corridor is a lack of urban amenities. Partially as a result of having little built development, there are few commercial businesses, entertainment venues, and public spaces. One measure of accessibility, Walk Score<sup>®</sup>, shows a steady decrease in these amenities across Loyola Avenue. In the office-oriented downtown, many businesses are only open during work hours, boosting accessibility measures but failing to serve all neighborhood purposes. This is illustrated by creative class survey respondents characterizing the CBD as having limited everyday shopping (RDA Global Inc., 2010).

There are several existing assets that could form the basis for a neighborhood in the Loyola corridor. There is little perception of crime and other negative characteristics, the area is simply under developed. A stronger connection could be made with the already successful Warehouse District, along with the renovation of vacant buildings of the same era. A few new restaurants, clubs, and high-end residences have already opened in the area. Lastly, Champions Square near the Superdome aims to create a sports district feel in conjunction with big events.

The transportation infrastructure in the study area is in a state of disrepair. Sidewalks and roadways alike suffer from design faults and significant wear and tear, while traffic and parking are problematic at peak hours. Many streets have been optimized to accommodate high volumes of traffic, at the expense of other modes. Several one-way, multi-lane roads with no on-street parking are used to move cars between downtown and the highways. These streets are treacherous for pedestrians and cyclists. There are numerous examples of missing ramps, crosswalks, sidewalk obstructions, and driveway entrances that make walking even small distances a challenge. Besides these blatant flaws, traffic calming, widened sidewalks, street furniture, and other pedestrian amenities are almost non-existent. Some recent street resurfacing projects have brought new sidewalks, ramps, and bike lanes to the area, but the implementation is haphazard.

The Loyola corridor features a lack of development, identity, and infrastructure, but has the potential to overcome these problems. Downtowns in similar circumstances have seen reinvention in other cities. There are also proven planning solutions from these examples. Most importantly, many of these changes are already a priority for stakeholders, and are a stated goal of the new transit investment.

### **Forecast for Future Development**

The addition of a streetcar on Loyola Avenue alone will lead to millions in investment for development in the vicinity. This may appear to be a bold statement, but it is already evident in the projects announced in the area. However, the dollar amount for this development must be separated from any evaluation of success. Transit-Oriented Development involves more than the sum of the finances invested, it realigns land uses and uses physical design to generate transit ridership.

One component of TOD is achieving a certain level of density. This is required to concentrate enough residences, workplaces, and stores within walking distance of each other and transit. Using Floor Area Ratio (FAR) as a measure of density, the build out scenarios used in the results would all be sufficient for TOD. If every lot were developed to these levels, around \$300 to \$600 million dollars in additional property value would be generated.

Many of the projects that have been announced for the area are residential in use, or are aimed at supporting residential development. Several former office towers are being renovated into condominiums and apartments, and all of the new construction is residential with ground floor commercial. The private development community has identified residential development as a market trend in the Loyola corridor. The other major developments concern hotel and convention facilities, sports facilities, and entertainment. There are no plans for new office space, possibly due to many large office towers existing in the CBD. These development trends are consistent with a vision of TOD for the area, and could form the framework for a neighborhood identity for the corridor.

The residents of the Loyola corridor will have greater accessibility than currently exists in the area. In the current state, there are neither residences nor amenities, making walking distances longer. With new development including commercial uses, and a major grocery store opening, many shopping trips will be possible within a few blocks. The area is currently well located for museums, sports, and theaters, but some connections are unintuitive and fragile. The streetcar

may offer a convenient mode for getting to the French Quarter for entertainment, but these trips are equally likely to take place on foot.

The transportation impact of the new streetcar is unclear. The new route is 1.2 miles in length, 0.8 miles of which is new track. From the Union Passenger Terminal, the streetcars will turn onto Canal Street and travel to the Mississippi River. These distances are barely longer than the distances most people are willing to walk. Without frequent, convenient service and well-timed transfers, few trips will be taken by transit. Future streetcar extensions may change this picture, however. A funded project to extend down Rampart Street and St. Claude Avenue is planned as an extension of the Loyola line, rather than a spur from Canal Street. Additionally, a discussed connection down Howard Avenue to the St. Charles line would link the Loyola line into a wider network.

Although surface parking will make up less of the land area on the Loyola corridor, parking will continue to play an important role. New development is being designed with significant amounts of structured parking. It is unclear how much is needed for the residential units, and if these lots will also serve the workers currently using the surface lots. Even if parking requirements were lower, these levels may be provided anyways to serve a currently auto-dependent population. These structures are significant costs for the developers, but can be innovatively designed into the building. Without building underground, the parking can be “hidden” in the lower stories without sacrificing commercial space and streetscape.

Changes to the pedestrian infrastructure are the most uncertain for the future. There is no comprehensive plan from any government agency, neighborhood group, or business improvement district for streetscape and infrastructure improvement. For changes to the street engineering, such as lane numbers and on-street parking, the Department of Public Works and other agencies will need to be involved. Private development has designed new sidewalks in some locations, often wider with furnishings. Even the major project in the area, the new streetcar, has planned little in pedestrian improvements. New shelters and plazas are planned on the neutral ground, but no changes to the other sidewalks, crossings, and intersections. Without a master plan for pedestrian infrastructure, gaps in the network will remain, barriers will persist, and dangerous streets will discourage many travelers.

While the core principles of TOD involve land uses than generate transit ridership, the new streetcar project may not achieve this goal. The stated purpose of the project in the TIGER application is to spur development, and to that end it is successful. However, this development is geared towards a population that values certain urban amenities, and a robust transit system is certainly one of them. The forecast for future change in the Loyola corridor involves significant improvements in the land uses and land value of the properties, but lacks vision for neighborhood identity or transportation infrastructure.

### **Susceptibility to Change in the Loyola Corridor**

There are numerous factors that play a role in the development and redevelopment of an urban area. Some are predictable, such as easy access to transportation and new demand for housing. Conversely, some factors can be difficult to anticipate – an owner’s willingness to sell, structural damage, or threat of crime. Among several indicators of future change, two stand out in the Loyola corridor: the amount of surface parking, and the vacant buildings. These land uses can be

considered the most susceptible to change, and additionally, their transformation would have a profound impact on the area.

As discussed earlier, parking will continue to play an important role in the Loyola corridor. However, surface parking is a low value land use that will feel pressure from development, and is incongruous with the goal of TOD. The physical area of parking is already slated to diminish, with the South Market District development using several blocks of surface parking as a footprint. The most susceptible surface lots are those independent from other development, typically operated by a parking company. The potential for adjoining surface parking with other land uses is less clear, and should be considered on a case-by-case basis.

Vacant buildings are a common occurrence in the Loyola corridor. Some are vacant due to storm damage or neglect, others because there is no demand for their use. These buildings have potential for redevelopment, but there are many complicating factors involved. Their vacancy may be the result of stubborn owners, legal battles, regulation, or zoning – all issues with unclear solutions. Additionally, the structural soundness and material quality of some vacant buildings may prohibit redevelopment for new uses.

The susceptibility to change for active land uses must also be considered. Although most current uses are appropriate for the character of a TOD neighborhood, some may be underperforming. For businesses and residences, their activity and upkeep determine their longevity in the area. Another factor is the physical form of the buildings. Office towers, machine sheds, and parking structures with no street interaction are less suitable for a walkable mixed-use area, and are not easily retrofitted.

For major buildings that will not change significantly, such as stadium, courthouses, libraries, and hospitals, their context can change to better integrate into the surroundings. The visitors and employees to these buildings may wish to live and shop in the vicinity, an opportunity that doesn't exist currently. Pedestrian access to current land uses may also strengthen as the entire area transforms.

The Union Passenger Terminal and surroundings, despite the prominent role they play in the streetcar project, have not been the focus of development plans or coordinated planning. While the station currently offers limited train and inter-city bus service, it is slated to serve as a greater hub for RTA service in the future. Additionally, a proposed rail connection to Baton Rouge would terminate at the UPT. In many cities, railway station areas have redeveloped into high-density nodes (Bertolini & Spit, 1998). For the UPT, there has been no proposal for the parking directly adjacent to the station, and little planning for better integration of the station and the neighborhood across Loyola Avenue.

## **Planning for Downtown Transit-Oriented Development**

With the announcement of a new streetcar line on Loyola Avenue, a significant amount of private development can be forecast for the surrounding area. In evaluating the projects that have been announced, the buildings that could be redeveloped, and the overall character of the area, the new development will have many of the components of a Transit-Oriented Development. A vision for a high density, mixed-use neighborhood with a focus on residential uses and urban amenities is held by stakeholders and planners alike. However, little concrete planning has been done for the area. As a sum of its parts, this private development may not achieve a strong

identity, walkable landscape, and vibrancy needed for successful TOD. These four planning tools could help deliver these visions for the Loyola corridor.

### ***Development Incentives***

Development incentives can help promote new construction, but also add desired features to other new and existing projects. If costs are higher for residential or mixed-use development, direct funding can help encourage developers to include them in their projects. Similarly, including ground floor commercial may be encouraged using incentives. More commonly, development incentives involve funding for designs and amenities that could be considered public goods. Adding green space, plazas, facades, and signage to buildings may not be cost-effective for the developer, but adds value to the entire district.

The Downtown Development District (DDD) currently provides some incentive programs for facades, streetscape, and other improvements to private development. With the addition of the streetcar, these programs should be evaluated holistically to be consistent with a future vision. While helping one developer with a new sidewalk, the program could be expanded to complete the whole block. Another DDD project, the streetscape of Canal Street, is a good example of how consistency can add value to these improvements.

Redevelopment of the vacant buildings in the Loyola corridor is another public good that could be addressed by incentives. Historic preservation grants could be used for some of them, while others are vacant for other reasons. Their enduring vacancy harms the success of other developments, making such an incentive a beneficial investment.

### ***Infrastructure Investment***

One of the main findings of the infrastructure analysis was the specific locations where pedestrian infrastructure was broken or missing. With many major routes for automobile traffic in the area, these gaps are a significant barrier to walkability. There have been new sidewalks and ramps added in the last five years in the area, but their design is far from adequate. Even in locations where new facilities exist, the presence of automobile traffic at high speeds is a significant deterrent to pedestrian travel.

A Complete Streets approach is necessary across the entire area in order to improve the infrastructure. Innovative traffic calming techniques can be used to make travel safer for all modes. New designs for pedestrians and bicycle facilities will bring new users of these modes. Currently, roadway resurfacing and new sidewalks are often built as parts of different projects, often with designs that contradict each other. Using Complete Streets would bring the best engineering practices to all projects.

This approach is clearly not being implemented in the Loyola streetcar project. The investment for the new route will only extend one lane on either side of the neutral ground. Not only does the transit mode not have an exclusive right-of-way, the ability for users to get to the stops is severely compromised by Loyola Avenue. The sidewalks across the street from the streetcar will continue to be minimal or non-existent. Crosswalks are ineffective with the volume and speed of traffic present, and are often indirect due to turn islands and turn lanes. Many of these intersections should be redesigned, especially due to the conflict between turns and streetcars, but no plans are in place to do so.

### **TOD Overlay Zone**

A TOD overlay zone for the Loyola corridor would be a major step towards achieving a consistent vision and true identity for the area. In addition to encouraging certain design aspects of new development, an overlay zone could add new incentives and change regulations in the existing zoning for the area.

In its current state, the urban design of the Loyola corridor has benefits and impediments to TOD. The street grid and downtown character of many buildings already offer opportunities, but other land uses are incongruous. The glut of surface parking makes the area desolate and empty. Other buildings have large setbacks and little street interaction. There is no consistent aesthetic for the CBD, unlike areas such as the French Quarter, so no specific architectural requirements would be appropriate. However, building design that adds to the streetscape, promotes businesses, and hides parking can be encouraged in the overlay zone.

Additional zoning for TOD in the Loyola corridor could relieve the pressures that developers feel from current parking requirements. For a full block development, the need for structured parking may pose a significant cost impediment to the construction. The South Market District development is slated to have 1,181 spaces for 487 apartments. Although other activities may use the parking, it is being provided at a very high amount. Instituting lower minimums or using a maximum may help reduce the amount of new development devoted to parking.

TOD overlay zones in other cities have led to high quality urban planning efforts. By defining the zone formally, a master plan for the area could be created. Master planning can get multiple stakeholders, agencies, and interests to agree on a vision for future development. These documents can influence policy-making, and can be used to evaluate success.

### **Value Capture**

The property values in the Loyola corridor are bound to increase with the introduction of the streetcar and a transition to TOD. These increases will correspond with additional property tax revenues collected. Many areas experiencing new development have captured these added revenues and used them for the incentives and improvements discussed above. Value capture can be an effective way to ensure the success of a TOD without requiring significant outside funds.

For the Loyola corridor, increased value of existing buildings as well as new development could possibly be captured. These increases could lead to tens of millions in additional tax revenue each year. There has been no discussion of implementing value capture for this area, or in relation to the streetcar. The DDD does already collect some additional revenue from the properties in their jurisdiction, and uses it to pay for their programs and incentives.

### **Future Research**

The results of this thesis are a snapshot in time. These are the land uses, property values, and conditions of the urban environment in late 2010 and early 2011. In the coming years, as the streetcar is opened and new buildings are built, the same research questions should be revisited.

A major topic not addressed in this thesis is the transportation impact of the new transit service. The new segment is only 0.9 miles in length, and will be operating in an automobile lane. The scheduling of the service is not yet known, and is likely to change as new additions are proposed for Rampart Street, St. Claude Avenue, and Howard Avenue. There are numerous engineering,

travel behavior, and traffic modeling questions to address in predicting the ridership of these new streetcars.

The land value method used here primarily used assessor data to forecast new development, but in comparison to estimates from the DDD, these values were significantly lower. Future research could use proprietary real estate data to better model what new development in the corridor is worth.

## **Conclusions**

This thesis discussed two types of impacts that the Loyola streetcar will have on the area surrounding it: the inevitable and the possible. Much of the evidence gathered points towards an anticipatory atmosphere related to new development in the area. Land uses that have been underperforming for decades seem to be reaching the end of their reign. New development slated for the area fits a formula seen in many urban areas, a preference for residential urbanism, downtowns, and Transit-Oriented Development.

On the other hand, there is no guarantee of some aspects of success. Lots that remain empty and streets that remain treacherous will hinder the entire area. Inconsistencies and shortsighted decisions will send signals to residents, visitors, and businesses alike that identity and vibrancy are missing. The Loyola corridor has the potential to become a proud gateway to the city, exciting entertainment district, and fully functional neighborhood.

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## **Vita**

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