Seeking Equitable Development in a Challenging Affordability Landscape: Examining the Relationship between Housing Prices and the Atlanta BeltLine

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ABSTRACT

A revival in linear park development has brought new open space to a growing number of communities previously characterized by low-income populations, obsolete infrastructure, and difficulties in attracting outside investment. This thesis examines the relationship between linear park development and escalation in property values using the case of the Atlanta BeltLine. Employing data from Fulton County in Georgia, I construct a linear regression model with a difference-in-difference specification to examine these effects at the point of park completion. I find notable property value appreciation effects due to the BeltLine’s development, and seek to place these findings in context of larger conversations about equitable development and open space. Considering the history of the BeltLine’s development, I examine ways in which Scott Campbell’s conception of equity planning has been realized in Atlanta and recommend ways in which local, state, and federal government may improve equitable development planning efforts in conjunction with future open space projects.

Supervisor: Albert Saiz, Associate Professor
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INTRODUCTION

“A GREAT VISION”

On the morning of January 5, 2004, Shirley C. Franklin delivered the State of City speech—her third as mayor of Atlanta—to a crowd of constituents gathered for breakfast at a downtown hotel. In a departure from her previous two addresses, Mayor Franklin declined to roll out a catchy alliterative idea to improve municipal management. She sought to move past a fixation with “nuts and bolts” issues, rather than add to the “Pothole Posse” and “Trash Troops” proposals of her previous annual speeches. Instead, she pushed the narrative that the city was moving in the right direction, pointing to several projects as evidence: the development of Tech Square, the completion of Atlantic station, and the proposal for a new linear park called the BeltLine that would ring the city’s downtown. Rather than making a detailed commitment to the project, she briefly described it as “a great vision.”

Her characterization expressed a belief in the project’s transformative potential. The proposal to repurpose much of the region’s obsolete train infrastructure as a 22-mile network of largely contiguous trails encircling a downtown core was unprecedented in a major American city. The proposal also proved to be expandable in scope, assimilating the ideas of disparate stakeholders and growing to incorporate transit, workforce development, brownfield remediation, and neighborhood stabilization agendas alongside the basic concept of creating open space. This expandability enabled citizens from various backgrounds to become custodians of the BeltLine proposal, forming the backbone of its popular support.

The ambition, expandability, and adoptability of the BeltLine proposal make it a fascinating planning case. It is an amalgam of physical design challenges and an example of urban adaptive reuse paired with a rich case study of the economic and social impacts of major catalytic infrastructure. Within Atlanta, the BeltLine has been one of the major forces buttressing a revival of in-town development over the last two decades. Beyond Atlanta, the BeltLine is a seminal exemplar of how environmental, economic and equity agendas can exist in tension within one project. Additionally, its development is a watershed event in the evolving conversation around incorporating “equitable development” principles into open space planning.

EQUITABLE DEVELOPMENT PLANNING AND PARKS

Scott Campbell of the University of Michigan once defined an “equity planner” as one who “sees the city as a location of conflict over the distribution of resources, of services,

6 Ryan Gravel, Where We Want to Live: Reclaiming Infrastructure for a New Generation of Cities (Macmillan, 2016), pp. 95
and of opportunities." Using that definition as a yardstick, there does not appear to be substantial evidence that most late 20th century park planners employed an equity lens on a consistent basis. At best, equity in the "opportunity" dimension became a more prominent consideration in open space planning in the wake of public reaction against urban renewal and other mid-century top-down planning movements. According to a 2016 Urban Institute Report, planners increased their emphasis on

Figure 1: Map of Atlanta with Planned BeltLine Corridor

participatory planning, and concomitant impact metrics focused on process and the extent to which plans incorporated community input. A criterion of particular interest was whether "the final plan reflect[ed] the community's stated interest." 8

In recent years, this paradigm in open space planning has shifted. The narrow focus on opportunity to participate in planning processes has expanded to include the distribution of opportunities, services, and resources ultimately afforded by the park amenity itself. With 2017 came the first significant, intentional practitioner convenings on the subject of park planning and equitable development. 9

Although an emphasis on incorporating equity planning in the Campbell mold has increased in recent years, the BeltLine was a seminal precursor to this maturing movement. Back in 2005, a group of consultants led by a firm then under the name of EDAW compiled a report evaluating the feasibility of using a tax-increment financing scheme to fund part of the BeltLine's capital cost and help underwrite the construction of subsidized housing and "quality development in underserved communities." 10 The concept would involve creating a buffer around the planned BeltLine right-of-way within which a portion of property tax revenues would support the project's development. This original vision called for capitalizing a Workforce Housing Fund using proceeds from bond issuances supported through the TIF (referred to in the state of Georgia as a tax-allocation district or TAD) scheme and "sufficient to ensure that a minimum of 20 percent of new residential units within the BeltLine TAD boundaries are affordable." 11

The above-stated ambition confronted questions of resource, service, and opportunity distribution directly and constituted an aggressive approach towards addressing concerns in some Atlanta communities that the BeltLine would 1) exacerbate gentrification trends already existing in the mid-2000s; 12 and 2) potentially expose new communities to similar pressures. The report also indicates that there is consistency between the previously stated objectives and those articulated by Atlanta residents. EDAW invited Atlantans to engage in a public participation process between April 2004 and the fall of 2005, and they explicitly called for "a variety of residential opportunities, including mixed-income and workforce housing." 13 Without delving too deeply into the precise definitions of "affordable" and "workforce housing," the significance of this commitment should not be understated in a political climate less conducive to redistributive social policy. 14

The foundational vision articulated in the 2005 EDAW report expanded four years later, when the Atlanta BeltLine, Inc. board published its Equitable Development

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8 "Equitable Development Planning and Urban Park Space" (The Urban Institute, July 2016) http://www.urban.org/sites/default/files/publication/82881/2000874-equitable-development-planning-and-urban-park-space_0.pdf.
14 Interview with BeltLine supporter, January 15, 2017.
Plan. The document articulated an objective of “minimizing involuntary economic displacement,” acknowledging that “while growth in land values can be beneficial to property owners, it places a tremendous burden on those who do not have the means to cover the associated tax increase. Proactive effort is required to ensure that existing residents and existing communities are not uprooted and instead have the opportunity to benefit from the economic rewards and improvements that accompany the BeltLine.”

These pronouncements indicate a strong alignment between the BeltLine’s early vision and the equity planning lens. Their reflection in subsequent Equitable Development Plans employed in projects such as the 11th Street Bridge Park in Washington, D.C. indicates the growing appeal of such concepts in park planning practice. The clear departure from the old participation-as-opportunity paradigm established the BeltLine’s status as a precedent setter in creating a marriage between urban linear park development and equity planning.

THE GROWING IMPORTANCE OF LINEAR PARKS

By way of definition, the national Rails-to-Trails Conservancy defines a linear park or a “rail-trail” as a “multi-purpose public path created from former railroad corridors.” The term multi-purpose is key, as commenters have rightly pointed out that these parks often include overlooks, playgrounds, and art, encouraging both active and passive recreation.

Linear parks converted from old train lines have increasingly appeared both in the urban cores and on the peripheries of cities since the 1980s. The reasons for this proliferation are manifold. Cities can reduce stress on roads and mass transit infrastructure without the costs associated with more intensive infrastructure, increase access to green space in dense contexts where carving out a Central Park-sized piece of land is infeasible, and eliminate eyesores that depress the value of abutting properties, stymieing prospects for neighborhood development efforts. Furthermore, such parks are often the best practical use for legacy rail infrastructure, given the urban design challenges of developing large residential or commercial buildings on rail right-of-way (that often lacks accessibility to roads) and the uncertainty posed by the potential (albeit remote) reversion to rail usage in some corridors where that remains a

21 ibid
possibility.

Policy also paved the way for linear park development. 1980 marked the passage of the Staggers Rail Act, which allowed rail corridors to undergo abandonment proceedings, which discontinue transportation use and open up possibilities for other planning priorities. Three years later, Congress grew concerned about the pace at which the new law had precipitated abandonment proceedings. It passed additional legislation, creating a more nuanced tool called “railbanking” that would allow train corridors to be retired for other uses while retaining the option to revert to rail uses later. The creation of this tool was instrumental in accelerating rail-trail development efforts.

In response to the development potential of linear parks, nonprofits and government entities have created a variety of resources for organizations seeking to repurpose infrastructure as linear parks. The national Rails-To-Trails Conservancy and the Trust for Public Land have offered technical assistance to grassroots organizations around the country developing proposals in urban, suburban, and rural contexts. Additionally, the Federal Highway Administration’s Bicycle and Pedestrian Program has published a variety of resources aimed at promoting linear park infrastructure, focusing on funding opportunities, environmental benefits, multimodal connectivity, and possibilities of pursuing equity in project planning.

PLAYING CATCH-UP

As mentioned previously, there is a robust conversation among advocates, designers, and park developers about how to augment existing linear park planning with equitable development concepts. There are also purposeful efforts, most notably the establishment of the High Line Network, to hardcode such ideas into plans for upcoming linear park projects. These efforts have gained exigency given existing angst about the failure of some recently opened linear parks to meet the equity ambitions of their creators and their home communities.

In public statements and interviews, Robert Hammond of Friends of the Highline has expressed regret over his and fellow co-founder Joshua David’s focus on community input with respect to the park’s aesthetics to the exclusion of other concerns because, in his words, “people have bigger problems than design.” Early BeltLine supporters Ryan Gravel and Nathaniel Smith went as far as resigning from the Atlanta BeltLine Partnership board out of concern that the organization had not done enough to meet its affordable housing goals and realize the project’s “full, inclusive vision.”

The equity conversation’s translation into the policy sphere, however, has been somewhat less coordinated. In 2017, two Chicago aldermen sought to slow gentrification along the popular 606 trail via an ordinance that would have made it prohibitively expensive for developers to densify existing nearby housing stock. The legislation was conceived under the presumption that new units would bring higher

24 ibid
27 ibid
A broader proposal, supported by the mayor, sought instead to preempt this blunt approach by expanding existing inclusionary zoning requirements in hot real estate markets, and removing the flexibility to use in-lieu fees to avoid the inclusionary requirements (see Conclusion section for more details). In the same year, Atlanta mayor Kasim Reed (Shirley Franklin’s successor) worked with a non-profit organization to pool philanthropic resources for capitalizing a fund that would provide property tax relief to qualified homeowners living near the BeltLine. Simultaneously, city legislators successfully campaigned to adopt an inclusionary zoning ordinance for neighborhoods close to the BeltLine (see Conclusions + Policy Implications section). The piecemeal and uncoordinated nature of these interventions within their respective contexts is not necessarily a negative. Designing good policy is inherently an iterative process. Individual proposals to deal with increasing unaffordability in neighborhoods proximal to linear parks have reflected the political exigencies and constraints present within the relevant cities. In the above examples, they have also reflected a retrospective understanding that park infrastructure has already begun to catalyze neighborhood change and that options to address such change are limited—especially when the reaction comes long after such changes begin to precipitate.

Practitioners can obviate such limitations through better prospective planning and through a better understanding of when and how equity challenges related to open space will manifest. In the above policy examples, media have described proposals as anti-gentrification, anti-displacement, anti-development, etc., creating some confusion about exactly what equity planning in the linear park space is attempting to accomplish. Lack of sufficient problem definition or understanding of the actual spatial and economic effects linear parks are having on communities may lead to policy responses that are sub-optimal options for promoting equitable development. Worse yet, the lack of viable proposals for promoting equity within linear park planning may make urban leaders more uneasy about embracing linear parks as worthwhile interventions in the way that Mayors Franklin, Emanuel, and Bloomberg have.

Through understanding the example of Atlanta BeltLine, its effects on property values, and how those effects are spatially distributed, this thesis will seek to illuminate some of the challenges inherent in promoting equity in linear park development. It will also seek to explore some of the policy and planning implications for Atlanta as well as for other cities exploring the possibility of implementing similar projects. First, the next chapter will provide some context on the history of the BeltLine, followed by a literature review. The Data + Methods section will introduce a quantitative study of how the BeltLine has impacted property values in the city of Atlanta. The following chapter will include an

analysis of this study’s results. The final section will explore the policy implications of the study’s findings, provide a summary of main points, and offer recommendations for future research projects.
EQUITABLE DEVELOPMENT AND THE BELTLINE

The BeltLine’s full story combines economic, racial, and organizing histories that capture optimism, prejudice, anxiety and a host of other sentiments. Chronicling each history is beyond the scope of this project, but equitable development is a consistent theme one can find throughout the story of the BeltLine’s development. Perspectives gathered from public officials’ comments, planning documents, conversations with former BeltLine officials, memoirs, and journalistic deep-dives form a body of accounts from which this thesis will construct a narrative of the efforts to foster equitable development as the BeltLine project came into being.

Though many sources were important in gaining an understanding of the BeltLine’s equitable development history, this thesis owes a great debt to Ryan Gravel’s recollections in Where We Want to Live: Reclaiming Infrastructure for a New Generation of Cities and Mark Prendergrast’s ambitious attempt at a definitive BeltLine history in City on the Verge: Atlanta and the Fight for America’s Urban Future. Both authors foreground equity issues, although Prendergrast’s more recent account takes a more critical lens of the BeltLine’s merits and challenges in this area.

RYAN GRAVEL’S APPEAL FOR EQUITABLE DEVELOPMENT

In 1999, Gravel wrote a master’s degree thesis on a proposal to re-envision Atlanta’s network of obsolete railroad tracks as a system of paths, parks, and light rail called the BeltLine. Although various people had studied the idea previously,32 Gravel’s proposal drew upon his training in architecture and urban planning to create an imaginative concept that was unfettered by some of the policy conversations to which previous adaptive reuse proposals for the infrastructure had been tied.33 The BeltLine’s multimillion-dollar proposals to promote transit and trails in a notoriously auto-oriented city were certainly pie-in-the-sky, but their freedom from the political baggage of past (and more policy-grounded) rails-to-trails schemes was key to the project’s capacity to morph the dominant conventions about how the city would develop in the years to come.

From an equity perspective, Gravel and other early supporters saw inclusivity as a crucial element of the BeltLine vision. Connecting “rich and poor, black and white” was an explicit stated aim in his 1999 thesis.34 Gravel meant for the BeltLine proposal to be a departure from the 20th century stadium and highway projects that had promised much but delivered little in the way of benefits to perennially marginalized communities.35 These sentiments marked a significant progression from the early 1990s, when the Rails to Trails Conservancy commissioned a report studying linear park adaptive reuse along the BeltLine and ultimately mothballed the findings due to concerns within the organization that a trail would unite both black and white Atlanta—an outcome, they

32 Ryan Gravel, Where We Want to Live: Reclaiming Infrastructure for a New Generation of Cities (Macmillan, 2016), p. 78
33 Ryan Gravel, Where We Want to Live: Reclaiming Infrastructure for a New Generation of Cities (Macmillan, 2016), p. 87
35 Ryan Gravel, Where We Want to Live: Reclaiming Infrastructure for a New Generation of Cities (Macmillan, 2016), pp. 118-19
surmised, that no one would have wanted. 36

Indeed, political scientists Robert Putnam notes in his book Our Kids that racial division has been a persistent motif in Atlanta’s history. Even after the decline of Jim Crow, white flight created a yawing spatial gap between black and white. As income and class stratification has emerged even within the black community, Atlanta found itself at the dawn of the 21st century as the major American city with the largest chasm between rich and poor. 37 The racism that undergirded the Conservancy report’s suppression may have been a powerful force in perpetuating and extending the social divisions that the BeltLine sought to countervail. Organizing, in the end, proved a stronger force in the opposite direction.

PHASES OF THE BELTLINE’S FORMALIZATION

At this point, it may be worthwhile to describe some of the key actors in advancing the BeltLine’s development. Two years after submitting his thesis, Ryan along with friends Sara Edgens and Mark Arnold enlisted the support of city Councilwoman Cathy Woolard to advance the project. 38 One year later, the first news article documenting the organizing effort appeared in the Atlanta Journal-Constitution. 39 Support from Mayor Shirley Franklin followed in 2004, and she charged Greg Giornelli, president of the Atlanta Development Authority, with carrying the planning process forward. 40

Up until then, a non-profit incorporated by Woolard and Gravel called Friends of the BeltLine was the project’s most formal standard-bearing organization. The organization focused on grassroots outreach to citizens but, in April of 2005, Mayor Franklin decided to create a more formal organization called the Atlanta BeltLine Partnership, installing semi-retired businessperson Ray Weeks at the helm to offer the project more professionalized leadership. 41 Both the Friends and the Partnership functioned in parallel until early 2007, when Weeks decided that it would be best if Woolard and Gravel’s group were absorbed into his more formal entity.

Around the same time, Ray Weeks spun off an organization called ABI or Atlanta BeltLine Incorporated, which would be the planning and construction arm of the BeltLine, leaving the Partnership to focus on grassroots outreach, affordability concerns, and programming. 42 ABI would function as a subsidiary of the Atlanta Development Authority, an organization analogous to New York’s Economic Development Corporation or Boston’s Planning and Development Agency. 43 In the following years, ABI’s functions involved to include “defining the Atlanta BeltLine plan; leading efforts to secure federal, state and local funding; spearheading all design and engineering;...”
constructing trails, parks, transit, streetscapes, affordable housing, and art; continuing the community engagement process; managing all vendors and suppliers; and serving as the overall project management office to execute the Atlanta BeltLine program."

TAX-INCREMENT FINANCING’S ROLE IN MAKING THE BELTLINE VISION WORK

Another organization that played a crucial early role in realizing the BeltLine vision was the Atlanta Department of Planning (ADP). In September of 2003, Alycen Whiddon of the ADP authored a landmark whitepaper describing how tax-increment financing or TIF (first used in Atlanta in 2001) could help finance the project. According to veteran economic development finance practitioner Karl Seidman, TIFs are structures under which

"incremental tax revenues generated in a designated area are set aside to fund specific projects or activities rather than paid to normal taxing jurisdictions...TIF often finances infrastructure improvements in a deteriorated or blighted area that are critical to attracting new investment, development, and business activity."

Whiddon estimated that new investments in 30% of the BeltLine’s 2,854 acres could lead to $2 billion in incremental taxes over a 25-year period. These revenues were thought to be sufficient to cover the cost of the BeltLine’s construction, but the idea needed further study. In 2004, the Atlanta Development Authority commissioned a study on the viability of establishing a tax-allocation district (synonymous with a TIF district) to fund the BeltLine’s construction. A consortium of consulting firms led by master planning firm EDAW (now doing business by the name of Design + Planning at AECOM) produced a report for the ADA. The report described in detail how a TAD scheme could work. EDAW’s report defined the boundaries of a TAD district, documented its existing conditions and land uses, and articulated a vision for its transformation.

The report was not merely a technocratic paper; it was a statement in support of equity planning values. Revenue raised through the TAD scheme would support not only the park’s creation but also subsidies for workforce housing and “quality development in underserved communities.” It proposed using TAD revenue to capitalize a Workforce Housing Fund that it speculated would be sufficient to ensure that 20 percent of the new residential units within the TAD district were affordable. Such a target required allocating 15% of the TAD proceeds towards this purpose. Given the prevalence of industrial use within TAD areas at the BeltLine project’s outset, this policy represented an aggressive commitment towards offering broad-based access to the BeltLine in the new residential communities that would rise alongside it.

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48 ** The term TAD is specified in Chapter 44 Title 36 of the Georgia Redevelopment Powers Law, which authorizes the use of tax-increment financing approaches and outlines the requirements for putting a TIF into place. This term will be used in lieu of the term TIF for the remainder of this thesis.
CONFRONTING DISPLACEMENT RISK

These goals arose in the middle of a public discourse about the BeltLine that gave voice to concerns about gentrification, especially in black communities. “While the BeltLine promises to bring hope and renewal to [African-American communities],” in the words of one critic, “the opposite is bound to happen. Developers will no doubt seize upon inexpensive and abundant land and build mixed-used developments with price tags that will far exceed the median income of these communities.”

Despite this concern, it would not necessarily be correct to suggest that the conversation about the BeltLine was the beginning of the conversation about gentrification in Atlanta. There is evidence that gentrification fears were developing throughout the city before awareness of the proposal’s viability became widespread. In the same speech in which she praised the BeltLine as “a great vision,” Mayor Franklin referred to anxieties about neighborhood change and acknowledged, “These changes have left many of [Atlanta’s] citizens feeling unsettled.” Through a promise to promote more affordable housing development, the BeltLine proposal, funded through the TAD scheme, attempted to ease established anxieties that could have posed an existential threat to its viability.

ARRESTED EQUITABLE DEVELOPMENT

The BeltLine’s ambition to promote inclusivity as part of its planning and development stalled amidst legal and macroeconomic barriers. One year after EDAW published its master plan for the BeltLine, a lawyer from the Buckhead neighborhood in Atlanta sued to challenge the school system’s authority to forego tax revenue that would be instead used for the BeltLine’s construction and equity initiatives. Officials were not able to resolve the issue until the fall of 2008 when Georgia amended its state constitution to allow for a diversion of taxes from school coffers to support TAD-supported initiatives.

By that time, the state of Georgia—like many other parts of the country—was seeing a precipitous increase in the number of home foreclosures. At the end of 2009, more than 1 in 8 Georgia mortgage holders were 30 days behind on their payments. Atlanta was particularly hard-hit. Fulton County experienced the most foreclosures in the state (24,621) by the end of 2009. This trend eventually abated, but its persistence made Atlanta an epicenter of the nation’s foreclosure crisis for years afterward. In the twelve months ending in May of 2014, metro Atlanta led the nation in completed foreclosures. It remained second highest in the nation during the following year.

56 Georgia Watch, “Georgia Foreclosure Crisis Part One: The Rippling Effects of Reckless Lending,” p.8, (Georgia Watch, 2010).
Figure 2: Parcels of Land in Atlanta within the BeltLine Tax- Allocation District
These trends in the housing market had a devastating impact on the BeltLine equitable development efforts and broader funding picture. According to a former BeltLine official, the foreclosure crisis depressed home values and created a significant shortfall between the expected TAD revenues and the actual income. This placed a major damper on the ability for BeltLine officials to meet the ambitious housing targets to which they had originally committed. In his 2016 letter resigning from the Atlanta BeltLine Partnership board, Ryan Gravel cited underwhelming investments in housing as a key driver in his decision to distance himself from the project.

EXCLUSION OF SINGLE FAMILY COMMUNITIES

Resources and legal issues were clear obstacles in realizing the BeltLine’s equitable development agenda, but early decisions made with respect to policy design now pose a different problem. The boundaries of the TAD explicitly excluded single-family neighborhoods in order “to protect the integrity of the City’s intown residential fabric.” The BeltLine’s equitable development plan, completed in 2009, expanded on the design implications of insulating single-family neighborhoods from the more intensive residential development intended for parcels abutting the BeltLine. Looking at Figure 2, the spatial dimensions of this strategic decision are immediately apparent. Parcels within the TAD are not distributed evenly around the boundaries of the BeltLine corridor; there are clear gaps in areas dominated by single-family residences.

The desire to inoculate single-family neighborhoods from densification brought one significant drawback: exclusion from measures meant to reduce exposure to economic displacement. New development in single-family neighborhoods would not be eligible for TAD-funded capital subsidies or TAD-funded down payment assistance for low-income homeowners. Georgia state law precludes usage of TAD funds outside the district in which the funds originated.

Because of place-based restrictions on the usage of funds intended for anti-displacement programs, there are few options for mitigating involuntary economic displacement pressures in single-family neighborhoods near to the BeltLine. This creates an interesting and exigent policy challenge in Atlanta, where city officials and non-profits have sought to raise money from philanthropists to capitalize funds to help low-income homeowners pay their escalating property tax obligations.

More study may illuminate the extent to which further efforts are needed in the Atlanta context and the measures that planners in other cities may or may not need to employ locally in order to minimize displacement risk. Several papers have studied the overall effect of the BeltLine’s announcement and construction on property values in Atlanta. No studies, however, have focused on the extent to which neighborhoods near the

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BeltLine but outside of the TAD boundaries have been subject to rapid property value appreciation and left to cope with rising tax bills without any assistance to account for the extent to which the infrastructure investment in the BeltLine has influenced the affordability of their neighborhoods.

This thesis will seek to fill this gap through examining the extent to which the BeltLine has impacted property values in neighborhoods where there are no special policy structures to protect affordability due to valorization from large-scale infrastructure development. With a better understanding of the BeltLine's pricing impacts, planners and policymakers will be better positioned to understand whether the BeltLine itself poses and unique affordability problem and how changes in policy design may address the possibility to develop projects like the BeltLine in the most equitable way possible.
Despite the many upsides of linear parks emerging as a popular category of adaptive infrastructure reuse and an exciting open space typology, their novelty has meant that available relevant literature is scarce. Origin stories and design overviews dominate the linear park popular literature including High Line: The Inside Story of New York City’s Park in the Sky, City on the Verge, and Where We Want to Live: Reclaiming Infrastructure for a New Generation of Cities. Literature on connections between equity and parks includes the relatively novel genre of equitable development plans offering park developers guidelines on an array of anti-displacement interventions such as training prospective homebuyers on subsidy programs and creating concession opportunities for local retailers.

There has been little study of the connections between large-scale linear park projects and resident displacement. To practitioners, the connections between parks and displacement have become increasingly apparent. Such connections, however, are not necessarily grounded in quantitative analysis of the relevant communities. Given the increasing role that parks have begun to play as lightning rods for worries about neighborhood change, it is increasingly likely that scholars will eventually direct more attention to teasing out the empirical veracity of claims that parks cause displacement. For now, it is best to rely on different existing papers that illuminate different aspects of these concerns.

Literatures on urban planning have pointed to the tensions inherent in planning for environmental sustainability and social equity at the same time. In a seminal article on the contradictions of sustainable development, Scott Campbell defined the “development conflict” in which planners experience difficulty negotiating how to increase social equity and protect the environment at the same time. The conversation about linear park adapted from legacy infrastructure turns Campbell’s development conflict on its head by forcing planners to consider instead how (or whether!) cities should make environmental improvements that threaten to reduce social equity. Park creation as an intervention fits under the umbrella of environmentalism, and the EJ literature includes voices that emphatically declare environmentalism has to be economically empowering. In the absence of such empowerment—particularly when affected communities are predominantly low-income—proposed park interventions can collide with local skepticism. Rather than being viewed as a positive, creation of new parks and rehabilitation of existing ones is then dubbed as “environmental gentrification” which “subordinates equity to profit-minded development.” Should such views become more dominant, increasing numbers of communities could choose to forego the positive benefits of open space

projects out of fear that such benefits might pale in comparison to the specter of displacement and speculative development.

Existing literature related to the possible connections between green space development and displacement is comprehensive in some areas, though concerning gaps exist in others. A recent study of the property value appreciation attributed to the 606 project in Chicago revealed a strong apparent relationship between the park and precipitous rises in property values, but the study neglected to control for a variety of factors that could have explained the rise in such prices. Another study of the “announcement effect” of the BeltLine in Atlanta used a hedonic pricing model to make the claim that proximity of that project suggested a strong relationship between large-scale linear park projects and property value appreciation.

The connections between large scale linear parks and property values is only part of a much broader literature on whether parks make homes more expensive. Many authors—dependent primarily on basic hedonic housing price models—have made an emphatic case that such connections do, in fact exist. Employing the different approach of measuring the incremental number of tourists parks attract, scholars have also been able to use regression-based approaches to affirm the relationship between green space and neighborhood desirability.

There are two limitations of basic regression approaches in examining the relationship between parks and displacement: the lack of longitudinal visibility into how green space availability affects housing values over time and the weakness of the regression approach for justifying causal relationships between building a project and resultant price hikes. Applying a difference-in-difference specification to linear regressions of housing and neighborhood data, however, may allow planners a new perspective on this phenomenon. Additionally the spatial considerations inherent in the study design can help address downstream questions about how broadly cities should apply anti-displacement strategies.

On the intervention side, urban planning researchers have proposed stricter regulation of real estate and tools such as community land trusts as ways to mitigate displacement pressures introduced by parks. Various other schemes have included establishing

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70 Geoff Smith et al., "Measuring the Impact of the 606" (Institute for Housing Studies at DePaul University, 2016).


74 Isabelle Anguelovski and Hamil Pearsall, “Contesting and Resisting Environmental Gentrification: Responses to New Paradoxes and Challenges for Urban Environmental Justice,” Sociological Research
anti-displacement funds through foundation donations, establishing comprehensive equitable development plans, legislation to curtail real estate development, and strategic property acquisition.\(^7^5\)

By using an analytical approach not often employed by researchers on the economic impacts of open space, this thesis aims to demonstrate some new paths that future studies may take in exposing the severity of Campbell’s development conflict while proposing solutions that might be appropriate for governments to take.

Online 12, no. 3 (August 21, 2016): 6.

DATA + METHODS

The principal investigative aim of this thesis is to understand how—if at all—the BeltLine has impacted property values. Of particular interest are properties that are close to the BeltLine, but outside of the TAD boundaries.

DIFFERENT HYPOTHESES ABOUT THE RELATIONSHIP BETWEEN PARKS AND PROPERTY VALUES

While several studies have found a positive relationship between proximity to open space and property value, others have highlighted negative consequences of proximity to heavily used active recreation spaces, along with other negative externalities. The hedonic effects of linear parks such as the BeltLine can be somewhat difficult to quantify as the exposure to benefits (programmed spaces, access points, concessionaries and other amenities) and drawbacks (noise, privacy) may vary by housing type and location along the right-of-way. In light of these factors, one should not assume a priori that open spaces have a positive impact.

BASELINE MODEL

Heterogeneity in property type, street configuration, and access to the BeltLine make isolating its influence on property values challenging. Finding a way to identify a single, meaningful treatment point is also a challenge, given that the project’s protracted development timeline has given property speculators a variety of signals that BeltLine-proximate land may soon become more valuable. One could therefore argue that its effects could have manifested at a variety of watershed moments (e.g. its endorsement by the mayor, the release of the TAD plan, groundbreaking, completion, etc.)

This thesis focuses on the opening of the BeltLine segments in both eastern and western Atlanta (the only segments currently in existence) as the treatment of focus for an analysis of property sales occurring between 2004 and early 2018. A regression model compares the prices of properties within 400 meters of the BeltLine with similar properties beyond this buffer after the opening of either the Eastside Trail or the Westside trail (whichever was closest to the relevant property). The chief reason for emphasizing ribbon-cutting events, as opposed to groundbreakings or construction announcements, is that amenities associated with the park such as food/drink concessionaires, art installations as well as other externalities such as positive branding impacts would not manifest as emphatically before the park opened. Scholars have observed similar effects with the introduction of new transit options of which linear parks are a variety.

One concern with the above approach and a principal reason for using a difference-in-difference analysis to control for neighborhood-level fixed effects is the possibility that the BeltLine may have increased demand for property near the park and concurrently depressed demand for property elsewhere in Atlanta, thus creating an upward bias.

76 See note 72
in the price premiums that one may find for properties near the BeltLine. Yet another concern is that properties sold during the study period may reflect some inherent selection bias (properties increasing/decreasing in apparent value). This analysis seeks to avoid these biases through controlling for both temporal and neighborhood-level fixed effects with a difference-in-difference methodology similar to that employed in Voicu and Been 2008.79 It also employs a second model to control for property-level fixed effects.

The model is structured as follows:

\[
\ln P_{icu} = \alpha + \beta_{\text{postOpening}} + \gamma_{\text{inBuffer}} + \rho_{\text{postOpening}*\text{inBuffer}} + \delta D_i + \chi T_i + \eta H_{it} + \mu X_c + \psi N_{ut} + \varepsilon
\]

where \(\ln P_{icu}\) is the log of the price of individual property \(i\) within census tract \(C\), in neighborhood planning unit \(U\) and in year \(t\). A Neighborhood Planning Unit or NPU is an administrative division of which there are 26 in the City of Atlanta. NPUs are the unit at which citizens typically convene to discuss planning decisions and are analogous to Community Districts in New York. \(\text{postOpening}\) is a dummy variable indicating whether a property was sold before or after the opening of the BeltLine segment (Eastside trail vs. Westside trail) to which it is the closest, \(\text{inBuffer}\) is a dummy variable indicating whether the parcel lies within 400 meters of an open BeltLine segment; an interaction term combines the two; \(D_i\) is a variable indicating distance in kilometers from the BeltLine for any given property; \(T_i\) is a dummy variable indicating property presence within the BeltLine TAD; \(H_{it}\) is a vector of property-level attributes (e.g. square footage, age of structure, single family vs. condo, etc); \(X_c\) is a series of census-tract fixed effects; and \(N_{ut}\) is a series of dummies that incorporate time trends for each of the 26 of Atlanta’s neighborhood planning units, measuring whether a sale took place in district \(U\) during year \(t\).

Several attributes of the model are worth highlighting. First, the interaction of the \(\text{postOpening}\) and \(\text{inBuffer}\) variables is the difference-in-difference measure of interest and an indicator as to the appreciation in value for properties close to the BeltLine after its opening. It should incorporate market preferences for many of the associated amenities that developed nearby (e.g. the opening of the popular Ponce City and Krog Street markets). Controlling for secular trends captured in the standalone \(\text{postOpening}\) variable should allow the interaction term to capture price effects for properties close to the BeltLine.

The \(D_i\) variable allows for analyzing properties within a buffer without employing the buffer in and of itself as a universal treatment. Space is important, and this analysis proceeds under the assumption that price effects should be different for a multifamily building with direct access to the park versus a similar building a quarter-mile away. \(W_i\) offers some visibility into how property value effects may differ—if at all—between TAD and non-TAD properties within the 400m buffer. Finally, including \(N_{ut}\) allows the model to account for property trends in 26 distinct sub-districts in Atlanta. This allows us to not only control for the effects of the property boom and bust within our study period, but also for how those effects manifested differently in different parts of the city. This should address concerns that secular trends related to the foreclosure crisis may have precipitated earlier and lingered later in neighborhoods with histories of concentrated

Figure 3 summarizes the study design and displays completed segments of the BeltLine, parcels within a 400M buffer, and comparison parcels in both eastern and western Atlanta against which BeltLine-proximate properties are being compared.

**DATA**

This analysis required data from a variety of sources. Property sales data were obtained from the Georgia Superior Court Clerks' Cooperative Authority, a clearinghouse for property transactions in Atlanta. The data, gathered using a web scraping script,
included price and date of sale, as well as address information. Much of the data were incomplete and diligent efforts were undertaken to clean records that appeared lacked sufficient detail, particularly with respect to address information. The data are maintained by the clerks for the purpose of assessing various transfer taxes, and each unique transaction is assigned an index number.

Building characteristics came from the Fulton County Tax Assessor’s office. Demographic information on the census tract level was pulled from 2016 ACS 5-year estimates compiled using Social Explorer.

Crucial to data compilation efforts were various geoprocessing tasks performed using GIS software. ArcMap generated data about proximity to the BeltLine, for all the parcels analyzed. GIS software was also used to define 400m buffers around both existing and planned segments of the BeltLine.

Sales data were adjusted based on year and month of sale (indexed to September of 2004) by using the Case-Schiller Atlanta Home Price index. Diligent efforts were undertaken to eliminate sales records that were apparent duplicates, sales that were obviously not arms-length, and foreclosure transactions.

Some summary statistics are in Table 1. The dataset reflects a lower proportion of condominiums within the buffer area and a higher proportion of loft apartments. Also notable is the concentration of BeltLine-proximate apartments in a select number of city council districts.

Table 2 compares some demographic characteristics of census tracts close to the BeltLine (>0 property sale within 400m) and those farther away.
### Table 1 - Selected Property Characteristics

<table>
<thead>
<tr>
<th>City Council District</th>
<th>Citywide</th>
<th>Within 400m of the BeltLine</th>
</tr>
</thead>
<tbody>
<tr>
<td>District 1</td>
<td>12.30%</td>
<td>0.00%</td>
</tr>
<tr>
<td>District 2</td>
<td>10.80%</td>
<td>13.70%</td>
</tr>
<tr>
<td>District 3</td>
<td>6.70%</td>
<td>5.80%</td>
</tr>
<tr>
<td>District 4</td>
<td>9.90%</td>
<td>40.50%</td>
</tr>
<tr>
<td>District 5</td>
<td>2.80%</td>
<td>20.30%</td>
</tr>
<tr>
<td>District 6</td>
<td>6.10%</td>
<td>7.10%</td>
</tr>
<tr>
<td>District 7</td>
<td>9.70%</td>
<td>0.00%</td>
</tr>
<tr>
<td>District 8</td>
<td>8.20%</td>
<td>0.00%</td>
</tr>
<tr>
<td>District 9</td>
<td>9.50%</td>
<td>0.00%</td>
</tr>
<tr>
<td>District 10</td>
<td>7.20%</td>
<td>2.70%</td>
</tr>
<tr>
<td>District 11</td>
<td>6.00%</td>
<td>0.00%</td>
</tr>
<tr>
<td>District 12</td>
<td>10.80%</td>
<td>10.00%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Structure Type</th>
<th>Citywide</th>
<th>Within 400m of the BeltLine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential 1 family</td>
<td>73.40%</td>
<td>76.10%</td>
</tr>
<tr>
<td>Residential 2 family</td>
<td>3.80%</td>
<td>9.50%</td>
</tr>
<tr>
<td>Residential 3 family</td>
<td>0.30%</td>
<td>1.00%</td>
</tr>
<tr>
<td>Single Family Residential Condo</td>
<td>17.00%</td>
<td>4.50%</td>
</tr>
<tr>
<td>Single Family Residential Townhouse</td>
<td>4.00%</td>
<td>4.00%</td>
</tr>
<tr>
<td>Single Family Residential Loft</td>
<td>0.90%</td>
<td>4.50%</td>
</tr>
<tr>
<td>Other</td>
<td>0.70%</td>
<td>0.50%</td>
</tr>
</tbody>
</table>

| N                     | 58,402   | 3,884                       |

### Table 2 - Comparison of Census Tracts based on BeltLine Proximity

<table>
<thead>
<tr>
<th>At Least One Transaction Within 400m of BeltLine</th>
<th>No Transactions in BeltLine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage Black</td>
<td>60.60%</td>
</tr>
<tr>
<td>Percentage Hispanic</td>
<td>2.69%</td>
</tr>
<tr>
<td>Percentage Foreign Born</td>
<td>5.97%</td>
</tr>
<tr>
<td>Mean Family Income</td>
<td>65,201</td>
</tr>
<tr>
<td>Poverty Rate</td>
<td>19.85%</td>
</tr>
<tr>
<td>Unemployment Rate</td>
<td>11.74%</td>
</tr>
<tr>
<td>Homeownership Rate</td>
<td>40.00%</td>
</tr>
<tr>
<td>Vacancy Rate</td>
<td>31.11%</td>
</tr>
<tr>
<td>Percentage of Kids under 5</td>
<td>5.97%</td>
</tr>
<tr>
<td>Percentage of Kids 5-17</td>
<td>12.37%</td>
</tr>
<tr>
<td>Percentage of Adults 18-65</td>
<td>71.90%</td>
</tr>
<tr>
<td>Percentage of Adults 65+</td>
<td>9.76%</td>
</tr>
</tbody>
</table>

| N*                                               | 20                          | 68                          |

*Note: Several of the census tracts included in the study returned null data for the 2016 ACS 5-year estimates*
RESULTS

Table 3 shows the key variables and coefficients for the baseline model from the previous section.

<table>
<thead>
<tr>
<th></th>
<th>Estimate</th>
<th>Standard Error</th>
<th>t value</th>
</tr>
</thead>
<tbody>
<tr>
<td>postOpening</td>
<td>1.18E-01</td>
<td>1.70E-02</td>
<td>6.934</td>
</tr>
<tr>
<td>inBuffer</td>
<td>2.44E-02</td>
<td>1.57E-02</td>
<td>1.582</td>
</tr>
<tr>
<td>postOpening * inBuffer</td>
<td>7.47E-02</td>
<td>3.11E-02</td>
<td>2.404</td>
</tr>
<tr>
<td>D (distance)</td>
<td>3.72E-02</td>
<td>4.58E-03</td>
<td>-8.114</td>
</tr>
<tr>
<td>T (in BeltLine TAD)</td>
<td>7.84E-03</td>
<td>1.45E-02</td>
<td>0.543</td>
</tr>
</tbody>
</table>

| Housing Attributes    |                      |                 |         |
| Age of Home           | -2.21E-03            | 1.14E-04        | -19.337 |
| Two Stories or More   | 7.49E-02             | 8.62E-03        | 8.498   |
| Dwelling Size (sft)   | 1.54E-04             | 4.52E-06        | 33.997  |
| Total Bedrooms        | 3.29E-02             | 3.88E-03        | 8.665   |
| Total Bathrooms       | 1.13E-01             | 4.73E-03        | 23.883  |
| Unit Type - One Family| 1.97E-01             | 1.28E-02        | 15.441  |
| Unit Type - Vacant    | -4.73E-01            | 6.08E-02        | -7.774  |
| Unit Type - Condo     | -4.65E-01            | 1.88E-02        | -24.767 |
| Unit Type - Loft      | -3.42E-01            | 3.37E-02        | -10.144 |
| Unit Type - Townhouse | 2.46E-02             | 2.07E-02        | 1.19    |

Absorbed Fixed Effects

<table>
<thead>
<tr>
<th>No. Coefficients</th>
<th>Categories</th>
<th>Redundant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year of Sale for Each Neighborhood Planning Unit</td>
<td>373</td>
<td>373</td>
</tr>
<tr>
<td>Census Tracts</td>
<td>109</td>
<td>110</td>
</tr>
</tbody>
</table>

N 57917
Adjusted R² 0.7595

Note: *** denotes 0.1% significance; ** denotes 1% significance; * denotes 5% significance; denotes 10% significance

The coefficient for the key interaction variable between presence within the 400m buffer and sale after the BeltLine opening is positive and significant. This may reflect the preference of in-moving homebuyers for a residence close to a park and the effects of new commercial space and retail/recreational amenities developing near the park, largely in keeping with the original basis for creating the TAD in the first place. The results indicate that properties sold within 400m of the BeltLine sold for 7.5% more than properties outside the buffer but within the same census tract after the BeltLine opened. This result comes when controlling for the also significant pre/post effects of the BeltLine citywide—a somewhat stronger effect—reflecting that properties within the 400m buffer exhibited behavior that deviated even from a citywide secular trend. Additionally, the lack of a significant result for the non-interacted 400m buffer variable does not allow us to reject a null hypothesis that properties within the buffer are the same as properties outside of the buffer when controlling for building characteristics, census tract fixed effects, and neighborhood-level property price trends.

The distance variable indicates a strong preference for BeltLine-proximate property
and suggests that a price gradient exists even within the 400m buffer. The TAD variable, however, does not show up as significant in this model. This does not allow rejection of a null hypothesis that properties within the TAD are any different from a price perspective—whether that be higher or lower. In other words, the suggestion here is that the same home price pressures present within the TAD district (where more intention for intensive retail, commercial, and residential development uses exists) could be expected outside of it, even when we control for dwelling type.

As for the housing attribute variables, they are largely in line with expectations and indicate effective controls alongside the census tract fixed effects and NPU-level price trend dummies.

Table 4 - Regression Results // Generalized Diff-in-Diff

|                          | Estimate | Standard Error | t value | Pr(>|t|) |
|--------------------------|----------|----------------|---------|----------|
| postOpening * inBuffer   | 1.49E-01 | 4.16E-02       | 3.58    | <2e-4    |

Absorbed Fixed Effects

<table>
<thead>
<tr>
<th>No. Coefficients</th>
<th>Categories</th>
<th>Redundant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year of Sale</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>Census Tracts</td>
<td>13836</td>
<td>13837</td>
</tr>
</tbody>
</table>

N 34955
Adjusted R² 0.869

Note: *** denotes 0.1% significance; ** denotes 1% significance; * denotes 5% significance; . denotes 10% significance.

Table 4 above shows the results of a generalized diff-in-diff model that controls for fixed effects on the parcel level rather than on the neighborhood level and omits many of the structural building controls, as they do not vary within properties. This model shows a stronger effect attributed to the treatment than was observed in the baseline model at least suggesting that bringing the fixed effects controls to the parcel level does not reveal some upward bias in the baseline model that disappears when a generalized diff-in-diff methodology is applied.

80 In previous iterations of the model, properties for which the TAD dummy variable recorded positive values suffered a statistically significant price penalty, suggesting that homes within the 400m buffer but outside the TAD may have seen declines that are more substantial with respect to affordability. However, the directionality and significance of this trend reversed and declined, respectively when census tract fixed effects were added to the model.
EXPLORING THE EQUITY IMPLICATIONS

With emphatic evidence suggesting a strong upward BeltLine influence on property values, this section turns to the question of the equity implications of these price trends. Of particular concern is how the BeltLine has affected lower-income communities, especially if we assume that price rises would be less manageable for lower-income households and particularly burdensome for renters and seniors living on fixed incomes. To explore this possibility, the city is divided into four household income quartiles, shown in Table 5.

Table 5 - NPUs Listed by Median Income Quartile (2006-2010 ACS Estimates)*

<table>
<thead>
<tr>
<th>Median Income ($)</th>
<th>Top Quartile</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NPU A 149,648</td>
</tr>
<tr>
<td></td>
<td>NPU B 94,982</td>
</tr>
<tr>
<td></td>
<td>NPU F 89,898</td>
</tr>
<tr>
<td></td>
<td>NPU D 76,426</td>
</tr>
<tr>
<td></td>
<td>NPU N 75,16</td>
</tr>
<tr>
<td></td>
<td>NPU E 64,081</td>
</tr>
<tr>
<td>Upper-Middle Quartile</td>
<td>NPU Q 61,386</td>
</tr>
<tr>
<td></td>
<td>NPU W 57,043</td>
</tr>
<tr>
<td></td>
<td>NPU P 51,484</td>
</tr>
<tr>
<td></td>
<td>NPU I 35,693</td>
</tr>
<tr>
<td></td>
<td>NPU M 35,086</td>
</tr>
<tr>
<td></td>
<td>NPU C 33,972</td>
</tr>
<tr>
<td>Lower-Middle Quartile</td>
<td>NPU R 32,849</td>
</tr>
<tr>
<td></td>
<td>NPU S 28,706</td>
</tr>
<tr>
<td></td>
<td>NPU H 28,188</td>
</tr>
<tr>
<td></td>
<td>NPU Z 26,354</td>
</tr>
<tr>
<td></td>
<td>NPU X 25,771</td>
</tr>
<tr>
<td></td>
<td>NPU G 23,148</td>
</tr>
<tr>
<td>Bottom Quartile</td>
<td>NPU J 22,754</td>
</tr>
<tr>
<td></td>
<td>NPU T 22,295</td>
</tr>
<tr>
<td></td>
<td>NPU Y 20,940</td>
</tr>
<tr>
<td></td>
<td>NPU V 20,858</td>
</tr>
<tr>
<td></td>
<td>NPU L 20,785</td>
</tr>
<tr>
<td></td>
<td>NPU K N/A</td>
</tr>
</tbody>
</table>

*Includes only NPUs for which 2004-2018 dataset had sales
The division of the city into these quartiles offers some visibility into the income inequality that exists within the city of Atlanta, with the populations of the highest-income NPUs enjoying incomes 7x higher than the lowest-income NPUs.

The BeltLine’s completed sections intersect with ten NPUs in the city shown below in this map.

Most of the Eastside trail’s nearby parcels lay within NPUs in the City’s highest income quartile, with the remaining ones lying within the upper-middle quartile. For the Westside trail, a majority of parcels near to the BeltLine are in the city’s bottom income quartile NPUs, with a few lying in lower-middle quartile NPUs. The map indicates the extent of the city’s economic segregation and the different contexts that surround the completion of both existing BeltLine segments.

The following table summarizes the number of sales within 400m of existing BeltLine segments that took place after its implementation, aggregated by income tier. As is readily apparent, a majority of the transactions occurred in the highest income tier, reflecting the relatively longer period that the Eastside trail has been open and the relative affluence of its adjacent neighborhoods.
Table 6 - Number of Observed Post-BeltLine Sales within 400m by Income Quartile

<table>
<thead>
<tr>
<th>Sales</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Top Quartile</td>
<td>718</td>
</tr>
<tr>
<td>Upper-Middle Quartile</td>
<td>97</td>
</tr>
<tr>
<td>Lower-Middle Quartile</td>
<td>16</td>
</tr>
<tr>
<td>Bottom Quartile</td>
<td>67</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>898</strong></td>
</tr>
</tbody>
</table>

Taking the baseline model for the difference-in-difference test, and swapping the `postOpening` and `inBuffer` interaction term for four additional interaction terms that interact NPU income quartile with both the `postOpening` and `inBuffer` variables, the following results are observed:

Table 7 - Selected Regression Results // Income Quartile Regression

| Estimate | Standard Error | t value | Pr(>|t|) |
|----------|----------------|---------|----------|
| `postOpening` | 1.18E-01       | 2.66E-01 | 44.442   | < 2e-16 *** |
| `inBuffer`       | 2.77E-02       | 1.57E-02 | 1.767    | 0.077267 .  |
| `postOpening * inBuffer` | 1.75E-02   | 3.41E-02 | 0.418    | 0.629056 .  |
| `postOpening * inBuffer` | 2.49E-01   | 7.45E-02 | 0.368    | 0.000311 *** |
| `postOpening * inBuffer` | -1.25E-01  | 1.57E-01 | -0.799   | 0.424074 .  |
| `postOpening * inBuffer` | 2.27E-01   | 8.40E-02 | 2.697    | 0.006988 ** |
| `postOpening` * `inBuffer` | 2.73E-02   | 4.58E-03 | -8.13    | 0.399e-16 *** |
| `postOpening` * `inBuffer` | 8.89E-03   | 1.45E-02 | 0.615    | 0.538316 .  |

**Housing Attributes**

- Age of Home: -2.21E-03, 1.14E-04, -19.319, < 2e-16 ***
- Two Stories or More: 7.57E-02, 8.62E-03, 8.647, < 2e-16 ***
- Dwelling Size (sq ft): 1.54E-04, 4.52E-06, 34.006, < 2e-16 ***
- Total Bedrooms: 3.28E-02, 3.88E-03, 8.465, < 2e-16 ***
- Total Bathrooms: 1.28E-01, 4.72E-03, 23.874, < 2e-16 ***
- Unit Type - One Family: 1.98E-01, 1.28E-02, 15.45, < 2e-16 ***
- Unit Type - Condo: -4.65E-01, 1.88E-02, -24.735, < 2e-16 ***
- Unit Type - Loft: -3.37E-01, 3.37E-02, -9.983, < 2e-16 ***
- Unit Type - Townhouse: 2.49E-02, 2.07E-02, 1.206, 0.227887

**Absorbed Fixed Effects**

<table>
<thead>
<tr>
<th>No. Coefficients</th>
<th>Categories</th>
<th>Redundant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year of Sale for Each Neighborhood Planning</td>
<td>373</td>
<td>373</td>
</tr>
<tr>
<td>Census Tracts</td>
<td>109</td>
<td>110</td>
</tr>
</tbody>
</table>

N: 57914
Adjusted R²: 0.7595

Note: *** denotes 0.1% significance; ** denotes 1% significance; * denotes 5% significance; denotes 10% significance

In this analysis, the null hypothesis would be that all properties sold after the BeltLine's
completion and within 400m of open BeltLine segments would have no difference in price when compared to BeltLine parcels elsewhere in the city regardless of time of sale. What the results in Table 7 show are emphatic and statistically significant coefficients for the interaction terms representing post-implementation and BeltLine-proximate properties in neighborhoods at the bottom and upper-middle quartile. This means that we can reject the null hypothesis for parcels within those two quartiles. It also suggests that we could have expected property within 400m of the BeltLine to grow in price at 26% and 22% in the upper-middle and lower income quartile neighborhoods respectively. The results in the top quartile were not significant (perhaps owing to the concentration of most data within this quartile) nor were the results in the lower-middle quartile (the one for which there were the fewest observations).

While the coefficients are substantially higher than they were for the key diff-in-diff variable in Table 3’s baseline model results, four factors should temper the conclusion that less affluent neighborhoods bear more of a price hike burden than BeltLine-proximate areas do on average (as represented by the diff-in-diff coefficient in the baseline mode). First, Table 6 shows that a preponderance of the data is in the top income quartile, with relatively few observations in the lower brackets. Second, the BeltLine has been open for less time in lower-income areas, creating some uncertainty as to whether any initial price premiums may persist over time. Third, there may be heterogeneity within the income composition of communities within NPUs that this analysis is leaving unaccounted for but that a more granular classification of geographic areas (e.g. census tracts) may be able to capture. Finally, it may be hypothetically possible that home prices in richer areas may have risen in advance of the BeltLine development (in response to pre-development speculative signals) in a way that prices in poor neighborhoods did not.

Insofar as one can consider both the results from the upper-middle and bottom tiers to be robust and a helpful companion to those from the baseline model, these results suggest that price appreciation due to the BeltLine’s opening may be higher on average on a percentage basis in poorer communities than it is in wealthier ones.

<table>
<thead>
<tr>
<th>Table 8 - Illustrative Example: Price Appreciation Effects for Typical Atlanta Home (price: $262,000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Implied BeltLine Effect on Property Value</td>
</tr>
<tr>
<td>Citywide</td>
</tr>
<tr>
<td>Top Quartile*</td>
</tr>
<tr>
<td>Upper-Middle Quartile</td>
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<tr>
<td>Lower-Middle Quartile*</td>
</tr>
<tr>
<td>Bottom Quartile</td>
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</tbody>
</table>

*Based on results that are not statistically significant
**Calculated based on property tax formula with rates from ’17 and ’18. Adjusted back to 2010 dollars for consistency purposes

In the example above the incremental property tax effects from the BeltLine’s opening on an average nearby home would be 3.5x times higher as a percentage of median household income in Atlanta’s poorest neighborhoods than it would be in the city.
overall. While one could suggest that the above example exaggerates the effects on the poor somewhat (their homes would likely be below the citywide price median), but it demonstrates that whereas the effect of higher prices attributable to the BeltLine may be infinitesimal to higher-income individuals, the impact on the poor is far from insignificant. Furthermore, this analysis inherently involves averaging. Individual situations could produce much more burdensome conditions than the overall picture reveals.
CONCLUSIONS + POLICY IMPLICATIONS

From the analysis in the previous section, it is clear that the BeltLine's opening has had a measurable impact on home prices in Atlanta. It is also clear that this effect is very unlikely attributed to a secular trend making housing more desirable citywide and that resultant incremental property tax burdens from the BeltLine's implementation fall most heavily on low-income communities. Within nearby properties, this property value appreciation effect is as apparent in the TAD district prioritized for intensive development as it is in the single-family neighborhoods that original BeltLine plans sought to preserve. Therefore, efforts "to protect the integrity of the City's intown residential fabric" and insulate single-family neighborhoods from changes in urban form have not isolated those same neighborhoods from price pressures.

The results point to another aspect of the BeltLine’s price appreciation that has potential implications for planning of parks and other pieces of largescale infrastructure: the opportunity for interventions that mitigate economic displacement pressures diminishes substantially after groundbreaking. This analysis does not capture whether announcement effects or various other signals that the BeltLine progressed closer to realization between the years 2004 and 2012 (although another analysis has). It is altogether believable that different strategies to maintain access to low cost homes in Atlanta (e.g. subsidized housing construction and community land trusts) could have diminished in efficacy long before the point of the BeltLine's groundbreaking. However, this analysis demonstrates a clear point at which planners can expect prices to spike. More concerning, the analysis reveals that the consequences of these price increases may fall disproportionately on the poor.

Rather than being a negative, city governments and other stakeholders can view these findings as evidence that a window of opportunity for planning and deploying affordability interventions exists up until the moment when a new park opens. While waiting until afterward does not preclude additional intervention, the lesson the BeltLine case holds for cities is that such waiting can make an uphill climb to promote equity and infrastructure development increasingly steep over time.

CURRENT POLICY CONVERSATIONS ABOUT AFFORDABILITY IN ATLANTA

In his 2016 State of the City address, Kasim Reed, who had succeeded Shirley Jackson as Mayor of Atlanta, announced his commitment to an inclusionary zoning overlay district with the BeltLine. The legislation was an acknowledgement that equity and affordability concerns had become concerns for the project even though the Westside segment had not yet opened. Its text, it also recognized that affordability concerns have extended beyond the boundaries of the of the tax-allocation district. The legislation also allows developers to make payments to an affordable housing trust fund

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83 City of Atlanta, “AN ORDINANCE TO AMEND THE 1982 ATLANTA ZONING ORDINANCE, AS AMENDED, CITY OF ATLANTA CODE OF ORDINANCES PART 16, SO AS TO ADD A NEW CHAPTER 36A ENTITLED ‘AFFORDABLE WORKFORCE HOUSING (BELTLINE OVERLAY DISTRICT)’” (2017).
in lieu of meeting the inclusionary requirements for new construction within the district.\textsuperscript{84}

As shown in Figure 5, the District includes property roughly a $\frac{1}{2}$ mile in each direction from the BeltLine. In a marked contrast to the borders of the TAD (also shown for contrast), the overlay district includes single-family communities and lacks the TAD’s asymmetry.

The inclusionary zoning initiative became law on November 29, 2017 and represents a progressive turn for Atlanta’s approach to below-market housing provision. It is not, however, a panacea.

\textsuperscript{84} Current requirements are either including 15% of apartments for residents at 80% of AMI or 10% of apartments for residents at 60% of AMI.
Another important current political discussion is the rate of several proposed reforms to Fulton County's property tax system. The system has three key components: the assessed value, which is calculated as 40% of fair market value; property tax rates, which are changed from year to year; and a universal “homestead” exemption that offers homeowners the ability to deduct $30,000 from their assessed value before tax rates are applied.85

In response to an uproar last summer over double-digit property tax assessment hikes across the city of Atlanta, the county froze property tax assessments for a year, while the state legislature explored several potential fixes to the system.86 The proposals include increasing the homestead exemption by $20,000 and then at a constant rate of 2.6% over the next few years, increasing the homestead exemption further for seniors, and allowing property taxes to be based on the whichever annual assessed value was lowest over a trailing three-year period.87 The measures have yet to take effect, and voters will have a chance to approve them via referendum later this year.

Both reforms around inclusionary zoning and property tax assessments respond to concerns highlighted in the previous section’s analysis. As the previous section showed, incremental property taxes for the average Atlanta home would take up 6.5 times as much of median household income in Atlanta’s poorest neighborhoods than it does citywide. This means that property tax relief measures would have a particularly strong benefit for households close to the BeltLine and vulnerable to economic displacement.

It remains to be seen how effective both inclusionary zoning and tax reform policies will be. Given the recent passage of inclusionary requirements, few buildings have been permitted with them in place. For tax reform, some uncertainty exists, as voters would have to approve the measures via ballot initiative in November of 2018.

OTHER PATHS FORWARD

There is no established playbook on how to incorporate equitable development planning principles into large-scale park development projects, but two forward-thinking models may prove instructive. One shows how planners can recognize and incorporate equitable development concerns into the planning process. The other shows how policymakers can integrate open space improvements into larger equity planning negotiations.

In the high-profile development of the 11th Street Bridge Project in Washington, D.C. the proposal to create a park using obsolete infrastructure (leftover bridge piers on the Anacostia River) came from a public design competition initiated by then planning director Harriet Tregoning. During the competition process, members of the public began to express concerns about displacement that the park could potentially exacerbate. That led to the convening of an Equitable Development Task force including the DC Office of Planning, the Local Initiatives Support Corporation, the Urban Institute, and the DC Fiscal Policy Institute among others.88

The group conceived an initial set of recommendations that could promote equitable development alongside the park's broader implementation. These proposals included anti-displacement training for business and property owners, first-time homebuyer

85 Arielle Kass, "FULTON COUNTY; Exemptions to Ease Property Taxes Due April 2," The Atlanta Journal-Constitution, March 28, 2018, sec. METRO.
86 ibid
88 Adam Kent, Conversation with Adam Kent, April 3, 2017.
training for households looking to buy, concessionaire opportunities for local businesses, and an effort to make people aware of their rights under existing DC policies such as the Tenant Opportunity to Purchase Act. After compiling initial recommendations, the group solicited input from the community, ultimately incorporating both technical and local knowledge into a framework that has guided the park’s development to date. Their approach has become a nationally recognized model as other groups have grappled with how to balance neighborhood improvements with protections against displacement.

Another approach—this time from New York—comes from the negotiation process that surrounded the rezoning of East New York. During a neighborhood-wide discussion on how to upzone the neighborhood for more residential development and implement new inclusionary zoning requirements, a local elected official and coalition of community organizations managed to secure about $32 million in park improvements. This investment would move forward only after the implementation of an inclusionary zoning framework that secured at least some level of low and middle-income accessibility as development moves forward in the coming decades.

The amount of funding for community benefits and the East New York rezoning process at large has not been without criticism. Although—like the 11th Street Bridge project—the East New York rezoning represents a prospective approach that hardcodes affordability intervention before park improvements occur, it will take years for the new inclusionary requirements produce a significant amount of subsidized housing stock. In the meantime, the neighborhood may fall victim to the type of displacement pressures that are making areas close to the BeltLine more inaccessible.

STATE AND FEDERAL LEVEL INTERVENTIONS

Projects like the BeltLine depend on various sources of funding to pay for land acquisition, construction, and programming. One of the largest sources of construction funds has been an array of federal formula programs including (but not limited to) the Transportation Investment Generating Economic Recovery (TIGER) and the Congestion Mitigation and Air Quality (CMAQ) program. As these are formula programs—as opposed to budget appropriations or grant programs—the federal government allocates states money based on criteria such as population, and states are then free to deploy the funding to projects based upon their own priorities.

The BeltLine received $18 million in funding from both the TIGER and CMAQ programs, as administered by the state of Georgia. Other linear park projects such as the 606 in Chicago have also received significant amounts of funding from formula programs.

Without these sources of federal funding, it would be challenging for expensive, large-scale linear park proposals to get done, offering state governments and metropolitan planning organizations tremendous leverage to set policy parameters within which individual project proposals must comply.

In light of the findings from the Atlanta case in previous sections, state governments could set guidelines or requirements that cities seeking funding for projects such as the BeltLine must meet certain requirements with respect to policies or programs meant to mitigate the potential economic displacement pressures that certain projects could create or exacerbate. This would ensure that communities position themselves well to promote equitable access to these spaces before signals such as ribbon-cuttings, groundbreakings, or even securing necessary funding cause property prices to escalate. Depending on the level of guideline prescriptiveness, states could give local governments a fair amount of leeway to come up with equitable development proposals that are responsive to local contexts and interests.

Conversations with regulators on the federal level have revealed that the Department of Transportation in DC adopts a relatively laissez-faire posture towards the deployment of formula grant funding. The agency takes a relatively active role in ensuring that states and metropolitan planning organizations do a good job of following community engagement processes. Additionally, federal DOT has published white papers encouraging lower levels of government to promote equity in both process and outcome with respect to implementing transportation projects.

That said, the federal government’s current guidance usually takes a retrospective view on equity considerations. It is common to see exhortations for states to make sure those federal funds are used to make sure low-income communities have as much access to bike commuting opportunities as high incomes ones do. It is not yet common to see guidance that encourages states to anticipate (and plan for) ways in which completion of federally funded transportation projects may actually shift the affordability and accessibility of neighborhoods altogether. As more evidence about the relationship between linear park projects, federal funding, and affordability concerns arises, the federal government can hopefully expand its cognizance of equity to incorporate more prospective considerations.

**OPPORTUNITIES FOR FURTHER STUDY**

While this thesis incorporates data and research design that have not (to the author’s knowledge) been used to study the effects of a major linear park project in the US, there are certainly ways this study could expand and opportunities for further research with respect to the relationship between linear parks and equity. A first opportunity would be to use credit bureau data to study whether out-migration in BeltLine proximate communities has in fact been higher after implementation—perhaps offering a close proxy measure for whether displacement is in fact occurring. Survey data and interviews may also provide some visibility into the individual consequences of economic pressures and how diverse racial and ethnic groups experience these pressures differently.

As far as refining the study design in this thesis is concerned, there are several steps that future research could take. Given the relatively abridged timeframe of available data after the opening of the Westside trail, it might be worthwhile to repeat a diff-in-diff

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95 Daniel Goodman and Christopher Douwes, Conversation with Federal DOT Staff, 3/12/18

study after several years to confirm this thesis’ findings. Alternatively, one could employ
an event study or more of a time series approach to capture the magnitude and
directionality of the Beltline’s effects over a longer time horizon. Additionally, one could
attempt to control for neighborhood price trends or census tract fixed effects at a more
granular level (e.g. in each quarter of sale as opposed to each year).

Additionally, one could repeat this approach for linear park projects in other cities
that have lower/higher percentages of homeownership to measure how different
contexts may affect whether and how the effects observed in Atlanta manifest similarly.
Expanding scope to the rental market, a future study could examine the movement
of median asking and effective rents (to the extent such data are available) in order
to ascertain how large-scale park projects like the BeltLine affect the rental housing
market.

Finally, one area not explored in this study but definitely worthwhile studying is the
interplay between the role that linear park projects have in remediating sites that may
pose environmental justice concerns, who those changes are for, and whether parks
that catalyze rapid change can still serve a bona fide environmental justice agenda.

CLOSING THOUGHTS

One of the earliest interviews conducted for this thesis was with a strong supporter of
linear parks, who acknowledged concerns about a connection between parks and
displacement. The supporter made a point of saying, however, that this issue paled in
comparison to larger concerns about the rising unaffordability of urban cores and the
suburbanization of poverty.

This is important perspective, and economic effects linear projects are but a small issue
in light of many other contributors to rising urban inequities. A lesson from the study of
the BeltLine, however, is that infrastructure has a tremendous ability to catalyze growth
in areas and likewise a tremendous capacity to foreground issues such as equity. The
question for the BeltLine and for similar projects moving forward is whether equity can
increase as a central consideration in open space development and whether this
increase will make beneficial projects “economically empowering” enough—borrowing
Laura Pulido’s words—to maintain the popular support necessary to carry them forward.
Absent this empowerment, the hope embodied in these projects may give way to the
fear that their benefits may accrue only to the wealthy and that poor communities
would be better off without them.
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