

**Transit-Induced Neighborhood Change:  
Evaluating Neighborhood Racial Change in Charlotte, North Carolina's Light Rail Corridor**

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## **Abstract**

U.S. cities have been building light rail infrastructure rapidly since 1990. Proponents of urban light rail infrastructure tout its mobility advantages over buses and its potential to attract investment. Critics of light rail worry about its displacement effects, claiming that light rail investments make areas more attractive for investment, causing property values to rise. This pattern could ultimately displace residents vulnerable to rent increases. This study contributes to the urban transportation and gentrification literature by focusing on change in racial composition along Charlotte, NC's light rail corridor. The results found a decrease in the Black population near the proposed rail line after the announcement of the light rail but an increase in the Hispanic/Latinx population. Possible explanations for this outcome, such as displacement by young white professionals and changing patterns of Hispanic/Latinx migration are discussed.

*JEL Classification:* J15, O18, P25, R40

**Keywords:** Light rail, Gentrification, Race, Displacement, North Carolina, Transportation, Public Transit.

## I. Background

Light rail ridership has been climbing in the United States since 1990.<sup>2</sup> Charlotte, North Carolina is among the cities that have adopted light rail transit over the past decade, with its Blue Line announced in 2000 and opened in 2007.<sup>3</sup> Since then, the line has achieved an average daily ridership more than double original estimates. Discussions for further additions to the line have been ongoing.<sup>4</sup>

Despite the popularity of light rail across American cities, reservations about its effects on surrounding neighborhoods remain at the forefront of discourse on transit development.<sup>5</sup> Residents worry about displacement of low-income and Black/Indigenous/People of Color (BIPOC) populations due to rising property values and the clustering of high-income serving businesses, as well as the cost effectiveness of light rail relative to that of bus services.

A theoretical discussion of light rail development supports the concerns of transit-adjacent residents. The Blue Line offers fast and cheap access to the Central Business District (Figure 1). The lowered cost of transport in areas adjacent to the light rail should attract residents who have a need to access the CBD. The lowered cost should also enable residents currently living in the CBD to move further away, since the transit option keeps the CBD accessible along its route.

Notably, two of Charlotte's largest employers, Wells Fargo and Bank of America Headquarters, lie close to light rail stations within the CBD.<sup>6</sup> These companies attract high income young professionals, who are more likely to prefer proximity to the CBD than the suburbs.<sup>7</sup>

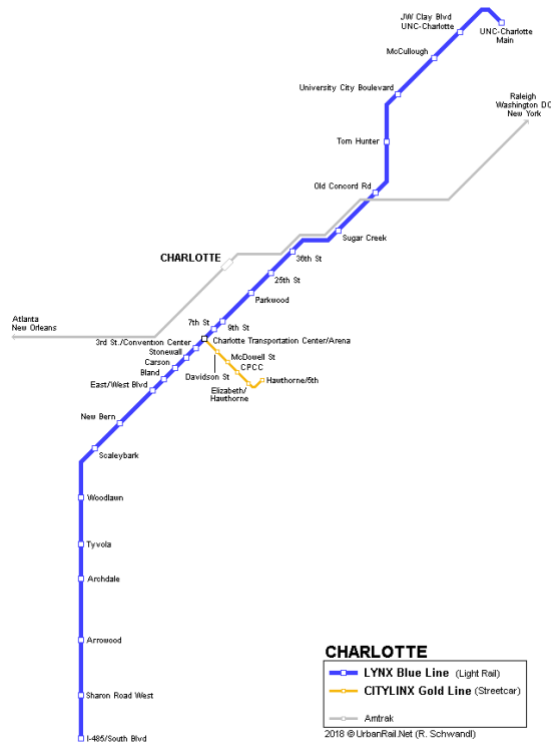


Figure 1. Map of Blue Line. (Source: Schwandl, 2018.)

<sup>2</sup> Dickens, 2018.

<sup>3</sup> Billings, 2011.

<sup>4</sup> Harrison, 2017.

<sup>5</sup> Turrentine, 2018; Brausell, 2018.

<sup>6</sup> Charlotte, City of, 2013.

<sup>7</sup> Nielsen, 2014.

Independent of commuting considerations, the new urbanist lifestyle of walkable, transit-accessible neighborhoods is appealing to young working professionals.<sup>8</sup> Thus, the light rail may induce these high-income professionals to locate close to areas easily accessible by light rail.

An influx of high-income individuals may then result in the displacement of low-income populations living close to the rail line, as demand for higher-end housing and amenities rises and as housing supply becomes restricted to high-income populations.

Charlotte's historical context makes race an important factor to analyze for the planning of public transit projects. The city is the second largest financial center in the United States and has experienced rapid economic growth over the past two decades. However, growth has been unevenly distributed. Black and Hispanic/Latinx residents across the city are vocal about worries of displacement as rents and home prices rise.<sup>9</sup> Once a model for school desegregation, Charlotte's schools are now North Carolina's most segregated.<sup>10</sup> A 2014 analysis by Chetty, et al. ranked Charlotte last in intergenerational mobility among fifty U.S. cities.<sup>11</sup> Understanding transit's role in demographic change is necessary if larger trends of displacement from gentrification are to be fully understood.

## **II. Literature Review**

Despite the theoretical backing of light rail's disruptive effects, empirical results are mixed. LeRoy and Sonstelie (1983) posit that poor individuals have a higher utility for public transportation. Public transit is cheap relative to car ownership, making it useful for those with limited incomes.<sup>12</sup> Glaeser, Kahn, and Rappaport (2008) concur, finding evidence that urban poverty is concentrated near transit stops in cities around the world.<sup>13</sup> Baker and Lee (2019) find that neighborhood change is heavily dependent on local contexts.<sup>14</sup> Portland saw counter-gentrification occur close to its light rail lines, which the authors attribute to the ability of low-income residents to cluster near Portland's transit corridors. San Francisco, on the other hand, saw intense gentrification around its light rail lines. There was a rise in income, a rise in the proportion of white residents, and a decrease in poverty in areas adjacent to light rail development.<sup>15</sup>

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<sup>8</sup> National Association of Realtors, 2015.

<sup>9</sup> Lacour, 2016.

<sup>10</sup> Henderson, 2018.

<sup>11</sup> Chetty et al., 2014, p. 72.

<sup>12</sup> LeRoy and Sonstelie, 1983.

<sup>13</sup> Glaeser, Kahn, and Rappaport, 2008, p. 20.

<sup>14</sup> Baker and Lee, 2019, p. 44.

<sup>15</sup> Baker and Lee, 2019, p. 44.

Kahn (2007) finds that Boston experienced gentrification around “Walk-n-Ride” light rail stations, but not near “Park-n-Ride” stations. They attribute this difference to the additional noise and traffic created by “Park-n-Ride” stations. It is noted that “Walk-n-Ride” stations offer the new urbanist lifestyle that young and high-income professionals desire, while “Park-n-Ride” stations do not.<sup>16</sup>

Beyond these studies, the literature tends to focus on changing property values or overall levels of poverty around light rail and other transit modes. However, changing property values and aggregate poverty levels do not reflect all aspects of neighborhood change. An understanding of the dynamics of neighborhoods in flux must consider race, a factor tied intrinsically to the development of U.S. residential neighborhoods and transportation corridors. An analysis of twelve U.S. metropolitan areas by the Dukakis Center for Urban and Regional Policy (2010) found that half of the areas around new rail transit stops experienced greater change in non-white Hispanic population than their overall Metropolitan Statistical Areas.<sup>17</sup>

The takeaway from the literature is that generalizations about neighborhood change across all urban areas are not possible. Individual metropolitan areas, and even neighborhoods within those areas, experience varying degrees of disruption from transit, based on local history, policy, and economic context.

A key challenge in all urban transportation literature is the endogenous nature of rail lines. The placement of rail infrastructure is determined by costs, ease of land acquisition, existing rail right-of-ways, resident demands, advocate demands, the calculus of political decision-makers, and a number of other considerations. Separating the decisions that drive the placement of light rail infrastructure from the effects of rail lines themselves is difficult.

This paper contributes to the transit literature by assessing the role of light rail investment on racial movement and displacement within the context of Charlotte, North Carolina’s light rail line. The analysis examines the change in Black and Hispanic/Latinx residents in neighborhoods adjacent to the light rail. A description of the model assumptions, hypotheses, data, methodology, and results are presented. The discussion includes assessments of the hypotheses, possible explanations for the trends observed, limitations and challenges, and avenues for further research.

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<sup>16</sup> Kahn, 2007, p. 181.

<sup>17</sup> Pollack, Bluestone, and Billingham, 2010, p. 23.

### III. Model Specifications and Hypotheses

This section details the assumptions underlying the model proposed in this analysis, as well as the logic behind the hypotheses derived from this model.

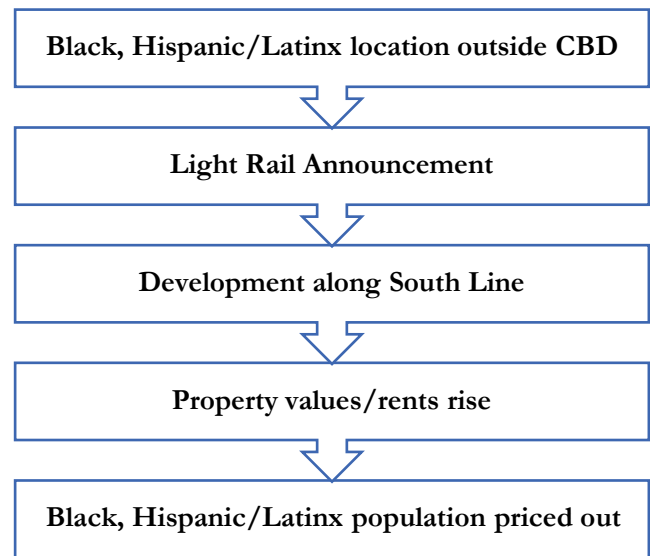
#### III.I Black Population Model

A low-income Black population has gradually moved into areas directly outside of Charlotte's CBD because of:

1. access to the CBD,
2. the availability of affordable housing,
3. access to transit, and
4. formal and informal housing discrimination in white neighborhoods of Charlotte.<sup>18</sup>

This model is consistent with the findings of Glaeser, et al. (2008), who posit that transit is a key factor in the concentration of low-income populations in urban areas.<sup>19</sup> The areas outside Charlotte's CBD have high proportions of housing units within 1/2 mile of a transit stop.<sup>20</sup> Before the opening of the light rail, this transit was exclusively bus service. Thus, the area is suitable for poor residents to access both affordable housing and transit.

In 2000, the Charlotte Blue Line was announced. The plans detailed a route running from the CBD through the southern alignment of Charlotte. After the announcement, plans for development began along the light rail route. One of the demand-side catalysts of this development was the appeal of the light rail as an amenity which fulfills young professionals' wishes to live a new urbanist lifestyle, characterized by walkability, accessibility to transit, and a distinctive "neighborhood character." Another demand-side factor of development was the reduction in the time needed to access the CBD, a key cost that individuals consider when deciding where to locate within an urban region. The supply-side catalysts include responses to the demand-side catalysts, such as the construction of high-income serving amenities and luxury housing.



*Figure 2: Incumbent Population Displacement Model*

<sup>18</sup> Herbert, 2019.

<sup>19</sup> Glaeser, Kahn, and Rappaport, 2008.

<sup>20</sup> Mecklenburg County, City of Charlotte, and University of North Carolina at Charlotte.

### III.II Hispanic/Latinx Population Model

The assumptions underlying the migration patterns of the Hispanic/Latinx population are the same as for the Black population, except for the reasons Hispanic/Latinx Charlotteans initially moved into areas outside the CBD. Hispanic/Latinx migrants still located in CBD-adjacent areas because of transit and affordable housing. However, historic housing discrimination is less of a factor for much of this population, given the recency of its rise to prominence in Charlotte. Existing social networks play a more important role in Hispanic/Latinx location, especially for new immigrants.<sup>21</sup>

This difference should not change the regression analysis in any meaningful way. The population should still react to shocks such as rising property values in the same manner as the Black population.

### III.IV Hypotheses

***H<sub>1</sub>*:** The areas adjacent to the light rail will experience a greater decline in Black population than Control areas.

***H<sub>2</sub>*:** The areas adjacent to the light rail will experience a greater decline in Hispanic/Latinx population than Control areas.

## IV. Methodology

A difference-in-differences analysis will be used, drawing largely on work by Billings (2011).<sup>22</sup> Their work analyzes changes in property values in areas adjacent to Charlotte's light rail, though a similar methodology is useful for demographic analysis.

### IV.I Data

The Charlotte-Mecklenburg Planning Department designates Neighborhood Profile Areas (NPAs) throughout the city, based on combinations of census block groups and community input.<sup>23</sup> NPAs form the basis of all data gathered for this analysis. In some instances, variables are not available at the NPA level. In these cases, estimates are made for the value of these variables based on census tract information, which often aligns with NPA boundaries.

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<sup>21</sup> Frey, 2001.

<sup>22</sup> Billings, 2011.

<sup>23</sup> "Charlotte Neighborhood Quality of Life Study 2010 and Business Corridor Benchmarking Analysis," 2010.

The Charlotte Quality of Life Dashboard contained information at the NPA level for the variables analyzed.<sup>24</sup> In cases where data for all variables were not available for the year 2000, the Brown Longitudinal Tract Database was used to estimate variable values for 2000, harmonized to 2010 census tract boundaries.<sup>25</sup> These harmonized values were then used to estimate the NPAs that overlapped them. This estimation also addressed changes that occurred in census tract boundaries over time.

NPAs with land area within one mile of the Blue Line were designated as “South Line” NPAs. NPAs within one mile of the proposed light rail lines were designated as “Control” NPAs.

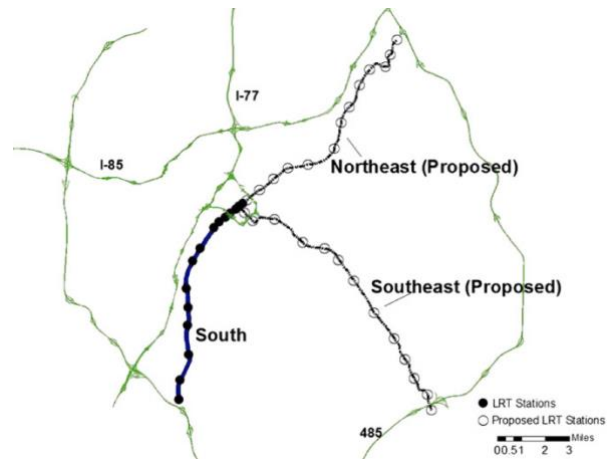


Figure 3: Actual and proposed routes for Blue Line. (Source: Billings, 2011.)

## IV.II Control Groups

The neighborhoods adjacent to the proposed Southeast and Northeast Lines are used as controls for the neighborhoods surrounding the existing light rail line, which runs south of the CBD (Figure 2).

Both the South and proposed lines run through primarily suburban residential areas, terminating at the CBD. All lines use existing rights-of-way and commuting corridors to inform their alignments.<sup>26</sup> Selected characteristics of both groups are presented in Table 1.

**Table 1: South Line and Control NPA Characteristics in 2000**

Variable Name	South Line		Control	
	Mean	<i>sd</i>	Mean	<i>sd</i>
Median Household Income	31,409	15,184	41,511	15,031
Percent w/ Bachelor's Degree	0.25	0.185	0.31	0.184
Percent Black Population	0.477	0.349	0.339	0.258
Percent Hispanic Population	0.141	0.166	0.104	0.146
Population Density	4.5	3.06	4.91	4.01
Total Population	1,999	1,633	2,029	1,132
N	16		34	

<sup>24</sup> Mecklenburg County, City of Charlotte, and University of North Carolina at Charlotte.

<sup>25</sup> Logan, Xu, and Stults, 2014.

<sup>26</sup> Billings, 2011, p. 528.



It must be noted that the South Line and Control group have important differences. The South Line contained a higher Black population than the Control area, as well as a population with a lower median household income and a slightly lower educational attainment. The South Line alignment was partially chosen due to these characteristics, with city officials hoping the light rail would stimulate development in the area.<sup>27</sup>

#### IV.III Regression

The treatment applied is the announcement of the light rail line (in 2000) rather than the actual opening of the transit line. Assuming the actors who are hypothesized to drive racial change, developers and incoming young professionals, are rational, we would expect them to begin acting on information of the light rail's arrival directly following the announcement.

Figures 3 and 4 show the average percent Black or Hispanic/Latinx population in the South Line, Control area, and overall county. The average percent Black population peaked in 2000 for the South Line and Control NPAs. The South Line's Black population fell faster than the Control's, while the county's overall Black population continued to rise.

The average percent Hispanic/Latinx population continued to rise in the South Line area, Control area, and the county overall. It appears that the Hispanic/Latinx increases experienced by the South Line were comparable to the overall county increase. The Black population of the county was still more than double that of the Hispanic/Latinx population in 2016.

Figures 3 and 4 offer a visual test of the parallel trends assumptions underlying the difference-in-differences regression. From 1990 to 2000, for both populations, the change in

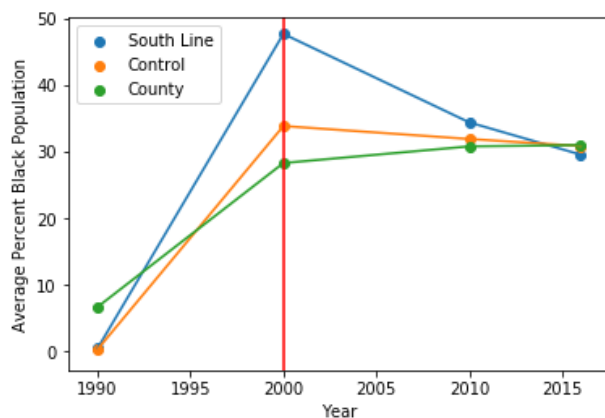


Figure 3: Average Percent Black Population Over Time (Reference line at 2000 marks light rail announcement).

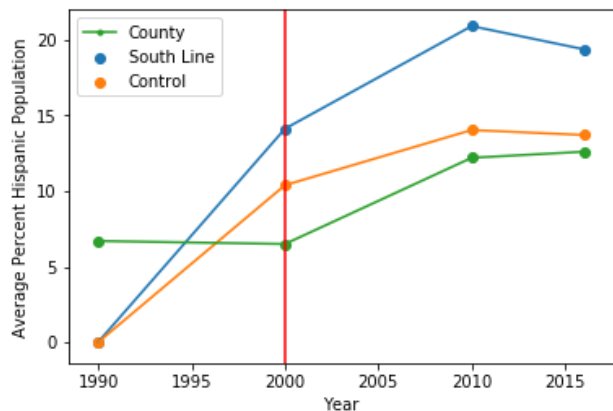


Figure 4: Average Percent Hispanic/Latinx Population Over Time (Reference line at 2000 marks light rail announcement).

<sup>27</sup> Ibid.

population is not exactly parallel for the South Line and Control, but the slopes are similar enough for a difference-in-differences estimation to be used.

The regression equation (Eq. 1) includes the dependent variable,  $Y$ , the percent Black or Hispanic/Latinx population. The dummy variable  $\delta_2$  is the coefficient of the interaction between the treatment dummy and the year, producing the difference-in-differences estimator.

$$Y = \beta_0 + \beta_1 Year + \beta_2 Income + \beta_3 Education + \delta_1 Treatment + \delta_2 Year * Treatment + \varepsilon \quad (1)$$

Income and educational attainment are included as control variables. Income is defined as inflation-adjusted median household income, and education is defined as the proportion of individuals over the age of 25 who have at least a bachelor's degree. Both income and education are highly correlated with race in the United States, making it necessary to control for these factors so that the effect on race alone may be observed.<sup>28</sup>

## V. Results

This section presents the results of the difference-in-differences regression, along with description of the change in population around the areas of interest.

### V.I Black Population

The Black population of the South Line area was declining in some areas prior to the announcement of the light rail project (Figure 4). On average, however, the area experienced a rise in the proportion of its Black population, driven by growth in just a few NPAs (Figure 4). From 2000 to 2010, the first period directly following the announcement of the light rail plan, the Black population declined even more rapidly around the CBD and to a lesser extent in other South Line areas (Figure 5). The average Black population continued to decline from 2010 to 2016 (Figure 6).

**Table 2: Black Population Differences-in-Differences Regression**

Dep Var = Percent Black Population	Estimate	SE
Difference-in-Differences Estimator	-1.481***	0.3154
Year	1.494***	0.181
Treatment Dummy	2982***	631.9
Income	-1.22E-04	1.08E-04
Education Level	-69.04***	10.79
Constant	-2941***	361.7

\*\*\*p<.001, R-squared = .5

<sup>28</sup> Noël, 2018.

Change in the Control area from 1990-2000 was close to constant in most NPAs. The spike in average Black population was driven completely by the growth in just one NPA (Figure 7). Decline in Black population was stronger closer to the CBD from 2000-2010, with some minor growth occurring farther away from the CBD (Figure 8). 2010 to 2016 was largely stable, with growth occurring evenly across NPAs (Figure 9).

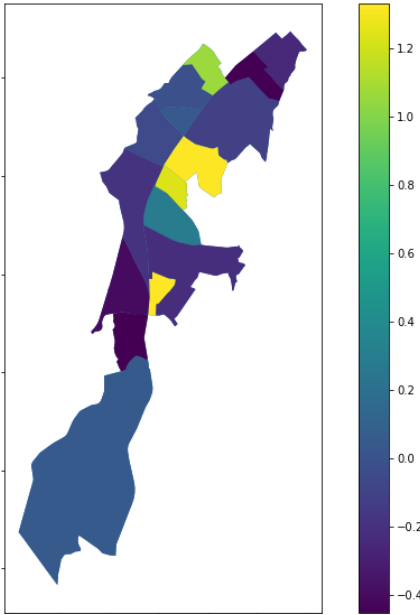


Figure 4: Percent Change, Black Population near South Line, 1990-2000.

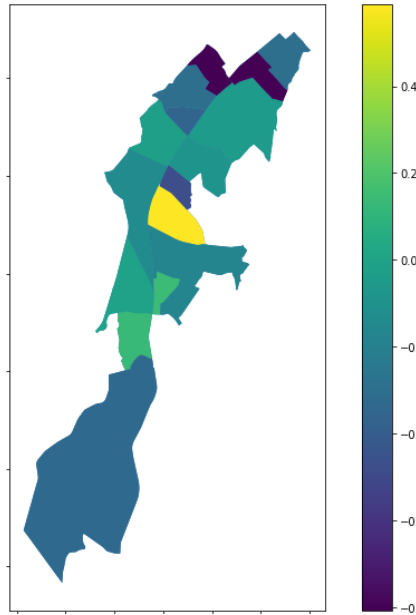


Figure 5: Percent Change, Black Population near South Line, 2000-2010.

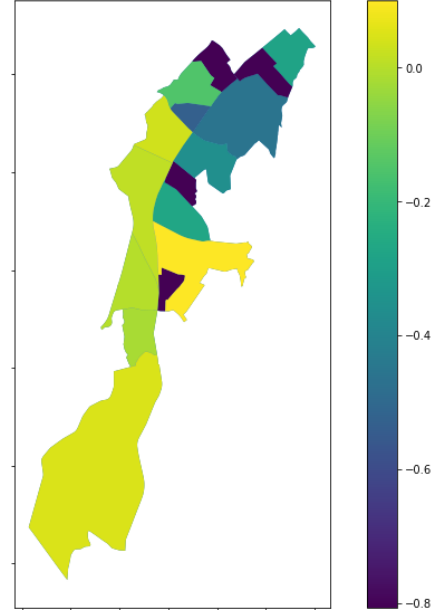


Figure 6: Percent Change, Black Population near South Line, 2010-2016.

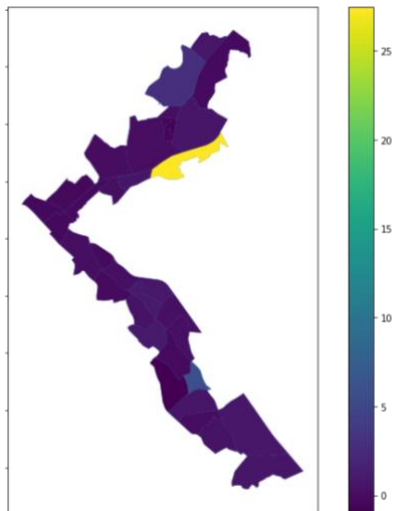


Figure 7: Percent Change, Black Population in Control Area, 1990-2000.

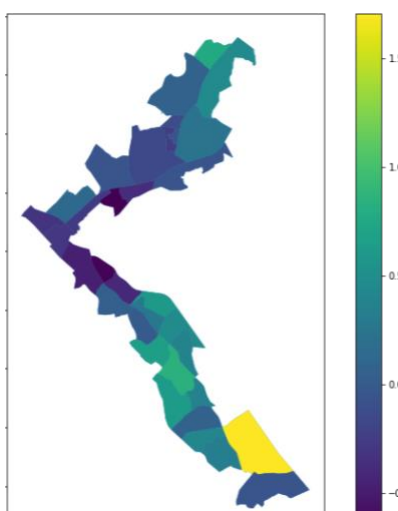


Figure 8: Percent Change, Black Population in Control Area, 2000-2010.

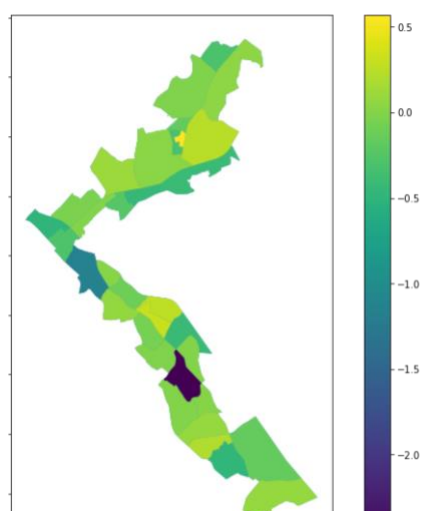


Figure 9: Percent Change, Black Population in Control Area, 2010-2016.

## V.II Hispanic/Latinx Population

The Hispanic/Latinx population stayed mostly constant from 1990 to 2000 around the South Line. Average growth was driven by outsized in-migration to just one NPA (Figure 10). From 2000 to 2010, growth was spread more evenly across the region (Figure 11). Substantial decline in some NPAs is observed for the first time from 2010 to 2016. The proportion of Hispanic/Latinx residents still continued to rise on average, with growth occurring both near and far from the CBD (Figure 12).

In the Control area, average Hispanic/Latinx population growth was driven by immigration to just a few NPAs from 1990 to 2000 (Figure 13). From 2000 to 2010, growth was also driven by just a few NPAs, though to a lesser extent than the previous period (Figure 14). From 2010 to 2016, growth was more evenly spread, though it was lowered even further than the previous period (Figure 15).

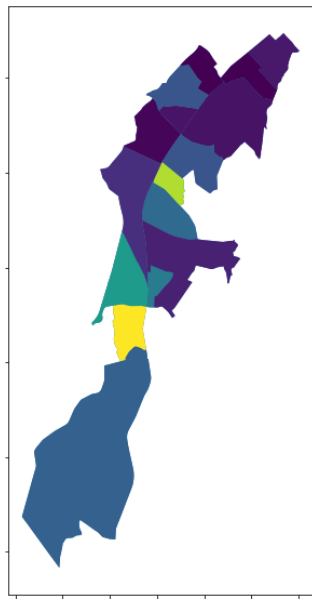


Figure 10: Percent Change, Hispanic/Latinx Population Near South Line, 1990-2000.



Figure 11: Percent Change, Hispanic/Latinx Population Near South Line, 2000-2010.

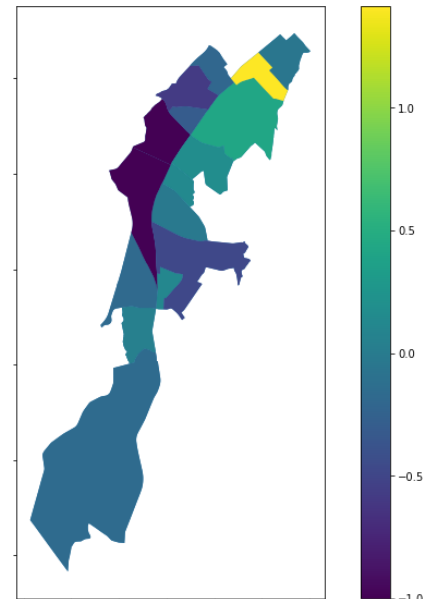


Figure 12: Percent Change, Hispanic/Latinx Population Near South Line, 2010-2016.

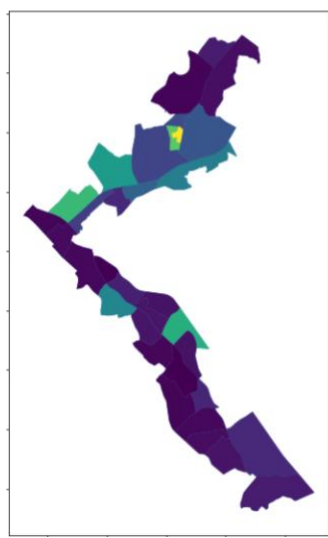


Figure 13: Percent Change, Hispanic/Latino Population Near Control Area, 1990-2000.

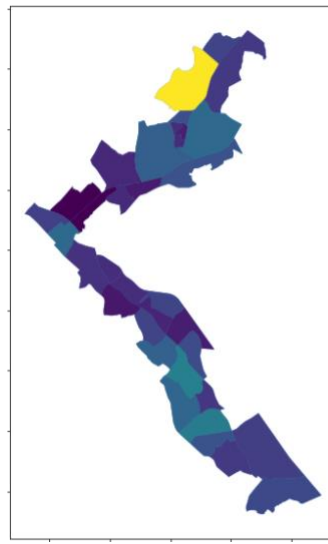


Figure 14: Percent Change, Hispanic/Latino Population Near Control Area, 2000-2010.

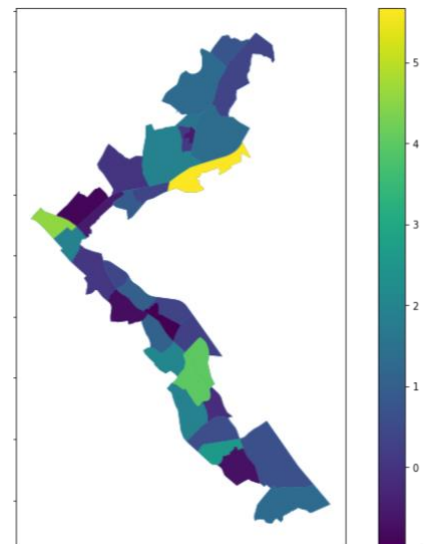


Figure 15: Percent Change, Hispanic/Latino Population Near Control Area, 2010-2016.

**Table 3: Hispanic/Latinx Population Differences-in-Differences Regression**

Dep Var = Percent Hispanic/Latinx Population	Estimate	SE
Difference-in-Differences Estimator	0.6135**	0.2221
Year	.606***	0.1275
Treatment Dummy	1226**	445.1
Income	4.37E-06	7.55E-05
Education Level	-30.12	7.575
Constant	-119.5	254.9

\*\*\* $p < .001$ , \*\* $p < .01$ , R-Squared = .28

## VI. Discussion

$H_1$  was supported by the difference-in-differences regression. The analysis suggests that the light rail may have caused the Black population to decline to a greater extent than it otherwise would have (relative to the Control area).

$H_2$  was contradicted by the analysis. The regression suggests that the light rail may have caused the Hispanic/Latinx population to *increase* to a greater extent than it otherwise would have (relative to the Control area).

This section posits potential explanations for the opposite outcomes experienced by the two populations, limitations of this study, and avenues for further research.

### VI.I Young White Professionals Hypothesis

The hypothesized situation discussed in the introduction of this paper does not hold true in this analysis. The proportion of the white population present in the South Line area remained

roughly constant, and the white population in the Control area dropped by a negligible amount.<sup>29</sup> It is possible that low-income white residents were displaced by development just as Black residents were, and higher-income white people entered the area. This is plausible, given that some NPAs closer to the CBD saw incomes rise post-light rail announcement. Further analysis is needed to understand the dynamics of the white population in the South Charlotte area, as this study is limited to the Black and Hispanic/Latinx demographic change.

## **VI.II Patterns of Segregation**

An unexpected result of the regression analysis revealed that the Hispanic/Latinx population increased significantly more in the South Line area than the Control area. This contradicts narratives that exist in discussions surrounding transit-induced neighborhood change, which often pose transit introduction (especially rail transit) as a force which attracts whites at the expense of poorer or BIPOC residents. Assessing why the light rail area resulted in opposite outcomes for Hispanic/Latinx residents than for Black residents may assist in the development of policies to protect incumbent Black populations from displacement in transit-rich areas.

An analysis by Frey (2010) notes that Hispanic/Latinx communities and Black communities have differing patterns of migration and residential segregation. Black residential clustering was originally driven by formal and informal housing discrimination. However, Black communities, on average, are becoming slowly less segregated from white communities, reflecting a rising Black middle class, and efforts to combat housing discrimination.<sup>30</sup>

Hispanic/Latinx segregation, on the other hand, is a function of the logic of migration. “Pioneers” move into areas with affordable housing and work availability, and friends and family follow, seeking similar amenities.<sup>31</sup> Clustering occurs because it makes sense for incoming migrants to stay in areas where they already have social networks, housing, and job opportunities available.

Part of the trend observed may be explained by these general trends in Black and Hispanic/Latinx migration. A portion of the incumbent Black population of the South Line may have simply moved because there were opportunities available elsewhere. Hispanic/Latinx residents may have moved into the area because affordable housing and jobs were available, independent of the effects of light rail.

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<sup>29</sup> Mecklenburg County, City of Charlotte, and University of North Carolina at Charlotte.

<sup>30</sup> Frey, 2001.

<sup>31</sup> Ibid.

However, this reasoning alone cannot explain the entire trend we observe by the South Line. This explanation does not explain why the South Line's demographic change was significantly greater than the Control area's. Though the South Line started with a higher Black population than the Control group, there is no compelling reason for why it experienced such a high amount of Black exit compared to the Control. On a number of important measures, the areas were the same. The South Line and Control NPAs had similar educational outcomes, poverty levels, bus transit access, and crime levels.<sup>32</sup> The light rail was the only major variable which differed between the areas during the study period.

A potential explanation lies in the changes the light rail brought to the housing market of South Charlotte. Billings (2011) showed that the development of new condominiums and single family homes increased following the light rail announcement.<sup>33</sup> However, anecdotal evidence suggested that much of this construction was aimed at high-income individuals. The incumbent Black population, which had a median household income below the county average, would not have benefitted from this development. An analysis by The Charlotte Observer (2019) showed that property values adjacent to the light rail grew faster than those not around the light rail, with some census tracts nearly doubling in average property valuations.<sup>34</sup> Rising property values mean rising property taxes for homeowners and usually translate to higher rents for renters, especially when land and existing buildings are sold for redevelopment.

### VI.III Car Ownership Rates & Effects of Immigration

Rising costs of living may have forced Black residents to leave the light rail region and move to areas with more affordable housing. This move would be made easier if the incumbent Black population had high rates of car ownership. They could still access the CBD or other areas of the city with a

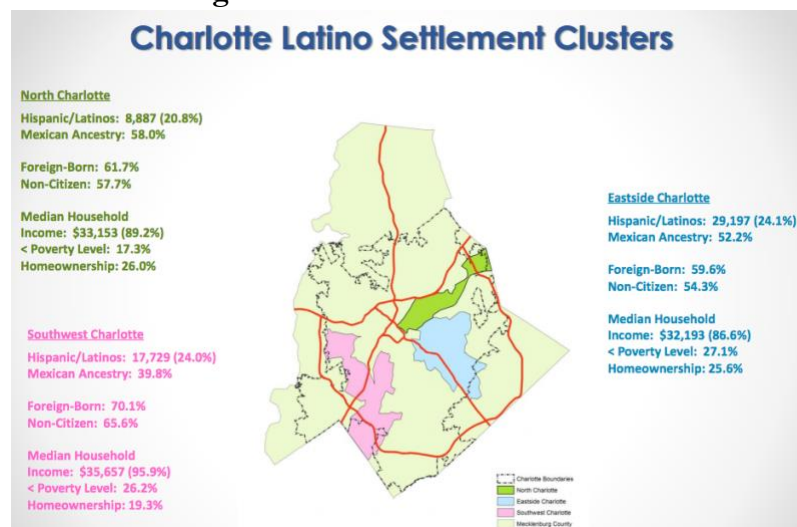


Figure 16: Charlotte Hispanic/Latinx Settlement Clusters. Source: Furnseth, Owen.

<sup>32</sup> Billings, 2011, p. 528.

<sup>33</sup> Ibid.

<sup>34</sup> Portillo and Off, 2019.

vehicle without paying the premium to live in a transit-rich area. Conversely, the Hispanic/Latinx population, which is a comparatively new immigrant population in Charlotte, may not have rates of car ownership as high as Blacks. A lower rate of car ownership could mean that Hispanics/Latinxs are willing to pay more to live near transit.

While data on car ownership by race/ethnicity are not available for this analysis, descriptions of Charlotte's Hispanic/Latinx population present compelling evidence that Hispanics/Latinxs may value transit more than Black Charlotteans. Analysis by Owen Furuseth at the University of North Carolina at Charlotte divides Charlotte's Hispanic/Latinx population into several clusters (Figure 16).<sup>35</sup> The "Southwest Charlotte" cluster overlaps with the South Line area significantly, and a Pew Research Analysis found that the Charlotte metropolitan region has as many as 100,000 undocumented immigrants, who are disproportionately Hispanic/Latinx.<sup>36</sup>

A high number of undocumented immigrants may explain the willingness of Hispanic/Latinx Charlotteans to pay more to live close to transit. Undocumented immigrants not covered under the Deferred Action for Childhood Arrivals (DACA) program are not eligible to receive driver's licenses in North Carolina. Even DACA-eligible residents' licenses have the words "No Lawful Status" written on them, certainly discouraging many eligible persons from obtaining licenses.<sup>37</sup> North Carolina's legislature also passed a bill in 2015 which would have allowed drivers without licenses to receive jail time, further discouraging undocumented immigrants from the use of personal automobiles.<sup>38</sup>

Anecdotal evidence supports the fear of immigration law enforcement as a compelling reason for undocumented immigrants, many of whom are Hispanic/Latinx, from driving cars.<sup>39</sup> It is possible, given the political climate surrounding immigration, that even some documented immigrants may be fearful of attempting to obtain driver's licenses.

## **VI.IV Black Displacement**

Given that:

1. the white population only slightly increased in the South Line area and
2. the Hispanic population significantly increased in the South Line area,

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<sup>35</sup> Misra, 2015.

<sup>36</sup> Passel and D'Vera, 2019.

<sup>37</sup> Rivas, 2013.

<sup>38</sup> Campbell, 2015.

<sup>39</sup> Misra, 2015.



the possibility of Hispanic/Latinx residents displacing Black residents must be considered. The migration of Latinx communities into historically Black communities is occurring in a number of urban areas across the United States, including Los Angeles and Chicago.<sup>40</sup>

This process is consistent with the previous discussion on Hispanic/Latinx clustering patterns. Urban areas with high concentrations of Black residents tend to have affordable housing available. In instances where Latinx/Hispanic populations move into historically Black neighborhoods, some analysis points to Black upward mobility as the driving factor for Black exodus.<sup>41</sup> This analysis appears even more salient in the context of Charlotte, which has lower segregation levels than many cities analyzed in transit literature (which are disproportionately in the Northeast and West).<sup>42</sup>

It is possible that this dynamic is at work in the South Line area as well. Despite the rise in property values, affordable housing may still remain in some areas (especially those at the furthest points from the light rail line). The incumbent Black population may have left due to both upward mobility and displacement pressures from rising property values, with Latinxs/Hispanics attracted to the area due to an excess supply of affordable housing.

Given the pressures that may have displaced a portion of the Black population, the Hispanic/Latinx population may experience the same pressures as time goes on. Continuing this analysis with data from the 2020 Census may reveal that the Latinx/Hispanic population is being displaced by the same factors as the Black population.

## **VI.V Limitations**

The dataset used in this paper relies on a number of NPA-level estimates based on tract-level data, since not all data are available at the NPA level. An ideal dataset would have all relevant variables available at the NPA level for a precise, granular analysis. More frequent data, perhaps at an annual basis instead of a decennial one, would aid in this analysis. A more holistic dataset would also include more control variables to be included in the regression equation. The difficulty of gathering and cleaning data at the NPA level limited the number of controls that could be used in this study.

An even more precise analysis would use micro-data to analyze neighborhood changes down to the block level and assess changes with regard to distance from stations or the line, similar to the

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<sup>40</sup> Jennings and Smith, 2017; Ramos, 2019.

<sup>41</sup> Medina, 2012.

<sup>42</sup> Frey, 2018.

work of Boarnet, et al. (2018).<sup>43</sup> The methodology used in this paper defines “light-rail adjacent” to mean any NPA with land area within one mile of the light rail track. This model assumes that areas within ½ mile, ¼ mile, or 1 mile away from the track are expected to change similarly, which is not the case in reality. Development is denser closer to the light rail line and as one moves further away from a rail stop, the transit line itself becomes less of an amenity. Residents may walk ½ mile or ¼ mile to a transit stop, but making housing decisions based on a 1 mile proximity to a transit line is less likely. A more holistic analysis would take this distance gradient into account rather than treating each NPA as being internally homogeneous.

## **VII. Conclusion**

This paper assessed the changes in Black and Hispanic/Latinx population in neighborhoods adjacent to Charlotte’s light rail line. The findings revealed that the light rail had a negative impact on the percent Black population, but a positive impact on the percent Hispanic/Latinx population living in the area. A possible explanation, a higher Hispanic/Latinx utility for proximity to transit, was discussed. The discussion included possible reasons for this utility differential among populations.

The limitations of this study make it clear that further research is needed on the effects of light rail, and the effects of Charlotte’s light rail in particular. Studies should focus on factors other than property values or aggregate poverty levels to develop a well-rounded understanding of the forces behind transit-induced neighborhood change, and these findings should be taken into account when city officials, planners, developers, and citizens debate the merits of new modes of transit.

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<sup>43</sup>Boarnet et al., 2018.

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