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Title

Assessing the Past & Current Impacts of the International Boulevard BRT Project in East Oakland

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Publication Date

2020

Assessing the Past & Current Impacts of the International Boulevard BRT Project in East Oakland

FINAL REPORT JANUARY 2020

Transportation Planning Studio
Department of City and Regional Planning, University of California, Berkeley
in partnership with the Dellums Institute for Social Justice | Just Cities



Acknowledgments, Limitations & Strengths

The authors would like to acknowledge and thank the Department of City and Regional Planning (DCRP) at the College of Environmental Design (CED) at UC Berkeley, and Just Cities. A special thanks also goes to the mentorship and support from studio instructor Professor Karen Trapenberg Frick and Margaretta Lin, Executive Director at Just Cities. We also appreciate the tremendous insights from colleagues at numerous public agencies and community organizations that participated in this research project. A very special thanks goes to Reverend Daniel Buford, Abigail Cochran, John Jones III, and Ms. Towanda Sherry and assistance on the report.

This report has limitations to its analysis. None of the authors have lived in East Oakland, and the majority of the authors identify as white, which is not the primary racial demographic of East Oakland. As Master's students in City Planning at UC Berkeley, the members of the research team are positioned to become professional "planners;" this positionality affects the methods of research, angles of investigations, framing, and conclusions.

Another limitation is that the East Bay Bus Rapid Transit (EBBRT) is currently under construction. Frustrations and anxieties may be at their peak levels, without the ability to assess the functionality or perspectives of the finished form. Furthermore, accurately measuring the effects of gentrification and displacement may take years and often decades; data may not yet reflect the real experiences currently felt by residents and business owners. This report seeks to assess the process and planning of EBBRT, look forward to potential concerns and possibilities, but cannot definitively assess the full scope of the successes and challenges of the system before it has started operations, which is slated for March 2020.

Finally, a major limitation is time and scope of work. Over a 10-week period, the authors as students investigated and analyzed this project to the best of their abilities, with ambitions for further research, interviews, and angles of analysis still to be conducted.

Strengths of this project are that as students, the authors arrive without existing organizational priorities and seek to listen and learn from those working on and affected the history of planning as one of injustice to humans and the planet.

Furthermore, we established group agreements which included principles such as approaching work with humility, giving voice and power to community leaders, transparency, and collective decision-making. Finally, a strength of the team was the access to a wealth of resources and knowledge, through the University of California, Berkeley, Just Cities and constituents intimately involved with the EBBRT.

About the Authors

The East Oakland BRT Equity Analysis team consists of four graduate students in City Planning in the Department of City and Regional Planning in the UC Berkeley College of Environmental Design, with support from Just Cities.

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Introduction

The practice of transportation justice requires a courageous and honest assessment of both the negative and positive impacts to low-income communities of color and people with disabilities from transportation projects and policies--past and present. This report seeks to use transportation justice to explore those impacts of East Oakland Bus Rapid Transit.

The report is prepared with Just Cities, a restorative justice in planning and policy social enterprise based in Oakland, in partnership with the Fall 2019 UC Berkeley City Planning Graduate Transportation Studio. This report provides a preliminary analysis of currently available information and data regarding the past and current impacts of the EBBRT on the people, environment, businesses, and homes around International Boulevard (East 14th Street)--while providing critical insight behind the planning and development process. The EBBRT project is expected to launch in March 2020. While this analysis cannot provide critical feedback on the project in operation, we have endeavored to detail the complex historical, political and technical dynamics that went into this project and study the current data available regarding International Boulevard.

Often, transportation projects and their impacts have been framed in narrow and siloed terms, avoiding complex and connected issues of economic development or land use while ignoring the broader histories of places and the people within them. We aim to broaden this lens and provide documentation in order to preserve this history for the future. In the sections that follow, we provide: 1) a brief history of East Oakland; 2) a detailed project overview and description; 3) stakeholder interviews; 4) an impact analysis; 5) preliminary recommendations, and 6) concluding thoughts and recommendations for further research.



East Oakland Histories in Brief

Before Oakland incorporated in 1852, the native Ohlone people lived in the Bay Area for thousands of years caring for the land and natural resources. The Chochenyo Ohlone People lived in the East Bay and built the village of Huichin, which is present day Oakland. The first Mission in the Bay Area was in Monterey in 1770, followed by other Missions in San Francisco, Santa Clara, and San Jose. These Spanish missionaries committed genocide against the Ohlone people in order to claim their land and resources.

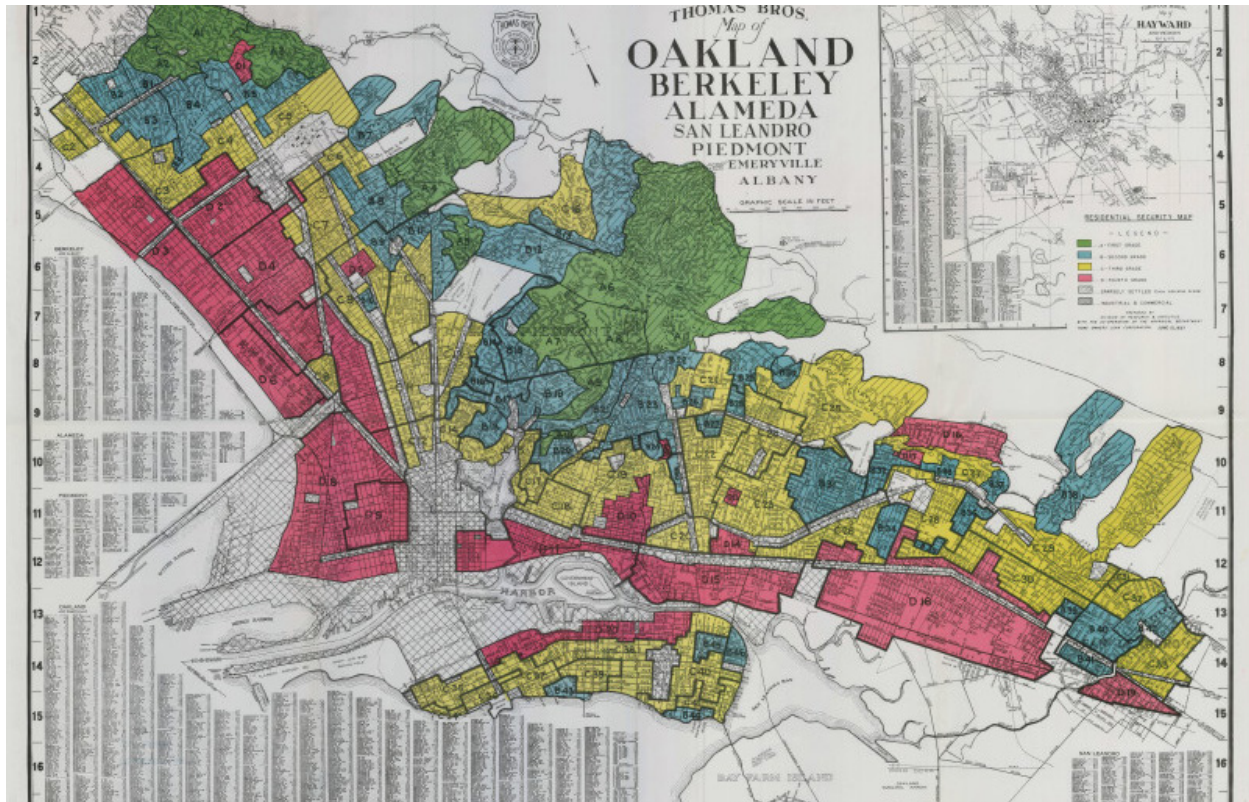
Spanish colonization of the Bay Area gave way to American control in the mid-1800's as more migrants from the east coast and midwest settled in San Francisco and the surrounding area. After Oakland incorporated in 1852, the city began to annex smaller surrounding towns including Fruitvale, Melrose, Lockwood, and Elmhurst in 1909 that make up present day East Oakland. For this report, East Oakland is defined as east of Lake Merritt to the San Leandro border and south of the Interstate-580 freeway.

As Oakland expanded as a city, transportation infrastructure began to develop to meet the needs of its growing population. While the Transcontinental Railroad terminated in West Oakland, the city required an intra-urban rail and the Key System began in the early 1900's to serve the East Bay with streetcars. In East Oakland, the original A streetcar route ran along East 14th Street and the same route operated with buses beginning in the 1940's and transitioned to AC Transit route A when AC Transit took over the Key System in 1960.

As transportation access increased in East Oakland, not all residents had access to living there. During the first half of the twentieth century, much of East Oakland was covered by racial covenants which prohibited homeowners from selling their properties to non-white people. This resulted in racial segregated and exclusive communities, which kept non-white Oaklanders out of homeownership, and subsequent wealth-building opportunities. This led to the proliferation of a "new white middle class, brought together in its own neighborhood clubs, homeowner groups, and secret fraternal societies" including the Klu Klux Klan in East Oakland.¹ While the building of single family homes proliferated in East Oakland in the 1920's, by 1930 East Oakland was less than 0.7% black compared to 2.6% for the city as a whole. By the 1940's much of East Oakland above 14th Street was rated as "blue/

desirable” or “yellow/definitely declining” grade in the Home Owners Loan Corporation (HOLC) redlining maps. However, areas of East Oakland / under 14th Street were rated as “red/hazardous” grade where banks would not issue any loans.² The seven all white public housing projects built after World War II were in East Oakland.³

Figure 1. Home Owners Loan Corporation (HOLC) Redlining Map, Oakland 1930s



Source: KQED, 2016.

Beginning in the 1950's, Oakland began building freeways through the city and completed two major projects (I-880 and I-580) by the mid 1960s. With the corresponding federal subsidisation of suburbanization via home mortgages and freeway expansion, many white families left Oakland and moved to surrounding suburbs. During the late 1950 to 1960's, Oakland lost thousands of manufacturing jobs and white middle-class homeowners.⁴ This opened up the opportunity for families of color to move into parts of Oakland, which had been previously restricted to them. Simultaneously, many black families were forced to move out of West Oakland due to freeway and BART construction and redevelopment endeavors that demolished hundreds of homes and businesses.

In the middle of the 1950's, Black Oaklanders began to purchase homes in parts of East Oakland as real estate agents began opening up neighborhoods for Black buyers and race relations became more volatile as Black families moved into formerly White communities.⁵ As Robert O. Self writes in *American Babylon*:

“Pullman porters, attorneys, physicians, and civil servants were among the first African Americans to purchase homes in far East Oakland, east of Fourteenth Street. In the late 1950’s and early 1960’s Fourteenth Street was first a red line — between black and white— and then a class boundary between middle-class black neighborhoods to the east and lower working-class black neighborhoods to the west. By the late 1960’s that boundary had become an economic gradient: the neighborhoods below Fourteenth Street were trapped in tenacious forms of poverty and unemployment.”⁶

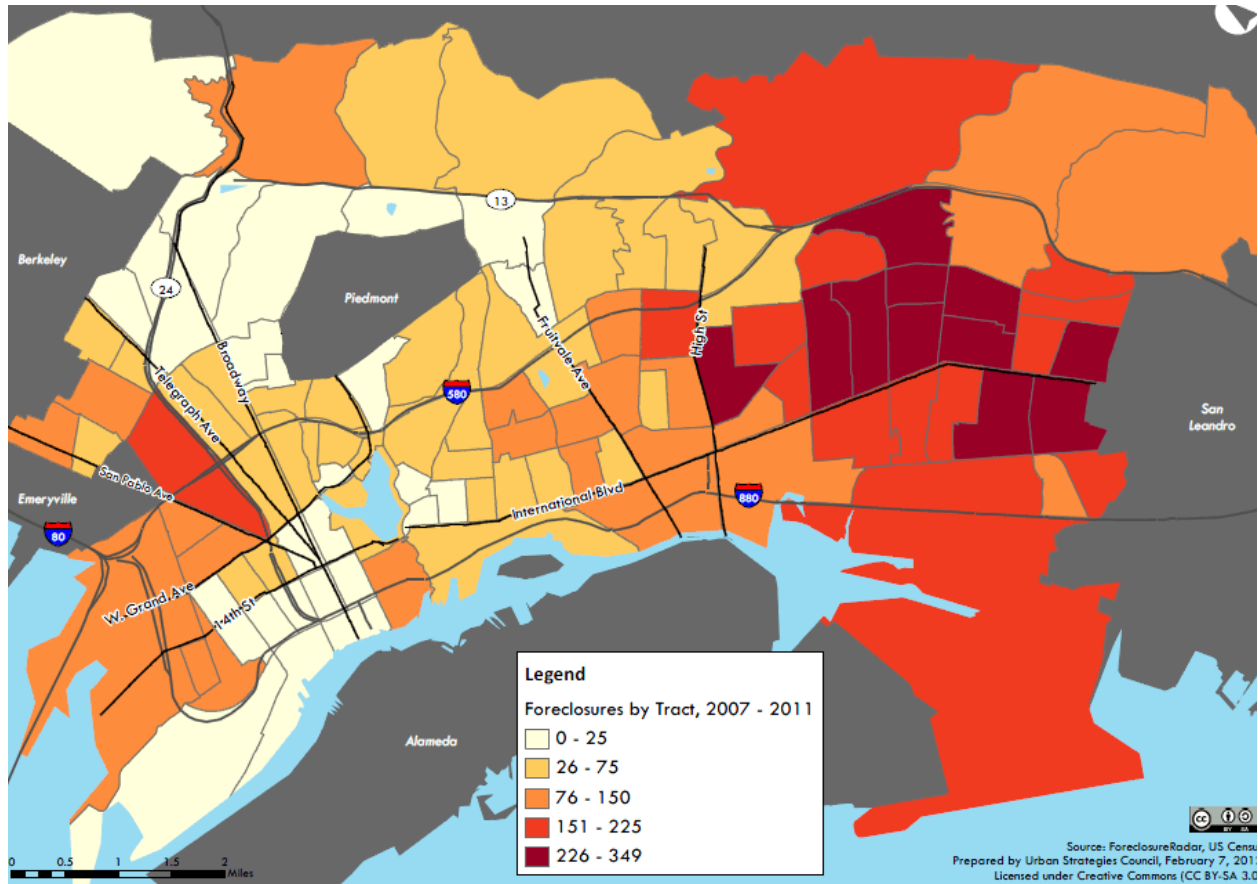
Despite more opportunities for black families to move into parts of East Oakland, public disinvestment and disregard for these communities followed in subsequent decades. Emblematic of this, in 1975 AC Transit doubled the amount of wait time between buses along the A route along East 14th Street, from seven minute wait to a 15 minute wait in the evening schedule.⁷

In 1983, Mayor Lionel Wilson had a black majority of members on both the city council and the school board, and black professionals in high ranking city positions, such as city manager, city attorney, city planning director, and director of economic development.⁸ However, poor and working-class blacks were not seeing the benefit of political representation as Oakland’s blue-collar economy continued to shrink; between 1981 and 1988, the city lost a combined 12,000 jobs in its traditional manufacturing industries, which left low-income black neighborhoods vulnerable to the epidemic of drugs and crime.⁹

In the 1990’s, the City renamed East 14th Street to International Boulevard to rebrand the corridor with a key goal of improving its public image. While some community members were excited about this, others felt it was a bandaid solution to more systemic issues, as well as erasing the black cultural history of the corridor.¹⁰ In 1990, the unemployment rate for black Oaklanders was 14.5% whereas it was 9.5% overall. In 1989, nearly one-quarter of black families lived beneath the federal poverty line.¹¹

The 2000s brought changes to International Boulevard and East Oakland. Along International, the transit-oriented development project called the Fruitvale Transit Village, opened in 2004 due in large part to advocacy by The Unity Council, a community development corporation that works closely with East Oakland’s Latino community. The Transit Village connects Fruitvale BART station to the neighborhood and increases Fruitvale’s retail, residential, and public space.¹² In the late 2000s, the foreclosure crisis disproportionately impacted East Oakland because of the number of predatory loans banks used to target homeowners of color, especially black homeowners.¹³ The same neighborhoods hit hardest by redlining-related disinvestment years earlier were again hit hard.

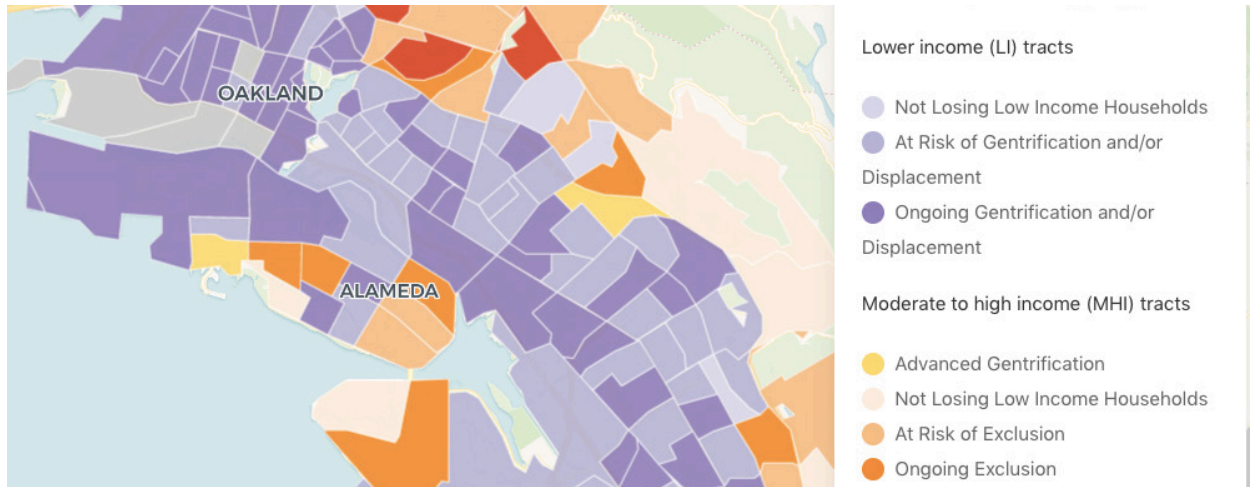
Figure 2. Over 10,500 Completed Foreclosures in Oakland between 2007-2011



Source: Urban Strategies Council, 2011- 2017.

Mostly recently, East Oakland has been subject to intense displacement pressures due to the rising desirability and home values in Oakland. Although East Oakland has not changed as much as parts of North and West Oakland, the Urban Displacement Project led by UC Berkeley shows that most of East Oakland is “at risk of gentrification and displacement” or is experiencing “ongoing gentrification and displacement,” and that 83% of the East Bay’s currently gentrifying neighborhoods were previously redlined.¹⁴

Figure 3. Urban Displacement Project's Typology for Oakland in 2018



Source: Urban Displacement, 2018.

The brief overview of East Oakland history provides the foundation for this report and demonstrates that the existing conditions for the International EBBRT project extend decades back due to structural racism, government policies, and private sector participation, and systematic disinvestment in the area. Understanding and acknowledging East Oakland's changes in demographics, political clout, and public investment over the twentieth and early twenty first centuries must be a fundamental piece of projects and plans that aim to improve the lives of current residents.



Project Description

Overview

The East Oakland Bus Rapid Transit (EBBRT) Project is a \$216 million transit infrastructure investment along International Boulevard which is currently under construction and expected to begin revenue service in March 2020, after being postponed at various times in recent years.¹⁵ With federal, state, regional and local funding, Alameda-Contra Costa Transit District (AC Transit) is leading the project design, construction and implementation of the EBBRT project.

The project will span from Downtown Oakland (20th and Broadway), near the 19th Street Bay Area Rapid Transit (BART) Station to the San Leandro BART Station totaling 9.5 miles, spanning through two cities. Southeast of 42nd Street (past the Fruitvale area), International Boulevard becomes the California State Route 185, which falls under state jurisdiction via the California Department of Transportation, also known as Caltrans.

This project is intended to link two major transit regional connectors along one of the most frequently traveled corridors in Alameda County. Currently, International Boulevard is served by AC Transit's 1 and 1 Rapid routes. According to AC Transit's 2018 Ridership Report, on average, 11,930 people ride the 1 daily--the busiest route in all of Alameda County, carrying approximately 50 people per trip and 45 people per hour.¹⁶ According to AC Transit officials interviewed, the primary reason AC Transit selected International Boulevard was because the current 1/1R route has some of the highest bus ridership numbers in the county and current service is not nearly as reliable or efficient as desired. Once the EBBRT is in service, the 1 and 1R routes will be removed. AC Transit estimates that the new EBBRT project will result in 25,000 daily boardings and buses will come, on average, every 7 minutes as compared to 10 minutes for the 1/1R.¹⁷

AC Transit initiated planning and design in 2002 and by 2016 official construction began on the corridor, totaling nearly two decades of planning, development and activism to date (Figure 5).¹⁸

Figure 4. New EBBRT Route from Downtown Oakland to San Leandro, replacing the 1/1R Route



Source: AC Transit, 2019.

International and to the experiences of people living nearby and traveling on the corridor. The next sections will further discuss BRT systems and how BRT progressed in the East Bay.

AC Transit’s four primary project goals are to increase and improve:

- Frequency & Reliability
- Accessibility
- Technological Innovation
- Safety¹⁹

The EBBRT project will operate in these neighborhoods: Downtown, Chinatown, East Lake, San Antonio, Fruitvale, Havenscourt/Lockwood, Elmhurst and Downtown San Leandro.

The project will dramatically alter the streetscape of International Boulevard, particularly between 20th Avenue and Durant, with the introduction of twenty-one median boarding stations (bus stops that are located in the middle of the street, rather than on the side) and twelve curbside stations. Riders who board the EBBRT between 20th and Durant Avenues will have to cross an intersection to access the station in the median. All of the stations located within Downtown Oakland and Chinatown will be curbside stops, while four out of five San Leandro are curbside stations rather than median stations. The project will also deliver new streetscapes and other pedestrian and cyclist infrastructure, including lighting and more frequent pedestrian crossings.

Overall, the project will deliver major changes to the built environment of

Figure 5. Key Milestones Timeline for the East Bay Bus Rapid Transit Project, 1991 to 2017

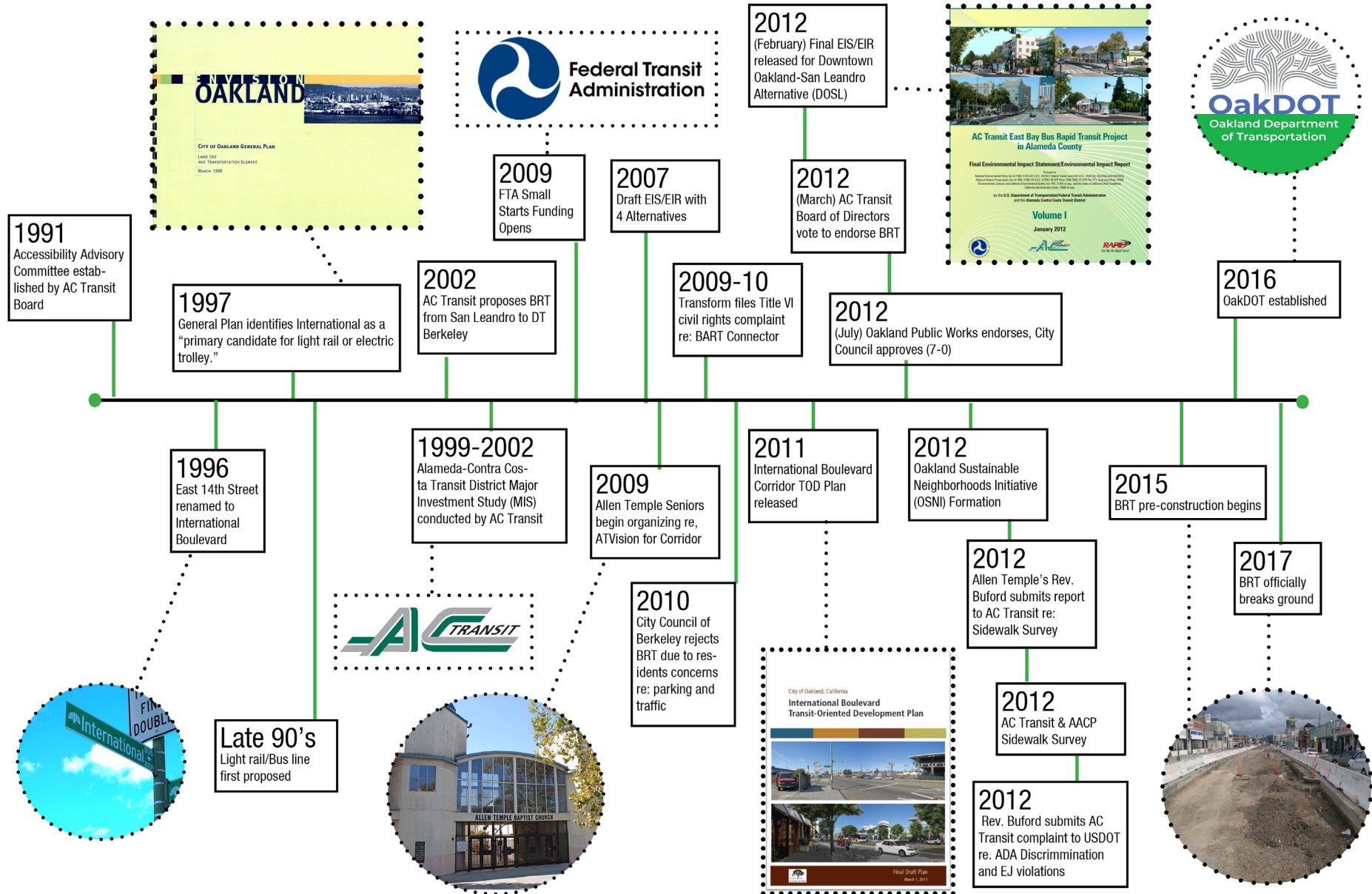


Figure 6. Photo Simulation of Illustrative Median Bus Stop



Source: AC Transit, 2019.

What is BRT?

Broadly speaking, transit advocates and planners in the United States and worldwide have long hailed Bus Rapid Transit as a lower-cost option of providing better “rail like” public bus service that can more easily gain political support than light rail projects.²⁰ BRT was first realized in Curitiba, Brazil in 1991 and then followed by Bogota, Colombia in 2000—the successes of these systems resulted in a global movement of cities investing in BRT (Oakland now being one of them along with San Francisco in the Geary and Van Ness corridors).²¹

A defining feature of BRT is its branding, which attempts to relieve the stigma and negative perception of public bus service by placing the word “rapid” in its title and differentiating itself as more reliable and technologically innovative than traditional bus service. The main point of BRT is that it aims to provide the same level of service as light rail, but without the costly infrastructure and lengthy construction of rail lines. Additionally, to make the BRT faster, routes operate on dedicated bus lanes and often make fewer stops (as is the case with the Oakland EBBRT project). BRT seeks to provide improved bus service by:

- Giving buses exclusive rights-of-way (removing other vehicles from its lane, so that they will be removed from traffic)
- Providing buses with signal priority (making the traffic signals turn green faster when buses approach to keep them moving)
- Creating boarding stations for increased access on and off the bus

Studies suggest that BRT does lead to zoning and economic investments changes similar to light rail transit (LRT), and property investments can increase by 10% to 20% in value.²²

In a review of equity impacts, Venter et al argue: “The available evidence raises concerns around gentrification and property value increases near BRT...routes that might price low-income households out of exactly the residential locations that are most beneficial to them in terms of accessibility.”²³ Protecting affordable housing, improved networking, and fare policies are key to achieving the equity these authors propose. Changes to land use around BRT corridors are often an explicit goal of BRT projects, and may be necessary to achieve ridership, revenue, and reduced emissions goals. For future BRT projects, specific metrics and intentional policies are required to monitor impacts on low-income and vulnerable populations. (See Appendix Item A for a full literature review.)

How did BRT move forward on International?

From a geographic and transportation perspective, International Boulevard is one of the busiest and most significant arteries in the East Bay because it connects Downtown Oakland to the South Bay. A key community leader has called International, “Not the backdoor of Oakland, but the front door.” International Boulevard is more than just a corridor, symbolically speaking, it is one of the most important roots of East Oakland and is a destination in and of itself. Since the early 1990s, planning agencies and select stakeholders have targeted International Boulevard as a prime candidate for further transit investment and development. AC Transit acknowledged that the agency conducted extensive research about the EBBRT project for over 10 years. Their preliminary research started with exploring alternatives including light rail, BRT, and simpler bus options. They reviewed College, Telegraph, Shattuck, Foothill & International Boulevards, before deciding on International due to the road width and ridership.

The 1998 Oakland General Plan stated that the City’s long-term planning goals were to, “Support the introduction of light rail or trolley buses in heavily traveled corridors.”²⁴ After that, AC Transit conducted a study on International in 1999, where they evaluated two other alternatives to BRT: 1) light rail and 2) enhanced bus service. They concluded that light rail was financially infeasible as it was too costly and that an enhanced bus service would not generate enough ridership to offset the costs of improvements. According to some AC Transit officials, light rail would have cost almost a billion dollars.

As EBBRT project planning progressed, the 2007 Draft Environmental Impact Report (DEIR) officially concluded that BRT would be the top choice, “With the understanding that LRT service would be considered the long-term goal.”²⁵ Furthermore, a critical caveat was that to access federal funding at the time through Small Starts, AC Transit’s project had to have a “fixed guideway system.”²⁶ Thus, enhanced bus service was not an option if AC Transit wished to utilize federal dollars. For AC Transit, EBBRT presented an exciting opportunity to garner Federal Transit Administration (FTA) dollars from the then newly instituted Small Starts funding program.

However, by 2008, the Great Recession deeply impacted Oakland, (particularly East Oakland). Partly in response, the City of Oakland, with the involvement of many nonprofit and community organizations, initiated a comprehensive study of International Boulevard

with the goal of seeking opportunities to spur economic activity through transit-oriented development (TOD). TOD seeks to densely develop homes and businesses near robust transit infrastructure in order to encourage greater use of transit and to minimize environmental impacts. By 2011, the City completed the plan, called the International Boulevard Transit-Oriented Development Plan (IBTOD), which articulated International as having the ideal conditions for light rail implementation in order to spur economic development related to transit.²⁷ The recommendation of future light rail showcased the desire for better transit infrastructure that would serve as a linchpin for new development.

As planning efforts progressed for the EBBRT, AC Transit proposed a route that would connect Downtown Berkeley to San Leandro's Bayfair BART station. The City of Oakland and San Leandro approved the EBBRT project in 2012; however, the City of Berkeley rejected EBBRT prior on the basis of business and parking impacts on the proposed route (despite 77% of voters aligning in support of EBBRT by opposing a 2008 ballot measure to stop the project from operating in Berkeley).²⁸ Even though merchants in East Oakland also voiced concerns regarding construction and parking, the City of Oakland moved forward with the project. Per AC Transit, in order to address parking concerns, they built two parking lots in the Elmhurst and Fruitvale neighborhoods. However, constituents of the corridor have voiced concerns regarding the adequacy and accessibility of these lots.²⁹

The original proposed route was to end at the Bayfair BART station; however, the City of San Leandro had concerns in 2011 regarding adequate road space for the EBBRT and business impacts for its merchants along East 14th which shortened the route. After the cities of Oakland and San Leandro committed to the EBBRT in 2012, the project was able to move forward. As mentioned earlier, AC Transit's construction officially began in 2016 but was originally anticipated to begin in 2015.³⁰ According to interviewed community leaders, construction related disruptions began as early as 2015. As typical of many major

Figure 7. EBBRT Bus in Testing in San Leandro



Source: UC Berkeley Transportation Studio, 2019.

public infrastructure projects, the EBBRT project has endured several setbacks (i.e. excavation of unknown utility lines). This has resulted in longer construction times and additional burden for people living, working, and traveling along International Boulevard.

Broadly speaking, the goal of the EBBRT was not only to improve service for 1/1R riders, but also to become an anchor that would aid in economic recovery and resiliency; however, now in the midst of rising regional unaffordability, efforts may exacerbate displacement and instability in vulnerable



Stakeholder Interviews

Overview

The Equity Analysis Team interviewed 25 stakeholders that are either closely connected to the EBBRT project or that formerly engaged or gained valuable knowledge about the project during or after the planning process. The stakeholders were comprised of two groups, community leaders and professional voices. Community leaders are activists from community-based groups and/or Oakland residents with direct ties and exposure to the EBBRT Project. On the other hand, the professional voices are staff from the City of Oakland, AC Transit, elected officials, or other professionals with close ties or knowledge about EBBRT.

The Team interviewed representatives from AC Transit, Alameda County Building Trades, Allen Temple Baptist Church, Alliance of Californians for Community Empowerment, City of Oakland, Communities for a Better Environment, East Bay Asian Youth Center, Just Cities, merchants (BRT/merchants forum with an approximate 25 people in attendance that included Oakland councilmembers), TransForm, and the University of California, Berkeley. Additional interviews were not conducted due to time and resources constraints of the team.

The Perspective of Community Leaders, Merchants, and Professionals

According to many of the professional voices the most practical solution to move people “quickly” along the corridor is BRT drawing from corridor study research and their observations in practice in the U.S. and Latin America. Overall, EBBRT would improve service and accessibility to transit users across incomes and physical needs, according to AC Transit staff. In particular, according to AC Transit interviewees, the primary benefits of the EBBRT project include: frequent and reliable service, accessibility, innovation, and safety. The City of Oakland primarily supported the EBBRT because Council aligned with AC Transit’s goal to improve accessibility and reliability for transit users along the corridor, said a City official. The City official also expressed optimism that EBBRT will spur business and job creation along the corridor, like in Cleveland, Ohio which too had implemented BRT in 2009.³¹ While there was general support from both the City and AC Transit,

individual agency responsibilities for project planning, design and implementation have varied during the project's evolution as discussed below. A summary of key topics and comments from the interviews also is shown at the end of this section (see Figure 9).

Challenges

AC Transit took full responsibility for the design process. A City of Oakland staff member mentioned that the Public Works Department was a more passive designer of the EBBRT, taking cues from AC Transit but hoping to include complete streets aspects in the project. However, the City of Oakland contributed funding to support infrastructure improvements, including improved lighting, crosswalks, curb ramps, and sidewalks.

From the beginning of the EBBRT planning process, the City of Oakland and AC Transit had different interests, the most common disagreements on the project revolved around parking and right of way, said an AC Transit official. From the City side, the reduction of parking was a problem, bound to impact the businesses along the corridor during construction. Merchants and community groups like Allen Temple Baptist Church advocated to keep as many parking spaces available. Merchants concerned with losing business due to the loss of parking spaces and groups like Allen Temple expressed concerns about losing spaces for church members during church activities, said several community residents interviewees. They also, added concerned about the loss of stops, particularly one in front of CP Bannon funeral home, a valuable institution for the Black community.

Economic development also was a key topic of interest, yet both agencies did not prioritize a budget or funding for mitigating impacts from the project on businesses, said an AC Transit Monies for this project are tied predominantly to transportation-related actions and are unavailable for business mitigation. According to an AC Transit official, it is not within the purview of the agency to provide funds purposefully for economic

Figure 7. Bus Passing CP Bannon Funeral Home



Source: UC Berkeley Transportation Studio, 2019.

development as it is the City's responsibility. Also, the AC Transit official noted that Oakland constantly seems to experience budget limitations, which prevents the City to support economic development and small businesses. On the other hand, Oakland officials have said the City has the resources to support businesses and that the City needs to do a better job to make them accessible.

According to a professional voice interviewee, when Berkeley rejected the

project, many Oakland community members and others had assumed that federal funding that would have been to construct the EBBRT portion in Berkeley could be redirected to support business mitigation in Oakland. However, this professional voice added that these participants in the process later learned this federal transportation funding was only allocated for direct transportation-related matters and that any use of federal and state funds would have been abuse of public funds for private gain.

AC Transit gave \$2 million to the City of Oakland for a mitigation fund to support businesses impacted by construction. Oakland set up the criteria and manages the process to allocate the funds. However, several interviewees noted that accessing the mitigation funds has been challenging and thus a significant barrier to addressing construction impacts to businesses along the corridor. According to a City official the process to access mitigation funds is unclear to merchants because of the much required administrative forms and adherence to legal and city requirements. At a recent public forum merchants voiced to councilmembers and Oakland staff that the current process is not favorable to them and needs to be fixed. As a result, it has become a challenge for businesses to provide proper documentation to request the funding available for mitigation.

According to a City official, Oakland has a valuable opportunity to effectively communicate with small businesses and share the City's resources that are available for businesses not only along the corridor but citywide. Recent direction from Council to City staff appears to prioritize addressing the challenges associated with the business mitigation funds along the corridor and economic development more broadly throughout the City. At the recent merchant forum councilmembers made a commitment to have a follow-up meeting with merchants, AC Transit, other councilmembers, and City staff to discuss addressing the challenges facing businesses, some time in early 2020. Prior to the merchant forum, Council members have met with the City Administrator and the Office of Economic Workforce Development to discuss addressing the mitigation challenges mentioned a City official. Also, prior to the forum councilmembers from Districts 2, 5, and 7 have hosted meetings with businesses in the corridor in the San Antonio and Fruitvale areas. Lastly, the city's Department of Economic Development is in the process of hiring a staff person dedicated only to work with the impacted businesses to process grants for merchants per the City official.

Changes in the Built Environment

East Oakland residents have experienced disinvestment over many decades and when new projects like the EBBRT become a reality it raises legitimate concerns, said a long-time East Oakland resident and environmental justice (EJ) advocate. The EJ advocate explained how alternatives to the recently completed 3.2-mile BART Airport Connector that provides rail service from Coliseum BART to the Oakland Airport could have offered access and other benefits to the residents in the area, which instead bypasses the neighborhood.³² The EJ advocate mentioned that the project should have included opportunities for local residents to board the Connector along the route to and from the airport or improved the previous shuttle service instead of building it. Another EJ advocate mentioned that there is a disparity in services and how construction is executed in affluent

and poor areas in the city. For instance, a business owner explained that when the construction crew broke ground on International, in front of their business the construction contractor did not wet the concrete and dust entered the business.

Gentrification and displacement are more alarming in neighborhoods closest to Downtown; parts of deep East Oakland remain affordable relative to other areas in Oakland, said a City official. Quietly, some new affordable housing in East Oakland is emerging. For example, about 460 affordable housing units on International Boulevard between 94th and 105th, mostly accessible to seniors are expected to open in early 2020, and monthly rent is expected to cost from \$400 to \$800, reported the City official.

AC Transit staff was skeptical of long-term impacts on gentrification and displacement from EBBRT, but also noted that in 2008 the economy was in a recession and few worried about gentrification, pointing to the community groups that supported International Boulevard TOD plan. They acknowledged that transportation planning and land use planning are more fully integrated pointing to the Affordable Sustainable Housing Cap and Trade program, which ties affordable housing to transit. This suggests that AC Transit presence can provide improved transportation access for affordable housing residents. Thus, gentrification and displacement appears to have been an unplanned potential impact from the EBBRT project.

Lessons Already Learned

According to an AC Transit official, the EBBRT project was intended to be a quick and inexpensive project, but instead it has resulted in delays in construction and cost increases from going from an estimated \$185 million when it was first proposed to the currently cost of \$216 million. One community leader interviewee mentions that AC Transit was motivated by the potential to secure federal funds for EBBRT, but there were some other alternatives, including fare integration or maintaining local service that could have improved the process. However, a key constraint to pursuing such improvements is that federal funds are limited to EBBRT specific purposes and existing service, and other related improvements are not allowable under the federal grant.

AC Transit interviewees stated that they spent much time and resources to address the concern for parking. Further, according to AC Transit, monetary resources were restricted to primarily capital expenses although some community groups advocated using grant funds for other purposes such as economic development in the corridor. An AC Transit official mentioned that small businesses along International need a lot of support and many do not keep proper records. Dealing with businesses was one of the reasons AC Transit decided to give the mitigation funds to the City of Oakland because it is their responsibility to offer economic development resources, not AC Transit, said the AC Transit official.

Overall, AC Transit is not surprised that Oakland has only granted only two mitigation grants to date. An AC Transit official argues that the City historically has lacked efficiency and funds to support businesses. However, the AC Transit official recommends Oakland can help support the success of the EBBRT by ensuring the City's public services such as police, fire departments, and other critical services are properly funded. In addition, Oakland should provide avenues for its residents to let their transportation and other

needs known. The AC Transit official also pointed that San Leandro and Berkeley, both have a transportation commission of residents for such purposes and suggests Oakland to have something similar.

According to an AC Transit official, the EBBRT project brings three important opportunities: to test a dedicated bus lane in Oakland; catch up to San Francisco; and, to bring investments to East Oakland, an area that has experienced disinvestment for over 60 years. The investments are coming in the form of better transit service, lighting, safety, pavement, among other things, added the AC Transit official. Despite the potential of the project, even AC Transit leadership expressed skepticism about the project from the beginning, acknowledged the AC Transit official. This is due in part to the significant cost, not only monetarily but also the changes that the project is bringing to the area; the AC Transit official acknowledged that changes along the corridor represent an incremental financial gain for the area, but a gain that will not be experienced by everyone.

On the other hand, community leader interviewees emphasized that it is worth noting that the project is bound to offer valuable investments, but in tandem with changing the area's character. Nevertheless, skepticism was strong around the impact of displacement and gentrification and other questions about what the project will and will not do. For instance, there were some people early in the process who believed that light rail was a better alternative to cars.

AC Transit has learned a valuable lesson from the EBBRT Project, said an AC Transit official. As a result, it does not plan to manage another BRT project. AC Transit has learned that they are more equipped to support the operations instead of the construction and planning. According to the AC Transit official regional agencies are best suited to take on the construction of BRTs. Thus, this interviewees felt Alameda County Transportation Commission (ACTC) is better equipped to take lead on future BRT projects, and ACTC will be spearheading the upcoming BRT priority project along the San Pablo corridor that traverses several East Bay cities including Oakland.

AC Transit also noted that city officials from both Berkeley and San Leandro now wish the EBBRT had been successful or extended in their cities. They pointed to the overwhelming loss of the anti-BRT ballot measure (Measure KK in 2012) to show that residents of Berkeley wanted the EBBRT. They lamented decisions made between 2008 and 2012 that were “old school thinking” with regards to parking that affected their decision-making, which required much funding at the expense of better design, more greenery, livability, and landscaping. The type of changes and development many opponents spoke about is already happening in Berkeley—high density housing along transit corridors—regardless of BRT concluded an AC Transit official.

With respect to development, people along International will be impacted and the City of Oakland needs to identify solutions to protect long-term residents said one AC Transit official. This interviewee argued that Oakland should begin to consider building housing along the corridor, at seven to eight stories high. Like many community leaders, environmental justice advocates mentioned that EBBRT seems to signal the acceleration of gentrification and displacement in East Oakland. They mentioned that construction and

other improvements along the corridor are creating a significant impact for the small local businesses who are mom and pop shops with limited financial resources to make improvements to their business or afford higher rents. For future projects, EJ advocates propose engaging the community and as many voices early in the planning process to help mitigate some of the impacts of displacement and gentrification, in addition to lessening the impacts on businesses.

On the other hand, EJ advocates feel optimistic about the new bus fleets offering an opportunity to reduce pollution emissions in the area, which is positive for people's health and climate change. The advocates also acknowledged that despite the potential improvements, many people in East Oakland that do not live within walking distance of the corridor may have a difficult time accessing it via transit. One EJ interviewee said that for many East Oakland residents it is more reliable and efficient to drive than to take transit because of long travel times to take transit that connects to the corridor. Incentives to get people to drive less need to be adopted to complement EBBRT, perhaps having a free shuttle, like the one in Downtown Oakland, mentioned one EJ advocate.

Monitoring the EBBRT is something some community leaders want to see moving forward. According to an EJ advocate, part of monitoring the impacts and benefits this investment will bring require looking at the following fundamental questions: Identify who has access? Who benefits? How is this going to change the character of the corridor and the surrounding neighborhoods? What is the plan for mitigation displacement and gentrification?

Improvements were suggested by both community leaders and some professional voices. Both groups suggest that the following changes could have made the project more complete, such as tying regional assistance funds for affordable housing along the corridor in tandem with couple discretionary funding to support affordable housing at EBBRT stations. It was also suggested to make the project as robust as possible and have it expand from Berkeley to Bay Fair BART in San Leandro, this includes adding designated lanes along the corridor to make it more reliable. They also offered important metrics to measure the changes in and quantify the impacts and benefits of the EBBRT include: assessing ridership, survey riders, travel time savings, reductions in vehicle miles traveled and greenhouse gases, investments in the community in the forms of business assistance, number of local hired workers by zip code, tax revenues from businesses, the number of affordable units along the corridor, and demographic shifts along the corridor and more broadly in the region.

In conclusion, construction impacts have shown immediate impacts on businesses, but the longer term strengths, weaknesses, and overall impacts from the EBBRT project will take some time to show. What businesses and residents are experiencing along the corridor is not unique to the area, the shift in the economic, racial, and social fabric of the Bay Area Region has contributed to the threats and impacts from displacement and gentrification, mentioned a professional voice. Overall, professional voices have expressed that it is too early to tell, and it is not fair to say that the EBBRT project alone is causing all these changes.

Figure 9. Summary Table of Key Themes from Interviews

Community Leaders	Professional Voices
<ul style="list-style-type: none"> • Concerns of Gentrification and displacement: How is the city going to address it moving forward? • Disparities in construction build out • Cut down (loss) of trees • Increase in property values—future development • The community the project is intended for was not engaged • Project created by “technocrats” disconnected from the community • Lack of accountability across institutional actors • EBBRT signals displacement and gentrification • Engage community early in the planning process • Hopeful about reduction in pollution emissions • People supported the project (idea) but not how it developed • Long-time disinvestment in East Oakland • Businesses wanted to be left alone • Lack of business input on mitigation fund process • Find ways to fix the mitigation funds allocation • Offer incentives for residents to use transit • Improve bus network connections 	<ul style="list-style-type: none"> • EBBRT will improve commute times • EBBRT will add construction jobs • Oakland’s busiest corridor will see an improvement • EBBRT will Improve road conditions • Construction creates impacts on merchants-disruptive • Small business need “hand holding” (technical assistance) • Small businesses are not the only constituents, but they have more opportunity to vocalize concerns • Connection between EBBRT and displacement/gentrification isn’t proven • City of Oakland and AC Transit have structural challenges • EBBRT does not have a vision • EBBRT is AC Transit’s coveted project • Businesses don’t understand the mitigation funds process • Difficult to keep track of local hiring goals • AC Transit: Important to have a physical presence in the corridor • Some people do not know the project is happening • Internal political difficulties • Limited attention was paid to mitigation impacts and funding



Impact Analysis

To assess the potential impacts of the East Bay Bus Rapid Transit project on International Boulevard, we draw from qualitative and quantitative data to examine community participation, housing and land use, safety and access, business and construction, and environmental justice issues.

Community Participation Analysis

Community Participation in Berkeley and San Leandro

Several professional voices within the City of Oakland and AC Transit expressed opposition to the original project for several reasons. One in particular is due to potential impacts for merchants along the corridor. Merchants in all three proposed cities expressed concerns about impacts to their businesses. However, merchants had a strong voice in preventing EBBRT in Berkeley and merchants in San Leandro changed the original EBBRT route.

During the planning process, community in San Leandro and Berkeley was effective at voicing their concerns. In Berkeley, the strong community presence from residents and merchants rejected the EBBRT project despite the strong council support. In San Leandro, strong community voices mainly from merchants changed the routing of the EBBRT from Bay Fair BART to San Leandro BART. San Leandro merchants feared that an added lane in East 14th Street was going to impact their business which was similar to the concerns from Berkeley residents and merchants, who expressed concern about the loss of parking and stops. However, throughout most of San Leandro's East 14th Street the road is wider in most sections and the intention from AC Transit was not to dedicate a bus lane, said an AC Transit representative. According to an AC Transit representative, the agency acknowledges they did a poor job at communicating the benefits and impacts to San Leandro constituents.

Community Participation in Oakland

Transportation advocates like TransForm supported the EBBRT project because they also believed in improving and providing a better transit service to East Oaklanders and transit riders. However, funding issues impacted the organization's ability to continue engaging throughout the process, perhaps contributing to the unfavorable outcomes experienced during construction. For about 10 to 12 years TransForm served as the community anchor connecting the City of Oakland and local community based organizations around transportation issues. Engaging rooted community groups and service providers in East Oakland was a valuable selling point to bring multiple stakeholders together. In addition, a TransForm staff member mentioned that the organization served as the outreach arm AC Transit did not have in East Oakland, and offered AC Transit an opportunity to access the community. Three key community groups were engaged in the outreach process during planning, each representing the predominant neighborhood areas in the corridor. These groups are Allen Temple Baptist Church, representing deep East Oakland; the Unity Council, representing Fruitvale Area; and EBAYC (East Bay Asian Youth Center), representing San Antonio. Each group had their particular asks from the project with EBAYC requesting direct financial support to support businesses, Allen Temple Baptist Church seeking parking for church members and safety and accessibility for seniors, and Unity Council advocating for direct business support.

Pressure from East Oakland residents and community groups moved AC Transit to become more adaptive of incorporating community suggestions including several design overhauls to accommodate various actors—city councils, local churches, and businesses. Specifically, AC Transit conducted a multiple-step review of bus stops for maximum efficiency coupled with accessibility; identified and removed low-performing bus stops; additionally, they intentionally located bus stops near senior/medical facilities due to the activism from Allen Temple Baptist Church's members.

It is common for many riders to lack any affiliation to an organized group. Often times riders--most likely unaffiliated--are neglected by decision makers. Whereas, organized groups and merchants are more likely to participate in the decision making process, and therefore have more access to decision-makers. Community organizations like ACCE, StreetLevel Health, APEN, Clínica De La Raza, Asian Health Services, among others initiated an effort to represent transit riders along International but was short-lived.

A public-private partnership in East Oakland emerged as a vision for development without displacement and established a community governance for development. The efforts of this initiative helped secure over \$850 million on commitments for investments and development in East Oakland for a 10-year period. This was the Oakland Sustainable Neighborhoods Initiative (OSNI), the space that convened community based groups in East Oakland.

Nevertheless, the values of OSNI were tested after the adoption of the EBBRT project due to its potential displacement impacts but also the economic opportunities from the development. OSNI member groups took action and discussed mitigation solutions around

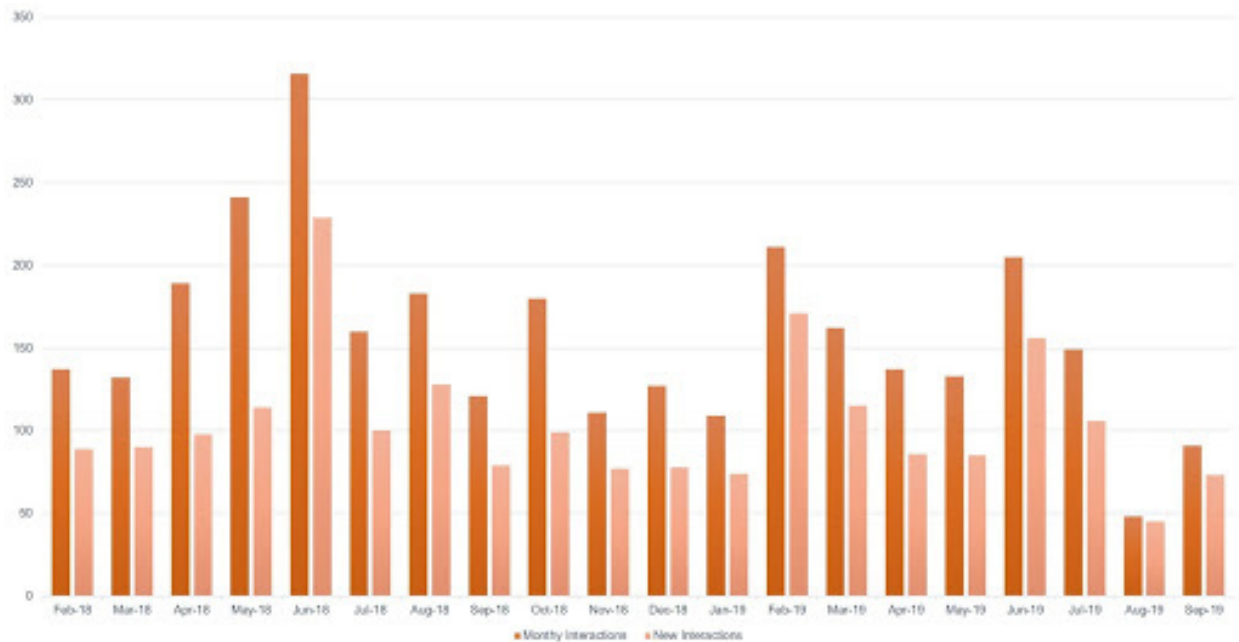
displacement and development, as a result a mitigation plan for business emerged from this space.

OSNI not only served as a space for community groups to voice their concerns and needs around the EBBRT but also for resident leaders through the Community Planning Leaders (CPL), a leadership project led by Causa Justa:Just Cause. CPL served an outreach function during the EBBRT planning process whereby leaders in CPL reached out to merchants and residents along the corridor. Over two years, from 2012-2014, the group conducted detailed outreach to residents and businesses between 23rd to 89th Avenues along International Boulevard. The primary concern that emerged from residents and merchants was the loss of parking. A culmination of the CPL outreach efforts led to town halls with merchants and residents, which offered opportunities to share more information about the EBBRT project and discuss concerns from the public.

Outreach in the Corridor by AC Transit

Having a daily community presence has been a significant achievement the AC Transit Construction Outreach Team has accomplished over the last two years since construction began according to AC Transit interviewees. For instance, the AC Transit Outreach Team has engaged hundreds of people in conversation along the corridor (Figure 10). On average, the outreach team interacted with about 157 people every month from February 2018 to September 2019. Of note, one agency interviewee noted that the Federal Highway Administration has considered AC Transit’s community presence in the corridor as a model to follow in future projects.

Figure 10. Monthly Outreach Interactions from February 2018 to September 2019



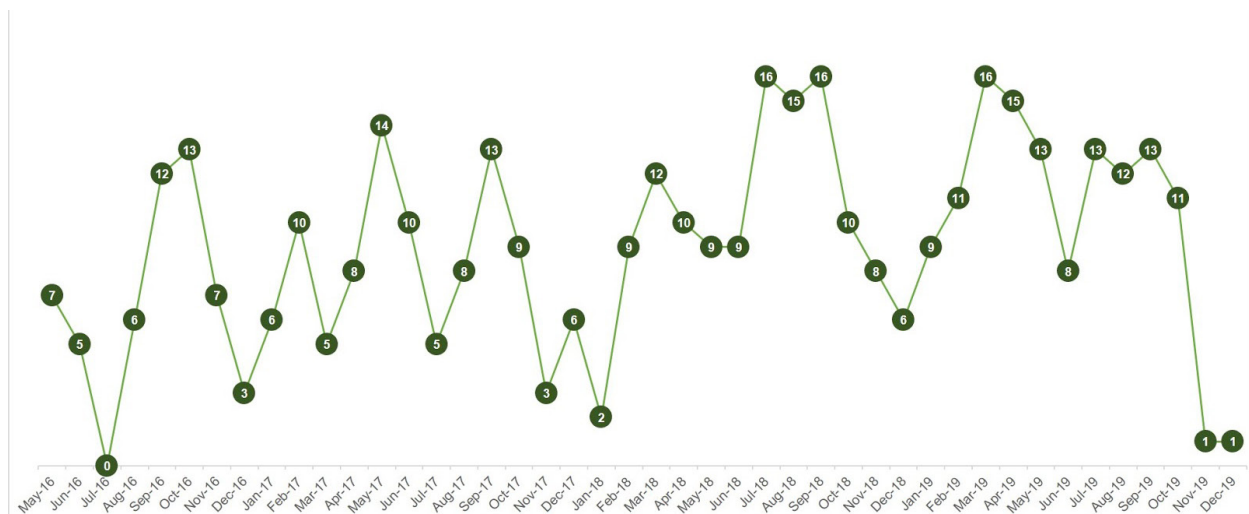
Source: AC Transit Staff Monthly Reports to the AC Transit Board of Directors, 2019.

The Outreach team has five team members, an office manager, a communications staff, and three staff that are the “boots on the ground” and are tasked with reaching out to businesses along the corridor. Residents and merchants come into the AC Transit office

situated in International Boulevard and 34th Avenue to learn about the EBBRT project and express concerns, particularly related to construction disruption along the corridor. For instance, both merchants and other daily users of the corridor want the disruption from the construction to end as soon as possible. AC Transit is similarly eager. However, construction is expected to last until March 2020 as previously noted.

In the last two years the AC Transit Outreach Team has engaged thousands of stakeholders along the corridor (Figures 10 and 11). The AC Transit Community Outreach Team has participated in about 390 outreach events as of October, 2019 (Figure 11). The team has built valuable relationships and trust according to an AC Transit staff. However, the team will not have a permanent physical presence in the area post-construction as the team is temporarily there to help mitigate construction related impacts. AC Transit staff said the agency is thinking about the type of resources and presence they will like to have once construction is over and bus operations begin. Lastly, in an effort to generate the public’s interest to utilize EBBRT, AC Transit will offer a three month free bus fare, most likely to be offered in early 2020.

Figure 11. Outreach Events per month from May 2016 to December 2019



Source: AC Transit Staff Monthly Reports to the AC Transit Board of Directors, 2019.

Housing and Land Use Analysis

Access and security to affordable housing is one of the most pressing and urgent issues for people in the Bay Area, particularly for low-income communities and communities of color. With Oakland's median apartment rent climbing to \$3,000 a month and the median home value reaching \$737,000, the ability to live in an affordable, safe, and healthy home is out of reach for most people.³³

The emerging academic research on BRT's impacts on displacement/housing shows that BRT tends to have the same impact as light rail, increasing surrounding property values by 10% to 20%.³⁴ For BRT to be effective in increasing ridership, the number of people living along the corridor must increase through other changes in zoning and increased dense development. These changes subsequently put more pressure on existing housing stock and businesses as land prices increase with the increased desirability of the area.

Figure 12. Current Housing Impacted by Construction on International & 15th Avenue



Source: UC Berkeley Transportation Studio, 2019.

current map and chart of zoning along International). According to this plan, some of the potential benefits of included increased resale value of properties around BRT, increased foot traffic for businesses, and reduced automobile use.³⁶ Coming out of the Great Recession, gentrification and displacement was not a significant part of the IBTOD plan or a concern for many community members, according to interviews.

Land use planning is an integral, but often invisible, part of determining who has access to opportunities, health, and wellbeing within a city. The ways in which pieces of land are designated for certain uses impacts the investments there and subsequent who can afford to live and work in a city. These zoning changes are indicators of future development that may displace current residents and businesses. Of note, in July 2017, the San Francisco Business Times published an article stating that the five hottest neighborhoods in the Bay Area for home appreciation are in East Oakland based on Zillow data. The neighborhoods were North Stonehurst, St. Elizabeth, Highland, Columbia Gardens, and Lockwood-Tevis.³⁷

Zoning along International Boulevard

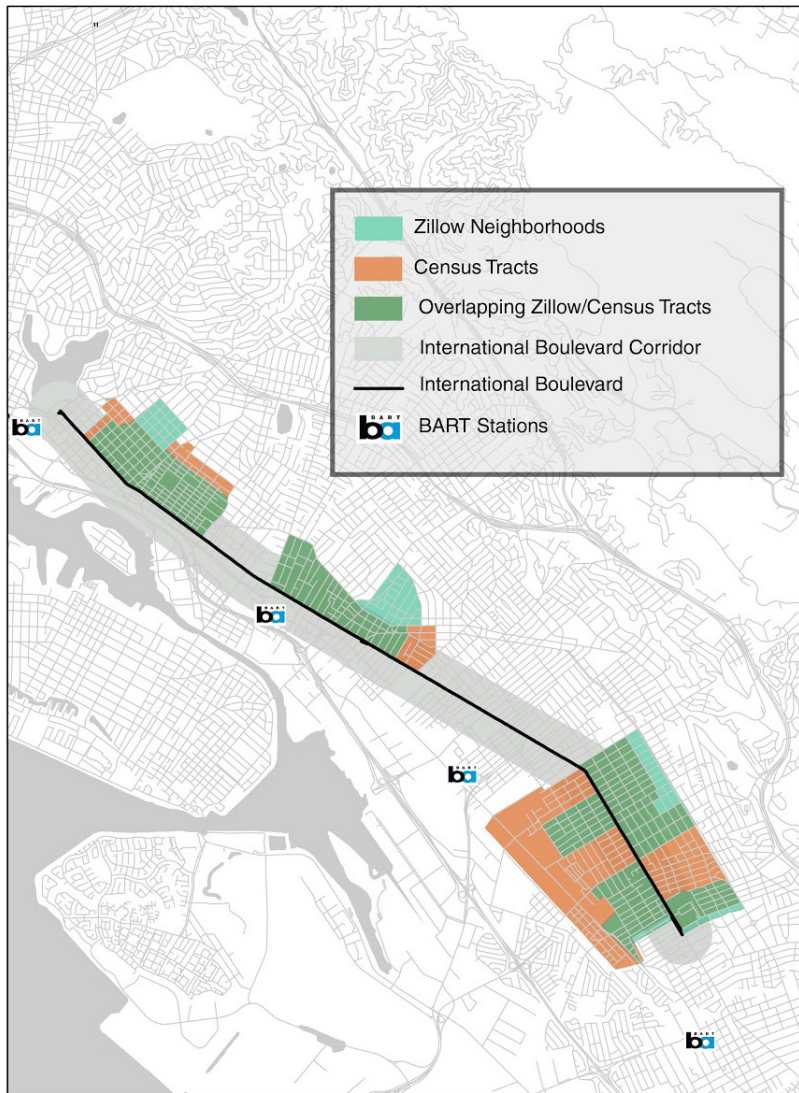
Prior to 2011, most of International Boulevard was zoned for medium-density mix of residential and commercial uses, along with higher density residential and commercial land uses with an emphasis on auto repair and wholesale sales.³⁵ However, after the adoption of the International Boulevard TOD Plan, there was a pronounced shift towards promoting greater density, compact development, pedestrian-scale environments and a mix of uses that would feed off the EBBRT project (see Appendix Item B for

Housing and Demographic Changes Along International

To assess these and related changes in house prices and rent along International Boulevard, we examined Zillow data for housing prices and rents in neighborhoods along the corridor. We also assessed demographic changes along the corridor by looking at changes in race/ethnicity and income of renter households from 2012 to 2017 using American Community Survey (ACS) 5-year data sets (See Appendix Item 4 for more information).

Figure 14 outlines the changes in neighborhood home values and rents from 2012 to 2017. It should be noted that Zillow creates their own neighborhood boundaries and as a result, their neighborhood definitions do not line up exactly with census tracts. Figure 13 illustrates the overlap in the areas.

Figure 13. Zillow Neighborhoods and Census Tracts along International



Source: Zillow Data and US Census Tracts, 2019.

In addition, Zillow begins tracking neighborhood information when a neighborhood becomes more desirable and the real estate and rental market becomes hotter.³⁸ Thus, not every neighborhood in the analysis has data going back more than seven years.

For neighborhoods along International Boulevard, median home values increased more than Oakland as a whole, while median rents increased at approximately the same rate between 2012 and 2017 (Figure 14).

Figure 14 demonstrates that home values and rent prices have increased significantly since the EBBRT project was approved in 2012. At the same time that rents have increased, renters' median incomes still remain a few thousand dollars less than median incomes overall (see Figure 15). Median incomes have not increased at the same pace as home values

Figure 14. Table of Median Home Values and Rents along International Boulevard

	Median Home Values		Median Rents	
	2012	2017	2012	2017
Eastlake/San Antonio	\$ 246,118	\$ 589,400	\$ 1,814	\$ 2,698
	Percent Change +139%		Percent Change +49%	
Fruitvale	\$ 180,682	\$ 467,050	\$ 1,693	\$ 2,625
	Percent Change +158%		Percent Change +55%	
Elmhurst/Deep East	\$ 200,448	\$ 398,460	\$ 1,784	\$ 2,591
	Percent Change +99%		Percent Change +45%	
International Blvd Neighborhoods	\$ 205,694	\$ 447,900	\$ 1,763	\$ 2,619
	Percent Change +118%		Percent Change +49%	
Oakland	\$ 377,897	\$ 740,700	\$ 1,976	\$ 2,884
	Percent Change +96%		Percent Change +46%	

Source: Zillow Home Value Index (ZHVI) Single-Family Homes Time Series, & Zillow Rent Index (ZRI) Multifamily, SFR, Condo/Co-op Time Series. Values from September in each year. Adjusted 2017 dollars.

Figure 15. Median Income Change by Housing Tenure from 2012 to 2017

	All HH Median Income 2012	All HH Median Income 2017	Renter HH Median Income 2012	Renter HH Median Income 2017
Clinton/San Antonio	\$ 35,024	\$ 40,131	\$ 32,366	\$ 35,629
	Percent Change +10%		Percent Change +10%	
Fruitvale	\$ 37,535	\$ 44,191	\$ 32,450	\$ 39,969
	Percent Change +18%		Percent Change +23%	
Elmhurst/Deep East	\$ 43,246	\$ 46,439	\$ 33,028	\$ 43,039
	Percent Change +7%		Percent Change +30%	
All International Tracts	\$ 37,173	\$ 42,008	\$ 30,776	\$ 37,168
	Percent Change +13%		Percent Change +21%	
Oakland	\$ 66,921	\$ 74,613	\$ 44,094	\$ 52,199
	Percent Change +11%		Percent Change +18%	

Source: ACS 2012 5 year estimates and ACS 2017 five year estimates, Table B25119 and S1903. All values in 2017 dollars.

From these findings, it is clear that renters are having a harder time making ends meet and are more vulnerable to rent increases leading to displacement.

In addition, we created an affordability table to compare the changes in rents to the changes in renter household income. The following table (Figure 16) displays the percent rent increase between 2012 and 2017, as well as the percent of median income that a renter household would have to spend on the median rent in their neighborhood.

Figure 16. Affordability Table from 2012 to 2017

	2012 Median Rent	2017 Median Rent	% Rent Increase 2012-2017	Median Renter HH Income 2012	% Income to Rent 2012	Median Renter HH Income 2017	% Income to Rent 2017
Eastlake/San Antonio	\$ 1,814	\$ 2,698	+49%	\$ 32,366	67%	\$ 35,629	91%
Fruitvale	\$ 1,693	\$ 2,625	+55%	\$ 32,450	63%	\$ 39,969	79%
Elmhurst/Deep East	\$ 1,784	\$ 2,591	+45%	\$ 33,028	65%	\$ 43,039	72%
International Blvd Neighborhoods	\$ 1,763	\$ 2,619	+49%	\$ 30,776	69%	\$ 37,168	85%
Oakland	\$ 1,976	\$ 2,884	+46%	\$ 44,094	54%	\$ 52,199	66%

Source: Zillow Rent Index (ZRI) Multifamily, SFR, Condo/Co-op Time Series. ACS five year estimates 2017, Table B25119. Zillow values for September of every year. All values in 2017 dollars.

In 2017, a household making the median income for a renter household along International Boulevard (\$37,168/year) would have to spend 85% of their income to afford the median rent (\$2,619/month). This is untenable for anyone, especially working people living paycheck to paycheck, and does not allow households to save, exacerbating the racial wealth gap between households of color and white households.³⁹

With this disproportionate increase in rents in comparison to incomes, there is potential for EBBRT to displace long time and vulnerable transit-dependent residents, like seniors, people with disabilities, low-income folks, and people of color, who could benefit most from reliable, fast, and efficient transit service.

With these staggering statistics, it is not surprising that the overwhelming majority of unhoused folks in the Bay Area are originally from the city where they currently live on the street. This is true of 78% of street homeless individuals in Alameda County, based on the 2019 point in time count.⁴⁰ In Oakland in 2017, a city which is known for its vibrant black arts, culture, and history, 70% of unhoused residents are black compared to the city’s population overall which is 23% black.⁴¹

Between 2012 and 2017, neighborhoods along International Boulevard saw a decrease in

their Black and Asian populations and an increase in their White and Latino populations (see Figure 17). In that period, Oakland saw a 12.8% decrease in its Black population to 22.8% of the overall population. This follows a continuous decline from 43% in 1990 to 35% in 2000 to 27% in 2010.⁴² Between 2012 and 2017, neighborhoods along International have seen a 29.3% increase in the number of white residents and 23% increase in “all other” races while they have lost 7.6% of their black population (see Figure 17).

While we cannot say to what magnitude, EBBRT may further exacerbate increasing rents as the neighborhoods along International become more accessible and desirable to a higher income and whiter demographic. The displacement pressures which disproportionately impact low-income people and people of color across Oakland are impacting communities along International Boulevard. The displacement of long-time residents—whether they move out of Oakland or end up unhoused on Oakland’s streets—negatively impacts neighborhood stability, civic life, and the soul of Oakland.⁴³

Figure 17. Race/Ethnicity Change along International Boulevard from 2012 to 2017

	White		Black		Asian		Latinx		All Other	
	2012	2017	2012	2017	2012	2017	2012	2017	2012	2017
Clinton/San Antonio	7.8%	10.5%	15.10%	18.2%	45.3%	38.0%	27.50%	27.5%	4.3%	5.8%
Percent Change	+34.3%		+20.7%		-16.1%		-0.2%		+36.6%	
Raw Number	1,053	1,546	2,111	2,692	6,096	5,611	3,782	4,267	5,86	832
Fruitvale	5.3%	5.4%	13.3%	12.4%	10.5%	12.8%	69.9%	66.8%	1.0%	2.5%
Percent Change	1.5%		-6.8%		22.4%		-4.4%		151.2%	
Raw Number	567	652	1,215	1,271	1,056	1,496	6,807	7,572	99	278
Elmhurst/Deep East	4.3%	4.6%	27.2%	28.0%	5.40%	4.3%	59.5%	60.2%	3.6%	2.9%
Percent Change	5.8%		3.0%		-20.3%		1.1%		-17.8%	
Raw Number	1,241	1,287	7819	7,685	1,481	1,212	17,202	16,510	977	764
All International Tracts	6.80%	8.8%	24.2%	22.4%	17.9%	16.5%	47.1%	47.5%	3.9%	4.9%
Percent Change	29.3%		-7.6%		-8.2%		0.9%		22.9%	
Raw Number	6,784	8,820	27,566	26,972	17,055	16,055	52,826	56,547	4,058	5,179
All Oakland	29.3%	31.3%	26.1%	22.8%	17.2%	16.2%	22.3%	23.5%	5.0%	6.3%
Percent Change	6.6%		-12.8%		-5.9%		5.2%		25.7%	
Raw Number	112,000	124,159	105,902	98,901	67,500	68,095	100,549	113,483	20,593	27,010

Source: ACS 2012 5 year estimates and ACS 2017 5 year estimates, Table B03002. Total population in census tracts along International Boulevard was 108,289 in 2012 and 113,573 in 2017. “All Other” category includes American Indian, Native Hawaiian, Two or More Races, and Other.

Access and Safety Analysis

Transportation scholars often make the distinction between “mobility” and “accessibility” in that mobility is about how far you can go in a certain amount of time and accessibility is how much you can reach in that amount of time. Mobility is about the movement and accessibility is about the destinations or how “get-at-able” are places. Mobility is about increasing speed where accessibility is about decreasing distance. These definitions inform our understanding of and approach to this analysis. AC Transit also highlights accessibility as being one of the key goals of the EBBRT:

“The bus floor and the station platform are at the same level to ease the boarding experience for people in wheelchairs or with strollers. Median stations will reduce street crossing distance.”⁴⁴

International Boulevard is auto-dominated corridor (and state highway)—and has been for decades since the removal of the Key System. Years of governance prioritizing the mobility of vehicles over people have resulted in spatial, economic, health and environmental inequities. Regionally in the Bay Area, nearly 15% of people of color do not have access to a car and, in particular, 23% of the black population does not have access to a car, as compared to only 10% of whites.⁴⁵ In census tracts along International Boulevard, approximately 20% of households do not have access to a vehicle.⁴⁶ Access to public transit and safe pedestrian assures greater autonomy for people with limited modal choices. Additionally, International Boulevard is home to numerous schools, medical institutions, religious organizations and senior services, so there is great need for accessible transportation infrastructure.

Figure 18. Parked Vehicles Obstructing Sidewalk Access

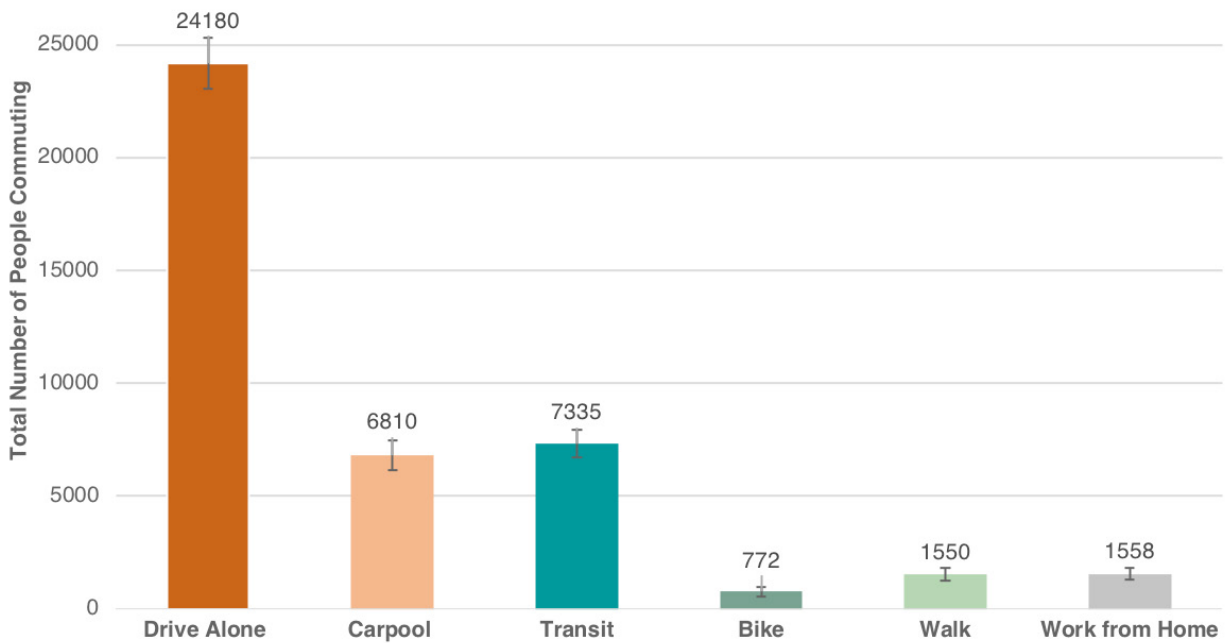


Source: UC Berkeley Transportation Studio, 2019.

Communities have adapted to the difficult physical conditions presented by the corridor—brought on by systemic factors encouraging vehicle mobility. Currently, International Boulevard is particularly inaccessible for pedestrians and bicyclists (Figure 19). Approximately 56% of all people living in census tracts around International report that they rely on vehicles to get to work versus 17% who take transit. Of the 17% who take transit, about half report relying on the bus (versus taking BART). Walking and biking represent the smallest modal categories (Figure 19). Additionally, from our preliminary findings, over one third of people living in census

tracts along International Boulevard have commutes between thirty minutes to an hour. Approximately 14% of people have commutes over ninety-minutes; while 17% have fifteen minutes or less of commuting. In sum, people living along International are dependent on vehicles to get to work, despite twenty percent of people not having access to a vehicle; and a large percentage of people cannot get to work within thirty minutes or less. Longer commutes can have enormous wellbeing, economic and environmental consequences.⁴⁷

Figure 19. Reliance on Vehicles for Residents Along International



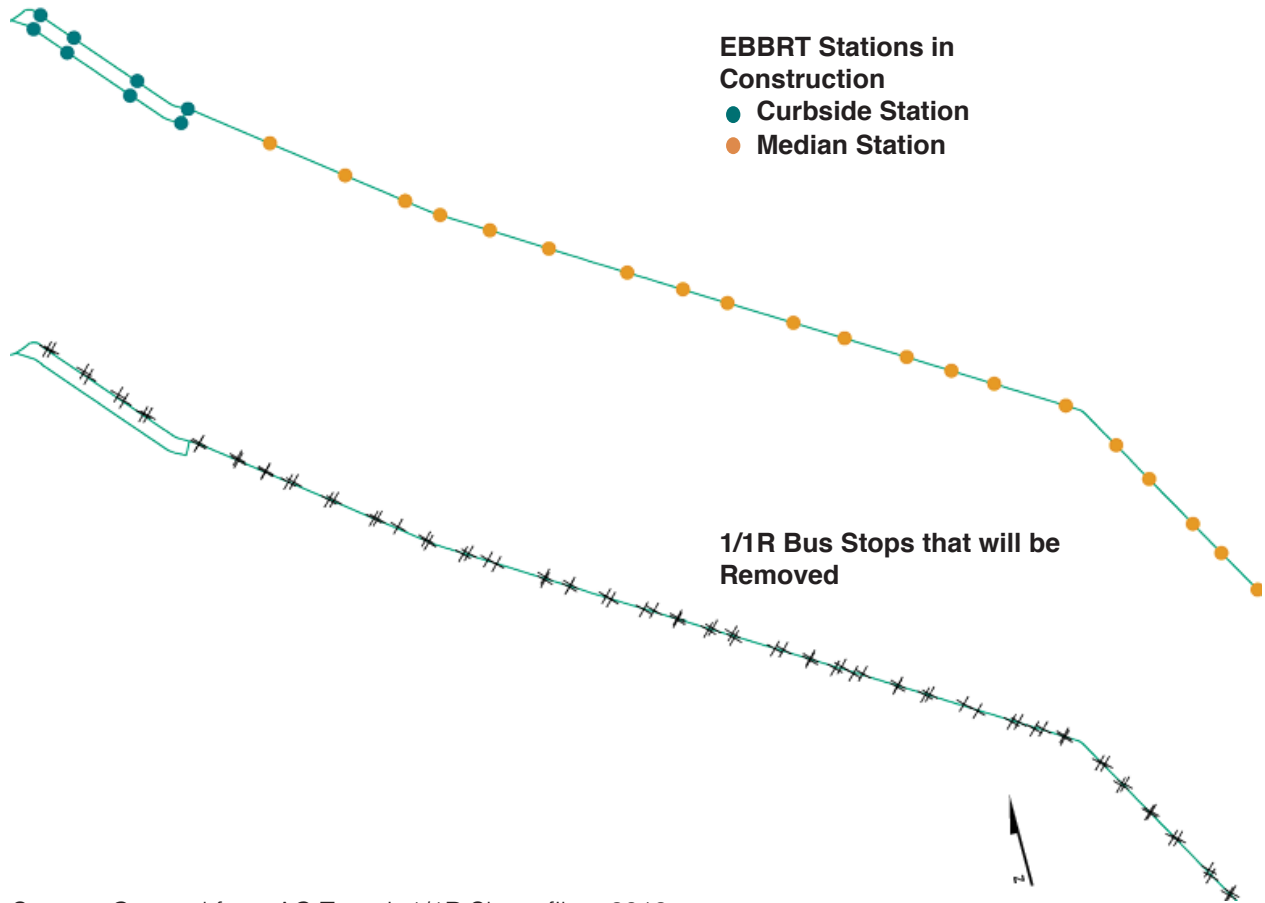
Source: ACS 2012-2017 5 year estimates, Table B08201 (Commute to work).

EBBRT Station Access versus 1/1R Access

The development of the International Boulevard EBBRT project showcases the trade-off between mobility and accessibility. Currently the 1 Bus Route makes seventy-six stops along International (both east & westbound), whereas the EBBRT will be making forty-six stops, a loss of thirty stops.⁴⁸ This equates to a forty percent reduction in the total number of bus stops (see Figure 20). To achieve greater speeds for the EBBRT, the bus needs to make fewer stops which reduces the overall accessibility to transit stations (similar to rail systems). Such changes can pose undue burdens on seniors, children, and people with mobility challenges (such as people who have pain while walking).

Currently, EBBRT stations are spaced out approximately one-third of a mile between each other as compared to one-fifth of a mile between each 1 Bus Stop; however National Association of City Transportation Officials (NACTO) guidelines recommend even greater spacing--three-fourths of a mile for BRT systems.⁴⁹ According to the Final EIR, planning efforts were made to locate stations near cultural and medical institutions (including schools).⁵⁰

Figure 20. Map of New EBBRT Stops versus 1/1R Stops to be Removed



Source: Created from AC Transit 1/1R Shapefiles, 2019.

However, per some community advocates, EBBRT bus stop placements were not sufficient. Prior to and after the approval of the project in 2012, there was strong activism and community organizing to assure greater access to transit. In 2012, Allen Temple Baptist Church in a press release stated that the EBBRT would, “Harm the interests of senior and disabled citizens in our residential facilities...by [reducing] the number of bus stops and lengthening the distances between stops.”⁵¹ According to one community leader, without their advocacy, one of the bus stops around Allen Temple Arms would have been removed (Figure 21). Without constituent pressure, the EBBRT bus station spacing could have been even greater than the average of one-third of a mile. Given these new constraints for riders, it is vital that pedestrian infrastructure is safe and adequately allows people to access the new stations.

Safety & Collision Analysis

International Boulevard, from a traffic safety perspective, is dangerous; it has been identified as part of Oakland’s high injury network, meaning that is one of several streets that is disproportionately burdened with severe and fatal collisions.⁵² The EBBRT project

Figure 21. EBBRT Stations near Allen Temple Baptist Church & Allen Temple Arms Senior Housing



Source: UC Berkeley Transportation Studio, 2019.

extremely vulnerable. The Centers for Disease Control (CDC) estimate that pedestrians are one and a half times more likely than motorists to be fatally injured in a crash; and amongst pedestrians, seniors and children are disproportionately at risk of being in severe and fatal collisions.⁵⁶

Along with the rising number of pedestrian-involved collisions, injuries and fatalities have also increased along International. Between 2014 and 2015, there was an alarming 26% spike in injuries and fatalities (the same year constituents reported initial EBBRT-related construction). Further analysis is required to determine if there may be a causal relationship; however, it is a deeply concerning finding and requires further analysis and action.

strives to improve traffic safety outcomes by, for example, limiting speeds on International (from 35 miles per hour to 25), decreasing roadway space dedicated to non-BRT traffic, implementing median stations, adding new pavement and adding more crosswalks.⁵³

From 2007 to 2017, there has been an escalating amount of collisions along International, particularly between 2014 and 2015 (a thirty percent increase in just one year) (Figure 22). It is important to mention that EBBRT-related construction efforts began in 2015 (despite AC Transit officially breaking ground in 2016).⁵⁴

Total numbers of pedestrian-involved collisions have also shown a concerning upwards trend, while the total number of bicycle-involved collisions have stayed relatively steady over a decade. This may be due to increasing numbers of people feeling uncomfortable biking on a corridor without any designated infrastructure and, thus, there may be fewer bicyclists in total.⁵⁵ As compared to other modes (other than bicycling), pedestrians are

Figure 22. The Rising Numbers of Reported Collisions on the Future EBBRT Route

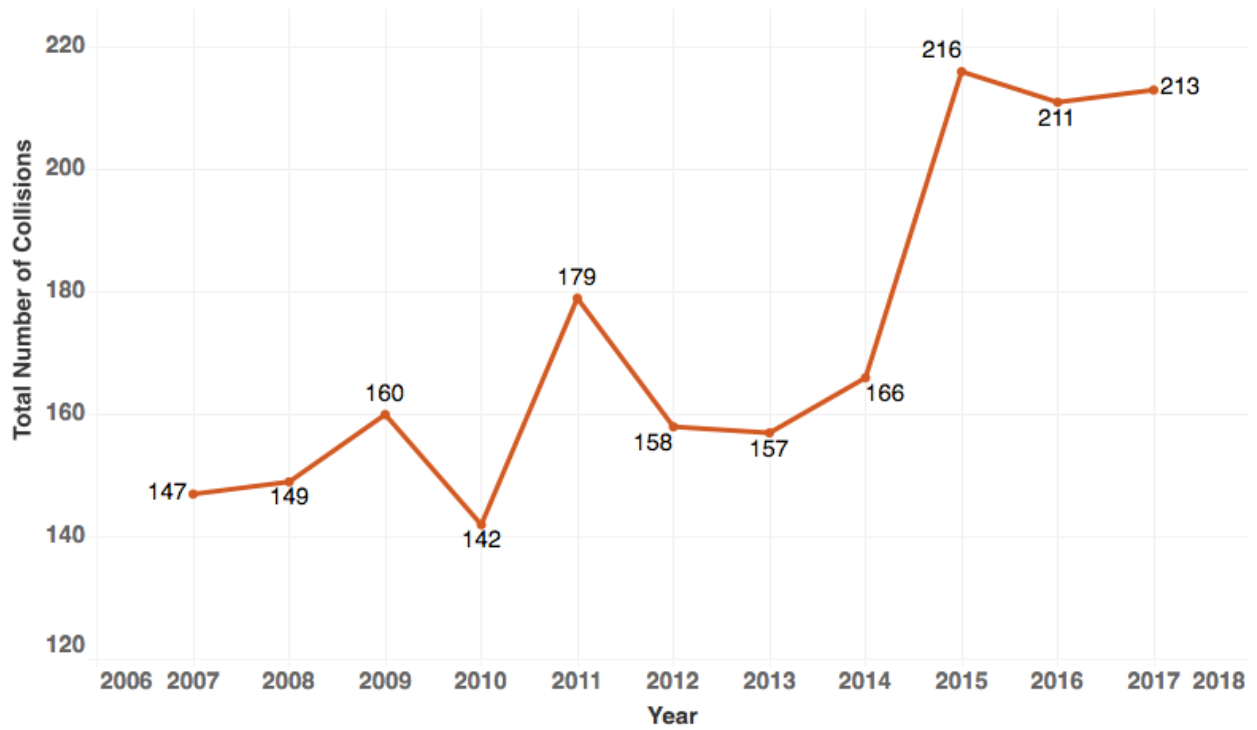
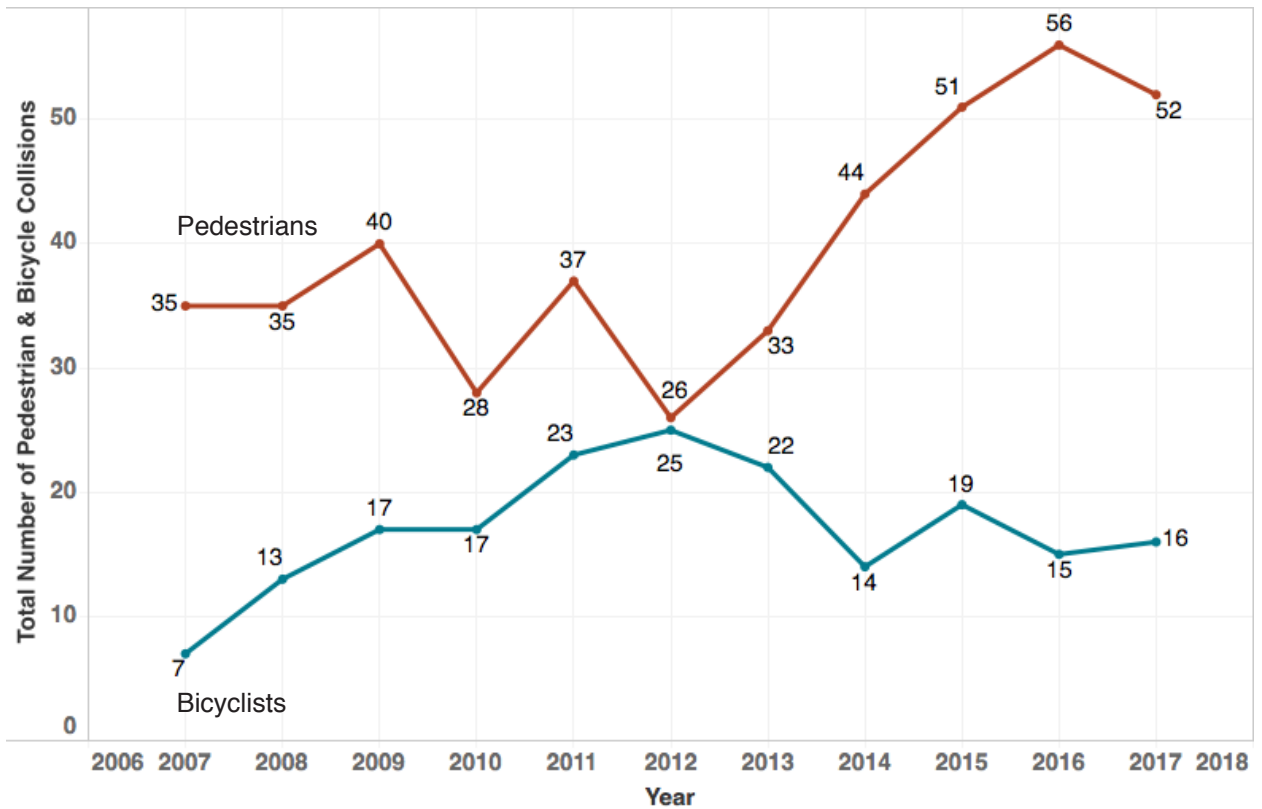
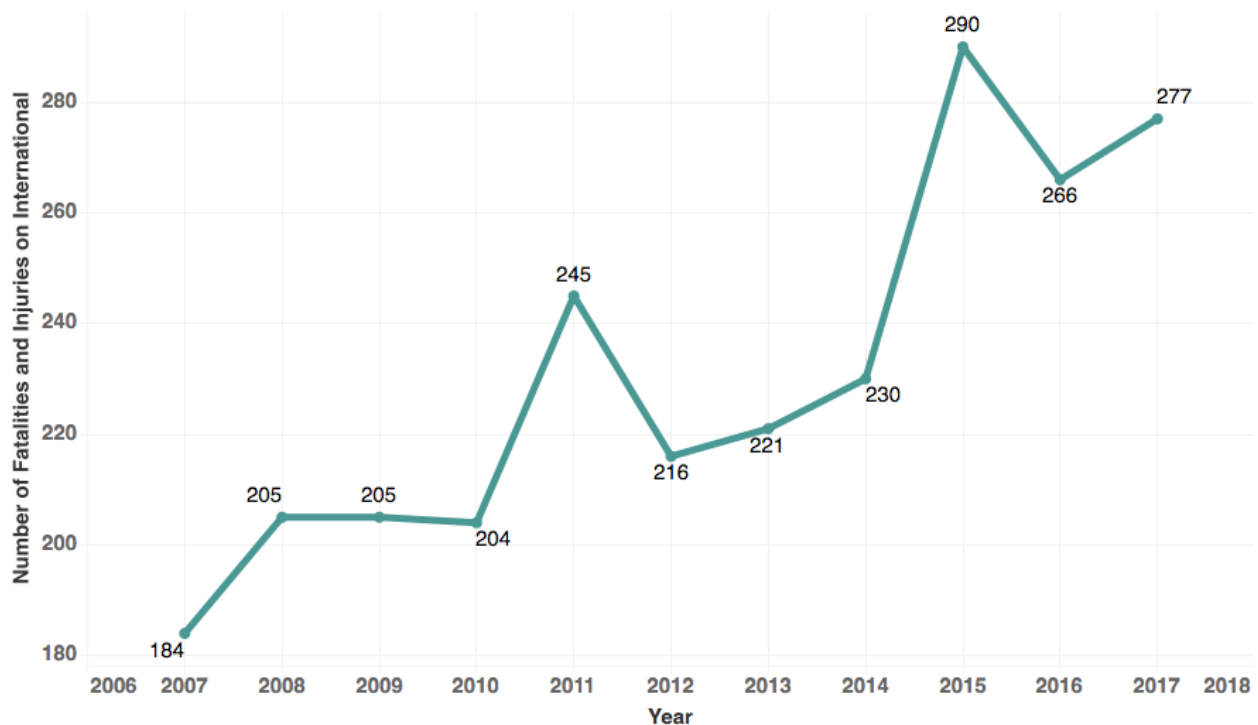


Figure 23. The Rising Number of Pedestrian Collisions on the Future EBBRT Route



Source (both Figures): Data obtained from SWITRS, 2007-2017. 2017 is the most recent year available. Collisions reported if within 100 ft. of the East Oakland BRT Route. Data may be under-reported.

Figure 24. Rising Numbers of Fatalities & Injuries for All Mode Types on International



Source: Data obtained from SWITRS, 2007-2017. 2017 is the most recent year available. Collisions reported if within 100 ft. of the East Oakland BRT Route. Data may be under-reported.

We have not identified exposure rates—in other words, how much traffic volume has increased over the years (as the data are inaccessible and difficult to obtain). If there are more people moving along the corridor, then we may expect to also see collisions increase. There may be additional factors driving up collision rates, such as mobile device usage and larger vehicles on the road. We currently do not have access to data post-2017 which could help further determine the construction impacts on safety (as EBBRT construction officially began in 2016). Moving forward, these data will be vitally important for analysis to inform similar projects in the future and to assess the overall physical design changes along International.

Constituents along the corridor have expressed concerns about the safety of the project, particularly the median stations. As mentioned prior, the median stations are one of two strategies for improving accessibility and safety per AC Transit. While median stations may provide a halfway point for transit users and pedestrians crossing International, they may exacerbate feelings of discomfort and danger (i.e. for people with smaller children who are at risk of unknowingly running into oncoming traffic). If motorists are still speeding along International and/or illegally driving in the EBBRT lane, such concerns may become reality.

Currently, the bus lane will not be painted a different color (like the “red carpet” lanes of San Francisco) and the main source of enforcement will come from cameras installed on the EBBRT buses per an interviewed AC Transit official.⁵⁷ Other research on BRT systems broadly have showcased that findings are mixed with regards to overall safety depending

on locally-specific factors.⁵⁸ Research seems to indicate that BRT can improve safety but can come at a cost of, “Increased risk on the nearby streets.”⁵⁹ Additionally, research has indicated that construction can worsen traffic safety conditions before BRT is placed in service. It is clear from existing research and from our preliminary findings that increased vigilance and action is required pre- and post-EBBRT service implementation as safety is critical to the potential success of EBBRT. From our analysis, action and monitoring is required to address the rising number of crashes, injuries and fatalities along International. It also remains vital to ensure that the communities dealing with the dangerous road conditions of past and present, also reap potential safety gains of tomorrow.

Business and Construction Analysis

Oakland Growth: International Boulevard

Transportation planning enables economic development and access to jobs. The Bay Area is expected to experience a significant job growth in the next 20 years. According to the 2013 Plan Bay Area, San Francisco, San Jose, and Oakland are the top three cities in the nine-county Bay Area that will make up about 40% of the jobs created from 2010 to 2040.⁶⁰ Plan Bay Area is a long-range regional transportation plan coupled with sustainable strategies for the nine-county Bay Area. Job growth increases demand for more housing, particularly nearby transit. Furthermore, Plan Bay Area also highlights that two-thirds of the job growth occurs in Priority Development Areas (PDAs) and all International Boulevard is considered a PDA.

Plan Bay Area projects in Oakland will add about 85,260 jobs by 2040. According to 2009 ABAG and MTC projections, approximately 4,468 new housing units will be produced along the International Boulevard corridor and approximately 6,700 new jobs will be produced in the context area. Investments to meet the demands of this growth requires among many things building the proper transit infrastructure to accommodate more people moving throughout Oakland. EBBRT is poised to become the long-term project transportation investment that can support the projected growth for Oakland. However, it is unclear the type of jobs that will be created in the upcoming decades, who will have access to the jobs and where workers will live. Employment growth in Oakland has to complement with housing growth specifically housing at all income levels.

Construction and Jobs

The EBBRT project is expected to stimulate the local economy by creating three hundred temporary construction jobs, currently the project has delivered 166 local jobs for Oakland and San Leandro residents. In addition, four hundred temporary local jobs in retail, services, and manufacturing, all during the construction.⁶¹ Despite the short-term job goals, it is difficult to track the current temporary jobs generated and determine whether the project is meeting the projected job creation jobs. Therefore, it becomes important that the EBBRT project meets the project labor agreements which support local job training and hiring of disadvantaged workers.

Figure 25. 1/1R Bus on International advertising local hiring



Source: UC Berkeley Transportation Studio, 2019.

As part of the construction a project labor agreement (PLA) was reached between the Alameda County Building Trades, AC Transit, and the City of Oakland. The PLA is composed of three main goals: provide temporary employment for local residents of Oakland and San Leandro, give opportunities to disadvantaged workers, and create an apprenticeship pipeline; the established goals are listed below. It is also worth mentioning that \$.10 of every worked hour is collected and granted to construction training and

employment organizations based in Oakland and San Leandro.

- Local Hire: Goal of 50% of all hours worked on the project are to be performed by Oakland and San Leandro residents
- Apprentice Utilization: 20% of all hours worked on the project are to be performed by apprentices.
- Disadvantaged Workers: Goal of 25% of all apprentice hours are to be performed by individuals with barriers to employment.

An EBBRT Progress report shared with the BRT Policy Steering Committee shows that about 166 local construction jobs have been generated as of the September 2019, Figure 26 shows all local workers hired from October 2018 to September 2019. However, the project does not seem to be on target to complete the 50% local hire work hours. The current percentage of work hours is about 35% as of September 2019. Also, the apprenticeship and disadvantaged workers goals are as of September 2019 both at 14%. However, with the extension of the project timeline there might be an opportunity to increase the percentage.

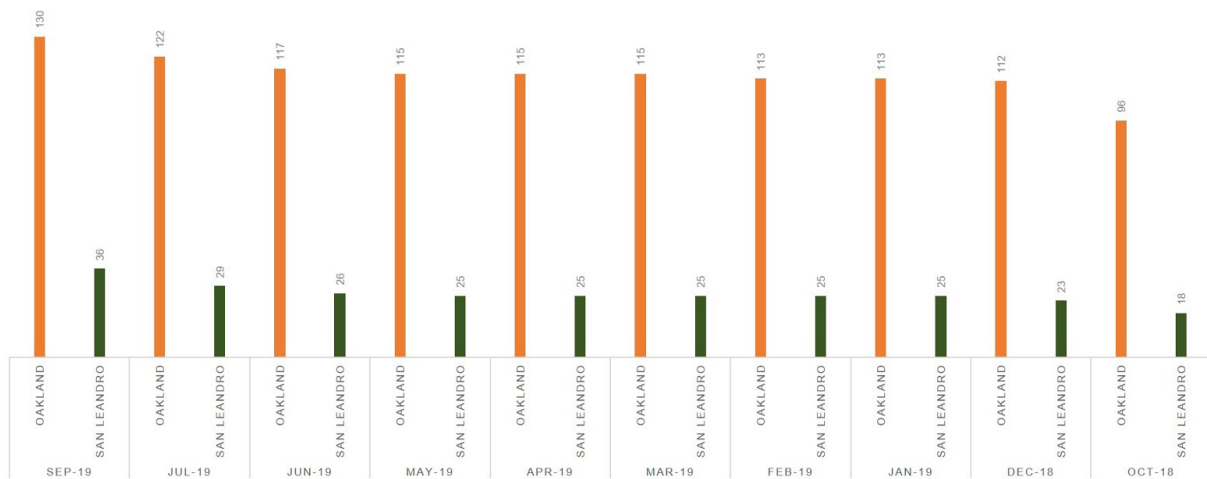
Throughout the project it has been difficult to hire local workers. The latest report (April 2019) to the Oakland City Council show that construction in the region has increased and created a high demand for construction workers, which in turn has created a shortage of qualified workers at the local level for the EBBRT project to meet the local hiring goals. A union representative referred to the EBBRT Project as a “horizontal project,” meaning that only a few trades are involved. The predominant involved trades are: laborers, operators engineers, and cement masons.

Additionally, the building trades is composed of 29 crafts, which makes it complicated to

keep track of local hiring goals because different crafts have unique hiring goals and how they are dispatched. For example, prime contractors and subcontractors have particular people they work with and different jobs they take on: they are highly mobile and cross many jurisdictions within the region, making it challenging to keep track of local hiring. Furthermore, jurisdictions often choose the lowest bidders for the project, which means that are usually the less expensive option. Those contractors not always keep track of their goals and usually engage in unfavorable processes and practices for workers, said an union representative. For this reason, the trades and project labor agreements are important mechanisms in infrastructure projects to ensure jobs are protected.

Moreover, each craft has unique requirements to qualify. Some require a certain level of education, such as a high school diploma or some college, while others may not. Laboring is a craft that does not require a high school diploma for workers to join. Therefore, the best way to keep track of local hiring is by monitoring the number of new workers and apprentices that join a particular project, for instance those not previously on the books of a company or returning employees absent from the company for over a 2-year period or more.

Figure 26. Oakland and San Leandro workers hired from October 2018 to September 2019



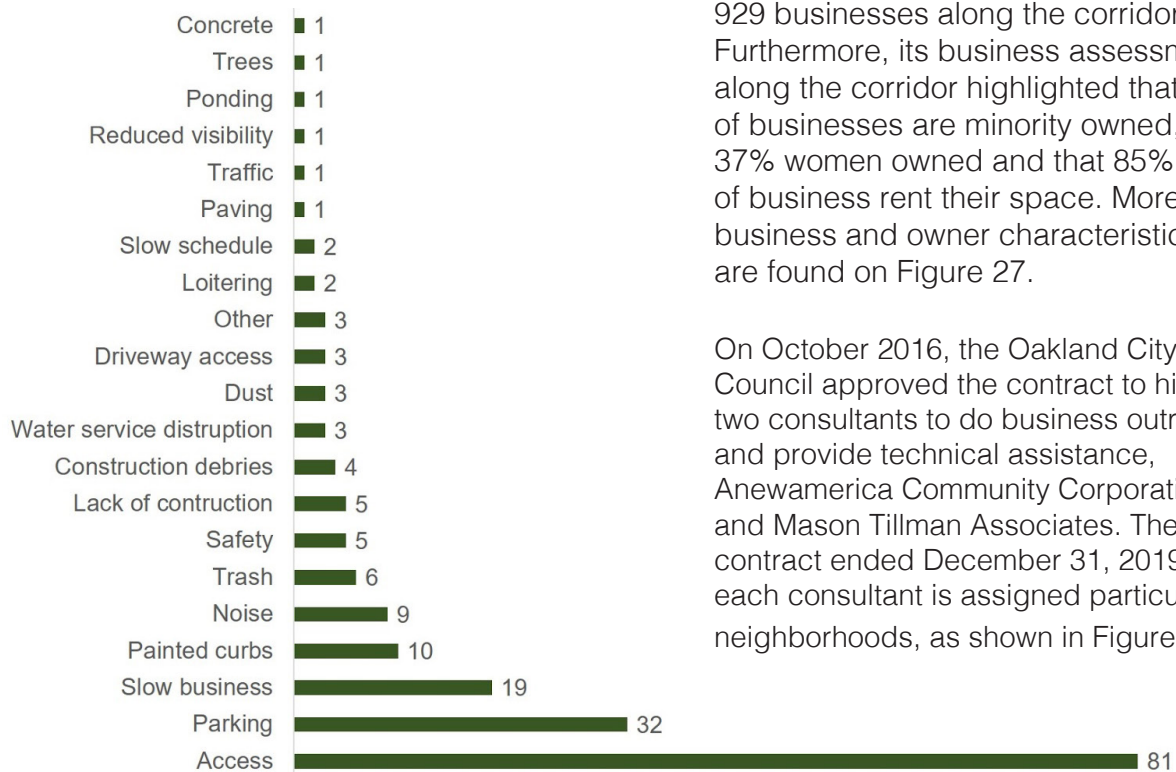
Source: AC Transit’s Staff Monthly Reports to the AC Transit Board of Directors.

Businesses

Construction has created an ongoing impact to businesses along the corridor. The most common construction-related complaints the AC Transit Outreach team has tracked are around access to the area, lack of parking, both appear to contribute to slow business for merchants along the corridor as suggested by Figure 27. Furthermore, Figure 27 summarize the 195 complaints that have been tracked by the AC Transit outreach team from February 2018 to September 2019.

In 2014, the City of Oakland Finance Department’s business license data had records for 826 businesses in the service and product industry and 319 in other category, along International

Figure 27. Tracked Complaints along International from February 2018 to September 2019



Source: AC Transit’s Staff Monthly Reports to the AC Transit Board of Directors.

Boulevard, adding to a total of about 1,145. However, in 2015 Main Street Launch, the first consultant hired to do business outreach, verified 929 businesses along the corridor. Furthermore, its business assessment along the corridor highlighted that 84% of businesses are minority owned, 37% women owned and that 85% of business rent their space. More business and owner characteristics are found on Figure 27.

On October 2016, the Oakland City Council approved the contract to hire two consultants to do business outreach and provide technical assistance, Anewamerica Community Corporation and Mason Tillman Associates. Their contract ended December 31, 2019 and each consultant is assigned particular neighborhoods, as shown in Figure 28.

The consultants have reported that some businesses are experiencing resistance from building owners to sign leases due to speculation of an increase in property value from the development. Approximately 333 businesses have declined technical assistance from business consultants due to multiple reasons.⁶² One long-time business owner said he needed business not a loan.⁶³

While other businesses are reluctant to provide financial information many do not feel the need to get assistance due to the long construction timeline and overall find the process to the mitigation funds “long and cumbersome.”⁶⁴ Also, businesses have expressed desire for funds to offer revenue loss assistance as well. To date since May 2018, only two Business Assistance Funds (BAF) have been awarded, one to support the relocation of a business and the other for equipment. The BAF have been available since 2016 and will be made available three years after construction ends. Clearly there are some barriers that small businesses are experiencing not only to having access to a business license and mitigation funds.

The April 2019 EBBRT report to the Oakland City Council highlighted that as of January 2019 there are 1,151 businesses in International Boulevard. In addition, the report

Figure 28. Business and Owner Characteristics by Main Street Launch, 2015

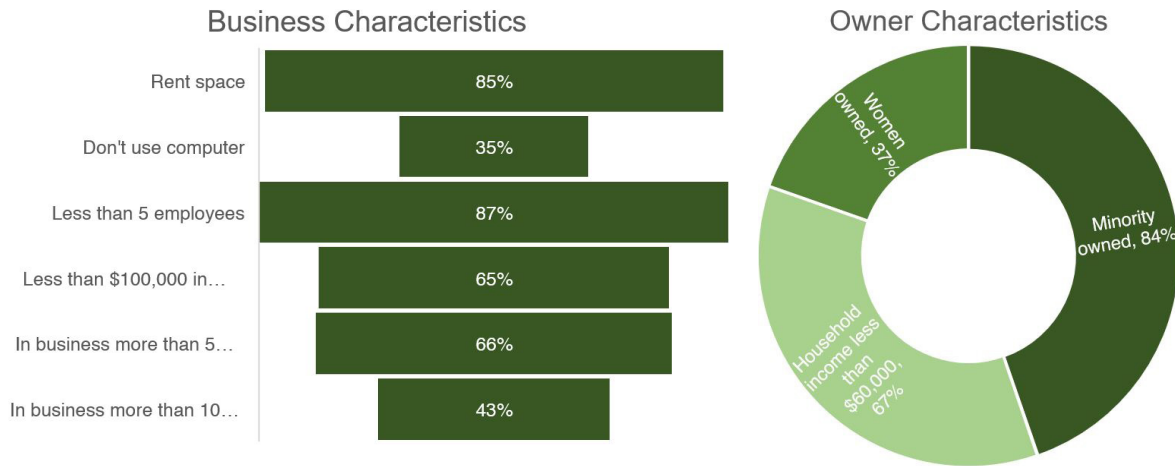
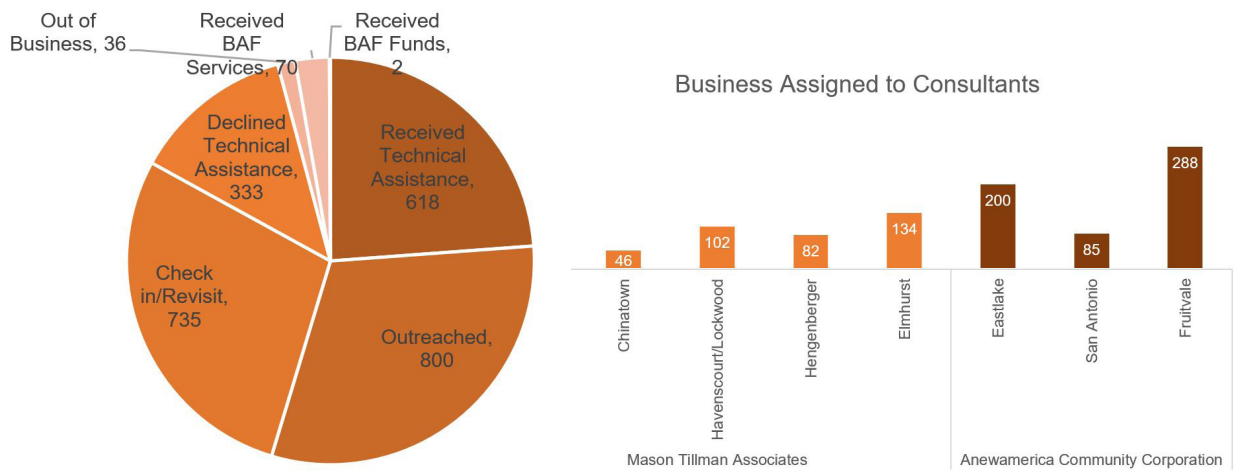


Figure 29. Businesses Assigned to Outreach Consultants for Technical Assistance



Source (both Figures): AC Transit Supplemental Report to Oakland City Council, April 2019.

mentioned that from 2017 to 2019, 36 locations have gone out of business. Furthermore, as of April 2019 there are 1003 businesses in the corridor with a valid business license that expires by the end of 2019, according to the Office of Economic Development data. Overall, the three different businesses counts on 2014, 2015, and 2019 along the corridor are not consistent. Figure 30 offers a list of all business licenses for years 2014 and 2019 along International Boulevard by neighborhood. Unfortunately, our analysis could not determine a satisfactory count about the numbers of business lost or gained from 2014 to 2019. Based on the City's business licenses data Central East Oakland (+72), Elmhurst (+66), and Fruitvale (+64) experienced an increase in business licenses from 2014 to 2019, and the San Antonio (-34) neighborhood experienced a decline.

In addition, Figures 31 and 32 show the number of valid business licenses by type (top five types) along the corridor and all the valid business licenses for the City of Oakland as of April 2019. The inconsistent counts of businesses prevent determining the social and economic vitality along the corridor. These uncertainties around number of businesses and the impacts from construction contribute to the community perception about the loss of businesses. Differences in the data and ground observations suggest that there are more businesses along the corridor and impacts from the project may be under or over reported.

Figure 30. Business Licenses by Neighborhood and along International, 2014 & 2019



Source: City of Oakland Business Licenses dataset, April 2019 and April 2014.

Figure 31. Top five business types along the International Boulevard, May 2019

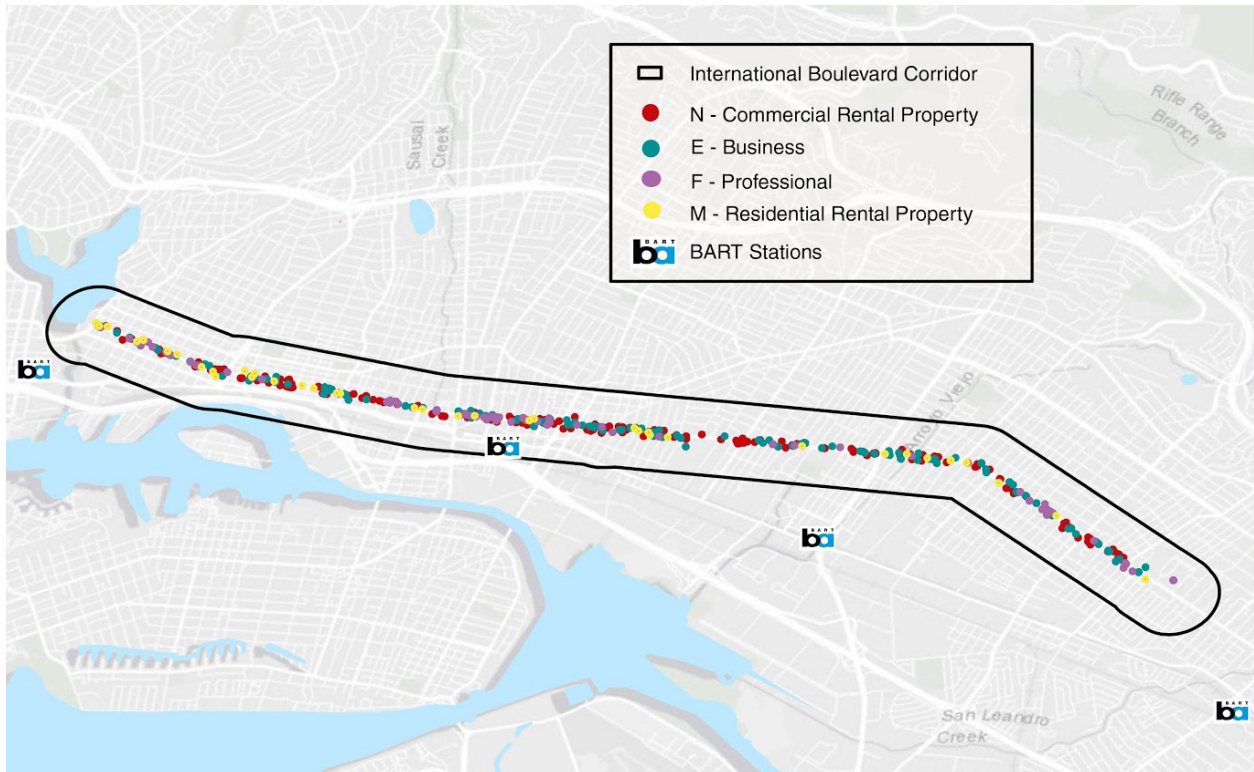
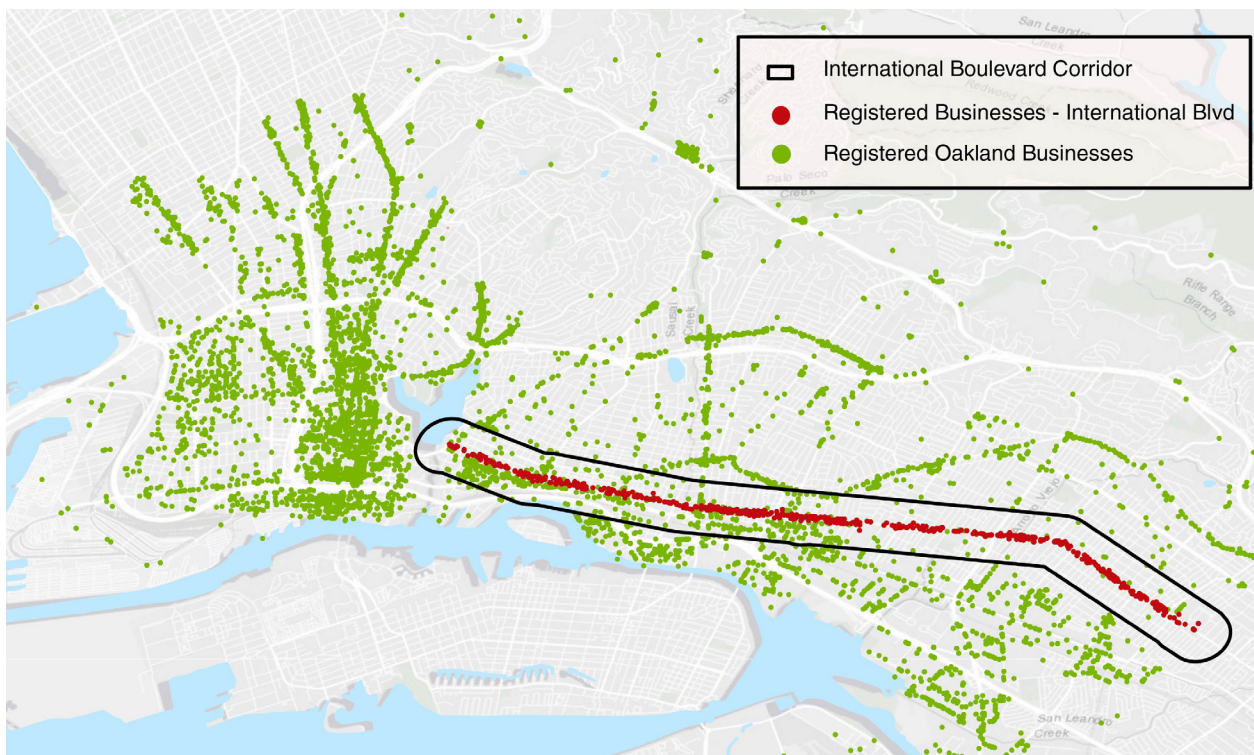


Figure 32. Oakland Business Licenses, May 2019



Source (both Figures): City of Oakland 2019 Business Licenses, April 2019.

Environmental Justice Analysis

While EBBRT hopes to reduce environmental impacts on East Oakland by increasing public transit use, improving health, and increasing planted landscaping space, an environmental justice lens is necessary to address socioeconomic and racial imbalances in the distribution of environmental benefits and burdens. Building off the development of social movements in the 1970s, the principles of environmental justice were codified in 1991 at the First National People of Color Environmental Leadership Summit, including affirming “the need for urban...ecological policies to clean up and rebuild our cities and rural areas in balance with nature, honoring the cultural integrity of all our communities, and provide fair access for all to the full range of resources.”⁶⁵ This section will explore the distribution of environmental benefits and burdens using an environmental justice framework.

History of Pollution Exposure

Though not one of the regularly-cited four benefits of EBBRT, improved environmental impacts on greenhouse gas (GHG) emissions and air quality are expected benefits of the system, and often a goal of Transit Oriented Development (TOD) projects.⁶⁶ Improved aesthetic and environmental conditions through increased tree planting and planted medians is cited by AC Transit, including in the Environmental Impact Report.⁶⁷ A desire for increased parks and green space was a major theme of community workshops for the International Boulevard TOD plan.⁶⁸

Historically, environmental justice has been a significant issue in East Oakland, subject to exposure to pollution from Interstate 880, the Oakland Airport, the Port of Oakland, and other industrial land uses. Specifically, the International corridor has some of the highest rates of exposure to environmental contamination in California. CalEnviroScreen 3.0 uses a set of indicators that reflect environmental conditions, exposure rates, and a population’s socioeconomic vulnerability to these exposures.⁶⁹

According to CalEnviroScreen, the census tracts along the corridor are on average in the 88th percentile for diesel particulate matter exposure, meaning the average is higher than 88% of census tracts in California.

Figure 33. Cal EnviroScreen 3.0 Scores, Percentile among Census Tracts of California (Average of Corridor)

Cal Enviro Screen Category	Percentile
Exposure to Diesel Particulate Matter	88 th percentile
Exposure to Particulate Matter Pollution (PM 2.5)	31 st percentile
Exposure to Active Clean Up Sites	66 th percentile
Asthma Rates	97 th percentile
Exposure to Toxic Release	49 th percentile
Groundwater Threats	81 st percentile
Pollution Burden	41 st percentile
Overall Cal Enviro Screen 3.0 Score Average	74 th percentile

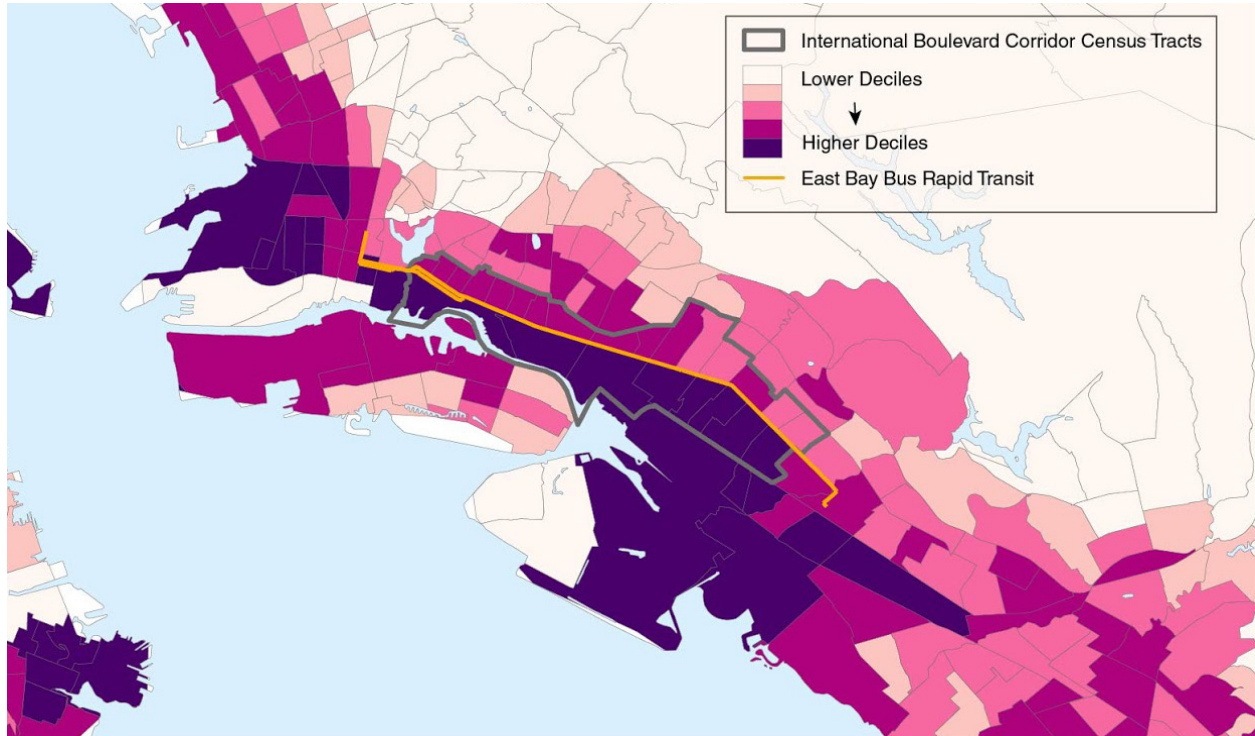
Source: CalEnviroScreen 3.0, 2019.

The corridor would also score in the 97th percentile in asthma rates, and the 66th percentile for exposure to active cleanup action sites (see Figure 33).⁷⁰ The corridor as a whole would be in the 74th percentile of overall pollution burden in California (see Figure 34).

This concentration of pollution exposure and

socioeconomic vulnerability is the result of a history of racism due to public policies and related actions in land use, housing and transportation (see: East Oakland Histories in Brief).

Figure 34. Cal EnviroScreen 3.0 Scores



Source: CalEnviroScreen 3.0, 2019.

Increasing Climate Vulnerabilities

While East Oakland currently struggles under poor air quality and environmental burdens, the climate crisis threatens to make conditions for environmental justice communities significantly worse. Academic research and climate scientists point to “considerable evidence suggesting that the poorest and most vulnerable members of society will disproportionately bear the negative impacts of global climate change as it accelerates in this century.”⁷¹ East Oakland is particularly susceptible to a number of vulnerabilities specific to climate change, including increasing levels of extreme heat days, air quality, drought, fires, and flooding due to sea level rise.

Flooding from sea level rise is a present and future issue for East Oakland. The San Francisco Bay Conservation and Development Commission (BCDC) and NOAA’s Office for Coastal Management (NOAA OCM) conducted an Adapting to Rise Tides “Oakland/Alameda Resilience Study,” analyzing the Coliseum and surrounding East Oakland neighborhoods as “vulnerable to both current and future flooding.”⁷² Newer studies have looked at “groundwater inundation,” which is another concern for coastal communities where the groundwater table increases with sea level rise, causing flooding even sooner than “marine” (ocean) flooding.

Figure 35. Map of Sea Level & Groundwater Flooding at 2 Meters



Source: Created using “D. Romero-Evans and Hill, 2019, plus data from Plane, Hill and May 2019.”

Groundwater inundation maps show significant parts of East Oakland and International Boulevard underwater at two meters of sea level rise (SLR) (Figure 35). While emissions pathways and climate models vary, some climate prediction models foresee 2m SLR by 2100 under the “business-as-usual” RCP 8.5 scenario, where emissions continue rising through the 21st century. California’s 4th Climate Assessment identifies median sea level rise between 0.74 m (RCP 4.5) and 1.37 m (RCP8.5) for 2100 along the California coast, but notes sea level rise could approach 3 meters by 2100.⁷³ Increased flooding during storm and king tide events (biannual exceptionally high tides) will be experienced sooner.

To mitigate the climate crisis, transit ridership is expected to increase with BRT and TOD, which could potentially reduce Vehicle Miles Traveled (VMT) and GHG emissions. Centering transportation in Oakland’s GHG reductions makes sense: as of 2017, transportation and land use activity accounts for 57% of Oakland’s sector-based emissions.⁷⁴ Curiously, the 2011 EIR shows little difference in emissions between “No Build” and the two alternative BRT options (see Figure 36), likely due to the need for significant land use changes in addition to BRT to achieve significant emissions reductions. The connections between BRT, TOD, and GHG emissions will be explored next.

Bus Rapid Transit, Transit Oriented Development, and Emissions

Overall, TOD’s relationship to emissions reductions is still debated. Studies suggest BRT is the most effective choice for cities to shift passengers to more energy efficient travel modes, and these structural changes are necessary to avoid the worst climate crisis scenarios.⁷⁵ As stated in the Land Use & Housing Analysis, BRT (and TOD in general) may lead to increased displacement due to increasing property values [see also Literature Review in Appendix A]. A recent report by TransForm highlighted the disparities in the use of transit, underscoring the need for analyzing residents’ carbon footprints when calculating reduced VMT and overall carbon impact. The TransForm report showed that in California, “Low Income” households reduce their driving mileage by 25-30% when living within ½ mile of frequent transit. Higher income households drive more than double “Extremely Low Income” households when both are close to transit. Even when accounting for reductions in transportation and building energy use emissions, affluent residents have larger carbon footprints, a problem multiplied if workers are displaced to areas requiring increased commuting. The TransForm report argued that investing in affordable housing near transit could meet the requirements of California Air Resources Board’s housing targets and significantly reduce greenhouse gas emissions.⁷⁶

Figure 36. Predicted 2035 Annual CO2 Emissions Summary (metric tons)

Mode	No-Build	LPA	DOSL Alternative	Absolute Change		Percent Change	
				LPA	DOSL	LPA	DOSL
General Traffic	589,954	585,976	587,154	(3,978)	(2,800)	-0.7%	-0.5%
Buses (Scenario 1)	3,481	4,241	3,859	760	378	21.8%	8.9%
All (Scenario 1)	593,435	590,217	591,013	(3,218)	(2,422)	-0.5%	-0.4%

Source: Final Environmental Impact Statement/Final Environmental Impact Report (FEIS/FEIR) Volume I, Part 14 – Chapter 4, Section 4.12-4.16, Air Quality, Noise Vibration, Greenhouse Gases, Energy, Biological Environment Note: “LPA” is the Locally Preferred Alternative, the original proposal from Berkeley to San Leandro.

The integration of land use and housing needs into TOD plans is a major gap in regional climate mitigation and resilience documents. EBBRT is identified as an important goal in many Oakland-specific and regional climate change mitigation and sustainability plans, as it aims to offer “a significant opportunity to make transit easier, faster, more reliable, and more convenient.”⁷⁷ Many plans identify EBBRT as “innovative” or part of “modernization,” words that often do not clarify the specific improvement or how they achieve the specified goals. Oakland’s 2020 Energy and Climate Action Plan (2017 Update) prioritizes EBBRT implementation while “minimizing short-term potential impacts to neighborhoods and businesses,” but does not provide details of how to achieve this.⁷⁸

Another ECAP goal is to “Advance Infill, Mixed-Use and Transit-Oriented Development,” without referencing affordability or gentrification displacement as parts of the equation. Resilient Oakland (2016) does identify funding the gap in affordable housing in Transit-Accessible Neighborhoods as a priority, understanding the role of housing in resilient neighborhoods. Funding from Measure KK, a 2016 City of Oakland Infrastructure Bond for \$100 million over 20 years, and the Affordable Housing and Sustainable Communities (AHSC) program, a statewide program using “cap and trade” funds to build affordable

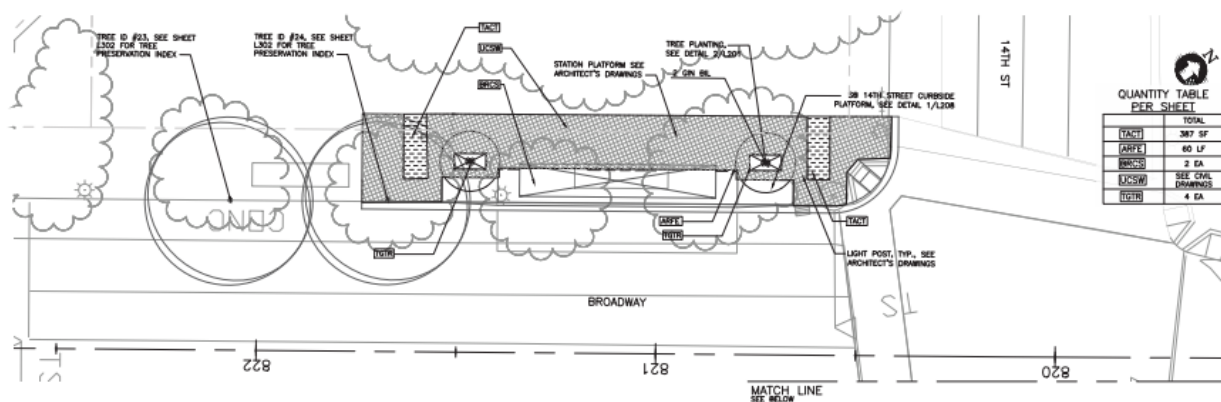
housing near transportation, are identified to “acquire and rehabilitate vacant, abandoned and blighted properties into green, healthy, and permanently affordable homes.”⁷⁹ Since AHSC’s inception, four projects have been awarded funding near the EBBRT project, totalling 327 units and 62,000 metric tons of GHG reductions, with AC Transit partnering on 3 of the projects.⁸⁰

Overall, the resilience and climate change mitigation plans tend to disregard the role of displacement and gentrification on GHG emissions. Recent research has explored the need to examine life-cycle carbon footprints, casting doubt on gentrifying cities purported reductions in greenhouse gas emissions.⁸¹ The new Oakland ECAP - renamed the Equitable Climate Action Plan - has been under development since early 2019 is currently undergoing public comment. It identifies life cycle emissions as a core angle of analysis, and will hopefully address issues of displacement - understanding that emissions that are displaced or externalized beyond Oakland’s border are not real reductions.⁸²

Old Trees, New Trees & Time

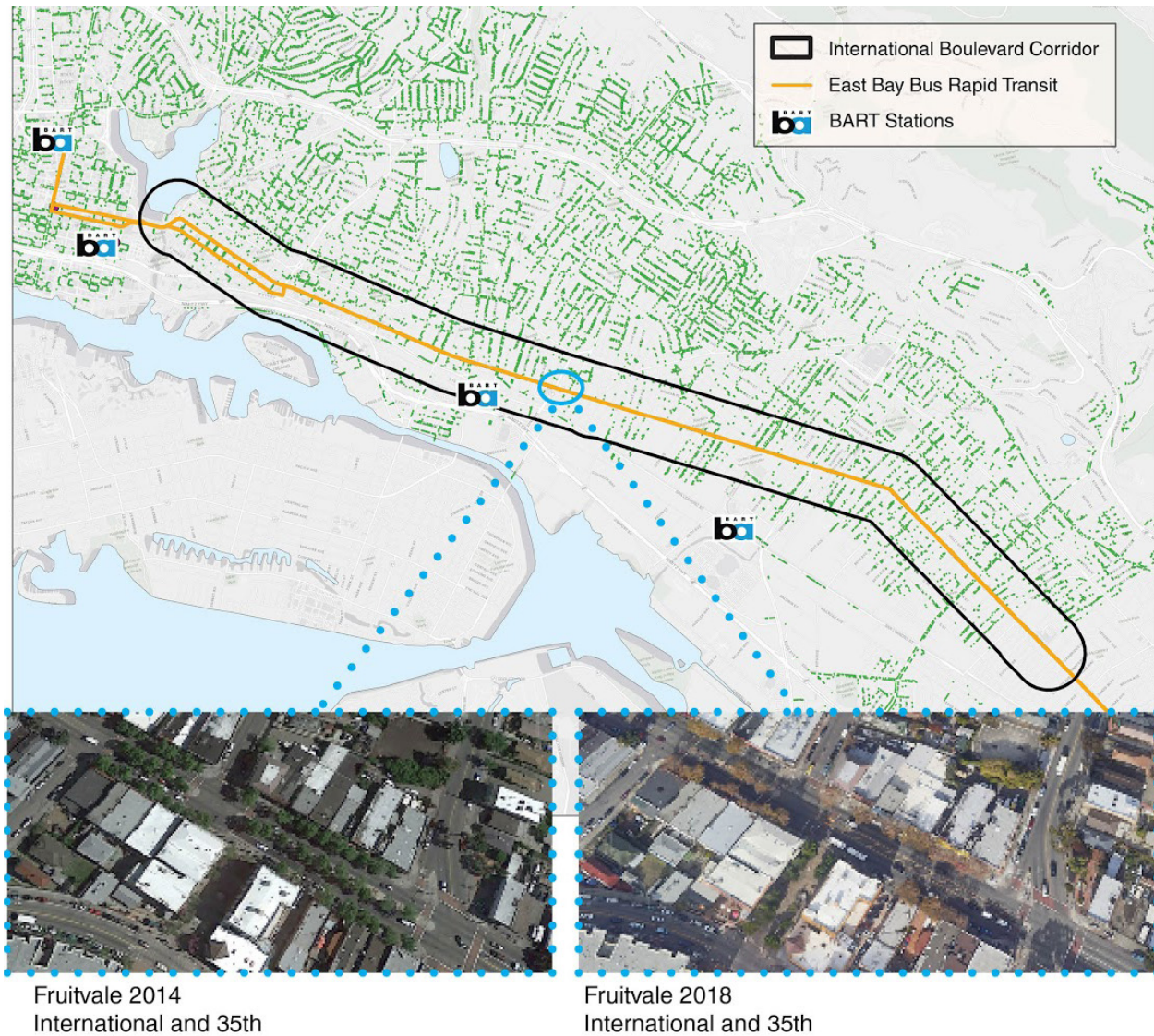
The role of trees is an important element of the EBBRT narrative, trees provide important ecosystem services to urban areas, including reducing air and noise pollution, conserving water and reducing the impact of stormwater, and cooling the the “urban heat island.” Anger from community leaders about the removal of mature street trees to make room for the bus boarding median is a repeated theme in constituent interviews we conducted (See: Section Stakeholder Interviews). [Figure 37] shows a particular group of mature trees by 35th and International that were removed. Geographers from UC Davis and UC Santa Cruz, Ingrid Behrsin and Chris Benner, documented how “[these] particular trees that greet community members on International Boulevard just beyond the Fruitvale Transit Village are more than merely landscape adornments; rather, they are daily symbols of community organizing triumphs that evoke a sense of self-efficacy and pride.”⁸³ According to interviewees, while AC Transit’s landscape plan promised overall increases in area of planted median and trees, accessible landscaping plans were not presented to the community, rather only landscape design drawings impenetrable to non-professionals (Figure 38).

Figure 37. Proposed AC Transit Landscaping Plan



Source: AC Transit, 2019.

Figure 38. Lack of Trees Along International in Comparison to East Oakland



Source: Created using data from the City of Oakland and Google Earth, 2014 and 2018.

Overall, 24% of the trees identified along the International Boulevard Corridor were slated to be removed due to “severe impacts,” curb demolition through the root zone, and other construction impacts (Figure 39). While the project plans to ultimately plant 295 new trees, increasing the tree stock by 150%, these trees will not immediately produce the benefits of shade, increased air quality, and aesthetic contributions to the neighborhood, raising residents concerns about who these trees are “for.” The diameter of the removed trees was on average 18.8”, as compared to average 3.3” diameter of the trees currently being planted (Figure 40). In interviews, residents expressed concerns that the new zero-emission hydrogen buses and sustainability goals of EBBRT were coming at the expense of their hard-won trees, which were “natural” and efficient tools to reduce CO2 emissions.

Per our stakeholder interviews, potential funds for planting trees and other plants were

Figure 39. EBBRT Tree Plan by the Numbers

Planted & Removed Trees

Pre-construction:	396	
Removed:	97	-24%
Planned to be added:	295	
New total	594	+150%
1 gallon plant	951	
5 gallon plant	189	
15 gallon plant	37	

Size of Trees Removed

< or = 5"	31	11%
< 14"	228	77%
> or = 14"	50	17%
> 20"	15	5%
> or = 50"	2	1%

(tree diameter at 4.5' above grade)

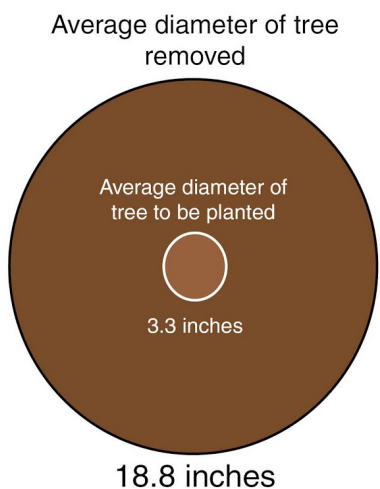
Size of New Trees

24" box	186	63%
36" box	109	37%
42-60" box	0	0%

(avg. caliper of 24" box is 1.5" - 2.5")

Source: AC Transit, 2019.

Figure 40. Average Tree Diameters to be Removed & Planted

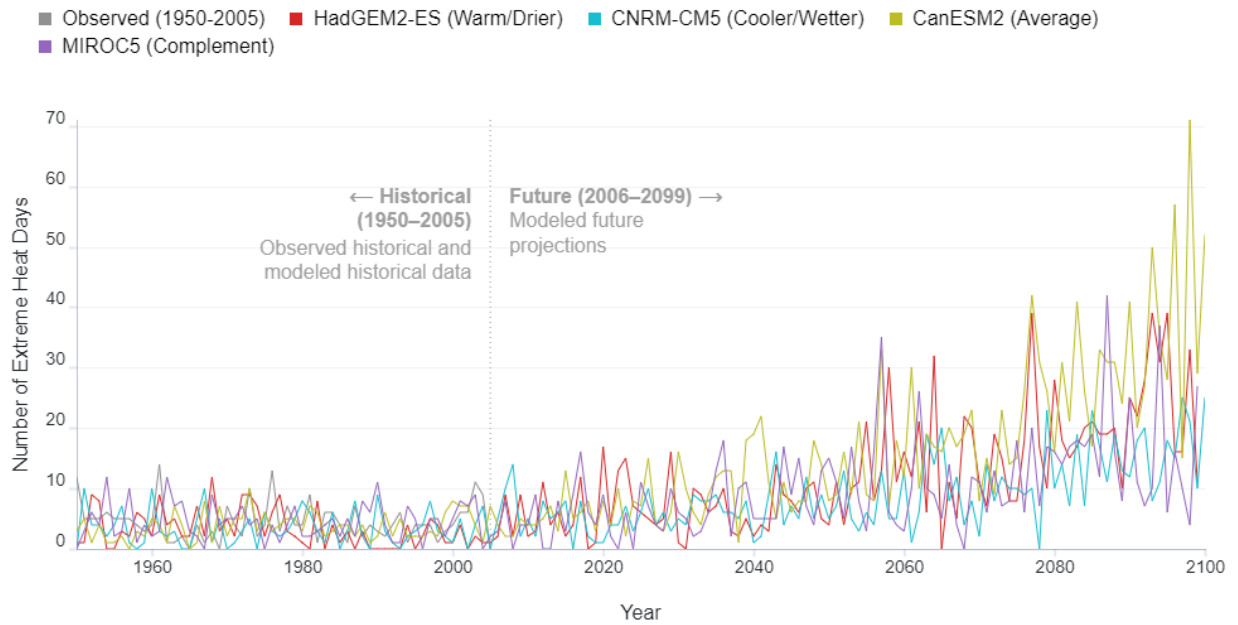


Source: Created from AC Transit Planting Plan.

limited to make budgetary allowances for the business mitigation funds, and our current inspection of EBBRT construction shows large swaths of concrete where plantings could have occurred. Resilient Oakland claims that “Oakland is eager to increase the use of green infrastructure to provide additional benefits, such as improved air quality, reduced urban heat island effect, creating habitat, and improving the experience of the public realm,” highlighting the desire for these benefits to be allocated to neighborhoods that have historically lacked access to parks, creeks, and street trees.⁸⁴ This diminished role of greening the corridor seems to be a lost opportunity, as Oakland is shown to be impacted by increasing heat levels due to climate change, which will have particular health impacts on socio-economically vulnerable residents of East Oakland (see Figure 41).

In conclusion, while the Final federal and state-required environmental document (FEIS/FEIR) claimed the EBBRT would have long-term Environmental Justice benefits by substantially improving transit access and mobility for the largely low-income, minority, and transit-dependent households along the corridor, there is a clear disconnect between the document’s expectations and local community goals of environmental justice.⁸⁵ As noted above, East Oakland residents desire more reliable public transportation, reduced greenhouse gas emissions, and better air quality, but those improvements cannot be experienced if the tide of development has displaced the long-term residents. In their book *Transit Oriented Displacement or Community Dividends*, Karen Chapple and Anastasia Loukaitou-Sideris lament that “the dearth of antidisplacement policies incorporated into climate change mitigation programs suggests that we have not” learned lessons from the “Public-led redevelopment processes [which] uprooted hundreds of thousands of families, many belonging to disadvantaged communities of color.”⁸⁶ Further work needs to be done to integrate land use, transportation, and environmental justice policy concerning the East Bay BRT.

Figure 41. Number of Extreme Heat Days (>88 F) By Year Under RCP 8.5 High Emissions Scenarios in Oakland



Source: Cap-Adapt, 2019. LOCA Downscaled CMIP5 Projections (Scripps Institution of Oceanography), Gridded Observed Meteorological Data (University of Colorado, Boulder). Note: Four models have been selected by California’s Climate Action Team Research Working Group as priority models for research contributing to California’s Fourth Climate Change Assessment.



Recommendations

We propose a series of recommendations to improve transit infrastructure planning and provision in Oakland and beyond. Our recommendations are grounded in the above analysis on the process of planning and implementing the East Bay Bus Rapid Transit system.

Rethinking Process

1. Community Governance Body

We propose creating systems for local, meaningful participation in planning processes —where information and evidence is provided to support informed and empowered community input and recommendations on planning decisions, with particular attention to access, considering language, mobility, financial, and scheduling barriers. Recent and active community governance models include the Rockridge Community Planning Council in Oakland, Congress of Neighborhoods in Los Angeles, the Neighborhood Action Plans in Minneapolis, and the Strong Neighborhoods Initiative in San Jose. These local community bodies will need to integrate with regional collaborative bodies for transportation planning.

2. Problem Solving Table

We propose the creation of an inter-agency and community problem solving table where agencies like AC Transit, EBMUD, the City of Oakland, and community representatives such as merchants and residents can come together to problem solve challenges during the planning and construction phases. A recent example of this was the Oakland Sustainable Neighborhoods Initiative (OSNI) in Oakland, in which community groups and city agencies collaborated on initiatives in East Oakland.

3. Regional Infrastructure Projects Body

We recommend the establishment and/or appointment of a regional infrastructure projects coordinating body to oversee large infrastructure projects focused on transportation planning, design and implementation, while actively monitoring and supporting operations and maintenance. The aim of such a body is to preserve institutional memory across the entire life of a project, while being able to situate projects and make decisions from a more comprehensive, regional perspective. A regional body would include internal and external peer review and oversight of projects as they move through the pipeline and clear key milestones. Additionally, there must be rigorous, democratic appointment and compensation for community-level representation within the regional body along with restorative justice training for participants. Given that transportation projects like EBBRT often have multiple layers of key stakeholders across public and private sectors, along with nonprofits, activist groups and constituents over long periods of time, this body should clearly and openly communicate about project management issues and devote resources and time towards developing innovative, effective, and accountable oversight.

Monitoring Impacts and Proactive Strategies for Social Equity

1. Accessible Business Mitigation Funds

Anyone conducting business in the City of Oakland must have a business license. Along International Boulevard there is a variation between the business licenses and businesses. Data suggest there are currently more businesses than business licenses (See Section: Business and Construction Analysis). To access mitigation funds businesses must have a business license, have an annual revenue of under \$3 million, be located within 500ft of the corridor, be in operation three years prior construction (since 2014), among other requirements. Approximately 333 businesses have declined technical assistance from business consultants, while others are reluctant to provide financial information, and overall find the process to the mitigation funds “long and cumbersome.” Also, businesses have expressed desire for funds to offer revenue loss assistance as well.⁸⁷ To date, only two mitigation grants have been awarded (May 2018). Clearly there are some barriers that small businesses are experiencing not only to have access to a business license but also to the mitigation funds. It is recommended to revise the mitigation funds requirement and process to offer an opportunity for impacted businesses to get an easier access to the funds. The most viable solution would be to determine the social and economic vitality by conducting a comprehensive count of businesses along the corridor to adequately measure the impacts and benefits from the project.

2. Resident Protections

We recommend implementing a number of resident protections along the corridor and/or throughout Oakland to reduce the potential for displacement. Some of these can include rent freezes, one-to-one replacement of demolished units, and a right to return policy. A forthcoming Just Cities report will outline some of these policies in more detail.

3. Transit Rider Improvements

While BRT presents a number of benefits, residents and transportation professionals we interviewed also identified other improvements that could have been made to the corridor and warrant current consideration moving forward. This includes exploring more politically difficult but worthwhile improvements such as fare integration across systems or even free bus services, and regular monitoring of services around the safety of median boarding islands, reviewing distance between stops, and fare box safety issues. With bus fares only representing 13% of system operating revenue for AC Transit, serious consideration for free AC Transit should be made.

Reimagining the Future of Transportation Projects

1. Equity Impact Analysis

We recommend that with any future transportation project- with significant impacts to the built environment and the consequent wellbeing of constituents- agencies, cities, and community groups must collaborate with communities to conduct an equity analysis during the planning phase (which is not traditionally done through the CEQA process). Such an analysis should recognize, respect and study the racial, socioeconomic, historic and cultural fabrics of communities in neighborhoods receiving and dealing with the burdens of project development. An example of this is the Wood Street Project in Oakland.⁸⁸ The goal of an equity impact analysis is to proactively prevent, rather than mitigate, negative impacts from transit investments. The rewards of improved public transit should be accessible long-term and reaped by the constituents who would bear the brunt of the planning and construction process.

2. Broader Transportation Frameworks

BRT transportation projects are primarily designed as mobility investments. However, these types of projects require a broader vision, beyond improving mobility, BRT projects must be planned as projects that help shape a city. As such, BRT projects need to incorporate long-term vision for sustainable growth to maximize economic and social vitality in distressed neighborhoods with protections for long-term residents/small businesses. In addition, have stable financial model including capital, operations and maintenance (particularly for landscaping/streetscape improvements critical to existing

residents), cost and schedule estimating. A broader vision may create the opportunity to address structural challenges that arise within the involved governmental agencies and foster a cohesive collaboration process across agencies and departments.

3. Climate Resilience Planning

Transportation projects in the 21st century should be squarely focused on both their potential to mitigate climate change through reduced greenhouse gas emissions, as well as preparing and adapting to the locked-in effects of climate change - particularly with a focus on equity, as climate change will disproportionately affect the poorest and most vulnerable members of society. Mitigation projections should include metrics for displacement and lifecycle emissions calculations. Adaptation analyses should be conducted of vulnerabilities due to increased number of extreme heat days, air quality, drought, fires, and flooding due to sea level rise and groundwater inundation. This planning for climate change should include an emphasis on social resilience, which understands that equitable access to quality education and jobs, housing security, and community safety can help communities prepare for the stresses and disruptions of climate change.

Concluding Thoughts

As transportation planning students and professionals, we see transportation as fundamentally an issue of social justice, not just a question of ridership levels and fare revenue recovery. Infrastructure projects such as the East Bay BRT provoke tough questions for transportation planners about how to invest in communities that have been neglected without shepherding in gentrification and displacement, and how to equitably adapt and mitigate to climate change. East Oakland is being transformed by EBBRT, and at the same time Oakland as a whole is rapidly changing - increasing in population and development density, and starting to experience a preview of major effects of climate change, including wildfires, increasing heat, and flooding vulnerability from sea level rise. How these changes are planned for and implemented matters greatly.

Bus rapid transit is a concept that provides many potential benefits - the potential to bring increased reliability, speed, and frequency to marginalized, transit-dependent residents of Oakland, and to be part of a global and regional solution to reduce greenhouse gas emissions; but these potential benefits must be implemented correctly. Successful implementation requires transparency, trust-building and communication. Transportation and planning agencies have planned for decades for the investments in land use and transportation that this project are bringing to East Oakland, yet some community leaders say they have been planned upon, not planned with. Mitigation funds have not been deployed to help businesses. Tenant protections have not been as robust as needed to keep long time and low-income residents in place. The historical disinvestment and lack of attention to this area of East Oakland is reflected in many facets of the implementation of the EBBRT project.

East Bay BRT highlights how transportation projects woefully lack larger, systemic support for comprehensive, integrated and thoughtful planning protections for the people living and working in areas receiving these projects. At the Untokening conference in 2016, an organizing of racial and social justice-oriented activists working in transportation advocacy, planning, and policy, defined a principle of Mobility Justice as demanding “that we fully excavate, recognize, and reconcile the historical and current injustices experienced by communities,” and to give impacted communities “space and resources to envision and implement planning models and political advocacy on streets and mobility that actively work to address historical and current injustices experienced by communities.”⁸⁹ The implementation of the EBBRT did not live up to these standards. Ultimately, the permanent impacts and benefits of EBBRT will be determined going forward —how success is monitored, how future investments are planned, and how historical injustices are corrected.

Appendices

A. Literature Review

The authors conducted a brief literature review of available, peer-reviewed research on 1) Bus Rapid Transit, 2) Social Equity, Gentrification, Displacement, and 3) Health and Environmental Impacts of BRT. Research on BRT is still a relatively new field, especially in the Global North, but studies provide important context.

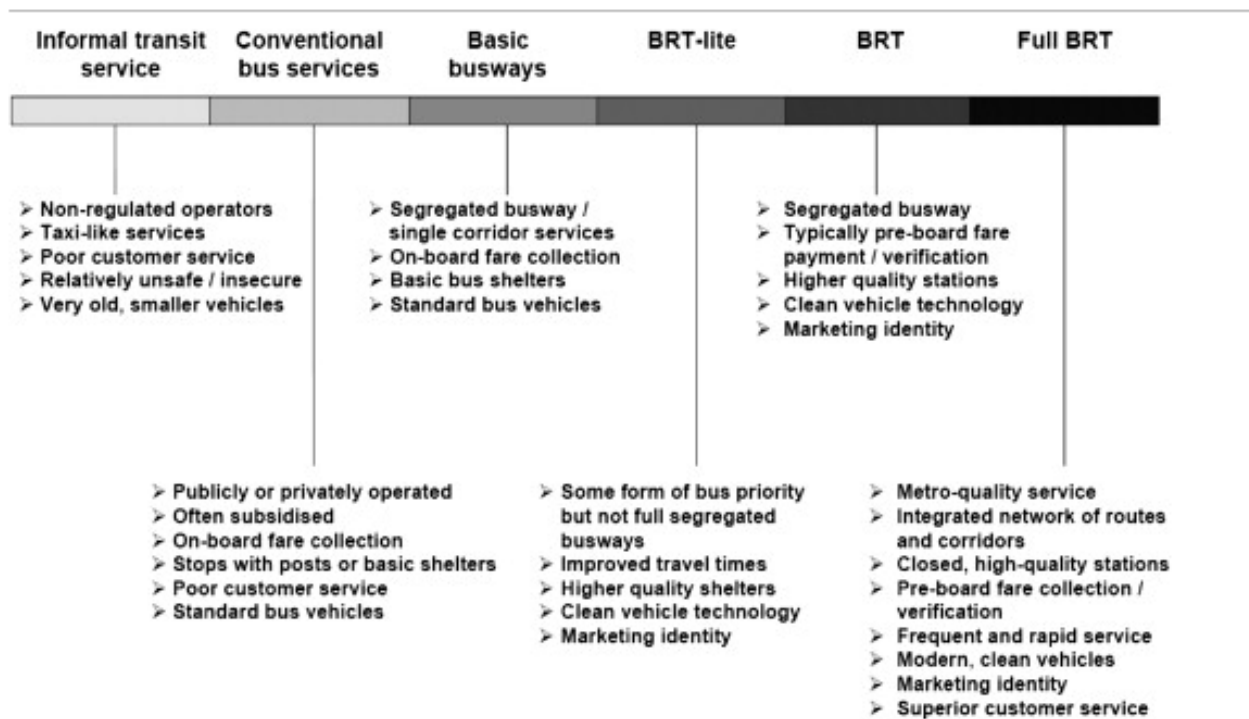
Bus Rapid Transit

BRT is a rapidly expanding transit model globally and in the United States, lauded for its relatively low cost, flexible operations, faster implementation, and improved environmental and user impacts. BRT's potential is primarily both to re-allocate road space to transit from vehicles, and change the priorities of the city's urban development policy to focus increased density around transit.⁹⁰ Some scholars argue that BRT is ideal for intermediate-sized cities, with populations between 100,000 and 500,000, which are expected to face unprecedented growth yet often cannot support light rail transit (LRT); and thus far, the majority of BRT systems in the Global South have not focused on land use changes, instead focusing on improving mobility with low costs, ignoring urban growth issues.⁹¹

Implementation flexibility is part of the charm, as BRT can operate as an open busway, allowing flow from local lines, as well as adapting to local conditions where fixed rail cannot. Nevertheless, BRT tends to adhere to fairly specific design guidelines that differentiate it from simply improved bus services, and the spectrum of bus services creates hierarchies of BRT (Figure 42). These design practices are codified in The BRT Standard, an evaluation tool and scoring method for BRT developed by the Institute for Transportation and Development Policy (ITDP) drawing from international examples. In an attempt to establish a common definition and scoring method, the BRT Standard labels corridors as Gold, Silver, or Bronze, covering very specific components of operations, access, infrastructure, and communications.⁹² Whether a corridor is “true BRT” has become a point of contestation among planners and in the popular media, often identifying systems as not “true BRT.”⁹³ The rapid increase in BRT projects in the U.S. has been significantly spurred on by the Federal Transit Administration of the U.S. federal government and its “Small Starts” initiative, which funds fixed and corridor-based LRT and BRT projects with costs under \$300 million.⁹⁴

Issues around implementation are common in large transportation projects. BRT systems in developing countries have often experienced problems including rushed implementation, tight financial planning, uncomfortably-high occupancy rates, poor communication and disruption during construction, and insufficient education and user information communicated.⁹⁵ Additionally, research on large-scale infrastructure projects, also called “megaprojects”, shows they have multiple layers of key actors that interact across public and private sectors, showing similar characteristics of complexity and controversy. Talking openly about project management issues and removing the “tacit consensus that misrepresentation is an acceptable business model for project development” is a key

Figure 42. BRT Spectrum



Source: ITDP BRT Design Guide

solution.⁹⁶ Recommendations include adding increasing budgets for optimism bias (the tendency to be too optimistic in forecasting project costs, scale, timing and benefits) developing appropriate multi-level governance structures and public engagement processes, establishing internal and external oversight, and freeing up time and attention for innovation and the cultivation of effective management.⁹⁷

Social Equity, Gentrification, Displacement

Research gaps exist on the social equity impacts of transportation projects, with particular gaps in studies of BRT, and more specifically BRT in the United States and other developed countries. A primary lens for equity analysis of BRT and public transit investment is BRT's connections to land value, gentrification, and displacement. Studies suggest that BRT does lead to zoning and economic investments changes similar to light rail transit (LRT), and property investments can increase by 10% to 20%.⁹⁸ Studies in Brisbane, Bogota, Beijing, Seoul, Pittsburgh, and Ontario show increasing property values and various levels of "uplift" in the environs of BRT.⁹⁹ A study of the Orange Line in Los Angeles found that rising median rents, home values, and educational attainment suggest an economic and demographic transition occurring in Orange Line neighborhoods, concluding that gentrification is occurring around the Orange Line, with economic factors of more significance than racial-ethnic factors in determining rates of gentrification.¹⁰⁰

Research suggests land use significantly affects the ridership numbers, primarily compactness, multifamily housing, and public and institutional land use.¹⁰¹ While BRT alone may not trigger increased property values, displacement and gentrification, these

results show strong incentives to enact land use changes around BRT for optimal revenue return and ridership. Beyond the potential impacts of gentrification and displacement, findings from the Global South suggest overall significant benefits to low-income populations through reduced travel time and cost savings. These equity benefits are not automatic, but only occur through “dedicated, sustained” efforts to provide equitably distributed services. Significant barriers to equity near BRT are determined by fare policies and if there are effects for even more rural or distributed, transit-dependent commuters.¹⁰² While high-quality bus-based systems can better serve low-density settlement patterns, this often relies on network effects and feeder-systems to reduce the costs and time of transferring.¹⁰³

Beyond the effects of BRT on land values and displacement, transportation equity analyses in general show the need for increased specificity, such as exploring differences across social groups within similar zones. Job accessibility, for example, is not evenly distributed across social groups (race, ethnicity, income, poverty status) within the same areas. Inner-city residents in Detroit, for example, are not disadvantaged by their location, but rather are disadvantaged by a lack of cars and poor transit service.¹⁰⁴ Some scholars have argued that mean-based “communities of concern” equity analyses often paper over distributional differences among social groups, including across age, gender, and race.¹⁰⁵

Health and Environmental Impacts of BRT

Research has shown that BRT directly offers reduced human exposure to traffic related air pollutants and associated health impacts.¹⁰⁶ BRT’s role in climate change may have profound, though indirect health and environmental benefits. The Intergovernmental Panel on Climate Change (IPCC), the world’s foremost body of climate science, identified rapid structural change to the transportation sector as necessary to stay to avoid some of the more severe impacts of climate change, with transportation accounting for 28% of global final energy demand. Electrification and switching of passengers to more efficient travel modes including buses were their key approaches.¹⁰⁷ This deep decarbonization of the transportation system is possible to achieve international goals such as the Paris Climate Agreement of 2015, with shifting toward more efficient travel modes as a key component.¹⁰⁸ Some suggest that BRT is the best choice for cities to achieve this mode shift: BRT offers the greatest potential for greenhouse gas reductions in a typical medium-sized U.S. city, due to energy generation mix, reduced cost, and speed of deployment.¹⁰⁹ Though BRT is a promising transit option for cities to reduce GHG emissions, still others suggest that life-cycle emissions analyses must be conducted to incorporate sources of energy, construction materials, and energy conservation management.¹¹⁰

Literature Review Conclusion

Venter et al write: “The available evidence raises very real concerns around gentrification and property value increases near BRT trunk routes that might price low-income households out of exactly the residential locations that are most beneficial to them in terms of accessibility.” Protecting affordable housing, improved networking, and fare policies are keys to achieving equity.¹¹¹ While research is still limited, BRT can trigger property value increases that lead to gentrification and displacement. Changes to land use around BRT corridors are an explicit goal- and are often necessary to reach ridership, revenue, and reduced emissions goals. Impacts of transit projects requires monitoring and intentional policies to support low-income and vulnerable populations.

B. Additional Housing and Land Use Analysis Information

Below is a zoning map and table from the Housing and Land Use Analysis section.

Figure 43. Map of International Boulevard Zoning for EBBRT



Source: City of Oakland Zoning Data, 2019.







Zoning	Description
 Community Commercial 1 (CC-1)	Intended to create, maintain, and enhance shopping centers and malls with a wide range of consumer businesses.
 Community Commercial 2 (CC-2)	Intended to create, maintain, and enhance areas with a wide range of commercial businesses with direct frontage and access along the City's corridors and commercial areas.
 Community Neighborhood (CN-2)	Intended to enhance the character of established neighborhood commercial centers that have a compact, vibrant pedestrian environment.
 Community Neighborhood (CN-3)	Intended to create, improve, and enhance areas neighborhood commercial centers that have a compact, vibrant pedestrian environment.
 Urban Residential (RU-4)	Intended to create, maintain, and enhance areas of the City that are appropriate for multi-unit, mid-rise, and high rise residential structures on the City's major corridors.
 Urban Residential (RU-5)	Intended to create, maintain, and enhance areas of the City that are appropriate for multi-unit, mid-rise, and high rise residential structures and ground floor neighborhood businesses on the City's major corridors.

Figure 44. Neighborhood Designation Based on Zillow & Census Tracts

Neighborhood	Zillow Name	Census Tracts
Eastlake/San Antonio	Clinton, Rancho San Antonio	4059.01, 4059.01, 4054.01, 4054.02
Fruitvale	St. Elizabeth, Fremont	4072, 4074
Elmhurst/Deep East	Webster, Cox, Highland, Durant Manor, North Stonehurst	4093, 4094, 4095, 4096, 4103, 4104
International Tracts	Clinton, Rancho San Antonio, St. Elizabeth, Fremont, Lockwood Tevis, Webster, Cox, Highland, Durant Manor, North Stonehurst	4053.02, 4054.01, 4054.02, 4059.02, 4059.01, 4060, 4061, 4062.01, 4062.02, 4072, 4073, 4074, 4075, 4088, 4087, 4086, 4089, 4085, 4095, 4096, 4094, 4103, 4093, 4104

The analysis used Zillow data from 2017 since that was the most recently available ACS 5YR data from the Census Bureau. The analysis will need to be updated as new years of data are released.

C. Endnotes

- 1 Rhomberg, C. (2004). *No There There: Race, Class, and Political Community in Oakland* (1st ed.). University of California Press; JSTOR. <https://www.jstor.org/stable/10.1525/j.ctt1pn62c> pg 175
- 2 Redlining and Gentrification | Urban Displacement Project. Retrieved October 25, 2019, from <https://www.urbandisplacement.org/redlining>
- 3 Rhomberg, C. (2004). *No There There: Race, Class, and Political Community in Oakland* (1st ed.). University of California Press; JSTOR. <https://www.jstor.org/stable/10.1525/j.ctt1pn62c> pg 99
- 4 Harris, A. P., Selbin, J., & Lin, M. (2007). From “The Art of War” to “Being Peace”: Mindfulness and Community Lawyering in a Neoliberal Age (SSRN Scholarly Paper ID 1024004). Social Science Research Network. <https://papers.ssrn.com/abstract=1024004> pg 2081
- 5 Self, R. O. (2003). *American Babylon: Race and the Struggle for Postwar Oakland* (STU-Student edition). Princeton University Press; JSTOR. <https://www.jstor.org/stable/j.ctt5hhq2x> pg 160 and Rhomberg, C. (2004). *No There There: Race, Class, and Political Community in Oakland* (1st ed.). University of California Press; JSTOR. <https://www.jstor.org/stable/10.1525/j.ctt1pn62c> pg 120
- 6 Self, R. O. (2003). *American Babylon: Race and the Struggle for Postwar Oakland* (STU-Student edition). Princeton University Press; JSTOR. <https://www.jstor.org/stable/j.ctt5hhq2x> pg 161
- 7 AC Transit History of Lines By Line Major Changes since 1960. (1978). AC Transit. <http://www.actransit.org/wp-content/uploads/History-of-Lines-by-Line.pdf>
- 8 Rhomberg, C. (2004). *No There There: Race, Class, and Political Community in Oakland* (1st ed.). University of California Press; JSTOR. <https://www.jstor.org/stable/10.1525/j.ctt1pn62c> pg 186
- 9 Rhomberg, C. (2004). *No There There: Race, Class, and Political Community in Oakland* (1st ed.). University of California Press; JSTOR. <https://www.jstor.org/stable/10.1525/j.ctt1pn62c> pg 186
- 10 Oakland Renames East 14th Street / It'll be ‘International Blvd.’ - SFGate. (n.d.). Retrieved November 11, 2019, from <https://www.sfgate.com/bayarea/article/Oakland-Renames-East-14th-Street-It-ll-be-2983004.php>
- 11 Rhomberg, C. (2004). *No There There: Race, Class, and Political Community in Oakland* (1st ed.). University of California Press; JSTOR. <https://www.jstor.org/stable/10.1525/j.ctt1pn62c> pg 186
- 12 Attoh, K. A. (2019). *Rights in Transit: Public Transportation and the Right to the City in California’s East Bay*. University of Georgia Press; JSTOR. <https://www.jstor.org/stable/j.ctt22nmc4p> pg 96
- 13 Reid, C. K. (2017). Financialization and the subprime subject: the experiences of homeowners during California’s housing boom. *Housing Studies*, 32(6), 793–815. <https://doi.org/10.1080/02673037.2016.1240760>

- 14 Redlining and Gentrification | Urban Displacement Project. Retrieved October 25, 2019, from <https://www.urbandisplacement.org/redlining>
- 15 AC Transit. (2019). Project Facts. <https://brt.actransit.org/>
- 16 Annual Ridership Report. (2019). AC Transit http://www.actransit.org/wp-content/uploads/board_memos/18-241%20Annual%20Ridership%20Report%202018%20-%20WEB.pdf
- 17 TRB Bus Rapid Transit Conference Presentation. (2018). AC Transit. <http://onlinepubs.trb.org/onlinepubs/Conferences/2018/BRT/KAkwabi.pdf>
- 18 City of Oakland. (2011). International Boulevard Transit-Oriented Development Plan. <https://cao-94612.s3.amazonaws.com/documents/International-Boulevard-TOD-Plan.pdf> Page pg 1-6.
- 19 AC Transit. (2019). AC Transit's East Bay Bus Rapid Transit (BRT). <http://www.actransit.org/brt/>
- 20 Polzin, S. & Baltes, M. (2002.) Bus Rapid Transit: A Viable Alternative? *Journal of Public Transportation*, 47-69. <http://doi.org/10.5038/2375-0901.5.2.3>
- 21 Hidalgo, D. & Gutiérrez, L. (2013.) BRT and BHLS around the world. *Research in Transportation Economics*. <http://www.brt.cl/wp-content/uploads/2012/12/Hidalgo-Gutierrez-2013.pdf>.
- 22 Rodriguez, D. (11/8). Group Discussion re: BRT and Displacement [Personal communication].
- 23 Venter, C., Jennings, G., Hidalgo, D., & Pineda, A. F. V. (2018). The equity impacts of bus rapid transit: A review of the evidence and implications for sustainable transport. *International Journal of Sustainable Transportation*, 12(2), 140–152.
- 24 City of Oakland. (1998.) Oakland General Plan, Land Use and Circulation Element, pg. 47.
- 25 AC Transit. (2007.) Draft Environmental Impact Report, 1-22.
- 26 Federal Transit Administration. (2019.) Small Starts Program. <https://www.transit.dot.gov/funding/grant-programs/capital-investments/about-program>
- 27 City of Oakland. (2011). International Boulevard Transit-Oriented Development Plan. <https://cao-94612.s3.amazonaws.com/documents/International-Boulevard-TOD-Plan.pdf> Page pg 3-6.
- 28 Berkeley Planet Daily. (2008). Berkeley City Council Rejects "Full Build" BRT for EIR, Endorses "Reduced Impact." <http://www.berkeleydailyplanet.com/issue/2010-05-04/article/35234?headline=Berkeley-City-Council-Rejects-Full-Build-BRT-for-EIR-Endorses-Reduced-Impact>.
- 29 AC Transit. (2019). AC Transit's East Bay Bus Rapid Transit (BRT). <http://www.actransit.org/brt/>
- 30 Cleveland. (n.d.). Retrieved December 19, 2019, from https://brtdata.org/location/northern_america/united_states/cleveland
- 31 KQED News. (2016). AC Transit Breaks Ground on East Bay's First Bus Rapid Transit Line. <https://www.kqed.org/news/11062141/ac-transit-breaks-ground-on-east-bays-first-bus-rapid-transit-line>.
- 32 Oakland Airport. (2016). BART to OAK Service Frequently Asked Questions. <https://www.oaklandairport.com/wp-content/uploads/2016/05/BARTtoOAKFAQ.pdf>.
- 33 Zillow. (2019). Oakland CA Home Prices & Home Values. <https://www.zillow.com:443/oakland-ca/home-values/>

- 34 Rodriguez, D. (11/8). Group Discussion re: BRT and Displacement [Personal communication].
- 35 City of Oakland. (2011). International Boulevard Transit-Oriented Development Plan. pg. 3-6. <https://cao-94612.s3.amazonaws.com/documents/International-Boulevard-TOD-Plan.pdf>
- 36 City of Oakland. (2011). International Boulevard Transit-Oriented Development Plan. pg. 3-6. <https://cao-94612.s3.amazonaws.com/documents/International-Boulevard-TOD-Plan.pdf>
- 37 The five hottest Bay Area housing markets are all in Oakland. San Francisco Business Times. Retrieved November 11, 2019, from <https://www.bizjournals.com/sanfrancisco/news/2017/01/05/zillow-housing-market-oakland-price-growth.html>
- 38 Methodology: Zillow Rent Index (2019 Update). (2019, August 16). Zillow Research. <https://www.zillow.com/research/methodology-zillow-rent-index-2019-25172/>
- 39 Shapiro, T., Meschede, T., & Osoro, S. (2013). The Roots of the Widening Racial Wealth Gap: Explaining the Black-White Economic Divide. <https://doi.org/10.13016/pvyx-ebny>
- 40 Alameda County Homeless Count & Survey Comprehensive Report 2019. (2019). Applied Survey Research. http://everyonehome.org/wp-content/uploads/2019/07/2019_HIRDReport_Alameda_FinalDraft_8.15.19.pdf
- 41 Oakland homeless camps point to racial bias. (2017, July 1). San Francisco Chronicle <https://www.sfchronicle.com/news/article/Oakland-homeless-camps-point-to-racial-bias-11260015.php>
- 42 Lin, M., & Rose, K. (2015). A Roadmap Toward Equity: Housing Solutions for Oakland, California. pg. 9. <https://www.policylink.org/sites/default/files/pl-report-oak-housing-070715.pdf>
- 43 Lin, M., & Rose, K. (2015). A Roadmap Toward Equity: Housing Solutions for Oakland, California. pg. 10. <https://www.policylink.org/sites/default/files/pl-report-oak-housing-070715.pdf>.
- 44 AC Transit. (2019). AC Transit's East Bay Bus Rapid Transit (BRT). <http://www.actransit.org/brt/>.
- 45 National Equity Atlas. (2012). https://nationalequityatlas.org/indicators/Car_access_%28old%29/By_race~ethnicity%3A7411/San_Francisco-Oakland-Fremont%2C_CA_Metro_Area/false
- 46 American Community Survey Data. (2012-2017.) Calculated at a 90% confidence level. Table B08201.
- 47 CloseCommute Systems. (2018). Closer Commutes. <https://engage.gov.bc.ca/app/uploads/sites/391/2018/08/Closer-Commutes.pdf>
- 48 Calculated in part using AC Transit data. (2019.) Median stations counted as making two stops in order to provide a fair comparison.
- 49 NACTO. (2015). Service Design Guidelines. pg. 9. https://nacto.org/wp-content/uploads/2015/04/service_design_guidelines_vta.pdf
- 50 AC Transit. (2012.) Final Environmental Impact Report, Purpose & Need. pg. 26. <http://www.actransit.org/final-environmental-impact-statementfinal-environmental-impact-report-feisfeir/>
- 51 Allen Temple Baptist Church. (2012). Press Release.
- 52 City of Oakland, OakDOT. (2019). Vision Zero. <https://cao-94612.s3.amazonaws.com/documents/ALL-HINs.pdf>

- 53 AC Transit. (2019). AC Transit's East Bay Bus Rapid Transit (BRT). <http://www.actransit.org/brt/>.
- 54 KQED News. (2016). AC Transit Breaks Ground on East Bay's First Bus Rapid Transit Line. <https://www.kqed.org/news/11062141/ac-transit-breaks-ground-on-east-bays-first-bus-rapid-transit-line>.
- 55 NACTO. (2016). High Quality Bike Facilities in Increase Ridership. <https://nacto.org/2016/07/20/high-quality-bike-facilities-increase-ridership-make-biking-safer/>
- 56 CDC. (2019). Pedestrian Safety. https://www.cdc.gov/motorvehiclesafety/pedestrian_safety/index.html
- 57 SFMTA. (2017). Red Transit-Only Work. <https://www.sfmta.com/blog/red-transit-only-lanes-work-two-new-studies-show-their-benefits>
- 58 Vecino-Ortiz, A. & Hyder, A. (2015). Road Safety Effects of Bus Rapid Transit (BRT) Systems: a Call for Evidence. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4608935/>.
- 59 Duduta, K., Adiazola, C., Wass, C., Hidalgo, D., & Lindau, L. (2012). Traffic Safety on Bus Corridors. https://www.embarq.org/sites/default/files/EMB2012_Traffic_Safety_on_Bus_Corridors_Pi_lot_Version.pdf
- 60 Metropolitan Transportation Commission. (2019). What is Plan Bay Area 2050? <https://www.planbayarea.org/plan-bay-area-2050-0>
- 61 AC Transit. (2019). Supplemental Report to Oakland City Council.
- 62 AC Transit. (2019). Supplemental Report to Oakland City Council.
- 63 East Bay Times. (2018). 70-year-old East Oakland furniture store closing amid bus line construction. <https://www.eastbaytimes.com/2018/04/14/70-year-old-east-oakland-furniture-store-closing-amid-bus-line-construction/>
- 64 AC Transit. (2019). Supplemental Report to Oakland City Council.
- 65 First National People of Color Environmental Leadership Summit. (1991). The Principles of Environmental Justice (EJ). http://www.columbia.edu/cu/EJ/Reports_Linked_Pages/EJ_principles.pdf
- 66 International Boulevard Transit-Oriented Development Final Draft Plan. (2011). City of Oakland, California. <http://www2.oaklandnet.com/oakca1/groups/ceda/documents/report/oak032598.pdf> pg 5
- 67 US Department of Transportation/Federal Transit Administration, & Alameda Contra Costa Transit District. (2012). Final Environmental Impact Statement/Final Environmental Impact Report—Summary. http://www.actransit.org/wp-content/uploads/Volume_1_Part_02_-_Summary.pdf
- 68 International Boulevard Transit-Oriented Development Final Draft Plan. (2011). City of Oakland, California. <http://www2.oaklandnet.com/oakca1/groups/ceda/documents/report/oak032598.pdf> pg 2-3
- 69 Witteborg, J. (2019, March 20). About CalEnviroScreen [Text]. OEHHA. <https://oehha.ca.gov/calenviroscreen/about-calenviroscreen>
- 70 Resilient Oakland Playbook. (2016). City of Oakland. <https://www.oaklandca.gov/documents/resilient-oakland-strategy> pg 59

- 71 Aldana-Cohen, D. (2016). Petro Gotham, People's Gotham. *Nonstop Metropolis: A New York City Atlas*, 47–54.
- 72 August, L. (2016, December 29). CalEnviroScreen 3.0 [Text]. OEHHA. <https://oehha.ca.gov/calenviroscreen/report/calenviroscreen-30>
- 73 Schrock, G., Bassett, E. M., & Green, J. (2015). Pursuing Equity and Justice in a Changing Climate: Assessing Equity in Local Climate and Sustainability Plans in U.S. Cities. *Journal of Planning Education and Research*, 35(3), 282–295. <https://doi.org/10.1177/0739456X15580022> pg 282
- 74 Oakland-Alameda-Resilience-Study-Final. (2016). Adapting to Rising Tides. <http://adaptingtorisingtides.org/wp-content/uploads/2014/12/Oakland-Alameda-Resilience-Study-Final.pdf> pg 27
- 75 Scripps Institution of Oceanography, UC San Diego. (2016, November 17). Probabilistic Scenarios of Sea Level Rise (SLR) along the California Coast a product of the California 4th Climate Assessment. http://trnerr.org/wp-content/uploads/2016/11/Cayan_SeaLevelRise_CoSMoSMeetingSanDiego_17Nov2016.pdf pg 27
- 76 Oakland Climate Action Plan—2017 Update. (2017). Oakland Public Works Department. <http://www2.oaklandnet.com/oakca1/groups/pwa/documents/policy/oak069942.pdf>
- 77 Global warming of 1.5°C. (n.d.). Intergovernmental Panel on Climate Change. Retrieved November 23, 2019, from https://www.ipcc.ch/site/assets/uploads/sites/2/2019/06/SR15_Full_Report_Low_Res.pdf; Vincent, W., & Jerram, L. (2006). The Potential for Bus Rapid Transit to Reduce Transportation-Related CO2 Emissions. *Journal of Public Transportation*, 9(3), 219–237. <https://doi.org/10.5038/2375-0901.9.3.12>
- 78 Why Creating and Preserving Affordable Homes Near Transit is a Highly Effective Climate Protection Strategy. (2014, June 10). TransForm. <https://www.transformca.org/transform-report/why-creating-and-preserving-affordable-homes-near-transit-highly-effective-climate>
- 79 Oakland Climate Action Plan—2017 Update. (2017). Oakland Public Works Department. <http://www2.oaklandnet.com/oakca1/groups/pwa/documents/policy/oak069942.pdf> pg25
- 80 Oakland Climate Action Plan—2017 Update. (2017). Oakland Public Works Department. <http://www2.oaklandnet.com/oakca1/groups/pwa/documents/policy/oak069942.pdf> pg 60
- 81 AHSC Resources—Strategic Growth Council. (n.d.). Retrieved November 3, 2019, from <http://sgc.ca.gov/programs/ahsc/resources/>
- 82 2030 ECAP Overview Presentation. (n.d.). City of Oakland. Retrieved November 11, 2019, from <https://www.oaklandca.gov/documents/2030-ecap-overview-presentation>
- 83 Behrsin, I., & Benner, C. (2017). Contested spaces and subjectivities of transit: Political ecology of a bus rapid transit development in Oakland, California. *Journal of Transport Geography*, 61, 95–103. <https://doi.org/10.1016/j.jtrangeo.2017.05.003>
- 84 Resilient Oakland Playbook. (2016). City of Oakland. <https://www.oaklandca.gov/documents/resilient-oakland-strategy> pg 75
- 85 US Department of Transportation/Federal Transit Administration, & Alameda Contra Costa Transit District. (2012). Final Environmental Impact Statement/Final Environmental Impact Report—Summary. http://www.actransit.org/wp-content/uploads/Volume_I_Part_02_-_Summary.pdf
- 86 Chapple, K., & Loukaitou-Sideris, A. (2019). Transit-oriented displacement or community dividends? Understanding the effects of smarter growth on communities. The MIT Press. Pg 265

- 87 Eligible uses of funds: Building renovations, facade improvement, acquisition/creation of private parking, business model alterations, product offerings, business lines, customer base, etc.) and, absent a feasible retention plan, relocation.
- 88 Mundie & Associates. (2005). *The Proposed Wood Street Project: Policy and Planning Framework*. City of Oakland Community & Economic Development Agency.
- 89 Untokening Collective. (2017). *Untokening 1.0 — Principles of Mobility Justice*. <http://www.untokening.org/updates/2017/11/11/untokening-10-principles-of-mobility-justice>
- 90 Nikitas, A., & Karlsson, M. (2015). A Worldwide State-of-the-Art Analysis for Bus Rapid Transit: Looking for the Success Formula. *Journal of Public Transportation*, 18(1). <https://doi.org/10.5038/2375-0901.18.1.3>
- 91 Cervero, R., & Dai, D. (2014). BRT TOD: Leveraging transit oriented development with bus rapid transit investments. *Transport Policy*, 36, 127–138. <https://doi.org/10.1016/j.tranpol.2014.08.001>
- 92 *The Bus Rapid Transit Standard*. (2019). Institute for Transportation and Development Policy. Retrieved November 9, 2019, from <https://www.itdp.org/library/standards-and-guides/the-bus-rapid-transit-standard/>
- 93 Jaffe, E. (2014, May 5). *The Importance of Running True BRT Through Downtown*. CityLab. <http://www.theatlanticcities.com/commute/2014/05/importance-running-true-brt-through-downtown/9033/>; Malouff, D. (2013, January 27). *The US has only 5 true BRT systems, and none are "gold."* Greater Greater Washington. <https://ggwash.org/view/29962/the-us-has-only-5-true-brt-systems-and-none-are-gold>; Nelson, A. (2015). *National Study of BRT Development Outcomes*. National Institute for Transportation and Communities. <https://doi.org/10.15760/trec.28>; Weinstock, A., Hook, W., Replogle, M., & Cruz, R. (2011). *Recapturing Global Leadership in Bus Rapid Transit: A Survey of Select U.S. Cities*.
- 94 Levinson, H., Zimmerman, S., Clinger, J., & Rutherford, G. (2002). *Bus Rapid Transit: An Overview*. *Journal of Public Transportation*, 5(2). <https://doi.org/10.5038/2375-0901.5.2.1>
- 95 Hidalgo, D., & Gutiérrez, L. (2013). BRT and BHLS around the world: Explosive growth, large positive impacts and many issues outstanding. *Research in Transportation Economics*, 39(1), 8–13. <https://doi.org/10.1016/j.retrec.2012.05.018>
- 96 Flyvbjerg, B. (2014). *What You Should Know About Megaprojects and Why: An Overview*. *Project Management Journal*, 45(2), 6–19. <https://doi.org/10.1002/pmj.21409>
- 97 Trapenberg Frick, K. (2016). *The Caltrain Corridor Vision Plan Appendix C Megaplanning for Mega and Mini Projects: Common Challenges and Ways Forward*. SPUR.
- 98 Rodríguez, D. (11/8). *Group Discussion re: BRT and Displacement [Personal communication]*.
- 99 Rodríguez, D. A., & Mojica, C. H. (2009). Capitalization of BRT network expansions effects into prices of non-expansion areas. *Transportation Research Part A: Policy and Practice*, 43(5), 560–571. <https://doi.org/10.1016/j.tra.2009.02.003>; Cervero, R., & Kang, C. D. (2011). Bus rapid transit impacts on land uses and land values in Seoul, Korea. *Transport Policy*, 18(1), 102–116. <https://doi.org/10.1016/j.tranpol.2010.06.005>; Jun, M.-J. (2012). Redistributive effects of bus rapid transit (BRT) on development patterns and property values in Seoul, Korea. *Transport Policy*, 19(1), 85–92. <https://doi.org/10.1016/j.tranpol.2011.09.003>; Perk, V. A., & Catalá, M. (2009). *Land Use Impacts of Bus Rapid Transit: Effects of BRT Station Proximity on Property Val-*

- ues along the Pittsburgh Martin Luther King, Jr. East Busway. <https://trid.trb.org/view/1401767>; Dubé, J., Rosiers, F. D., Thériault, M., & Dib, P. (2011). Economic impact of a supply change in mass transit in urban areas: A Canadian example. *Transportation Research Part A: Policy and Practice*, 45(1), 46–62. <https://doi.org/10.1016/j.tra.2010.09.002>; Mulley, C., Ma, L., Clifton, G., Yen, B., & Burke, M. (2016). Residential property value impacts of proximity to transport infrastructure: An investigation of bus rapid transit and heavy rail networks in Brisbane, Australia. *Journal of Transport Geography*, 54, 41–52. <https://doi.org/10.1016/j.jtrangeo.2016.05.010>
- 100 Brown, A. E. (2016). Rubber Tires for Residents: Bus Rapid Transit and Changing Neighborhoods in Los Angeles, California. *Transportation Research Record*, 2539(1), 1–10. <https://doi.org/10.3141/2539-01>
- 101 Vergel-Tovar, C. E., & Rodriguez, D. A. (2018). The ridership performance of the built environment for BRT systems: Evidence from Latin America. *Journal of Transport Geography*, 73, 172–184. <https://doi.org/10.1016/j.jtrangeo.2018.06.018>
- 102 Venter, C., Jennings, G., Hidalgo, D., & Pineda, A. F. V. (2018). The equity impacts of bus rapid transit: A review of the evidence and implications for sustainable transport. *International Journal of Sustainable Transportation*, 12(2), 140–152. <https://doi.org/10.1080/15568318.2017.1340528>
- 103 Cervero, R. (2013). Bus Rapid Transit (BRT): An Efficient and Competitive Mode of Public Transport. <https://escholarship.org/uc/item/4sn2f5wc>
- 104 Grengs, J. (2012). Equity and the Social Distribution of Job Accessibility in Detroit. *Environment and Planning B: Planning and Design*, 39(5), 785–800. <https://doi.org/10.1068/b36097>
- 105 Bills, T. S., & Walker, J. L. (2017). Looking beyond the mean for equity analysis: Examining distributional impacts of transportation improvements. *Transport Policy*, 54, 61–69. <https://doi.org/10.1016/j.tranpol.2016.08.003>
- 106 Nugroho, S. B., Fujiwara, A., & Zhang, J. (2011). An empirical analysis of the impact of a bus rapid transit system on the concentration of secondary pollutants in the roadside areas of the TransJakarta corridors. *Stochastic Environmental Research and Risk Assessment*, 25(5), 655. <https://doi.org/10.1007/s00477-011-0472-x>
- 107 Global warming of 1.5°C. (2019). Intergovernmental Panel on Climate Change. https://www.ipcc.ch/site/assets/uploads/sites/2/2019/06/SR15_Full_Report_Low_Res.pdf
- 108 Gota, S., Huizenga, C., Peet, K., Medimorec, N., & Bakker, S. (2019). Decarbonising transport to achieve Paris Agreement targets. *Energy Efficiency*, 12(2), 363–386. <https://doi.org/10.1007/s12053-018-9671-3>
- 109 Vincent, W., & Jerram, L. (2006). The Potential for Bus Rapid Transit to Reduce Transportation-Related CO2 Emissions. *Journal of Public Transportation*, 9(3), 219–237. <https://doi.org/10.5038/2375-0901.9.3.12>
- 110 Cui, S., Niu, H., Wang, W., Zhang, G., Gao, L., & Lin, J. (2010). Carbon footprint analysis of the Bus Rapid Transit (BRT) system: A case study of Xiamen City. *International Journal of Sustainable Development & World Ecology*, 17(4), 329–337. <https://doi.org/10.1080/13504509.2010.490657>
- 111 Venter, C., Jennings, G., Hidalgo, D., & Pineda, A. F. V. (2018). The equity impacts of bus rapid transit: A review of the evidence and implications for sustainable transport. *International Journal of Sustainable Transportation*, 12(2), 140–152. <https://doi.org/10.1080/15568318.2017.1340528>