BRTOD – State of the Practice in the United States

By: Andrew Degerstrom

September 2018

Metro Transit

Contents

Artist rendering of Pittsburgh's East Liberty neighborhood and the Martin Luther King, Jr. East Busway

Introduction

Purpose of this Report

If Light Rail Transit (LRT) was the "next big thing" for the past several decades, Bus Rapid Transit (BRT) is poised to take its place for the next several. BRT went from a foreign concept several decades ago to more than 20 true BRT lines operating in the United States today, with many more in various stages of planning. Here in the Twin Cities, there is currently one operational BRT line, two more lines in the planning phase, as well as 5 rapid bus lines with some BRT features in operation or planning. One of the draws of BRT is its ability to provide a level of travel benefits comparable to that of LRT for smaller ridership corridors.

In contrast to BRT's well-known capability to provide comparable travel benefits to rail, not much is known about its ability to provide comparable development benefits, both economic development and transit-oriented development (TOD) benefits. Compared to rail, BRT systems can vary widely in design and level of features, which complicates the degree to which BRT can deliver development benefits. Further, with a few exceptions, BRT systems in the United States have just not been around long enough for the development benefits to be widely known. This report attempts to answer this question: how well does BRT perform in delivering development benefits, both in terms of economic development more broadly and TOD more specifically?

The first part of this report is presented as a literature review of BRT's economic development impacts, as well the factors that affect the success of BRTOD[1] implementation.

The second part of this report presents a series of case studies of both existing and planned BRT lines with a specific focus on the TOD component. The list of case studies is by no means exhaustive but does provide a good sample of projects both locally and nationally. The case studies are:

- **HealthLine** – Cleveland, Ohio
- **Martin Luther King, Jr. East Busway East Liberty Station** – Pittsburgh, Pennsylvania
- **Uptown/Oakland BRT and the EcoInnovation District** – Pittsburgh, Pennsylvania
- **Rapid bus A Line** – Minneapolis and Saint Paul, Minnesota
- **METRO Gold Line** – Saint Paul, Maplewood, Oakdale, and Woodbury, Minnesota

1 BRTOD, or Bus Rapid Transit-Oriented Development, refers specifically to TOD associated with BRT projects.

Economic Development and Transit-Oriented Development

Economic development is a widely used, albeit nebulous term. One reason for that is that there is no universal definition of economic development. However, for this report, the definition provided by Leigh and Blakely (2017) will be used, which is as follows:

> **Economic Development:** A process of human and physical development that establishes a minimum standard of living that increases over time, reduces inequality, and promotes and encourages sustainable resource use and production.

There is a connection between transportation and economic development. Transportation provides economic development benefits, indicated by land value increases, if it decreases time of travel, connects more people to more destinations, and improves the quality of travel. Rail transit is widely believed to provide these economic development benefits because the infrastructure investment conveys a sense of permanence that gives private sector developers confidence. The question of this report is whether or not BRT can provide similar economic development benefits.

Transit-Oriented Development, like economic development, does not have a universal definition. However, the term is usually associated with higher-density, mixed-use, and walkable development located around transit. Peter Calthorpe, who many consider to be the creator of the concept of TOD as we know it today, defines it as a market driven approach to address numerous social and environmental problems based on the principles of human scale, walkability, and transit-supportive density (Carlton, 2009). The Metropolitan Council (2014) defines TOD as:

> **Transit-Oriented Development:** Walkable, moderate to high-density development served by frequent transit with a mix of housing, retail, and employment choices designed to allow people to live and work without the need of a personal automobile.

Although both terms contain the word "development," economic development and TOD are not the same thing. Economic development is more broadly concerned about establishing a minimum and rising standard of living in an equitable and sustainable way, whereas TOD is focused on connecting land use and transportation through physical development concentrated around transit. However, the goals of TOD are compatible with those of economic development. By concentrating higher-density, mixed-use, and walkable development around transit, the standard of living can be improved by giving people more transportation options, lowering their transportation costs, increasing their accessibility to jobs, and leading to a healthier lifestyle by encouraging more walking. TOD also addresses sustainability, as higher-density, mixed-use development is considered more efficient and thus more environmentally friendly. Additionally, the reduced use of private automobiles as a result of TOD reduces emissions and improves air quality. Because the goals of economic development and TOD are compatible, TOD can be considered as an economic development tool.

Definition of Bus Rapid Transit

Unlike heavy rail or LRT, BRT systems vary widely in design and level of features. The Institute for Transportation and Development Policy (2016) defines BRT as:

> **BRT:** A bus-based rapid transit system that can achieve high capacity, speed, and service quality at relatively low cost by combining segregated bus lanes that are typically median aligned with off-board fare collection, level boarding, bus priority at intersections, and other quality-of-service elements (such as information technology and strong branding)

The Institute for Transportation and Development Policy (2016) also has developed a BRT Standard and Scorecard and establishes four rankings for BRT: Basic, Bronze, Silver, and Gold. In order to be considered Basic BRT, any BRT line, among other requirements,[2] has to score at least 20 points across all five of what ITDP have classified as the BRT basics elements: dedicated right of way, busway alignment, off-board fare collection, intersection treatments, and platform-level boarding. According to the ITDP, Cleveland's HealthLine is ranked as Silver Standard, and Pittsburgh's Martin Luther King, Jr. East Busway is ranked as Bronze Standard (2018). As for the other BRT

2 Other requirements are at least 3 kilometers in length with dedicated lanes, a score of 4 or more points in the dedicated right-of-way element, and a score of 4 or more points in the busway alignment element.

lines featured as case studies in this report, they have either not yet been ranked by ITDP or are still in the planning phase.

More recently, the concept of BRT in the United States has expanded to include what is commonly referred to as Rapid Bus, or Arterial BRT (ABRT).[3] This type of service is characterized as improved, faster bus service operating on city streets with some BRT features. The Metropolitan Council's 2040 Transportation Policy Plan (2018) makes a distinction between Dedicated BRT, Highway BRT and Arterial BRT. Dedicated BRT is service that uses special roadways or lanes of roadways dedicated to the exclusive use of buses, Highway BRT is service that uses limited access roadways, and Arterial BRT is service that operates in mixed traffic. Additionally, ABRT is further defined as service that includes off-board fare payment, semi-level and all-door boarding, in-lane stops, and signal priority (Metro Transit, 2018). Guthrie and Fan (2016) note that most transit services in the United States marketed as BRT more closely resemble the Metropolitan Council's definition of ABRT.

For this report, both services that are considered to be more traditional BRT as defined by the ITDP, as well as services that are considered to be ABRT or Rapid Bus will be considered as BRT.

3 ABRT is a term unique to the Minneapolis/Saint Paul region.

Literature Review

Although there is a significant amount of literature on the economic development impacts of rail transit, there is a limited amount with regard to BRT. A majority of the literature on the economic development impacts of BRT focuses on systems in Asia and South America. As the United States exists in different political and real estate contexts than other parts of the world, those studies are not of much use. The remaining literature that is applicable to the United States can be grouped into two main categories: statistically rigorous studies examining the economic development impacts of BRT more broadly, and literature exploring the opportunities and challenges of implementing BRTOD.

BRT Economic Development Outcomes

Land Capitalization[4]

There are several studies examining the land capitalization effects of BRT in the United States. One study looks at the effects of BRT on property values of single-family residential homes, one study looks at the effects of BRT on sale prices of single-family residential homes, one study looks at the effects of BRT on the sale prices of both residential and commercial properties, and one study looks at the effects of BRT on office rents.

The first study was Cervero and Duncan (2002). Looking at two of Los Angeles' Metro Rapid BRT lines, they found that residential properties near the Metro Rapid stops had lower sale prices and commercial properties had higher sales prices compared to properties not located near stops. However, they note that the newness of service at the time of the study and the fact that the BRT lines were located in urban renewal districts may have had an impact on the results.

The next study was Perk and Catalá (2009), who looked at the relationship between property values of single-family residential homes and their distance to stations along Pittsburgh's Martin Luther King, Jr. East Busway. They found that, all else being equal, a property located 1000 feet away from a station was valued at approximately $9,745 less than a property that was only 100 feet away from a station.

Perk et al. (2017) looked at the relationship between distance to BRT stations and sale price of single-family residential homes for Eugene, Oregon's EmX BRT system. The study looked at three cross-section time periods of 2005, 2010, and 2016, which represents a time prior to the implementation of EmX, a few years after EmX began operating, and the most recent information available, respectively. They found that a 100-meter decrease in distance to a station in 2005 increased sale price by $823, in 2010 increased sale price by $1,056, and in 2016 increased sale price by $1,128, all else being equal.

There was one study, Nelson and Ganning (2015), that looked at the effect of BRT on office rents. They looked at office rents for applicable properties within 0.50 miles of BRT corridors in Cleveland, Eugene, Kansas City, Las Vegas, and Pittsburgh. For Cleveland, Eugene, and Kansas City, they found a statistically significant, positive rent premium for office space within 0.50 of their BRT corridors. For Las Vegas and Pittsburgh, they found statistically significant, positive rent premiums within 0.50 of their BRT corridors outside of downtown. Inside downtown, they found positive rent premiums, but they were not statistically significant.

BRT Impacts on Jobs

There are several studies that examine the impacts of BRT on jobs. They can be broken down into three categories: changes in jobs by industry sector, wage level, and skill level.

The first study, Nelson et al. (2013), examined the effects of BRT on jobs by industry sector for Eugene, Oregon's EmX BRT. Their analysis covered the years 2004 and 2010, which represented three years before and after the system opened. Results are divided among three distance bands: within 0.25 miles of BRT stations, between 0.25 and 0.5 miles of BRT stations, and greater than .5 miles from BRT stations. For jobs overall between 2004 and 2010, the

4 Land capitalization is the effect of locational benefits or land improvements being reflected in higher land values, sales prices, rents, etc.

region outside of the 0.5-mile station areas lost about 5 percent, or more than 5,000, jobs between 0.25 and 0.5 miles of stations jobs stayed about the same, and within 0.25 miles of stations jobs increased by about 10 percent, or nearly 3000.

When looking at jobs by sector, within 0.25 miles of stations, jobs in the Information, Real Estate, Management, Administrative, Education, Health Care, Lodging/Food, and other sectors all increased by more than 10%. Jobs in the Management sector specifically more than doubled. However, many of these same sectors lost jobs between 0.25 and 0.5 miles of station areas, while some gained jobs in both distance bands. Between 0.25 and 0.5 miles of station areas, jobs in the Transportation and Arts/Entertainment/Recreation sectors increased by 160% and 130%, respectively. Jobs in the retail sector increased slightly in both the 0.25 and 0.5-mile distance bands but decreased beyond the 0.5-mile distance band. The authors surmise that the differences in jobs be sector is that the market is sorting jobs based on proximity to BRT stations, and some sectors are able to outbid others for the closest proximity within the 0.25-mile band.

Examining changes in job numbers alone cannot determine if BRT proximity confers a comparative advantage for certain sectors. In order to make that determination, the authors also conducted a shift-share analysis.[5] Based off of this analysis, the authors found that some sectors, mainly Construction, Manufacturing, and Trade appeared to be displaced by other sectors seeking BRT proximity. Other industries, specifically Retail Trade, Transportation and Warehousing, Finance and Insurance, Real Estate and Rental Leasing, and other services, appeared to be attracted to BRT station areas.

Nelson and Ganning (2015) also looked at the impacts of BRT nationally on both sectoral job change, and job change by wage level. Looking at sectoral job change, the authors gathered LEHD[6] data for a sample of 226 BRT stations along nine BRT corridors that opened between 2002 and 2010. With regards to total employment change, the authors found a statistically significant, positive relationship with proximity to BRT stations. However, when broken down by job sector, they found that only Manufacturing had a statistically significant relationship.

Looking at job change by wage level, the authors took LEHD data for all 12 BRT systems operating in 2010, converted the data into wage categories (lower-, middle-, and upper-wage), and conducted a shift-share analysis. They divided their analytic periods into pre-recession (2002-2007) and recovery (2008-2011). Pre-recession, the authors found a negative shift in share of jobs across all three wage categories for BRT station areas compared to their central counties. During the recovery, lower-wage jobs still had a negative shift, albeit smaller than pre-recession, in share of jobs for BRT station areas. Both middle- and upper-wage jobs showed positive shifts during the recovery.

The last study, Guthrie and Fan (2016), looked at the impacts of BRT nationally on both change in jobs by skill level and wage level. As the authors' intention was to highlight BRT impacts for policy makers in the Minneapolis/Saint Paul area as they begin to implement BRT, the authors limited their analysis to peer regions as considered by the Metropolitan Council for transit purposes that opened either BRT or LRT between 2003 and 2010. The authors took LEHD data and converted it into both skill level (blue-, pink-, and white-collar) and wage level (lower-, middle-, and upper-wage) categories. As a regression model was the method used for analysis, many additional variables other than proximity to BRT were used. For a majority of the models, station area street mileage was a significant, positive predictor of jobs after implementation of BRT service. ABRT was consistently found to be a significant, negative predictor of job change, as well as dedicated guideway BRT as a negative predictor specifically for pink collar jobs. Finally, distance from the central business district was a significant, negative predictor of both upper-wage and white-collar jobs in BRT station areas. The authors acknowledge several limitations of their findings. First was the Great Recession falling in the middle of their study period. Second was that the general trend of jobs shifting outward, along with the fact that most BRT and LRT lines are primarily implemented in central cities and inner suburbs, questions the appropriateness of using metropolitan-wide controls for analysis.

5 Shift-share is an analysis method that attempts to determine how much of regional job growth or decline can be attributed to national trends versus unique regional factors.

6 Longitudinal Employer-Household Dynamics. LEHD data provides statistics on employment, earnings, and job flows at detailed levels of geography and industry and for different demographic groups.

BRT and Private Investment Return

A sweeping, national study on the private investment return for BRT, LRT, Streetcar, and Enhanced Bus[7] systems (Hook et al., 2013) found that generally and under similar conditions, both LRT and BRT can leverage many times more TOD investment than they cost. In total, the study examined 21 transit corridors in the United States and Canada; 8 BRT corridors, 7 LRT corridors, 2 streetcar corridors, and 5 enhanced bus corridors. Of those 21 corridors, Cleveland's HealthLine BRT leveraged the second highest total investment in TOD.

Other BRT Impacts

Nelson and Ganning (2015) also examined several other BRT impacts, including the distribution of certain land uses, location affordability, and the location of people and housing. For the distribution of certain land uses, the authors used CoStar[8] data for the years 2000-2015, with data for the years 2000-2007 (pre-recession) and 2008-2015 (post-recession) grouped together and compared against each other. The study area was within 0.5 miles of BRT corridors, as opposed to BRT station areas. For multi-family housing, although new construction within 0.5 miles of BRT corridors was relatively small, their share more than doubled post-recession. For office space, the share of new office space within 0.5 miles of BRT corridors increased by one third and was statistically significant.

With regard to location affordability, the authors looked at transportation costs as a share of total income with respect to distance of BRT stations for all twelve BRT lines operating in the US in 2010, using HUD's Location Affordability Index[9] for the year 2010. Based on their regression results, the authors report that household transportation costs as a share of total income increases with respect to distance from BRT stations, up until approximately 8 miles in distance.

Finally, on the location of people and housing, the authors attempted to determine if, relative to the metropolitan area as a whole, there was an association between BRT and change over time in population; households by householder age and household type; and housing by total supply, vacancy rates, and tenure. Overall, for the most part, the authors found that BRT systems were not associated with any substantial shifts in population, household, and housing unit location over time.

7 Enhanced Bus corridors were any BRT systems included in the study that were rated as below Basic using ITDP's BRT Standard.
8 CoStar is a provider of commercial real estate information.
9 The Location Affordability Index provides estimates of household housing and transportation costs at the neighborhood level.

Factors that Affect the Success of BRTOD Implementation

The most important factor leading to successful implementation of BRTOD mentioned in literature, either explicitly or implicitly, is level of government support. Hook et al., (2013) concluded that level of government support for TOD was the strongest predictor of success. According to the authors, the types of activities that qualify as government support include the following:

- Rezoning
- Creating a comprehensive plan with a specific focus on the BRT corridor
- Proactive outreach to developer
- Environmental clean-up
- Land assembly
- Extensive marketing of the corridor
- Range of financial incentives

The Government Accountability Office (2012) prepared a report on BRT and economic development for the Committee on Banking, Housing, and Urban Affairs in the United States Senate. One of their general observations was that transit-supportive local policies and development incentives is one factor that can enhance BRT's ability to leverage economic development.

Thole and Samus (2009) found that any of the following may provide incentive or disincentive for new development along BRT corridors, all of which can be considered as forms of government support:

- Local land use plans, policies, zoning, and capital improvement programs
- Financial and non-financial incentives (e.g. density bonuses, tax incentives, streamlined development application process, loan support, etc.)
- Experience of the transit agency and other local institutions at implementing TOD

Cervero and Dai (2014) listed any of the following as BRTOD implementation tools that cities and other local government agencies can use:

- Higher permissible zoning density
- Targeting of supportive infrastructure improvements
- Assistance with land assembly
- Blight removal

Further, they administered an online survey to more than 50 global cities with BRT systems, asking respondents to identify barriers to implementing BRTOD. Of the 17 different barriers reported, 9 of them can be considered as a lack of government support:

- Lack of dedicated funding for TOD
- Absence of TOD plan
- Little local expertise with TOD
- Weak political support
- Skepticism among local governments
- Absence of regional transit/land use plan
- Zoning restrictions
- Inadequate BRT services
- Siting of BRT stations in locations not conducive to TOD

Another important factor leading to successful implementation of BRTOD is the strength of the real estate market (Thole and Samus, 2009; Hook et al., 2013; Cervero and Dai, 2014). Furthermore, Hook et al. (2013) identifies the strength of the real estate market as the secondary indicator of success for BRTOD. The authors categorize market strength into three groups: strong, emerging, and limited. An emerging or limited market will not necessarily prevent any BRTOD from occurring, but a higher level of government support is needed to overcome any market barriers, and local jurisdictions have to be willing to accept TOD projects that are less than ideal. For example, they might have to accept a project that is single-use instead of mixed-use, lower density than what is desired, or has more parking than what is desired.

As BRT levels can vary quite drastically in terms of level of features, anywhere from operating in mixed-traffic on arterial streets to exclusive, grade-separated guideways, level of features is also mentioned as a factor affecting the successful implementation of BRTOD. However, how important the level of features are is not as clear. Physical design features that convey a sense of permanence is often mentioned as especially important for BRTOD (Currie, 2006; Thole and Samus, 2009; Government Accountability Office, 2012; Cervero and Dai, 2014). However, Hook et al. (2013) identified the level of features as only the tertiary indicator of success for BRTOD. They determined level of features using the BRT Standard (Institute for Transportation and Development Policy, 2016), which grades BRT systems as Below Basic, Basic, Bronze Standard, Silver Standard, or Gold Standard. Several of the systems in the United States that they looked at which were considered to be Below Basic still had a significant amount of TOD investment in part to

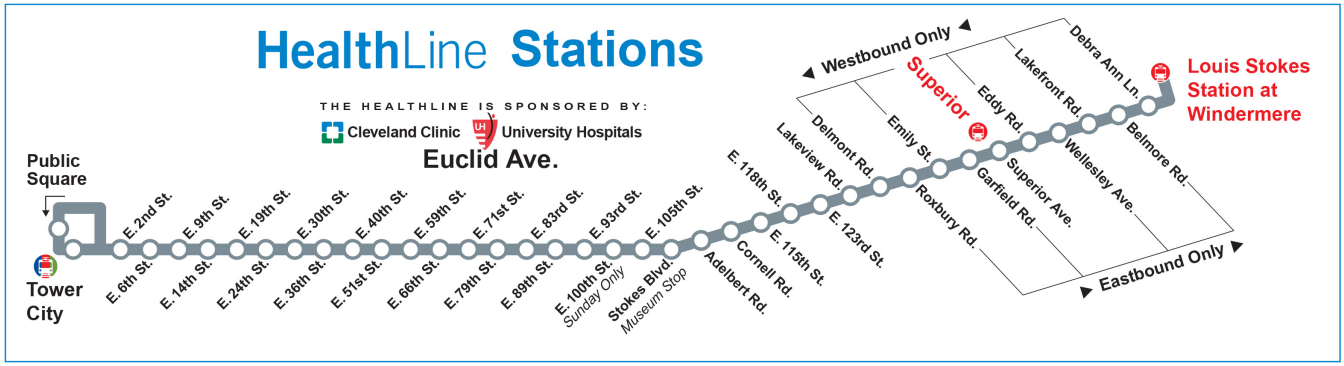
a strong level of government support and/or a strong real estate market. Also, there is a difference in whether or not physical design features that convey a sense of permanence are considered as part of the level of features for BRT. A majority of the literature would indicate yes. However, Hook et al. (2013) looked at streetcar systems in Portland and Seattle as part of their study and scored them using the same BRT Standard. As the BRT Standard prioritizes features that impact speed and reliability than physically permanent features, both streetcar systems received Below Basic ratings. However, if sense of permanence was the factor of primary importance, that would put streetcars above BRT in terms of success at leveraging TOD because of the rail component.

One final factor mentioned affecting the success of BRTOD implementation is institutional presence (hospitals and universities) along BRT corridors. A lot of the success in TOD along BRT lines in Cleveland, Eugene, and Kansas City has been attributed to institutional anchors along their corridors (Government Accountability Office, 2012; Hook et al., 2013). However, Hook et al. (2013) did not include institutional presence with their indicators of success as institutional presence is not a feature that is universal amongst BRT systems.

Case Studies

The second half of this report looks at several case studies of TOD implementation for BRT lines, both planned and currently in operation. For the case studies of BRT lines currently in operation, the focus will be both challenges that local leaders faced in implementing TOD, along with factors that led eventually led to success. For the case studies of BRT lines currently in the planning phase, the focus will be on best practices in the planning process that should be successful in leveraging TOD.

Cleveland HealthLine[10]



Cleveland HealthLine Route Map

Cleveland's HealthLine is probably the best-known example of BRT in the United States. Connecting Cleveland's two largest employment centers of Downtown and University Circle, the HealthLine operates along Euclid Avenue in a median-aligned, dedicated right-of-way. The level of design features has earned the HealthLine a Silver Standard rating from the ITDP based on their BRT Standard, the only BRT line in the United States to do so (Institute for Transportation and Development Policy, 2018). Cleveland's HealthLine is not just considered a successful project in terms of BRT, but also a successful project in terms of leveraging TOD. Of the 21 North American transit corridors examined by Hook et al. (2013), the HealthLine saw the second highest level of total TOD investment along the corridor, only behind Portland's MAX Blue Line LRT. Based on amount of development per dollar of transit investment, the HealthLine came out ahead of all the other transit corridors. Cleveland's success is a story of how, despite a depressed market, strong government support and institutional anchors can leverage significant TOD investment.

History of Cleveland and the HealthLine

Like many Rustbelt cities, the fortunes of Cleveland have been closely linked with the rise and fall of the manufacturing industry. From the late 19th Century through the 1950s, Euclid Avenue was one of Cleveland's most important corridors. Often referred to as Millionaire's Row, it was lined with the mansions of some of Cleveland's most successful business tycoons. As the economy boomed, a lot of the mansions were replaced with popular department stores. The vibrancy of this era was not to last. Cleveland started experiencing significant population and tax base loss as middle-class families started migrating out to the suburbs, leading to drastic cuts in municipal services. Events such as the Hough Riots of 1966 or the Glenville Shootout of 1968 only exacerbated this problem. Combined with the rapid loss of manufacturing jobs, in 1979, Cleveland was the first city since the Great Depression to default on its loans.

Focused on the revitalization of the city, the Dual Hub strategy started to form in the 1970s. The idea was that if they were to connect Cleveland's two largest hubs,

10 Case study summarized from Hook et al. (2013), unless otherwise noted.

Downtown and University Circle, with a mass transit link, both would become more vibrant and the blighted middle, known as MidTown, would begin to fill in. Some of the early thinking was to connect the two with rail. However, the cost of the project kept rising, and combined with continued population and tax base loss, made it not financially viable. That is when the idea of BRT began to emerge.

The Greater Cleveland Regional Transit Authority (GCRTA) began studying BRT as early as 1995. In 1998, Ohio Governor George Voinovich, former mayor of Cleveland, took a trip to Curitiba Brazil, home of the world's first BRT system. Impressed by what he saw, he organized a second trip, this time bringing some of Cleveland's business leaders and staff from GCRTA. They became convinced BRT was the way to move forward. Plans were drawn up, which included a full feature corridor along Euclid Avenue. Not only would the project include the BRT project itself, but it would also include burying power lines, installing fiberoptic communications, rebuilding antiquated sewer and water lines, and street level amenities such as improved sidewalks, bike lanes, and street art. The total project cost was approximately $200 million, $50 million for the BRT itself, and $150 million for all of the infrastructure upgrades. GCRTA was awarded a New Starts grant from the Federal Transit Administration (FTA) for $82 million. Another $75 million came from the State of Ohio, $21 million from GCRTA, $10 million from the Northeast Ohio Areawide Coordinating Agency, $8 million from the City of Cleveland, and the remaining $3 million from miscellaneous sources. Opening in October 2008, the HealthLine features platform level boarding, center median stations, off board fare collection, 4.5 miles of dedicated lanes, reduction in stops from over 100 to 32 from the local bus route it replaced, and frequencies as short as 2.1 minutes during peak.

GCRTA operates a special fleet of customized New Flyer DE60LFA diesel-electric hybrid buses on the HealthLine.

Government Support and Sources of Financing

Zoning and Comprehensive Planning

MidTown Cleveland, Inc., the community development corporation (CDC)[11] for the MidTown neighborhood, created an area master plan called "Beyond 2005: A Vision for MidTown Cleveland," which was adopted by the City Planning Commission in 2005. The plan called for higher-density, mixed-use development with a focus on the pedestrian, with the HealthLine as the centerpiece. The plan also proposed zoning changes, as the City's pyramid form of zoning did not give planning authorities much control of what uses went in to the MidTown corridor.[12]

The new zoning that was adopted as a result was the "MidTown Mixed Use District 1." Not as strict as form-based zoning, it laid out a set of requirements that new developments should follow, and any new development was subject to review by a board composed of architects and urban designers, which gave the city a little more flexibility on how strictly to apply design regulations. The regulations that were introduced as part of the new zoning district included:

- Minimum height of 3 stories for new buildings.
- New buildings must be built to the street line.
- New buildings must fill at least 80% of the lot width.
- Most buildings are required to have ground floor retail.
- Parking minimums reduced by half and converted to maximums.

Although the MidTown area plan was adopted in the absence of a citywide plan, in 2007, the City adopted "Connecting Cleveland 2020." The plan emphasized the creation of a development corridor along Euclid Avenue and supported a transit-oriented MidTown. In 2009, the City, along with MidTown, Inc., hired a consulting firm to develop an economic development plan for MidTown. The main recommendation for that plan was to market MidTown

11 CDCs are non-profit, community-based organizations focused on revitalizing the neighborhoods in which they are located.

12 Pyramid zoning is where higher-intensity uses are not allowed in lower-intensity zoning districts, but not vice-versa. Therefore, the City could not prevent lower-intensity uses from locating along Euclid in the MidTown corridor.

as a "Health-Tech Corridor." The intent was to leverage the various health-related institutions in University Circle as anchors in order to attract additional health-related development in MidTown. This also resulted in the BRT line being branded as the "HealthLine."

Financing

The City of Cleveland had many financing tools at its disposal, with funds coming from the State, Federal Government, and local foundations. The HealthLine itself was funded in part by a New Starts grant from the FTA and a grant from the Ohio Department of Transportation's Transportation Review Advisory Council.

The two main grant programs from the State of Ohio were the Clean Ohio Brownfield Revitalization Fund and the Ohio Job Ready Sites (JRS) program. Clean Ohio awarded funds on a competitive basis to assist environmental cleanup. It required an engineering firm's certification of an environmental problem that could be addressed through the grant. The JRS program offered funding for vacant commercial or industrial sites that were not necessarily contaminated but were strategic for economic development purposes. Funds could be used for property acquisition, infrastructure upgrades, or construction build-out of speculative facilities. Both programs provided funding for several high-profile projects along the corridor, including the Wooden Spencer Screw factory building, the MidTown Tech Park, and the Victory Building. The Clean Ohio program ended in 2013, and the JRS program ended after 2012 (Ohio Development Services Agency, 2018a; 2018b).

The city of Cleveland was designated as Federal Entitlement city under the Community Development Block Grant (CDBG) program. This allowed the City to receive annual grants directly from the Federal government, instead of through the State. One program available through CDBG is the HUD Section 108 program. Section 108 provides low interest loans for economic development, housing rehabilitation, public facilities, and large scale physical development projects.

There are several local foundations, such as the Cleveland Foundation, Mandel Foundation, and George Gund Foundation, that provided assistance with redevelopment. Specifically, the Cleveland Foundation helped MidTown, Inc. obtain a $750,000 line of credit for land acquisition and pre-development activities. Sometimes foundations awarded funds to organizations directly, but oftentimes they used a funding intermediary.

Two types of Federal tax credits were used for development along the HealthLine corridor; New Market Tax Credits (NMTCs) and Historic Preservation Tax Credits (HPTCs). NMTCs were provided to developers in exchange for delivering below-market investment opportunities for businesses. At least $50 million in NMTCs have been used along the HealthLine corridor, including for high-profile projects such as the Middough Building, Allen Theater, Baker Electric Building, MidTown Tech Center, and the Agora Building. HPTCs have been used for high profile projects such as the Baker Building, Victory Building, Hanna Annex building, Allen Theater, and the Middough Building.

MidTown is also a part of a Federal Supplemental Empowerment Zone. Being designated an Empowerment Zone provided access to tax credits, Section 108 loans, funding for MidTown, Inc. for land acquisition, and grants for gap financing.

The City of Cleveland also administers the Cleveland Vacant Property Initiative. The initiative provides low-interest construction loans and forgivable loans for costs of urban redevelopment that do not add value, such as asbestos abatement or demolition. The MidTown Tech Park, Cleveland Agora, and the Victory Building all received funds from this initiative.

Development

Downtown and University Circle

Most of the new development that has occurred along the HealthLine corridor since its opening has been in Downtown and University Circle. For the City of Cleveland, their primary goal for Downtown has been to increase its residential population. Most of the residential population growth that has occurred in Downtown since the HealthLine opened has been along Euclid Avenue. There have also been seven major new hotels and residential conversions that have occurred. Approximately 45% of the cost of the development that has occurred Downtown was underwritten by the State and Federal governments through loans, credits, and other public programs.

For the remainder of the development, a majority has occurred in University Circle. University Circle, Inc., the CDC for University Circle, with the Kent H. Smith Charitable Trust, launched a $7 million corridor revitalization initiative. As part of the initiative, pedestrian facilities were upgraded, the University Circle Visitor and Living Center was built, and streetscape enhancements

such as lighting, benches, and flower beds were added. Case Western University and University Circle, Inc. spearheaded a $100 million redevelopment of a retail district along Euclid Avenue into an arts and retail district. Approximately $2 billion in construction and renovation projects have occurred, with $96 million devoted to residential and commercial development, with the remainder going to University buildings and cultural institutions. Additionally, there was a $350 million renovation of the Cleveland Museum of Art and the construction of the Museum of Contemporary Art for $27.5 million.

MidTown

Although Downtown Cleveland and University Circle saw relative success in attracting redevelopment along the HealthLine corridor, MidTown struggled in comparison. The City's Department of Economic Development had a stronger hand in the efforts to redevelop MidTown than the other areas. They were responsible for assembling land, clearing sites, and cleaning up any environmental contamination. They also took a group of potentially interested developers to Philadelphia for inspiration, looking at the work the University of Pennsylvania did to revitalize blighted neighborhoods around its campus.

Private foundation money was also used to help pay for some of the planning efforts. MidTown, Inc., along with the Cleveland Foundation for Greater University Circle, applied for Living Cities funds. Living Cities is a private foundation intermediary that awards grants for community redevelopment. MidTown, Inc. received a $14.77 million grant from the organization, which paid for engineering and planning studies for a few key sites.

The City also worked to build a new police station in MidTown on a site that had been vacant for many years but was controlled by the City under a land bank program. Grant funding was used to pay for design and engineering of the new police station, and the City sold income tax bonds to pay for the construction.

MidTown Tech Park

The MidTown Tech Park, which opened in 2011, was the first private redevelopment in MidTown after the opening of the HealthLine. Geis Companies, a long-time, primarily suburban, developer in the greater Cleveland area, was interested in a site at 6700 Euclid Avenue. However, they were nervous about the City's new zoning code for the MidTown area, which required a minimum of three stories, ground floor retail, and maximum parking requirements. They felt there was not enough demand for retail in the neighborhood, and they were not confident they could fill all three stories. Their plans to build the building on a speculative basis also complicated the issue.

MidTown Tech Park, 6700 Euclid Avenue

Geis went into negotiation with the City Planning Commission's Design Review Committee. The negotiation resulted in three major variances: Geis would build a two-story building instead of three, the existing surface parking could be retained but had to be moved to the back of the building, and there would be no ground floor retail. The City felt that as the market in MidTown improved, they could more aggressively enforce their new zoning code. However, they were not willing to let the developer walk away.

Due to the recession, Geis companies was not able to secure any conventional financing. However, they were able to secure a mix of public funds to help finance the project. The City gave them a $10.7 million HUD Section

108 loan, as well as $250,000 from their Vacant Property Initiative. They also received $25 million in NMTCs.

The City's Economic Development Department worked closely with Geis to market the new development, and were able to attract a company called JumpStart Inc., an organization that provides venture capital and technical assistance to startup firms.

After MidTown Tech Park opened, Geis later invested in a second and third development in MidTown. Both involved renovating and reusing existing buildings. Each was more urban in character than the last.

Lessons to Learn

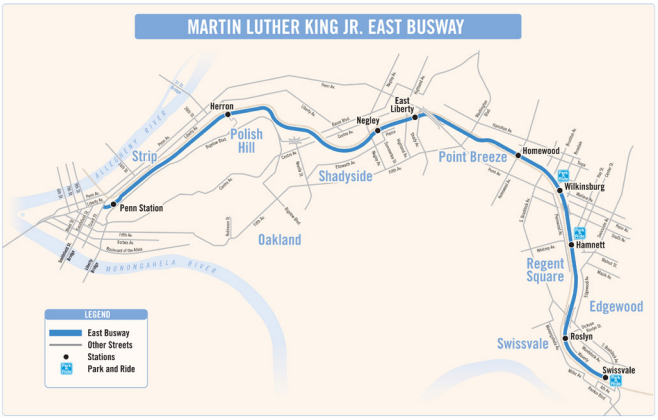
With $5.8 billion in total investment along the corridor since its opening and $114.54 million in development per dollar of transit investment according to Hook et al. (2013), the second highest and highest performing amongst all 20 transit corridors, respectively, there are several very important lessons that can be learned.

1. Level of government support for TOD is the most important indicator of success for leveraging TOD from a transit investment. The government did a lot to support TOD along the HealthLine corridor. Not only did the City of Cleveland help market the corridor, create land use plans, update zoning so that it is more transit supportive, and provide financing through several different programs, there was also a variety of different sources of financing at the State and Federal level. This level of activity would be considered strong government support according to Hook et al. (2013).

2. Strong institutional anchors can also play a pivotal role in leveraging TOD. Not only have the institutional anchors played a strong role in the redevelopment in University Circle, their presence also served as the foundation for the marketing strategy to redevelop MidTown as a Health Tech Corridor.

3. Despite strong government support, weaker market conditions can still hinder TOD investment. As Downtown Cleveland and University Circle are the city's two largest employment centers, the market was stronger and as a result, have seen the most TOD investment along the HealthLine Corridor. MidTown was a much weaker market and can now be considered as an emerging market. Nearly $36 million of public financing went into MidTown's first development. However, the development was far from ideal from a TOD perspective, as it was only two stories, had no ground floor retail, and had a significant amount of surface parking. As the market improves in MidTown, the City will better be able to enforce good TOD principles.

Pittsburgh Martin Luther King, Jr. East Busway East Liberty Station



Map of Pittsburgh's Martin Luther King, Jr. East Busway

The Port Authority of Allegheny County, the primary transit provider for the greater Pittsburgh area, operates the oldest BRT system in the United States. The system consists of three busways: the South Busway, the Martin Luther King, Jr. East Busway, and the West Busway, which opened in 1977, 1983, and 2000, respectively. Unlike what is considered to be more traditional BRT, Pittsburgh's busway system is a direct service model, meaning that a variety of local, limited, and express bus routes use the busways for part of their routes, and continue in mixed-traffic for the remainder of their routes. Although the Port Authority does not brand any of the busway service as BRT, the bus route P1 (East Busway All Stops), along with the level of features, has earned the Martin Luther King, Jr. East Busway a BRT Bronze Standard rating from ITDP using their BRT Standard (Port Authority of Allegheny County, 2018b; Institute for Transportation and Development Policy, 2018).

It is along this busway that the East Liberty station, along with the adjacent East Liberty neighborhood, are located. As Pittsburgh's busways were planned and built as transportation tools only, and not as economic development tools, the first twenty-five years after the East Busway opened saw a very limited impact on development. However, since the late 1990's, the neighborhood adjacent to the station has begun to redevelop. Pittsburgh's philanthropic community has been the primary driver of development in the neighborhood, with support from the city.

Port Authority New Flyer D60LFR operating on route P1 - East Busway All Stops

History of East Liberty[13]

East Liberty once was a vibrant neighborhood with a bustling commercial district, being the third largest shopping center in Pennsylvania. Several factors led to the neighborhood's decline: urban renewal wiping out a lot of the urban fabric and replacing it with parking lots and other auto-oriented development, a new highway called Penn Circle cutting off the residential part of the neighborhood from the commercial core, collapse of the steel industry leading to the neighborhood losing much of its economic base, population loss as upper-income residents began moving to the suburbs, housing stock falling into disrepair, and the loss of about one million square feet of commercial space to abandonment.

As the Port Authority could no longer afford to maintain its streetcar system, it began to phase out its service and replace it with buses. Looking for lower-cost alternatives to improve transit service and ease congestion, plans formed to convert former railroad rights-of-way into busways. The East busway, running through the East Liberty neighborhood, provided a critical mobility link connecting the neighborhood to downtown Pittsburgh, cutting down a trip that previously took almost an hour down to between seven and fifteen minutes.

Pittsburgh Development Fund and the new East Liberty Home Depot[14]

When Tom Murphy became mayor of Pittsburgh in 1994, he set as one of his top priorities the revitalization of the city. As such, he created the Pittsburgh Development Fund (PDF), a revolving economic development fund, managed by the city's Urban Redevelopment Authority (URA). Funding came from a portion of Allegheny County's hotel excise tax, with approximately $6.2 million going into the fund each year for ten years. With money available in the fund, the URA was able to issue Special Tax Development Bonds to finance development throughout the city, loaned out to developers at low interest rates and only had to be paid back once projects reached a certain revenue threshold.

The first redevelopment in East Liberty that utilized PDF funds was a new Home Depot store. Of the over 1500 acres of property owned by the URA across the city, one site was a former Sears store in East Liberty that had been vacant for ten years. Mayor Murphy identified Home Depot as a possible anchor tenant for the site because of the chain's popularity and ability to attract customers from the surrounding wealthier neighborhoods. Home Depot was not interested at first because they felt the site was too far away from the interstate. Murphy, along with the Mayor of Atlanta and the local Pittsburgh Jewish community brought Home Depot cofounder Bernard Marcus to Pittsburgh. While there, Murphy was able to successfully lobby him, convincing him of East Liberty's potential and his belief that Home Depot could serve as a catalyst for future redevelopment in the neighborhood. With a commitment from Home Depot secured, the URA set out to finance the project. Home Depot contributed $5.33 million, or 47% of the total project cost. The remainder was financed in part by PDF funds and part by bonds they were able to sell due to the creation of a tax increment financing (TIF)[15] district district on the parcel.

From a TOD perspective, the project was less than ideal. First, the site is located relatively far away from the East Liberty station. Second, although Pittsburgh's zoning code gave the city the ability to negotiate with Home Depot over the design, the final design was still largely suburban in nature. Through negotiation, Home Depot agreed to reduce the size of its parking lot by two thirds from what was originally proposed. However, that was still more off-street parking than the city and Murphy would have liked, but they were worried about losing their anchor tenant, so agreed. The Home Depot opened in 2000.

Private Redevelopment Initiatives

East Liberty Development, Inc.

Some of the earliest efforts to redevelop the neighborhood of East Liberty date back to 1979, when the East Liberty Quarter Chamber of Commerce formed the CDC East Liberty Development, Inc. (ELDI) with initial funding provided through a three-year grant from the Ford Foundation (East Liberty Development, Inc., 2018; Hook et al., 2013). Some of ELDI's first efforts in the 1980s

13 Section summarized from Hook et al. (2013).
14 Ibid.
15 TIF is a common redevelopment financing mechanism in the United States where future property tax revenue within a defined geographic area is diverted toward redevelopment or public improvement projects within the same area.

focused on the reopening of several intersections that had been closed due to the construction of Penn Circle, as well as attracting commercial development, with the Local Initiatives Support Corporation (LISC) providing access to financing to the latter (East Liberty Development, Inc., 2018; Hook et al., 2013). However, the commercial developments facilitated by ELDI did not have the catalytic effect on the neighborhood as was hoped, which led to the deals failing and bankrupting the organization (Hook et al., 2013).

After ELDI recovered from bankruptcy in the 1990s, a new CEO was brought in, Maelene Meyers, who recognized the need for a comprehensive plan for the neighborhood in order to attract development (Hook et al., 2013). With assistance from the City of Pittsburgh, URA, and several others, ELDI led in the creation of its first comprehensive plan in 1999 called "A Vision for East Liberty," (East Liberty Development, Inc., 1999). Although the zoning plan was not accompanied by any zoning changes, it placed particular emphasis on the East Busway as a link to regional jobs and a way to reinforce the commercial core of the neighborhood (Hook et al., 2013).

ELDI also created the East End Growth Fund. Several local foundations collectively gave ELDI $2.47 million in initial funding, which was used to invest in more projects. Cash flow coming in from those projects provided ELDI access to lines of credit, which have been used to purchase and rehabilitate additional properties throughout the neighborhood (Hook et al., 2013)

ELDI has played a major role in a lot of the redevelopment projects in the neighborhood, investing in projects or helping to assemble a variety of funding sources to help finance projects. ELDI has also played a major role developing affordable housing in the neighborhood.

Bakery Square, 1.0

Bakery Square 1.0

Bakery Square 1.0, which is now a major office building and home to Google, was a project that involved the renovation of an old, vacant Nabisco Factory. Developed starting in 2007 by Walnut Capital, they were able to finance the project through a combination of a $1 million grant from the state Department of Environmental Protection for environmental cleanup which was secured by the City, $10 million in tax-exempt financing from the state's Building PA[16] program, and a $10 million TIF package from the URA (Hook et al., 2013).

Eastside Project

A local developer, the Mosites Company, undertook a major, more than decade long project to help revitalize the neighborhood. The plan was originally inspired by ELDI's 1999 comprehensive plan, and in addition to collaborating with ELDI, the developer has also worked with the URA, Port Authority, City of Pittsburgh, and various other county, state, and federal entities to complete the project (Urban Land Institute, 2011; Krauss, 2014). The project has been developed in four stages.

Eastside I - East Liberty Whole Foods

The first phase, Eastside I, was a Whole Foods Market, which was completed in 2002. A variety of different funding sources were used to finance the project. Working with the Mayor Murphy, Mosites was able to secure a $3 million investment from a local bank, $1 million loan from the national LISC, and a $1 million bond guarantee from another bank (Hook et al., 2013). One foundation provided funds to LISC which in turn provided ELDI with equity capital to invest in the project. The investment was in the form of a loan, which was to be repaid once the project achieved a specific profit margin (Hook et al., 2013). ELDI also helped to close the remaining gap in financing by securing a $500,000 grant from the US Department of Health and Human Services for job creation in depressed neighborhoods (Hook et al., 2013). The Whole Foods was arguably a great success, with first year sales nearly triple that of company projections (Urban Land Institute, 2011; The Mosites Company, 2018a).

The second phase, Eastside II, opened five years later, in 2007. The project is mixed-retail comprising of four buildings, and is anchored by Walgreens, Starbucks, one of the region's top grossing wine and spirits store, and two of the city's top restaurants (Urban Land Institute, 2011; The Mosites Company, 2018b).

16 The Building PA program provides mezzanine capital for developers for real estate assets in small to mid-sized Pennsylvania communities.

The third phase, Eastside V, was the city of Pittsburgh's first Target store, which opened in 2011. The project required a new two-way road system to replace the former Penn Circle in order for connectivity and accessibility (The Mosites Company, 2018d). The project was financed by a combination of private and public funds, including $2

Eastside V - East Liberty Target

million from the State's Redevelopment Assistance Capital Program, $10 million grant from the US Department of Housing and Urban Development, $46 million in NMTCs from LISC and PNC Bank, a $13 million equity investment from PNC bank, and $20 million loan from another bank (Hook et al., 2013).

The fourth and final phase, Eastside III, completed in 2016, was arguably the most ambitious project. The project was a multi-stage TOD which consists of several components: a 43,000 square foot mixed commercial space, 360 luxury apartments, a 554-space shared-use parking facility, and a new transit center (Krauss, 2014, The Mosites Company, 2018c). The new transit center includes the reconstruction of the East Liberty station with better integration with other local bus routes, a new pedestrian bridge connecting East Liberty with the Shadyside neighborhood on the south side of the busway, plaza/pathway access through the development connecting the station with Centre and Penn avenues, a new elevated road above the parking structure, and a 120-space bike garage (Krauss, 2014; Belko, 2015; The Mosites Company, 2018c). The transit center cost $150 million with nearly 20 public and private funding sources, including a $15 million grant from the FTA and increment from a Transit Revitalization Investment District (TRID)[17] (Krauss, 2014; Belko; 2015).

Reconstructed East Liberty station on the Martin Luther King, Jr. East Busway as part of the Eastside III project

Affordable Housing

ELDI has also been a leader in the neighborhood on affordable housing. Initially, with subsidies from the URA, ELDI began redeveloping dilapidated sites scattered across the neighborhood as mixed-income and market-rate housing, but those early efforts were relatively unsuccessful. With funding from LISC, ELDI hired a consulting firm to conduct a market study, which determined that in order for ELDI's current strategies to work, they first needed to attract upper-income residents to the neighborhood, but that would not happen if the neighborhood was not safe or well maintained, or lacked various commercial or public space amenities.

The opening of Whole Foods marked the beginning of attractive amenities for upper-income residents. But to address safety and maintenance issues, ELDI enlisted the help of current residents to identify problematic properties and tenants in the neighborhood. With assistance of a grant from the local LISC office, ELDI began to acquire problem properties. Vacant homes were purchased and held for sale or future redevelopment. Properties with problem tenants were purchased, leases not renewed, and repairs were made. After ELDI began those activities, other housing units it had developed began to sell. Equity base from the initial grant leveraged a pre-development line of credit from LISC, which allowed ELDI to significantly increase its residential property holdings. ELDI was able to use Low Income Housing Tax Credits and HPTCs, as well as partnerships with the URA and the Pennsylvania Housing Finance Agency, to finance the construction and renovation of homes in the neighborhood.

As of 2015, East Liberty had 2671 units of housing. Of those units, 866, or 32%, are considered long term affordable, which includes affordable housing, workforce affordable housing, public housing, and supportive

17 Transit Revitalization Investment Districts are a type of TIF district unique to Pennsylvania

housing.[18] [19] [20] [21] The remaining 1805 units are market rate, many of which are affordable to people making 60% or less of the AMI. (East Liberty Development, Inc., 2015).

Mixed-income housing[22] projects have also played an important role in the redevelopment of the neighborhood. One of the latest mixed-income project, East Liberty Place South, contains 39 affordable units, 11 workforce affordable units, and 5 market rate units, and along with its matching 54-unit counterpart across the street, replaced an ill maintained, twin-towered high-rise apartment building (East Liberty Development, Inc., 2015; Hook et al., 2013; McConnell Schaarsmith, 2015; Reid, 2013). The $13.6 million project was financed with an $8.7 million loan from BNY Mellon, $3.8 million in funding from HUD, and $1.2 million in state and other federal funding including from the Pennsylvania Housing Finance Agency and the URA (McConnell Schaarsmith, 2015; Schooley, 2013). The developer of East Liberty Place South, The Community Builders, are responsible for several other mixed-use projects in the neighborhood, including East Liberty Place North, New Pennley Place, Pennley Commons, and Penn Manor (Reid, 2013).

East Liberty Place South

Although significant efforts have been made to develop new affordable housing, the turnaround in the real estate market and redevelopment that has occurred in East Liberty in recent years is having a negative impact on existing affordable housing. Nothing, arguably, is more illustrative of this than the redevelopment of the Penn Plaza apartments. The current property owner, LG Realty Advisors, purchased the apartment complex from the URA in 1966. Once the Federal Housing Agency (FHA) mortgage was paid off in 2000, all of the FHA-mandated rent controls expired and LG was free to do what it wanted with the property (Deto, 2015; Lyons, 2017). Although the complex was no longer rent controlled, many of the residents were recipients of Section 8 vouchers and many of the units had below-market rents (Deto, 2015). Deciding they wanted to redevelop the site with luxury apartments, office space, and Whole Foods as its anchor tenant which was to move from its original East Liberty location, LG Realty served all residents with a 90-day eviction notice in July of 2015. The City of Pittsburgh intervened, leading to a memorandum of understanding that allowed residents more time to move out, which was completed by March 2017 (Vrabel, 2018). The housing units lost as a result represented 12% of East Liberty's rental housing (East Liberty Development, Inc., 2015).

Penn Plaza demolition

LG Realty's original proposal was denied by the Pittsburgh's City Planning Commission, and Whole Foods subsequently pulled out as the anchor tenant (Belko, 2017b; Vrabel, 2018). The current proposal includes just office and retail and was approved by the Planning Commission with an added restriction on height, which was subsequently struck down in court after the developer appealed the Planning Commission's decision (Belko, 2018a; Belko, 2018b; Nelson Jones, 2018; Vrabel, 2018). Although the developers counter that they agreed to commit 50% of the tax increment from the development to an affordable housing fund that they estimated to generate $10-12 million, there was still substantial outcry from the community, including protests, over the destruction of so many affordable units and that the development will not include any replacement affordable units (Belko, 2017a; Iannotti, 2018; Mikek, 2018). As of the writing of this report, construction on the new development has not yet begun.

18 Affordable housing in this context is anything that is either subsidized for or affordable to people making 60% or less of the Area Median Income (AMI) (East Liberty Development, Inc., 2015).
19 Workforce affordable housing is anything affordable for families making 60-80% AMI (East Liberty Development, Inc., 2015).
20 Public housing is restricted to tenants making less than 80% AMI, who only pay 30% of their income for rent (East Liberty Development, Inc., 2015).
21 Supportive housing is for people with special needs and disabilities, many of which only pay 30% of their income for rent (East Liberty Development, Inc., 2015).
22 Mixed-income housing is any housing project that includes a mix of market-rate and income-restricted, subsidized affordable units.

Lessons to Learn

The redevelopment around the East Liberty station provides many lessons to be learned for implementation of BRTOD around the country:

1. A weaker local market can be a significant barrier to redevelopment, and although it can be overcome by a certain level of government intervention, it impacts the quality of initial redevelopment. According to the characteristics laid out by Hook et al. (2013), the neighborhood around the East Liberty Station could be classified as an emerging land market, at least when redevelopment first started to occur. The neighborhood was centered on an economic anchor, albeit depressed, which was the commercial core of the neighborhood. Though generally blighted, there was plenty of land in the neighborhood available for redevelopment. With government support, primarily through a variety of financing mechanisms, the neighborhood did begin to redevelop. Although the weaker state of the market was able to be overcome by government intervention, it still impacted the quality of the initial redevelopment as exemplified by the suburban style of the Home Depot redevelopment.

2. As the local real estate market picks up, caution needs to be exercised to make sure existing residents do not become displaced. Although the land market was weaker in earlier years, it has since strengthened significantly. The events surrounding the redevelopment of the Penn Plaza apartments and resulting loss of so many Section 8 and below-market rate units illustrates this.

3. Government support of redevelopment efforts through various sources of financing is vital to its success. All of the major redevelopments in East Liberty, Home Depot, Whole Foods, Baker Square 1.0, Target, utilized multiple sources of government financing. Although the Mayor and City of Pittsburgh took the lead in attracting the Home Depot, private actors took the lead on the other redevelopment projects. Providing various sources of financing only, as was the case with the later redevelopment projects, would classify the level of government support as moderate according to Hook et al. (2013). It is unclear if more intense levels of investment would have occurred with strong government support.

4. Community Development Corporations, with sufficient access to financial resources, can be relatively successful in redevelopment efforts. Although East Liberty Development, Inc. struggled in its early years, it ended up playing a significant role in a lot of the redevelopment that has occurred. LISC was a major source of financing for ELDI, providing financial resources directly to ELDI and acting as a funding intermediary between ELDI and various foundations. With these financial resources, ELDI has been able to rehabilitate a lot of blighted property in the neighborhood and produce a significant number of affordable housing units. ELDI also played a pivotal role in the Whole Foods development by securing the gap financing needed to allow the project to move forward.

Pittsburgh Uptown-Oakland BRT and the EcoInnovation District[23]

Uptown, Pittsburgh

The Uptown neighborhood of Pittsburgh is located between and connects the city's two largest employment centers: Downtown and Oakland. It is a long, but narrow neighborhood, as it is wedged between the Hill District to the north and the Monongahela River to the South. Because of its strategic location in between and geographic constraints, Uptown is viewed as a convenient pass-through and its streets are congested with traffic going to and from both Downtown and Oakland. There is already a substantial level of bus service going through the neighborhood, but buses get stuck in congestion, severely impacting their reliability.

23 Case study summarized from City of Pittsburgh (2017), unless otherwise noted.

Given these challenges, an idea was launched in 2011 to connect Downtown and Oakland with a BRT system. However, one challenge presented itself: a lack of community buy-in from the residents of Uptown. To resolve this issue, the City of Pittsburgh and Port Authority of Allegheny County decided to take an innovative approach. They decided to put the BRT project on hold, and instead approach the residents of Uptown about creating a new community plan for the redevelopment of the neighborhood. The proposed BRT project was still an integral part of the plan but putting the project on hold to do the plan first allowed for the plan to shape the potential transit improvements, and not the other way around. This approach got the community buy-in that was needed.[24]

The plan morphed into what is called the EcoInnovation District, a first of its kind hybrid combining the goals of both EcoDistricts and Innovation Districts. EcoDistricts is an organization based in Portland, Oregon, and was formed with the vision of creating just, resilient, and sustainable cities from the neighborhood up. They created the EcoDistricts Protocol based on that vision which provides a roadmap for city leaders, and the organization uses their protocol to certify areas as EcoDistricts (EcoDistricts, 2018). Innovation districts focus on creating economic opportunity through merging the innovation and employment potential of tech and creative start-ups, anchor institutions focused on research, and amenity rich residential and commercial environments. They accomplish this by taking advantage of and revaluing the intrinsic qualities of cities: density, walkability, and transit-oriented places (Brookings Institution, 2018).

In order to pay for the creation of the plan, the City of Pittsburgh, Port Authority of Allegheny County, and Allegheny County jointly applied for, and received, a TOD Planning Pilot Grant from the FTA.[25] [26]

History of Uptown

The History of Uptown dates back to the early 1800s, when a person by the name of James Tustin built an estate in the area and called it "SoHo." The estate also included fruit orchards, which were referred to as the "SoHo Gardens." The SoHo estate and gardens have left an influence on the neighborhood even until this day, reflected in the neighborhood's commitment to gardening and the development of Tustin Community Garden.

Uptown really took off during the industrial revolution. Mills lined the Monongahela River, and it became a landing spot for river boats. Goods from both were distributed to the rest of the region, leading to Uptown developing as a transportation hub for moving goods and people to other destinations.

A lot of Eastern European immigrants began moving to the neighborhood, attracted by the mills and factories. They mixed with a growing African American population. It was at this time that the neighborhood's two main streets, Fifth and Forbes, emerged as vibrant main streets with many stores and services, and serving as vital links in the City's streetcar network, connecting Downtown to the rest of the region.

The neighborhood's fortunes took a turn for the worse during the urban renewal area. Redlining led to significant racial segregation. Many projects sought to replace "blighted" areas with civic amenities for the predominant use by the city's white population, many of these areas where African American's were heavily concentrated. Construction of freeways led to many white families moving out to the suburbs. Finally, private developers began purchasing properties and replacing many with surface parking lots to serve commuters and the needs of nearby arenas. Many historic buildings have been lost, and the scattered nature of the conversion to surface parking lots have left tears in the neighborhood's fabric.

This trend of tearing down buildings for parking led the City to implement an Interim Planning Overlay District, which required review and approval of any demolition. Its purpose was to serve as a temporary measure while the EcoInnovation District plan was being made and more permanent zoning reforms could be put into place.

24 J. Miller and B. Masciotra, personal communication, June 27, 2018.
25 Ibid.
26 The FTA TOD Planning Pilot Grant provides funding to local communities to integrate land use and transportation planning with a new fixed guideway or core capacity transit capital investment. For more information, see Federal Transit Administration (2018).

The EcoInnovation District Plan

The EcoInnovation District plan was a result of a robust planning process that included formal events and surveys, neighborhood parties and lots of one-on-one and group discussions that took place on the street, in residents' backyards, and multiple places in the community. Through that process, a broad vision was laid out and eight overall goals were identified, which served as a blueprint for the recommendations laid out in the plan:

> **Vision: Preserve and strengthen the existing *community*, encourage balanced, equitable, and green *development*, provide choice in *mobility*, and invest in sustainable *infrastructure*.**

Goals:

1. **Equity.** Foster a vibrant, diverse community where the residents of Uptown are an active and vital part of the community's future, benefit directly from improvements and don't solely bear the burden of systems that largely serve other communities.

2. **Opportunity.** Encourage new business and creative production, advance training opportunities and, create a clear pathway for residents to access job opportunities.

3. **Health.** Elevate individual community and environmental health in the planning, design, and development of Uptown.

4. **Choice.** Reduce traffic and offer real transportation choices that are cost effective, pleasant and safe for residents and businesses including walking and bicycling.

5. **Identity.** Reinforce Uptown's unique character by protecting and reusing existing buildings whenever possible, promoting excellence in design for new structures and expanding local arts and community events.

Rendering showing what BRT might look like running through Uptown

6. **Connectivity.** Create stronger connections to the Hill, Oakland, Downtown, the Monongahela River, nearby parks and forested slopes, and beyond.

7. **Performance.** Pursue solutions for water, building systems and district energy that will enable Uptown to reach the highest levels of environmental performance and efficiency.

8. **Leadership.** Create partnerships and a model for sustainable local leadership that can continue to engage residents effectively and take action in the community.

The strategies laid out in the plan are organized based upon the four major themes laid out in the vision, and address the goals listed above.

Community

The physical neighborhood of Uptown has changed drastically due to urban renewal, institutional growth, and population decline. The population that does remain is extremely diverse in regard to race, education level, income, and home-ownership rates. A history of a lack of development and investment in the neighborhood shows signs that it is starting to reverse, with rents rising citywide 12.8% from 2014-2015, 14% in the Greater Hill District, which includes Uptown. As a result, 207 households in the neighborhood are at risk of displacement. And although reported crimes continue to decline, there is still a significant amount of more visible crime, such as prostitution, drug use, and illegal dumping. This is the context for the challenges that the existing community of Uptown faces today.

The recommendations presented in this section of the plan, fully implemented, could yield these potential results:

- A mixed-income community by protecting affordability and existing residents.
- Site control and the reuse of vacant, delinquent properties to support community priorities.
- Repaired and weatherized homes saving residents money on maintenance.
- Pathways to new clean tech jobs.
- New public art and community events.
- Improved lighting and no more illegal dumping.
- Stronger partnerships between local institutions and non-profits.

Development

What once was a neighborhood with vibrant main streets and attractive spaces, the land in Uptown today is 37% underutilized, either being vacant or surface parking lots. However, development pressure is coming from multiple fronts. First, the vacancy rate for office space in nearby neighborhoods is critically low, and Uptown is poised to start absorbing some of that demand. Second, there is a need for more housing in Uptown, due to both a rising demand for housing and the existing population is too small to support neighborhood commercial spaces.

The recommendations presented in this section of the plan addresses these challenges and opportunities, and fully implemented, could yield these potential results:

- 300,000 square feet of rehabilitated work space.
- A mixed-income community including 30% affordable housing to serve a range of family and individual needs.
- 360,000 square feet of new office and research space.
- New stores and better services and support for existing business owners.
- Better managed parking with no reduction in the total number of spaces.
- A new zoning code to encourage developers to build with community goals in mind.

Mobility

Uptown's transportation system can be one of the neighborhood's biggest assets, as well as one of the biggest liabilities. Uptown has very good tunnel and bridge connections. However, as a critical link connecting both Downtown and Oakland, cars are funneled from the bridge and tunnel connections through the neighborhood on their way to either Downtown or Oakland, and the resulting traffic often overwhelms the neighborhood. While people from outside the neighborhood driving in is the primary cause of high traffic levels, 42% of owner-occupied units in the neighborhood have a car, and only 25% of Uptown residents commute to work by car. However, mobility alternatives to driving are quite inadequate, and the presence of basic infrastructure is not a guarantee that it will be safe or accessible. For pedestrians, there are many physical barriers such as highways and hills, difficult intersections to cross, and nearly half of all intersections have no marked crosswalks. For bicyclists, there are no dedicated facilities in the neighborhood. And for transit, buses get stuck in traffic and become unreliable, and bus stop amenities are almost nonexistent.

The recommendations presented in this section of the plan address these challenges, and fully implemented, could yield these potential results:

- Achieve a 50% reduction in vehicle emissions by 2030 for the city of Pittsburgh.
- Reduce single occupancy vehicle mode share to 40% or less by 2030 for people coming to Uptown.
- Maintain or increase the non-single occupancy vehicle mode split for trips originating in Uptown as the neighborhood grows.
- Reduce fatal and severe-injury crashes to zero.
- Increase transit and bike, and bike share linked trips along the corridor.
- Reduce surface parking acreage within the EcoInnovation District by 40% by 2030 while maintaining utilization of public lots.
- Reduce institutional demand for all-day parking spaces by implementing TDM programs.

Infrastructure

From the river to the hillside, Uptown contains amazing natural assets. However, those assets lack adequate access, and remain untapped and underutilized. Also, Uptown has the fewest number of acreage of parks and open spaces compared to neighborhoods citywide. Hillsides, steep slopes, and antiquated infrastructure leads to significant stormwater issues, with streets, basements, and first floors of buildings frequently flooding. Despite these infrastructure challenges, there is tremendous opportunity to integrate district energy within existing systems.

The recommendations presented in this section of the plan address these challenges and opportunities, and fully implemented, could yield these potential results:

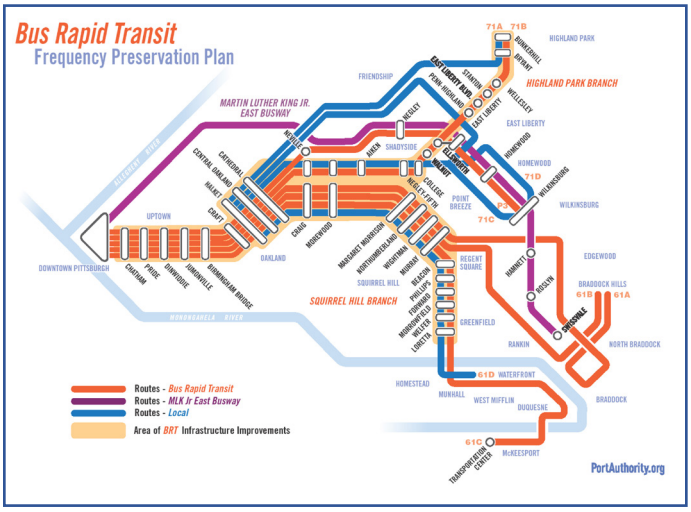
- Over 10 acres of new open space – an over 300% increase
- 2.25 miles of new trails and connections
- A 40% street tree canopy, up from 5% today
- 30 acres of stormwater management accounting for 20% of Uptown's existing impervious surfaces
- Resilient and inexpensive district energy with reduced carbon dioxide emissions
- Increased recycling, community composting and less waste directed toward landfills

Uptown-Oakland BRT[27]

The Uptown-Oakland BRT project will connect Downtown Pittsburgh with Uptown, Oakland, and several additional neighborhoods. It will be Pittsburgh's first ABRT project, operating primarily on city streets. It will also be the first BRT project to actually be branded as such by the Port Authority.

Like Pittsburgh's busways, the new BRT will be operated as a direct service model. The most recent service plan has five separate routes, one new and four converted from local routes operating on the main trunk between Downtown and Oakland before branching off:

- P3 – Downtown, Uptown, Oakland, East Busway (New)
- 61A – Downtown, Uptown, Oakland, North Braddock
- 61B – Downtown, Uptown, Oakland, Braddock-Swissvale
- 61C – Downtown, Uptown, Oakland, McKeesport-Homestead
- 71B – Downtown, Uptown, Oakland, Highland Park



Most recent map of BRT service plan

The new BRT service will be coming with major infrastructure upgrades. The most significant infrastructure upgrade will be 8 miles worth of new bus-only lanes and complete street reconstruction in the main trunk section. Additional infrastructure upgrade includes 81 new stations, and traffic signal upgrades. The addition of bus-only lanes is also the linchpin of the EcoInnovation District plan, as their inclusion made the project eligible for additional FTA dollars to pay for a complete street reconstruction, which is vital to address a number of existing mobility and streetscape issues in Uptown today.

Port Authority New Flyer D60LFR operating on route 61C, one of the proposed routes to be converted to BRT

Lessons to Learn

The planning for the EcoInnovation District and new Uptown-Oakland BRT offers many lessons to be learned for policy makers implementing BRTOD across the country.

1. Policy makers do not have to be limited to only doing TOD planning with new BRT projects. The EcoInnovation District is much more than a TOD plan, it is a comprehensive economic development plan. TOD is an integral part of the plan, but it also focuses on workforce development, business attraction and retention, and preservation, and community identity, among other things.

2. BRT projects do not necessarily have to come before any TOD planning. Policy makers in Pittsburgh, when not receiving the community buy-in for the BRT that they were hoping for, instead chose to put the BRT project on hold and pursue the EcoInnovation District plan first. This allowed for the plan to shape any transit improvements, and not the other way around. It is also a good way to balance regional needs with the needs of the neighborhood. At the regional level, this is a BRT project that comes with an economic development plan. To the neighborhood, it is an economic development plan that comes with a BRT project.

3. Use of an FTA TOD Planning Pilot grant gives communities the resources they need to do comprehensive land use and economic development planning and integrate it with BRT projects from the

27 Section summarized from Port Authority of Allegheny County (2018a).

start. Policy makers in Pittsburgh applied for, and were awarded, an FTA TOD Planning Pilot grant to pay for the creation of the EcoInnovation District plan.

4. TOD and economic development plans are essential, but they are only effective when given the resources required to implement them. The only part of the EcoInnovation District plan that has any funding committed is the BRT project itself and streetscape improvements. The plan does identify a variety of potential funding sources for implementation, but without any funding committed, it is too early to tell how successful the plan will be.

BRTOD at Home, the rapid bus A Line and the METRO Gold Line

Here at home, there are two good case studies for BRTOD: the rapid bus A Line and the METRO Gold Line. The A Line opened in 2016 and is already showing promising TOD investment. The Gold Line is currently in the implementation phase but has been following good TOD planning practices.

A Line

A Line route map

The A Line is an ABRT line that opened in 2016. It connects Rosedale Mall in Roseville with the 46th Street Station on the METRO Blue Line in Minneapolis via Snelling Avenue and Ford Parkway in Saint Paul, and it replaced route 84 as the primary transit service along that corridor. It utilizes a number of design features to make bus service faster and more reliable, including curb bump-outs to allow buses to stop in the traffic lane, increased stop spacing, semi-level, all-door boarding and alighting, off-board fare payment, and transit signal priority. Those features, along with enhanced stations with increased amenities and security features, as well as uniquely branded buses, gives the A Line its BRT feel. However, the lack of any dedicated bus lanes automatically earns the A Line a Below Basic rating using the BRT Standard (Institute for Transportation and Development Policy, 2016). Despite that, the A Line has already been having success at leveraging TOD.

Passengers boarding A Line bus at Rosedale Transit Center

Snelling South Rezoning and Development

Beginning in 2015 and in preparation for the opening of the A Line, the City of Saint Paul began a rezoning study for Snelling Avenue from Midway to Ford Parkway. The study called for rezoning of existing single-use commercial and single-use multi-family residential designations to mixed-use designations of varying density (City of Saint

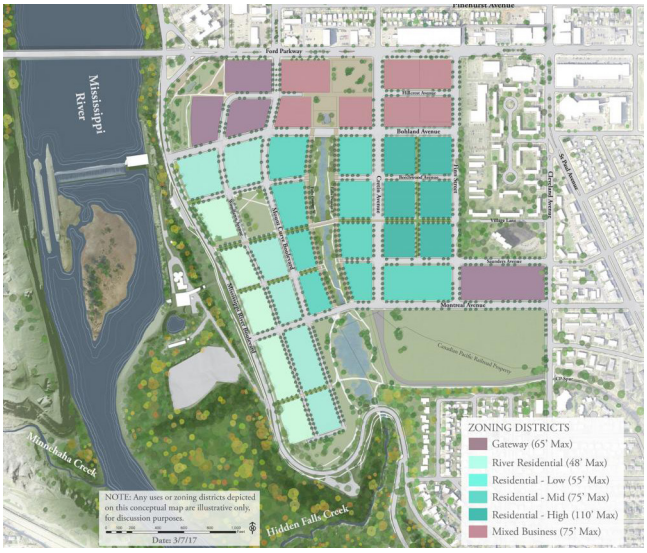
Paul, 2017c). The zoning changes were adopted in 2017. Saint Paul's mixed-use designation, known as "Traditional Neighborhood," was already applied to key parcels on the corners of Snelling Avenue and its major cross streets. However, the rezoning will allow for mixed-use development to fill in stretches of Snelling between its major cross streets over time.

Snelling Avenue has already seen significant development activity. Opened in 2015 in advance of the A Line, the Vintage on Selby is a mixed-use project containing 210 market-rate apartments and an approximately 40,000 square foot Whole Foods, which relocated from its previous location in Saint Paul. Minneapolis-based Ryan Companies was the developer, and the site was previously home to an Associated Bank, which was demolished and relocated to a new building one block north (Jossi, 2016). Across Selby Avenue to the south, the same developer is proposing another mixed-use development on the site of the current O'Gara's Irish pub. The proposal is for 163 apartments and a smaller, 4,000 square foot footprint to be occupied by O'Gara's on the ground floor (Morris, 2018). Further south at the intersection of Snelling and St. Clair avenues, another mixed-use project by Minneapolis-based Reuter Walton, containing 118 market-rate apartments and 4,000 square feet of retail, was recently approved (Johnson, 2018). All three sites were already zoned for mixed-use prior to the rezoning study.

A Line at Snelling and Dayton stop in front of the Whole Foods mixed use development

Ford Site Redevelopment[28]

Ford Motor Company once operated a large assembly plant in the Highland Park neighborhood of Saint Paul, situated on the south side of Ford Parkway between the Mississippi River and Cleveland Avenue. The plant operated from 1925 to 2011, ending with production of the Ford Ranger. With the facility closed, Ford was interested in selling the site. At 122 acres, the site presents an extremely rare opportunity to redevelop vacant land in a central city.



Proposed zoning map for the Ford Site

In anticipation of this redevelopment, the City of Saint Paul adopted the Ford site master plan, called "Ford Site: a 21st Century Community," in 2017. The plan contains two major components: the zoning plan and the public realm plan. The zoning plan, which will rezone most of the site for mixed-use of varying densities, at full build out, could provide up to 1,500 jobs and 4,200 units of housing. The public realm plan includes a brand-new grid containing an interconnected system of streets, bikeways, and walkways, as well as parks and natural spaces. The A Line runs along the northern edge of the site on Ford Parkway. Although there are not currently any plans for transit service through the site, the new street grid will be transit ready.

Conceptual rendering of what the Ford Site could look like in the highest density area after redevelopment

In 2016, the City of Saint Paul took proactive action to establish a TIF district at the site to preserve the right to use TIF as a potential financing tool for future development. And as of June 2018, the City has chosen Ryan Companies to develop the site (Nelson et al., 2018).

28 Section summarized from City of Saint Paul (2017a; 2017b), unless otherwise noted.

METRO Gold Line[29]

METRO Gold Line route map

Currently in its project development phase, the METRO Gold Line will be a new BRT line connecting Downtown Saint Paul and Woodbury through what is referred to as the Gateway Corridor, which follows Interstate 94 from Saint Paul out to its eastern suburbs. The Gold Line will be the third BRT line to open as part of Minneapolis/Saint Paul's regional system of transitways known as METRO, after the METRO Red Line which opened in 2013, and the METRO Orange Line currently under construction. Although the METRO Red and Orange Lines are highway-running BRT, the Gold Line will be the first BRT to operate in its own dedicated guideway.

As part of the planning process, Metro Transit has received a TOD Planning pilot grant from the FTA. The grant funds a corridor-wide station area planning effort. The effort is committed to gaining as many riders for the Gold Line as possible and increasing the number of people riding within each station area. The key objectives are to establish a multi-modal corridor, increase potential ridership through development and transit access, enable station areas to achieve their development potential, and identify infrastructure investments and policy changes.

Helmo Station BRTOD Plan

The Helmo Station will be located at Helmo Avenue and 4th Street North, just northeast of the intersection of interstates 94, 494, and 694 in the city of Oakdale. The vision for the station area includes a station hub with street-oriented retail adjacent to high-density multi-family housing, a mixed-use neighborhood of multi-family housing, new office space, and a neighborhood park, an open space corridor, a new street grid, and a multimodal corridor of walking and biking trails. At full build-out, the plan will add up to 945 units of housing, 125,800 square feet of traditional office space with an additional 317,844 square feet of flex office/residential space, 30,000 square feet of limited retail and services, parks, a station plaza, 15.22 acres of open space and natural areas, and a 100-space park and ride.

In addition to the FTA TOD Planning grant that funded BRTOD plan, there are several different forms of government support that is being provided. The City of Oakdale contributed additional money to conduct fit testing. Fit testing makes sure that the different types of development proposed in the plan can feasibly fit on the different parcels within the station area and can prevent having to go back and make modifications to the plan if complications were to arise.[30] The City will also be paying for the $15.1 million in infrastructure improvements which includes the new street grid, and will write and adopt a Planned Unit Development, which will serve as the implementation arm of the BRTOD plan.[31] The City also has the ability to do land assembly, although there are no plans to do that currently.

Lessons to Learn

The A Line and Gold Line present several important lessons related to comprehensive planning and transit supportive zoning.

1. In a strong land market, only a moderate amount of government support and relatively small transit investment is needed to leverage TOD. Although the A Line is rated as Below Basic BRT according to the BRT Standard, and the only support the City of Saint Paul provided has been rezoning, the stretch of Snelling Avenue south of I-94 is already seeing significant TOD activity.

2. Taking full advantage of opportunities to develop vacant land in what is already a fully developed neighborhood has the potential to leverage significant amounts of TOD. With the Ford Site, the City of Saint Paul is taking full advantage of a rare opportunity to develop 122 acres of nearby vacant land along the A Line. The full redevelopment plan has been adopted, a developer chosen, and there is the potential to use TIF to help finance any development.

3. Use of a TOD Planning grant from the FTA is an excellent opportunity to plan for TOD, especially in

29 Section summarized from City of Oakdale (2018), unless otherwise noted.
30 Personal Communication, B. Streetar, May 18, 2018.
31 Ibid.

more suburban settings. The eastern portion of the Gold Line is located in more suburban settings where BRTOD is a less proven concept compared to urban settings. Use of a TOD Planning grant to conduct a corridor-wide station area planning effort is a smart way to ensure the proper land use framework that will make TOD possible is in place before the new line is built. For the Helmo Station specifically, the City of Oakdale has provided additional support including additional planning and paying for significant infrastructure upgrades. The land use framework is now in place, it is just a matter of time to see if the market responds or if additional government support will be needed to fully leverage TOD.

Conclusion

BRT is becoming more popular as a more cost-effective way to improve transit service and should see significant expansion across the United States in the next decade. However, BRT is not only a good and cost-effective transportation tool, it can also be a good economic development tool. Although the amount of literature is relatively small, there is strong evidence that BRT increases land values and attracts jobs. TOD will always be the strongest economic development tool available to BRT. Although BRT has a shorter, and less well-known track record of leveraging TOD compared to rail, from the experiences of those cities that have built or are currently planning BRT lines, several major themes emerge which can serve as lessons and best practices for cities that implement BRT in the future. Government support, including transit-supportive comprehensive plans and zoning, financing, land assembly and environmental cleanup, and marketing, is the most important factor leading to BRT's success at leveraging TOD. The strength of the real estate market also plays a role. In a stronger market, less government support is needed to leverage TOD, and cities typically have more leverage to ensure any development follows good TOD principles. In a weaker market, more government support is needed to stimulate development, and cities have less leverage to enforce good TOD principles. Related to the strength of the market, strong institutional anchors along a BRT corridor can help leverage TOD. And finally, although the level of features is important for improving transit service, it is not as important in leveraging TOD. As such, with a high level of government support and a strong real estate market, ABRT projects can also attract significant levels of TOD.

References

Belko, M. (2015, October 14). $150 million East Liberty transit center opens with ribbon cutting. Pittsburgh Post-Gazette. Retrieved from http://www.post-gazette.com/business/development/2015/10/14/East-Liberty-transit-center-officially-opens-with-ribbon-cutting/stories/201510140209

Belko, M. (2017a, January 17). Developer files appeal in rejected Whole Foods, apartments plan for East Liberty. Pittsburgh Post-Gazette. Retrieved from http://www.post-gazette.com/local/city/2017/01/17/Pennley-Park-developer-appeals-rejection-of-East-Liberty-Penn-Plaza-redevelopment-Whole-Foods/stories/201701170160

Belko, M. (2017b, January 10). Planning board rejects East Liberty development anchored by new Whole Foods. Pittsburgh Post-Gazette. Retrieved from http://www.post-gazette.com/local/city/2017/01/11/Planning-commission-rejects-plans-for-new-Whole-Food-Market-and-apartments-in-East-Liberty/stories/201701110078

Belko, M. (2018a, June 6). Battle over controversial Penn Plaza development headed to court. Pittsburgh Post-Gazette. Retrieved from http://www.post-gazette.com/business/development/2018/06/06/Battle-over-Penn-Plaza-headed-to-court-Gumberg-Enright-East-Liberty-development/stories/201806060158

Belko, M. (2018b, May 15). Planners approve controversial Penn Plaza redevelopment in East Liberty. Pittsburgh Post-Gazette. Retrieved from http://www.post-gazette.com/business/development/2018/05/15/Commission-approves-controversial-Penn-Plaza-redevelopment/stories/201805150152

Brookings Institution. (2018). Innovation Districts. Retrieved from Brookings Institution: https://www.brookings.edu/innovation-districts/

Cervero, R., & Dai, D. (2014). BRT TOD: Leveraging transit oriented development with bus rapid transit investments. Transport Policy, 36, 127-138.

Cervero, R., & Duncan, M. (2002). Benefits of Proximity to Rail on Housing Markets: Experiences in Santa Clara County. Journal of Public Transportation, 5(1), 1-18.

City of Oakdale. (2018). Helmo Station BRTOD Plan - Final. Retrieved from City of Oakdale: https://www.ci.oakdale.mn.us/DocumentCenter/View/2181/Helmo-Station-BRTOD-Plan---Final-PDF?bidId=

City of Pittsburgh. (2017). EcoInnovation District. Retrieved from EcoInnovation District: http://www.ecoinnovationdistrict.org/read-draft-plan-here

City of Saint Paul. (2017a). Ford Site: A 21st Century Community. Retrieved from City of Saint Paul: https://www.stpaul.gov/sites/default/files/Media%20Root/Planning%20%26%20Economic%20Development/Ford-Site-Master-Plan-Executive-Summary-v01.pdf

City of Saint Paul. (2017b). Ford Site: A 21st Century Community. Retrieved from City of Saint Paul: https://www.stpaul.gov/sites/default/files/Media%20Root/Planning%20%26%20Economic%20Development/Ford-Site-Master-Plan.pdf

City of Saint Paul. (2017c). Snelling Avenue South Rezoning Study. Retrieved from City of Saint Paul: https://www.stpaul.gov/sites/default/files/Media%20Root/Planning%20%26%20Economic%20Development/2016%20Oct4%20Informational%20MtgV2.pdf

Currie, G. (2006). Bus Transit Oriented Development—Strengths and Challenges Relative to Rail. Journal or Public Transportation, 9(4), 1-21.

Deto, R. (2015, July 22). Recent Penn Plaza evictions highlight East Liberty's severe lack of affordable housing. Pittsburgh CityPaper. Retrieved from https://www.pghcitypaper.com/pittsburgh/recent-penn-plaza-evictions-highlight-east-libertys-severe-lack-of-affordable-housing/Content?oid=1841883&storyPage=2

East Liberty Development, Inc. (1999). A Vision for East Liberty. Retrieved from East Liberty Development, Inc. : http://eldi.wpengine.com/wp-content/uploads/2016/12/1999-Communityplan.pdf

East Liberty Development, Inc. (2015). Affordable Housing in East Liberty. Retrieved from East Liberty Development, Inc.: https://www.eastliberty.org/wp-content/uploads/2016/11/Affordable-Housing-in-East-Liberty_2015.compressed.pdf

East Liberty Development, Inc. (2018). About ELDI. Retrieved from East Liberty Development, Inc.: https://www.eastliberty.org/about-eldi/

EcoDistricts. (2018). About. Retrieved from EcoDistricts: https://ecodistricts.org/about/

Federal Transit Administration. (2018). Pilot Program for Transit-Oriented Development Planning - Section 20005(b). Retrieved from Federal Transit Administration: https://www.transit.dot.gov/TODPilot

Government Accountability Office. (2012). Bus Rapid Transit: Projects Improve Transit Service and Can Contribute to Economic Development. Washington: Government Accountability Office.

Guthrie, A., & Fan, Y. (2016). Economic Development Impacts of Bus Rapid Transit. Minneapolis: University of Minnesota.

Iannotti, R. (2018, April 16). East Liberty Luxury Redevelopment Plans Come Under Fire. CBS Pittsburgh. Retrieved from https://pittsburgh.cbslocal.com/2018/04/16/east-liberty-redevelopment-protest/

Institute for Transportation and Development Policy. (2016). The Bus Rapid Transit Standard. Retrieved from Institute for Transportation and Development Policy: https://www.itdp.org/2016/06/21/the-brt-standard/

Institute for Transportation and Development Policy. (2018). BRT Rankings. Retrieved from Institute for Transportation and Development Policy: https://www.itdp.org/library/standards-and-guides/the-bus-rapid-transit-standard/best-practices-2013/

Johnson, B. (2018, June 21). St. Paul OKs Snelling Avenue apartment project. Finance & Commerce. Retrieved from https://finance-commerce.com/2018/06/st-paul-oks-snelling-avenue-apartment-project/

Jossi, F. (2016, September 21). Top Projects of 2015 series: Vintage on Selby. Finance & Commerce. Retrieved from https://finance-commerce.com/2016/09/top-projects-of-2015-series-vintage-on-selby/

Krauss, M. J. (2014, September 2). EastSide III caps a long collaboration in East Liberty. NEXTpittsburgh. Retrieved from https://www.nextpittsburgh.com/neighborhoods/east-liberty/eastside-iii-caps-a-long-collaboration-in-east-liberty/

Lyons, K. (2017, June 2). For growing cities, a cautionary tale from Pittsburgh. Technically Media. Retrieved from https://technical.ly/2017/06/02/lawsuit-pittsburgh-development-cautionary-tale/

McConnell Schaarsmith, A. (2015, May 20). East Liberty Place South latest project to revitalize neighborhood. Pittsburgh Post-Gazette. Retrieved from http://www.post-gazette.com/local/city/2015/05/20/East-Liberty-Place-South-latest-project-to-revitalize-neighborhood/stories/201505200229

Metro Transit. (2018). Rapid bus projects. Retrieved from Metro Transit: https://www.metrotransit.org/abrt

Metropolitan Council. (2018). 2040 Transportation Policy Plan. Retrieved from Metropolitan Council: https://metrocouncil.org/Transportation/Publications-And-Resources/Transportation-Planning/2040-TPP/2040-TPP-Complete.aspx

Mikek, B. (2018, July 28). Community members protest development at former Penn Plaza. Pittsburgh Post-Gazette. Retrieved from http://www.post-gazette.com/local/city/2018/07/28/Protest-former-Penn-Plaza-apartments-pittsburgh-east-liberty-development/stories/201807280076

Morris, W. (2018, May 23). Design shrinks O'Gara's pub, adds rentals. Fiance & Commerce. Retrieved from https://finance-commerce.com/2018/05/design-shrinks-ogaras-pub-adds-rentals/

Nelson Jones, D. (2018, July 11). Judge rules in favor of developer of former Penn Plaza apartments site. Pittsburgh Post-Gazette. Retrieved from http://www.post-gazette.com/local/city/2018/07/11/Common-Pleas-Penn-Plaza-Pennley-Park-South-affordable-housing/stories/201807110188

Nelson, A. C., & Ganning, J. (2015). National Study of BRT Development Outcomes. Portland: National Institute for Transportation and Communities.

Nelson, A. C., Appleyard, B., Kannan, S., Ewing, R., Miller, M., & Eskic, D. (2013). Bus Rapid Transit and Economic Development: Case Study of the Eugene-Springfield BRT System. Journal of Public Transportation, 16(3), 41-57.

Nelson, E., Walsh, J., & Norfleet, N. (2018, June 26). Ryan Cos. to develop massive Ford site in St. Paul. Star Tribune. Retrieved from http://www.startribune.com/ryan-cos-to-develop-massive-ford-site-in-st-paul/486494011/

Ohio Development Services Agency. (2018). Brownfield Revitalization. Retrieved from Ohio.gov: https://development.ohio.gov/cleanohio/BrownfieldRevitalization/

Ohio Development Services Agency. (2018). Job Ready Sites. Retrieved from Ohio.gov: https://development.ohio.gov/redev/JRS_funding.htm

Perk, V. A., & Catalá, M. (2009). Land Use Impacts of Bus Rapid Transit: Effects of BRT Station Proximity on Property Values along the Pittsburgh Martin Luther King, Jr. East Busway. Washington: Federal Transit Administration.

Perk, V. A., Catalá, M., Mantius, M., & Corcoran, K. (2017). Imapcts of Bus Rapid Transit (BRT) on Surrounding Residential Property Values. Portland: National Institute for Transportation and Communities.

Port Authority of Allegheny County. (2018a). BRT. Retrieved from Port Authority: http://portauthority.org/paac/portals/0/brt/webppt.pdf

Port Authority of Allegheny County. (2018b). Schedules & Maps. Retrieved from Port Authority: http://www.portauthority.org/paac/SchedulesMaps/TripPlanner.aspx

Reid, L. (2013, November 4). Mixed-Income Housing a Cornerstone of East Liberty Redevelopment. 90.5 WESA. Retrieved from http://www.wesa.fm/post/mixed-income-housing-cornerstone-east-liberty-redevelopment#stream/0

Schooley, T. (2013, November 4). TCB breaks ground on East Liberty Place South. Pittsburgh Business Times. Retrieved from https://www.bizjournals.com/pittsburgh/news/2013/11/04/tcb-breaks-ground-on-east-liberty.html?s=print

Schooley, T. (2014, May 13). Mosites unveils plans for next phase of East Side project. Pittsburgh Business Times. Retrieved from https://www.bizjournals.com/pittsburgh/news/2014/05/13/mosites-unveils-plans-for-next-phase-of-east-side.html?s=print

The Mosites Company. (2018a). Eastside I. Retrieved from The Mosites Company: https://mosites.net/portfolio/eastside-i/

The Mosites Company. (2018b). Eastside II. Retrieved from The Mosites Comapny: https://mosites.net/portfolio/eastside-ii/

The Mosites Company. (2018c). Eastside III. Retrieved from The Mosites Company: https://mosites.net/portfolio/eastside-iii/

The Mosites Company. (2018d). Eastside V. Retrieved from The Mosites Company: https://mosites.net/portfolio/eastside-v/

Thole, C., & Samus, J. (2009). Bus Rapid Transit and Development: Policies and Practices that Affect Development Around Transit. Washington: Federal Transit Administration.

Urban Land Institute. (2011). ULI Case Studies - Eastside. Retrieved from Urban Land Institute: https://casestudies.uli.org/wp-content/uploads/sites/98/2016/06/Eastside-PDF.pdf

Vrabel, J. (2018, April 10). Key moments in the Penn Plaza displacement saga. PublicSource. Retrieved from https://www.publicsource.org/key-moments-in-the-penn-plaza-displacement-saga/