Investing in High-Speed Rail to Washington, D.C. to Boost Baltimore's Economy

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(Image: A MARC Penn Line train at Odenton, Maryland by Ryan Stavely)

Introduction

Across the United States, there are more than 65 cities that are home to more than 300,000 people. Some cities, such as Seattle, Portland, and San Francisco, feature vibrant, modern economies. In such desirable, productive cities, housing prices are extremely high, and this reduces the opportunities for young people, poor people, and immigrants and increases homelessness. At the same time, there are other cities, such as Detroit and St. Louis, characterized by low levels of economic opportunity. In these cities, there are an aging and increasingly vacant housing stock, relatively little job formation, high rates of poverty, and low home prices.

There are few pairs of neighboring cities in the United States such that one city is booming while the nearby city is struggling. Just 40 miles to the north of economically booming Washington D.C lies economically struggling Baltimore City. Affordable housing has been hard to come by in the Washington, D.C. real estate market in recent years with housing sale prices up over 50 percent in the last decade. Just 40 miles north, Baltimore struggles with a seemingly intractable problem of addressing a vacant housing stock of over 16,000 units. The close physical proximity between these cities offers the possibility that an effective investment in cross-city transit could help residents of both cities to gain improvements in quality of life and economic vitality.

The COVID-19 pandemic has caused a crisis among public transit agencies as riders fear being in close proximity to other riders and state and local governments experience budget crises and shortfalls. Many governments are responding to this by cutting service to reduce costs, including the Maryland Transit Authority which proposed significant cuts to train and bus service. County government officials, recognizing the crucial role that transit plays in their local economies, voiced strong opposition to the proposed cuts. However, a significant unknown is the extent to which post-COVID (once a vaccine is widely distributed and available) transit ridership will return to pre-COVID transit ridership levels.

Currently, there is a slow commuter train, the Maryland Area Regional Commuter (MARC), that travels from Baltimore to D.C. in 65 minutes. If this train could be rerouted as a faster express line using existing infrastructure, this 40-mile trip could be completed in 35 minutes. In this brief, we argue that such a cross-city transit upgrade would benefit both cities as they would effectively become an integrated local labor market. Young professionals who work in Washington, D.C. would have the opportunity to pursue a more affordable lifestyle in Baltimore City. Families would be more attracted to the greater Baltimore/D.C. metro area because of the potential increase in working opportunity permutations. The City of Baltimore could gain an infusion of thousands of middle class families who would seek to live in the city and increase the tax base.

Recent electoral victories at the federal and local level may provide an opportunity to direct more investment toward the MARC and the infrastructure that supports it. President Biden's support of Amtrak is well-known, and the president-elect's $2 trillion infrastructure plan is wide ranging, as is Mayor Scott's support of transportation initiatives in general, including the recent call for the Maryland Legislature to pass the Transit Safety and Investment Act to help fund the MTA maintenance backlog. At a time when both Democrats and Republicans in Congress voice support for infrastructure upgrades, it is important to delve into the details to understand what infrastructure investments may be cost effective and to anticipate issues regarding the political economy of actually implementing improvements to an existing system. In short, who are the "winners" and "losers" from upgrading the MARC? Is there clear evidence that the "winners" gain more than the "losers" lose? What risks are involved in implementing such a project? Who should pay for this project? What are possible unintended consequences of such an ambitious project?

In this report, we explore these questions. We highlight what we know based on existing data sources and what we do not know given data limitations and the fact that these sister cities have not had a high-speed railroad connecting them. In conducting an ex-ante evaluation of an infrastructure project that has not been built yet, we must be honest about our own "known unknowns" about the benefits and costs of this proposed project.

Both Washington, D.C.'s and Baltimore's respective economies would be stronger if the two labor markets were more closely integrated.

We examine the current MARC service from Baltimore to D.C. and what an express train could look like, focusing on who stands to benefit and who might oppose such changes. We also explore whether residents of D.C. could be induced to live in Baltimore through significant housing cost savings and if improved MARC service would augment the job market for the current residents of Baltimore. Again, we pay particular attention to the occupations that stand to benefit the most. Finally, we examine the implications that an improved MARC service could have on the redevelopment of vacant properties in close proximity to the two MARC stations in Baltimore City and possible barriers to this redevelopment.

Both Washington, D.C.'s and Baltimore's respective economies would be stronger if the two labor markets were more closely integrated. Given the realities of traffic congestion between the two metro areas, new transport strategies must be considered. A "silver lining" of the ongoing COVID-19 economic lockdown is that more people than ever are telecommuting. We expect that in the post pandemic economy, more people will telecommute and expect to visit their workplace just once or

twice a week. This rise of telecommuting creates even more opportunities for the integration of the Baltimore and Washington, D.C. labor markets.

Context and Background – MARC Train Service

Over the years, Baltimore and the District of Columbia have grown into a region with a combined population of 9.8 million, making it the fourth largest combined statistical area (CSA) in the United States. It is also the second most educated CSA, with 45 percent of the population with a bachelor's degree or higher, and the second highest income CSA, with the median household earning $87,000 a year.

In general, public transportation in each core city is fragmented with two separate and distinct rail and bus networks serving each city as well as multiple smaller bus systems providing service. The only public transit system that serves the entire region is the Maryland Area Regional Commuter (MARC) train service. MARC operates three lines, including the Penn Line, which runs along the Amtrak Northeast Corridor with the majority of trains running from Baltimore Penn Station to Washington Union Station. In the following sections, we explore levels and patterns of service. It should be noted that all numbers are pre-COVID.

Level and Pattern of Service and Travel Times

A total of 29 trains operate on weekdays on the Penn Line in each direction.[1] The majority operate as locals, stopping at all stations between Penn Station and Union Station. There are few trains that could be considered express service. In the morning peak, there are two trains which skip two and three stations respectively and in the evening peak, there are four trains which skip between three and four stations. There are additional expresses which run northbound in the morning and southbound in the evening, but they would not be used by travelers living in Baltimore and working in D.C.

Ridership and Capacity

Daily boardings in February 2020 on the Penn line were about 26,000. While this shows a spike over February 2019 by almost 3,000 daily boardings, February 2019 encompassed several snow days on which commuter travel was reduced.[2] A bi-level MARC car has approximately 130 seats. With an average of six cars per train, one train can carry 780 seated people with another 100-plus standing spaces for a capacity of 880 people. Single level cars have fewer seats but the majority of the runs on the Penn Line are made with bi-level cars. In general, there is limited capacity to carry additional riders in the peak periods. Capacity varies during peak hours with some trains (generally stopping at only key stations) operating with standing loads and other local trains having some empty seats.

[1] As of the November 11, 2019 timetable.
[2] MARC Rider Advisory Committee minutes.

Providing Express MARC Service: The Proposal

How could the current MARC service be improved to provide a faster express service for Baltimore to D.C. commuters? What would be needed to make this vision a reality, and what would it look like in practice?

Time and Frequency

The current MARC "express" service reduces running times by about 11 minutes from 60 to 65 minutes to 48 to 55 minutes, as indicated in Table I, below. Amtrak Acelas, some of which make no stops between Baltimore and D.C., take 28 to 38 minutes for the trip. Given those travel times, it can be assumed that a non-stop express MARC train could make the trip in 35 minutes.

Table I – Running times between Baltimore and Washington, D.C. for MARC and Amtrak trains, 2019.

Service Type	Running time in minutes
MARC Locals Southbound – Morning Peak	60-63
MARC – Express Southbound – Morning Peak	54-55
MARC Locals Northbound – Evening Peak	60-65
MARC Expresses Northbound – Evening Peak	48-56
MARC Northbound Non-Stop Morning Peak	41
Amtrak Regional	40-46
Amtrak Acela	28-38

Source: MARC public timetable effective November 11, 2019; Amtrak website December 6, 2019

Peak period service from Penn Station is relatively frequent. Eight trains depart Penn Station for Washington between 6 am and 9 am about every 22 minutes. All but one stops at West Baltimore, and all but two are locals, making all stops to Union Station. Similarly, eight trains depart Washington Union Station heading for Baltimore between 4 pm and 7pm about every 22 minutes. During this period, all but three stop at West Baltimore, and five follow some sort of express pattern, skipping three to four stops and making the average evening return trip somewhat shorter than the morning commute. Express trains could either be added to this schedule, or existing trains could be converted to express service. If no additional trains were added, it is unlikely that an express train could be taken every 22 minutes, but something in the window of 30 to 45 minutes is reasonable.

Increased Service

There are two ways to provide faster MARC service under present conditions. The state could either convert existing local trains to express running patterns or add new trains operating as limited or non-stop between Baltimore and D.C. In general, we will consider express service to mean non-stop running from Baltimore to D.C. and back. Given the number of jobs relatively close to the New Carrollton Station, a stop there may be warranted on one or two express trains. In addition, given our focus on the redevelopment of vacant housing in Baltimore, a stop at the West Baltimore MARC Station would be necessary for some express trains.

Converting Local Trains to Express Trains

Converting local trains to express trains would mean taking some number of existing trains that make all stops or have some express characteristics now and converting them to full express service between the two cities. It would entail little to no additional cost and improve running times. However, it would have a negative impact on commuters boarding at interim stops, reducing their service frequency and convenience. MARC staff are reluctant to reduce service at one station to increase it at another without strong ridership sentiment in favor of both changes. MARC has conducted no surveys in the recent past inquiring about interest in express service, so this remains a serious unknown.

Ridership counts in 2018 show 2,927 daily boardings at Baltimore Penn Station with about another 700 boarding at West Baltimore. Reducing stops on local trains would deny some trains to people taking MARC from interim stations. Most affected would be Odenton with 2,320 daily boardings. This could only be mitigated by having some express trains stop at Odenton as well. Passengers at other stations would have less trains to choose from and less available capacity, but the lower numbers reduce the impacts.

Nevertheless, riders are continually seeking more service – not less. One could expect significant localized opposition to a change in service in this manner, a hurdle that must be considered. One way to avoid this impact would be to add trains to run an express service.

Additional Trains

The addition of trains to run express service would have no impact on existing ridership. However, while converting local trains to express would be a no-cost option, this option could involve additional operating cost, depending on how it was scheduled. In its extreme, it could require purchasing additional rolling stock (locomotives and coaches). At present, the Maryland Department of Transportation is focused on mid-life overhaul of the existing fleet and is not likely to be in the market for more and replacement rolling stock for 10-20 years. As a result, it can be concluded with some certainty that the addition of express trains to the schedule would have to be taken from the existing fleet. There would also be the need for additional capacity or slots[3] on the Northeast Corridor between Baltimore and Washington.

[3] Slots can be thought of as rolling sections of track capacity that accommodate one train, sufficiently spaced between trains ahead and trains behind in a specific time period.

By all indications, there seems to be no interest on the part of the existing Maryland administration to increase funding for public transportation and specifically to increase the cost of operating MARC. The MARC Cornerstone Plan, which lays out a vision for the future of MARC, is largely capital-oriented and does not provide plans for growth in service. The plan does outline an express pattern of operations for the MARC Penn Line which shows limited stopping at BWI, Odenton, and New Carrolton. The report suggests this will take capital investment, which is not currently available. Overall, there has been no increase in the MARC budget over the last few years and none expected in the next few years, other than to account for cost-of-living wage increases and increases in the Amtrak and CSX contracts for using their rail. A possible way to pay for the improvements could be a congestion charge on highways between D.C. and Baltimore with funds dedicated to public transit projects. Although this method of funding would face significant political hurdles.

Amtrak owns the rail corridor that MARC utilizes. There were approximately 84 pre-COVID Amtrak trains that ran each day between Baltimore and Washington. With the addition of approximately 58 weekday MARC trains, there are a total of 142 daily passenger train movements plus some number of CSX freight trains – although much of the freight service runs outside of the 6 am to 11 pm period when the passenger service is concentrated. As the owner of the line, by Amtrak standards, this is one of the busiest rail corridors in North America. As such, Amtrak may be resistant to increasing MARC service on the Penn Line.

At present, capacity is generally allocated by train slot. Capacity is constrained by the number of trains running at a given time as well as any physical right-of-way constraints. There are several constraints between Baltimore and D.C. on the Northeast Corridor. As an example, one of them is the tunnel segment running from east of the West Baltimore station to east of Penn Station. As a result of the deteriorating condition of those tunnels, speeds in the tunnel are limited to 30 mph for passenger trains and 20 mph for freight trains.

However, this could provide a bargaining chip for increased MARC service. The State of Maryland has committed funding for a $466 million expansion of the Howard Street Tunnel using state, federal, and CSX funding, with a pledge to go forward despite other COVID-related cuts to the state transportation budget. If the State of Maryland and City of Baltimore provided additional funds for upgrading the tunnel, Amtrak could, in return, allow for an increased contract for additional MARC express service. This would improve the current situation for all partners, as MARC, Amtrak, and CSX could increase speeds, and CSX could carry double stacked cargo from the Port of Baltimore, furthering the economic case for the upgrade.

Additional capacity increases could be achieved through additional and run-around tracks, new interlockings, and new platforms as well as signal improvements which allow for higher speeds and shorter headways. Track additions could also be tempered by right-of-way conditions and adjacent property availability and suitability. Large amounts of wetlands are present on both sides of the Baltimore-Washington right-of-way. However, at present, the deferred maintenance value for the Amtrak Northeast Corridor is about $28 billion. The recently introduced Transit Safety and Investment Act in the Maryland legislature aims to address the MTA $2 billion maintenance gap and may go some way to improving MARC speeds with upgrades to tracks and switches.

Nevertheless, there is some hope on the horizon for capacity improvements which could accommodate express MARC trains. The incoming Biden administration has promised to spark “the

second great rail revolution" that includes improvements for high-speed rail. Amtrak is performing some upgrades, including track improvements which could allow for increased speeds as well as some realignment to increase capacity. There are also plans to provide additional platform space at New Carrollton and Baltimore Penn Station. While much of this is being completed to allow for more Acela service, it could also create more capacity for MARC service.

A long-standing issue for MARC, especially as it has grown, relates to the storage of trains when they are not in use, particularly outside of rush hours. Currently, many train sets are lined up on limited track space at Union Station and Penn Station. Adding trains could aggravate this issue. Additionally, both stations are scheduled for significant reconstruction in the next few years which could further limit storage capacity. However, after these upgrades, this issue would likely be alleviated.

Making the Change: Living in Baltimore and Working in the Capitol

To try to understand whether a faster MARC service could entice D.C. residents to move to Baltimore while keeping their job and make Baltimore residents consider a job in D.C., it is important to consider a variety of factors that may influence the decision-making process. These factors include commuting time, convenience, cost, and accessibility; housing affordability and location; occupations and wage premiums; marketing and awareness; social networks and leisure preferences; and quality of life concerns.

Making the Commute

Commuters living in Baltimore and working in D.C. face the choice of driving or taking the MARC. Time, convenience, cost, and accessibility are all important factors that determine whether one chooses to make the drive or use public transportation.

Commute Time

A 35 minute MARC express train, as outlined above, would be a significant improvement for Baltimore to D.C. commuters. This improved service would cut travel time almost in half and save commuters nearly one hour a day.

However, commutes from Baltimore to D.C. often involve more than just time on the MARC train. To estimate what a typical commute could look like, we have formulated a theoretical commute from a home address at 27th Street and North Calvert Street in Baltimore to a work destination in D.C. at the corner of Connecticut Avenue, NW and K Street, NW. We compare three commute scenarios: travel by car, travel with current MARC service, and travel with assumed express travel time on MARC. Each trip starts at 7 am on a weekday.

Table II – Example trip from Baltimore to D.C.

Start	Interim/Finish	Drive (minutes)	MARC Current (minutes)	MARC Express (minutes)	Action
27th St./North Calvert St.	Penn Station		10	10	Walk to 27th and St. Paul and take MTA Silver Link bus
Penn Station	Penn Station		8	8	Enter station, walk to platform
Penn Station	Union Station		59	35	Existing 7.22 departure, theoretical new express
Union Station	Union Station		12	12	Alight train, walk to Red Line metro station, wait 2 minutes for train
Union Station	Connecticut Ave., NW and K Street, NW		10	10	Red Line and exit to street
Total		**83**	**99**	**75**	

Source: Google maps, MTA bus and MARC timetables, and Washington Metro travel times, November 2019.

In the above scenario, driving is 16 minutes faster than traveling with the current MARC timetable, and a new express MARC train is eight minutes faster than driving. These travel times are subject to significant variations. In the final months of 2019, the MARC had an on-time performance rating of 90 to 92 percent, although that covers the entire day and not just the peak periods.[4] Peak period on-time performance can be expected to be worse, due to right-of-way congestion and shorter train turn around times. The reliability of driving times varies significantly as well. Maryland's urban interstate highways are the second most congested in the nation. Car travel times on I-95 and MD-295 are moderately to extremely unreliable during peak rush hour.

However, the COVID pandemic has greatly reduced traffic congestion, and the sharp increase in people working from home either all the time or for several days a week will likely persist at some level in a post-COVID world. Yet a significant amount of research has demonstrated that highways almost always operate at capacity, even if additional lanes are built.[5] Commuters are fairly responsive to this induced demand, and that will likely remain unchanged in a post-COVID world.

On the present MARC schedule, it would be nearly impossible to get the commute under an hour. However, with express service, some commutes could come in close to the one hour mark, depending on the proximity of home and work to the stations. This means that an express MARC service could entice a significant number of people to live in Baltimore and work in D.C. if they were able to live relatively close to Penn Station or the West Baltimore MARC Station and work relatively

[4] MARC Advisory Committee
[5] Duranton and Turner (2011)

close to Union Station, which we will discuss in more depth below. The possibility of increased remote work and telecommuting where workers only need to commute to the office one or two days a week make this commute even more worthwhile.

Cost

A monthly unlimited ride pass on MARC for travel between Penn Station and Union Station costs $216. For train commuters there may be costs for parking at Penn Station or bus fares and the cost of the last-mile segment in D.C. between Union Station and the work location. Considering our scenario described above, the daily cost could be estimated as follows.

Table III – Estimated cost of travel modes

Expense	Cost	Comment
MARC	$10.29	Monthly pass with 21 working day round-trips
Bus – home/Penn Station	$3.80	Two trips per day
Metro – Union Station/Farragut North	$4.50	Two trips per day
Total	**$18.59**	

Assuming 290 working days in a year (subtracting weekends, vacation, and holidays), this comes to an annual commute expenditure of about $5,400. This assumes that any extra costs associated with running an express MARC service would not result in increased fares. It should be noted that choosing to drive to Penn Station and parking in the Penn Station garage can increase this price significantly with monthly parking passes at the station and nearby garages ranging from $175 to $240 in general. However, as we will discuss below, the significant savings on housing costs would more than outweigh this commute cost if the tradeoff is living in D.C. versus living in Baltimore. Similarly, the pecuniary benefits of working in D.C. instead of Baltimore would help offset these costs in many, but not all, occupations. If telecommuting is possible, the cost is significantly reduced.

With respect to MARC, commuting to Washington by train remains a bargain compared to driving. With an approximate 90-mile round-trip for the commute outlined above, the daily cost is three times more expensive at $64, assuming an average $12 per day for parking with a monthly parking permit and the 2019 IRS mileage rate of $0.58 per mile for the operation of a car.

Accessibility

There are two stations which would serve as boarding locations for people living in Baltimore and commuting to D.C. on MARC – Baltimore Penn Station and the West Baltimore Station, about 2.5 miles apart from each other. Besides location, there are vast differences between them.

Baltimore Penn Station

All MARC southbound and northbound trains begin, terminate, or stop at Penn Station. It is an Amtrak Northeast Corridor station so it has most station services including ticket sales through ticket agents and machines, a large indoor waiting area with ample seating, rest rooms, a bar/cafe, limited convenience food outlets, WiFi, and an information desk.

Penn Station generally has good transit connectivity, with taxis, car drop-off lanes, bicycle racks, a variety of bus services, a connecting branch of the light rail, and dockless scooters and bicycles. In addition, there are over 2,000 garage parking spaces within a third of a mile of Penn Station. The station is a geographically central location in the city and is about a mile and a quarter from the central business district. The redevelopment of the station and its immediate surroundings is planned for the near future which will result in significant upgrades in amenities.

West Baltimore Station

All local MARC southbound and northbound trains stop at West Baltimore, with some express trains bypassing it. The station is basically two short, low-level wood platforms and a bus stop shelter. Doors to only one or two cars of a train are available. There are 325 free parking spaces available. Dockless bicycles and scooters may be available but generally in small numbers, if at all. The station provides virtually no protection from the elements when waiting for trains and has no amenities. Barring significant upgrades to the West Baltimore MARC Station, Penn Station is significantly more accessible and convenient.

Housing Affordability and Stock

There is a dramatic difference between the cost of housing in Baltimore and D.C., particularly with respect to sales prices. In 2019, the average sales price of a home in D.C. is $628,900 compared to $148,700 in Baltimore, while the average rent in D.C. is $2,700 a month compared to $1,300 a month in Baltimore.[6] With these estimates, the average annual savings could be about $16,000 for renters, easily outweighing the commute cost of around $5,400 a year. The vacancy rate for homes for sale in the District of Columbia was 1.4% compared to 4% for Baltimore City in 2018.[7] The comparable vacancy rates for rental housing was 7.5% in Washington and 13.5% in Baltimore. These rates hold for housing that is available for move-in.

For people who choose to live in Baltimore and commute to D.C., it is reasonable to assume they would choose to live within a short distance of either Penn Station or the West Baltimore MARC station. In recent years, housing stock has increased in the immediate vicinity of Penn Station with the Nelson Kohl Apartments development. The planned redevelopment of Penn Station with mixed-use commercial space will likely result in an increase in housing development close to the station. The vacant homes statistics cited earlier suggest there are ample opportunities close to the stations to find, purchase, and rehabilitate housing.

[6] Zillow (2019)
[7] US Department of Housing and Urban Development (2018)

Of the 16,000 plus vacant housing notices that were active as of April 2020, 1,075 of them were within a half mile of the West Baltimore MARC Station, and 92 were within a half mile of Penn Station. The area around the West Baltimore MARC Station presents a clear opportunity for developers. Following Baltimore City's 2017 zoning code overhaul, which encourages transit-oriented development and allows for taller buildings near transit stations, several developers have projects in the works in the vicinity of the station including an apartment complex and a mixed-use space. Developers could begin by focusing on areas closest to the station, blocks that the city has already demolished, and blocks that are entirely vacant. In addition to the hundreds of vacant homes, Baltimore Route 40, also known as the "Highway to Nowhere", presents yet another opportunity for development.

Figure I: West Baltimore MARC Station and Vacant Buildings and Land

Source: Open Baltimore

However, significant improvements would have to be made in both the amenities of the West Baltimore station and in quality of life in the neighborhoods around the station to make it a more attractive site for transit-oriented development. The West Baltimore MARC Station would likely need amenity upgrades that include a shelter to protect riders from the elements and platform upgrades. The parking lot could be redeveloped as a mixed-use complex with improved station amenities. Investments in the station and surrounding neighborhood by the state and city would signal momentum in this effort.

Gentrification Without Displacement?

Large-scale redevelopment around the West Baltimore MARC station may prompt fears of gentrification and displacement of low income residents. The average home value in the Midtown-Edmondson neighborhood where the West Baltimore MARC station is located was just over $48,000 in 2019.[8] The homeownership rate in the four census tracts that border the West Baltimore MARC station have a similar rate to that of the city, where 48% of occupied housing units are owner-occupied. This means that over half of the occupied housing units near the station would potentially be affected by rent increases if redevelopment occurred. Past research has shown that communities that receive increased access to new transit-oriented development experienced greater gentrification than those that did not.[9] A planned $6 million investment in apartments, parks, and playgrounds in Baltimore's Johnston Square neighborhood prompted concerns that fixed-income residents would suffer from property tax increases. How could the city protect existing residents against such gentrification?

As a first step, the city could engage in a targeted neighborhood public awareness campaign to promote universal participation in the state's Renters Tax Credit Program and Homeowners Tax Credit Program, which limit the amount of taxes that low-income residents pay. Given that a significant number of the vacant properties surrounding the West Baltimore MARC station and a significant amount of land in the underutilized Highway to Nowhere are publicly-owned, land value capture and community land banking present possible strategies to safeguard against displacement for the city. The city could create a non-profit housing cooperative entity to manage publicly-owned properties near the station with a requirement to make them permanently affordable. They could also create a neighborhood-owned Real Estate Investment Trust (REIT) where legacy residents share in the profits of gentrification. New strategies for community shareholding and profit are becoming increasingly popular across the U.S., and the city could consult experts who have gone through the process in other cities.[10]

Developers who build near the station could also be required to have a percentage of below-market-rate units through the city's inclusionary zoning. However, in its nine years of existence, the program has only produced 34 affordable units, through a loophole that allows developers to forgo adding affordable units if they can prove it would make the development unfeasible.

Another way to ensure the community benefits is the auctioning of upzoned transit-oriented development (TOD) rights to developers and use of the funds to support local schools, infrastructure, parks, or other public goods. Increased taxes could also be earmarked for affordable housing or other community benefits. Given that any development near the station would be TOD, the city could waive minimum parking requirements, making higher density zoning more feasible.

To make an investment in transit infrastructure upgrades worthwhile and sustainable, the city and state need to ensure they recoup a significant share of their investment in the form of increased tax revenue. A recent study of the 2nd Avenue subway line extension in New York City showed that although the infrastructure project generated more than $4.5 billion in market present value, the city

[8] Zillow (2019)
[9] Kahn (2007).
[10] Theodos and Edmonds (2020)

only recuperated $1.8 billion or 30% of the total amount. The authors suggest that local governments should follow the lead of cities like Tokyo and Hong Kong in implementing better value capture practices.[11] This revenue could then be reinvested in transit infrastructure improvements in other parts of the city.

If the city is able to safeguard residents against displacement, the gentrification brought on by transit-oriented redevelopment could bring significant gains to neighborhood residents. For example, Mary Ann Winterling and Lockerman-Bundy Elementary Schools have some of the lowest enrollment numbers of any of Baltimore City's public schools, ranking 108th and 110th respectively among the city's 117 traditional public schools. If new families moved into the neighborhood and sent their children to Baltimore City Public Schools, enrollment could rise, increasing funding. Increased population in the neighborhood would make commercial entities such as grocery stores and retail outlets more viable, bringing goods and services to the neighborhood.

Working in the Capital: Occupations and Wage Premiums

One's job is an important determinant of one's ability to live in Baltimore and commute to D.C. While living close to Penn Station or the West Baltimore MARC Station is an important factor, so is both having a job in relative proximity to D.C.'s Union Station and being employed in an industry where the remunerative benefits are significantly greater in D.C. than in Baltimore. Relatively few people live in Baltimore and work in D.C. In 2017, slightly fewer than 3,000 people lived in Baltimore and commuted to D.C. for their primary occupation. A further 300 Baltimoreans worked secondary jobs in D.C.[12]

Unfortunately, we do not know how many of these commuters drive or take the train. While 2018 ridership numbers show upwards of 3,600 boardings at Baltimore's Penn Station and West Baltimore MARC Station, we do not know the final destination of these riders. We also do not know how many of them are travelling to D.C. to an office and how many might be going to D.C. for meetings or other purposes. Many federal government consulting firms have offices in Baltimore but need to travel to D.C. regularly to meet clients. Many workers regularly travel to D.C. for a variety of reasons. While these workers are not travelling to a D.C. office on a regular basis, proximity to D.C. and easy transit on the MARC make their business more profitable.

The geography of these jobs does not differ greatly from the overall geographic concentration of jobs in D.C. Figure II and III show this geography with one- and two-mile radius rings from Union Station. This means that it is unlikely that the majority of these commuters currently use MARC (preferring to drive instead), and those that do likely have jobs closer to the station or are willing to commute longer distances than average workers. The distance to the Central Business District[13] is a greater determinant of the geography of jobs for Baltimore to D.C. commuters than the distance to Union Station.[14] The unknown is if MARC express service was implemented, would more people use it and would their jobs be in close proximity to the station?

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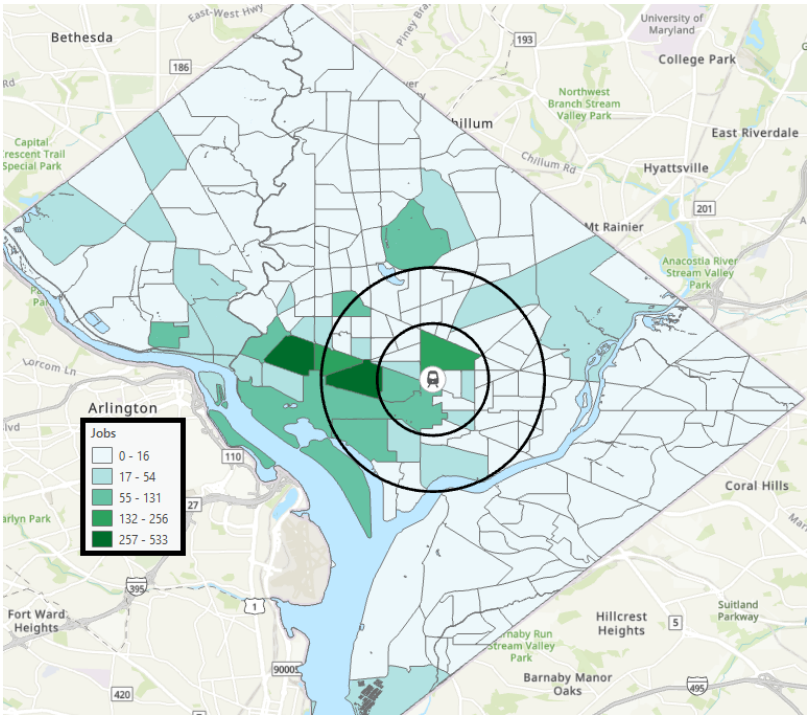
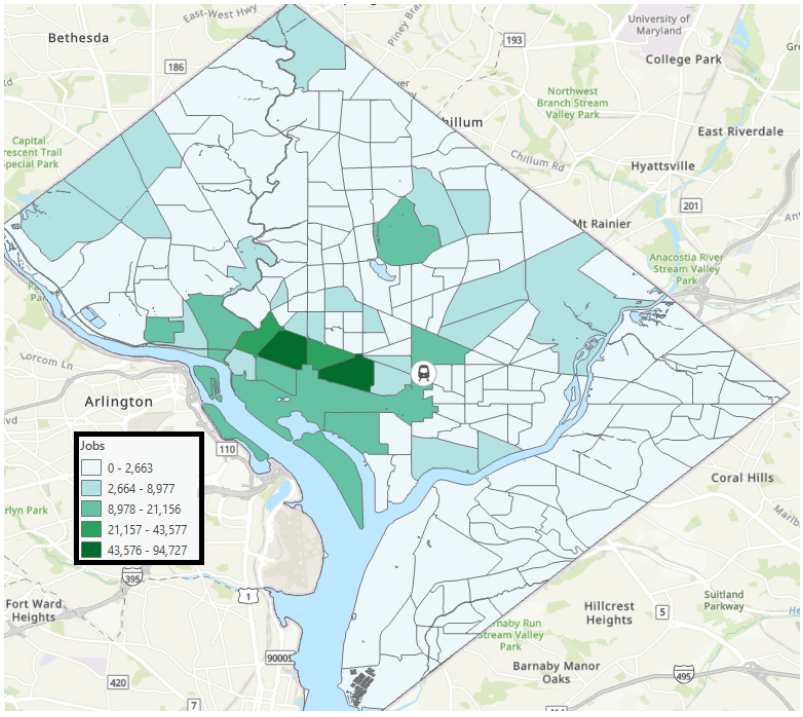
[11] Gupta, Nieuwerburgh, Kontokosta (2020)
[12] Census Bureau (2017).
[13] Holian and Kahn (2012).
[14] Distance to the Central Business District was twice as negatively correlated as distance to Union Station for the number of jobs for Baltimore to D.C. commuters.

Figure II: Jobs by census tract for Baltimore to D.C. commuters, 2017



Source: Longitudinal Employer-Household Dynamics, Origin-Destination Employment Statistics

Figure III: All jobs in D.C., 2017



Source: Longitudinal Employer-Household Dynamics, Origin-Destination Employment Statistics

People are generally willing to accept longer commute distances and times for higher wages. Researchers have identified a one-hour commute ceiling to take a higher paying job.[15] Longer commutes tend to be rewarded with higher wages.[16] Our scenario on page 7 is close to this ceiling. Given this, it is reasonable to assume that jobs within a mile of Union Station would be most accessible to Baltimore to D.C. commuters. In 2017, there were nearly 87,500 jobs within one mile of Union Station and just over 304,000 jobs within two miles of Union Station.[17] If a two-mile radius is to be considered within the job market for Baltimore commuters, this nearly doubles the number of jobs in the Baltimore City labor market (337,000 in 2017).

Additionally, jobs in the D.C. labor market are generally more remunerative than jobs in the Baltimore labor market. Jobs within a mile of Union Station in D.C. are higher paid than in Baltimore City, with over 65% of jobs with an annual salary over $40,000 compared to just 55% in Baltimore. Clearly, the opening up of the D.C. job market to Baltimoreans could have a significant impact on available job opportunities.

On average, jobs in D.C. pay almost $30,000 a year more than jobs in Baltimore City, and D.C. offers over twice the number of jobs than Baltimore offers. As such, the average Baltimorean stands to benefit significantly from increased access to the D.C. job market. However, certain workers stand to benefit much more than other workers from the labor market opened up by a faster train to D.C. In 2019, employees in every industry other than educational services, finance and insurance, and utilities earned more in Washington, D.C. than in Baltimore City.[18] The wage premium is highest in certain industries as detailed in Table IV, which ranks the wage premium for industries in Baltimore and D.C.

Table IV – Wage premium by major industry group in Baltimore and D.C., 2019

Industry	DC Pay Premium	DC Job Differential*
All industries	$29,498	431,600
Management of companies and enterprises	$140,406	-2,707
Wholesale trade	$67,337	-1,129
Public administration	$50,987	154,021
Other services	$50,122	63,212
Real estate and rental and leasing	$44,616	7,589
Arts, entertainment, and recreation	$40,316	9,352
Manufacturing	$38,352	-6,930
Transportation and warehousing	$35,164	-6,150

[15] So, Orazem, Otto (2001)
[16] Zax (1991)
[17] Census Bureau (2017). Measured as the distance from the Census block centroid to Union Station.
[18] Bureau of Labor Statistics (2019)

Information	$33,986	18,681
Professional and technical services	$33,139	103,023
Administrative and waste services	$19,274	23,958
Accommodation and food services	$10,212	48,882
Retail trade	$8,229	8,770
Health care and social assistance	$4,490	-6,558
Construction	$4,211	3,998
Educational services	-$11,719	-1,585
Finance and insurance	-$22,000	7,005
Utilities	-$40,018	-1,139

Source: Quarterly Census of Employment and Wages, 2019. *We calculated the job differential by subtracting the total number of jobs in Baltimore from the total number of jobs in D.C.

Workers in these professions stand to benefit more from a faster MARC train than those lower down the wage premium ladder. For example, people working in public administration stand to make over $50,000 more a year on average in the D.C. job market, making the commute well worth the trip. However, workers in construction stand to make $4,000 a year more on average, which would not cover the cost of the commute, not to mention the additional time spent commuting. Some professions make substantially more in D.C. than in Baltimore, such as lawyers, who makes almost $84,000 more a year with over 23,000 more jobs.

The D.C. job market also offers significantly higher salaries and more jobs than Baltimore City in several booming industries. For example, businesses in the computer systems design industry in Washington, D.C., employed 24,633 workers in 2019, compared to just 2,876 in Baltimore City. The average salary for those employees was over $12,500 higher in D.C. than in Baltimore. Businesses in the professional and technical services industry in D.C. paid over $33,000 a year more in average salaries and employed over 100,000 more workers than businesses in Baltimore City in 2019. Jobs in these industries can be done almost entirely working from home, offering the possibility that workers would only need to commute to D.C. for team meetings once or twice a week at most. Opportunities also exist in the service industry. Washington, D.C., employed over 48,000 more people in the accommodation and food service industry with average salaries more than $10,000 higher than in Baltimore City in 2019.[19]

The rise of dual-earner households has presented a colocation problem for highly educated couples leading many to seek out large metro areas.[20] The improvement of MARC express service to D.C. could make Baltimore City a more attractive location for such “power couples” as an expanded job market could offer the opportunity for one partner to work in D.C. while the other works in Baltimore. These could be couples where one partner works for the federal government, as a government

[19] Bureau of Labor Statistics (2019)
[20] Costa and Kahn (2000)

contractor, or in a business that benefits from close proximity to the federal government and requires frequent travel to D.C.

Commercial rents are significantly cheaper in Baltimore than in D.C. The market rent for office space in the Baltimore Central Business District is almost half that of the Washington, D.C. Central Business District and 40% less at the city level.[21] Consulting companies, and government contractors located in Baltimore City rely on proximity to D.C. to do business. An improved MARC express service could act as a draw for more of these types of businesses to locate in Baltimore, taking advantage of cheaper commercial rents while still being able to access the federal government.

Even before the COVID-19 pandemic forced many Americans to work remotely from home, an increasing number were able to do so. In 2018, 25% of employees worked from home, up from 21% in 2006.[22] The pandemic will likely push managers to increase their consideration of remote work forces. As more and more Americans are able to work remotely and go into their office on occasion, this opens up the opportunity for people to take advantage of cheaper rents and not need to be located close to expensive central business districts. This makes Baltimore City a particularly attractive location, and a faster train to D.C. would further facilitate an increasingly remote workforce.

Many of the census tracts closest to MARC stations have the highest unemployment rates in Baltimore and lowest average incomes for working people. This raises the question of the viability of connecting Baltimore residents in these areas with jobs in D.C. and the ability of improved MARC travel to make that more possible. Minorities toward the lower end of the wage spectrum tend to have longer commutes than whites in similar occupations.[23] If minority employees in Baltimore are already commuting longer distances, it raises the possibility that a commute of equal length to D.C. for a higher-wage job could be attractive. While the D.C. wage premium is highest for occupations requiring high degrees of education, there are some service occupations, such as security guards and bartenders, where the premium is significantly higher than the cost of commuting.

Although the likely availability of higher-wage jobs in D.C. (especially in the federal government sector) is attractive, the cost of commuting may be challenging for potential candidates. If this is to be viable, there would need to be some outreach to Baltimore residents to make them aware of job opportunities. Commute costs could be mitigated, to some extent, with Federal Transit Administration programs that allow for pre-tax commute cost deductions as well as for transit subsidies that are offered by some employers including many federal agencies.

There is also a possibility that D.C. jobs require skills that are not found to be as prevalent in the Baltimore population. This argues for more focus in Baltimore on what current and future job markets look like in the Baltimore-D.C. corridor and how training and preparation can be directed accordingly.

[21] CoStar (2020)
[22] Bureau of Labor Statistics (2019)
[23] Ross and Petitte (1999)

Social Networks, Awareness, Quality of Life, and Preferences

For many residents of the District of Columbia, Baltimore can seem like a lot more than 40 miles away. Too often, the only thing people outside of Baltimore read about the city is the violent crime problem. While this is certainly an issue, and one that has the close attention of city leaders, there are many qualities that make Baltimore City an attractive place to live. Of these, the cost of living should be highlighted as a major draw. The city also boasts excellent dining and entertainment scenes, thriving arts districts, many great universities and colleges, a redeveloped waterfront, growing sea and air ports, and world renowned hospitals.

Enticing D.C. residents to move to Baltimore would likely take more than providing a faster train. A large-scale marketing campaign could be complementary. The non-profit organization Live Baltimore sponsors various campaigns designed to encourage people to move to Baltimore and buy homes. In Fall 2018, it sponsored a campaign aimed at encouraging people who work in Washington to buy homes in Baltimore. Beyond that, there are few examples of marketing campaigns aimed specifically at people in D.C. This suggests a knowledge gap about the financial advantages of home ownership in Baltimore and the MARC service that could make it realistic for people continuing to work in D.C. after the move.

It can be expected that D.C. commuters who move to Baltimore, are likely to have formerly lived in D.C. or nearby. This means they are likely to have networks of friends, relatives, and social links that revolve around that city. Weekend train service may provide a disadvantage to maintaining those connections without driving.

Post-COVID Uncertainty

One of the most significant unknowns is the extent to which post-COVID transit ridership levels will return to pre-COVID transit ridership levels once a vaccine is widely distributed and available. As of December 2020, MARC ridership was down 90% from 2019 levels, making it the most impacted of any form of transit in Baltimore City. Recent survey data collected by economist Nick Bloom suggests that a significant residual fear of proximity to other people will persist after a vaccine is widely available, with 72% of respondents saying they would still be wary of activities such as riding the subway or getting into a crowded elevator and 12% of respondents saying they would have no return to pre-COVID activities and would continue to social distance. While it is difficult to know the intersection between this wary subset of the population and the subset that took mass transit before the pandemic, one can assume that there will be a significant decrease in the number of people willing to take mass transit. Such unknown tempering of demand should be an important consideration for transit planners and policy makers.

An increasing fear of crowds and urban density, however unfounded, and increasing work from home has led to a rise in demand for suburban living during the pandemic that will likely persist. This acceleration of an existing trend may mean that demand for center city living in cities such as Baltimore may decline. However, it is very unlikely that demand for center city living will completely disappear. Young people will still likely demand to be where the action is in the city center.

Finally, a recent Boston University survey of mayors found that 35% of mayors expect to make or see dramatic financial cuts. This ranked it behind only schools and parks and recreation for areas

where the highest number of mayors expect cuts. Further, 40% of mayors did not expect a "return to normal" for mass transit until after 2021 and 40% expected less transit use in the future.[24]

Conclusion

The improvement of MARC service from Baltimore to D.C. could entice D.C. residents to move to Baltimore while continuing to work in D.C., increase the job market and salaries of Baltimore residents who would be more likely to work in D.C. and continue to live in Baltimore, and provide a redevelopment opportunity for neighborhoods around the West Baltimore MARC station.

However, many unknowns remain. Who is the marginal rider who would be attracted to move from D.C. to Baltimore if only the train was faster? Who is the marginal rider in Baltimore who would seek out a higher paying job in D.C. if express service was provided? Would redevelopment of vacant properties occur if there were a faster train, safer neighborhoods, and some level of station upgrades at the West Baltimore MARC station? Survey research could shed light on current MARC riders and workers in D.C. who would consider moving to Baltimore.

Will public transit ridership return to pre-pandemic levels after the worst of the pandemic subsides? Overall, transit ridership was down 76 percent in the second quarter of 2020. Any future transit planning will need to make public health considerations front and center to ease the minds of wary and risk-averse travel who might see driving a car as the safer option.

The rise in work from home due to the pandemic offers a real opportunity for Baltimoreans to fully participate in the D.C. labor market for jobs that can mostly be done from home. As highlighted in this report, D.C. employers offer significant wage premiums across most industries and occupations, especially in tech jobs and jobs that can be done fully remote.

The incoming Biden administration has a strong history of providing funds for rail infrastructure upgrades, including a $2.45 billion Department of Transportation loan in 2016 to Amtrak for Northeast corridor upgrades. There is a possibility that track upgrades between Baltimore and D.C. could benefit MARC, which travels on Amtrak tracks. The continuation of the Howard Street Tunnel expansion project also bodes well for speeding up MARC travel times. Such improvements would help bring the vision of an express MARC train closer to reality.

[24] Boston University Initiative on Cities (2020).

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