

An Infill Station in Atlanta

Evaluating a MARTA rail stop at Hulsey Yard

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Across America a handful of cities have begun experimenting with an uncommon method for fostering new ridership and economic development adjacent to their heavy rail routes. Infill stations provide municipalities the chance to adapt their public transit infrastructure to a changing urban landscape in addition to increasing their tax base. The Metropolitan Atlanta Rapid Transit Authority (MARTA) commissioned an infill station study in 2007 but is yet to act on any significant recommendations. Since the study, Atlanta's BeltLine has grown tremendously both in physical size as well as its popularity and influence. The BeltLine's Eastside Trail crosses MARTA at Hulsey Yard, one of many potential infill station locations. Using the case study of what is perhaps the most well-known infill station, D.C.'s NoMa-Gaullaudet U station, this paper attempts to determine the potential for an infill station along MARTA's eastern line at Hulsey Yard while considering political and fiscal realities regarding the state of Georgia and MARTA. This paper finds Hulsey Yard to be a sufficient location for an infill station, now more so than ever before, but also acknowledges the severe limitations MARTA faces in terms of transit-friendly resources.

Introduction

In an era where every new transit investment appears to be either a bus rapid transit line or a light rail corridor initiative, an uncommon opportunity exists for America's aging heavy rail systems. It involves a previously untapped capability held only by existing rail systems known as infill stations (Freemark 2014). Infill stations are rail stations built around an existing track between two existing stations. Prior to the last decade these developments virtually did not exist anywhere in the United States, however since 2004 eleven such stations (either commuter rail or metro rail) have opened in six different cities with nine more in the planning process. Many of America's older heavy rail agencies planned their systems to bypass large industrialized sections of their cities, creating ridership gaps within areas with stations more than a mile apart, or greater than one-half mile walking distance to either station (Brassard 2012), (Market + Main Inc. 2007, 4).

Such is the case in Atlanta, where the Metropolitan Atlanta Rapid Transit Authority (MARTA) built the East Line. Completed in 1979, it originally stretched from Five Points Station to Avondale Station. Today, MARTA operates a diametrical rail network with lines that begin and end in the outer suburbs and connect at one point in the central business district (CBD). The east line now functions as the Blue line (**Figure 1**), which provides full east-west service with six train cars at each headway, and the Green Line, a trunk line/shuttle type service with two train cars at each headway. The average

station spanning distance between MARTA stations is approximately one mile, however this is due to the majority of the stations being in low density residential areas. In a way, MARTA operates as a defacto commuter rail system near its periphery which slowly becomes more recognizable as metro rail transit when it nears the system center. Its farthest stations are in some cases only accessible by vehicles via freeway ramps, while some downtown stations offer nothing more than an entry way from a sidewalk. It is here, near the CBD, where the residential density is highest and the sidewalk grid is relatively well-preserved, that ridership gaps are most susceptible

Figure 1: Contemporary map of MARTA’s heavy rail network



to spanning between stations which exceed a mile in length (Market + Main Inc. 2007, 4), (Vuchic 2005).

The methodology of this paper includes an ArcGIS Network Analysis of both the traffic analysis zones (TAZs) and Atlanta Regional Commission (ARC) road network surrounding Hulsey Yard. Some empirical information, e.g. public and private development patterns, land use assessments, and population shifts are applied as well. The most significant method is the case study of the Washington Metropolitan Area Transit Authority’s (WMATA) first infill station. Multiple aspects of the station are scrutinized including its genesis, planning, construction, and current state. In addition, a transportation planner in Alexandria, VA is interviewed concerning what will be WMATA’s second infill station, in addition to a discussion of the implications of the political and fiscal realities of the Washington metropolitan region. Each of these aspects are revisited in a discussion section near the end of the paper and synthesized in the conclusion afterward.

Literature Review

The subject of infill stations has not been widely researched by members of the academic community and is therefore very limited in terms of available historic literature. This literature review will discuss the definitions infill stations and their possible implications into the lack of available research, identify and discuss existing and proposed stations within transit agencies in the United States, determine the common characteristics of ideal infill station locations, and discuss engineering, environmental, and fiscal issues which present themselves to these types of stations as well as ways to overcome them.

The most straightforward explanation of infill stations I found was from an 'infill station study' created by Insomnia LLC/Market + Main Inc. for the Metropolitan Atlanta Rapid Transit Authority (MARTA). This report begins by defining an infill station as "A new station along an existing rail line between existing stations", a definition which is more or less repeated by every other source which uses the phrase "infill station", or those which simply discuss them as new stations built around existing lines (Nelson et al. 2005). Insomnia notes that infill stations provide transit agencies with what can be a more cost effective method for capturing ridership than extending or creating new rail lines. Their study goes on to point out that especially with 30 plus year old agencies, the areas adjacent to and in-between their stations are vastly different today than when they were constructed. As such, infill stations afford the transit agency the unique opportunity to consider decades of public and private reactions to their initial investments when placing such a station. This is a sentiment also noted by Yonah Freemark, a writer for the transportation blog 'The Transport Politic'. Insomnia concludes its introduction with indicating that infill stations have been shown to manifest themselves in public-private partnerships, or partnerships with other agencies or non-profits which have become interested in an area due to a transit line, and would therefore have a vested interest in seeing access to that line improved (Parsons Brinckerhoff).

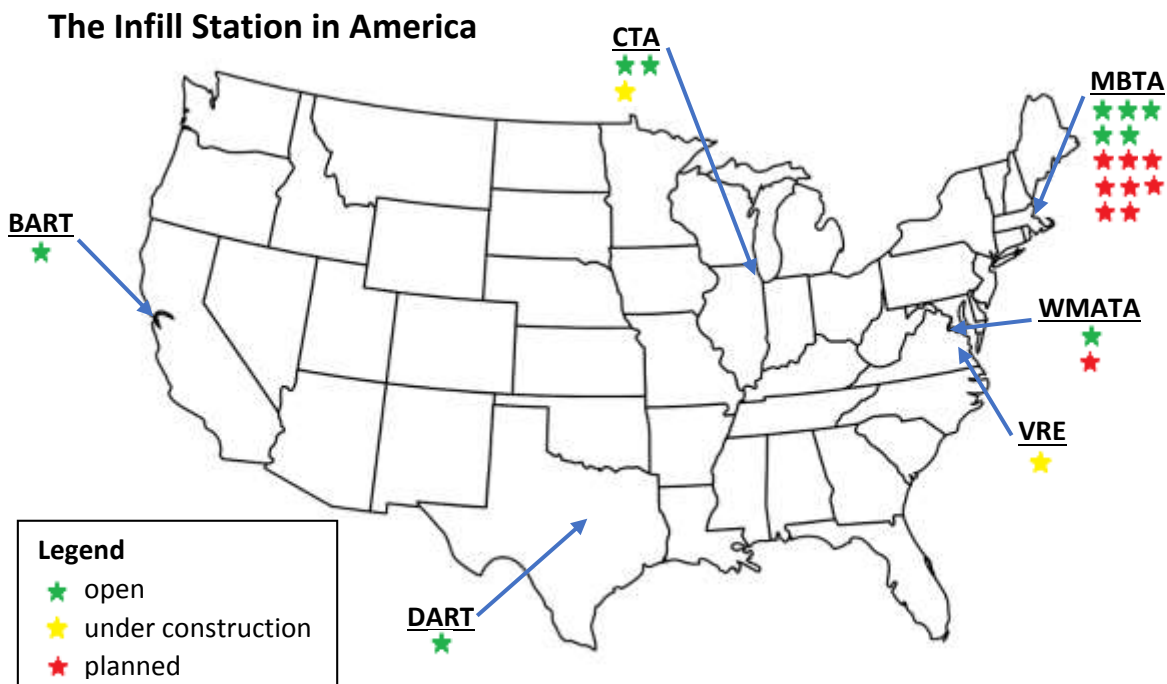
Insomnia LLC creates a methodology for potential station identification specific to MARTA's needs, beginning with a list of assumptions. An ideal infill station must reach higher standards than simply finding itself within a rail span longer than one half-mile. Such standards could be creating new connections points to new or existing travelways (especially bike/pedestrian-oriented travelways), or fostering opportunities for new transit oriented developments. This is a fundamental concept expressed by all sources interested in infill station identification. Insomnia continues their methodology where in keeping with the above assumption, as well as the concept of cost efficiency, it is presumed infill stations will be built for pedestrian-access only. With older heavy rail lines, the odds of sufficient space being available for parking structures is low, not to mention that adjacent existing stations would likely

cover the needs of those commuting by car. While this is generally found to be true, there is at least one exception to this rule, as the West Dublin/Pleasanton BART station has two parking structures built to serve it (Cabanatuan 2011).

Insomnia goes on to discuss how large stations structures are not needed for infill endeavors, many potential stations may require constructions which are on par with or exceed the existing stations' structures. A significant contributor to cost of construction remains to be service disruption, for which every effort should be made to minimize. In addition, while central station platforms cost less to build due to the ability to location all entry and exit points in one location (eliminating the need for over/under crossings), most infill stations will require side platforms as they will likely not have adequate space between rail lines. Finally, most pre-planned heavy rail stations are intentionally built along straightaway spans to ensure minimum gap between platforms and train car doors. However many spans between existing stations may be along gentle curves, and as such would need to be checked for compliance with ADA standards (Market + Main, Inc. 2007).

The first legitimate infill station in the United States appears to be Yawkey Station (MBTA commuter rail) between Back Bay and Newtonville stations. This station opened part-time in 1988 due to its convenience to Fenway Park. In 2001 the station became a regular full-service station (Belcher 2014). Beyond that, the rest of America's nine infill stations have come online since the mid-2000s, with several currently under construction and even more in the planning stage.

Figure 2: Existing, under way, and proposed infill stations within the United States



Open, under construction, and planned infill stations in the United States (**Figure 2**):

- Bay Area Rapid Transit (BART)
 - West Dublin/Pleasanton, opened 2011 (Cabanatuan 2011)
- Chicago Transit Authority (CTA)
 - Morgan, opened 2012 (Butler 2008)
 - Oakton-Skokie, opened 2012 (Bullington 2012)
 - Cermak-McCormick Place, under construction (Garfield 2010)
- Dallas Area Rapid Transit (DART)
 - Lake Highlands, opened 2010 (Lindenberger 2009)
- Massachusetts Bay Transportation Authority (MBTA)
 - Yawkey, opened 1988, full access 2008 (Belcher 2014)
 - Talbot Ave, opened 2012 (Rocheleau 2013)
 - Newmarket, opened 2013 (Rocheleau 2013)
 - Four Corners/Geneva, opened 2013 (Rocheleau 2013)
 - Assembly, opened 2014 (Freemark 2014)
 - Blue Hill Avenue, planned 2015 (Dumcius 2014)
 - Boston Landing, planned 2016 (Rocheleau 2012)
 - Union Square, planned GLX (Massachusetts Bay Transportation Authority 2014)
 - Washington Street, planned GLX (Massachusetts Bay Transportation Authority 2014)
 - Gilman Square, planned GLX (Massachusetts Bay Transportation Authority 2014)
 - Lowell Street, planned GLX (Massachusetts Bay Transportation Authority 2014)
 - Ball Square, planned GLX (Massachusetts Bay Transportation Authority 2014)
 - College Avenue, planned GLX (Massachusetts Bay Transportation Authority 2014)
- Virginia Railway Express (VRE)
 - Potomac Shores, under construction (Parlemo 2014)
- Washington Metropolitan Area Transit Authority (WMATA)
 - NoMa – Gallaudet U, opened 2004 (Parsons Brinckerhoff)
 - Potomac Yard, planned (Margolis 2013)

Peter Brassard is a writer at the Pedestrian Observations blog. He is concerned with his transit agency, the Rhode Island Public Transit Authority, and their obsession with expanding rail lines further into less dense suburbs at the expense, he feels, of the inner city. He feels a stronger effort should be made by the agency to take advantage of the populated pedestrian friendly neighborhoods the existing rail line passes directly through. While he would prefer to see the commuter trains act more like mass transit when traversing the urban core (i.e., make more frequent stops - similar to Germany's S-bahn or San Francisco's BART), he realizes this may not be in their immediate interest and would settle for a shared-track approach where shuttle trains stop at all major stations as well as his proposed infill stations. The stations he has in mind would be entirely "bare bones", requiring little capital cost and disruption of service to install. He proposes they be pedestrian-only stations, and have no park and ride, or even drop-off points (Brassard 2012). Nelson et al. also find that existing rail corridors, and in particular some commuter rail corridors may present opportunities to expand ridership when passing through denser urban neighborhoods en route to a single downtown location (Nelson et al. 2007).

Brassard points out that infill station-friendly rail spans in older urban centers are often bypassing industrial nodes between residential areas. He feels new stations in these areas could act to revitalize and transform them into new centers for economic development which would directly benefit the station. Brassard's point here is consistent with the layout of the rail span between the King Memorial and Inman Park-Reynoldstown MARTA stations, the span which will house the proposed infill station further in this research paper (Brassard 2012).

Yonah Freemark addresses the lack of agencies engaging in studies on infill stations. He feels most are far too preoccupied with rail line expansion, "transit oriented sprawl" as Brassard calls it, and that many agencies have not even considered the fiscal benefits of infill stations. Freemark also provides a small history of infill stations, mentioning how in the United States it appears to be a phenomenon only within older heavy rail systems, whose existing stations were constructed decades prior (Freemark 2014).

The MBTA's Fairfield Corridor improvements project is perhaps the greatest undertaking of infill station implementation on any single line in the United States to date. Nelson et al.'s research finds that in its 9.2 mile stretch, there were only three stations between the origin and terminal stations. The Fairfield line is a commuter rail line, so lengthy station spans aren't entirely unwarranted. However, it is unusually short as a commuter rail line, with all of its stations contained within the city limits of Boston. With the lowest overall ridership of all MBTA commuter lines, the MBTA eventually decided to improve ridership. They found infill stations to be the best strategy. Commonly with commuter lines, infill

stations are opposed as they may discourage suburban riders who do not want commuting times increased, however with the Fairfield line not extending to any suburbs, it became an ideal candidate for infill stations. The MBTA approved 5 new stations for the Fairfield line, with the intent to transform the commuter line into a full-fledged mass transit line (Nelson et al. 2007).

The study by Edwards and Kelcy highlights the issue with the original stations, and the need for new stations. Edwards and Kelcy point out the need to location stations either in-between or underneath bridges within the adjacent road network along the line. Building a station near bridge crossing perpendicularly to the rail line allows for easier access to both sides of a platform without additional constructs from MBTA (Edwards and Kelcy 2004).

Parsons Brinckerhoff consulting studied the history and implementation of WMATA's first infill station, today known as the NoMa - Gallaudet U Station. They explain how in the late 1990s, the area north of Massachusetts Avenue contained freight rail yards, vacant lots and warehouses, as well as other abandoned buildings. The once important rail corridor had since dwindled with the consolidation of freight companies. In 1999, a study found approximately 5,600 people living within walking distance of the future station site. The WMATA Red Line ran directly through the area, but made no stops along its nearly 2 mile span from Union Station and Rhode Island Ave Station (Parsons Brinckerhoff).

In a 1998 plan, District of Columbia planners identified the area north of Massachusetts Avenue as an ideal area for redevelopment and a new WMATA station, with its proximity to downtown and inexpensive, underutilized land. Further plans from other agencies also identified the same area (also near the intersection of New York Avenue and Florida Avenue) as a prime candidate for redevelopment efforts. Further into 1998, the District of Columbia's Department of Housing and Community Development created the "New York Avenue Task Force" to begin the process of fostering economic development in the area. As a result, they named the area "NoMa" to create a stronger identity. The task force eventually became the Action 29-New York Avenue Metro Station Corporation, a non-profit in charge of overseeing and implementing the private sector's role in funding the new infill station. The non-profit representatives included members of the private sector, community leaders, and environmental activists (Parsons Brinckerhoff).

Due to Action 29's incredible outreach effort, which actively recruited as many stakeholders as possible and held multiple meetings in a variety of locations (e.g. churches and community centers), there was very little resistance to the infill project. Negotiations between Action 29 and the private land

owners in the vicinity of the station eventually resulted in a public-private partnership to build the infill project, wherein the Federal Government agreed to match the funds raised by the private land owners (\$25 million) with the remainder being paid by the District of Columbia (Parsons Brinckerhoff).

News alone of the interest in the station provoked private developers to begin buying up parcels near New York and Florida Avenues – even before the public-private partnership negotiations had completed. Over 15 million square feet of development has been created around the station since it opened in 2004. A technology high school geared towards benefitting minority students has also opened. Overall, this infill station is viewed as a phenomenal success and a model for public private partnerships. It should be noted that most of the infill stations in existence today did not come about from public-private partnerships, and the agency with the most prolific account of infill stations (MBTA) does not appear to have ever engaged in them. Nevertheless, they present themselves as the most realistic opportunity available to the creation to the proposed infill station in this paper.

While all within the grey and academic literature (1) agree infill stations constitute “a rail station built along an existing line between existing stations”, there are discrepancies as to which endeavors deserve the title. Some infill stations are built on sites of formerly demolished stations (Butler 2008, Garfield 2010) – so while it technically satisfies the definition above, it may not appreciate the difficulty experienced by other infill projects implemented at locations where no former planning was carried out, nor any right of way was designated for such a station.

Some agencies have managed to blur lines even further by announcing mass transit “line extensions” along existing commuter rail right of way (Massachusetts Bay Transportation Authority 2014), yet specifically do not consider these infill stations, as the new stations are not in-between the existing stations of the line in question but between stations of an entirely different line. Setting aside the semantics of agency speak, it is clear these stations will face the same types of issues encountered by other official “infill” endeavors. Were the definition broadened to accommodate “any creation of a new platform around an existing active rail line, providing new access to a previously unserved area”, many more stations would fall into the category and perhaps the concept may be more widely understood, discussed, and researched by academics.

Research Topic & Case Study

This paper proposes an infill station along MARTA’s Blue/Green Line, approximately 0.67 miles east of the existing King Memorial station, and 0.79 miles west of the existing Inman Park –

Reynoldstown station.

To communicate the spatial justification for the proposed infill station, the unique situation of the near-CBD MARTA Blue/Green line stations is scrutinized, as explained by **Figure 3** below. The span from 5 Points station to Georgia State station is 0.42 miles (maximum walking distance from center point is 0.21 miles), from Georgia State station to King Memorial station is 0.61 miles (maximum walking distance from center point is 0.3 miles), from King Memorial station to Inman Park – Reynoldstown station is 1.46 miles (maximum walking distance from center point is 0.73 miles), and from Inman Park – Reynoldstown station to Edgewood – Candler Park station is 0.79 miles (maximum walking distance from center point is 0.39 miles). As should be clear, there is certainly a text book case of significant spanning between the King Memorial and Inman Park – Reynoldstown stations with potential to result in a ridership gap.

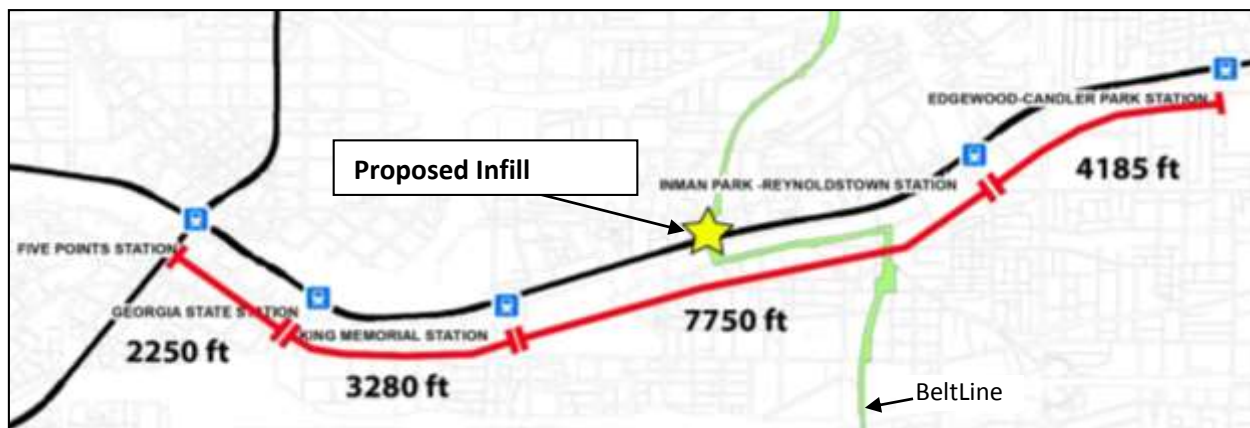


Figure 3. Proposed Infill Station, BeltLine, with nearby existing MARTA stations and spanning distances.

Source: ArcGIS 10.2.1, author's representation

The need for this particular infill station was originally observed by the author. Upon further investigation it was found that the proposed station was identified as a station span worth studying in MARTA's 2007 Infill Station Study by Market + Main, Inc. The study proposes thirteen infill stations throughout the rail network, and eventually ranks them based on criteria mentioned in the literature review. The study names the proposed station "Hulsey Station", a reference to the Hulsey rail yard which the current span runs adjacent to. The study finds the most compelling reason for an infill station at this location is due to what it describes as a large redevelopment opportunity of Hulsey Yard, an enormous component of in-town industry. While there are developers interested in the property, there appear to be no plans by CSX to sell the yard (Market + Main Inc. 2007, A5).

The study, which utilized ARC and TAZ figures from 2005 and forecasts for 2015, determined that the overall demand for transit (based on population) for Hulsey station would decrease from the levels at the base year. Considering the rampant development along the BeltLine since the East Side Trail (Monroe Drive to Irwin Street) has been built, most of which took place after 2007, it is important to consider new residential and commercial development which has helped to densify the areas within a short walk of the infill station location. Just a block from the station site, the Alexan on Krog Street is well under construction, and is set to house 222 apartment units. Further up Krog Street is the Krog Street Market, which will eventually house 6,000 square feet of retail, plus a housing component. A ten minute walk south from the station site, through Cabbagetown, brings you to Memorial Drive where the former Parmalat dairy site is in the works to be redeveloped into a mixed-use retail, housing, and entertainment venue establishment. Atlanta BeltLine Inc. is set to choose a contractor and begin construction within the following year on the East Side Trail's southern extension (Irwin Street to Memorial Drive), with a completion date some 18-24 months later (Kessler 2013, Walton 2015).

To further reinforce the commitment to this station location, a location-allocation analysis was performed using ArcGIS Network Analyst. This analysis uses TAZ centroids, which contain the primary variable of population, along with an ARC street network set up account for distance cost. The street networks generally factor in the lane widths and numbers, however by only considering pedestrian access to the proposed station, this was left out. Furthermore, the street network was modified slightly in an effort to better represent the true connectivity provided by the BeltLine East Side Trail's southern extension. The tweaks were administered by applying connection paths between the BeltLine and the existing street network which, it is assumed, will allow access at each potential intersection. The distance cost and flow rate provided to these appendages were identical to the rest of the network, as it is also assumed all sidewalks or walking paths within the network will be equal in terms of pedestrian capacity and speed. Finally, a barrier layer, which represents anything impassible by street network, was added to account for the real-world obstructions of Hulsey Yard and Oakland Cemetery.

ESRI's location allocation analysis tool helps inform the user or where and how to locate and allocate demand for service to some centrally positioned facility. It optimizes the facility location using distance measuring tools involving Euclidean distance and cost distances and attempts to minimize overall impotence between facilities. For this paper it was utilized to determine the potential ridership available to a specific area near and around Hulsey Yard, effectively competing with the neighboring Inman Park-Reynoldstown and King Memorial stations (ESRI 2014). Using the location-allocation tool, it was determined there were 7,173 potential riders within a half-mile walking distance of the King

Memorial station, along the modified street network. For Inman Park – Reynoldstown, there were found to be 3,612 potential riders. This is likely due to the non-grid-like street network between the station and the rest of Inman Park, and the failure of the street network to compensate for the pedestrian bridge over Hulsey Yard (any lack of accuracy for potential ridership capture south of the King Memorial and Inman Park – Reynoldstown MARTA stations should not hurt the authenticity of this analysis as those areas are too far to consider capture from the proposed infill station). And finally, the proposed infill station captured 9,788 potential riders within a half-mile walking distance. It may be worth noting that due to the 0.6 mile distance between the King Memorial station and proposed infill station, the 0.5 mile capture would likely take away from some of King Memorial’s former capture potential. The stations were programmed to compete with one another over TAZs, and those closer to a particular station were given to it (Gibbons et al. 2005), (ESRI 2014). The analysis’ output is displayed in **Figure 4**.

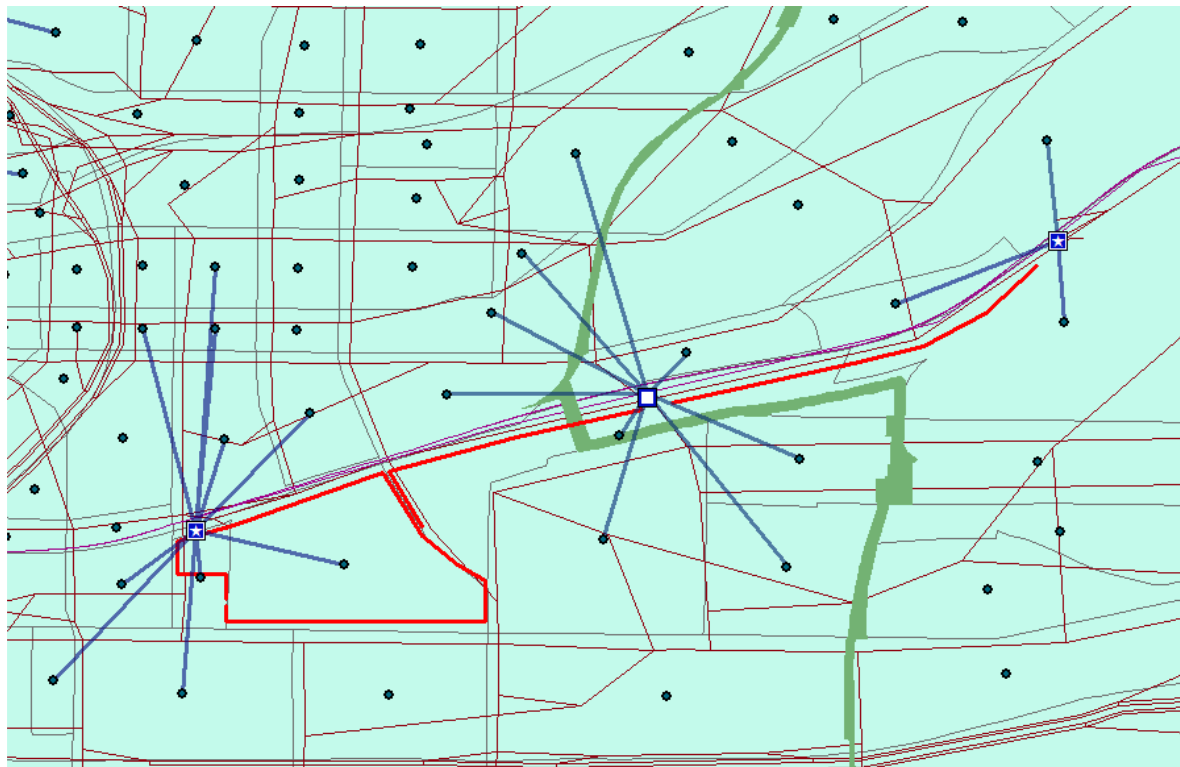


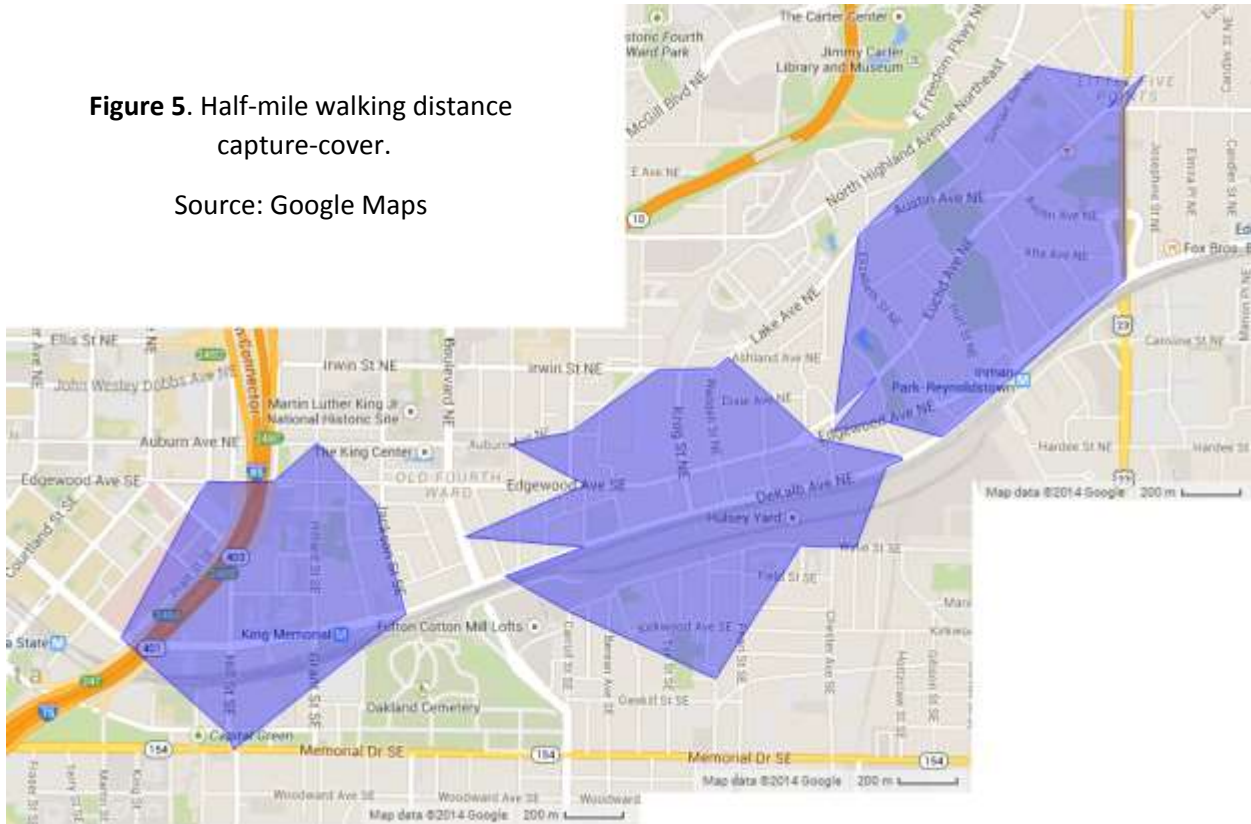
Figure 4. Location-allocation ridership capture for proposed infill station plus adjacent stations. The bottom layer is TAZs with centroids (teal), followed by the ARC road network (maroon), MARTA rail (purple), BeltLine right of way (green), effective barriers (red), and the location allocation output (blue).

Source: ArcGIS Network Analyst. ESRI 2014.

Additionally, a capture-cover map tool was utilized to translate, empirically, the actual coverage area of a 0.5 mile walking distance, or approximately ten minutes walking time at three miles per hour. This tool seems to under-represent the southern capture capabilities of the King Memorial and Inman Park – Reynoldstown stations (likely due to network connectivity issues within the Google Maps interface), but the BeltLine – Krog Street infill station appears unaffected. A major component of this is also to communicate how little cross-over actually occurs with the 0.5 mile walking distances (Guerra et al. 2011). This is represented by **Figure 5**.

Figure 5. Half-mile walking distance capture-cover.

Source: Google Maps



As with any project which deals with construction in and around an urban landscape, cooperation and coordination between existing property owners and developers will be key to seeing a project's fruition. This infill station would absolutely require some acquisition of portions of land at multiple points within the parcels adjacent to the station, and it has the potential to call into question the need for air rights as the station itself would protrude significantly into the airspace above at least one adjacent parcel. The three stations closest to this site have lengths of 622, 615, and 600 feet. For the purposes of this project, the average of 612 feet will be used for the analysis of proposed alignments. There are two alignments suggested for this station as expressed in **Figure 6**: (1) a station completely between the intersections of Krog Street and Airline Street, which would need coordination

of the owners of five different parcels, three of which are the same company and are currently vacant lots, however the drawback would be this alignment sits on a slightly stronger curve than the alternative, and (2) a station which almost perfectly straddles Krog Street, sit along a straighter 612 foot segment, but would involve seven parcels, three of which are almost entirely built-out.



Figure 6.

Suggested alternative alignments for proposed infill station.

Station alignments are outlined in red, affected parcels in cyan.

Current property owners ca. 2014 Fulton County tax records:

Parcels A, B, and C: Aramark Uniform and Career Apparel LLC

Parcel D: Tim Barrett Designs Incorporated

Parcel E: Georgia Railroad and Banking Company

Parcel F: resident

Parcel G: resident

Parcel H: resident

Source: ArcGIS, author's representation

Case Study: Washington Metropolitan Area Transit Authority's NoMa – Gallaudet U Infill Station

Parsons Brinckerhoff consulting studied the history and implementation of WMATA's first infill station, today known as the NoMa - Gallaudet U Station. They explain how in the late 1990s, the area north of Massachusetts Avenue contained freight rail yards, vacant lots and warehouses, as well as other abandoned buildings. The once important rail corridor had since dwindled with the consolidation

of freight companies. In 1999, a study found approximately 5,600 people living within walking distance of the future station site. The WMATA Red Line ran directly through the area, but made no stops along its nearly 2 mile span from Union Station and Rhode Island Ave Station (Parsons Brinckerhoff).

In a 1998 plan, District of Columbia planners identified the area north of Massachusetts Avenue as an ideal area for redevelopment and a new WMATA station, with its proximity to downtown and inexpensive, underutilized land. Further plans from other agencies also identified the same area (also near the intersection of New York Avenue and Florida Avenue) as a prime candidate for redevelopment efforts. Further into 1998, the District of Columbia's Department of Housing and Community Development created the "New York Avenue Task Force" to begin the process of fostering economic development in the area. As a result, they named the area "NoMa" (referring to its geographic location north of Massachusetts Avenue) to create a stronger identity. Around the same time, then-president Clinton signed the National Capital Revitalization Act which intended to correct fiscal issues within the District of Columbia in an effort to make it more financially viable. One aspect of the Act was an economic development plan of which 40 detailed "action items" were eventually added. "Action 26" of the plan called for the NoMa area to become a "technology, media, housing, and arts" district, and "Action 29" called for the "construction of a new Metro station at New York and Florida Avenues". The New York Avenue Task Force eventually became the Action 29 Corporation, a non-profit in charge of overseeing and implementing the private sector's role in funding the new infill station. The non-profit representatives included members of the private sector, community leaders, and environmental activists (Parsons Brinckerhoff), (NCPDP 2006).

Due to the Action 29 Corporation's incredible outreach effort, which actively recruited as many stakeholders as possible and held multiple meetings in a variety of locations (e.g. churches and community centers), there was very little resistance to the infill project. Negotiations between Action 29 Corporation and the private land owners in the vicinity of the station eventually resulted in a public-private partnership to build the infill project, wherein the Action 29 Corporation represented the private entities, and the Federal Government, the District of Columbia, and WMATA represented the public entities. The Federal Government agreed to match the funds raised by the private land owners with the remainder being paid by the District of Columbia. In the end, private entities contributed \$35 million, the Federal Government contributed \$31 million (plus an additional \$6 million to build the Metropolitan Branch Trail, a pedestrian bike trail running parallel to the station), and the District of Columbia

contributed the remaining \$44 million of the overall \$110 million project (Parsons Brinckerhoff), (NCPPP 2006).

The Red Line pre-2004 traversed the NoMa neighborhood via two side-by-side heavy rail tracks, which then split just north of the station site to provide access to the WMATA's Brentwood Yard maintenance facility. It was decided a central platform would be the most cost effective approach, but this also meant a gap had to be created between the north and south-bound tracks. Given the northbound track had no actual room to shift due to adjacent freight and commuter train tracks, the

southbound tracks were rebuilt with a gradual shift to create a continuous 28.5 foot gap between Florida Avenue and M Street to make way for the new platform. **Figure 7** shows the newly realigned southbound track (red), the parallel path of the new Metropolitan Branch Trail (green) and the eventual building footprint of the new station and platform (black). The station would eventually be accessible from the south (M Street entrance), and a central entrance at the mid-way point via a newly constructed road network within the large parcel adjacent to the station (RKG Associates Inc. 2014).

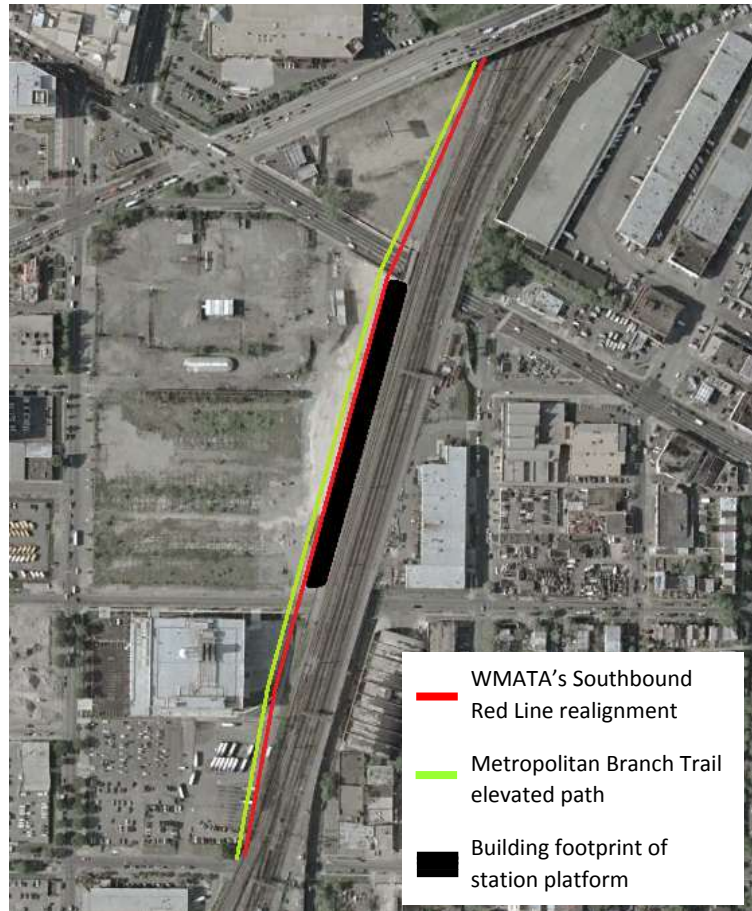


Figure 7. New alignment for southbound track and MBT line.
Source: Google Earth

News alone of the interest in the station provoked private developers to begin buying up parcels near New York and Florida Avenues – even before the public-private partnership negotiations had completed. By 2007, some 15 million square feet of development has been created around the station since it opened on November 20, 2004. A technology high school geared towards benefitting minority students has also opened. In recognition of the tenth anniversary of the November 2004 opening of the NoMa station, economic planning and real estate consultants RKG

Associates Inc. were given the task of tolling its impact on the NoMa business improvement district (BID) as of November 2014, in addition to a five year projection through 2019. Some 3.8 million square feet of office, 183,000 square feet of retail, 3,057 residential units, and 622 hotel rooms were developed within the boundaries of the NoMa BID since the station’s construction. The economic output totaled \$4.7 billion across all industries, labor earnings totaled \$1.9 billion, and approximately 30,000 jobs (14,500 interim and 15,500 permanent) have been created since 2004, all of which can be directly or indirectly related to the construction of the station. In addition to that, RKG attributed \$330 million in total municipal revenue from 2006 to 2014, accounting for property, sales, and income taxes (RKG Associates Inc. 2014).

For the projected period from 2015 through 2019, the study sees an additional 2.4 million square feet of office, 285,000 square feet of retail, and 2,624 residential units. They also see yearly municipal revenues increasing from the 2014 level of \$68 million per year to \$152 million, yielding nearly \$1 billion by 2019. The RKG Associates Inc. report concluded that the NoMa – Gallaudet U Metro infill station became one of the District of Columbia’s most significant economic drivers over the ten year period from 2004 to 2014. The neighborhood has gained such a strong identity that in 2012, WMATA recognized its success by renaming the station “NoMa – Gallaudet U Metro Station” from the previous “New York Ave-Florida Ave-Gallaudet U Metro Station”. The station is still viewed as an excellent model of a public-private partnership, and actually won the 2006 Infrastructure Award from

Figure 8. Left: 1999 satellite image of DC, Right: 2013 satellite image of DC.
Source: Google Earth



the Nation Council for Public-Private Partnerships (Parsons Brinckerhoff, NCPPP 2006). **Figure 8** juxtaposes a before and after satellite image.

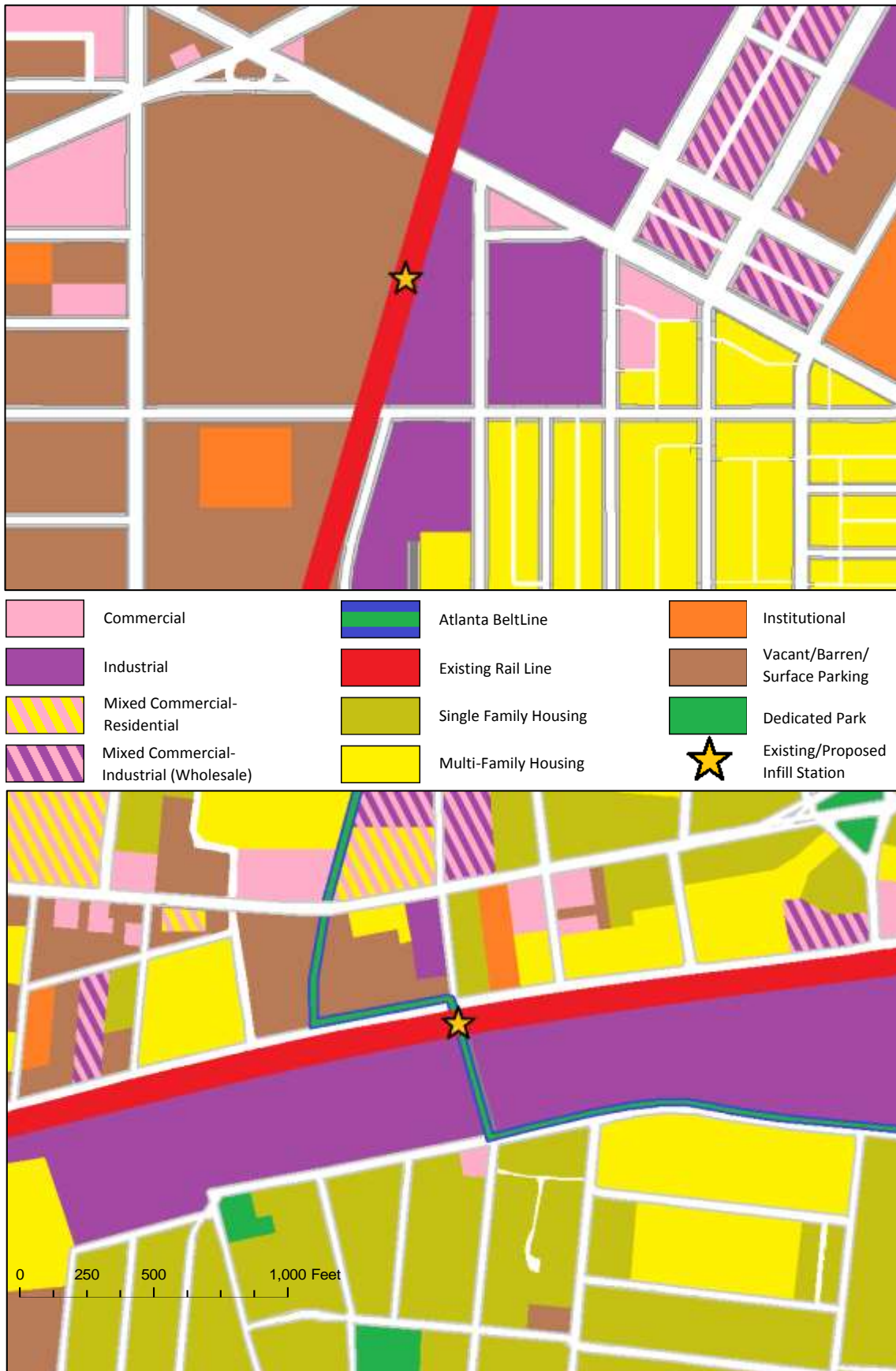
Comparison

There are several key similarities and differences between the implementation of WMATA's NoMa – Gallaudet U station and the proposed station of this paper. The case study infill station was WMATA's first, and likewise the proposed BeltLine – Krog Street infill station would be MARTA's first. Furthermore, the estimated costs of each station are very close. The WMATA station was estimated to cost \$75 million (1999 USD) (actual cost \$110 million, 2004 USD), while the MARTA station is estimated to cost \$80 million (2007 USD). The WMATA station was built around an elevated rail segment, and while MARTA's segment would also be elevated it would be significantly higher from the ground below than the WMATA segment. In addition, both stations are intended to operate as pedestrian-only stations (save for curbside bus service).

Figure 9 juxtaposes the land use conditions two years before the WMATA station was built (above image) with the current conditions surrounding the MARTA infill site (below image) at the same scale. It becomes clear how vast an area within the contemporary NoMa neighborhood was effectively blighted or barren entirely. This actually proved to be one of the greatest assets to the area in terms of its ability to be completely rebranded. DC planners saw the area as a blank slab with high potential should the infill station be built, and indeed the station would fundamentally change the neighborhood forever. More than anything, however, the pre-station land use map speaks to the type of neighborhood the area which would become NoMa was. The streets near the intersection of New York and Florida Avenues were scattered with low-density services which served primarily low-income residents. The socioeconomic status of the area had much to do with the eagerness and willingness of the local business owners to support the Action 29 Corporation, as they believed that station had the potential to seriously turn the neighborhood around. As the RKG 10-year update reported, it did just that.

By stark contrast, the neighborhoods on either side of the proposed MARTA infill station are in quite a different socioeconomic status in 2015 than NoMa in the late 1990s. Inman Park, which fell into blight following white flight from Atlanta in the 1950s saw its first signs of gentrification in the 1970s, and is today a very affluent in-town neighborhood full of restored mansions. Cabbagetown, once known as an urban enclave of poor, rural factory workers has been gentrifying since the 1990s and today is a very popular neighborhood for families and young professionals. Reynoldstown began seeing signs of development and gentrification by the mid-2000s as more Whites began moving into the then-majority

Figure 9. Above: NoMa land uses ca. 2002. Below: BeltLine & Krog St. land uses ca. 2015.



Black neighborhood, and over the past five years have become increasingly more expensive, particularly as the BeltLine (which traverses the entire neighborhood) gained momentum.

This is all to speculate that the modern residents of these Atlanta neighborhoods may not be as keen on the idea of an infill station as the economically depressed residents of old-NoMa were, at least in respect to the economic development potential such a station could bring. The residents of these Atlanta neighborhoods who use the city's transit system are most likely considered to be choice riders by their transit agency, as they are most likely not genuinely dependent on mass transit for their transportation needs given the socioeconomic climate of their current addresses. This concept also certainly points out that this proposed infill station is not necessarily based on the ethics of equity, as there are many more stations mentioned in Insomnia's report which would serve a much more disparaged population than the people living around Hulsey Yard.

Comparing WMATA and MARTA more broadly, they too have intriguing similarities and differences which do much to explain the current state of each. Based on 2012 transit agency profiles from the National Transit Database, Atlanta and DC metropolitan statistical areas are home to 4.5 and 4.6 million people, respectively, although Atlanta's population is spread over twice the square mileage of DC, per 2000 Census. When it comes to capital funds, which are the types of funds that could be used toward an infill station project, MARTA received \$107,903,273 from local sources and \$39,876,753 from federal sources, for a total of \$147,771,026 in 2012. MARTA receives no funding from the State of Georgia for operating nor capital costs. WMATA received \$98,700,160 from local sources, \$62,124,840 from state funds, and \$289,211,801 from federal sources in 2012, for a total of \$450,036,801 (NTD). The 2012 NTD profiles were the most recently available, but they represent a funding structure that has been in place for many years. The discussion section will go deeper into investigating what has led to the current funding situation for both agencies and what their implications are for the future feasibility of MARTA and its capital investments.

Discussion

A transit agency could have several reasons for investing in an infill station. Some agencies may care a great deal about the built up demand surrounding their rail gaps and take this into consideration when deciding where an infill station will be placed. This is the case with MBTA and their Fairmount corridor and GLX projects. MBTA has stated it is primarily concerned with providing better access, and not necessarily sparking economic development. Their existing and proposed projects traverse relatively dense areas that are already built out. This is not the case, however, with this paper's case study.

WMATA was not actively considering any infill stations when the idea was presented to them by the DC planning department in the late 90s. In fact, one of the most important differences between WMATA and MARTA is that WMATA, as an agency, often takes on a relatively small role concerning the land uses around its stations. WMATA is able to do this because the local jurisdictions it serves are more than willing to do their non-transit work for them (i.e. fundraising, outreach, real estate, etc.).

Less than 10 years after the opening of the NoMa-Gallaudet U infill station, WMATA's second infill station is already well underway in its planning process. Potomac Yard, located in Alexandria, VA between the Braddock Rd and National Airport stations on the Blue and Yellow lines has been conceived of as a potential infill station since as early as 1973. It was not until the 2010 small area plan created by the City of Alexandria that a substantive forward motion on the station was actually made

“I would say that building the station is the number one priority for the City. You hear from our Mayor, our Council members, the Chamber of Commerce, and the business community. You also hear it from residents that realize that they'll benefit from the creation of an access point to the region. This benefit will be reflected in their property values and (hopefully) a relief in their tax burden...”

“I would say the success of NoMa has definitely given the City of Alexandria the confidence to push through with the idea. Whereas if NoMa hadn't been built, I don't think there would be that drive. It helps for us to have something to point at. But it's also economics due to the nature of the large swath of largely vacant land in Potomac Yard. This blank slate will allow the City to create the density necessary to warrant an infill station. Potomac Yard is a huge chunk of land inside the Beltway, near DCA, and close to other activity centers. This is a unique opportunity for the City to seize, and we know it. The City wouldn't go through this effort of building a metro station if all we could build were neighborhoods of 3-story townhomes. I don't think the economics work everywhere there is a gap on a heavy rail system, which is why so few infill stations have been built -- and probably why there is so little literature out there.” (R. Hayhurst, personal communication, March 15, 2015).

Ray Hayhurst is an urban and transit planner in the City of Alexandria's Department of Transportation and Environmental Services, and is working directly on the Potomac Yard infill station project. His above quote exemplifies the type of environment WMATA is able to exist in, and speaks to the way the local planners, residents, businesses, and jurisdictions view them as an agency and view the role of transit on a broader scale.

In an email interview, he explains why transit oriented development (TOD) appears to be ubiquitous around WMATA stations, and especially around its Virginia stations. The existing building height limit within DC proper has actually created a somewhat artificial demand for space in places without the regulation, which manifests in places like Arlington and Alexandria. In addition, General

Services Administration guidelines for leasing buildings requires that all federal buildings be accessible by public transportation which is aided in that all federal employees and the majority of private employees received subsidized WMATA fares. On the local jurisdiction-front, cities like Alexandria and Arlington also have pressure to preserve their historic low and medium density residential areas, so they tend to rezone the areas around their WMATA stations as high density. Much of the rest can be chalked up to the free market. Virginia as a whole is quite similar to Georgia in terms of the amount of urban and rural areas as well as the political connotations of each. Georgia only has the mass transit example of MARTA in Atlanta, the only heavy rail metro transit in Virginia is that which serves northern Virginia (R. Hayhurst, personal communication, March 15-21, 2015).

“The Northern Virginia jurisdictions have come together to create their own transportation authority (NVTA) to fund transportation projects in this part of the state, so they’re not beholden to the rural/conservative politicians that exist in the rest of the state,” (R. Hayhurst, personal communication, March 19, 2015).

MARTA decided to commission its own infill station study in 2007, which is just one example of multiple instances when the agency has had to take an initiative into their own hands to see it make any progress. MARTA also has recently established an internal TOD department which directly seeks out potential TOD initiatives and oversee communication and coordination with private developers. These are two examples of instances which WMATA would not have to provide any capital or employees as they have local jurisdictions which are more than willing to do this work for them.

Looking back in its history, MARTA has consistently been the instigator of its TOD projects, and it is rather inconceivable the City of Atlanta would take on a role which is described by the District of Columbia or the City of Alexandria in this paper. Most of MARTA’s TOD at this point deals with office developments adjacent to their stations. In 1997, MARTA began the process of planning Lindbergh City Center, a mixed-used medium density village with residential, commercial, and office components. MARTA spent \$80 million in capital funds to complete the Lindbergh TOD, for which they saw less than \$1 million in returns of a year out from the investment. The investment is typically not seen as successful, and the stigma of MARTA of a hole for money grows larger among the Atlanta business community. This is the same business regime which rules Atlanta and, whether formally recognized or not, determines to a great deal the decisions of every significant investment in the city (Dumbaugh 2004, Konrad 2005).

Pulling from the original data output of the location-allocation analysis, as well as the capture-cover display, it is suggested there would be demand to satisfy the initial justification of a new infill station at Krog Street and the BeltLine East Side Trail southern extension. The case study exemplifies that such an effort is far from improbable, especially when multiple stakeholders pool their resources, but also exemplifies how important the support of the transit agency is. As with many grass roots efforts, coalition building is pertinent to seeing a project continue forward without losing momentum. A non-profit corporation similar to the case study's Action 29 is foreseeable given how politically active the communities surrounding the proposed station are, and how great their desire for more access to transit is. People move to the BeltLine to afford themselves a higher quality of life and rely less on vehicles. One would think it should only follow that business and developers responding to such demand would see an interest in promoting an option which would tremendously improve the accessibility to the BeltLine, particularly considering the light rail component of the BeltLine may be decades away.

Infill stations offer an incredible opportunity for connectivity and ridership improvements, for a fraction of the cost of line extensions. It is unusual for the non-profits, let alone the private sector, to enter into public transit (usually do to astronomical costs), however with infill stations, the costs are certainly finite, and once the money is raised, the result will have a lasting and profound impact.

Recommendations

Studying WMATA's NoMa - Gallaudet U infill station has provided great insight to the ways which other transit agencies are run when the circumstances of their local jurisdictions are more favorable than MARTA's. This paper concurs with the 2007 MARTA infill station study that the "Hulsey Yard" concept is not an ideal first infill station for the agency, provided MARTA would be the main overseer of planning and development. Should the City of Atlanta and BeltLine Inc. decide a station at this location would be worth the investment, it could feasibly provide excellent access and connectivity for Cabbagetown, Reynoldstown, Inman Park, and the Old Fourth Ward neighborhoods, as well as any users of the BeltLine, to the existing MARTA rail network.

As far as planning implications go regarding the future of MARTA infill projects, the City of Atlanta or other progressive municipalities which are serviced by existing MARTA rail should seriously look at their land use plans, similar to what the way the District of Columbia and Alexandria have done, and consider potential ways it could work with MARTA to improve their own communities and potentially drastically increase their tax base. The case study and follow up interview with Hayhurst

exemplify how odd MARTA's role has become in Georgia, and municipalities who see themselves as serious about improving transit should recognize this and do what they can to mitigate MARTA's non-essential roles in the implementation of a project. Given the current political climate, it is unlikely multiple jurisdictions within the Atlanta metropolitan region could work together to form something as singularly focused as the Northern Virginia Transportation Authority. In addition to progressive municipalities, forward-thinking institutions, semi-public, and private entities should recognize how significant a role they play in a region where the only mass transit agency is its own biggest cheerleader. If BeltLine Inc. seriously wants an infill station which provides its users direct access to an existing rail network they must take it upon themselves and their city to assist the transit agency.

Conclusion

Infill stations provide rail transit agencies the moment to increase connectivity and improve ridership. They also provide citizens, non-profits, and nearby private land owners the ability to create a transportation coalition for something truly local, unlike most options for supporting transit agency initiatives. As a result of cumbersome street networks and large station spans, there is a clear ridership gap present for the area between the King Memorial and Inman Park – Reynoldstown MARTA stations. An infill station in this area, near the BeltLine and Krog Street, would drastically increase connectivity to the BeltLine (whose own transit may not be available for many years) and all of its new developments, as well as to Cabbagetown and western Reynoldstown, which have dealt with poor transit access due to several barriers. Though WMATA has several distinct advantages MARTA does not (e.g. the federal government as an immediate stakeholder and finance provider), there much more to be said about the easiness of its TOD development and planning processes, which are without a doubt the result of a vast cooperation and coordination between local jurisdictions and the agency. While honorable, it is distressing to see what kind of roles MARTA has been forced to take on to ensure its own survival and better serve their city.

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