Amazon HQ2's "National Landing" project:
A critical assessment

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New Virginia Majority

Summary:

Amazon's expansion into "National Landing" will result in mass displacement of nearby low-income communities of color in Alexandria and Arlington. It will intensify and accelerate the area's affordable housing crisis.

This paper presents spatial analyses - including historic land-use and development patterns - detailing likely impacts. The most significant impact will be the pricing out of low-wage working people from the area's home-owning and rental markets – at least 2,500 apartment units in Alexandria and at least 500 units in Arlington can expect significant rental increase as Amazon grows its presence. The increasing cost of housing will also impact area homeowners as their home assessments will spike as well their property taxes. Ironically, the domino effects of such displacement will both increase utilization of the mass transit system and worsen congestion.

Seattle's experience is instructive. Since 2012, Amazon's growing presence has coincided with the massive displacement of African American residents. Home prices have risen by 350 percent.

Unless questions of housing density, affordability, and transit expansion are fully addressed, Amazon's headquarters will lower the quality of life of many residents, with the most directly and adversely impacted being the area's low-income communities of color.

Amazon comes to Crystal City

Amazon recently selected Crystal City for one of its new headquarters (HQ2). The corporation's new home will form a new "National Landing" planning area, combining parts of Potomac Yard, Crystal City and Pentagon City in a cross-jurisdiction mixed-use transit oriented redevelopment project adjacent to Reagan National Airport. The Virginia Economic Development Partnership led the collaboration with Arlington, Alexandria and developer JBG Smith. Amazon is expected to invest $2.5 billion in the National Landing location, creating more than 25,000 jobs. The state of Virginia has committed $550 million in direct payments to Amazon as well as up to $195 million in state investments for transportation.[1] Alexandria and Arlington together plan to provide up to $71 million in subsidies to Amazon and a related Virginia Tech campus.

Stephen Fuller, head of the Stephen Fuller Institute at George Mason University, claims the effect of HQ2's demands on housing "will be geographically dispersed and gradual".[2] He argues that increased housing stock will offset price increases, as no single jurisdiction will house all of the HQ2 employees. He wrote his report prior to Amazon deciding on two East Coast headquarters and hence used the projection of 50,000 new jobs for his study.[3] In Fuller's rosy scenario (Figure 1 below), newcomers would be scattered across the region evenly and not disproportionately in neighborhoods and communities closer to Amazon.
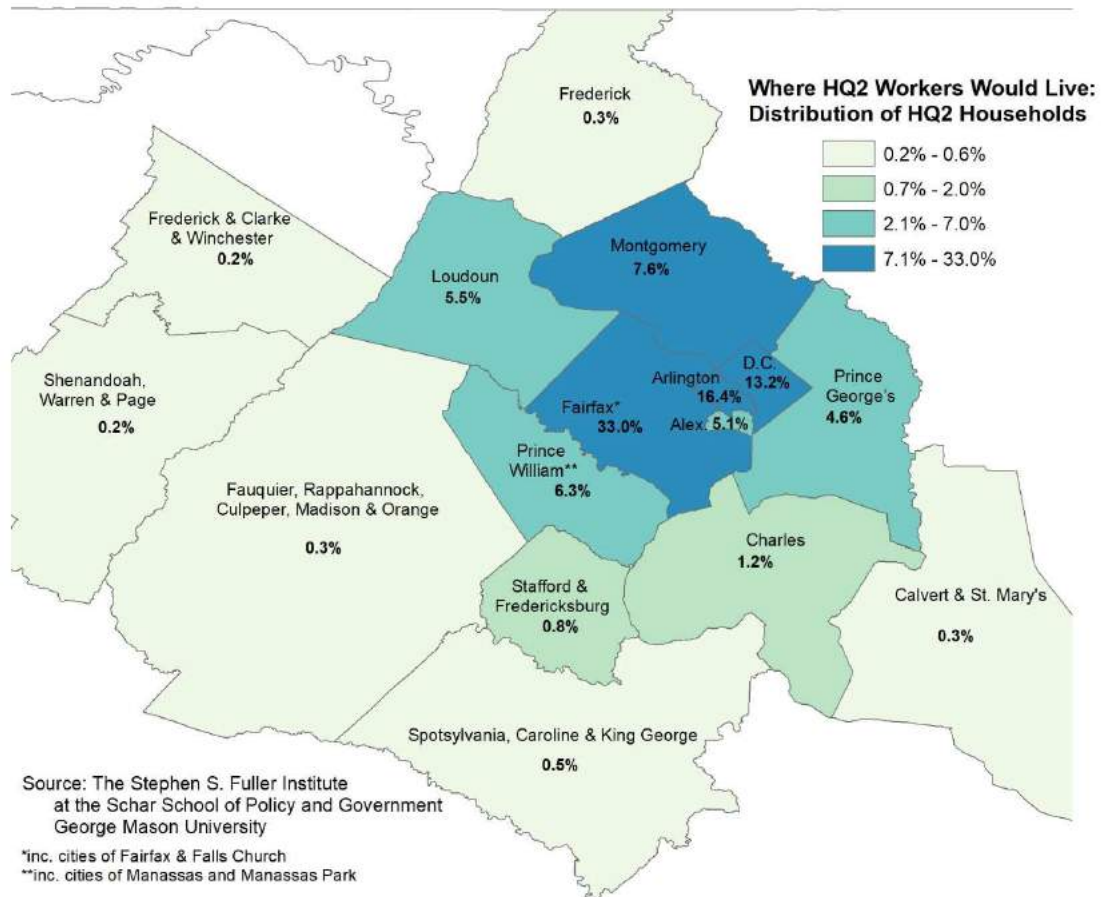
Figure 1. Where HQ2 Workers Would Live: Distribution of HQ2 Household (The Stephen S. Fuller Institute)

However, even accepting this analysis, Arlington and Alexandria, for example, will be disproportionately affected, given current housing density and population figures, as Figure 2 illustrates below.
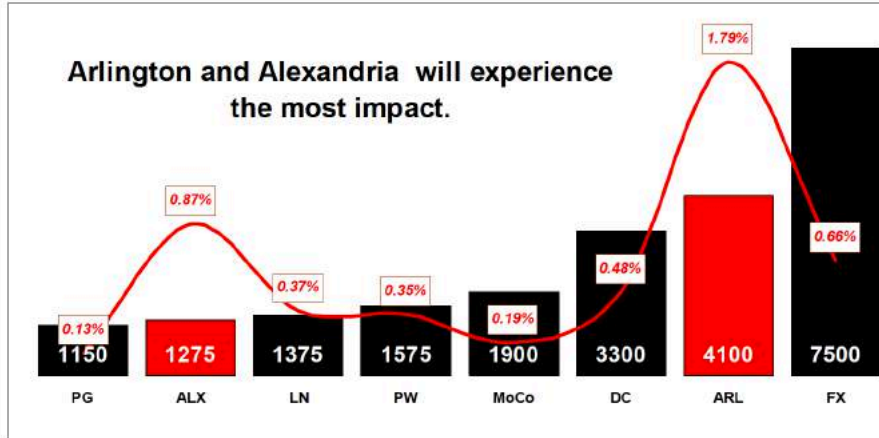
Figure 2. Potential impact of HQ workers by county, based on current Crystal City home to work patterns: Approximate counts and percentage increase of commuters residing in area counties by 2017 population. This graph shows the disproportionate impact of Amazon on Arlington and Alexandria. The red line tracks changed population by jurisdiction as a percentage. The bar graph shows the projected number of new Amazon workers upon full build-out.

Figure 2 shows the place of residence data of current Crystal City workers presented in Fuller's map by approximate counts of potential new residents commuting to Crystal City by county. The line graph indicates the potential impact these new residents will have on each jurisdiction by percentage increase in the current population. The bars show the estimated numbers of estimated Amazon HQ2 and National Landing newcomers. Arlington and Alexandria stand out, even though the overall number of estimated newcomers is fewer than in other jurisdictions.

The Washington area is already a tight real estate market with low vacancy rates and dwindling counts of affordable housing. The transit-oriented National Landing proposal will make matters worse. In this market, single-family homes in low-density residential neighborhoods near the headquarters would be priced out of the range of middle-income homeowners, while rental property owners will be forced to raise rents and upgrade their properties in order to afford higher real estate taxes and to accommodate new potential tenants.

Decisions of where to live are often based on the quality of life and public services rather than accessibility[4] particularly when public transit systems are correlated to rising real estate prices.[5,6] Median rents at the zip code level, downloaded from Zillow[7] indicate an already stressed housing market, Figure 3.
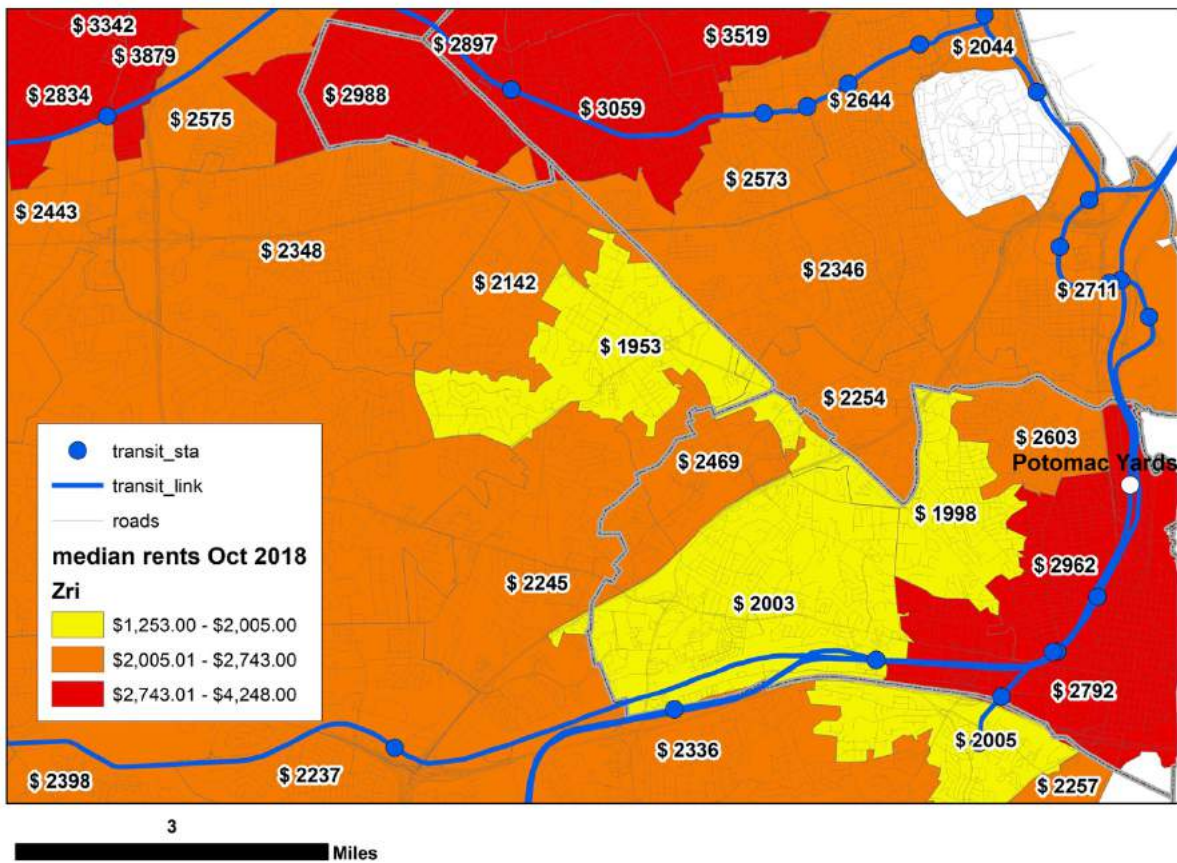
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Figure 3. 2018 median rents by zip codes. (Zillow)

"National Landing" and Amazon HQ2 will likely accelerate rent increases and condo-conversion pressures on areas within a 30 to 40 minute commuting window, especially in immediately proximate areas. Zip codes with high-transit accessibility have the highest rents. (Figure 3) Despite other considerations, such as the housing stock, quality of schools, and neighborhood amenities, home-to-work travel time figures prominently when choosing where to live.[8] The pockets of relatively low median rents in Fairfax and Alexandria are at high risk of redevelopment as the 'rent gap' between actual and potential rents will encourage upscale redevelopment. Additionally, the opening of a new metro stop at Potomac Yard will created more pressure to raise rents as an area currently dominated by big box stores and parking lots will give way to higher density urban development patterns, as Figure 4 illustrates.
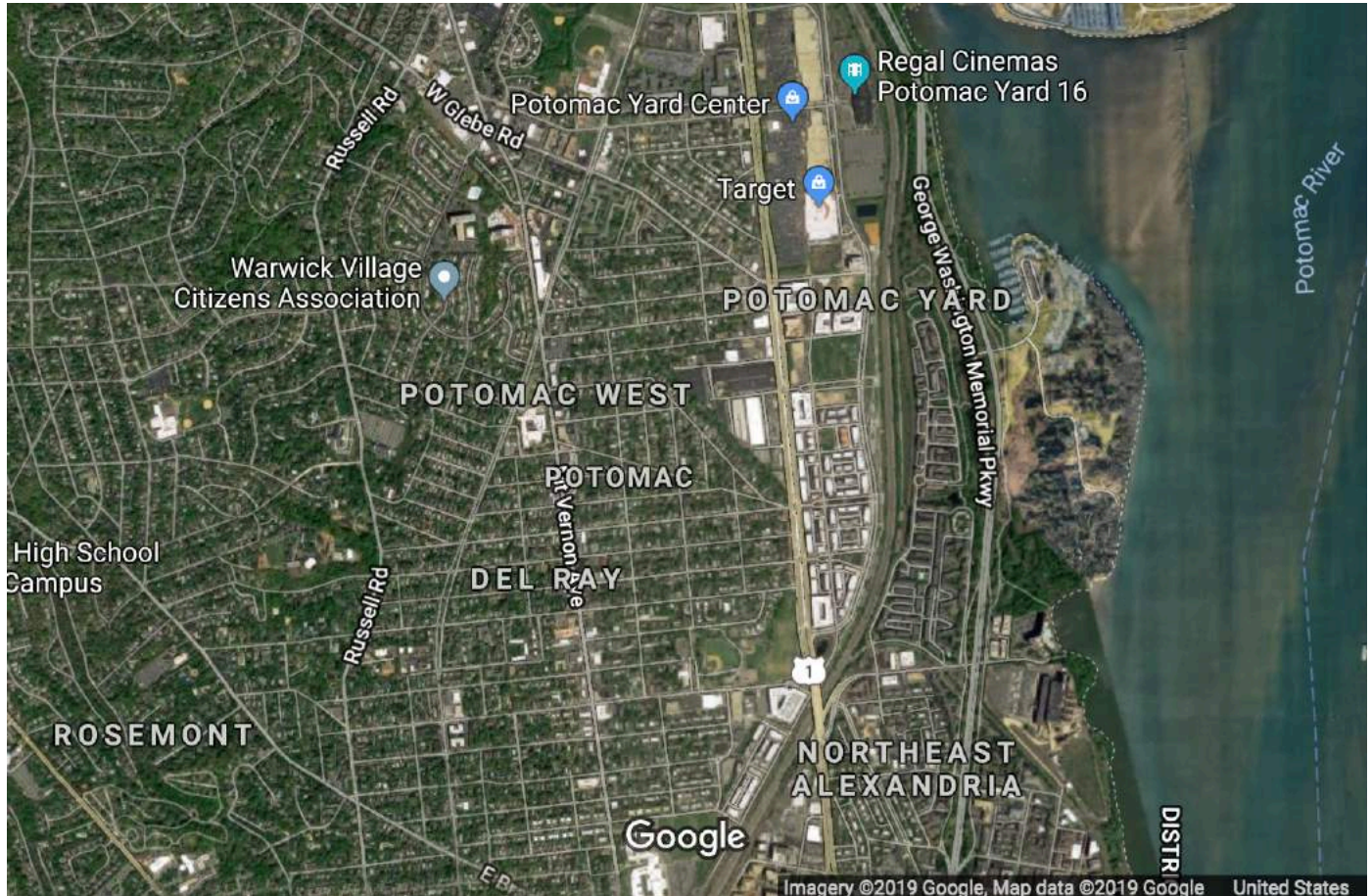
Figure 4. Site of the future Potomac Yards metro stop in the National Landing redevelopment zone with 2019 overhead photo. (Google Maps).

The Potomac Yard section of Alexandria, the southernmost part of the National Landing redevelopment site, displays a street pattern that consists of a grid running perpendicular to the water. It also shows elements of a street hierarchy associated with rail and pedestrian mobility. These street patterns reflect the changing uses of this particular piece of real estate linked to political and economic shifts at the local, regional, and global scales over time. The National Landing project and Amazon HQ2 initiative propose vibrant, walk-able, transit-oriented community building as its driving mission. **However, will the realization be inclusive of communities of color and low- and moderate-income working families? How will this development impact middle class homeowners in the nearby Del Ray neighborhood?**

Driving Development – The Pentagon

The transformation of Arlington and Alexandria is related to socioeconomic changes as the United States emerged from civil war to become a continental and global power, even as the legacy of slavery continued to linger on in the form of segregation and Jim Crow. Pockets of "freedmen" (African American formerly enslaved people) were scattered in parts of Arlington and Alexandria. One of the largest railroad yards on the East Coast dominated the area and fostered industrial and shipping activities in Potomac (rail) Yards. World War II led to massive growth of the U.S. military. When the Pentagon was built, from1941 to 1943, 150 Black families were displaced from Queen City in East Arlington[9], Figure 5. This set in motion a number of changes in the built environment as formerly discrete but interconnected sets of urban enclaves were transformed into a single integrated economy, centered in Washington D.C., during and after WWII.

Figure 5. Queen City, East Arlington.

Queen City was taken by eminent domain, with little to no compensation for the Black families living there; Eleanor Roosevelt intervened so that former residents were provided temporary housing in trailers. The biggest loss in Queen City, however, was not property or belongings, but rather community.[9] While the Pentagon may have been a necessary wartime structure, without mitigation it came at the expense of the poorest and most marginalized area residents. Amazon HQ2 and the National Landing project include some mitigation measures, but the Queen City example illustrates why these measures will not be enough.

Transformed Economy, Established Housing and Traffic

The Washington Metropolitan region is undergoing a rapid transformation from a centralized economy oriented towards the District, to a decentralized economy dispersed across the region. High-technology development related to government and the new service economy are the engine for its. This began in the Reagan years and, in the following 35 years, has driven Northern Virginia's emergence as both an immigrant gateway and technology hub. This has been fueled in part by privatization of formerly public sector jobs, the rise of internet services (eg, AOL, etc.) and post-9.11 explosion of high-tech security and defense contractors. This has led to the creation of highly-networked, geographically clustered and scattered but dense development. The mismatch of older suburban road grids and housing patterns with new polycentric business development creates ongoing traffic congestion.

As the map below (Figure 6) shows, Producer Services (PSs) including high tech and information technology enterprises are organized as loosely coupled horizontal synergistic networks rather than directed hierarchical entities. Across the Washington Metro area, there are five clusters of such enterprises.
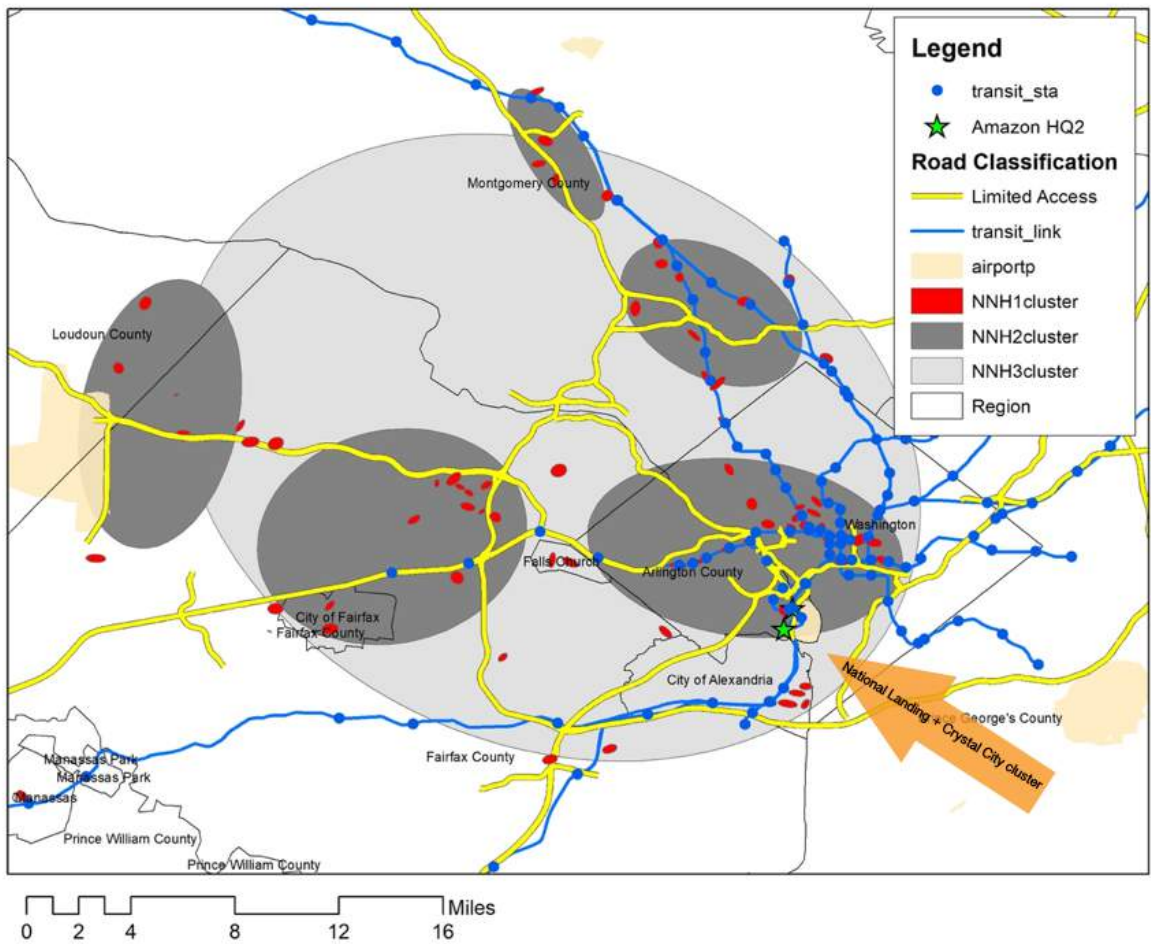
Figure 6. The National Landing site is in one of the five clusters. Hierarchical clusters of producer service enterprises (PSs) 2004 data from ESRI, cluster analysis with Crimestat software, DoJ.

DC-VA, Rockville, and Gaithersburg clusters had a balance between enterprises. Tyson's Corner and Sterling had an overabundance of PSs, while those PSs outside of clusters are in places dominated by other industries, see Appendix 2. Major highways and Metro stations -- that is, the built transportation environment -- serves a DC-centered economy that is less and less the actual economy. Suburban housing patterns – relatively low density and spread out over hundreds of square miles are ill suited for cross-regional work. **This pattern has implications for commuting and housing, suggesting a spatial mismatch between legacy settlement patterns/zoning, transportation, population density, and the transit-oriented growth and the new urban model, Figure 7.**
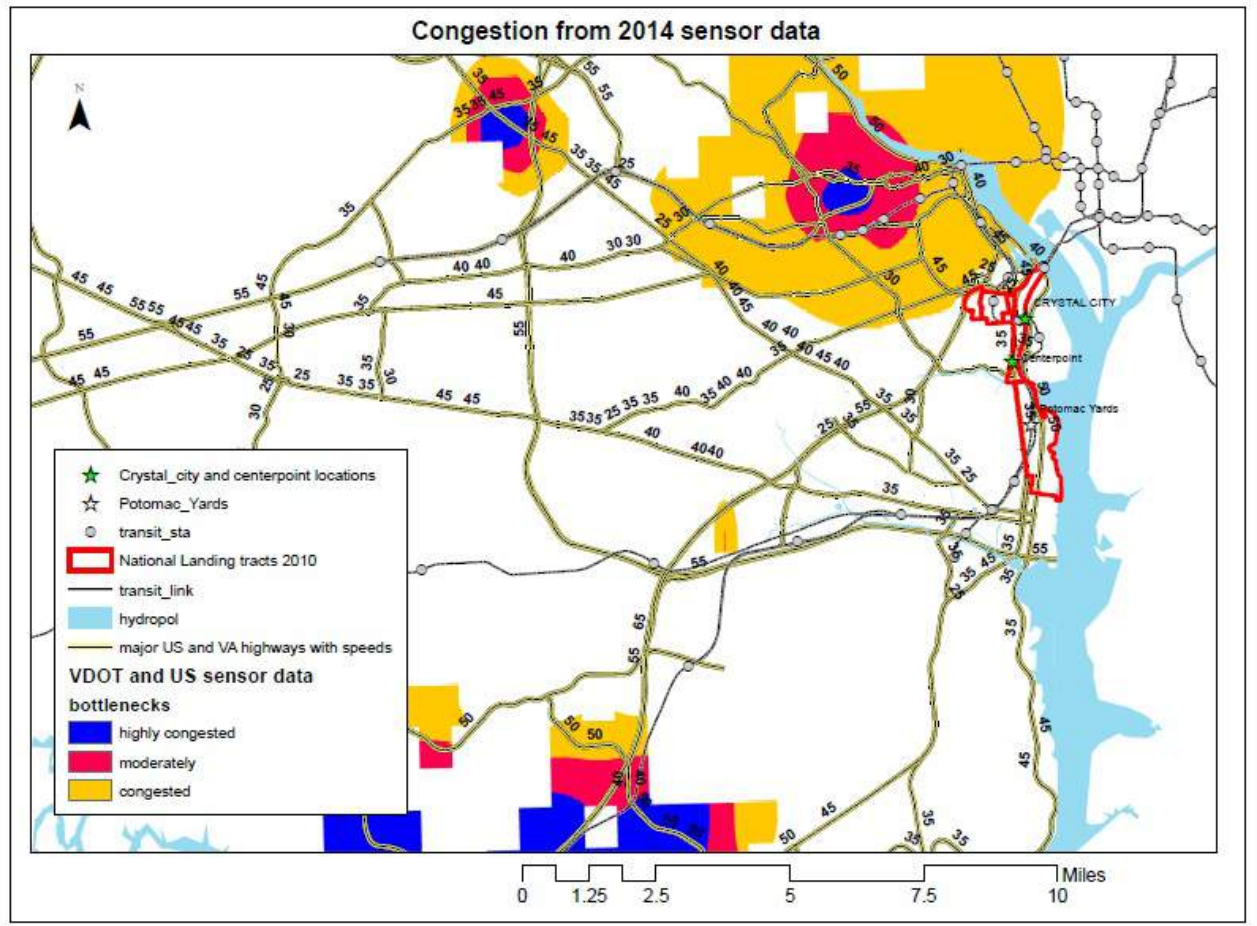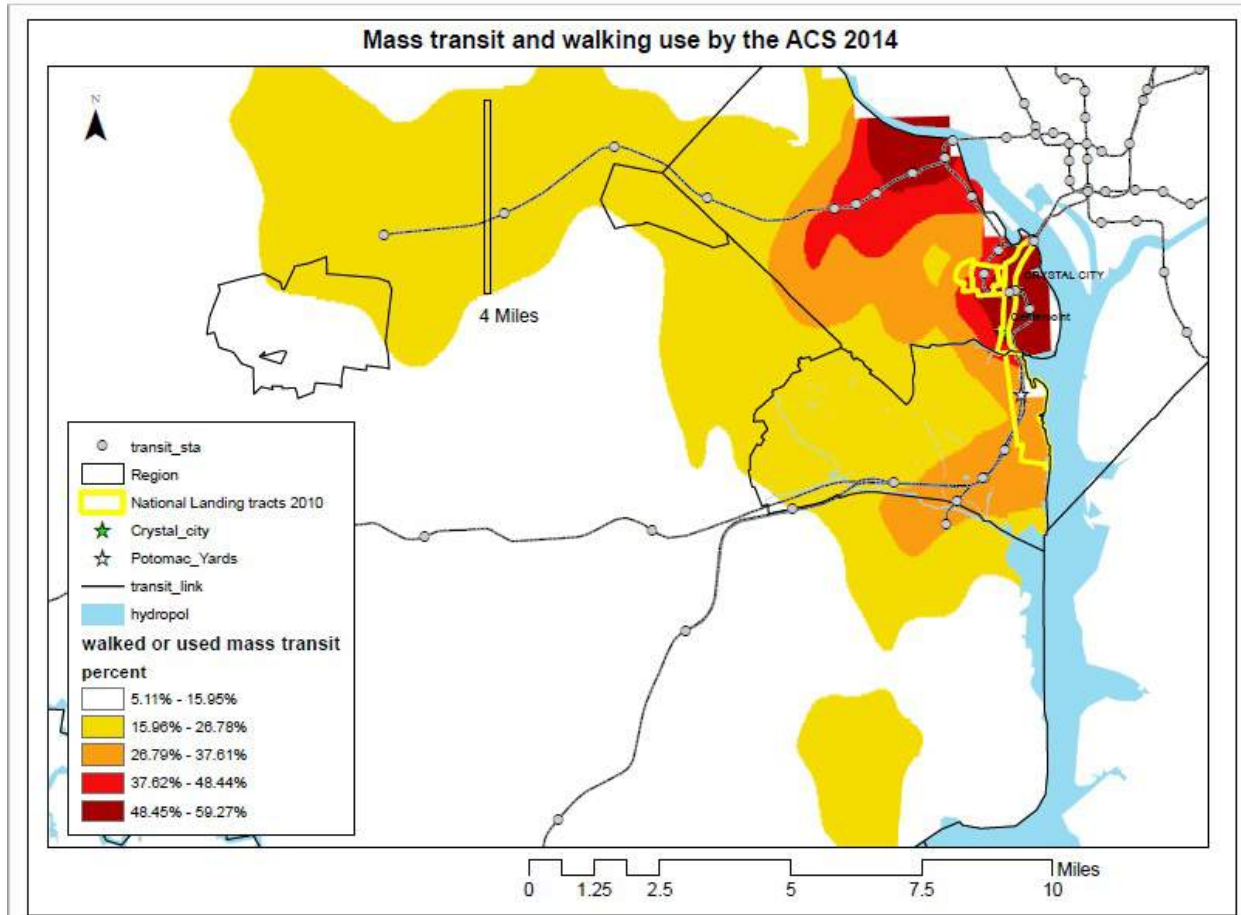
Figure 7(a). Congestion (VDOT)

Figure 7(b). Mode of commuting. (US Census 2010)

Figure 7. Congestion and transit-oriented commuting from U.S. Census and VDOT data

This housing and transportation mismatch causes major congestion throughout the region. Congestion is most intense along the Dulles Toll Road corridor. The Rosslyn and Tyson's Corner traffic congestion (Figure 7(a)) acts as an incentive to use mass transit (Figure 7(b)). The density, historical street grids, and transit options in Arlington and Alexandria create the conditions for vibrant community. Highest and best use logic would indicate multi-family high- density housing as the best option as high-density development around transit hubs would reduce road congestion. Without public subsidies high density development in neighborhoods close to HQ2 will be significantly higher priced than the current garden apartments. Working class people will likely be displaced even as the number of service jobs supporting high-wage workers increases. This will further exacerbate the traffic congestion which will further the demand on the existing local housing stock.
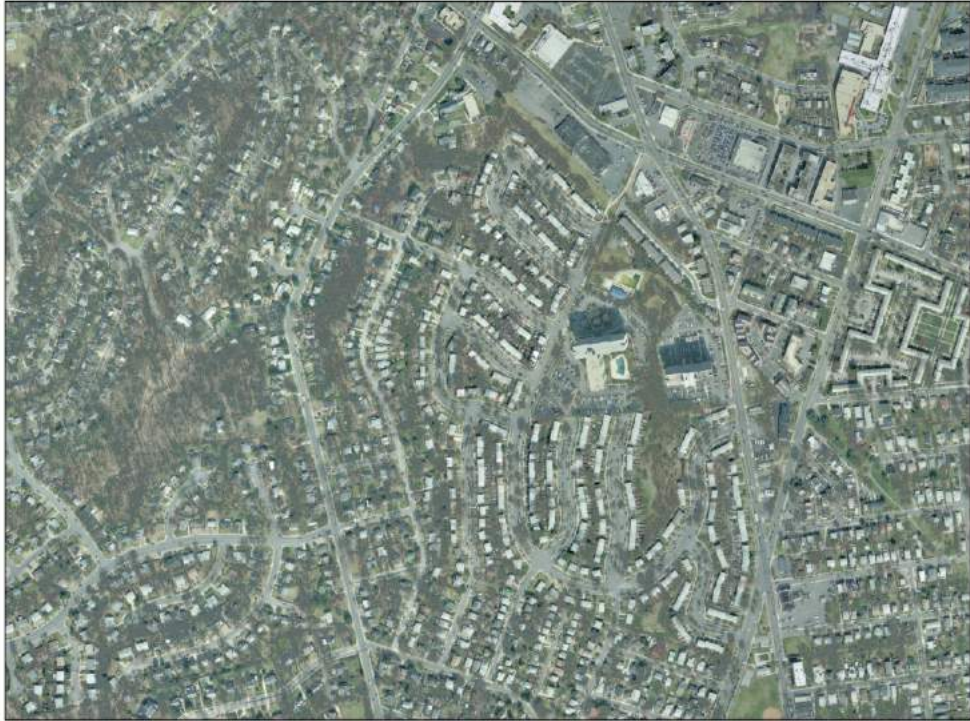
Figure 8(a). South of Four Mile Run, North Alexandria
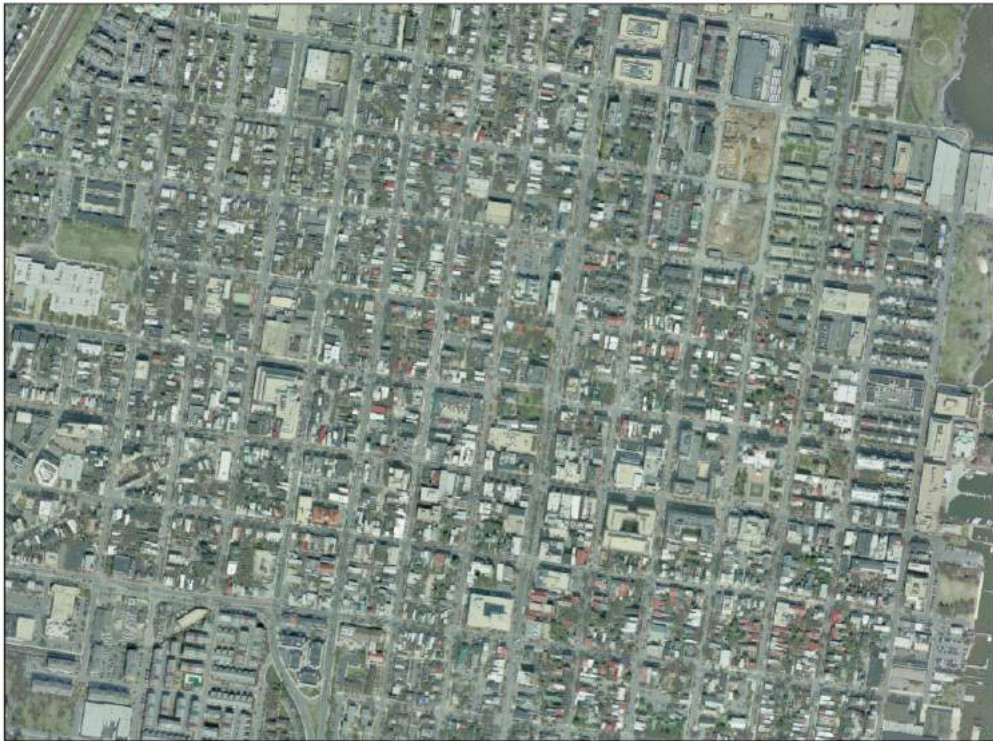
Figure 8(b). Old Town Alexandria

Figure 8. Aerial photography of Alexandria displaying a hierarchical street network associated with car mobility designed to reduce permeability and increase safety 8(a) and a gridded street system that optimizes permeability for pedestrians, 9(b).

Road systems evolved with changes in the modes of transportation and models of urban development as illustrated in Figure 8.

As proposed in the National Landing development plan, smart growth will revise three fragmented areas as a mixed-use community centered on the new Potomac Yard metro stop, stepped back to accommodate nearby low-density residential neighborhoods. This plan pits homeowners and slow growth advocates against developers and enterprises seeking to optimize the use of commercial and mixed use space in the National Landing area.

Commuting Pattern Analysis – Getting to HQ2

With market-based housing, the value and use of property are dependent on their highest and best use. Transportation planning is connected with land use classification, planning regimes, and zoning, as socio-spatial processes. Ultimately, the politics of land use and transportation systems are embedded in the struggle for the right to the city, when the interests of developers, homeowners, renters, workers and employers collide. In this section, the existing traditional, low-density settlement pattern and the transit-oriented model are compared by distance from the Amazon HQ2 sites in the National Landing redevelopment area.

An analysis of the multi-modal transit oriented National Landing proposal demonstrates that regardless of the model, impact on housing markets will be concentrated in South Arlington, the Four Mile Run area of Alexandria, including Chirilagua/Arlandria and parts of Washington, DC. There are 16465 points: 13 percent falling in water, leaving 14250 points, ranked in order of accessibility: walking (8), Metro/rail accessible (4), highway/major road access (2) and secondary road access (1). The graph shows the distribution of all included points/cells, 14250, with a trend line to fit the distribution.
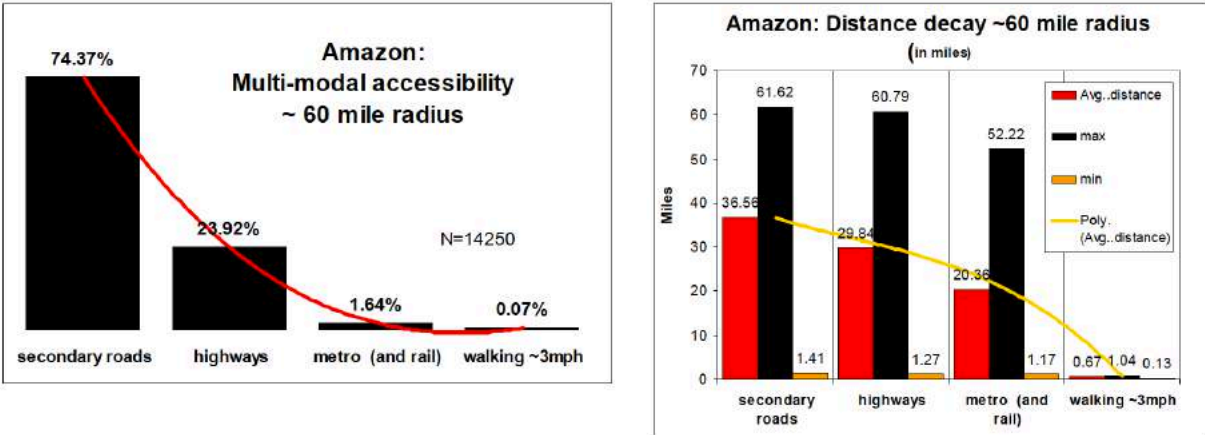

Figure 9. Grid cells by accessibility rankings and distance decay from the Amazon HQ2 site

As shown in Figure 9, most cells—about 74 percent--are not easily accessible to major highways. Only about 24 percent are within one mile of a major highway access point. While only 1.6% were within walking distance of a metro or rail station. If transit were a reality rail, light rail, and metro would be accessible to a larger area -

For all the cells, the average distance by accessibility to the proposed site/s ranged from 37 miles to 6/10ths of a mile, while the maximum distance was 62 miles by major highways. The multi-modal attribute is evident in the minimum values,

consistent for secondary, highway, and metro/rail access distances, ranging from 1.17-1.41 miles. Figure 10 shows the normalized distance and counts of cells grouped by multi-modal accessibility rankings.
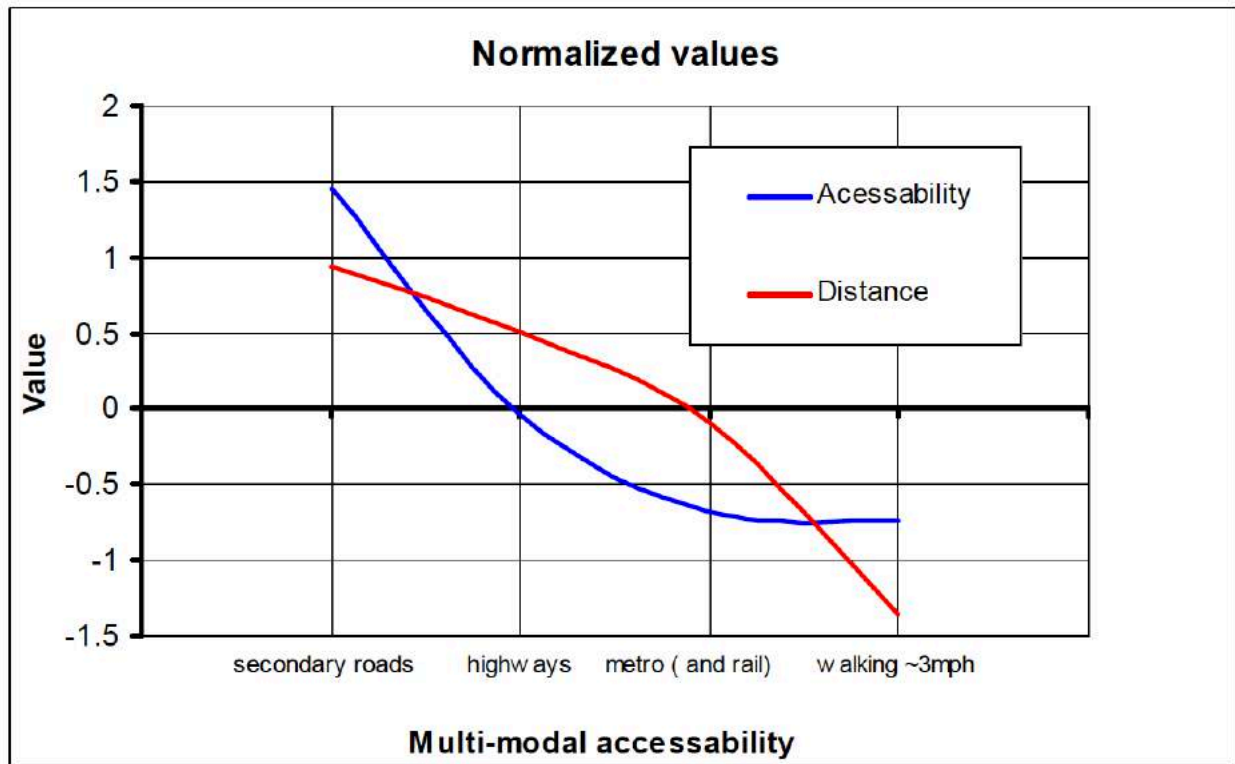

Figure 10. Grid cells by accessibility rankings and distance from the Amazon HQ2 site.

The z scores of grid cells by multi-modal accessibility rank exceed one standard deviation for secondary roads. The distance z scores exceed one standard deviation only for cells within walking distance of the Amazon HQ2 sites, but only for the least accessible and most accessible cells does the ranking matter more than distance.

Overall accessibility for each point was calculated as accessibility rank/distance for a combined score for the multi-modal and low-density models. The resulting values for each model were interpolated from the points to a surface, displayed in four quantiles; each group contains the same fraction of the total population of pixels, excluding the lowest values, in Figure 11 (a) and 11 (b).
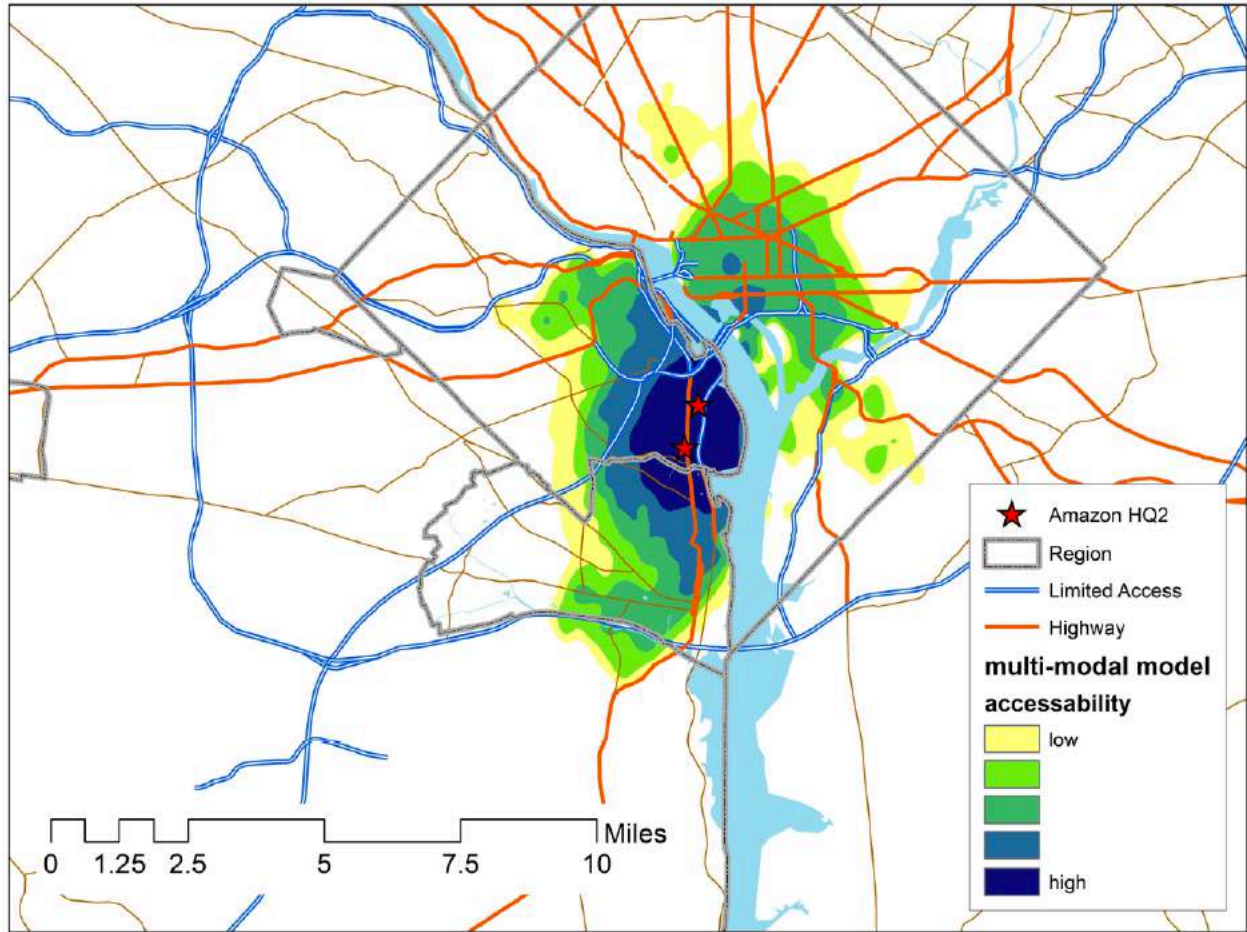
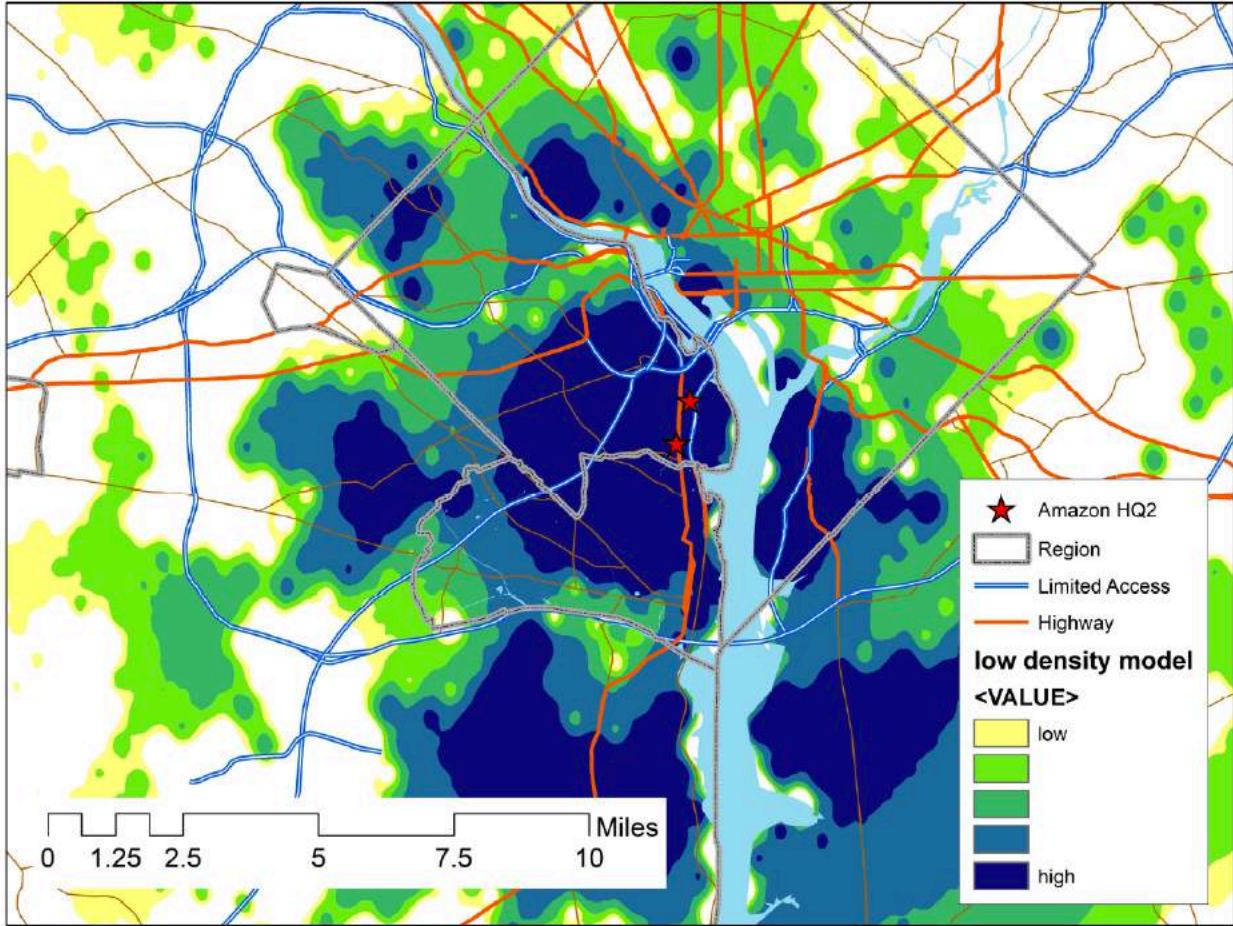*Figure 11(a). The multi-modal model.*

Figure 11(b). The low density model.

Figure 11. A comparison of the surfaces generated for the multi-modal and low-density models.

Figure 11 suggests that the multi-modal model will have the greatest impact on a relatively small area, accessible by local roads and public transit. The low-density model 11(b) shows an impact scattered across the region in pockets. The same data presented by equal intervals shows that regardless of the model, the areas adjacent to the Amazon HQ sites will experience significant impact, Figure 12.
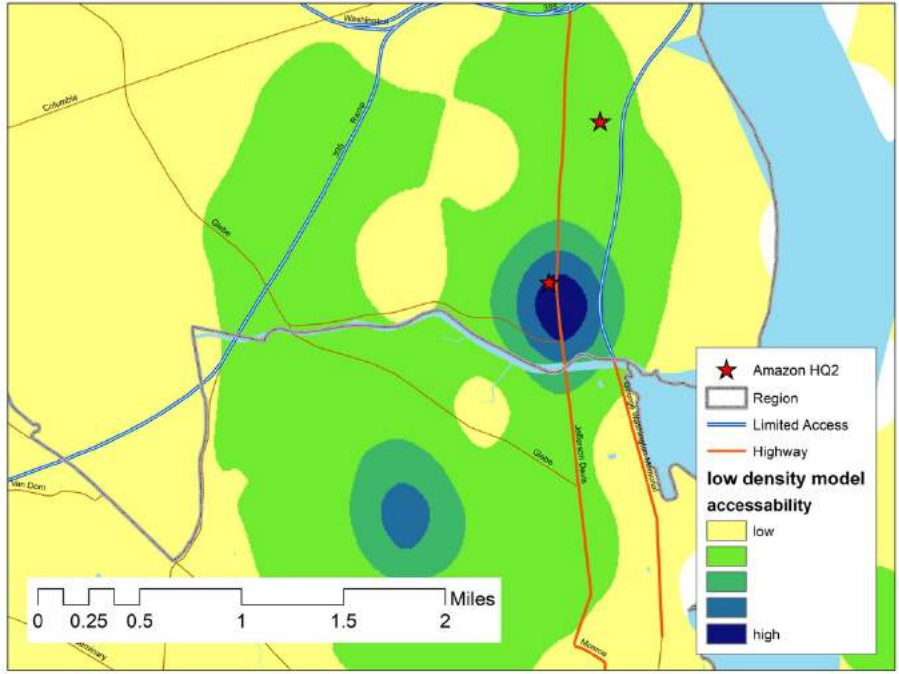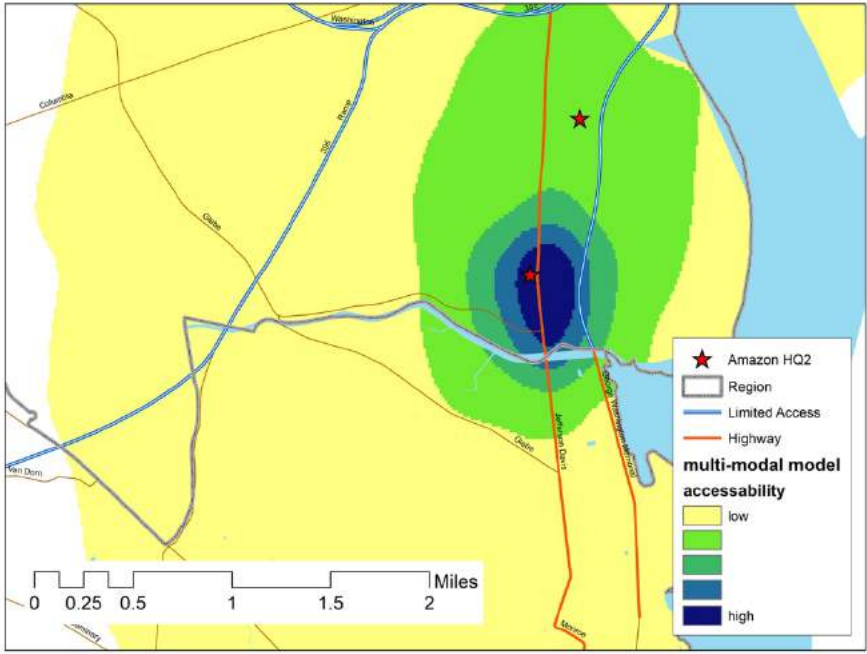
Figure 12(a)The multi-modal model

Figure 12(b). The low density model

Figure 12. Surfaces for multi-modal and low-density models depicted by an equal interval scale to highlight outliers.

Given the traffic congestion across the region, the prevalence of low-density residential housing, and the history of zonal, concentric ring, auto-centered planning, the impact of Amazon HQ2 and National Landing project will be concentrated in the S. Arlington and Alexandria areas, with secondary effects felt along the Orange line corridor, and nearby high density, Metro accessible areas of Washington.

The current spread of Crystal City workers is not indicative of the likely future impact of Amazon HQ2. For transit-oriented, multi-modal model legacy commuting models, half a mile was considered a walkable distance to metro stops. The maximum distance to major roads was one mile from an on-ramp or exchange, as a one-to-two mph crawl from secondary to major roads, and lights would significantly increase door-to-door drive time.

Community at Risk of Displacement

A final map depicts affordable housing complexes in the Arlington and Alexandria that are currently market rate affordable. These apartment complexes and their residents are likely to be displaced and replaced by higher income tenants or homeowners by the Amazon HQ2 project.
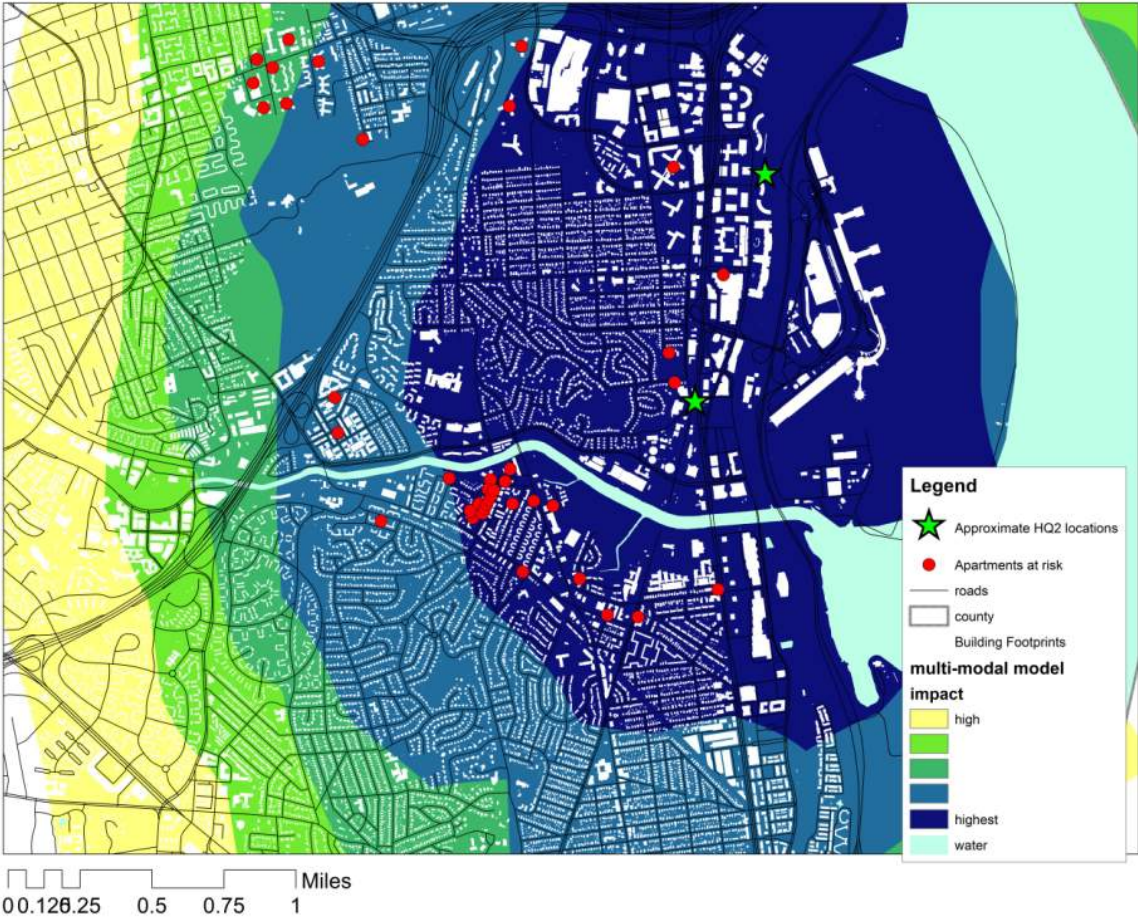

Figure 13. Multi-modal accessibility and at risk housing

The red dots are not just points on a map, but indicate homes filled with people who in their everyday lives contribute to the vitality and social capital of their communities. Through their work, and cultural expressions, they create a sense of place from lifeless bricks and mortar. The greatest concentration of red dots comprises Arlandria / Chirilagua. This unique community of over 6,000 people is overwhelmingly populated by working class Central Americans. These apartments once housed Jimmy Dean and Patsy Kline and served as an urban gateway for white working people in the segregated 1950's. Following desegregation in Alexandria many African Americans moved into this area in the mid-1970s. Since the early 1980s this area has become a unique Latinx immigrant gateway with a vibrant small business district and a

cultural vibrance that is unique in not just Alexandria but all of Virginia. It is critical to note that without concentrated mitigation strategies and investment a rooted, historic, unique Latinx community will be destroyed by the public investment that attracts Amazon's HQ2.

Conclusions

Low wage residents currently living in areas near the Amazon HQ2 will face displacement pressure from the projected 25,000 high-wage Amazon employees. Amazon employees are likely to prefer living within a 40-minute commute of HQ2 – he distance of either a short walk, drive, bike ride or a short Metro trip. Residents of nearby apartment complexes with lower rents are likely to be most impacted and displaced by increased housing costs as Amazon workers seek convenient housing close to HQ2.

The area most likely to be impacted is one of the only areas with a concentrated Latinx residential and business community. In addition to the elimination of affordable housing an irreplaceable community with unique cultural characteristics will be destroyed.

Although beyond the scope of this study, state, local and private funding to preserve or create affordable housing is needed in order to preserve this unique community and housing for up to 6,000 lower income working people.

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Appendix

The National Landing site is in one of the five clusters. It contains the largest count of smaller clusters when compared by Location Quotients (LQs), the ratio of PSs to all enterprises over the ratio of all producer enterprises to all enterprises in the study area, the DC metro region. A perfect match between the region and a smaller area is 1, the greater the divergence between a small area and the region, the higher or lower the score. The number of producer service enterprises is highest in the DC VA cluster, even if the LQ is lower than the percentage of PSs to all enterprises, as in Appendix 1.

Area name: (NNH level 2)	# PS firms (count)	As % of all CBSA PSs	# all firms (count)	PS # as percent of all firms #	LQ
Tyson's	1932	7.21%	10387	18.60%	1.45
DC VA cluster*	5272	19.66%	36017	14.64%	1.14
Rockville	1065	3.97%	7635	13.95%	1.09
Gaithersburg	475	1.77%	3032	15.67%	1.22
Sterling	1023	3.82%	5618	18.21%	1.42
Outside all clusters	17043	63.57%	146686	11.62%	0.91
Total for clusters	9767	36.43%	62689	15.58%	1.22

Appendix 1. A comparison of DC Metro PS clusters by Location Quotients (LQs)

Of particular interest in Appendix 1 is that location quotients for producer services show a range from a low of .13 for Gaithersburg to a high of 1.45 for Tyson's Corner. Producer services in the two Northern Virginia clusters, Tyson's and Sterling accounted for the largest share of all enterprises in those areas, relative to the regional ratios of producer services to all enterprises. The DC-VA cluster is closer to the regional distribution. The graph (Appendix 2) shows normalized Z values for the LQ scores and one standard deviation.
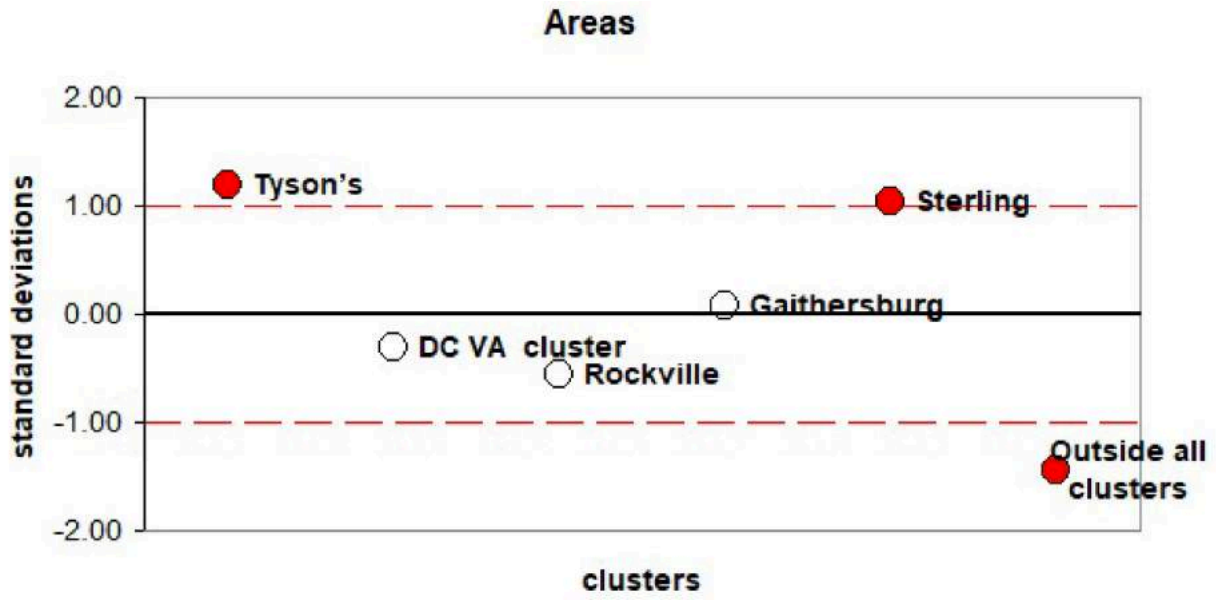
Appendix 2. Z values for areas by LQs. Values falling within one standard deviation are within the normal variation. Values higher and lower are significantly different from the average.

Citations:

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