CENTRAL MARYLAND MICROTRANSIT CONTEXT REPORT

BALTIMORE METROPOLITAN COUNCIL

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Produced by: Foursquare Integrated Transportation Planning

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1. Introduction

This Microtransit Context report provides an assessment of both existing and future conditions in the Baltimore region. The report compiles a variety of data and information impacting the transit landscape to support coordinated microtransit planning. The intent of the memo is to understand the state of the practice with respect to microtransit in the region, as well as regional context that is relevant and important to understanding where and how microtransit can fit in.

This report is organizing into the following sections.

- ***Transit Services*** introduces the transit agencies in the region, describes the existing transit network including existing cross-jurisdictional connections and modes offered, and presents information about key performance indicators. This section also inventories previous and ongoing microtransit efforts, establishing the baseline of microtransit activities in the region.

- ***Transit Environment*** analyzes demographic, socioeconomic, commuting, and land use data to characterize the opportunities and challenges for transit usage, particularly microtransit usage, in the region today and in the future.

- ***Travel Patterns*** identifies key destinations and trip patterns throughout the region, both today and in the future. This section highlights trip patterns, notably short-distance cross-jurisdictional trips, that represent an opportunity to replace personal vehicle trips with microtransit trips.

- ***Microtransit Suitability*** assesses where there are populations with high transit needs and the right conditions to support microtransit to identify locations in the region that may be suitable for microtransit service.

2. Transit Services

Transit Environment

The Baltimore region has a diverse set of transit modes and services that make up its regional network. This section provides an overview of the key features of the current regional transit system. The regional system encompasses the Baltimore Metropolitan Council's (BMC) seven-member area of Anne Arundel County, Baltimore City, Baltimore County, Carroll County, Harford County, Howard County, and Queen Anne's County.

PARTNER TRANSIT AGENCIES

BMC's transit partner agencies include Annapolis Transit; Anne Arundel County Transit; Baltimore City Department of Transportation's Charm City Circulator; Baltimore County Circulator (or The Towson Loop/The Loop); Carroll Transit System (or Connect Carroll); Harford LINK; Maryland Department of Transportation (MDOT) Maryland Transit Administration (MTA), which will be referred to as MTA in this report; Regional Transportation Agency of Central Maryland (RTA); Queen Anne's County Ride. **Figure 1** is an illustrative depiction of the partner transit agencies across the region.

Figure 1: Illustrative Map of the Baltimore Region's Partner Transit Agencies

Service Areas and Connections

Transit agencies in the BMC region offer different service types, as listed in **Table 1**.

Table 1: Modes Offered by Transit Agency

AGENCY	MODES OFFERED
Annapolis	Paratransit, Bus
Anne Arundel County	Paratransit, Bus, Microtransit
Baltimore City - Charm City Circulator	Bus, Ferry
Baltimore County – The Loop	Bus, Paratransit
Carroll County	Paratransit, Bus, Countywide Demand Response[1]
Harford LINK	Paratransit, Bus
MTA	Paratransit, Bus, Commuter Bus, Commuter Rail, Light Rail, Heavy Rail
Queen Anne's	Paratransit, Bus, Countywide Demand Response
RTA	Paratransit, Bus

Most agency jurisdictions or service areas are contained within a specific jurisdiction; however, some agencies provide connections to other jurisdictions within the BMC region. These jurisdictions are primarily served by the transportation providers listed in **Table 2** which identifies bus and demand response service in the BMC region.

[1] Microtransit is included in this mode category.

Table 2: Partner Transit Agency: Primary Service Area and Connections within the BMC Region

JURISDICTION	LOCAL TRANSIT AGENCY	OTHER JURISDICTION CONNECTIONS VIA FIXED ROUTE	CROSS-JURISDICTION DEMAND-RESPONSE SERVICE
Anne Arundel County	Annapolis Transit	Baltimore County	No cross-jurisdiction service
	Anne Arundel County		No cross-jurisdiction service
	MTA	Baltimore County, Anne Arundel County, and Howard County	Yes, within three quarters (¾) of a mile of any Local Bus[2] route in Baltimore City and Anne Arundel and Baltimore counties and within three quarters (¾) of a mile radius of a Light Rail or Metro Subway station
Baltimore City	MTA	Baltimore County, Anne Arundel County, and Howard County	Yes, within three quarters (¾) of a mile of any Local Bus route in Baltimore City and Anne Arundel and Baltimore counties and within three quarters (¾) of a mile radius of a Light Rail or Metro Subway station
	Charm City Circulator	--	No cross-jurisdiction service
Baltimore County	MTA	Baltimore City, Anne Arundel County, and Howard County	Yes, within three quarters (¾) of a mile of any Local route in Baltimore City and Anne Arundel and Baltimore counties and within three quarters (¾) of a mile radius of a Light Rail or Metro Subway station
	Baltimore County Circulator (The Loop)	--	No cross-jurisdiction service
Carroll County	Carroll Transit System	--	No cross-jurisdiction service
Harford County	Harford Transit LINK	Cecil County	No cross-jurisdiction service

[2] BaltimoreLink Basics | Maryland Transit Administration

JURISDICTION	LOCAL TRANSIT AGENCY	OTHER JURISDICTION CONNECTIONS VIA FIXED ROUTE	CROSS-JURISDICTION DEMAND-RESPONSE SERVICE
Howard County	MTA	Baltimore City, Anne Arundel County, and Howard County	Yes, within three quarters (¾) of a mile of any Local route in Baltimore City and Anne Arundel and Baltimore counties and within three quarters (¾) of a mile radius of a Light Rail or Metro Subway station
	RTA	Anne Arundel County, City of Laurel, Prince George's County	For paratransit - within the ADA service area of three quarters (¾) of a mile of fixed-route service.
Queen Anne's County	County Ride	Anne Arundel County and Talbot County	No cross-jurisdiction service

Summary Operating Statistics

Table 3 summarizes bus operating statistics for each agency, including the number of bus routes and stops serviced by each agency. This data includes 2022 National Transit Database (NTD) agency figures for bus service, including the number of unlinked passenger trips (UPT), vehicle revenue hours and miles (VRH and VRM), and vehicles operated in maximum service (VOMS).

Table 3: Bus Operational Statistics by Agency

AGENCY	FIXED ROUTES OPERATED	STOPS	UPT	VRM	VRH	VOMS
Annapolis	10	237	202,812	386,206	39,540	10
Anne Arundel County	8	196	78,660	796,181	55,761	7
Baltimore County – CountyRide	--	--	26,531	17,268	6,916	10
Baltimore County – The Loop	2	49	30,349	284,983	25,440	15
Charm City Circulator	5	106	1,137,841	459,740	66,457	18
Carroll County	6	71	19,205	224,469	14,844	7
Harford LINK	7	188	194,812	905,977	38,474	12
MDOT MTA	66	4,093	40,168,414	19,472,968	1,695,080	627
Queen Anne's	3	25	13,308	99,022	9,900	6
RTA	15	644	269,010	1,355,638	95,532	23

Table 4 includes this information for demand response service, which in some cases includes paratransit, including ADA complementary paratransit service, and microtransit. This table also identifies whether the agency directly operates the demand response service or uses purchased transportation. One agency, MTA, uses a mix of purchased and directly operated service; however, most of its services are purchased/contracted.

Table 4: Demand Response Operational Statistics by Agency

AGENCY	UPT	VRM	VRH	VOMS	DEMAND RESPONSE TYPE
Annapolis	2,801	22,451	4,501	1	Directly Operated
Anne Arundel County	71,249	558,249	29,751	24	Purchased
Baltimore County – CountyRide	30,349	284,943	25,440	15	Directly Operated
Carroll County	52,414	384,781	30,646	20	Purchased
Harford LINK	43,331	381,614	22,416	13	Directly Operated
MTA	1,801,983	19,472,968	918,641	548	Purchased (Additional 15 Directly Operated VOMS)
Queen Anne's	4,044	92,405	11,550	7	Directly Operated
RTA	54,366	607,414	38,586	22	Purchased

MTA is the largest operators in the region, with substantially more hours, miles, and vehicles operated than other agencies. All agencies only operate local bus service and demand response services, though MTA operates a number of different bus and rail service types.

Other services such as the BWI Partnership County Connector also connect the region through funding partnerships.[3] These services are typically call-ahead with limited information available and are not explored extensively in this document. This service averages approximately 280 passengers per day as of FY 2023.[4]

Demand Response and Microtransit Services in the Region

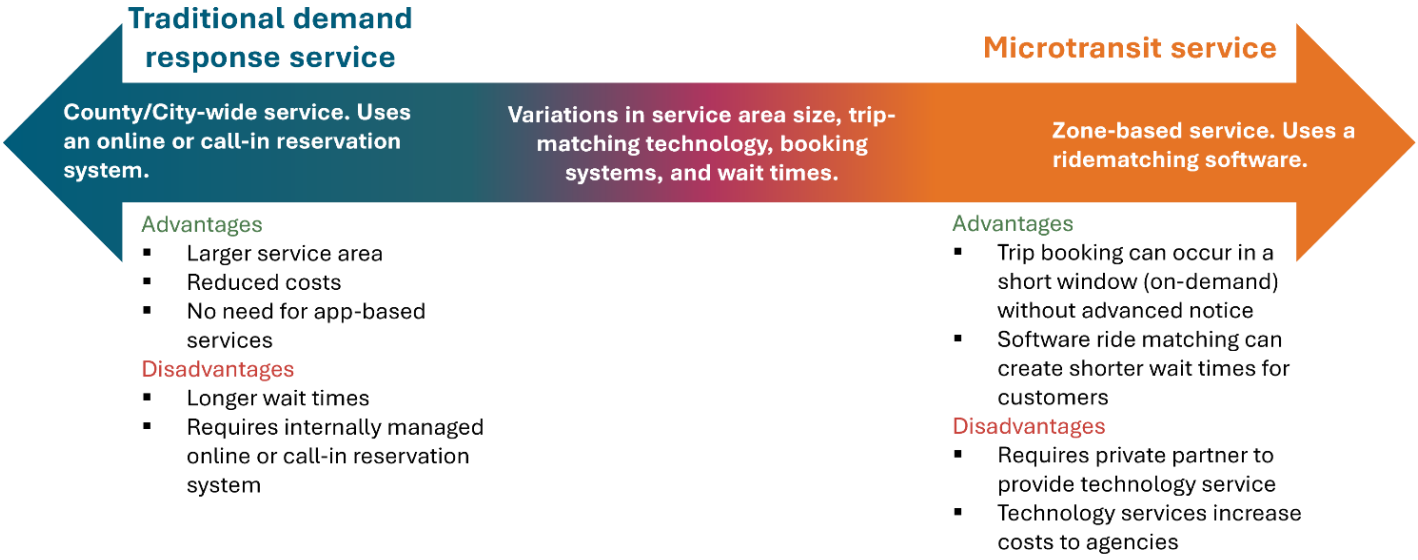
On-demand services are growing in popularity as agencies of all sizes and all operating environments (e.g., rural, suburban, and urban) implement on-demand services, notably microtransit service, to expand into previously underserved areas, extend service coverage into unserved areas, or replace underperforming fixed-route transit services. Jurisdictions in the BMC region have also expressed interest in on-demand services, having studied and established varying degrees of on-demand services from traditional demand response to microtransit. Additionally, Montgomery and Prince George's counties, while not within the BMC region, are neighboring jurisdictions with relevant experience piloting microtransit service in a similar environment.

[3] "County Connector." BWI Business Partnership. Accessed July 2024. https://bwipartner.org/county-connector/

[4] "FY23 Grants Report." BWI Business Partnership. Accessed July 2024. https://bwipartner.org/fy23-grants-report/

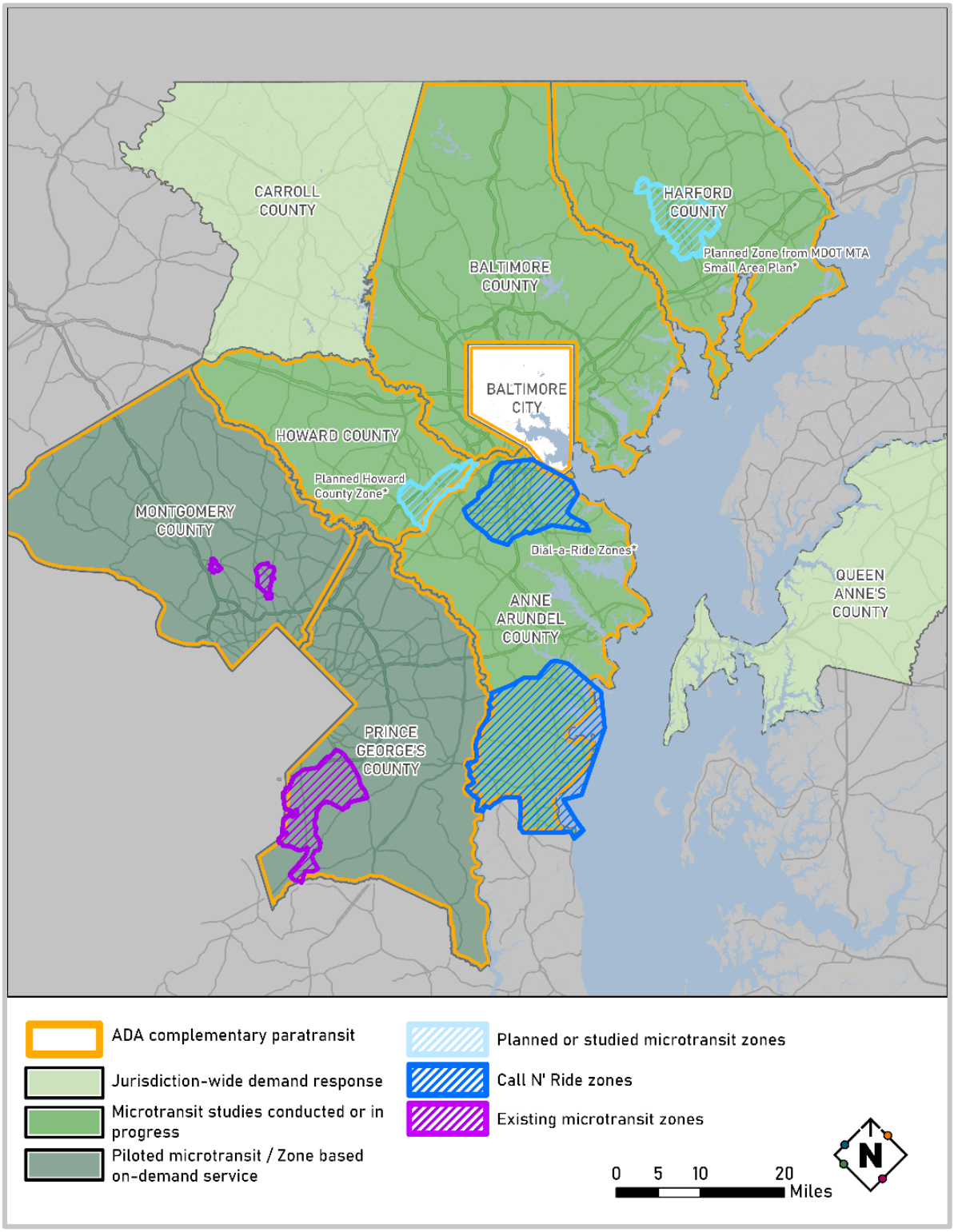
Demand response services in the BMC region range based on the type of service, service hours, and geographic size of the area served. Traditional on-demand services such as paratransit serve entire counties or areas within three quarters of a mile of an existing transit route. Counties with limited fixed-route services sometimes opt for a county-wide demand response service regardless of existing transit service. These systems provide essential service to areas of the county that are underserved and provide service to populations that may need service, including door-to-door service, such as those with disabilities or older adults. However, demand response services operating across large service areas such as entire counties often require users to book a trip several hours, or even days, in advance to ensure the service operates as efficiently as possible within limited resources. On the other hand, on-demand microtransit service provides one solution to long wait times by limiting service to a smaller service zone and scaling vehicle needs based on demand. Recommended zone sizes typically range between five to seven miles in suburban to rural areas to maintain low wait times often between 10 to 20 minutes. Although small zone-based microtransit may not provide countywide service, it can bridge important gaps between areas with no service and the existing transit network and can provide important neighborhood connections. Error! Reference source not found. below p rovides a visual representation of the spectrum of on-demand services described above.

Figure 2: Spectrum of Demand Response and Microtransit Services



While all jurisdictions within the BMC region offer some type of demand response service, including ADA complementary paratransit service where required, only two counties (Harford and Howard counties) are actively implementing microtransit service. Anne Arundel County is currently offering its residents a zone-based call-and-ride service. The other demand response services in the region, such as for ADA complementary paratransit service, require an application to qualify for service and limit services to within three quarters of a mile from existing fixed-route service. In the case of Carroll and Queen Anne's Counties, the countywide demand response service serves as the county's required paratransit service. A map of microtransit initiatives by jurisdiction is presented in and each service is described below in **Figure 3**.

Figure 3: Status of Demand Response and Microtransit Services in the BMC Region, Montgomery County, and Prince George's County



Summary of Demand Response and Microtransit Services, Policies, and Funding by Jurisdiction

To better understand the state of on-demand services in the region, this section details existing demand response and microtransit service, associated policies, and associated funding for both existing and proposed services, by jurisdiction.

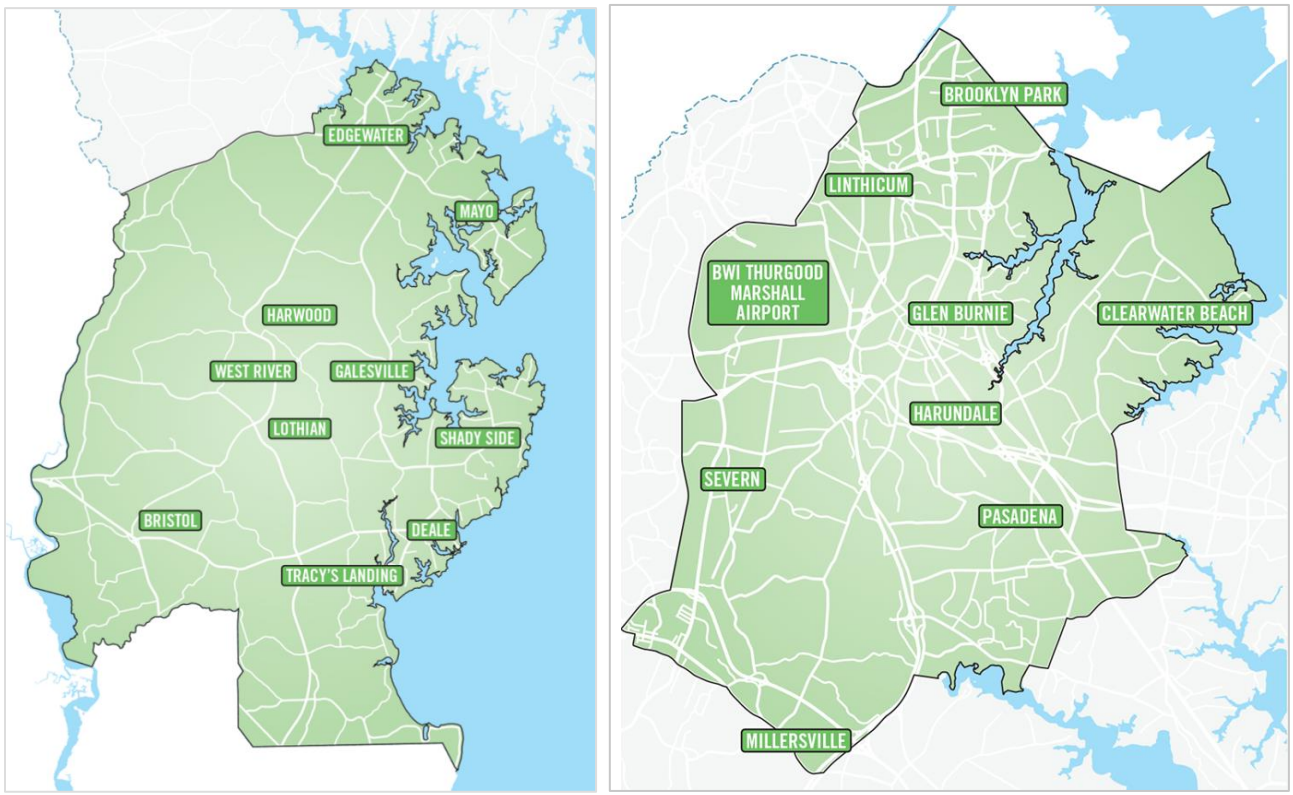
One caveat to this summary is that jurisdictions with existing demand response and microtransit operations in the Baltimore region have limited publicly available information on the funding sources for their services. Operating expenses detailed below were referenced from respective jurisdiction's National Transit Database (NTD) agency profiles, which also have limitations in capturing microtransit and paratransit services under the umbrella "demand response" category. Where applicable, publicly accessible interviews with agency representatives were also used.

ANNE ARUNDEL COUNTY

Overview

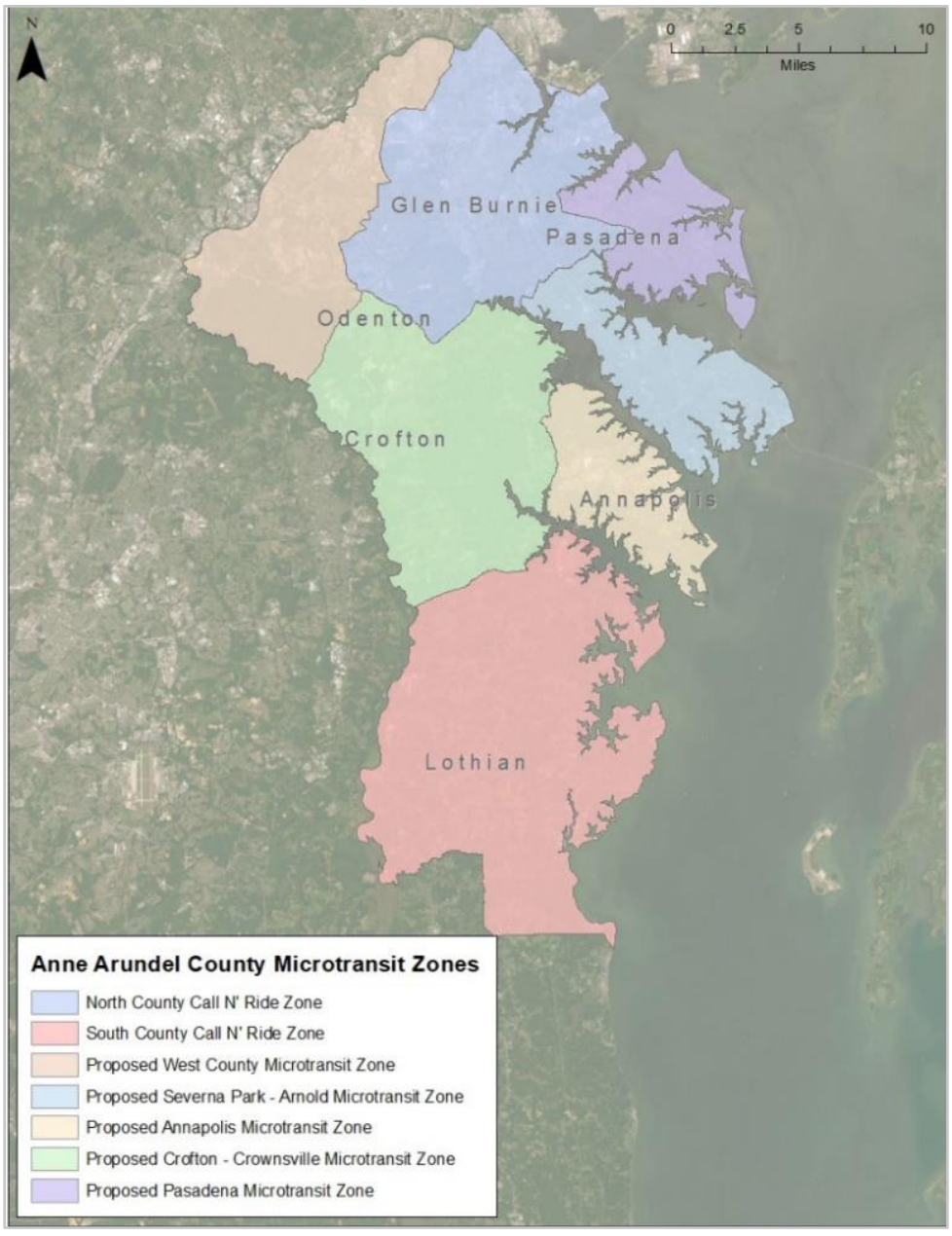
Anne Arundel County has zone-based, dial-a-ride service, called "Call N' Ride," with a goal of providing mobility to residents in the northern and southern portions of the county. Each zone operates Monday through Friday from 7 a.m.–7 p.m. Trips may be requested at least two hours ahead of time. These zones are shown in **Figure 4 and Figure** and **Figure 5**. Each zone averages between approximately 400-500 riders per month.

Figure 4 and Figure 5: Anne Arundel County South Zone Map (left) and North Zone Map (right)



The South County zone was expanded after the county's 2018 Transit Development Plan (TDP). There are additional planned zones from the 2024 TDP identified in **Figure 6** which would expand to provide service in the remainder of the county. Adding new microtransit zones is currently unfunded, however. The County will continue to be opportunistic with funding and will look to expand the North Zone and deploy app-booking capabilities in the meantime. Ultimately, the county may decide to retain "Call N' Ride" service as opposed to microtransit, especially in the South Zone, as customers there are largely older adults who have expressed concerns over moving to exclusively app-based technology.

Figure 6: Proposed Zones from 2024 Transit Development Plan Draft Update



Policies

Anne Arundel County's "Call N' Ride" services have public-facing policies pertaining to age requirements, fares, and ride requests.

- Age Requirements: Call N' Ride requests can only be made by riders ages 18 and over. For riders between the ages of 13 to 18, they must have a signed permission slip from their guardian on record to use the service on their own. For riders younger than 13 years of age, they are required to ride with their guardian or caregiver.
- Fares: There is currently no fee for Call N' Ride for all county residents.
- Ride Requests: Riders must call at least two hours in advance for their desired trips. For pick-ups before 9 a.m., they must call between 5 p.m. and 7 p.m. the previous business day to schedule.

Existing Funding

In Anne Arundel's 2022 NTD Agency Profile, it was reported that operating funding sources agency-wide are acquired through Federal and Local Government, with each contributing 43.5 percent and 56.5 percent, respectively[5]. This provided the agency with approximately $11.7 million in operating funds, with $6.5 million allocated to Demand Response. This appropriation of funds does not specify the percentages given to the county's microtransit and paratransit operations, respectively. In addition, to increase resident's access to Call N' Ride's fare free services, while also responding to exponential increases in ridership, in January 2024, the county implemented a 25-cent tax toward ride-share including Uber and Lyft in Anne Arundel. The $350,000 to $500,000 annually that is expected to generate from the tax will go to the county's transit system[6].

Proposed Future Funding

As part of Anne Arundel County's Transit Development Plan (TDP), the county aims to expand their Call N' Ride services with five new zones (see **Figure 6** for a visual of the envisioned Call N' Ride network). In the plan's budget, shown below in **Figure 7**, the five zones are envisioned to be phased out over the first three years of the TDP and be funded by a mix of federal, state, and local funding.

[5] 2022 Annual Agency Profile - Anne Arundel County (NTD ID 30129)
[6] Anne Arundel Makes Free Transportation More Accessible (governing.com)

Figure 7: Conceptual Financial Plan for Operating (Source: Anne Arundel County TDP)

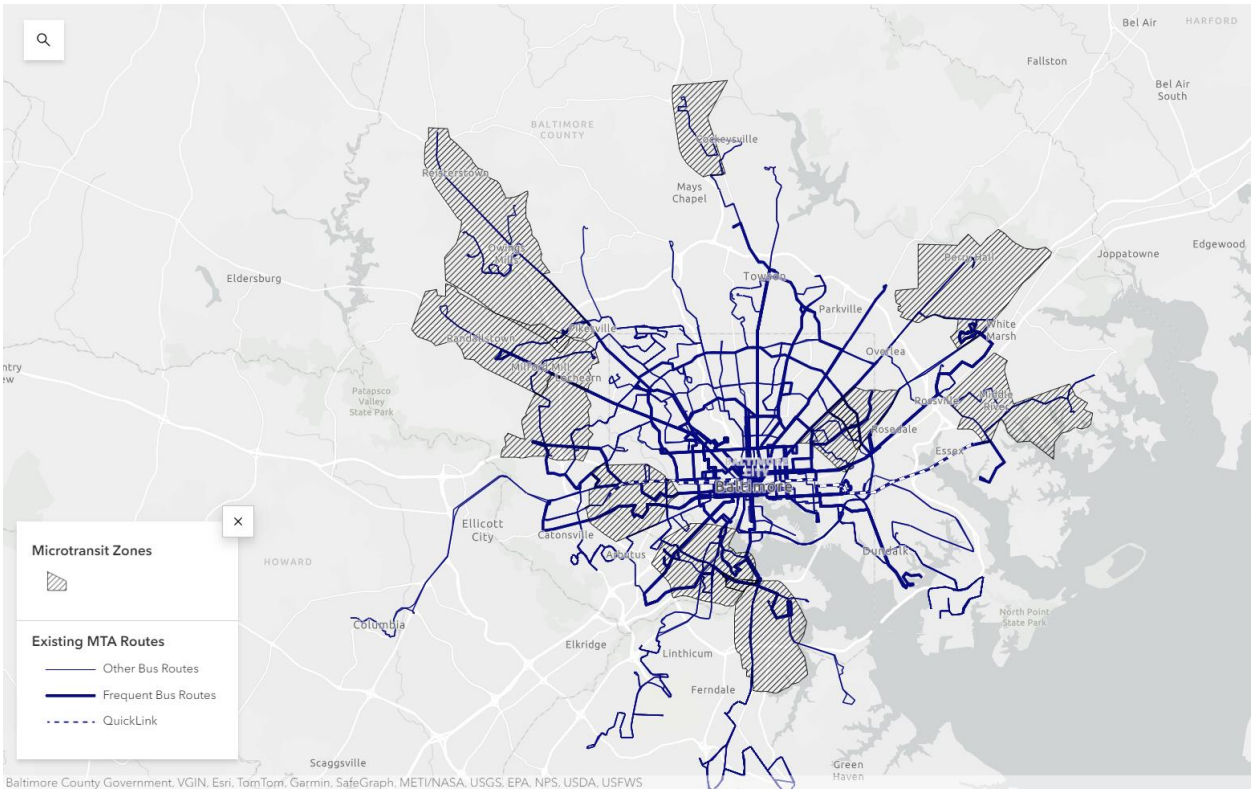
Proposed Operating Requests	Projected Year				
	1	2	3	4	5
Proposed Future Projects					
Baseline Operating Cost with Inflation	$15,077,120	$15,830,976	$16,622,525	$17,453,651	$18,326,334
Year 1					
West County On-Demand	$575,770	$604,559	$634,786	$666,526	$699,852
Annapolis/Parole On-Demand	$415,120	$435,876	$457,670	$480,553	$504,581
Year 2					
Severna Park/Arnold On-Demand		$596,461	$626,284	$657,598	$690,478
Pasadena On-Demand		$738,904	$775,849	$814,642	$855,374
Year 3					
Crofton/Crownsville On-Demand			$770,812	$809,352	$849,820
AACC/Severna Park - Fort Meade/NSA			$885,583	$929,862	$976,355
Year 4					
Laurel - NSA/Fort Meade (Possible RTA Service)				$872,977	$916,625
Crofton - Bowie (Possible RTA Service)				$669,501	$702,976
Annapolis – Arundel Mills/BWI Airport				$1,651,435	$1,734,007
Crofton – Cromwell Light Rail				$1,218,083	$1,278,987
Year 5					
Parole - New Carrollton Express (Possible MDOT MTA Service)					$627,165
I-97 Express Bus					$632,142
Pasadena – NSA					$557,917
Glen Burnie – Fort Meade					$557,917
Total Proposed Operating Expenses	**$16,068,010**	**$18,206,775**	**$20,773,509**	**$26,224,180**	**$29,910,531**
Anticipated Funding Sources for Operating					
Federal/State	$7,798,635	$8,836,689	$10,082,457	$12,727,949	$14,517,126
Local	$8,269,375	$9,370,087	$10,691,052	$13,496,231	$15,393,406
Total Proposed Operating Revenues	**$16,068,010**	**$18,206,775**	**$20,773,509**	**$26,224,180**	**$29,910,531**

BALTIMORE CITY

Proposed Service and Funding

MTA's BMORE BUS plan proposes 11 new microtransit zones, as shown in **Figure 8**. These zones were designed for passengers taking short, local trips like running errands, going shopping, and socializing. They were also designed to connect riders in hard-to-serve areas to major transit hubs. Each proposed microtransit zone also provides feeder service to at least one bus route. The 11 recommended zones are located in Baltimore County, near Middle River, Cockeysville, Owings Mills, Windsor Mill, as well as along the City of Baltimore's southwest border. At this time, there are no funding sources identified.

Figure 8: Conceptual Microtransit Zones (Source: BMORE BUS)



BALTIMORE COUNTY

Proposed Service and Funding

In Baltimore County's 2021 TDP, six conceptual microtransit zones were developed along with a conceptual financial plan for operations where the microtransit zones were considered "mid-term TDP projects," shown in **Figure 9**. Regarding funding, the TDP report stated at the time that MDOT MTA did not anticipate increases in current federal and state programs that support current County Ride services, so any service expansions or improvements would most likely require additional local support. Post-TDP, MTA is currently working on BMORE BUS: a transit plan for the Baltimore region that will develop recommendations for transit service improvements over the next five to ten years. On the project's website, one of the improvements MTA is considering is on-demand transit, which may include Baltimore County and Anne Arundel County.

Figure 9: Conceptual Financial Plan for Operating (Source: Baltimore County TDP)

	Year					
Current/Projected Services	**1**	**2**	**3**	**4**	**5**	**Long-Term**
Baseline CountyRide Operating Budget[1]	$2,111,064	$2,174,396	$2,239,628	$2,306,817	$2,376,021	$2,447,302
Towson Circulator [2]	$1,357,200	$1,397,916	$1,439,853	$1,483,049	$1,527,541	$1,573,367
Short-Term TDP Projects						
Expanded CountyRide Service		$125,491	$129,256	$133,133	$137,127	$141,241
Owings Mills Microtransit Service		$249,260	$256,738	$264,440	$272,373	$280,544
Mid-Term TDP Projects						
Lochearn/Milford Mill Microtransit Service			$256,738	$264,440	$272,373	$280,544
Essex-Middle River Microtransit Service			$256,738	$264,440	$272,373	$280,544
Southwest Microtransit Service				$264,440	$272,373	$280,544
Arbutus/Halethorpe Microtransit Service				$264,440	$272,373	$280,544
Towson Microtransit Service				$264,440	$272,373	$280,544
CountyRide Saturday Service				$264,440	$272,373	$280,544
Middle River/Essex/Dundalk - Tradepoint Crosstown Route				$594,048	$611,869	$630,226
Long-Term TDP Projects						
Owings Mills Circulator					$1,527,541	$1,573,367
White Marsh – Essex Crosstown Route					$611,869	$630,226
Towson-White Marsh Crosstown Route					$611,869	$630,226
Perry Hall – Towson Crosstown Route					$611,869	$630,226
Pikesville- Woodlawn Crosstown Route						$630,226
Woodlawn – Catonsville Crosstown Route						$630,226
Pikesville-Towson Crosstown Route						$630,226
Overlea/Parkville – Towson Crosstown Route						$630,226
Subtotal Projected Operating Expenses	**$3,468,264**	**$3,947,063**	**$4,578,950**	**$6,368,127**	**$9,922,319**	**$12,740,891**

CARROLL COUNTY

Overview

Carroll County has countywide dial-a-ride service that is open to the public without an application process. Service is available Monday through Friday from 7 a.m.–5 p.m., and trip cost is based on trip distance. Typical costs range from $4 one-way to up to a maximum of $9 one-way. Reservations for essential appointments such as dialysis, radiation, employment, and routine doctor's appointments may be scheduled for up to four weeks in advance. Other trips or appointments can be scheduled two weeks in advance. Same-day reservations may be made; however, availability is not guaranteed.

Additionally, Carroll County's fixed-route bus service, called TrailBlazers, will deviate up to three-quarters of a mile during regular operations. TrailBlazer customers must schedule a deviation at least 3 hours in advance and will incur a $1 additional fee.

Policies

Carroll County's demand response service has policies pertaining to age requirements, fares, and ride requests. In addition, to use the service, all riders must be registered with the Carroll Transit System (CTS).

- Age Requirements: Riders must be 13 years of age or older to ride alone.
- Fares: Exact fare is required to use the service. Riders can pay the fare using cash, tickets, or fare accounts which can be refilled using cash, checks, or credit card. Carroll County determines fares based on trip distance, however, there are flat rates in certain instances. **Table 5** shows the distance-based cost and exemptions.
- Ride Requests: Contingent on registering with CTS, riders must schedule a trip providing information on the trip's date, desired pick-up and return time, and street address to be picked up at. Same day reservations are based on availability, and riders have up until one-hour before their scheduled trip to cancel.

Table 5: Distance-Based Fare for Carroll County Demand Response Service

FARE	DISTANCE
$4.00	Within 5 miles
$6.00	5 – 10 miles
$7.00	10 – 15 miles
$8.00	15 – 20 miles
$9.00	20 – 25 miles
$2.00	Riders age 65+ going to nearest Senior Center
$5.00	Dialysis clients outside Westminster Area

Existing Funding

Carroll County's demand response is contracted out and operated by the non-profit, Ride with Us, and there is limited publicly available information on Carroll County's allocation of funds toward the contactor. In Carroll County's 2022 NTD Agency Profile, the county received operating funds, agency-wide, largely through federal funds (83 percent), approximately 6 percent from state and local funds combined, and the remaining 11 percent from directly generated revenue, which total $228,386 in the 2022 fiscal year[7]. With the $2.3 million-dollar operating budget that year, the county's demand response operating costs were $1.6 million dollars and generated 90 percent of the county's fare revenue ($208,295).

HARFORD COUNTY

Overview

Harford County has a proposed microtransit zone in Bel Air (shown in **Figure 3**) from the Bel Air/Forest Hill (Harford County, MD) Small Area Plan. This zone is planned to operate approximately eight hours per day and to provide service in areas that currently have limited or no service. This zone is not yet in operation as of August 2024. Additionally, Harford County operates deviated fixed-route service in Cecil County only.

Policies

Harford County's demand response service has public-facing policies pertaining to age requirements, eligibility requirements, fares, and ride requests. In addition, to use the service, riders must fill out Harford Transit LINK ADA transportation application and then have their application approved.

- Age Requirements: Riders must be over the age of 60 and/or have a qualifying disability[8] who does not live within the ADA paratransit service area.
- Eligibility Requirements: Once eligibility is determined, the individual will receive a card with an expiration date of when they will have to reapply (typically every five years, unless eligibility is based on a temporary status). If denied service, the rider may file an appeal.
- Fares: Each trip is a flat fare of $2.
- Ride Requests: Riders can request a ride during the operating hours for Harford Transit LINK fixed-route bus service. Trip requests can be made within 24-hours of Harford Transit business operations (Monday through Friday, 3:30 a.m.–7:30 p.m.). If a passenger cancels their trip within an hour of scheduled pick-up or misses their time slot, Harford County has a "No Show Policy," which **Table 6** details.

[7] 2022 Annual Agency Profile - The County Commissioners of Carroll County, Maryland dba Carroll Transit System (NTD ID 30092)

[8] HTL-ADA-Application-2024_202406121324029887.pdf (harfordcountymd.gov)

Table 6: Harford County's "No Show Policy"

NO SHOW	ACTION
1st	Written notice
2nd	30-day suspension
3rd	3-month suspension
4th	6-month suspension

Existing Funding

In Harford County's 2022 NTD Agency Profile, it was reported that operating funding sources, agency-wide, were largely acquired through federal funds (90 percent), with assistance from local government and directly generated revenue at six percent and four percent of the budget, respectively[9]. With the $5.8 million generated through these funds, demand response required one-third of the budget at $1.9 million and also generated one-third of the fare revenue for the fiscal year ($72,000).

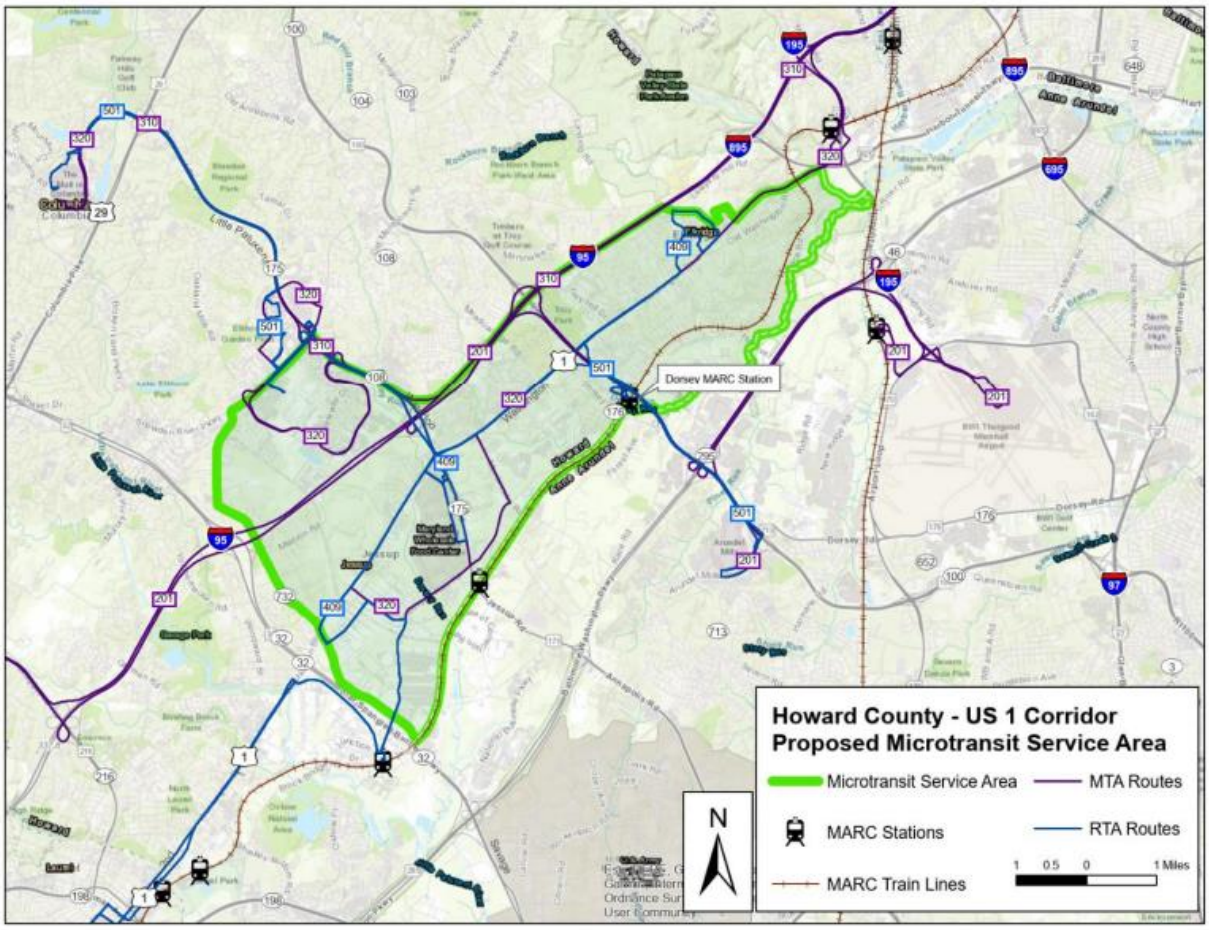
HOWARD COUNTY

Overview

Howard County first proposed microtransit service in the US 1 Corridor (Howard County) Small Area Plan, which was completed in March 2021. In May 2024, the County issued a Request for Proposal (RFP) to a one-year, turn-key (contracted/Transportation as a Service) microtransit service pilot. Microtransit service will be operated under the "RTA" brand name. The pilot will have two additional one-year options available to continue or expand services for up to a total of three years. **Figure 10** below shows the proposed microtransit service area that will be refined once a contract is awarded to a microtransit provider.

[9] 2022 Annual Agency Profile - Harford County Maryland dba Harford Transit LINK (NTD ID 30074)

Figure 10: Proposed Microtransit Service Area (Source: RFP NO. 07-2024)



Policies

In preparation for the proposed microtransit service, Howard County's RFP includes policies that would pertain to the public including fares, rider experience, ride requests and service area parameters.

- Fares: Fares would exclusively be collected through the RTA Transit App. In addition, the fare model would be the same as RTA's existing fixed-route fare structure.
- Rider Experience: Rides will be pooled to include 2 to 6 (or more) passengers. Maximum wait time for pick-up once a trip has been requested is 30 minutes. Average wait time for pick-up is 15 minutes or less. Average walk distance to a stop is 0.10 miles. Maximum walk distance to a stop is 0.25 miles
- Ride Requests: Maximum vehicle operator wait time for passengers is 5 minutes. Maximum time added to a requested ride is up to 5 minutes.
- Service Area Parameters: Trips must begin and end within the zone. The only exception is for the US-29N micro transit zone.

Funding

The RFP did not include a conceptual financial plan or potential funding sources for consideration.

QUEEN ANNE'S COUNTY

Overview

Queen Anne's County operates countywide door-to-door demand response called "County Ride." Service is provided under the County's Department of Aging and in conjunction with Delmarva Community Transit (DCT). Interested riders can call or email County Ride services to reserve a ride.

Policies

Queen Anne County's County Ride service has public-facing fare and ride request policies.

- Fares: There is currently no fee for County Ride. This is a pilot program and will be available until December 31, 2024.

- Ride Requests: Riders can call a ride, or send an email, between 8 a.m.–4 p.m., Monday through Friday. There is no information on the County Ride website specifying if the ride has to be called in the day before, like other agencies in the Baltimore region. Like Harford County, County Ride also has an iteration of the "No Show" policy for cancellations within a certain window of time or if a rider misses their trip. County Ride's policy runs on a point system (see **Table 7**), however, with the following points received for the following actions:

    - Same Day Notice: Cancelling your ride between two hours and one hour before the trip. **1 POINT**

    - Late Notice: – Cancelling your ride between sixty minutes and thirty minutes before your scheduled trip. **3 POINTS**

    - No-Show/Cancel at Door: Cancelling your ride less than thirty minutes before your scheduled trip (includes telling the operator at your door that you will not be taking your trip) OR not being present within the Ready Window after the operator has waited five minutes (includes showing up to take the ride after the operator's wait time but before the operator has pulled away). **5 POINTS**

Table 7: Queen Anne's County "No Show Policy"

CUMULATIVE POINTS	WITHIN	ACTION
12	30 days	1 week suspension
24	60 days	2 week suspension
36	90 days	6 week suspension
48	120 days	10 week suspension

Existing Funding

Queen Anne's County's "County Ride" service is operated under the county's Department of Aging. Referencing the county's approved Fiscal Year 2025 budget, there is limited information revealing how the county classifies "County Ride" within the subcategories under Revenue and Expenditures[10]. The county's NTD Agency Profile provides information on the breakdown of agency-wide operating expenses. Similar to Carroll County, the county largely received funding from the federal government (66 percent) [11]. Additional assistance was provided from the local and state governments that yielded a combined share of 32 percent, and directly generated revenue supported two percent of the budget. $1.4 million was generated through these funds, and Demand Response required 30 percent of the budget at $422,721 yet generated 44 percent of the fare revenue for the fiscal year ($15,765).

[10] Queen Anne's County Budget: FY2025 Department of Aging

[11] 2022 Annual Agency Profile - Queen Anne's County Department of Aging (NTD ID 30192)

3. Transit Environment

Service Area Demographics

The built environment and demographics of a service area influence the demand and need for transit, as well as the efficiency of fixed-route or microtransit service. This section reviews the demographic characteristics of each jurisdiction, including:

- Current population and employment totals and densities
- Future population and employment totals and densities
- Minority population total
- Household income
- Age breakdown

POPULATION AND EMPLOYMENT

Population and employment density are critical to the success of a fixed-route or microtransit system. To offer efficient and cost-effective service, it is crucial to target the appropriate transit type to the density of an area.

Each jurisdiction varies in terms of density and overall population and jobs, though Baltimore City, Baltimore County and Anne Arundel have the highest population and jobs throughout the region. **Figure 11** and **Figure 12** detail the current population and jobs from 2022 American Community Survey 5-Year estimates, 2022 Longitudinal Employer-Household Dynamics (LEHD) data, and BMC Round 10 population and job forecasts for 2050 population and employment by jurisdiction. Overall, population and employment are expected to increase across all jurisdictions. In the 2050 projections, Anne Arundel, Baltimore City, and Baltimore County have the majority of population and jobs across each time period.

Figure 11: Current and Future Population Projections

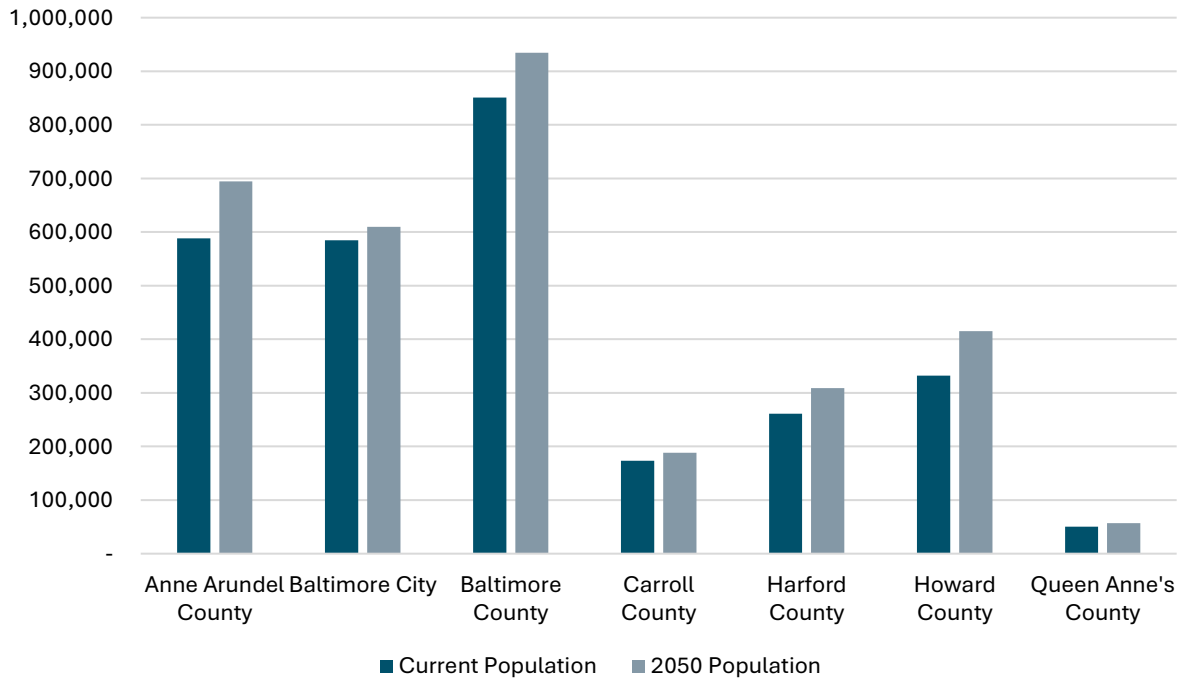


Figure 12: Current and Future Jobs Projections

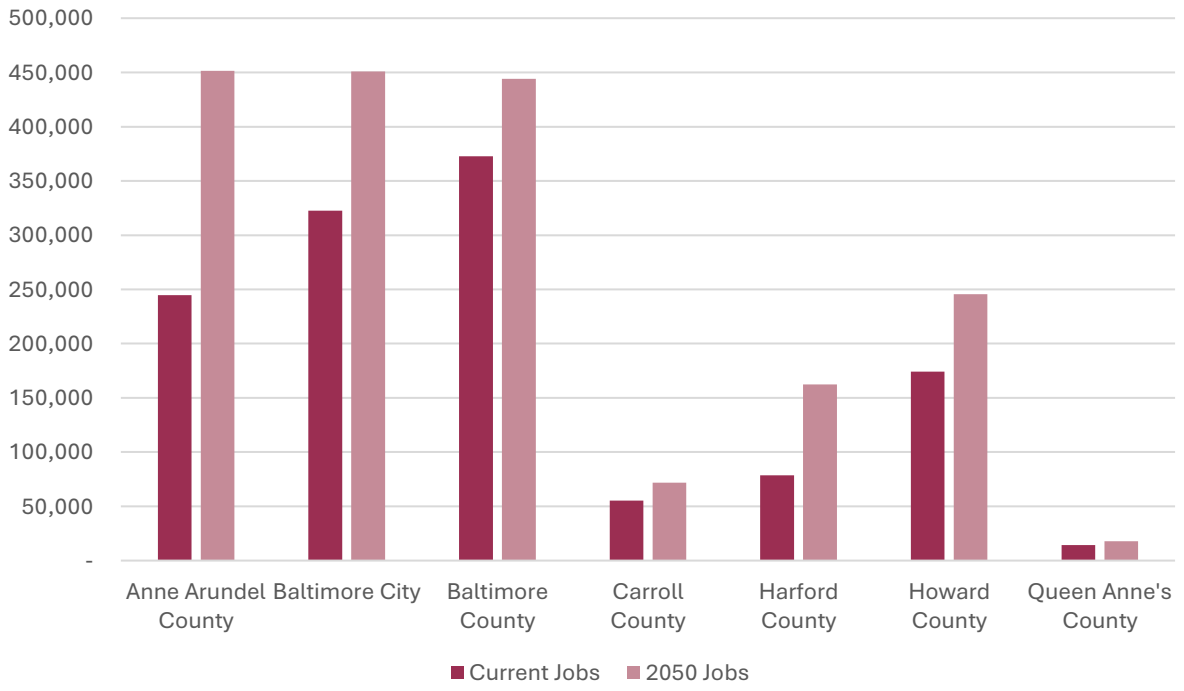
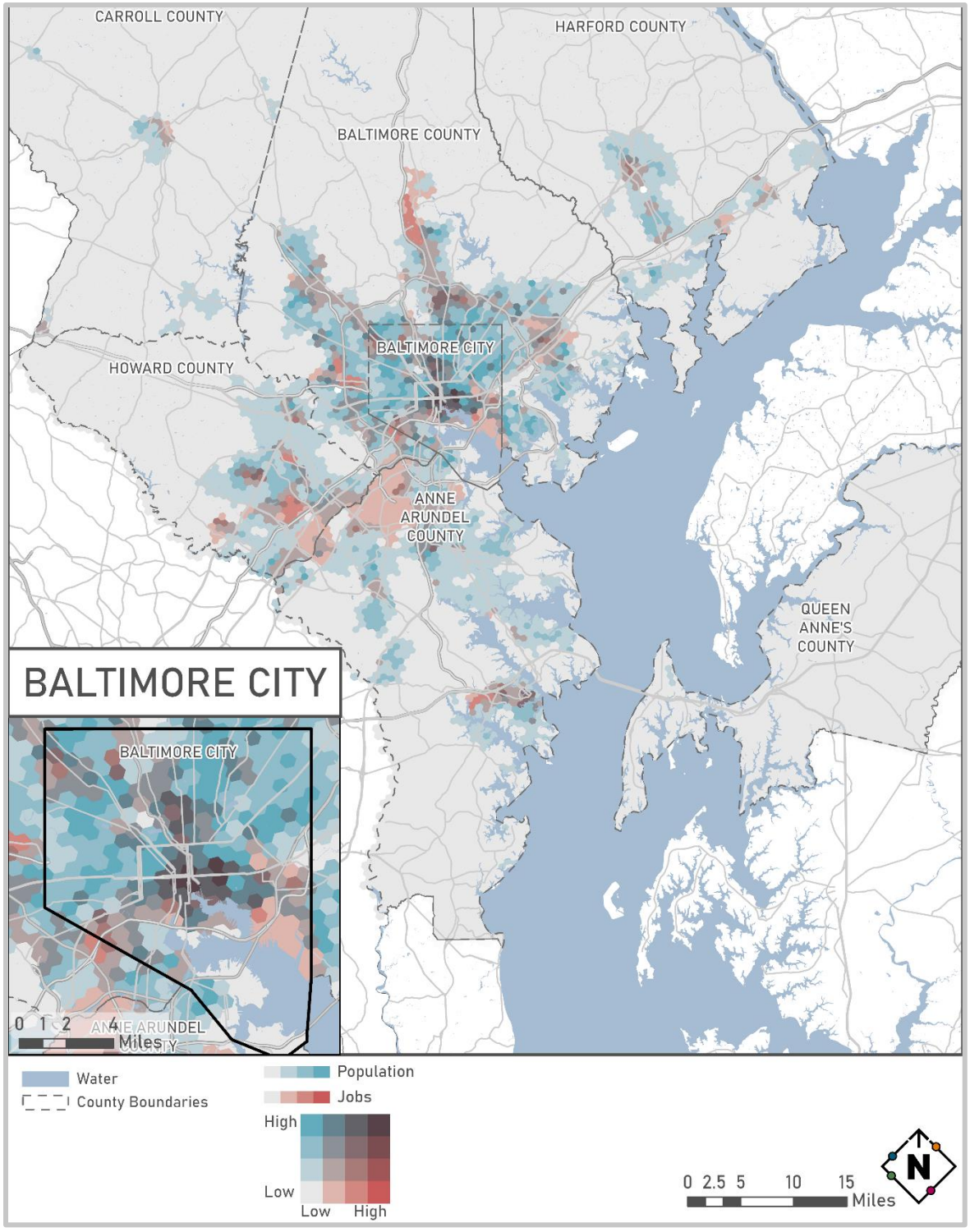


Figure 13 depicts current population and employment densities. In both current and future cases, Baltimore City and Baltimore County have the highest combination of population and jobs, with some increases in density in other jurisdictions between 2022 and 2050. Compared to the region overall, Anne Arundel is projected to experience the greatest increases in density by 2050, along with some increases in parts of Carroll and Howard counties.

Figure 13: Current Population and Employment Densities



AGE DISTRIBUTION BY JURISDICTION

Age is another factor in transit usage, with younger and older individuals more likely to use transit as a mode of travel. **Figure 14** shows the breakdown of age groups for each jurisdiction in terms of total population, while **Figure 15** includes the percentage of each group. Age distributions are approximately equivalent across each jurisdiction, however Baltimore City has a slightly higher percentage of working age population, while Queen Anne's County has a higher percentage of population age 65 and over.

Figure 14: Age Distribution by Jurisdiction

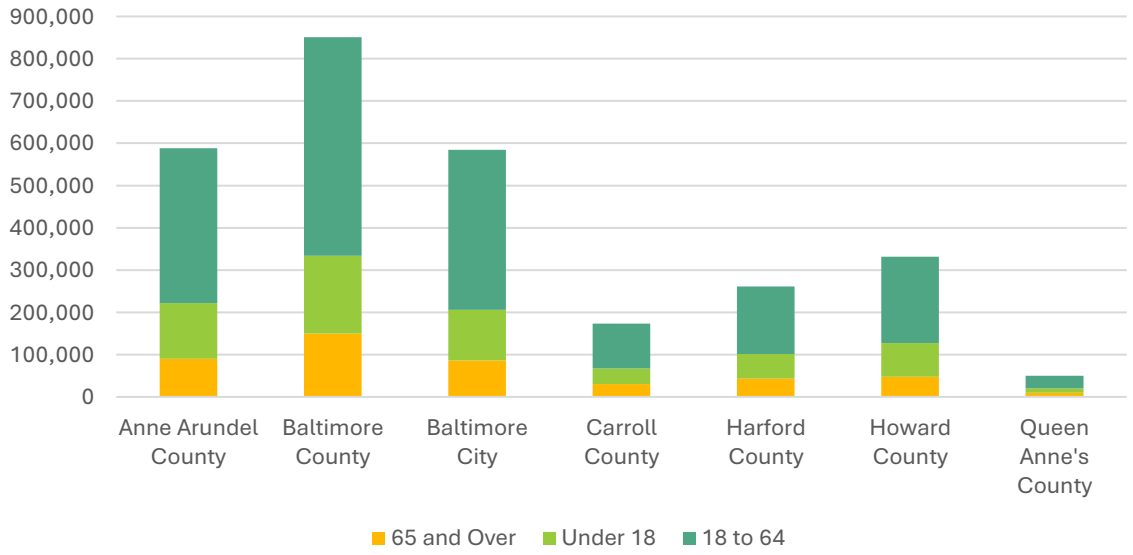
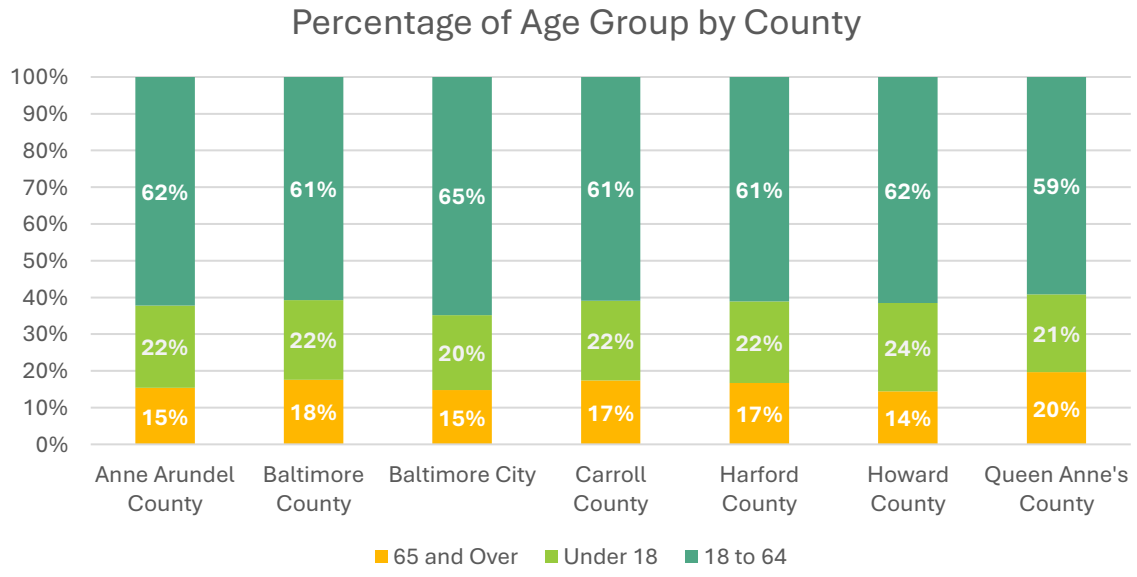


Figure 15: Percentage of Age Group by Jurisdiction



MINORITY POPULATION BY JURISDICTION

It is critical to ensure that transit is provided in an equitable manner and to diverse groups. Access to quality transit provides important connections to employment and essential services. People of color are more likely to utilize transit to access services. **Figure 16** shows the minority population percentage of each jurisdiction, while **Figure 17** shows the racial composition for each jurisdiction. In this analysis, minority population is calculated as the total population minus the non-Hispanic White population. Baltimore City has the highest percentage of minority population. Aside from Baltimore City, Howard County is the only other jurisdiction exceeding the regional average. Most jurisdictions have a majority or plurality of non-minority residents, with Baltimore City and Baltimore County both having a substantial Black population.

Figure 16: Minority Population Percent by Jurisdiction

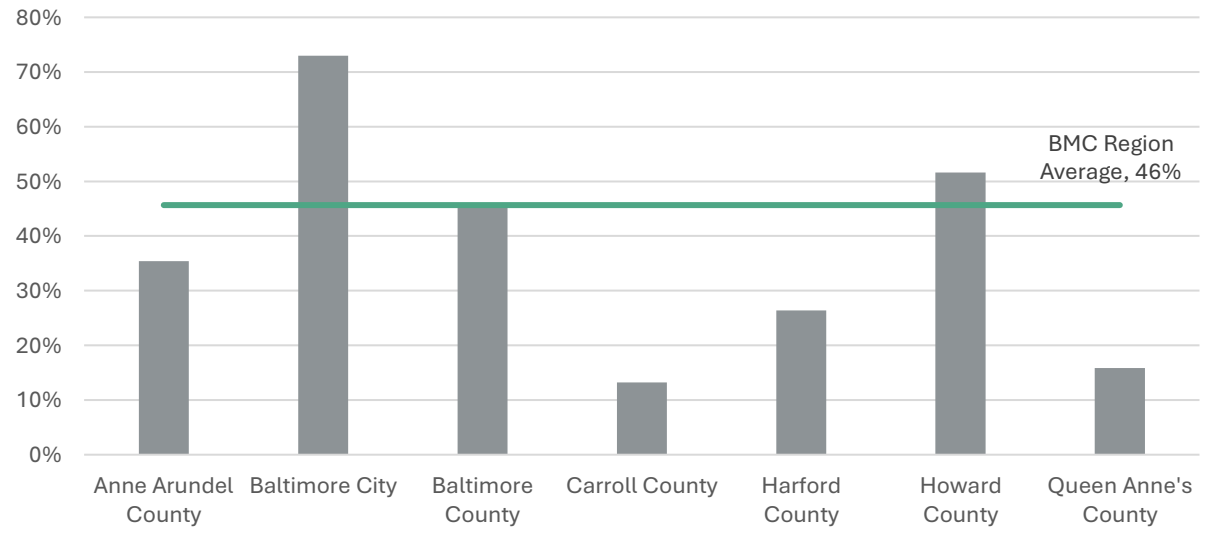
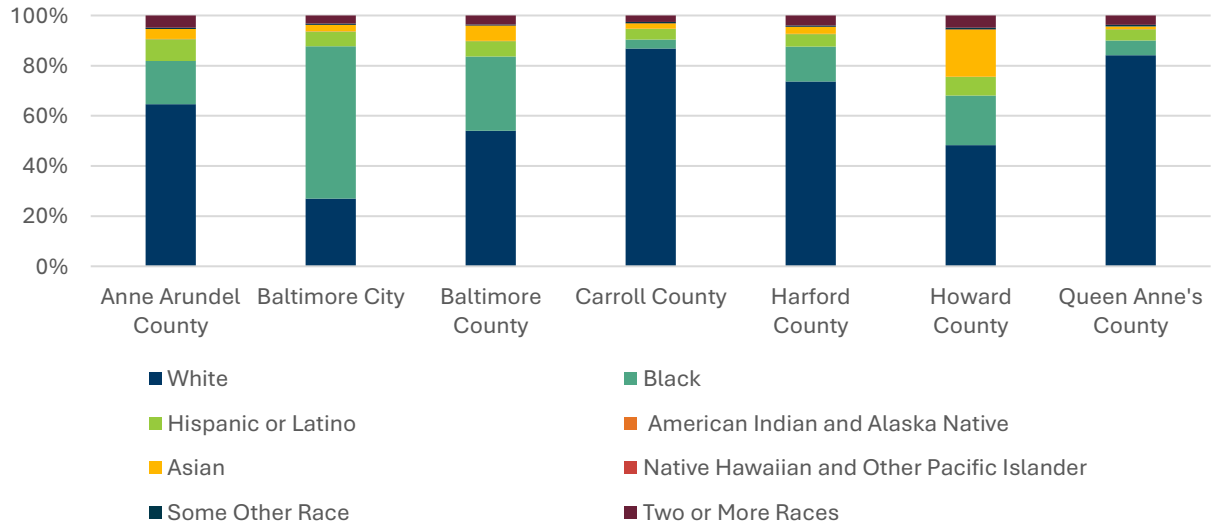


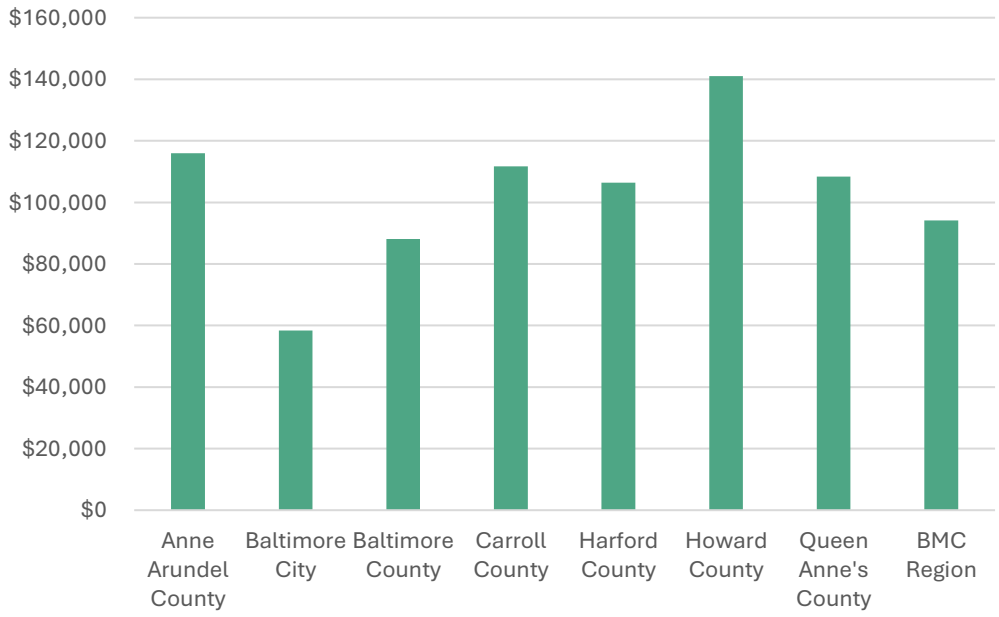
Figure 17: Racial Composition by Jurisdiction



MEDIAN INCOME BY JURISDICTION

The region's jurisdictions also vary in terms of household income, with Baltimore City and Baltimore County having lower median household incomes compared to other jurisdictions in the BMC region, as shown in **Figure 18**. Income is inversely correlated with the use of transit services, as people from lower income households are more likely to use transit, likely due to the high cost of personal vehicle ownership.

Figure 18: Median Household Income by Jurisdiction



Access to a Personal Vehicle and Affordability of Transit versus Car Ownership

About 90 percent of households in the BMC region have access to at least one personal vehicle.[12] Nearly all jurisdictions' percentages of households with at least one car exceed 95 percent of all households. Baltimore County and Baltimore City are the two exceptions at 92 percent and 74 percent, respectively.

Affordable transit options may be beneficial to people living in areas with higher housing cost burdens (see **Figure 47** in the appendix which visualizes housing cost burden percentages across each jurisdiction in the BMC region). When it pertains to housing burdened rental units in the region, percentages range from 22 percent in Anne Arundel County to 53 percent in Baltimore City[13]. For housing burdened owner households, percentages range from 13 percent in Baltimore County to 26 percent in Baltimore City[14]. Certain residents who allocate significant expenses toward housing may find that car ownership and maintenance can be unsustainable. Affordable transit options potentially fill this mobility gap, providing access to a variety of

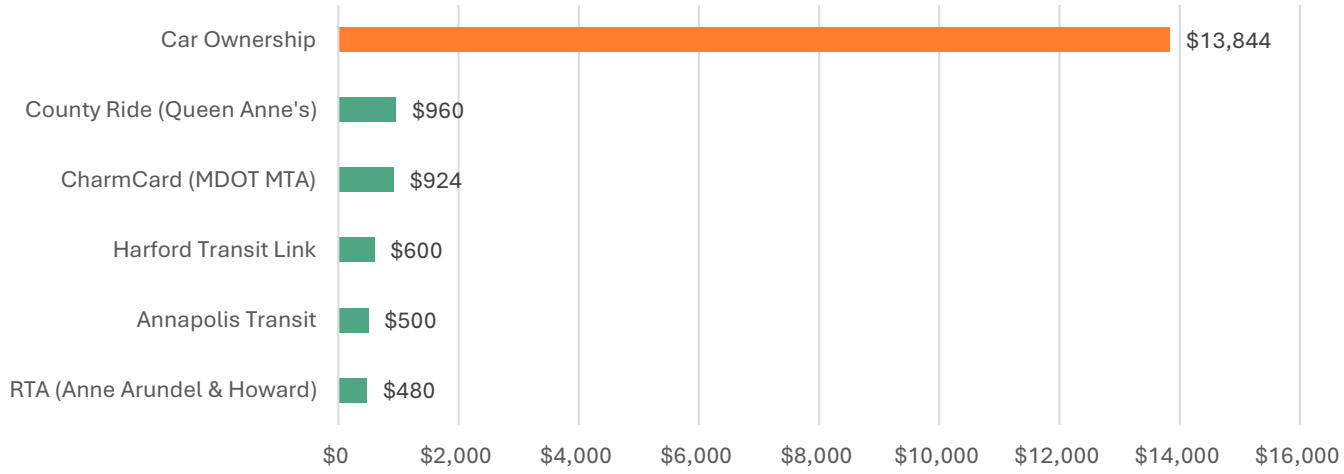
[12] B08201: Household Size by Vehicles Available (ACS Five Year Estimates, 2017 – 2022) - Census Bureau Table

[13] Consolidated Planning/CHAS Data | HUD USER (ACS Five-Year Estimates, 2016 – 2020)

[14] Consolidated Planning/CHAS Data | HUD USER (ACS Five-Year Estimates, 2016 – 2020)

activity generators. **Figure 19** visualizes the annual cost of car ownership, based on the 2023 average[15], compared to the annual cost of monthly transit passes of local transit providers in the BMC region.

Figure 19: Annual Cost of Car Ownership Compared to Average Annual Cost of Monthly Transit Passes



Commute Mode Share

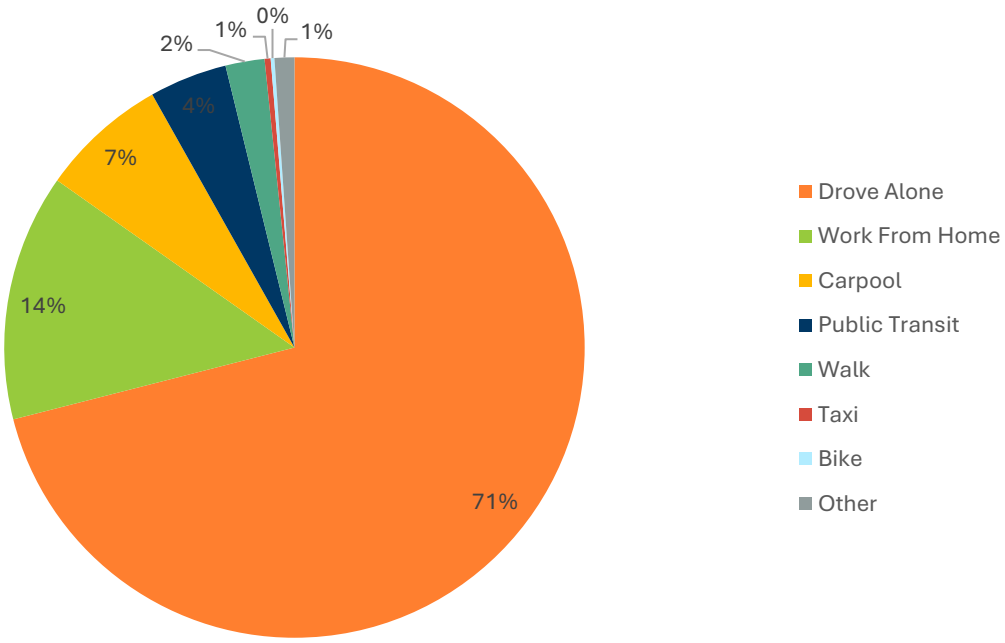
Mode share is a common indicator used to illustrate the effectiveness of infrastructure, investments, policies, and land-use decisions in supporting different types of travel to work. By examining commute mode share, planners and decision-makers can better understand one portion of overall travel demand in the Baltimore region.

REGION WIDE

Figure 20 shows mode share throughout the BMC service area. Single occupancy vehicle (SOV) travel, referred to as “Drive Alone,” is the predominant mode of travel at 71 percent. Working from home is the only other commute mode that exceeds 10 percent in the BMC service area, at almost 14 percent. In the BMC region, people who take public transit as their primary mode of commuting make up 4 percent of the total mode share, which is higher than the national average of 3 percent.

[15] AAA. Your Driving Costs 2023

Figure 20: Commute Mode Share in BMC Service Area



URBAN AREAS AND RURAL TO SUBURBAN AREAS

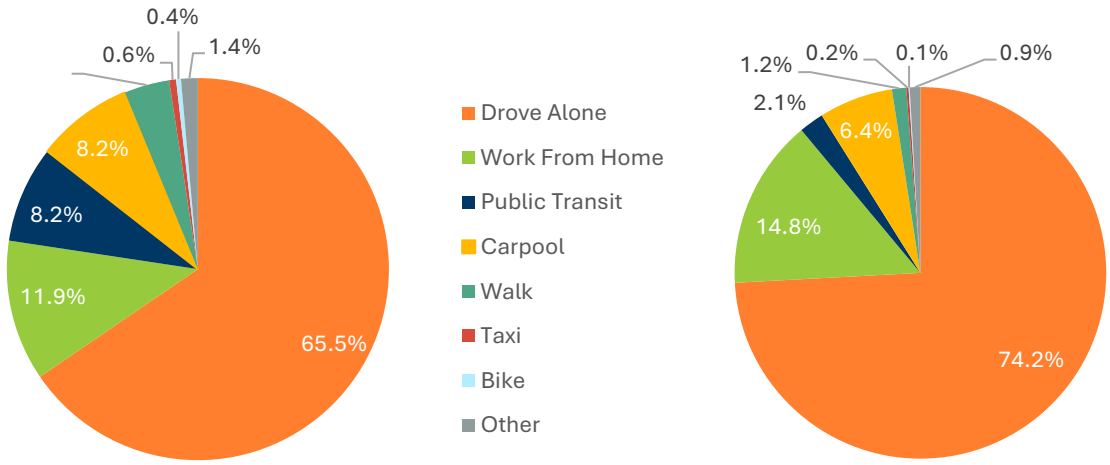
Urban Areas

Figures 21 shows mode share in urban areas across the BMC service area. “Drive Alone” is the most common mode for urban areas at 66 percent, which is less than the service area average of 71 percent. “Work from Home” is the only other mode that exceeds 10 percent of total mode share for urban areas at 12 percent, which is less than the service area average (14 percent). These findings suggest that there are more “in-person” jobs as well as a greater likelihood to use public transit in these areas.

Rural to Suburban Areas

Figures 21 shows mode share in rural to suburban areas across the BMC service area. Similarly, “Drive Alone” is also the most used mode for rural to suburban areas at 74 percent, which exceeds the service area average of 71 percent. “Work from Home” is the only other mode that exceeds 10 percent of total mode share for rural to suburban areas at 15 percent, which also exceeds the service area average (14 percent). These findings suggest population and activity generator densities are lower in these areas, moreover, a low demand exists for public transit.

Figures 21 and 22: Commute Mode Share in Urban Areas (left) and Rural to Suburban Areas (right)



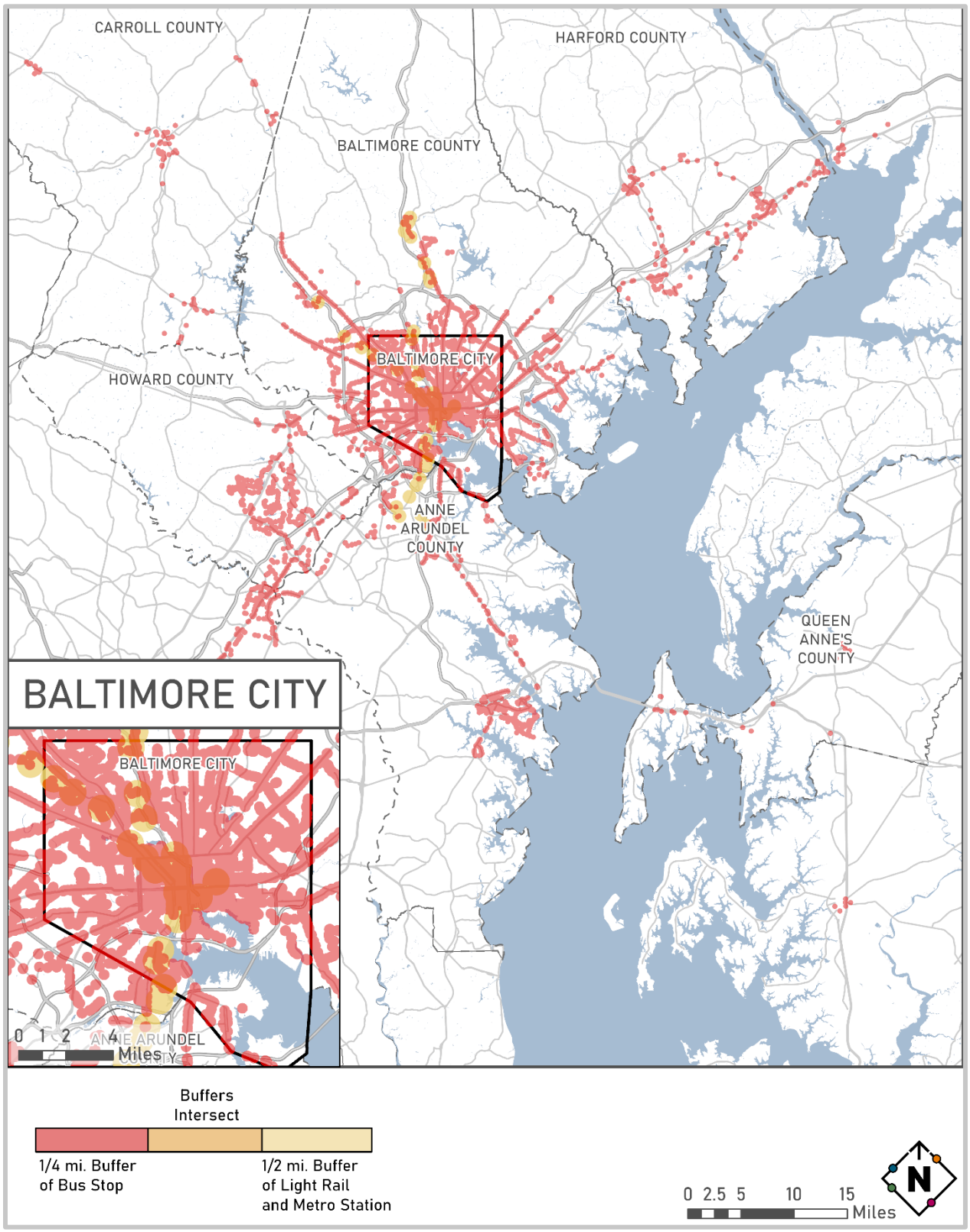
Access to Transit

One of the most common ways people access fixed-route transit is by walking to the nearest bus or rail station. Walking access is considered within a quarter mile of a bus stop and half-mile of a rail station, respectively. In the BMC region, minority and low-income populations are more likely to live within walking distance of bus, metro, and light rail transit modes compared to the region's entire population. **Table 8**Error! Reference source not found. shows the total population, as well as minority and low-income populations, that are within walking distance to transit in the BMC Region. **Figure 23** visualizes the population in the BMC region within ¼ mile of a fixed-route bus stop and/or ½ mile of a Metro or Light Rail station.

Table 8: Access to Fixed-Route Transit Among Sociodemographic Groups

WALKING DISTANCE METRIC	TOTAL POPULATION	MINORITY POPULATION	LOW-INCOME POPULATION
¼ mile of a fixed-route bus stop	973,260 (49%)	626,075 (57%)	232,206 (62%)
½ mile of a Metro or Light Rail station	135,781 (7%)	92,048 (8%)	41,690 (11%)
Total BMC Region Population	2,004,389 (100%)	1,099,390 (100%)	375,975 (100%)

Figure 23: Walking Access to Fixed-Route Bus and Rail



Transit Ridership Growth

According to BMC's demographic and socioeconomic forecasting, between 2020 and 2050, the region is projected to see over a 12 percent increase in total population.[16] While BMC's forecasting model does not show projections for populations who primarily use public transit, this report provides estimated 2050 figures for populations who use public transit as their primary commute option using BMC forecasting coupled with ACS commuter data. **Table 9** shows the 2050 population projection for each jurisdiction, and the estimated 2050 figures for populations who use public transit as their primary commute option.

Table 9: 2020 v. 2050 Population Estimates

JURISDICTION	2020 POPULATION	2020 PUBLIC TRANSIT COMMUTES	2050 POPULATION FORECAST	2050 PUBLIC TRANSIT COMMUTES	PERCENT CHANGE
Anne Arundel County	592,695	7,879	694,235	9,226	17%
Baltimore City	585,708	30,403	609,776	31,650	4%
Baltimore County	854,523	17,721	934,521	19,387	9%
Carroll County	172,891	453	188,357	493	9%
Harford County	260,924	1,122	308,810	1,328	18%
Howard County	332,317	3,850	414,820	4,805	25%
Queen Anne's County	49,874	200	57,032	229	14%

[16] Round-10_Jurisdiction.pdf (baltometro.org)

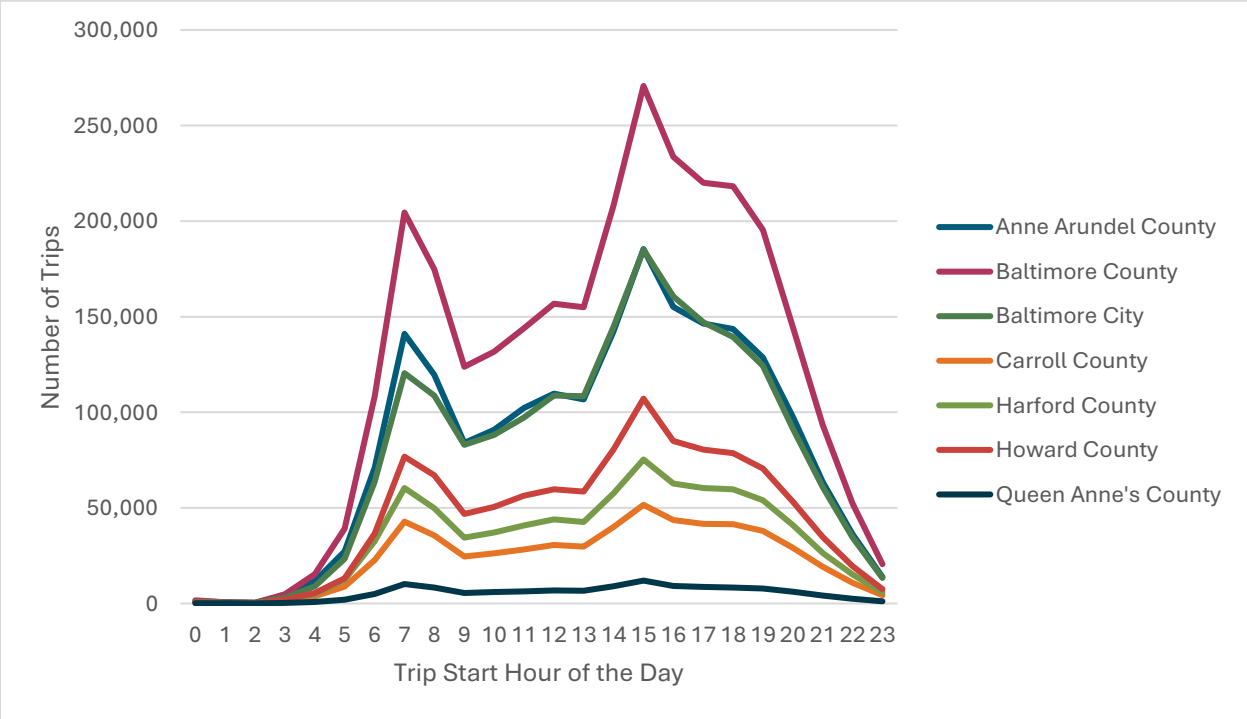
4. Travel Patterns

Travel Patterns via All Modes

Understanding where, when, why, and how people travel is valuable in planning and evaluating transit service. This section uses location-based data to provide insights on travel patterns in the BMC region.[17]

Overall, Baltimore County has the largest share of trips in the region. Trip demand is highest in the morning, around 6:00 a.m., with a higher and more pronounced peak in the afternoon between 3:00 p.m. to 6:00 p.m. (**Figure 24**). The breakdown of trip purposes, shown in **Table 10,** is consistent across the region's jurisdictions, with nearly half of trips being for Work and Shopping purposes. Trip durations (**Table 11**) vary from approximately 20 minutes to just under 30 minutes, with trip distance varying between shorter trips in more dense areas in Baltimore City, to longer trips in more suburban jurisdictions.

Figure 24: Trip Volumes by Hour by Jurisdiction



[17] Data on trips on an average weekday was retrieved from Replica's Fall 2023 Average Weekday dataset. Trips were then assessed by the origin jurisdiction of the trip and aggregated based on each jurisdiction. Excludes commercial and return to home trips.

Table 10: Trip Purpose by Jurisdiction - Percent of Jurisdiction Total

Purpose	Anne Arundel	Baltimore City	Baltimore County	Carroll	Harford	Howard	Queen Anne's	BMC Region
Eating	14%	13%	14%	13%	13%	14%	11%	13%
Lodging	1%	1%	0%	0%	1%	1%	1%	1%
Maintenance	6%	6%	5%	5%	6%	5%	5%	6%
Other	5%	8%	6%	5%	5%	6%	4%	6%
Recreation	4%	4%	3%	3%	4%	4%	4%	4%
Education	10%	9%	10%	9%	10%	11%	12%	10%
Shopping	31%	27%	31%	31%	30%	31%	27%	30%
Social	9%	10%	8%	14%	11%	8%	18%	9%
Work	18%	21%	20%	18%	19%	19%	18%	19%
Work from Home	2%	1%	1%	2%	1%	2%	1%	1%

Table 11: Trip Duration and Distance by Jurisdiction – All Modes

Origin Jurisdiction	Average Trip Duration (Minutes)	Average Trip Distance (Miles)
Anne Arundel County	22.5	8.3
Baltimore County	21.6	7.4
Baltimore City	21.3	6.4
Carroll County	25.0	9.2
Harford County	23.1	8.4
Howard County	22.3	8.6
Queen Anne's County	28.2	10.8

Travel Patterns via Transit

Similar to the “all modes” travel pattern analysis, travel patterns were analyzed for trips made using transit for each jurisdiction within the BMC Region (seen in **Figure 25** and **Table 12** and **Table 13** below). This analysis focuses on trip times, trip mode and purpose, and trip duration and distance. Data on trips on an average weekday was retrieved from Replica’s Fall 2023 Average Weekday dataset. Trips were then assessed by the origin jurisdiction of the trip and aggregated based on each jurisdiction. Carroll County is not present from this analysis, as Replica did not identify any trips as originating within Carroll County for the time period analyzed.

Figure 25: Transit Trip Volumes by Hour by Jurisdiction

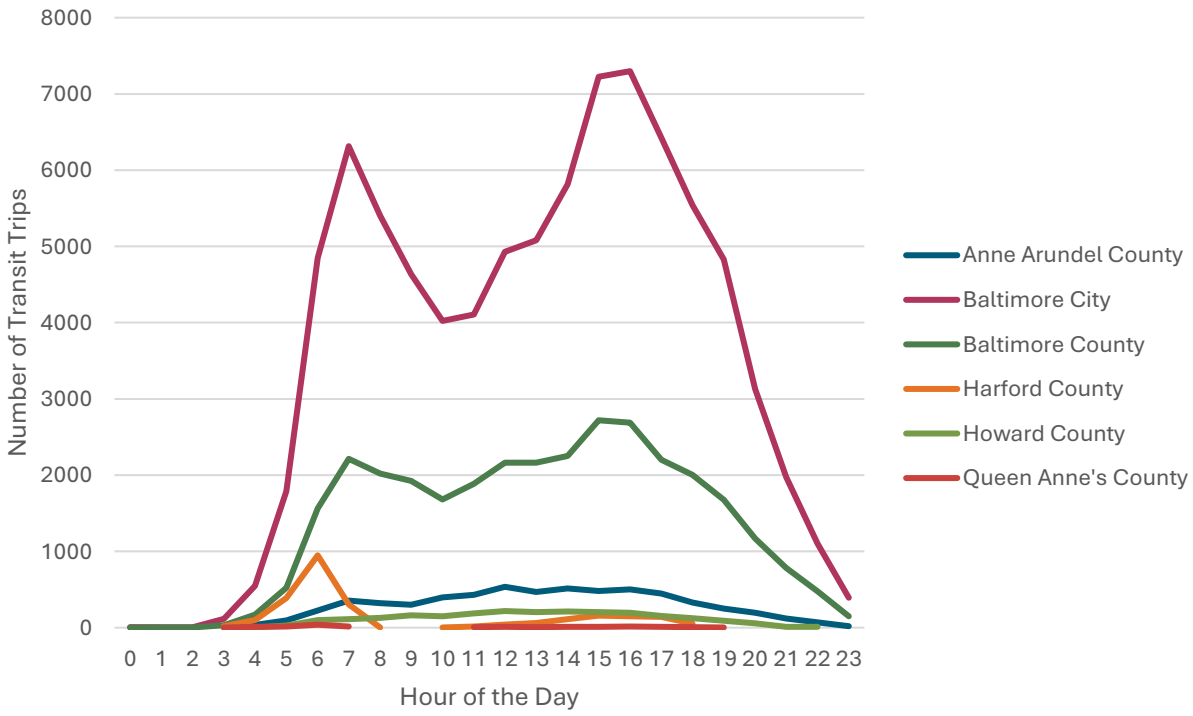


Table 12: Transit Trip by Purpose

PURPOSE	ANNE ARUNDEL	BALTIMORE CITY	BALTIMORE COUNTY	CARROLL[18]	HARFORD	HOWARD	QUEEN ANNE'S	BMC REGION
Eating	11%	9%	10%	--	3%	9%	6%	9%
Lodging	2%	1%	0%	--	0%	1%	0%	1%
Maintenance	4%	4%	3%	--	2%	4%	1%	3%
Other	4%	8%	5%	--	2%	4%	2%	7%
Recreation	3%	2%	2%	--	1%	3%	0%	2%
Education	1%	1%	1%	--	0%	1%	1%	1%
Shopping	23%	19%	23%	--	6%	24%	8%	20%
Social	6%	5%	4%	--	1%	3%	1%	5%
Work	46%	51%	51%	--	85%	51%	82%	52%
Work from Home	0%	0%	0%	--	0%	0%	0%	0%

[18] Information on Carroll County trip information is not available in Replica Places Studies due to limited daily trips per day. During discussions with Replica staff, they indicated that ground truth data can be provided to provide insight into Carroll County transit trip trends, but this endeavor would likely take time beyond the preparation time of this document.

Table 13: Average Transit Trip Duration and Distance by Jurisdiction

Origin Jurisdiction	Average Trip Duration (Minutes)	Average Trip Distance (Miles)
Anne Arundel County	50	9.7
Baltimore County	48	9.3
Baltimore City	37	5.7
Carroll County	--	--
Harford County	77	20.5
Howard County	41	7.8
Queen Anne's County	70	17.5

Travel Flows

Figure 26 and **Figure 27** provide a regional overview of trips within or between zip code tabulation areas (ZCTA) for weekday and weekend trips.[19] Trip volumes are similar between each day type.

As is evidenced in both figures, weekday and weekend travel flows are highly concentrated in large population centers throughout the region, primarily in high activity and population areas such as central Howard County along US Route 1 and I-95 near southwest Baltimore City, in Anne Arundel County near Annapolis, and in both Cockeysville and Bel Air north of Baltimore City. Harford County has substantial travel within the county but limited regional connectivity, while Queen Anne's County has limited major travel.

Flows connecting to Baltimore City are significant and more numerous than other jurisdictions. This is despite ZCTAs within the city typically being more compact than other ZCTAs in other jurisdictions.

[19] Data based on Replica's Fall 2023 Average Weekday and Weekend datasets. Both internal and external flows were filtered to trips with volumes exceeding an average of 5,000 trips per day to better visualize major connectivity.

Figure 26: Weekday Travel Flows - BMC Region

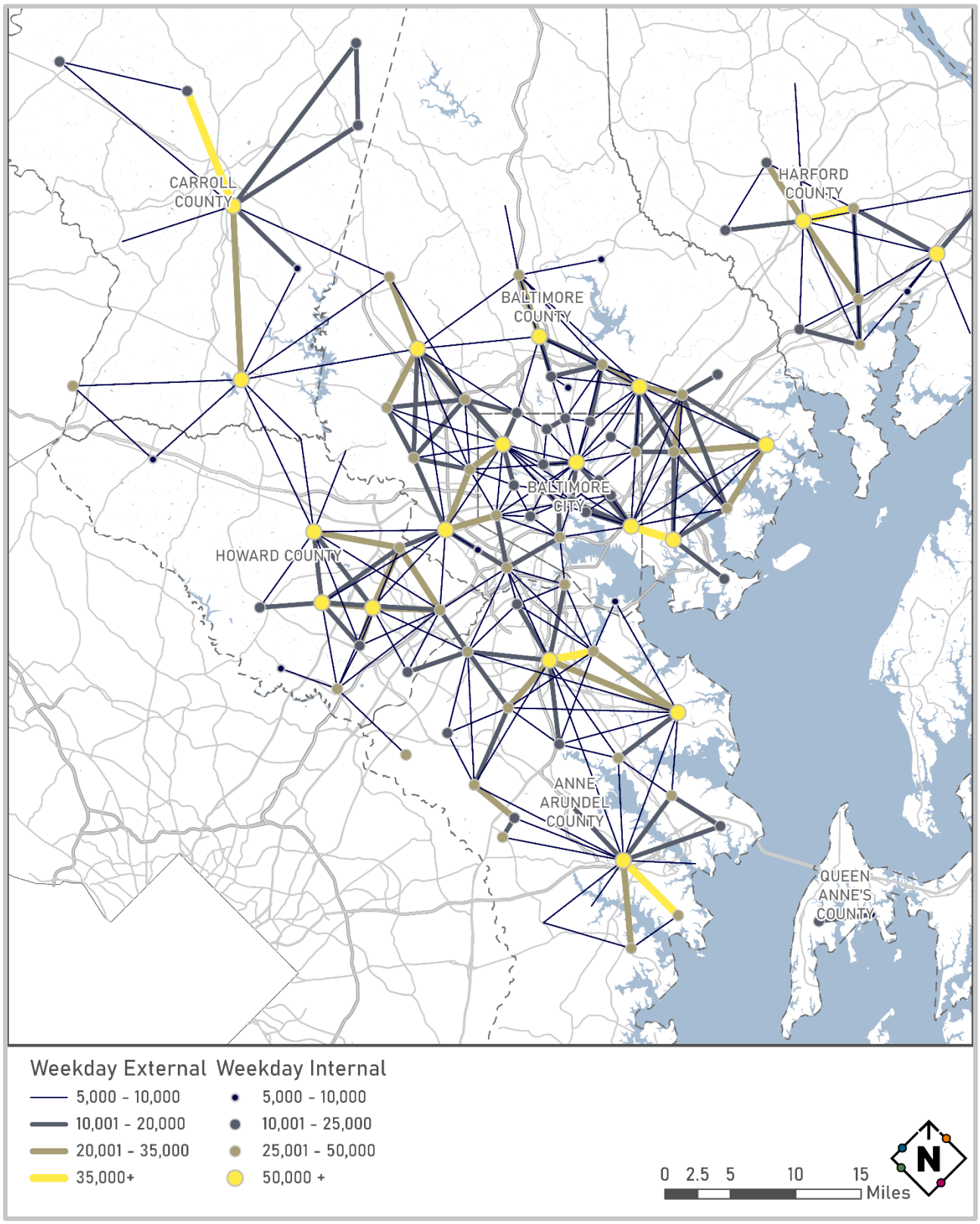
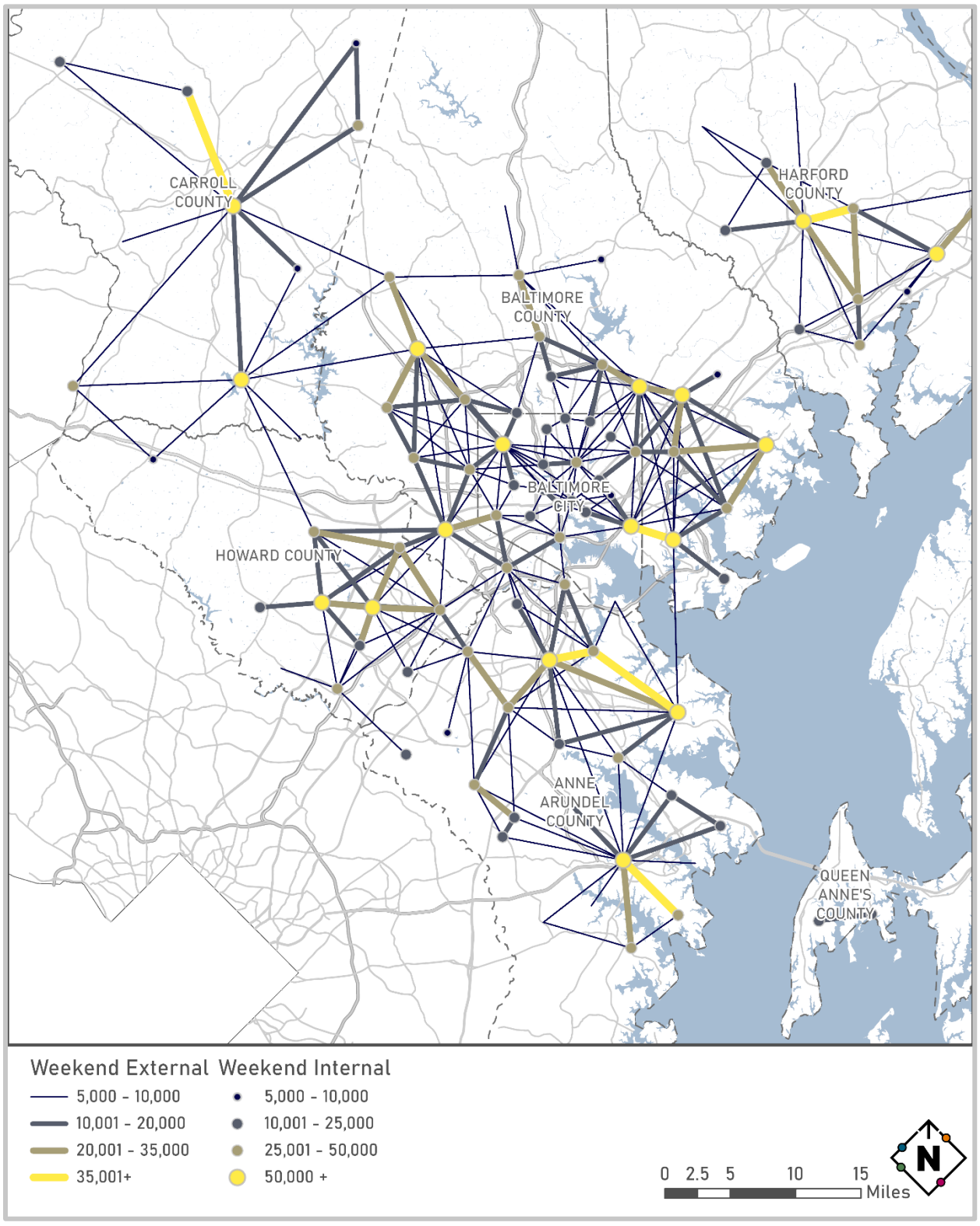


Figure 27: Weekend Travel Flows - BMC Region



CROSS-JURISDICTIONAL TRIPS

Microtransit service is well suited for shorter trips, and understanding the demand for shorter trips across jurisdictions can help to target facilities or regions for microtransit zones.[20] Because of the hard limit on trip distance, some jurisdiction-to- jurisdiction trips are not feasible, as the minimum distance between jurisdictions exceeds what would be a short trip. As a result, Queen Anne's County is omitted from the summary tables below, as crossing the Chesapeake Bay Bridge is over four miles by itself.

Table 14 breaks down the percent of shorter trips from each origin jurisdiction to other jurisdictions. These percentages are not bidirectional. Some jurisdictions have a larger percentage of shared trips such as Howard and Anne Arundel. Overall, Baltimore City and Baltimore County have the largest share of these short trips, highlighting the importance of both Baltimore City and County to regional travel demand.

Table 14: Weekday Cross-Jurisdictional Short Trip Share

ORIGIN	DESTINATION					
	ANNE ARUNDEL COUNTY	BALTIMORE CITY	BALTIMORE COUNTY	CARROLL COUNTY	HARFORD COUNTY	HOWARD COUNTY
Anne Arundel County	--	36%	23%	0%	0%	41%
Baltimore City	6%	--	94%	0%	0%	0%
Baltimore County	4%	90%	--	1%	1%	4%
Carroll County	0%	0%	47%	--	0%	53%
Harford County	0%	0%	100%	0%	--	0%
Howard County	52%	0%	36%	12%	0%	--
All Trips	7%	41%	46%	1%	0%	5%

[20] Replica Fall 2023 data was also used to evaluate shorter distance, cross-jurisdictional trips. Trips were filtered to those that crossed from one jurisdiction to another, and that were less than five miles.

Error! Not a valid bookmark self-reference. then analyzes the share of each trip purpose by origin jurisdiction for cross-jurisdiction short trips. Overall, shopping, eating, and work have the highest mode share across all jurisdictions. A list of definitions for each trip purpose is included in the **Appendix**.

Table 15: Cross-Jurisdiction Short Trip Purposes

ORIGIN JURISDICTION	SHOP-PING	EATING	WORK	SOCIAL	SCHOOL	OTHER	ERR-ANDS	RECRE-ATION	WORK FROM HOME	LODG-ING
Anne Arundel County	38%	16%	20%	6%	5%	7%	4%	3%	1%	0%
Baltimore City	40%	17%	13%	7%	6%	6%	5%	3%	1%	1%
Baltimore County	36%	16%	16%	8%	7%	6%	5%	3%	2%	1%
Carroll County	37%	17%	9%	14%	7%	3%	5%	3%	4%	0%
Harford County	34%	13%	10%	14%	15%	3%	5%	4%	2%	0%
Howard County	41%	18%	14%	6%	4%	6%	4%	4%	2%	1%
All Trips	38%	17%	15%	7%	7%	6%	5%	3%	2%	1%

Points of Interest

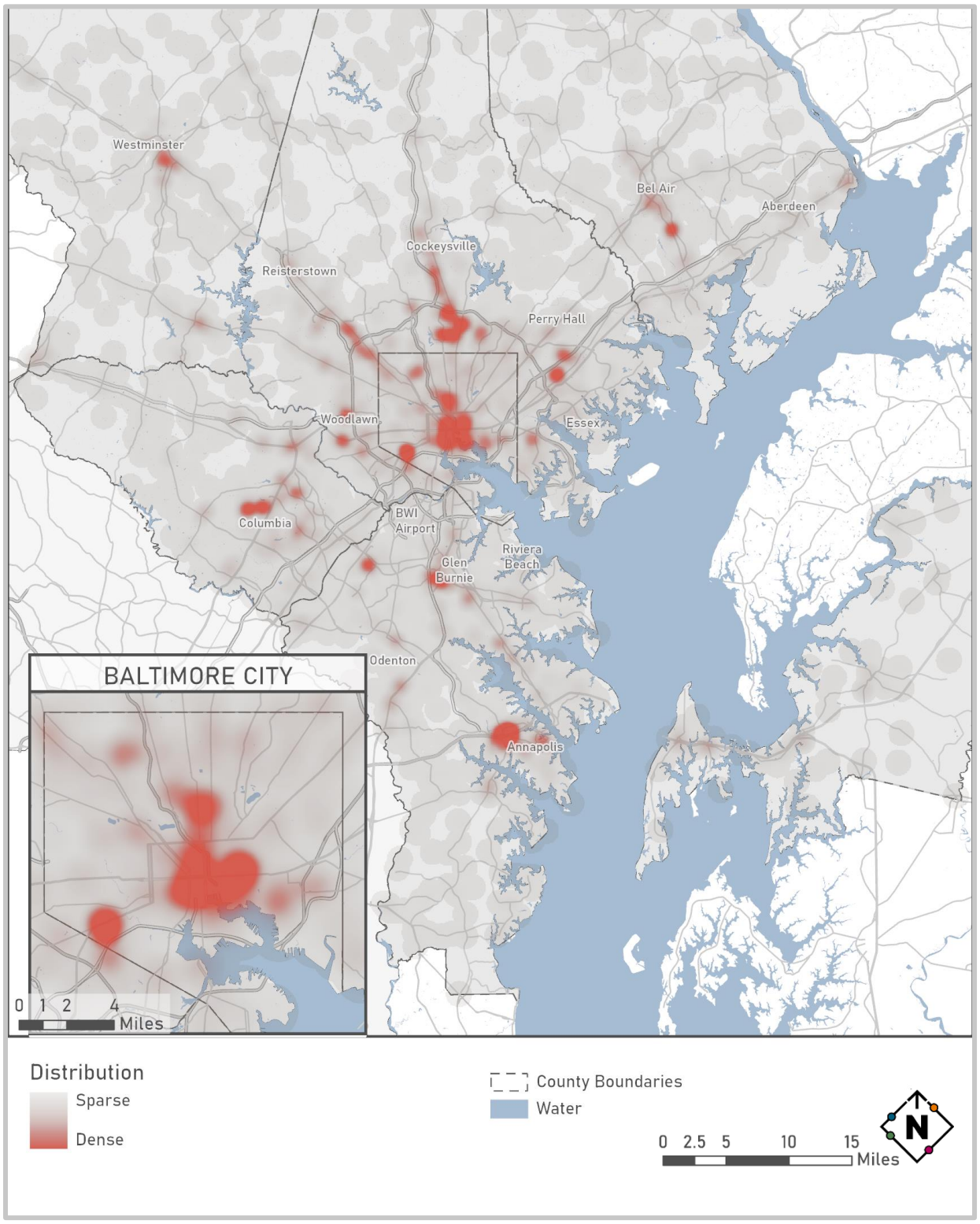
Points of interest are another key component in assessing how transit services, including microtransit, promote access to key destinations. Points of interest serve as a trip generator, as passengers most often want to travel between their residence and other destinations or amenities. Points were classified and aggregated to core categories of:

- **Education** – Primary, secondary, public, or private educational facilities (excluding professional programs such as cosmetology schools).
- **Grocery** – Grocery stores, supermarkets, or farmers markets.
- **Housing** – Multifamily housing such as apartments or condos.
- **Medical** – Hospitals, clinics, medical testing, and other medical service facilities.
- **Shopping** – Larger shopping destinations such as plazas, malls, or big box stores.

These categories help to identify a range of trip attractors, as these destinations reflect essential services and dense housing locations. Due to the number of points of interest within the region, points of interest are identified using a heat map rather than as individual points.

Microtransit service can connect populations within areas that are difficult to serve to critical services. The map in **Figure 28** identifies dense clusters of points of interest, however it is important to consider locations that may have less trip generator density, as these areas may be well suited for microtransit service but have limited trip generators. Targeting microtransit service to connect highly suitable locations to areas of even limited points of interest density is crucial to improving regional mobility.

Figure 28: Points of Interest Density in BMC Region



5. Microtransit Suitability

Microtransit service has the potential to provide incredibly valuable service to communities that may not have access to fixed-route transit service or the necessary characteristics to support fixed-route service. It provides innovative options for transit riders who may need greater connections to high-capacity transit, to jobs, commerce, and services that are not served by existing transit, or who simply live or work in areas that are hard to reach due to the existing road infrastructure. However, to ensure the success of microtransit zones, a variety of demographic and employment factors must be considered to maximize efficiency while serving populations that need service the most.

The following section describes a microtransit market analysis of the BMC region which includes an assessment of transit need, transit potential, and a microtransit suitability analysis.

Transit Need

Transit need, pictured in **Figure 29** below, is designed to capture the socioeconomic traits of the BMC region using 2022 American Community Survey (ACS) data, suggesting a community's increased likelihood to utilize transit services. This metric is extremely valuable for the identification of areas that are suitable for microtransit because it highlights the areas where populations would most likely use the service.

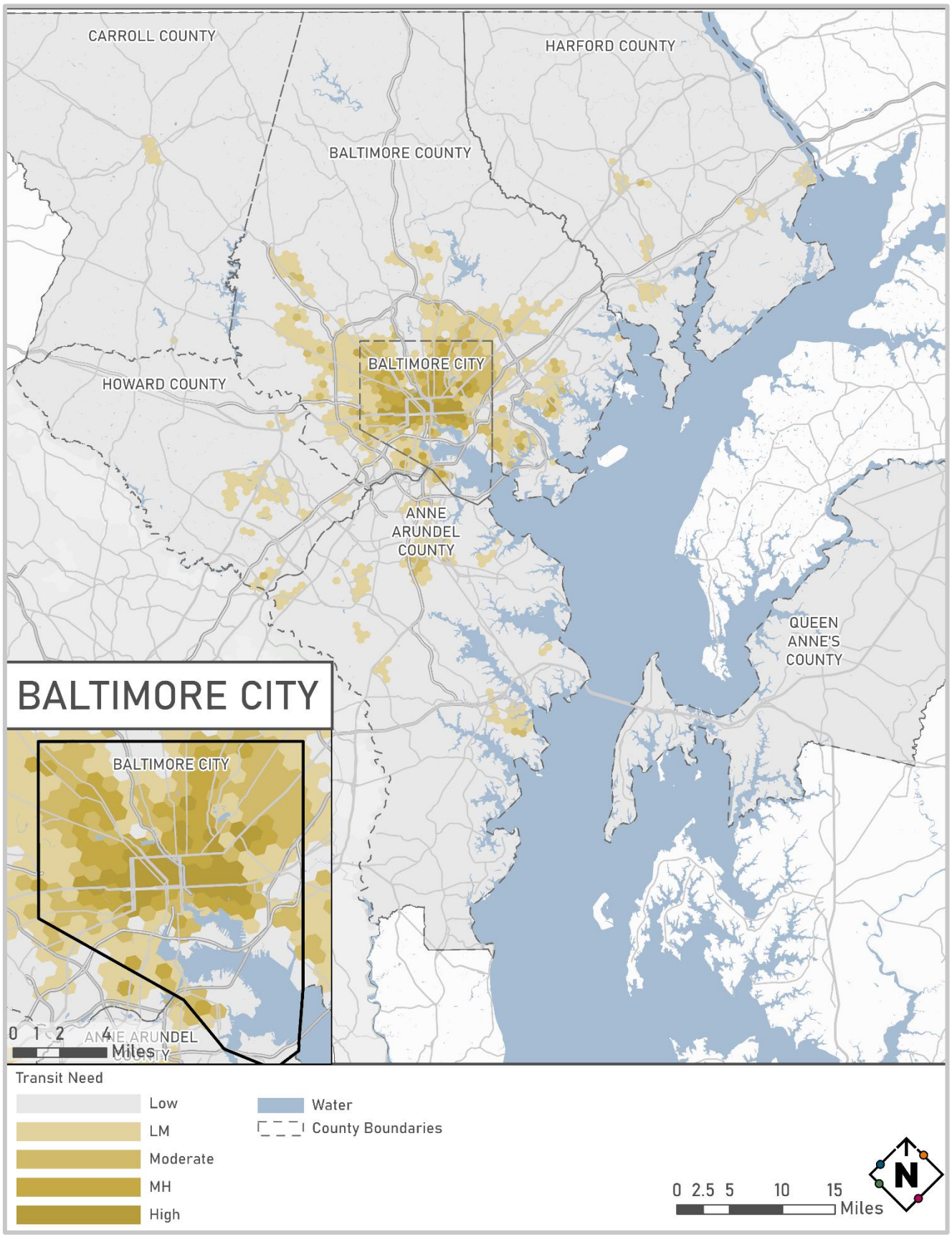
Transit Need specifically identifies transit-oriented populations more inclined towards transit use and identifies jobs—such as those in retail, healthcare, recreation, education, and government sectors—that need travel options at various times throughout the day, rather than predominantly during traditional peak hours. This approach allows for a more nuanced understanding of transit reliance, focusing on both transit-oriented populations and the nature of activities generating consistent transit use across different times. See **Table 16** for a breakdown of characteristics that are correlated with higher transit usage.

Table 16: Transit-Oriented Population Index and Variables

INDEX	VARIABLE	DATASET
Transit-Oriented Populations	Population	Total Population
		Non-White or Hispanic Population
	Age	Seniors
		Youth
	Income	Households at or below 150 percent of the poverty line per acre
	Vehicle Ownership	Zero-Car Households
		One-Car Households
	Disability Status	Population with a Disability

The highest levels of transit need in the BMC region are largely concentrated in central Baltimore, largely due to the demographic and employment characteristics of the area. Pockets of moderate to moderate-high Transit Need can be found in more residential areas of Baltimore City towards the northeast along the US Route 1/ Belair Road Corridor, north along the York Road corridor, and in most of western Baltimore City between Wabash Avenue and West Franklin Street. Pockets of low-moderate to moderate transit need can be found near town centers throughout the jurisdictions. Examples include areas such as downtown Annapolis, Columbia, Cockeysville, Westminster, and Bel Air, among others.

Figure 29: Transit Need - BMC Region



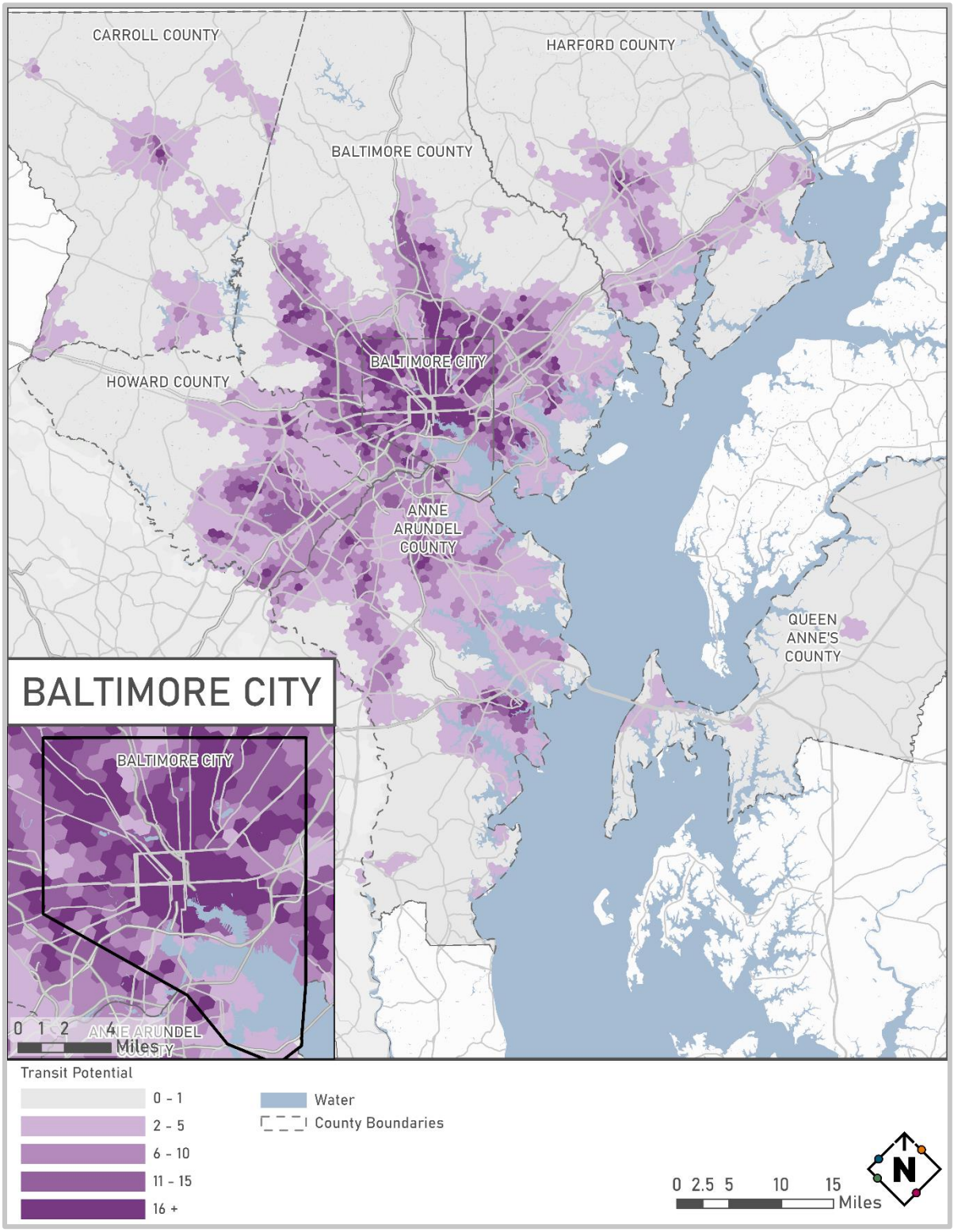
Transit Potential

Transit Potential evaluates an area based on population and employment density, two crucial factors in determining the viability and efficiency of transit services. As a very general rule of thumb, fixed-route transit services need densities of at least five people and jobs per acre – along with appropriate built environment conditions – to support a base level of service. Slightly lower densities of between two to five people and jobs per acre are potentially better suited for microtransit service. In such environments, smaller vehicles are better suited to meet the less intense demand, providing a more efficient and responsive transit solution compared to traditional fixed route systems in densely populated areas.

Figure 30 shows Transit Potential in the BMC region, where hexagons in dark purple represent areas with highest transit potential and areas in gray represent areas where potential is lowest. These demographic metrics were developed using 2022 American Community Survey (ACS) data. It is vital to note that the areas that would be most suitable for microtransit (two to five people and jobs per acre) are shaded in light purple. Like Transit Need, Transit Potential is highest in downtown Baltimore City. Transit Potential is also much higher in town and city centers such as Annapolis, Columbia, Westminster, Bel Air, and others. Moderate to moderate high Transit Potential is very concentrated along key corridors extending out from Baltimore City, primarily along interstates such as I-95, I-83, and I-795.

Low-moderate transit potential, which is most suitable for microtransit service, can be found in the spaces between major corridors in the BMC region. These are most likely suburban residential areas that have little to no access to transit other than along major corridors. These areas have the potential for high microtransit suitability because population and job density are sufficient for transit services, but not enough for fixed route transit.

Figure 30: Transit Potential – BMC Region



Microtransit Suitability

Following the analysis of Transit Potential and Transit Need for the BMC region, a microtransit suitability can be developed by using a bivariate analysis to identify areas that would most benefit from microtransit service. The bivariate analysis compares Transit Potential and Transit Need to highlight areas with higher transit need and lower transit potential, conditions that are optimal for microtransit service.

Figure 31 below illustrates the different factors of the bivariate analysis; Transit Potential is indicated in purple, where dark purple indicates highest Potential and light purple to gray indicates lowest Potential. Transit Need is indicated in gold, where high Transit Need is darker and low Transit Need is light gold or gray. The areas highlighted in red indicate areas where Transit Need is moderate to high, but Transit Potential is moderate to low, conditions which are optimal for microtransit.

Figure 31: Bivariate Analysis Factors

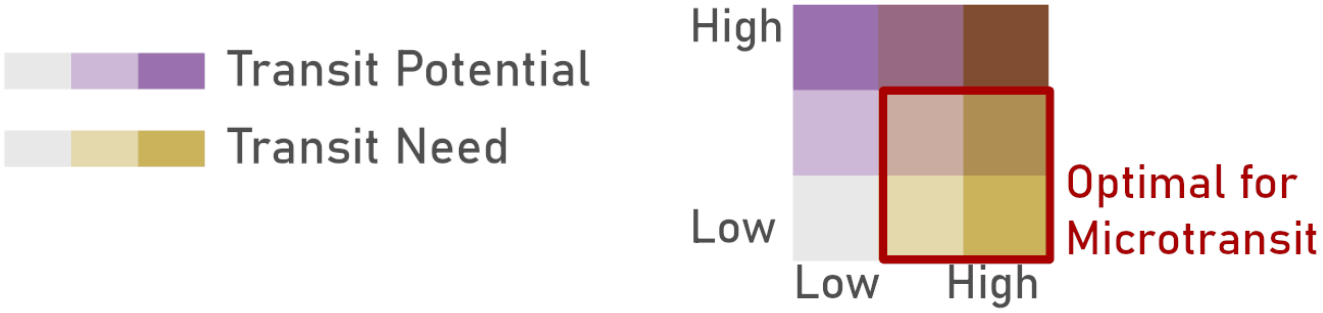


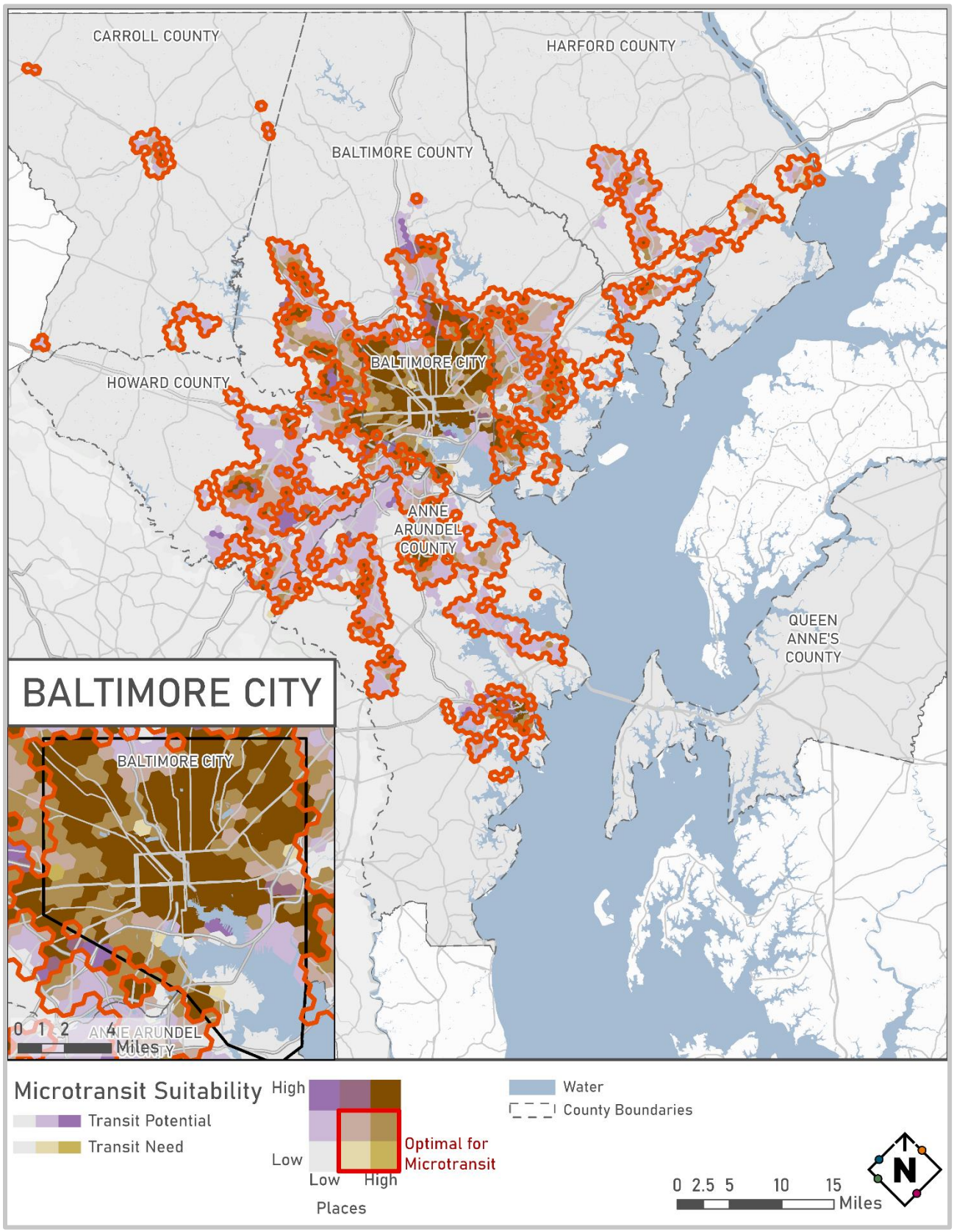
Figure 32 below provides a regional overview of Microtransit Suitability in the BMC region, where areas that are optimal for Microtransit are highlighted in red. A few rather large clusters of high suitability areas are immediately apparent in areas such as west of Baltimore, in northeast of Baltimore City in communities along I-695, in the Columbia area along US Route 1, the Dundalk area east of Baltimore, and in northern Anne Arundel County along US Route 2. While these areas may be too large to develop one zone, they ultimately could be further refined into regionally important zones considering their location and their proximity to major activity centers and transit infrastructure.

More pockets of high microtransit suitability can be found at important activity nodes such as near town and city centers such as Annapolis, Cockeysville, Westminster, Bel Air, Aberdeen, and Havre de Grace. Important regional activity centers in Howard and Anne Arundel counties also displayed high suitability including North Laurel, Odenton, Crofton, and Riviera Beach, among other areas.

Pockets within Baltimore City also stood out for their high suitability. Although public transit within city limits is more robust than in other areas of the BMC region, microtransit service could provide important connections to high-capacity transit as a first/last mile alternative. Areas that stand out within city limits include south Baltimore in the Violetville, Morrell Park, and Cherry Hill areas, residential areas near Druid Hill Park, and the North Roland Park areas.

Following the identification based on the suitability analysis, localities can continue the zone development process by identifying built and natural barriers such as highways, parks, and coastlines to refine boundaries. The areas in red identified for this analysis are largely illustrative and would need further refinement to ensure the success of microtransit service. Detailed maps of microtransit suitability for each jurisdiction can be found in the appendix of this report.

Figure 32: Microtransit Suitability Analysis - BMC Region



6. Key Findings

This section summarizes the key findings of this report's four main sections.

- ***Transit Services:*** The Baltimore region has a multimodal transit network operated by ten transit providers with a variety of service types. Seven agencies provide fixed-route bus and associated paratransit service. Of those seven agencies, three agencies provide some form of demand response or microtransit service. Only MDOT MTA provides additional service types including commuter bus, commuter rail, light rail, and heavy rail. All jurisdictions within the BMC region, apart from the City of Baltimore, have either studied or implemented microtransit service, indicating growing interest for on-demand, shared transportation services.

- ***Transit Environment:*** The Baltimore region's population total is anticipated to grow 12 percent by 2050 and employment is expected to grow 25 percent by 2050. Today, roughly half of the population has access to fixed-route transit and continuing to provide affordable transit access for a growing population base will be key in sustaining a high quality of life and minimizing cost burdens.

- ***Travel Patterns:*** An analysis of travel flows indicates that the highest volumes of travel flows are contained within Carroll County, Harford County, and Anne Arundel County. The highest volume of travel flows also occur between the City of Baltimore and Baltimore County. Other cross-jurisdictional trips are predominantly found between the following pairs: Anne Arundel-Howard, Caroll-Howard, and Harford-Baltimore County. When short (less than 5 miles) cross-jurisdictional trips take place, they are most often for dining, shopping, and work trip purposes, suggesting microtransit should prioritize not only cross-jurisdictional trips between common pairs but also connecting to this kind of destination.

- ***Microtransit Suitability*** Analysis results highlight microtransit suitability at discrete nodes within specific jurisdictions such as Westminster, Edgewood, and Annapolis, as well as a number of stretches between and along jurisdictional borders such as North Laurel-Jessup, Ellicott City-Catonsville, and Baltimore City-Lansdowne-Brooklyn Park.

7. Looking Ahead

This report provides an overview of the state of the environment and transit system in the Baltimore region. The findings – particularly those related to future growth, cross-jurisdictional travel demand, and transit access – will serve as the starting point for identifying enhancement opportunities.

Proposed enhancements will occur through a regional lens to bridge cross-jurisdictional gaps. These enhancements may take the form of seeking out new or diversified funding sources, proposing changes to existing zone boundaries, adding new zones, and redefining the coordination of services, including but not limited to establishing a cooperative agreement for a turnkey microtransit provider or sharing a unified operator training program.

Combined, these two reports will help BMC and local agencies make informed decisions regarding streamlining inefficiencies, expanding the footprint of microtransit, and creating microtransit system enhancements.

8. Appendix

Mode Share

METHODOLOGY

To determine which block groups are classified as “urban” and which ones are considered “rural to suburban,” a classification schema was developed based on industry studies that have identified thresholds for levels of transit service, as shown in **Table 17**.

It is important to note that higher levels of transit service will be appropriate in areas that are made up of Census Block Groups with sparser jobs and population density based on land use and presence of activity generators.

Table 17: Population and Job Density Thresholds to Support Transit Levels of Service

Population Per Acre	Jobs per Acre						
		<2	2 – 5	6 – 10	10 – 15	15 – 25	25+
	<1	Microtransit	Microtransit	60 min	45 min	30 min	15 min ≤ x
	1 – 5	Microtransit	Microtransit/ 60 min	60 min	45 min	15 – 30 min	15 min ≤ x
	5 – 10	60 min	60 min	60 min	30 - 45 min	15 – 30 min	15 min ≤ x
	10 – 15	30 - 45 min	30 - 45 min	30 - 45 min	30 min	15 min	15 min ≤ x
	15 – 20	15 – 30 min	15 – 30 min	15 min	15 min	15 min	15 min ≤ x
	20+	15 min ≤ x	15 min ≤ x	15 min ≤ x	15 min ≤ x	15 min ≤ x	15 min ≤ x

Note: Rural cells are shown in pale yellow, suburban cells are shown in orange, and urban cells shown in red. Rural to suburban areas combines the pale yellow and orange cells.

JURISDICTIONAL LEVEL RESULTS

Anne Arundel County

In Anne Arundel County, “Drove Alone” is the most common mode at 73.6 percent of all commute trips, which exceeds the service area average. “Work from Home” also accounts for more than 10 percent of Anne Arundel’s mode share at 14.6 percent, which is slightly more than the service area average. **Figure 33** compares Anne Arundel County to the BMC service area across all reported modes.

Figure 33: Mode Share in Anne Arundel County

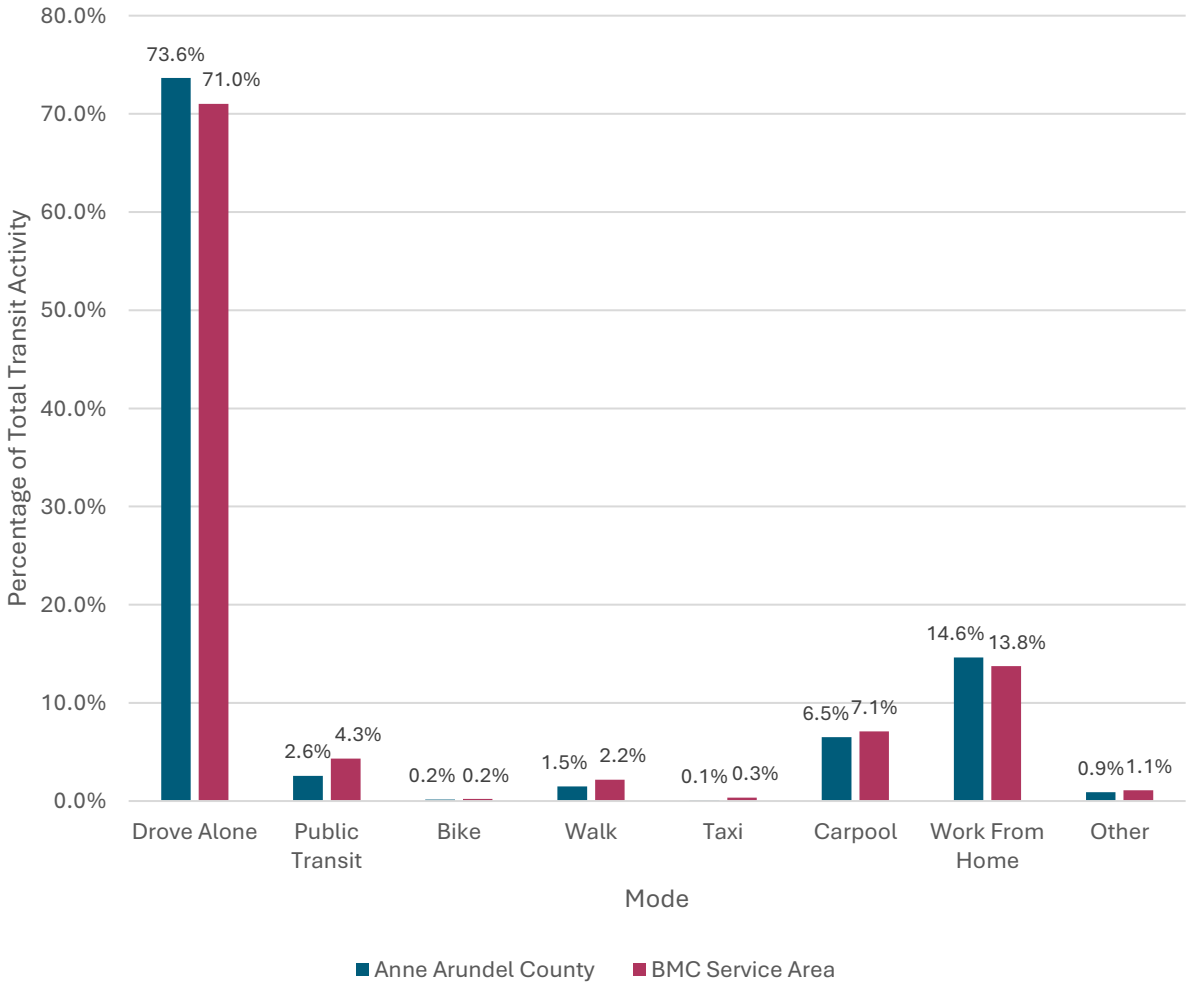
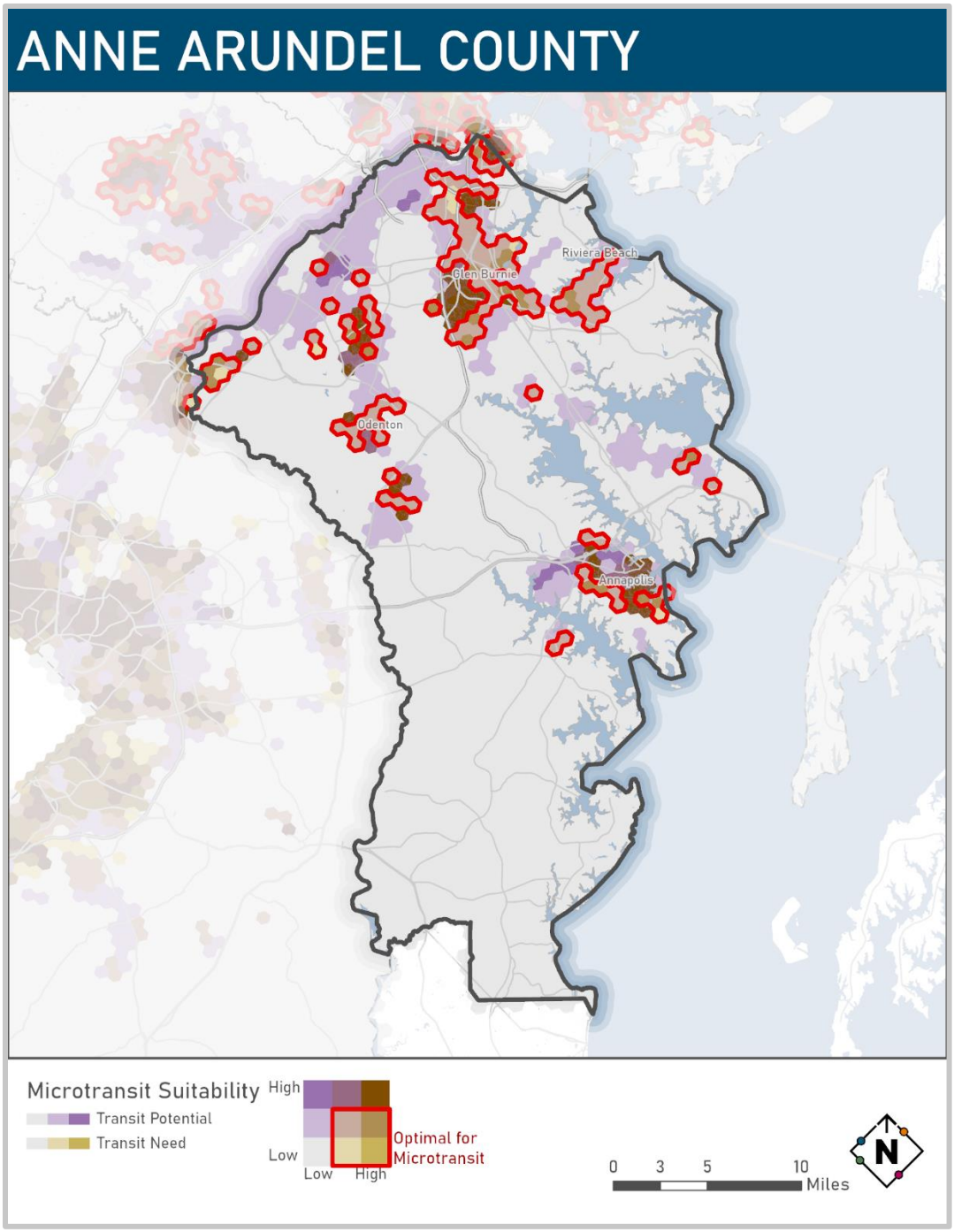


Figure 34 depicts the Microtransit Suitability analysis overlaid on Anne Arundel County. Areas bordered in red are considered good candidates for microtransit services. In Anne Arundel, candidates for microtransit based on this analysis include Glen Burnie, portions of Annapolis, Odenton, and the Green Haven/Riviera Beach area.

Figure 34: Anne Arundel County Microtransit Suitability



Baltimore County

In Baltimore County, “Drove Alone” is the most common mode at 72.7 percent of all commute trips, which exceeds the service area average. “Work from Home” also accounts for more than 10 percent of Baltimore County’s mode share at 12.1 percent, which is slightly less than the service area average. In addition, Baltimore County has a higher-than-average carpool mode share at 7.8 percent, compared to 7.1 percent for the BMC service area. **Figure 35** compares Baltimore County to the BMC service area across all reported modes.

Figure 35: Mode Share in Baltimore County

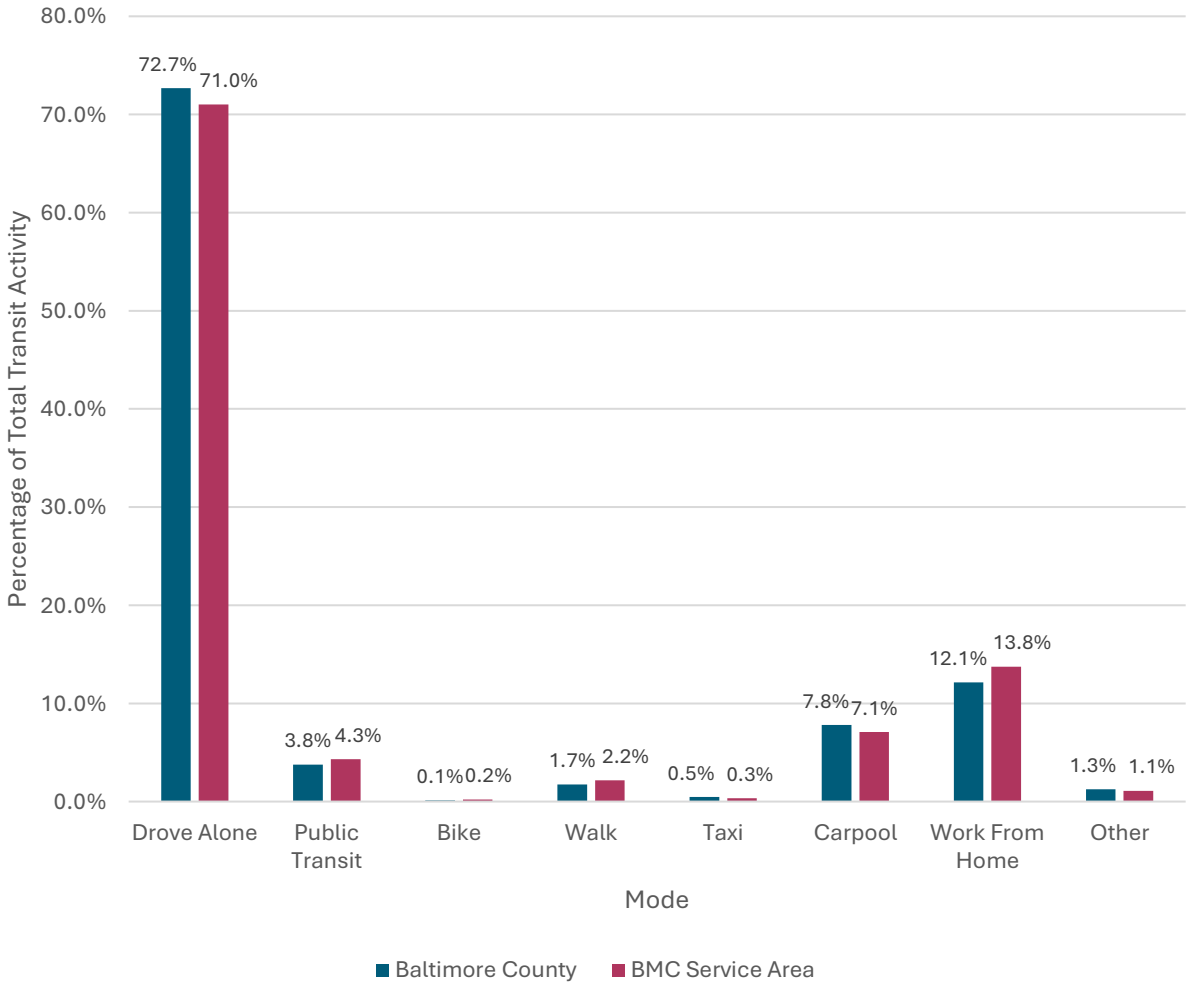
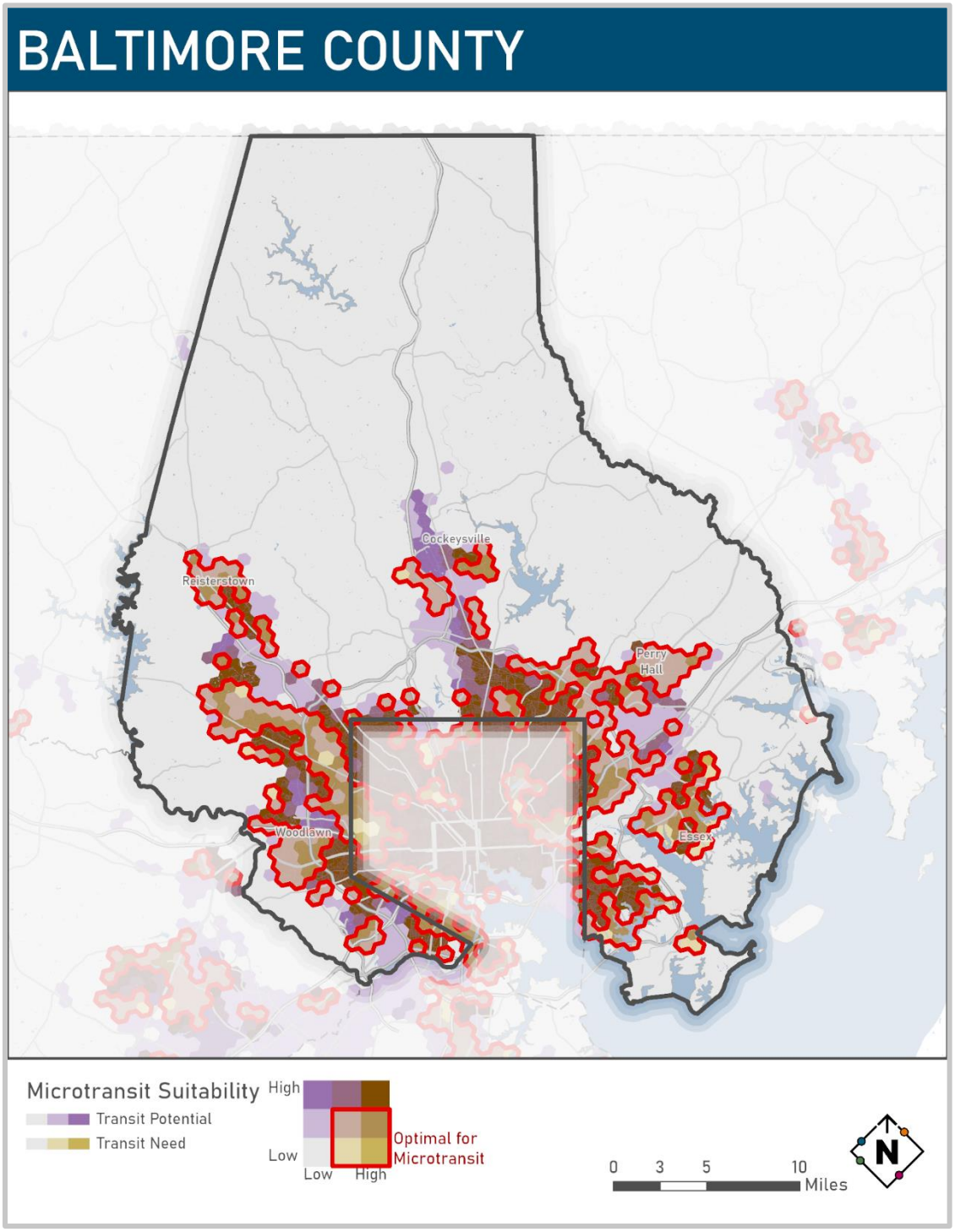


Figure 36 depicts the Microtransit Suitability analysis overlaid on Baltimore County. Areas that appear to be candidates for microtransit based on this analysis are largely within the MDOT MTA service area. These places include Cockeysville, Essex, Perry Hall, Reisterstown, and Woodlawn.

Figure 36: Baltimore County Microtransit Suitability



Baltimore City

In Baltimore City, “Drove Alone” is the most common mode at 56.4 percent of all commute trips. However, this mode share is notably less than the service area average at almost 15 percentage points. In addition, the Public Transit mode share is 13.6 percent, which is more than three times the service area average of 4.3 percent. These trends are partly due to BaltimoreLink serving large portions of the city, as well as transfer opportunities to the Metro, Light Rail, and MARC Commuter Rail. **Figure 37** compares Baltimore City to the BMC service area across all reported modes.

Figure 37: Mode Share in Baltimore City

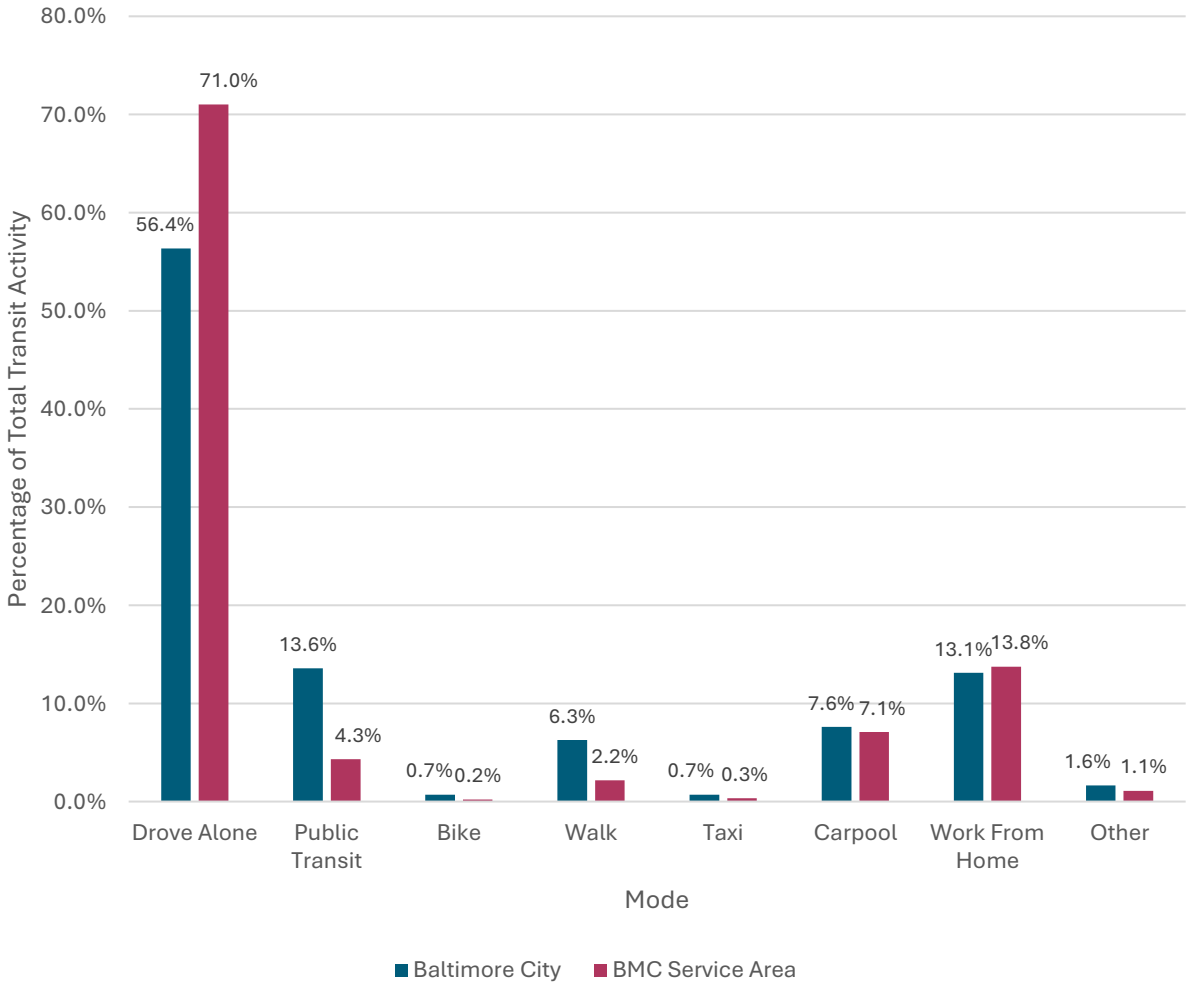
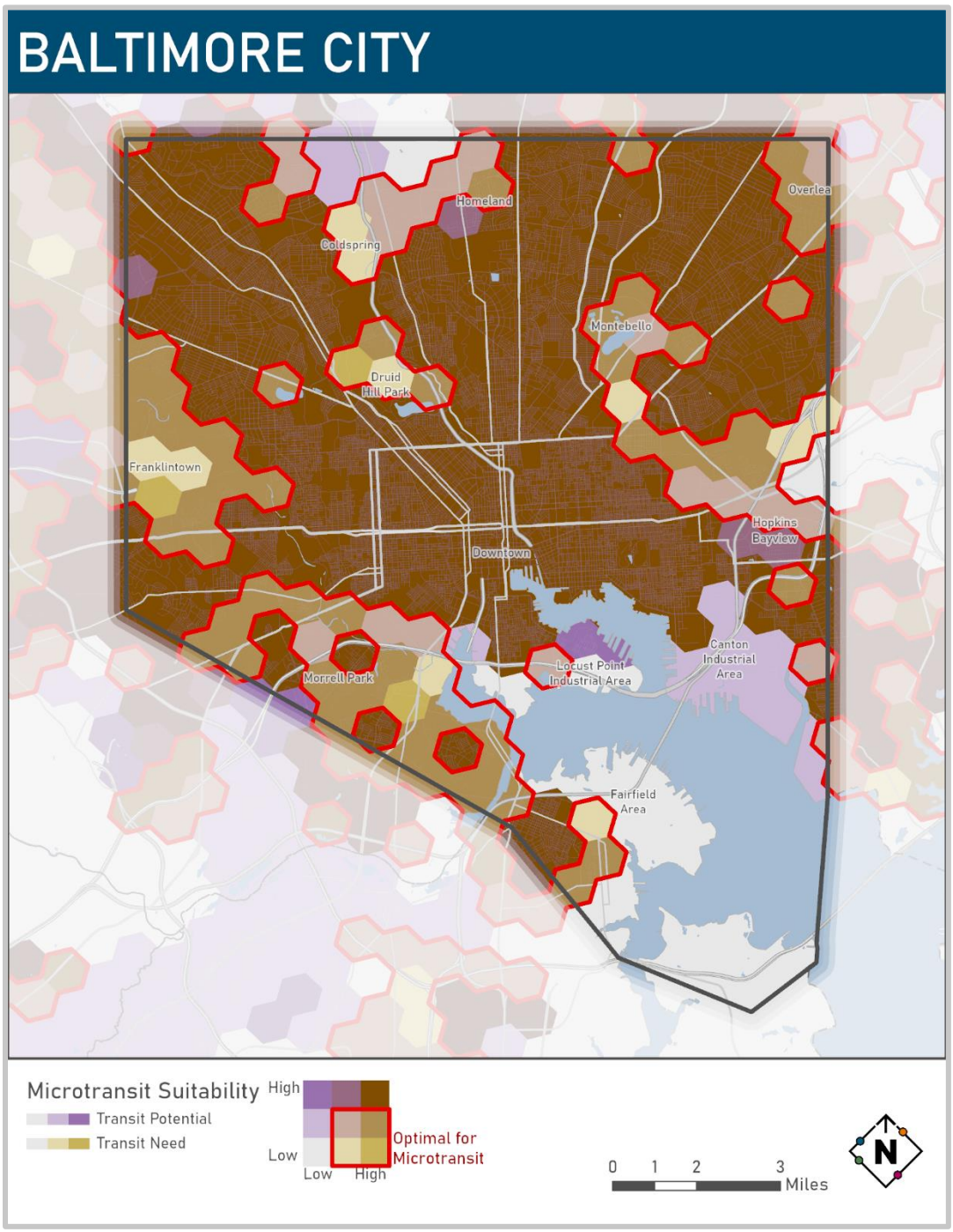


Figure 38 depicts the Microtransit Suitability analysis overlaid on Baltimore City. Areas that appear to be candidates for microtransit based on this analysis are toward the border of the city with Baltimore County, and include neighborhoods such as Cold Spring, Franklintown, the Hopkins-Bayview Campus, Montebello, Morrell Park, and Overlea.

Figure 38: Baltimore City Microtransit Suitability



Carroll County

In Carroll County, “Drove Alone” is the most common mode at 77.8 percent. “Work from Home” also accounts for more than 10 percent of Carroll County’s mode share at 13.7 percent, which is close to the service area average of 13.8 percent. **Figure 39** compares Carroll County to the BMC service area across all reported modes.

Figure 39: Mode Share in Carroll County

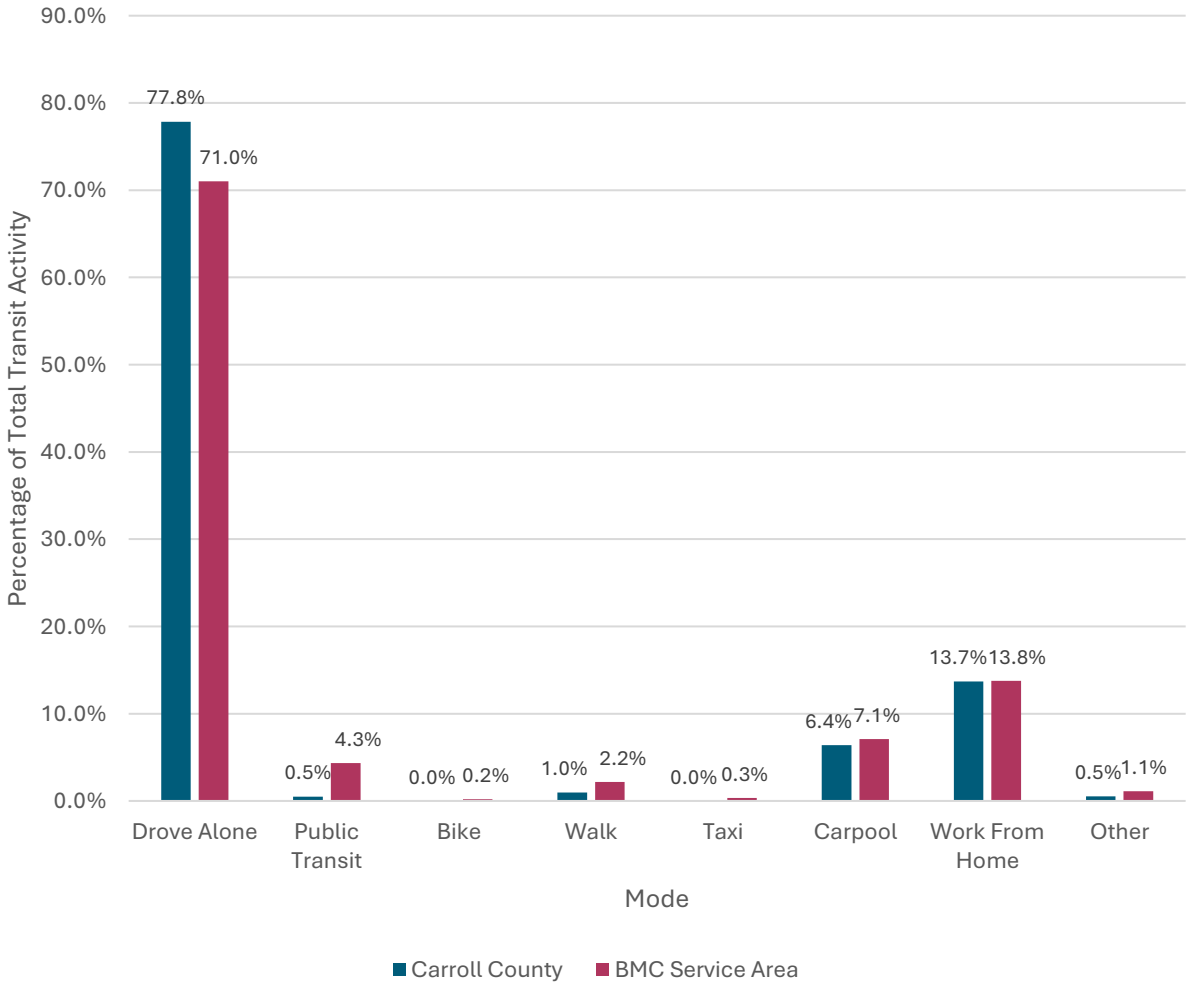
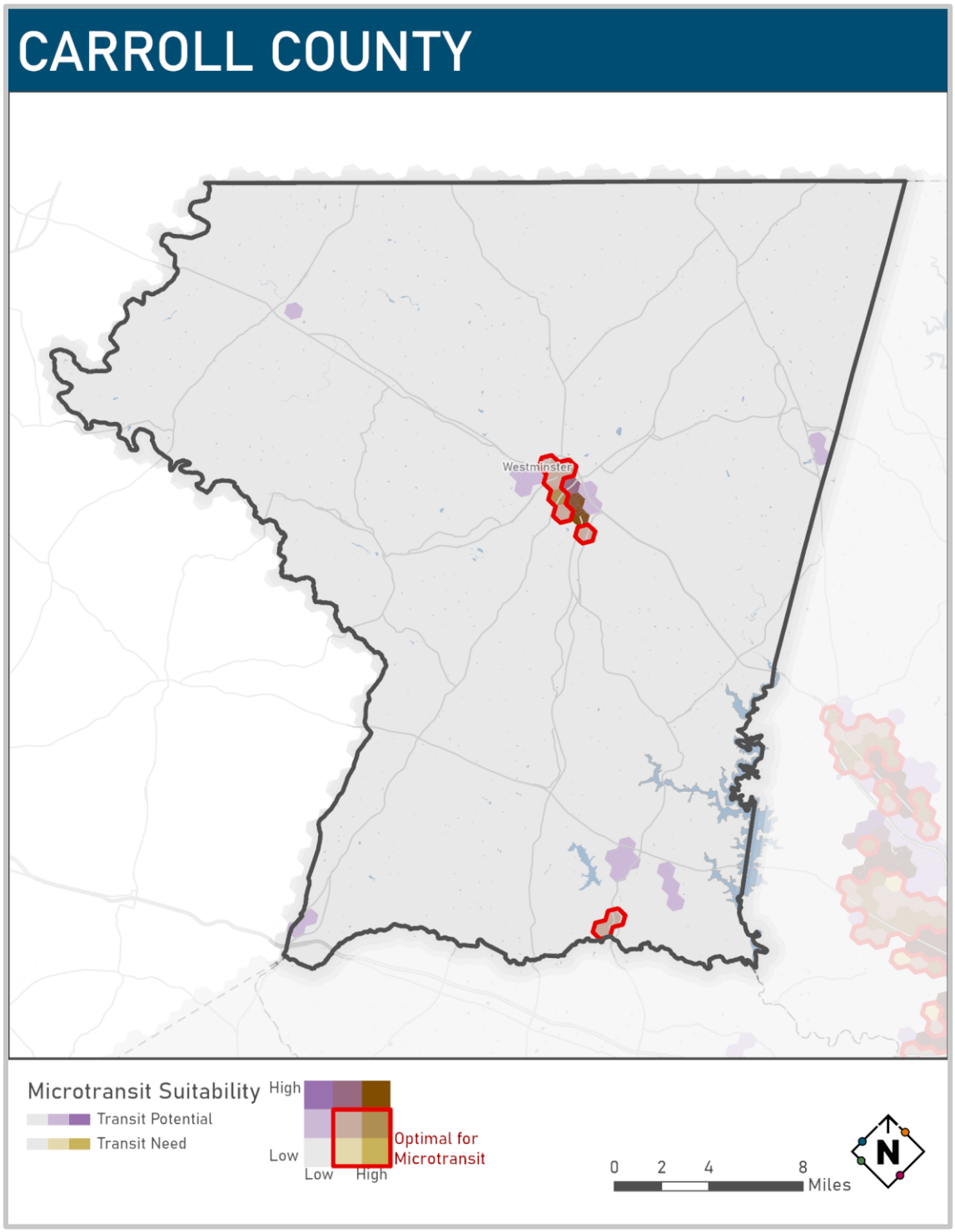


Figure 40 depicts the Microtransit Suitability analysis overlaid on Carroll County. Two areas in the county were flagged as candidates for microtransit based on this analysis: the Westminster area and in the southeast bordering Howard County (Sykesville).

Figure 40: Carroll County Microtransit Suitability



Harford County

In Harford County, “Drove Alone” comprises the majority of the county’s total mode share at 78.1 percent, which exceeds the service area average. Like many of the other jurisdictions in the BMC service area, “Work from Home” accounts for more than 10 percent of Harford County’s mode share at 11.6 percent. **Figure 41** compares Harford County to the BMC service area across all reported modes.

Figure 41: Mode Share in Harford County

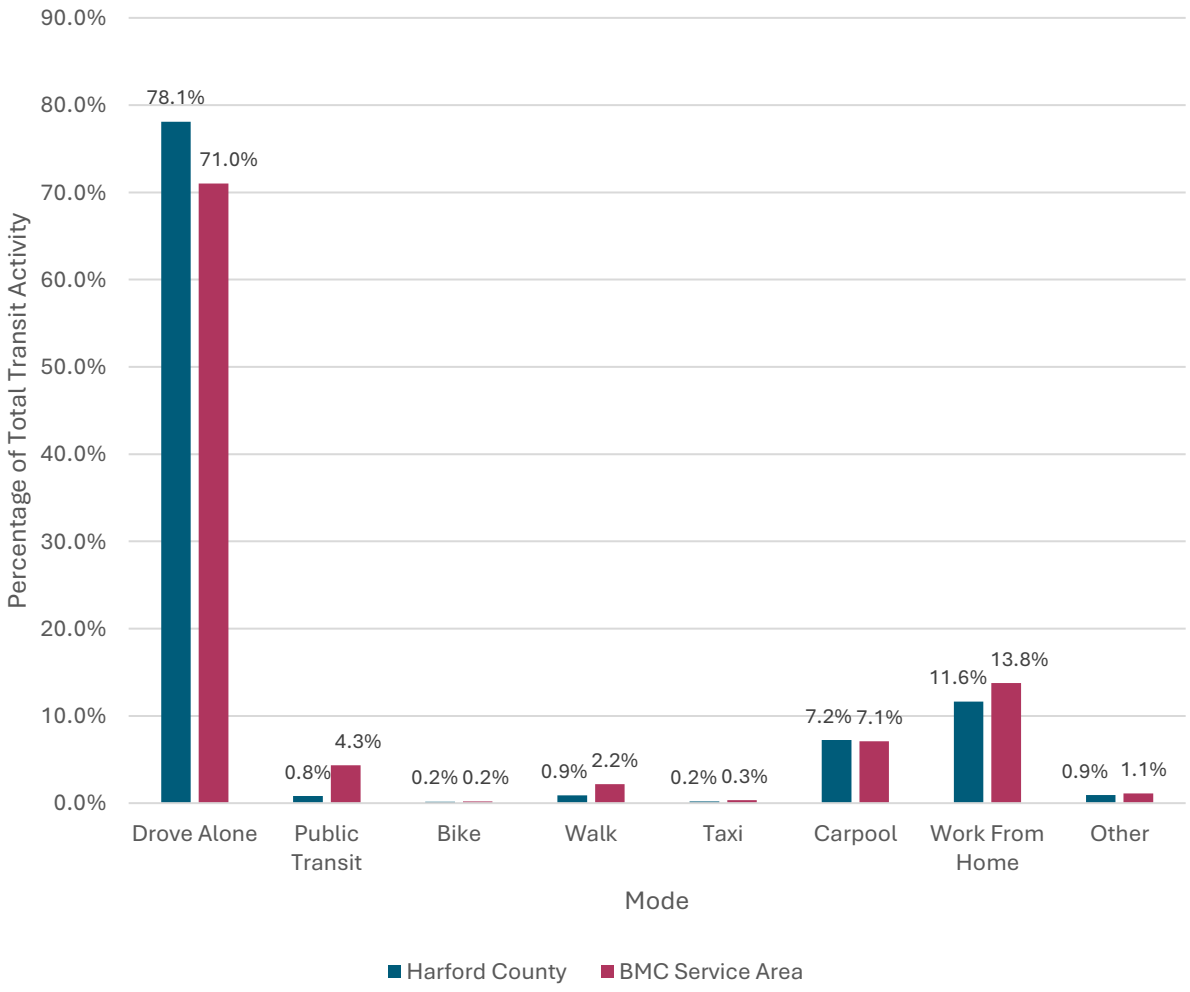
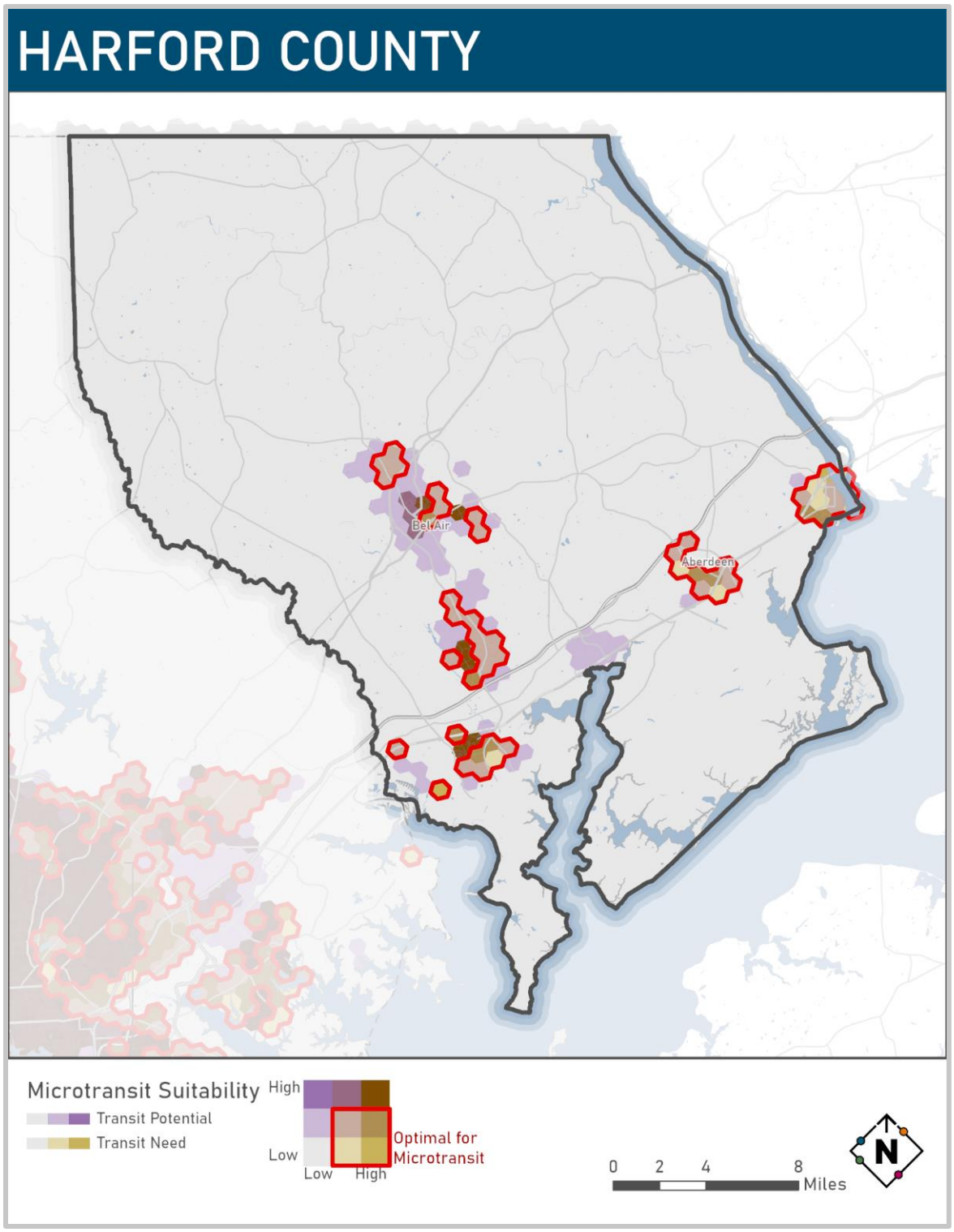


Figure 42 depicts the Microtransit Suitability analysis overlaid on Harford County. Areas that appear to be candidates for microtransit based on this analysis include Aberdeen, Bel Air, Edgewood, and Havre De Grace.

Figure 42: Harford County Microtransit Suitability



Howard County

In Howard County, “Drove Alone” accounts for 70.5 percent of the county’s total mode share, which is slightly below the service area average. Of the jurisdictions included in the BMC region, Howard County has the highest “Work from Home” mode share at 19.3 percent. **Figure 43** compares Howard County to the BMC service area across all reported modes.

Figure 43: Mode Share in Howard County

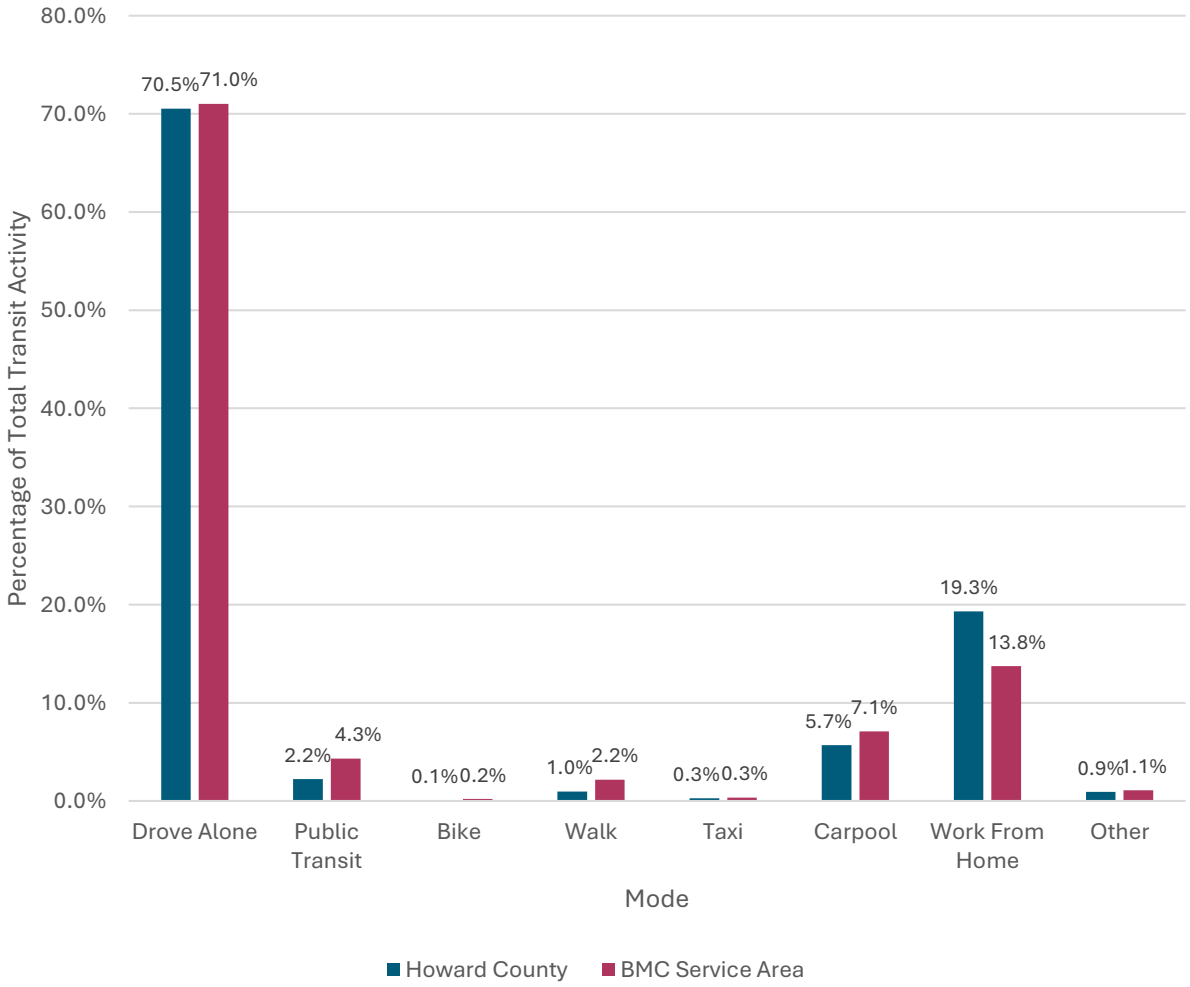
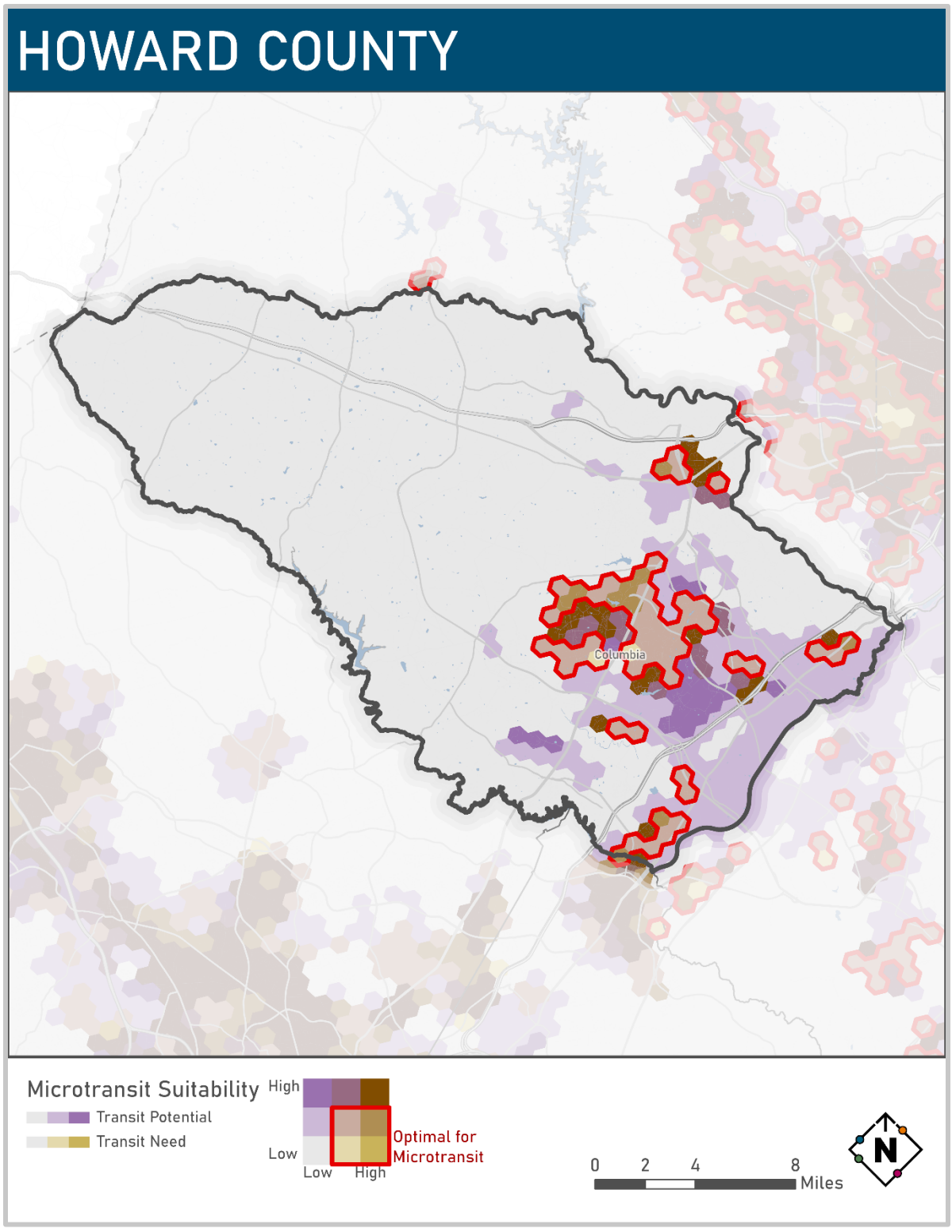


Figure 44 depicts the Microtransit Suitability analysis overlaid on Howard County. Areas that appear to be candidates for microtransit based on this analysis include Columbia and communities along U.S. 1 including Elkridge and Savage.

Figure 44: Howard County Microtransit Suitability



Queen Anne's County

In Queen Anne's County, "Drove Alone" accounts for 78.9 percent of the county's total mode share, which is the highest of any jurisdiction in the BMC service area. "Work from Home" also accounts for more than 10 percent of Queen Anne's County's mode share at 11.6 percent. **Figure 45** compares Queen Anne's County to the BMC service area across all reported modes.

Figure 45: Mode Share in Queen Anne's County

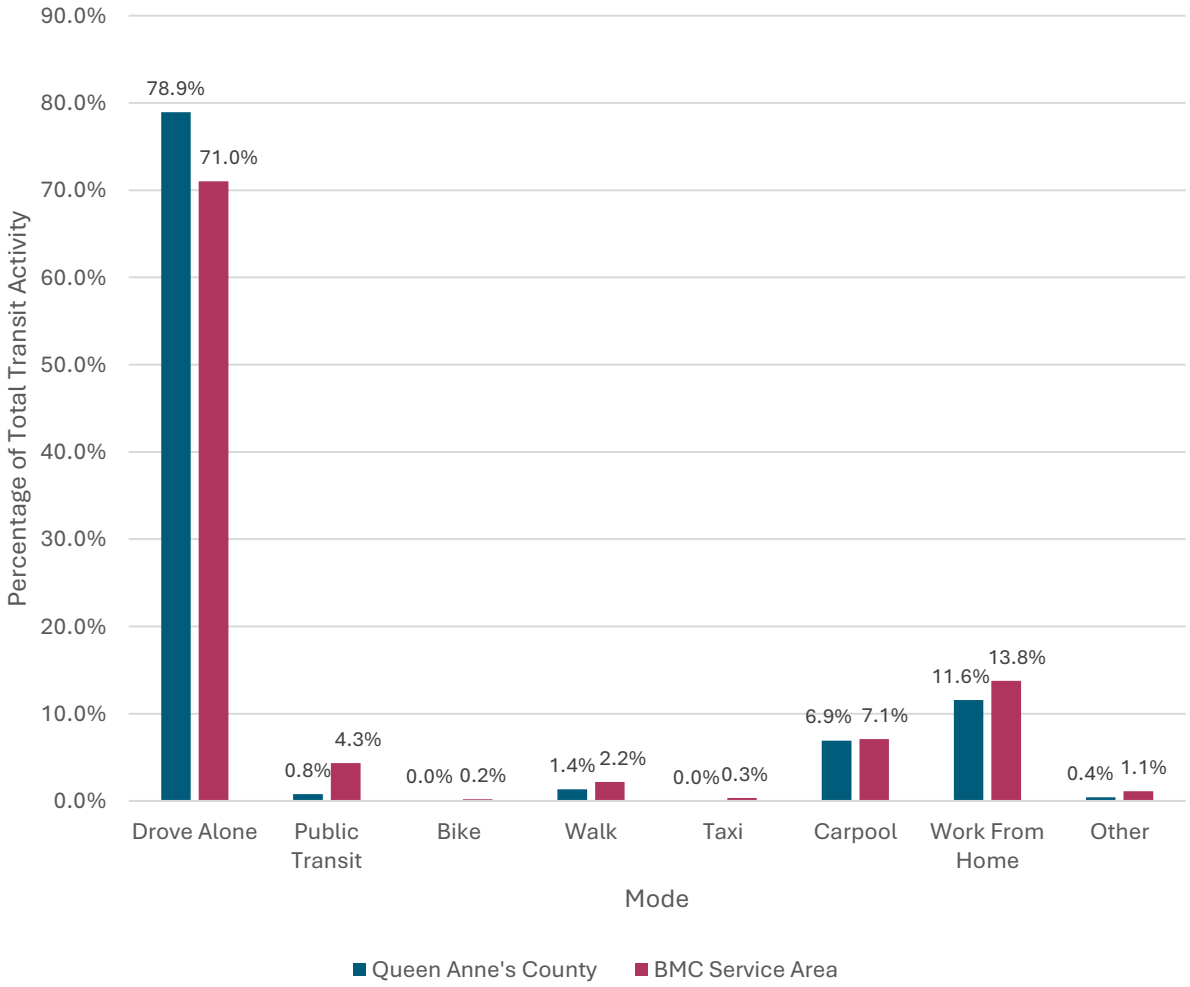
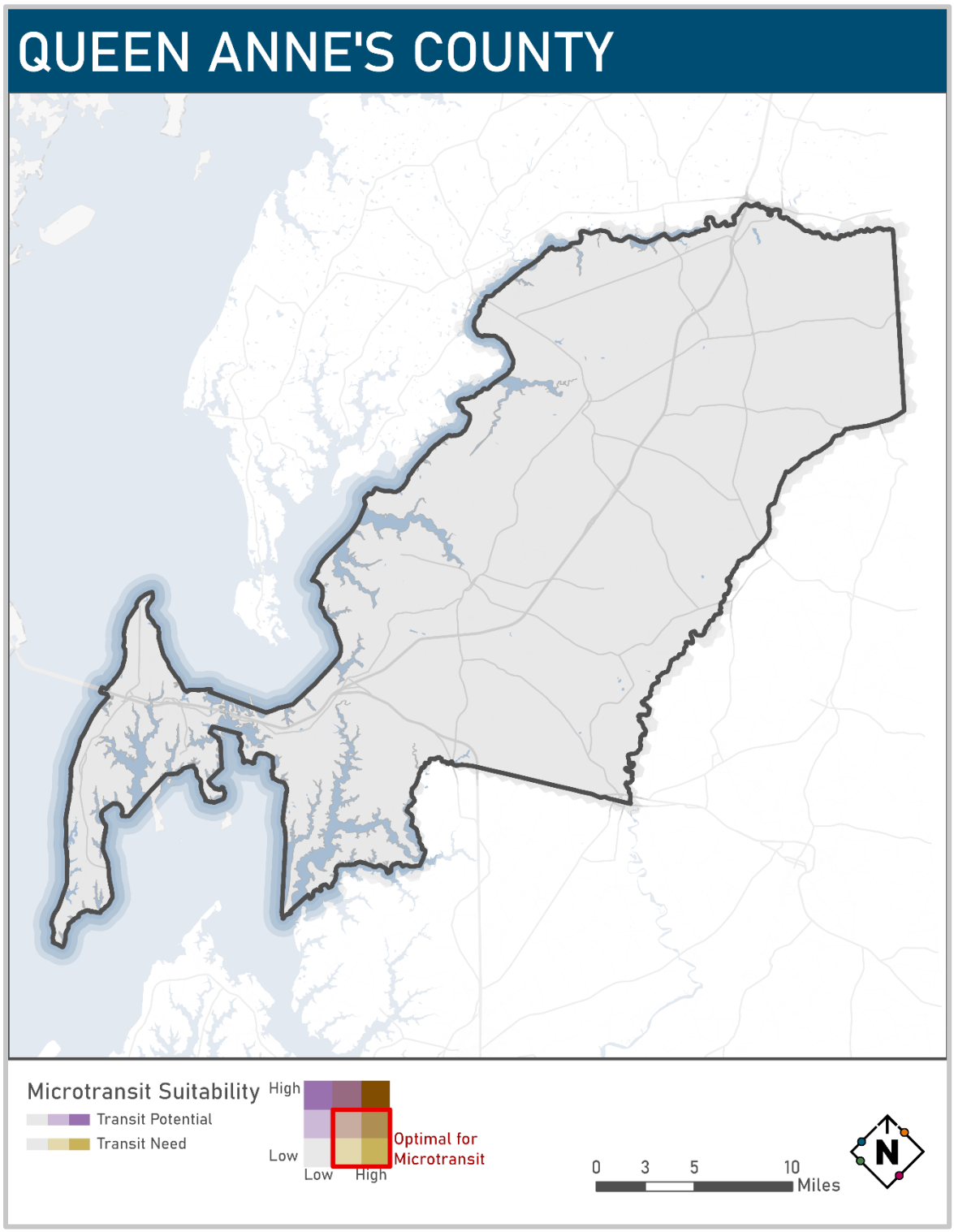


Figure 46 exhibits microtransit suitability for Queen Anne's County. As is evidenced in the map, the county does not exhibit transit potential or need in the bivariate analysis. However, this does not mean that transit potential or need are not existent and likewise that microtransit service cannot be implemented in the county. As evidenced in **Figure 30**, there are pockets of low moderate transit potential throughout the county. Similarly, the absence of yellow in **Figure 29** does not indicate that transit need does not exist, but rather that it is significantly lower.

Microtransit service could bring many potential benefits to the residents of Queen Anne's County, despite low suitability. To curtail inefficiencies, agencies can implement service at reduced hours or with less vehicles to adapt to existing demand in the county.

Figure 46: Queen Anne's County Microtransit Suitability



TRIP PURPOSE DEFINITIONS

Replica definitions[21] of trip purposes are included below.

- **Eat**: Trips to restaurants
- **Lodging**: Trips by visitors to overnight accommodation such as a hotel
- **Errands (labeled as "Maintenance")**: Trips to hairdressers, auto shops, banks, and a variety of other locations for the purpose of conducting errands
- **Other**: Catch-all category for all other trips not assigned any of the purposes listed herein
- **Recreation**: Trips to recreational destinations such as parks and swimming pools
- **School**: Trips to schools such as community colleges and universities
- **Shopping**: Trips to stores and other commercial centers
- **Social**: Trips for social activities
- **Work**: Trips where the destination is the person's workplace
- **Work from home**: Trips where a resident is returning home to work (specifically for residents who are working from home on the modeled day).

[21] "Seasonal Trip Table." Replica - Data definitions. Accessed July, 2024. https://documentation.replicahq.com/docs/disaggregate-trip-tables.

COST BURDEN FOR HOMEOWNERS AND RENTERS

Figure 47 shows the percentage of cost burdened rental and homeowner units compared to the total population of each jurisdiction in the BMC region. Affordable transit options may be beneficial to people living in areas with higher housing cost burdens.

Figure 47: Cost Burden Rental and Homeowner Units in the BMC Region