

# Dutchess County Transit Study



Final Report | Report Number 23-16 | May 2023



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# **Dutchess County Transit Study**

*Final Report*

Prepared for:

**New York State Energy Research and Development Authority**

Albany, NY

Richard Mai  
Senior Project Manager

and

**New York State Department of Transportation**

Albany, NY

Edward Mark  
Project Manager

Prepared By:

**Nelson\Nygaard Consulting Associates, Inc.**

New York, NY

Larry Gould  
Principal

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# Abstract

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The goal of the project is to study existing public transportation services in Dutchess County and develop strategies to improve public transportation needs where service is provided and recommend alternatives where there is limited or no service. The study will focus on underserved groups, including older adults, people with disabilities, veterans and those with low incomes. The project will assess future market trends and examine the feasibility of integrating new services such as on-demand microtransit and other technologies.

# Keywords

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# Acronyms and Abbreviations

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ADA	Americans with Disabilities Act
API	Application Programming Interface
BRT	Bus Rapid Transit
DAR	Dial-A-Ride
DCPT	Dutchess County Public Transit
FTA	Federal Transit Administration
GTFS	General Transit Feed Specification
OFA	Office for the Aging
STOA	State Operating Assistance
TNC	Transportation Network Company

# Summary

---

In 2020, Dutchess County Public Transit (DCPT) engaged Nelson\Nygaard to study public transportation services in the county. The aim of the study is to recommend strategies that better address public transportation needs where service is provided and to recommend alternatives where there is no service or very limited service. A particular focus is on serving the most vulnerable, including older adults, people with disabilities, veterans, and those with low incomes.

## S.1 Market Assessment and Outreach

The project included an assessment of pre-COVID transit services within the current and anticipated market. This included evaluating DCPT services (fixed-route and demand-response) and cataloging other available services for those that do not or choose not to drive. Outreach included meetings and presentations as well as a rider survey. The data and input served as the basis for recommendations, including a range of options to improve access.

## S.2 Public Transportation Availability

The consultant team reviewed the availability of public transportation (DCPT bus, DCPT Dial-A-Ride, or other local demand-response (reservation-based) services in each municipality noting that 20 of the 22 cities and towns, and all eight villages, have some service available and that the towns of Clinton and Milan have neither fixed-route or demand-response service. In addition, there are places in communities where available services are restricted (e.g., age) or where bus stops are too distant for some people.

## S.3 Dutchess County Public Transit Bus Service

The following are some of the key takeaways from the assessment of DCPT fixed-route service (13 routes and two rail links).

- Within the City of Poughkeepsie, there is significant redundancy in the paths of service for county routes, which pass through the city to serve outlying communities, and the former city routes that were designed for circulation within the city. As a result, a rider within the city looking for the next trip to the Poughkeepsie Transit Hub at a certain time may need to choose among several different bus stops, each served by a different route.
- Due to varying headways and bay capacity, the opportunity to make pulsed connections at the Transit Hub or elsewhere varies by time of day. Some well-used connections currently require significant waits.

- The most heavily used routes immediately outside of Poughkeepsie feature complex route variations and redundancies with uneven headways.
- DCPT provides fixed-route service well outside areas that can support such service; these routes have extremely long headways and carry very few riders.

To address these issues and using best practices in bus route service design, the team developed recommendations for a new route network. The number of all-day routes is reduced to 10 (excluding school-oriented trips open to the public) and the rail links are discontinued. Implementing the recommendations for the service is estimated to save approximately \$1.25 million annually. The consultant team recommends investing the savings in a range of demand-responsive services in each municipality and in microtransit services where feasible. If implemented, the redesigned bus network will offer more 60-minute and some combined 30-minute headways. Uniform spans will permit more pulsing at the Transit Hub (but within the capacity of the hub and adjacent curbside areas). This will permit more riders to transfer between bus routes.

## **S.4 Dutchess County Public Transit Dial-A-Ride**

The following are the key takeaways from the assessment of the current DCPT Dial-A-Ride (DAR) service:

- Funding for the Dial-A-Ride program is derived from federal, State, county, and municipal sources, and supplemented with modest fare revenue. The service is opt-in, meaning individual municipalities pay a daily fee to have Dial-A-Ride service and like many transit services, operating costs exceed revenues. The municipal contribution toward the cost of operating Dial-A-Ride has not changed since 2014 despite increased operating costs.
- Based on staff input, the daily cost to operate Dial-A-Ride is \$800 per vehicle per route, including drivers, customer service staff, supervisors, fuel, and vehicles. Each participating municipality pays Dutchess County \$230 per day toward Dial-A-Ride service and daily fare revenues are estimated at \$15, totaling approximately \$245 in daily revenues, excluding any reimbursements from other funding sources. This means that each day of operation requires an average subsidy of \$555.
- The high percentage of Dial-A-Ride trips taking place entirely within three-quarters mile of DCPT's fixed-route services is an indicator that service policies should be changed to direct some riders to use the bus rather than Dial-A-Ride for certain trips. This is not possible with the current scheduling tools DCPT uses but could be implemented with a new software platform. Based on input from staff, there are riders who use fixed-route service on days when the Dial-A-Ride is not operating, or when their trip request cannot be accommodated. This is most apparent in the City and Town of Poughkeepsie and in Fishkill. Some of the demand-response riders would be unable to access a fixed route due to their disability; for those who apply for and are eligible, the Americans with Disabilities Act (ADA) service would be an alternative.

Given the characteristics of Dutchess County, the Nelson\Nygaard team has proposed a demand-response service plan with the following four components:

1. In rural areas, DCPT would provide reservation-based demand-response service designed to facilitate next-weekday travel (e.g., call Monday to travel on Tuesday).
2. In areas where other entities operate public or private transportation service, DCPT would form partnerships to subsidize travel on partner vehicles, either with non-profit organizations,<sup>1</sup> other public agencies, or transportation network companies (TNCs) like Lyft/Uber.
3. To test the viability of microtransit service, (same-day, app-based service) DCPT would undertake weekday pilots in up to three primary and two secondary zones.
4. On a limited basis, DCPT could continue to offer municipally subsidized demand-response service similar to today's Dial-A-Ride program, albeit with more community funding than today and with new rules that restrict travel when certain trips can be made on fixed route or microtransit.

Figure ES-1 illustrates the demand-response proposal for each municipality.

## **S.5 Funding and Costs**

Available funding for this program is estimated at \$3,200,000 (including savings from fixed-route changes), of which just over \$800,000 would support the DCPT next-day service and partnerships with nonprofits or TNCs, and \$2,400,000 would support microtransit pilots and the acquisition of new software to oversee the entire program. Additional funding is likely available from federal and State transportation programs, particularly for pilots.

For microtransit, the team recommends investigating weekday pilot programs in three primary and two secondary microtransit zones as shown in Figure ES-2. Primary microtransit zones include:

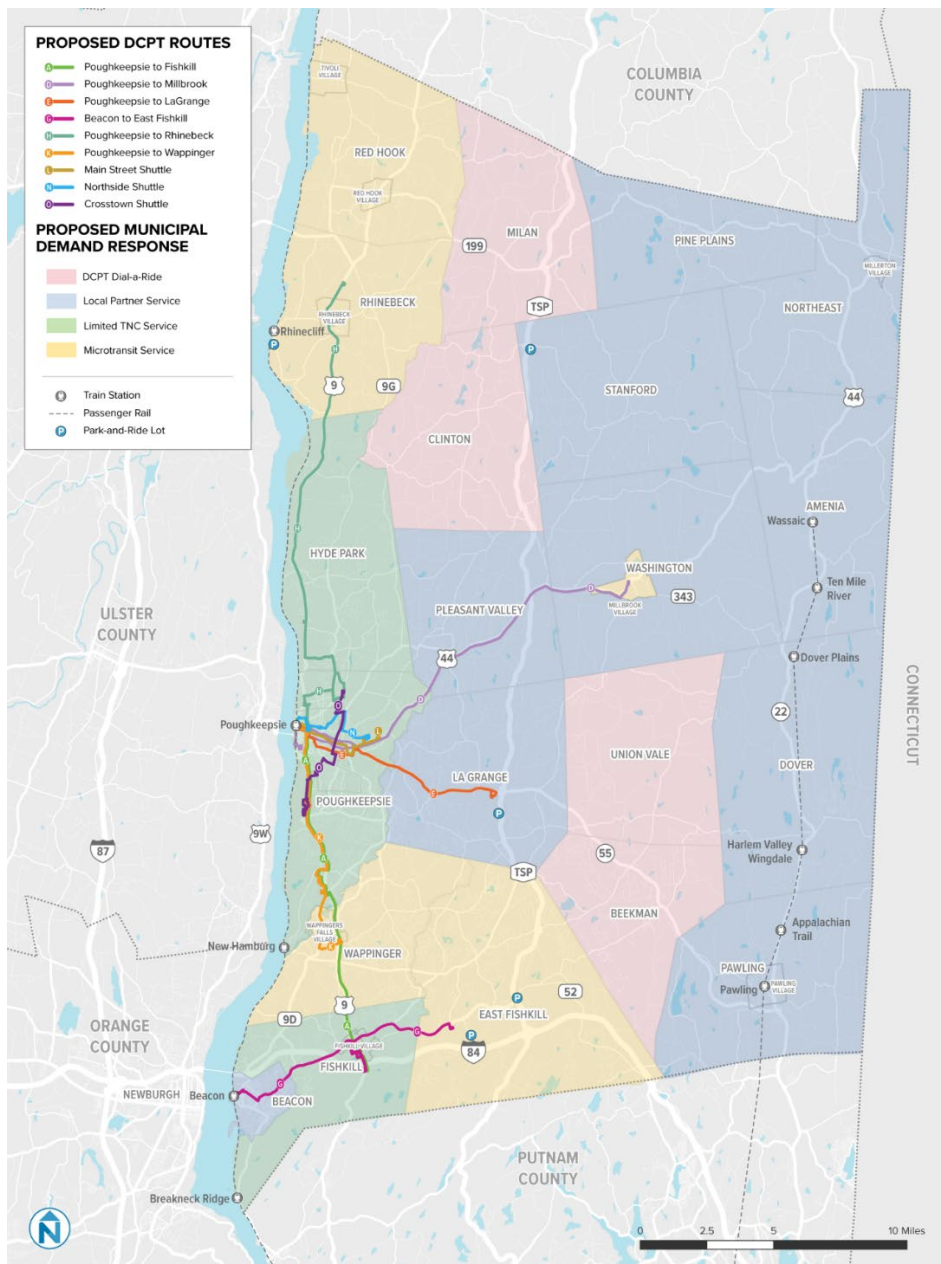
- Northwest Dutchess County with a connection to the Walmart in Kingston, a recommendation of the Mid-Hudson Transit Study.
- Wappinger-Wappinger Falls with a connection to the Castle Hill VA Medical Center.
- East Fishkill with a connection to Hopewell Junction.

Costs for each pilot are estimated to be between \$800,000 and \$1,200,000 per year depending on fleet requirements.

Secondary pilot locations include service in Dover Plains and in Pawling with connections to bus service to the east. Annual operating costs are estimated at approximately \$600,000.

Not all of the microtransit recommendations will ultimately prove feasible and further work with microtransit providers is needed to refine details and costs. In addition, once pilots are underway, DCPT can expect to deploy vehicles differently, change zone boundaries, and adjust service policies in response to market demand. Marketing this service widely and effectively will be critical to its success.

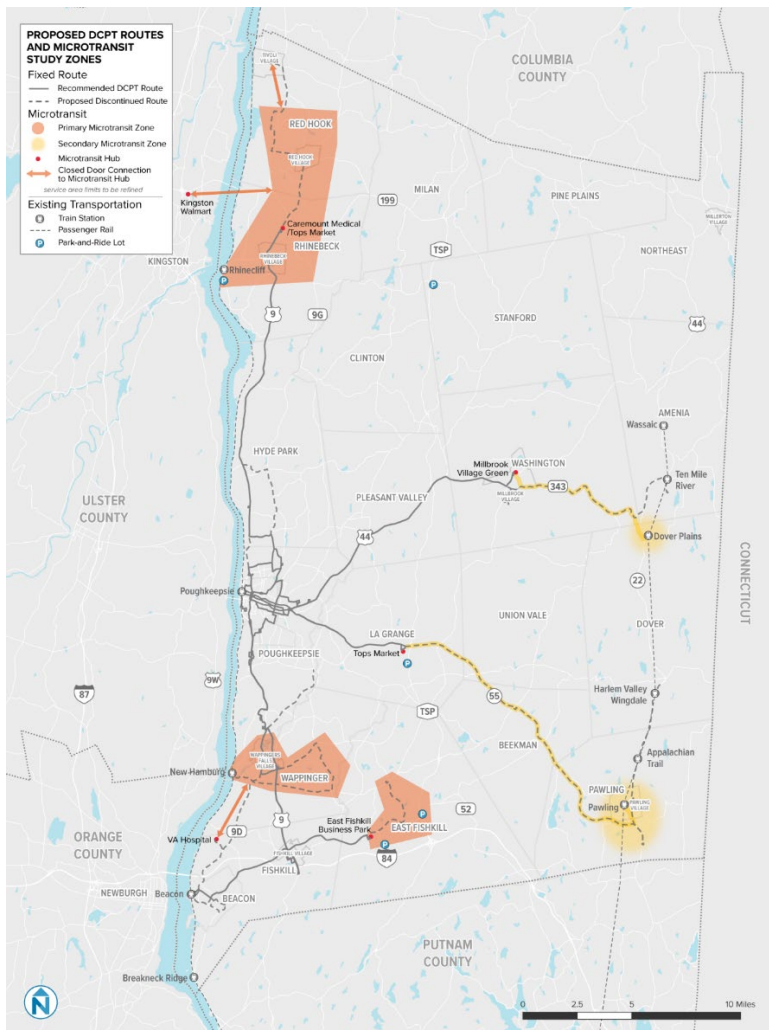
**Figure S-1. Proposed Fixed Routes and Demand-Response Services**



## S.6 Summary

With the implementation of the recommended plan, Dutchess County will operate a more market-responsive bus system that better serves its riders with more convenient and simpler schedules and where more transfers will be permitted. DCPT will be able to evaluate the feasibility of microtransit. All communities will have some form of publicly subsidized transportation, whether by DCPT bus, DCPT next-day Dial-A-Ride, a community-based service, a TNC provider, or a microtransit provider. The system will be managed with an integrated software platform for users to request trips and track vehicles (including fixed-route buses)—a system that DCPT, its partners, and vehicle operators will also be able to use. These integrated services are available today in other cities (an example of one is provided in the report appendix). The Nelson\Nygaard team believes such an approach will also work in Dutchess County.

**Figure S-2. Proposed Dutchess County Public Transit Routes and Microtransit Study Zones**



# 1 Introduction

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## 1.1 Study Purpose

In 2020, Dutchess County Public Transit (DCPT) engaged Nelson\Nygaard to study public transportation services in the county. The aim of the study is to recommend strategies that better address public transportation needs where service is provided and recommend alternatives where there is no service, or very limited service. A particular focus is on serving the most vulnerable, including older adults, people with disabilities, veterans, and those with low incomes.

The project included an assessment of pre-COVID transit services within the current and anticipated market. This included evaluating DCPT services (fixed-route and demand-response) and cataloging other available services for those that do not or choose not to drive.

Outreach included meetings and presentations as well as a rider survey. The data and input served as the basis for recommendations, including a range of options to improve access.

This report is a compilation of the completed work for the DCPT study. Section 2 sets the stage by describing the market for public transportation and compares this with the services provided. Section 3 describes and evaluates existing fixed-route and demand-response services. Section 4 outlines the outreach process including the results from the rider survey. Section 5 presents the recommended plan, including microtransit.

## 1.2 Study Participants

The study was led by Dutchess County Public Transit with support from its contractor, bus operators that participated in interviews, and staff from Dutchess County, including the Dutchess County Transportation Council. Others participated via meetings and through the rider survey, as discussed in section 4.



### **1.3 COVID-19 Considerations**

Like many transit agencies, DCPT has seen a substantial drop in ridership since the onset of the COVID-19 pandemic. Even with reductions in the number of active cases and immunization of a large proportion of the population, system ridership remains far lower than before the onset of the pandemic. The information presented in this report is based on data from the latter part of 2019. The recommendations developed for the study remain valid in terms of the strategies presented. However, if ridership remains well below pre-COVID levels, adjustments will be needed to account for potentially different budget resources.

## **2 Demographics, Activity Centers, and Travel Flows**

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This section compiles available data regarding the current and anticipated market for public transportation, including development patterns, population, and employment data, and existing travel flows. The underlying market for transit services provides insights on the needs of people travelling throughout the county. It also puts equity at the center of the analysis, highlighting areas that have high-transit needs that may or may not be aligned with available transportation services. Comparing the market for transit to how transit is currently provided gives insights on which areas and populations are adequately served, which may need more services, and where current service levels may not be supported.

### **2.1 Data Sources**

The Nelson\Nygaard team used pre-COVID data from the United States Census Bureau, Dutchess County, and StreetLight (for traffic flows) to examine:

1. The underlying demand for transit services based on population density, job density, demographics, and other factors.
2. The identification of key activity centers that generate demand for transit.
3. Where people were traveling in 2019 both within and beyond the county.

### **2.2 Approach**

The demographic analysis evaluates the relationship between DCPT bus routes, underlying county development patterns, travel flows, and demographics (see Table 1). For reference, DCPT fixed-route services are shown in Figure 1.

The land use analysis is largely based on the distribution and density of population and jobs. Residents' socioeconomic characteristics also help determine an area's transit need. Travel patterns show how people in the region travel across all modes, some of which may currently or potentially be on public transit.

**Table 1. Market Analysis Components**












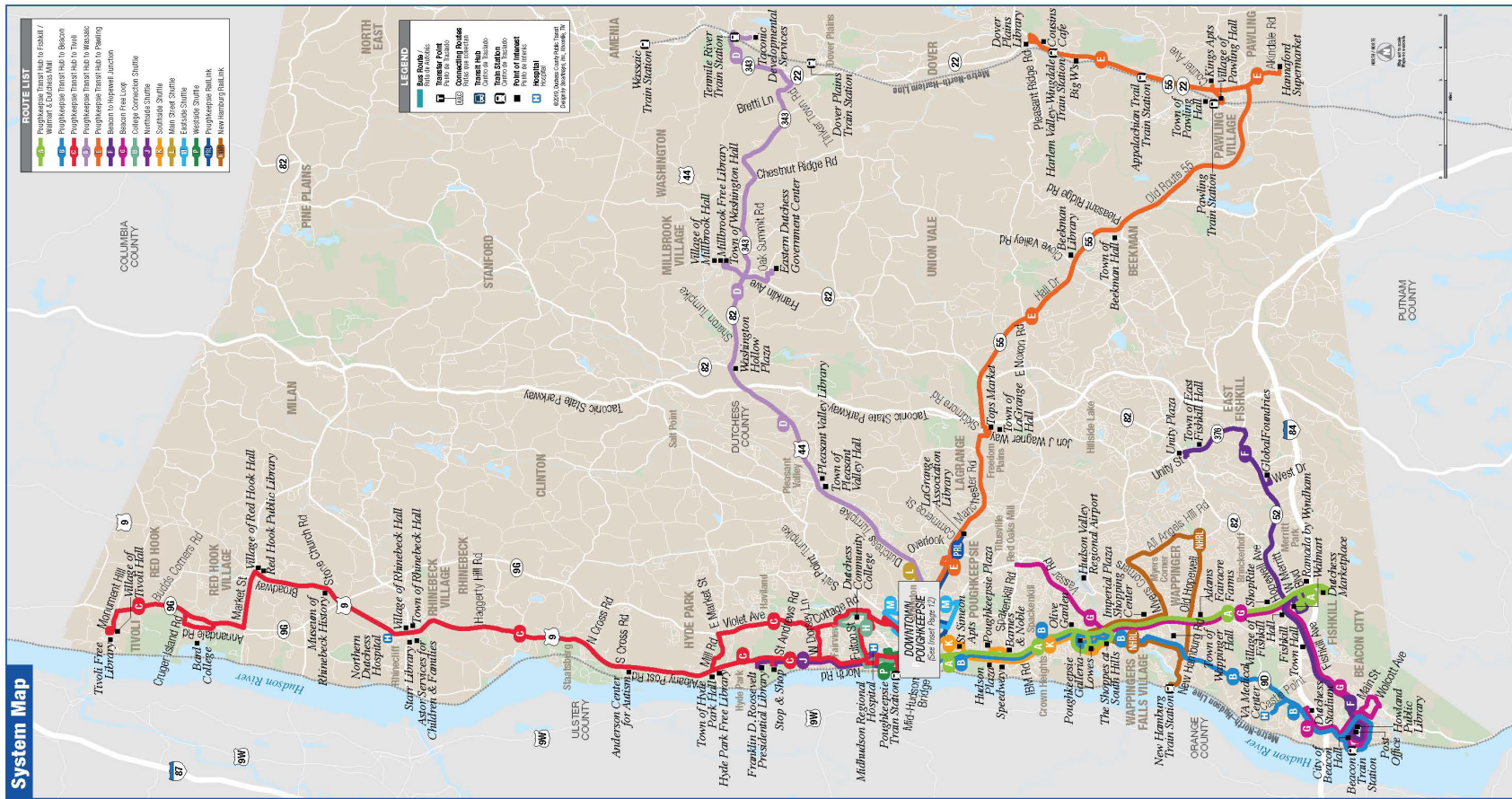
Demographic and Travel Inputs	Transit Inputs
 Population & Population Density	 DCPT Service Areas
 Employment & Employment Density	 Ridership Trends
 Socioeconomic Characteristics	 Top Destinations
 County Travel Patterns	 Travel Flows
<b>Analysis, Findings and Output</b>	
 Insights into the Relationship between Market Conditions and Ridership.	
 Comparing Transportation Service Supply and Demand.	
 Evaluate Markets that are Successful, Duplicative, and Underserved.	

Figure 1. Dutchess County Bus Routes



## 2.3 Demographics and Activity Centers

### 2.3.1 Land Use and Transit Demand




























Figure 2 illustrates the relationship between land use and transit demand, showing how the market for transit increases as density rises. As a rule, rural areas cannot support scheduled bus routes. Certain portions of lower density areas may be able to support reservation-based bus service (demand response) or on-demand services such as microtransit<sup>2</sup>, albeit less efficiently. Within Dutchess County, the City of Poughkeepsie supports higher frequency service.

**Figure 2. Land Use and Transit Demand Infographic**

Source: Composite data compiled by Nelson\Nygaard from various sources.

Key:

- Bus Rapid Transit (BRT)—BRT services provide enhancements similar to rail with increased investment in stations, better protection from traffic congestion, longer stop spacing, and off-board fare collection.
- Rapid Bus—Rapid bus services operate in mixed-traffic and make limited stops.
- Local Bus—Local bus services (e.g., DCPT Routes A-P and Rail Links) operate in mixed-traffic and make relatively frequent stops.

LAND USE			TRANSIT				
Land Use Type	Residents per Acre	Jobs per Acre	Appropriate Types of Transit		Frequency of Service		
 Downtowns & High Density Corridors	>45	>25	 Light Rail	 BRT	 Rapid Bus	 Local Bus	 10 mins or better
 Urban Mixed-Use	30-45	15-25	 BRT	 Rapid Bus	 Local Bus	 10-15 minutes	
 Neighborhood & Suburban Mixed-Use	15-30	10-15	 Local Bus			 15-30 minutes	
 Mixed Neighborhoods	10-15	5-10	 Local Bus	 Micro-transit		 30-60 minutes	
 Low Density	2-10	2-5	 Micro-transit	 Rideshare	 Volunteer Driver Pgm	 60 mins or less or On Demand	
 Rural	<2	<2	 Rideshare	 Volunteer Driver Pgm		 On Demand	

### 2.3.2 Population Density

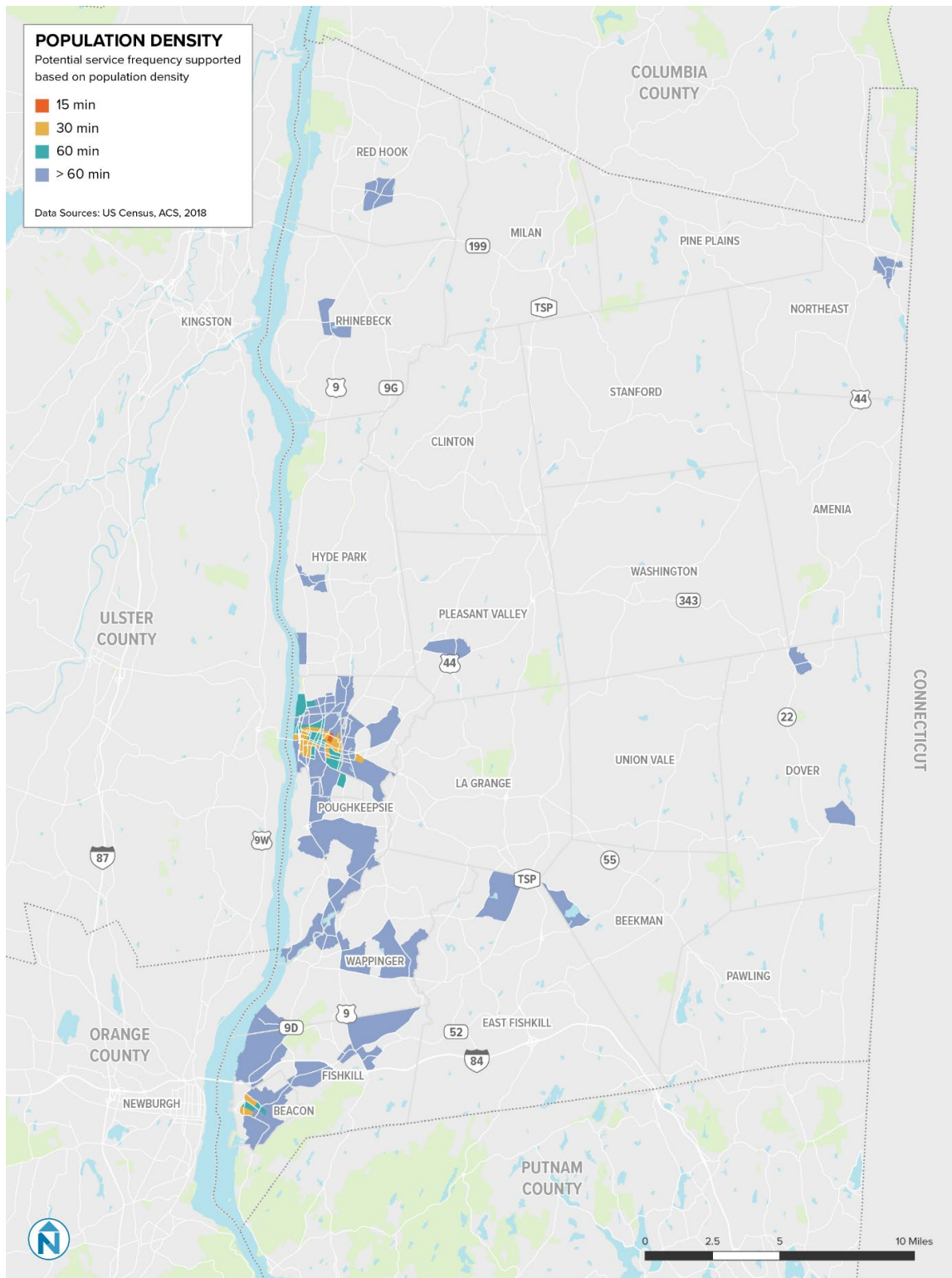
Population and job densities also provide an indication of the underlying population-based demand for transit in terms of the type and frequency of service that would be most appropriate. For example, to support 30-minute service, there generally must be at least 15 households per acre or more than 15 jobs per acre, or a combination thereof. However, these densities broadly indicate demand across contiguous and nearby areas. Clusters of density throughout an area or along a corridor are strong indicators of demand, while a dense but small block in an isolated area would not produce sufficient demand in and by itself. Demand can also “accumulate” along corridors: for example, if there are many blocks along a corridor that each have the density to support 30-minute service, the entire corridor may be able to produce enough demand for 15-minute or better service.

In Dutchess County, the areas with the highest population density that support more frequent transit service (30-minute service and better) are found in the southwest part of the county (see red and orange areas in Figure 3 and Figure 4), including parts of the City of Beacon and the City of Poughkeepsie. The county includes lower-density communities, small clusters of development, and rural expanses. Within the lower-density communities, the following locations by themselves could support some less-frequent transit service (60-minute service or longer). These are highlighted in turquoise and purple:

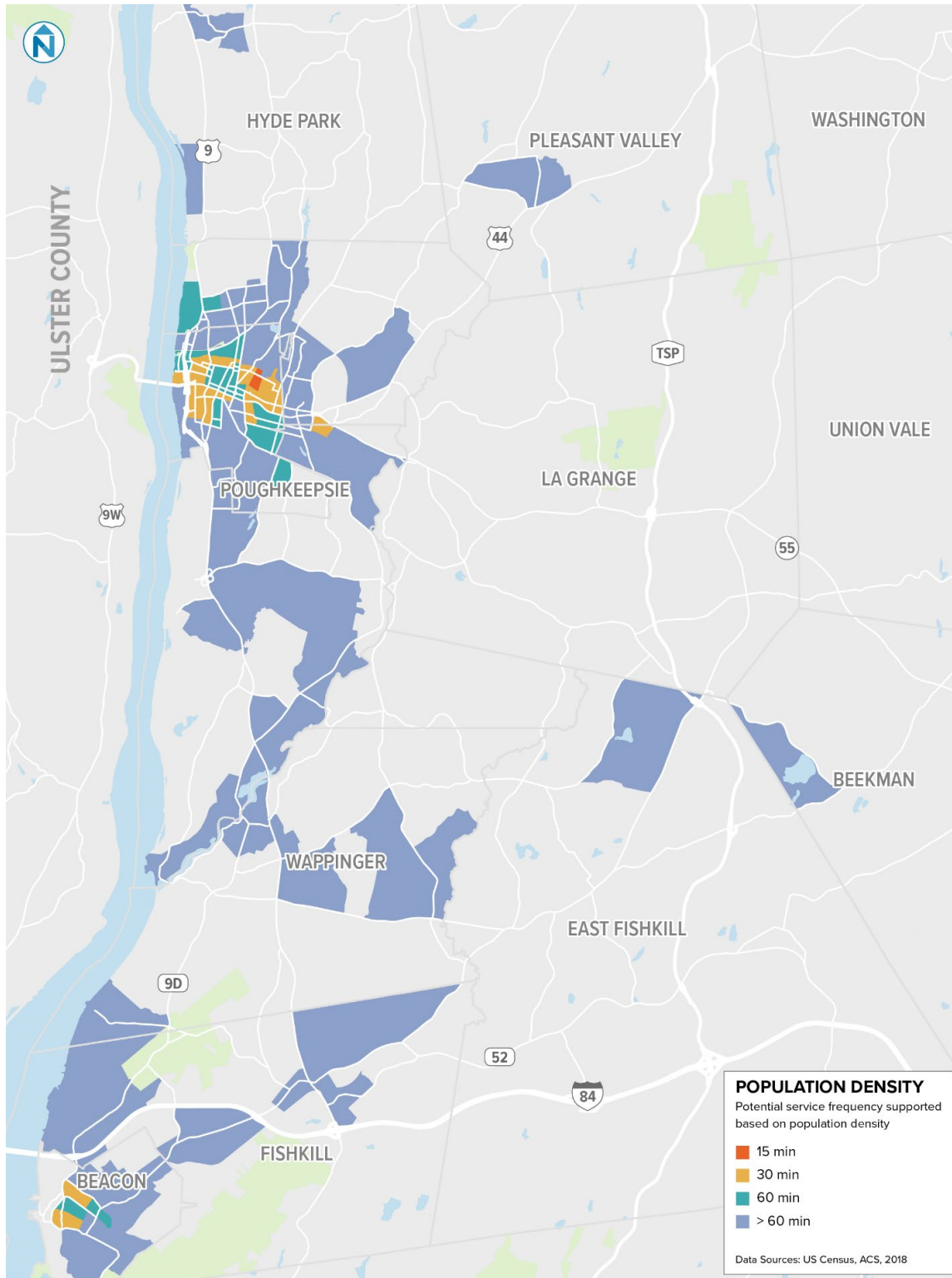
- Sylvan Lake area of Beekman
- Dover Plains
- Wingdale area of Dover
- Hillside Lake area of East Fishkill
- Parts of Fishkill (town)
- Fishkill Village
- Parts of Hyde Park
- Millerton Village
- Parts of Pleasant Valley
- Red Hook Village
- Parts of Rhinebeck Village
- Parts of Wappinger (town)
- Wappinger Falls Village

It is important to note that a number of these areas are isolated and operating fixed-route bus service to these locations is typically not cost effective.

**Figure 3. Transit Frequency Supported by Population Density**



**Figure 4. Transit Frequency Supported by Population Density in Southwestern Dutchess County**





### **2.3.3 Concentrations of Employment**

The concentration of jobs also affects transit demand since some people commute by bus. Like population density, the underlying demand for transit typically grows with an increase in employment density. As shown previously in Figure 3, an area with two to five jobs per acre generally supports 60-minute transit service. Areas with five to ten jobs per acre typically support more frequent transit service.

In Dutchess County, transit-supportive employment clusters are concentrated in just a few areas.

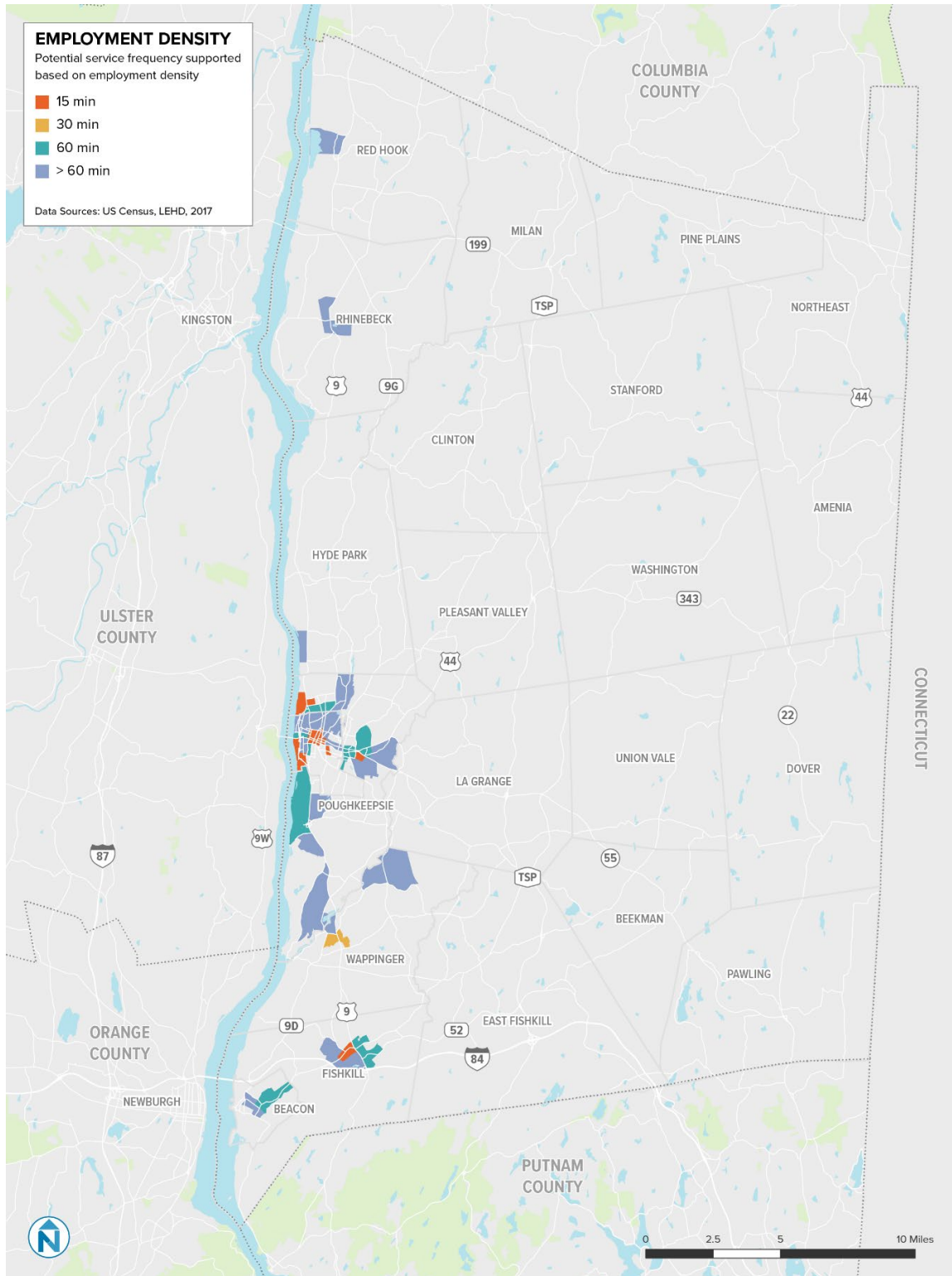
Locations with the highest employment density (see shaded areas in Figure 5 and Figure 6) are found in the southwest part of the county and include:

- City of Poughkeepsie
- Town of Poughkeepsie
- City of Beacon
- Village of Wappingers Falls
- Village of Fishkill

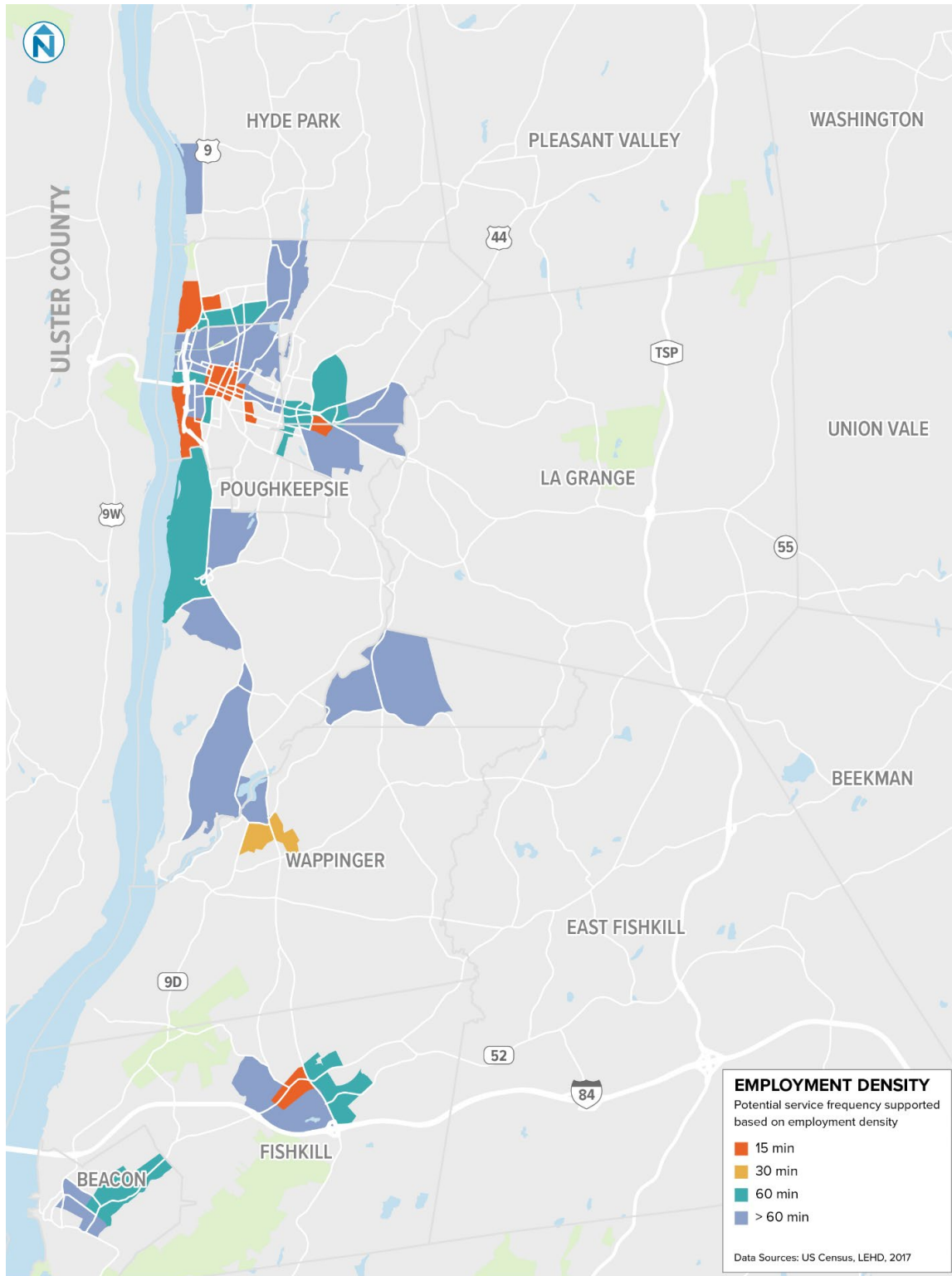
Outside these areas, only a few other clusters within the county have significant employment density, including portions of the following:

- Town of Fishkill
- Hyde Park (Culinary Institute of America)
- Town of Red Hook (Bard College)
- Village of Rhinebeck
- Town of Wappinger

**Figure 5. Transit Supportive Concentrations of Employment**



**Figure 6. Transit Supportive Concentrations of Employment in Southwest Dutchess County**



### **2.3.4 Socioeconomic Factors**

Nelson\Nygaard employs a Transit Propensity Index (TPI) to help in evaluating the collective impacts of socioeconomic characteristics and transit need. Figure 7 and 8 show the TPI of places where the combined population and employment density is greater than or equal to two people per acre. The TPI is an equally weighted balance of the densities of the following groups of people/households:

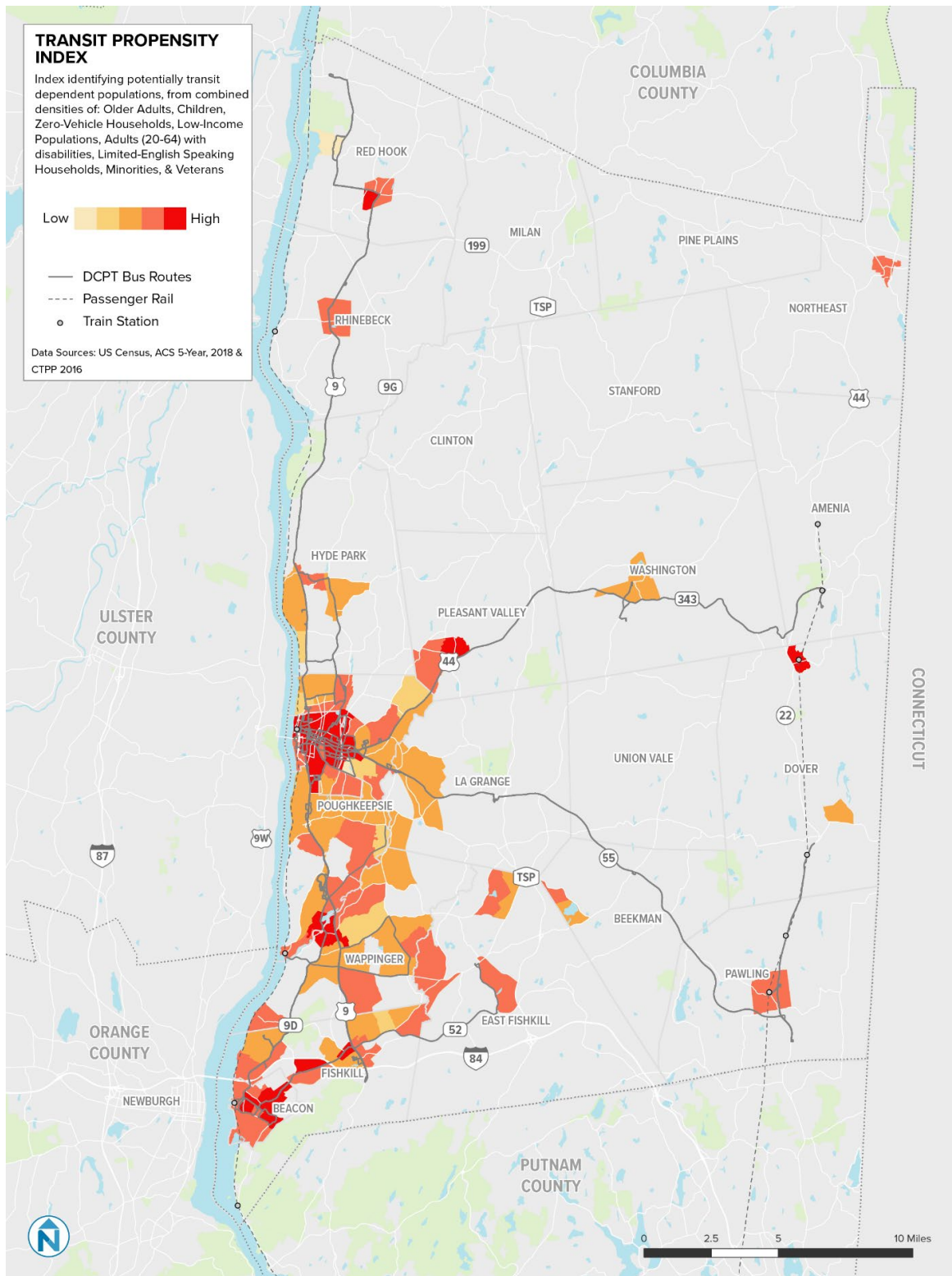
- Low-income households (below 150% of the poverty level)
- Households without vehicles
- Older adults
- Children under 18
- People with disabilities
- Limited English-speaking households
- Veterans
- Minorities

In Dutchess County, the areas that score highest on the TPI include<sup>3</sup>:

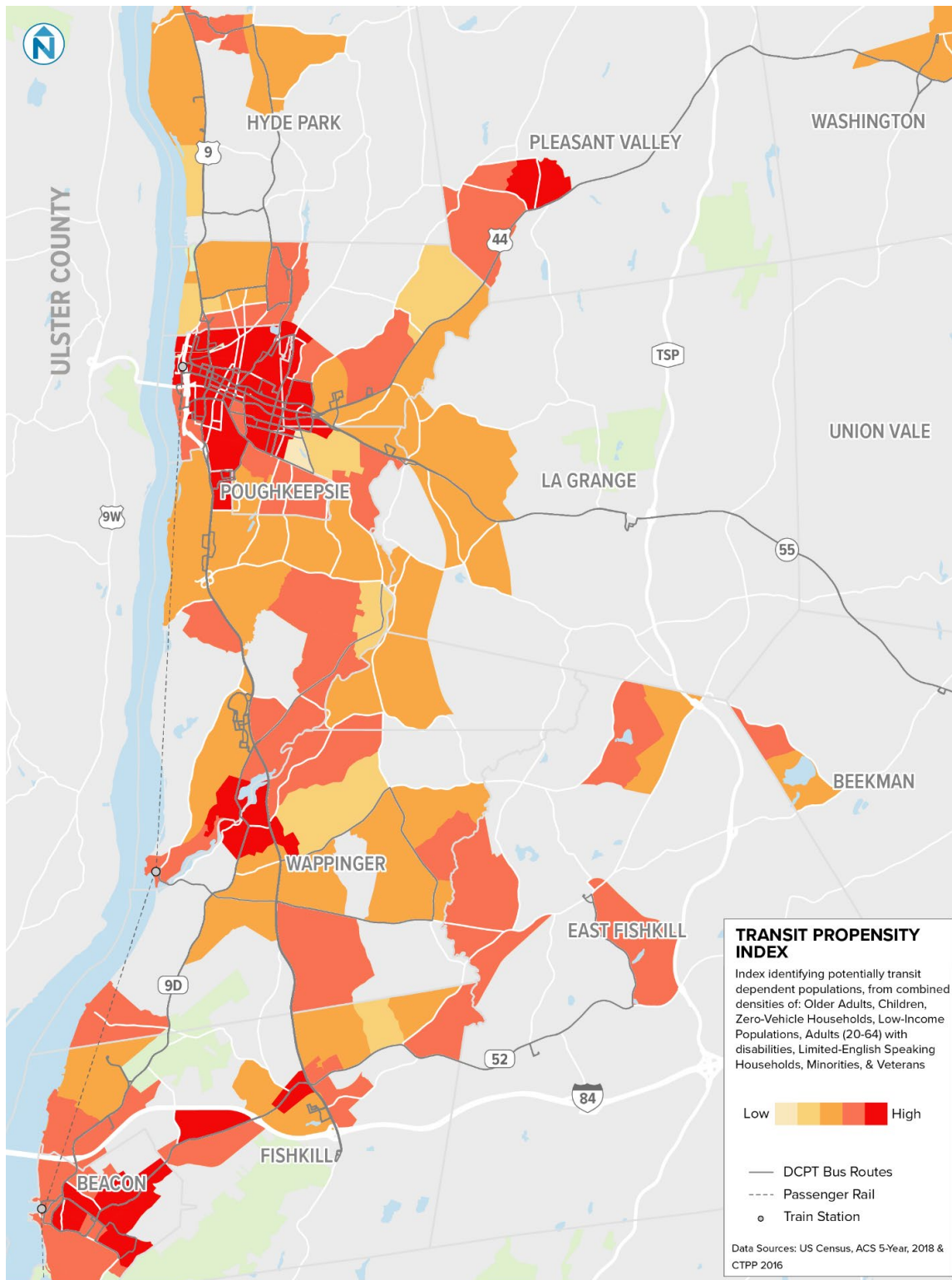
- City of Beacon
- City and Town of Poughkeepsie
- Dover Plains town center (Town of Dover)
- Pleasant Valley town center (Town of Pleasant Valley)
- Village of Fishkill
- Village of Wappingers Falls
- Village of Red Hook

Most of the areas that score high on the transit propensity index have some level of DCPT bus service. Dover Plains is an exception.

**Figure 7. Transit Propensity Index**



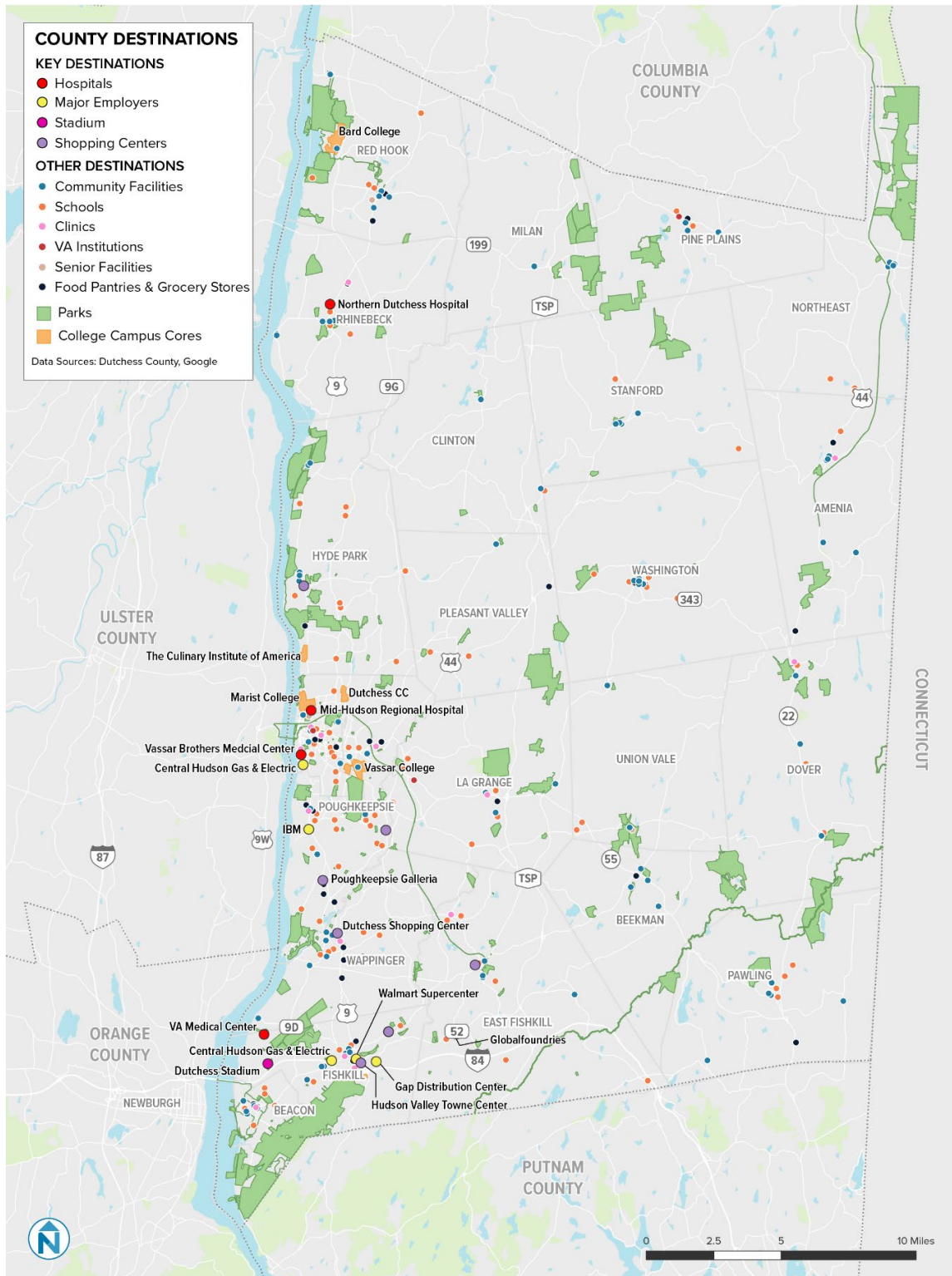
**Figure 8. Transit Propensity Index in Southwest Dutchess County**



### **2.3.5 Important Destinations**

Figure 9 shows important destinations and other areas of activity, many of which are potential transit nodes. Most of these places—larger employers, shopping destinations, and hospitals—generate relatively consistent demand for transit throughout the year. Activities at recreation areas and educational institutions are more variable. Some activity centers have less peak-period travel compared with employment centers.

**Figure 9. Important Destinations and Other Areas of Activity**





## 2.4 Travel Patterns

Because most people in the county travel by automobile, the consultant team evaluated travel flows, particularly to or from areas that may or may not support fixed-route transit. With the widespread use of smartphones and Global Positioning System (GPS)-enabled vehicles, it is now possible to aggregate location-based movement patterns. The team purchased travel pattern data from StreetLight for the months of March, April, September, and October 2019 within Dutchess County and surrounding areas.<sup>4</sup>

### 2.4.1 Travel Flows within Dutchess County

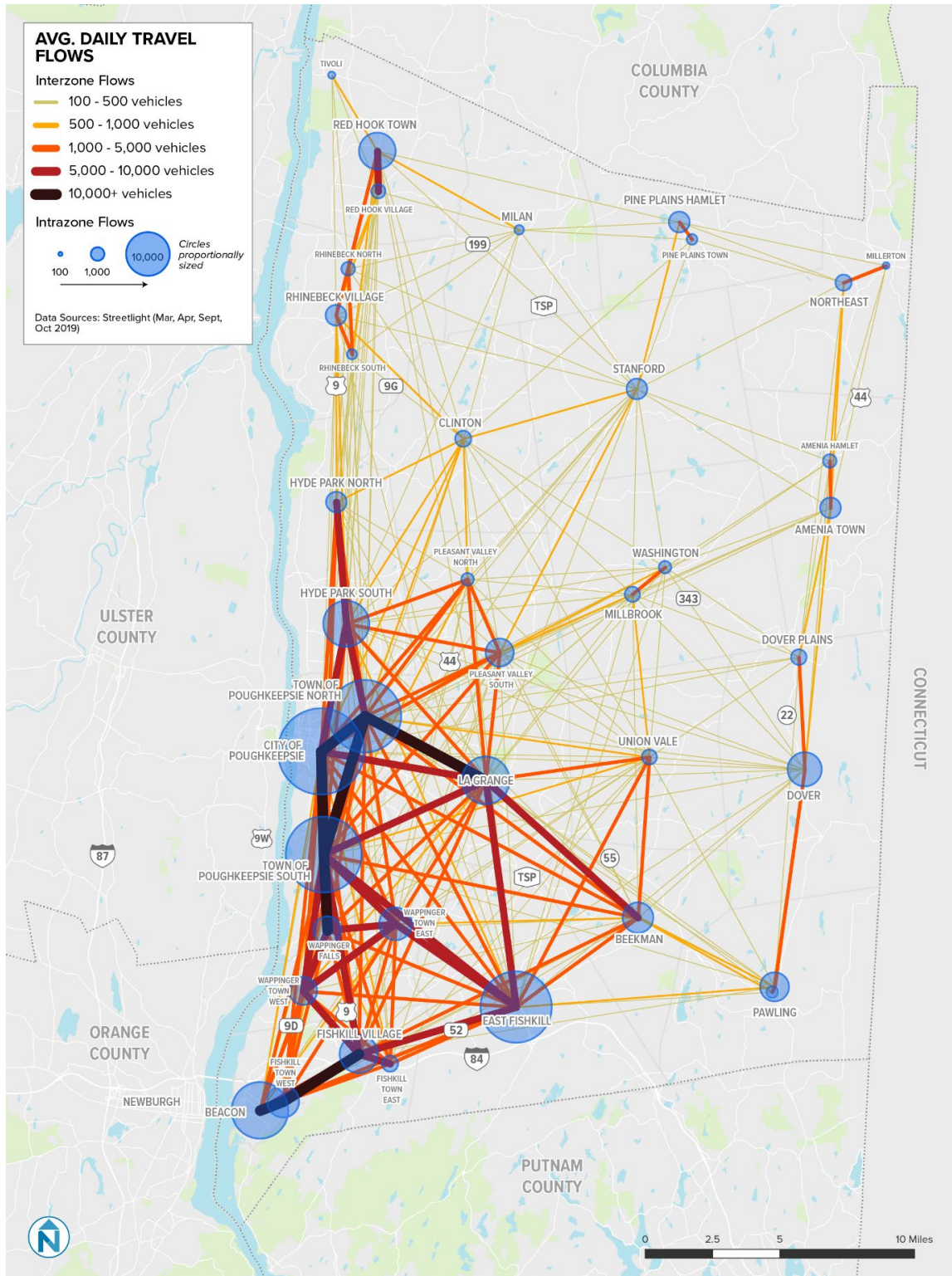
The tables and maps on the following pages show the ten highest bi-directional travel flows within Dutchess County (see Table 2). Figure 10 shows overall flows between origins and destinations, known as O-D pairs, and Figure 11 shows flows within southwest Dutchess County. Analysis of the data demonstrates:

- The City and Town of Poughkeepsie is the county’s largest population center and accounts for roughly 45% of all daily vehicular trips starting and ending within the county.
- The largest daily trip volumes within the county are concentrated in the southwest. The communities along the north/south Route 9/9D corridor from Fishkill to Poughkeepsie see travel in each O-D pair exceeding 10,000 daily trips.
- In addition to the Route 9 corridor, other areas with daily volumes between 5,000 and 10,000 include adjacent communities with strong travel connections: Poughkeepsie-LaGrange, Poughkeepsie-Wappinger, Poughkeepsie-East Fishkill, LaGrange-East Fishkill, and LaGrange-Beekman.
- The Route 9 corridor north of Poughkeepsie shows an interesting pattern. North-south flows remain relatively high from Beacon into North Hyde Park (5,000–10,000 daily trips) but then drop off before picking up again between Rhinebeck and Red Hook.
- Southeast Dutchess has a noticeable connection along the Route 22 corridor between Pawling and Dover, and within Dover Plains.

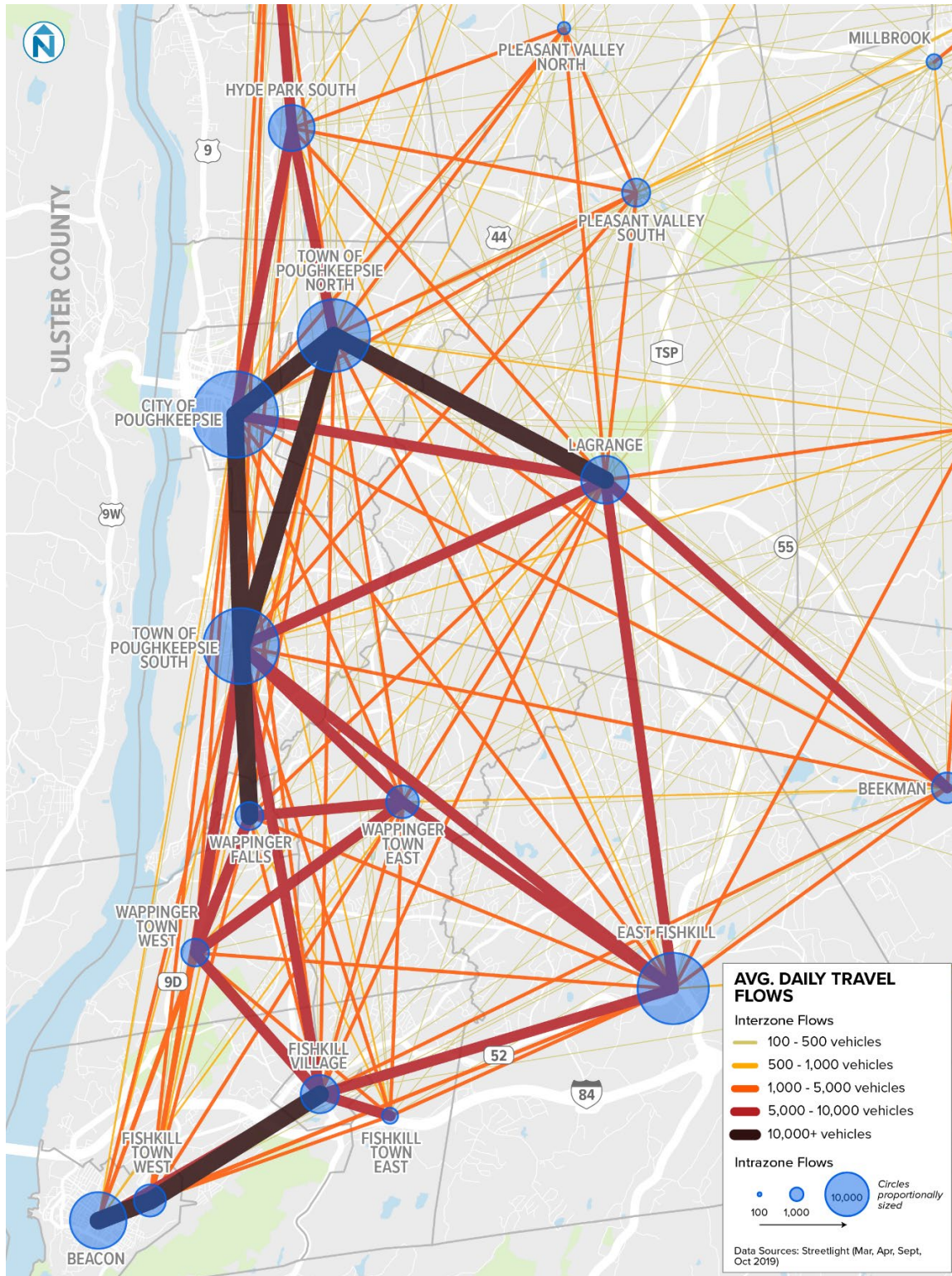
**Table 2. Top Ten Travel Flows within Dutchess County (bi-directional)**

Rank	Zone 1	Zone 2	Avg Daily Travel Flows
1	Town of Poughkeepsie North	City of Poughkeepsie	35,008
2	City of Poughkeepsie	Town of Poughkeepsie South	21,334
3	Town of Poughkeepsie North	Town of Poughkeepsie South	14,782
4	Wappingers Falls	Town of Poughkeepsie South	10,671
5	Fishkill Town West	Fishkill Village	10,390
6	Town of Poughkeepsie North	LaGrange	10,256
7	Fishkill Town West	Beacon	10,027
8	Wappinger Town East	Town of Poughkeepsie South	9,588
9	Town of Poughkeepsie North	Hyde Park South	9,543
10	Fishkill Village	East Fishkill	8,603

**Figure 10. Travel Flows within Dutchess County**



**Figure 11. Travel Flows within Southwest Dutchess County**



## 2.4.2 Travel Flows to and from Dutchess County

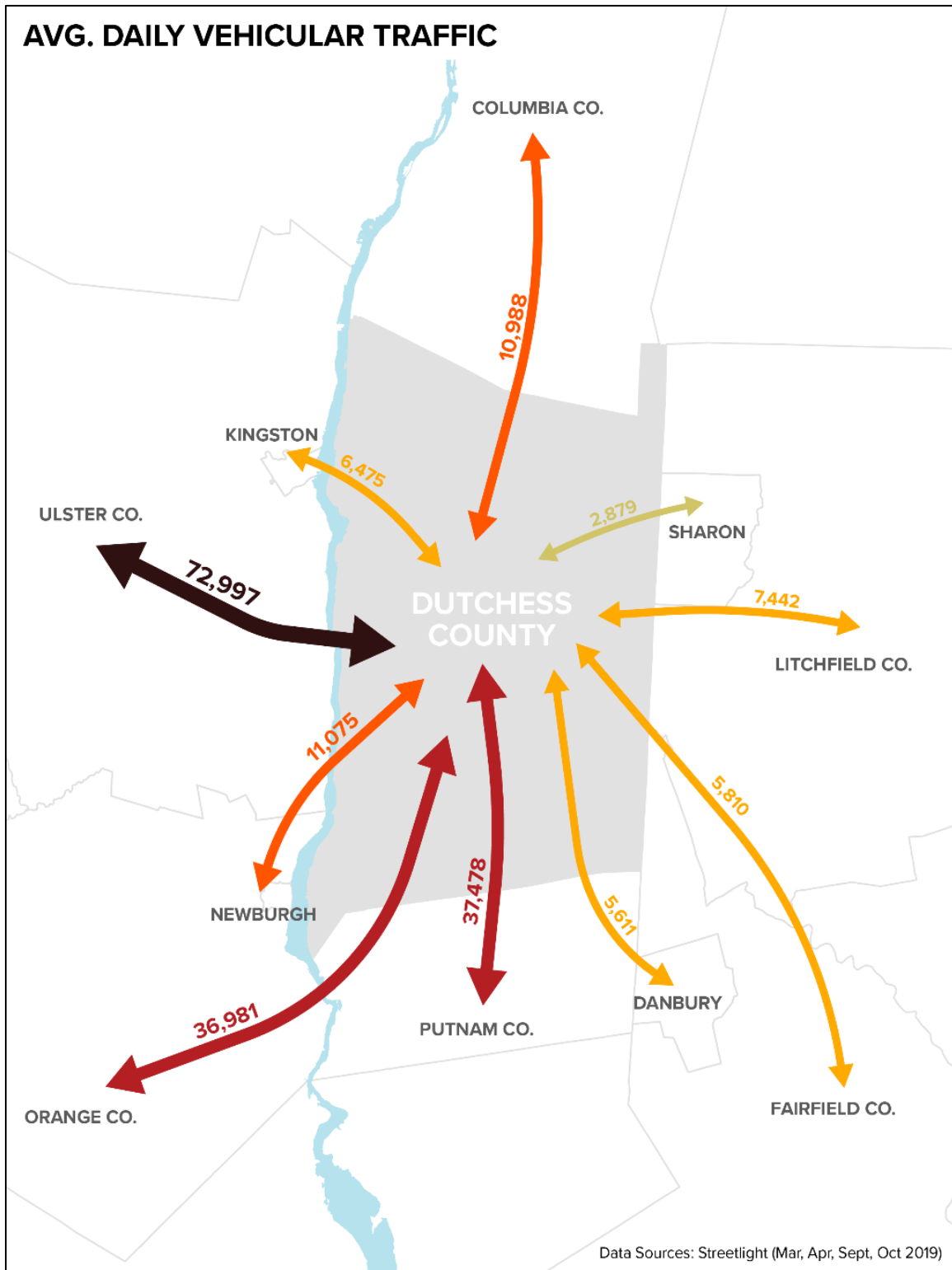
StreetLight also provides data on flows into and out of Dutchess County. Table 3 lists the top ten zones based on travel flows. Figure 12 shows daily trips that either begin or end in the county. As shown:

- The highest regional connections with the county are concentrated to the west and south. The largest volumes are between Dutchess and Ulster counties at roughly 75,000 daily round trips. This is nearly double the second highest regional connections, Putnam and Orange counties, both with roughly 37,000 daily trips.
- Areas to the north (Columbia County) and east (Connecticut) have comparatively fewer trips. These locations together total only about 30,000.

**Table 3. Top Ten Travel Flows Into/Out of Dutchess County (bi-directional)**

Rank	Zone 1	Zone 2	Avg Daily Vehicular Traffic
1	City of Poughkeepsie	Ulster County	16,962
2	Town of Poughkeepsie South	Ulster County	10,420
3	Town of Poughkeepsie North	Ulster County	9,145
4	Putnam County	East Fishkill	6,576
5	Beacon	Orange County	6,271
6	Putnam County	Pawling Town	5,936
7	Fishkill Town West	Orange County	4,845
8	Fishkill Village	Orange County	4,505
9	Ulster County	Red Hook Town	4,276
10	Putnam County	Fishkill Village	4,133

Figure 12. Travel Flows to and from Dutchess County



## **2.5 Future Demand**

The analysis focused on the market for transit, existing activity centers, and recent travel flows. Future planning must account for population and employment growth, major infrastructure investments, and new development. According to Dutchess County staff, population is not expected to grow significantly in the county. The population is expected to grow older however, which will likely increase the number of people who require transportation services.

In addition, new development projects that may impact future transit demand include an Amazon warehouse and distribution center in the Town of East Fishkill and the Hudson Heritage development adjacent to Marist College. These and other known projects were included in the development of recommendations.

### **2.5.1 Market Findings**

- The City and Town of Poughkeepsie, Wappinger Falls, Fishkill, and Beacon are most supportive of fixed-route service. Route 9, which is currently served by several bus routes, is the strongest transit corridor supporting higher-frequency service.
- Although not quite dense enough to support frequent fixed-route service, communities such as Dover Plains, Pleasant Valley, and Red Hook have populations with a need for transit that could be fulfilled by a mixture of fixed-route and demand-responsive transit.
- There are wide areas of the county that cannot support fixed-route service and other areas that would lend themselves to having transit hubs where fixed-route and demand-response services can meet.
- The strongest measured neighboring county connection is with Ulster County; this may include travel to/from the Walmart in Kingston.

### 3 Existing Transit Services

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Access to public transportation varies throughout Dutchess County. Some municipalities have several options available, while options are limited or unavailable in other communities. To account for the full range of public transportation, the consultant team compiled a list available public services including fixed-route (scheduled) bus and rail (DCPT bus, Metro North Rail, and/or Amtrak), and demand-response (reservation-only) service. Table 4 summarizes the availability of public transportation services in each of the county's 20 towns, eight villages, and two cities in tabular form, while Figure 13 illustrates this graphically. As shown, 20 of the 22 cities and towns and all eight villages have some service available; the towns of Clinton and Milan have neither fixed-route nor demand-response services.

DCPT provides fixed-route service in both cities, 14 towns, and seven villages. In addition to the demand-response options listed below, DCPT provides limited countywide Flex service, Friends of Seniors offers countywide volunteer driver services for older adults, and the Dutchess County Office for Aging provides transportation to the Senior Friendship Centers. These and other demand-response services listed in the table are described in more detail later in this section.

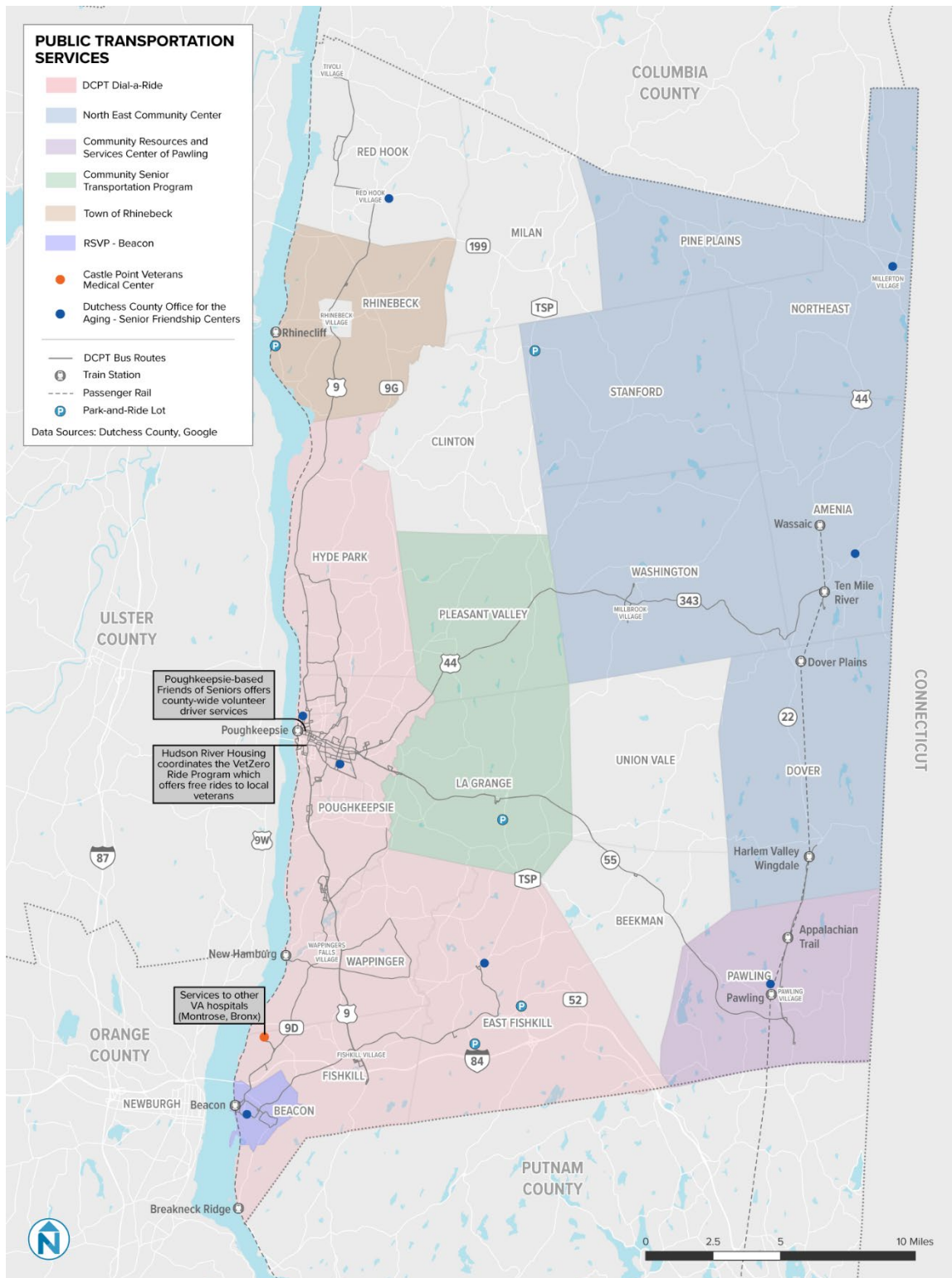
**Table 4. Public Transportation Availability by Municipality**

Municipality	DCPT Bus	Metro North	Demand-Response Provider
Amenia (town)	No	Yes	North East Community Center
Beacon (city)	Yes	Yes	RSVP
Beekman (town)	Yes	No	None
Clinton (town)	No	No	None
Dover (town)	Yes	Yes	North East Community Center
East Fishkill (town)	Yes	No	DCPT
Fishkill (town)	Yes	No	DCPT
Fishkill (village)	Yes	No	DCPT
Hyde Park (town)	Yes	No	DCPT
La Grange (town)	Yes	No	Community Senior Transportation
Milan (town)	No	No	None
Millbrook (village)	Yes	No	North East Community Center
Millerton (village)	No	No	North East Community Center
North East (town)	No	No	North East Community Center
Pawling (town)	Yes	No	Pawling Resource Center
Pawling (village)	Yes	Yes	Pawling Resource Center
Pine Plains (town)	No	No	North East Community Center
Pleasant Valley (town)	Yes	No	Community Senior Transportation
Poughkeepsie (city)	Yes	Yes*	DCPT
Poughkeepsie (town)	Yes	Yes	DCPT
Red Hook (village)	Yes	No	None
Red Hook (town)	Yes	No	None
Rhinebeck (village)	Yes	No	None
Rhinebeck (town)	Yes	Yes*	Rhinebeck
Stanford (town)	No	No	North East Community Center
Tivoli (village)	Yes	No	None
Union Vale (town)	Yes	No	None
Wappinger (town)	Yes	Yes	DCPT
Wappingers Falls (village)	Yes	No	DCPT
Washington (town)	Yes	No	North East Community Center

\* Includes Amtrak rail service.



**Figure 13. Public Transportation Services**



## **3.1 Fixed-Route Bus Service**

As noted, DCPT provides fixed-route services in both cities, 14 towns and seven villages. DCPT's fixed-route system map was presented in Figure 1. Figure 14 shows the individual bus routes throughout the county and Figure 15 shows services in Poughkeepsie.

The bus system includes 15 fixed routes with complementary paratransit as required by ADA. Service is centered in the cities of Poughkeepsie and Beacon and denser parts of the county. Several routes extend along major State highways into rural areas to serve hamlets and villages. The Poughkeepsie Transit Hub is located at Civic Center Plaza in downtown Poughkeepsie with additional curbside bus parking on Market Street. There is some scheduled pulsing of departures at this hub, but this pulsing is not universal, mostly due to varying headways and bay capacity.

The route structure reflects the consolidation of the county and city bus systems in 2017, thus expanding county bus operations within the City of Poughkeepsie. While some redundancies in service were addressed by a prior transit study. Route profiles, including ridership statistics and other key data are presented as an appendix to this report.

The operation is privatized with all positions, except the Transit Administrator (equivalent to a General Manager), as employees of the contractor. The fleet consists primarily of transit buses from manufacturers like Orion, Gillig, and El Dorado, in 30 feet 35 feet and 40 feet lengths. DCPT's International cutaway, or modified vehicle on a light or medium-duty truck chassis, buses are occasionally used on fixed-route service. The county bus garage/facility is located on 14 Commerce Street (off Route 55) in LaGrange, about three miles east of downtown Poughkeepsie.

### **3.1.1 Complementary Paratransit**

DCPT operates complementary paratransit service as required by the Americans with Disabilities Act (ADA) within three-quarters of a mile of fixed-route bus service. The ADA service requires reservations at least the day prior to travel and riders must be certified as eligible for ADA paratransit. Demand for this service is generally under 50 riders per week. In February 2020, the last full month prior to the beginning of the COVID-19 pandemic, weekday ridership was between 25 and 34 trips per day with about ten trips on Saturday. Forty-one unique riders traveled during February 2020.

**Figure 14. Existing Dutchess County Public Transit Bus Routes**

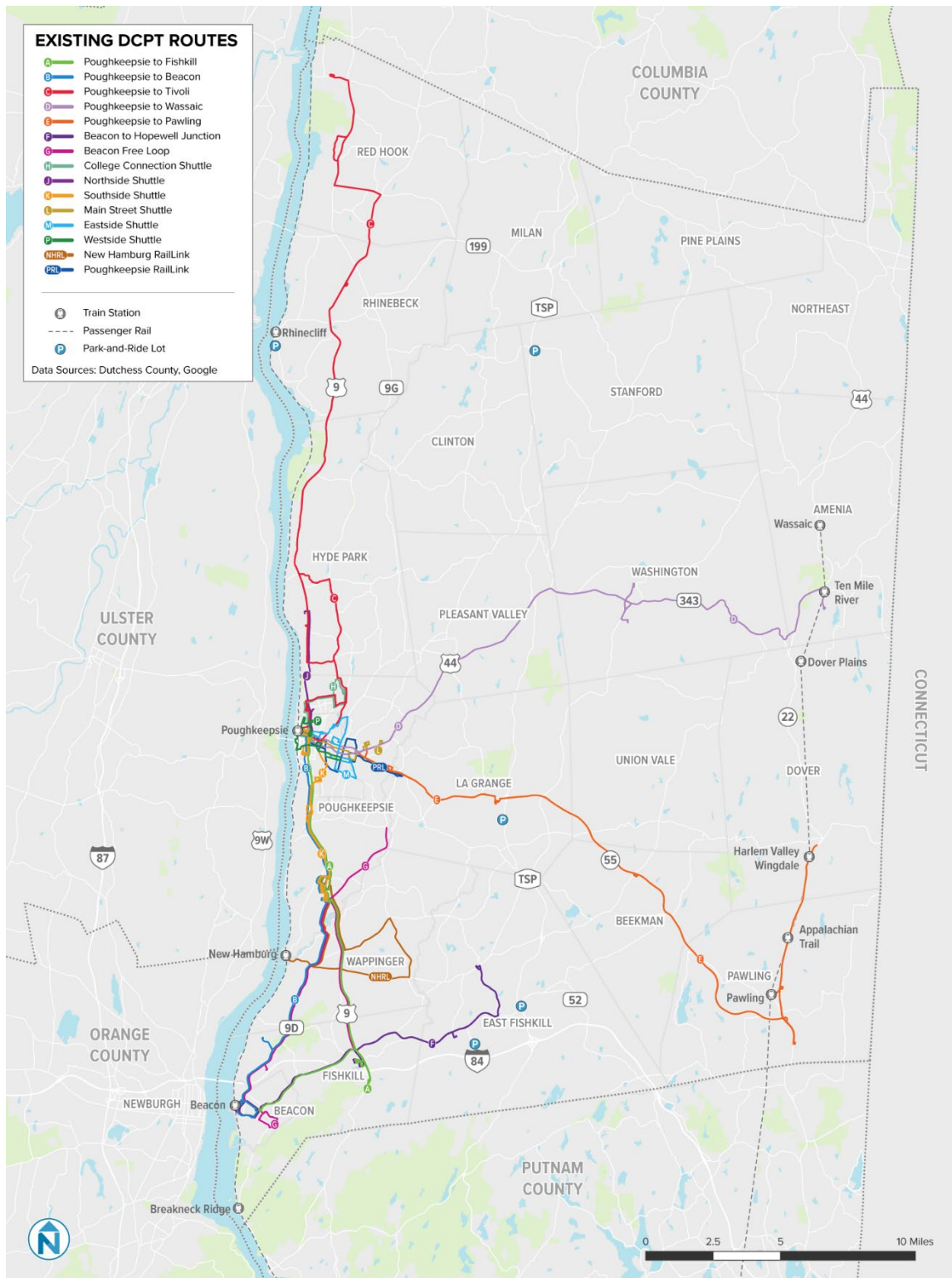
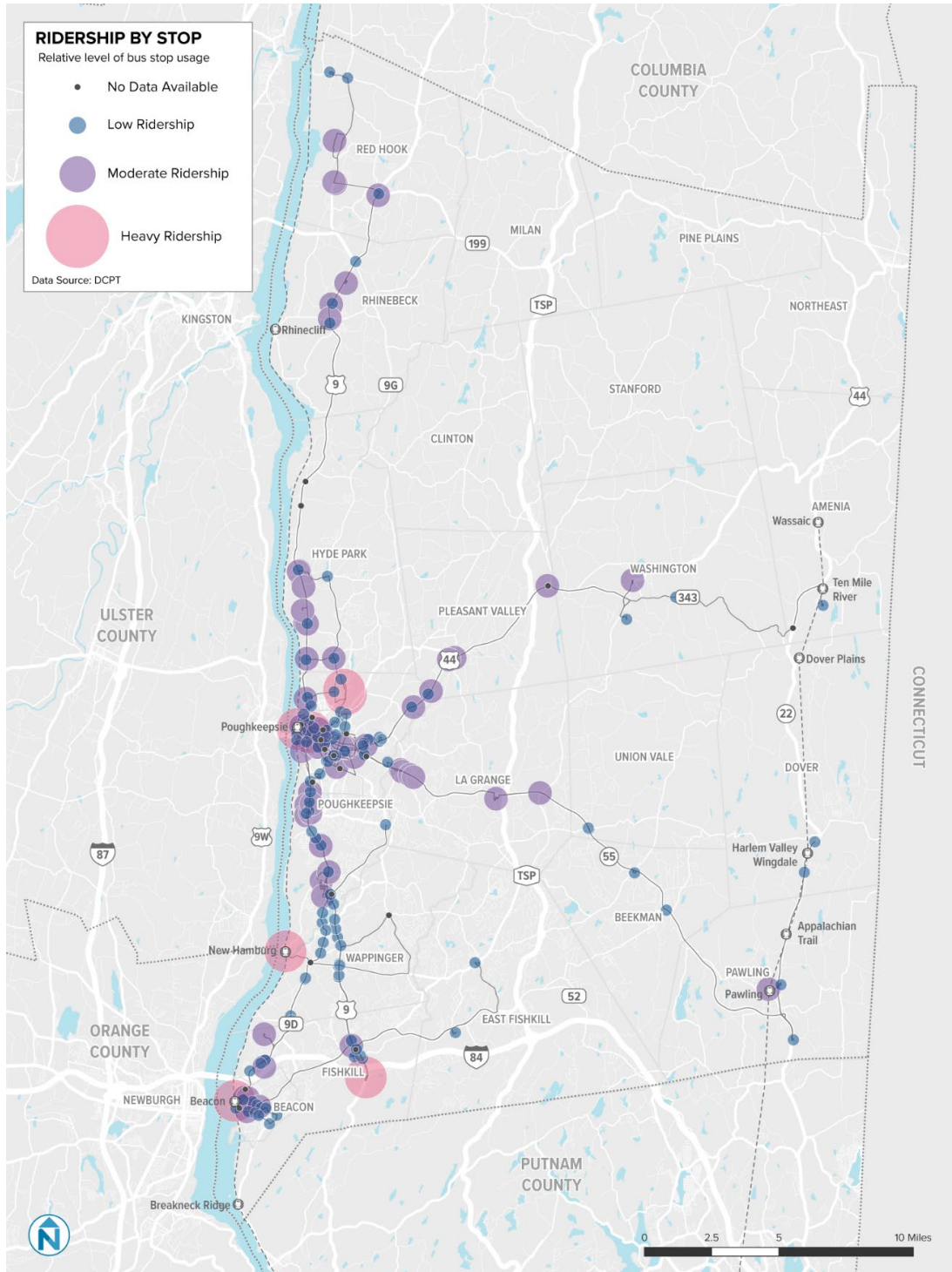


Figure 15. Existing Dutchess County Public Transit Bus Routes (Poughkeepsie)



Figure 16 shows the relative fixed-route bus ridership by stop based on DCPT staff input. As shown, with a few exceptions, most ridership is concentrated in Poughkeepsie, along the southern Route 9 corridor, and in Beacon.

**Figure 16. Relative Ridership by Stop for Dutchess County Public Transit Bus Routes**



### **3.1.2 Key Takeaways on Fixed-Route Service**

The team developed route profiles for each fixed route as presented in the appendix. To facilitate easy comparisons with the recommendations presented in section 5, a summary of the team’s observations about each route are presented. The following are some of the key takeaways from the assessment of DCPT fixed-route service.

- Within the City of Poughkeepsie, there is significant redundancy in the paths of service of the county routes, which pass through the city to serve outlying communities, and the former city routes, that were designed for circulation within the City of Poughkeepsie. As a result, a rider within the City of Poughkeepsie looking for the next trip to the Transit Hub at a certain time may need to choose among several different bus stops, each served by a different route.
- Due to varying headways and bay capacity, the opportunity to make pulsed connections at the Transit Hub or elsewhere varies by time of day. Some well-used connections require significant waits.
- The most heavily used routes immediately outside of the City of Poughkeepsie feature complex route variations and redundancies with uneven headways.
- DCPT provides fixed-route service well outside areas that can support such service; these routes have extremely long headways and carry very few riders.

## **3.2 Demand-Response Service**

### **3.2.1 Providers**

In addition to DCPT’s fixed-route and complementary paratransit, DCPT operates Dial-A-Ride service in communities that opt into the service by paying an annual fee, and a countywide demand-response service called Flex.

DCPT operates Dial-A-Ride in six municipalities that have contracted for this service. There are no eligibility restrictions. The Flex service is available in municipalities without DCPT fixed-route service and in parts of the City of Poughkeepsie without fixed-route service. The service operates with very limited hours (9 a.m.–1:45 p.m.) and with only two vehicles. See Appendix A for published DCPT service information on Dial-A-Ride and Flex.

North East Community Center provides demand-response transportation to destinations in Dutchess County and nearby Connecticut for trips originating in Amenia, Dover, North East, Pine Plains, Stanford, and Washington (Millbrook); services are open to all, but priority is given to older adults and people with disabilities for medical trips. Local demand-response services are also available in LaGrange

(older adults), Pawling (all ages), Pleasant Valley (older adults), and Rhinebeck (older adults). Poughkeepsie-based Friends of Seniors offers countywide volunteer driver services to older adults. In addition, a volunteer driver program in Beacon serves older residents with local transportation.

This service landscape means that older adults and people with disabilities have access to the most options. However, individuals needing transportation who do not meet age or disability restrictions in communities where no public transit service is available must get a ride from someone else or use private transportation.

### **3.2.2 Ridership and Usage Patterns**

Table 5 shows pre-pandemic Dial-A-Ride ridership statistics for a representative month (October 2019). As shown, 2,071 trips were taken by 233 unique riders. Each rider took an average of 8.8 trips, but this varied by service with East Fishkill riders taking an average of 15.3 trips and Hyde Park riders taking only 4.6 trips per rider (Hyde Park only contracts for one day of service per week). While the overall average trip was five miles, average trip lengths in East Fishkill (10.1) and Hyde Park (7.7) were longer, reflecting longer distances to key destinations.

The consultant team evaluated the locations of demand-response travel to determine how many trips could potentially be served by fixed routes. This was calculated as the percentage of trips where the pickup and drop-off addresses were both within three-quarters of a mile of fixed-route service, a measure equivalent to the requirement for complementary paratransit under ADA. This distance was used as a proxy for possible ADA ridership demand that could result from not having any Dial-A-Ride service available. As shown in Figure 21, 74% of the analyzed trips were entirely within three-quarters of a mile of the fixed route. This was most prevalent in the City of Poughkeepsie (98%) and in the Town of Poughkeepsie (94% for the north service and 78% for the south service). Once again, East Fishkill and Hyde Park had the fewest trips entirely within three-quarters of a mile of fixed-route service, consistent with the limited fixed-route service available in those towns.

**Table 5. October 2019 Dial-A-Ride Service Statistics**

Service	Unique Riders	Oct 2019 Trips	Trips per Rider	Avg. Trip Length (miles)	Fully within Fixed Route	Percent
Poughkeepsie City (Combined)	103	595	5.8	3.7	574	98%
East Fishkill	16	245	15.3	10.1	44	18%
Fishkill	24	179	7.5	3.8	130	73%
Hyde Park	24	107	4.6	7.7	54	50%
Poughkeepsie Town North	49	236	4.8	6.0	223	94%
Poughkeepsie Town South	34	287	8.4	3.9	225	78%
Wappinger	59	422	7.2	4.1	293	69%
<b>Total</b>	<b>233*</b>	<b>2,071</b>	<b>8.8*</b>	<b>5.0</b>	<b>1,543</b>	<b>74%</b>

\* 233 overall unique riders (some use more than one service)—individual services sum to 309 riders and 1,784 unique trips.

Table 6 summarizes the distribution of service by weekday, showing that Wednesday was the highest demand day. Each vehicle in service provided an average of between 43 and 58 trips that month.

**Table 6. Monthly Dial-A-Ride Trips by Weekday (October 2019)**

Service/Trips (Oct 2019)	Mon	Tue	Wed	Thu	Fri	Total
October 2019 Weekdays	4	5	5	5	4	
Poughkeepsie City (Combined)	75	140	135	155	90	<b>657</b>
East Fishkill	65	No Svc.	100	No Svc.	80	<b>299</b>
Fishkill	No Svc.	120	No Svc.	58	No Svc.	<b>233</b>
Hyde Park	No Svc.	107	No Svc.	No Svc.	No Svc.	<b>107</b>
Poughkeepsie Town North	74	No Svc.	No Svc.	95	67	<b>290</b>
Poughkeepsie Town South	63	No Svc.	126	No Svc.	98	<b>341</b>
Wappinger	75	74	100	88	85	<b>476</b>
<b>Total</b>	<b>352</b>	<b>442</b>	<b>461</b>	<b>396</b>	<b>420</b>	<b>2,071</b>
Vehicles	6	6	5	5	6	
Average Trips/Vehicle/Month	44	55	58	50	53	
Vehicle Days	24	30	25	25	24	128



### **3.2.3 Operating Costs and Subsidies**

Funding for the Dial-A-Ride program is derived from federal, State, county, and municipal sources, and supplemented with modest fare revenue. The service is opt-in, meaning individual municipalities pay a daily fee to have Dial-A-Ride service and like many transit services, costs to operate exceed revenues received. Each participating municipality pays Dutchess County \$230 per day toward Dial-A-Ride service and daily fare revenues are estimated at \$15, totaling approximately \$245 in daily revenues, excluding any reimbursements from other funding sources. The municipal contribution toward the cost of operating Dial-A-Ride has not changed since 2014 despite increased operating costs.

#### **Costs**

- Based on staff input, the daily cost to operate Dial-A-Ride is \$800 per vehicle per route, including drivers, customer service staff, supervisors, fuel, and vehicles. This means that each day of operation requires an average subsidy of \$555.
- Using October 2019 data, total operating costs (no subsidy and no fares) are estimated at \$102,400 or \$49.45 per trip.
- After including the municipal contributions and fare revenues, net costs for the same month are estimated at \$71,040 or \$34.30 per trip.
- By comparison, based on data reported to the Federal Transit Administration, the per-trip cost on fixed route was \$9.14 in FY2019.

### **3.2.4 Key Takeaways on Contracted Dial-A-Ride Services**

- The high percentage of Dial-A-Ride trips taking place entirely within three-quarters mile of DCPT's fixed-route services is a possible indicator that service policies should be changed to direct some riders to use the bus rather than Dial-A-Ride for certain trips. A more comprehensive trip planning analysis would be needed to determine which riders could make the same trip on a fixed-route as on Dial-A-Ride without having to transfer, but based on input from staff, there are riders who use fixed-route service on days when the Dial-A-Ride is not operating, or when their trip request cannot be accommodated. This is most apparent in the City and Town of Poughkeepsie and in Fishkill. Some of the demand-response riders would be unable to access a fixed route due to their disability; for those who apply for and are eligible, the ADA service would be an alternative.
- DCPT provides complementary paratransit within three-quarters mile of its fixed-route service. Subsidizing Dial-A-Ride in existing service areas is inherently inefficient. Given that some of the Dial-A-Ride customers can travel on fixed-route buses, the consultant team believes that it does not make financial sense to offer demand-response services to these customers in instances where they can complete the trip on a fixed route.

## **4 Outreach and Survey**

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The project included various forms of interactions and engagement, including meetings with DCPT and county staff, a meeting with representatives of the accessibility community, interviews with fixed-route operators, and an online survey aimed at transit riders. Based on the information gathered from these engagement efforts, the team developed recommendations to improve the efficiency of existing services and meet the overall goals of the study.

### **4.1 Project Meetings**

#### **4.1.1 Standing Project Meetings**

Over the course of the transit study, the project team met regularly with Dutchess County staff to share updates on task progress and project milestones, discuss potential recommendations, and review work completed.

#### **4.1.2 Meeting of Dutchess County Departments**

On November 11, 2020, the project team met with representatives of other county departments. Attendees included Dave Whalen (Public Works), Michael Grattini (DCPT), Todd Tancredi (Office for the Aging), and Toni Ciarfella (ThinkDifferently/Deputy Commissioner for Special Needs). Regarding the older population, the discussion focused on the role of Office of the Aging (OFA), its senior friendship centers, transportation services provided, and county population trends and general transportation needs. For those with special needs, the discussion focused on universal access to employment, education, recreational activities, etc. as well as areas of the county that need more service. Meeting participants expressed a desire for more on-demand services.

#### **4.1.3 Dutchess Access Committee**

On November 16, 2020, the project team met with the Dutchess County Access Committee. Attendees included Michael Grattini and Amanda Sammon (DCPT), Dave Whalen (Public Works), Emily Dozier (Planning), Patrick Muller, Barbara Wood, Tom and Laura Price, and AJ Anderson. The project team discussed the relationship between transportation and accessibility, gaining considerable insights into the travel needs of seniors and persons with disabilities in the county. Ongoing challenges with the existing transportation system (e.g., lack of bus stop amenities, challenges with the rider app reliability, communications with dispatchers, etc.), as well as preferences for potential improvements (microtransit, service to the northeast part of the county, use of text for making reservations, etc.) were discussed.

#### **4.1.4 Dutchess County Executive**

On April 6, 2021, the project team presented its initial findings and recommendations to the Dutchess County Executive's Office. The project team and DCPT staff provided an overview of the state of the transit system, first discussing vital statistics and impacts from the COVID-19 pandemic followed by project work completed to date as well as tasks in progress. The results of the initial market analysis were shared, and the team revealed the initial recommendations for fixed-route service changes and the direction of microtransit planning.

### **4.2 Bus Operator Interviews**

The project team interviewed most of DCPT's bus operators to discuss the system's fixed routes. The team gathered information about bus stop locations, boarding and alighting patterns, and issues such as pinch points for certain routes and insights from passengers. Input received from these interviews were then incorporated into the service planning task for proposed fixed-route improvements, discussed later in the report.

### **4.3 Rider Survey**

In March 2021, an online survey was undertaken to ask about various public and private transportation services in Dutchess County. The survey also asked about the use of and attitudes toward technology in general and specifically about DCPT's bus tracker app. The main target audience were people who used the fixed route, ADA, Dial-a-Ride, or Flex service before or since the COVID-19 pandemic. Input was also sought from riders of other public on-demand transportation services including those provided by OFA, North East Community Center, Pawling Resource Center, etc.

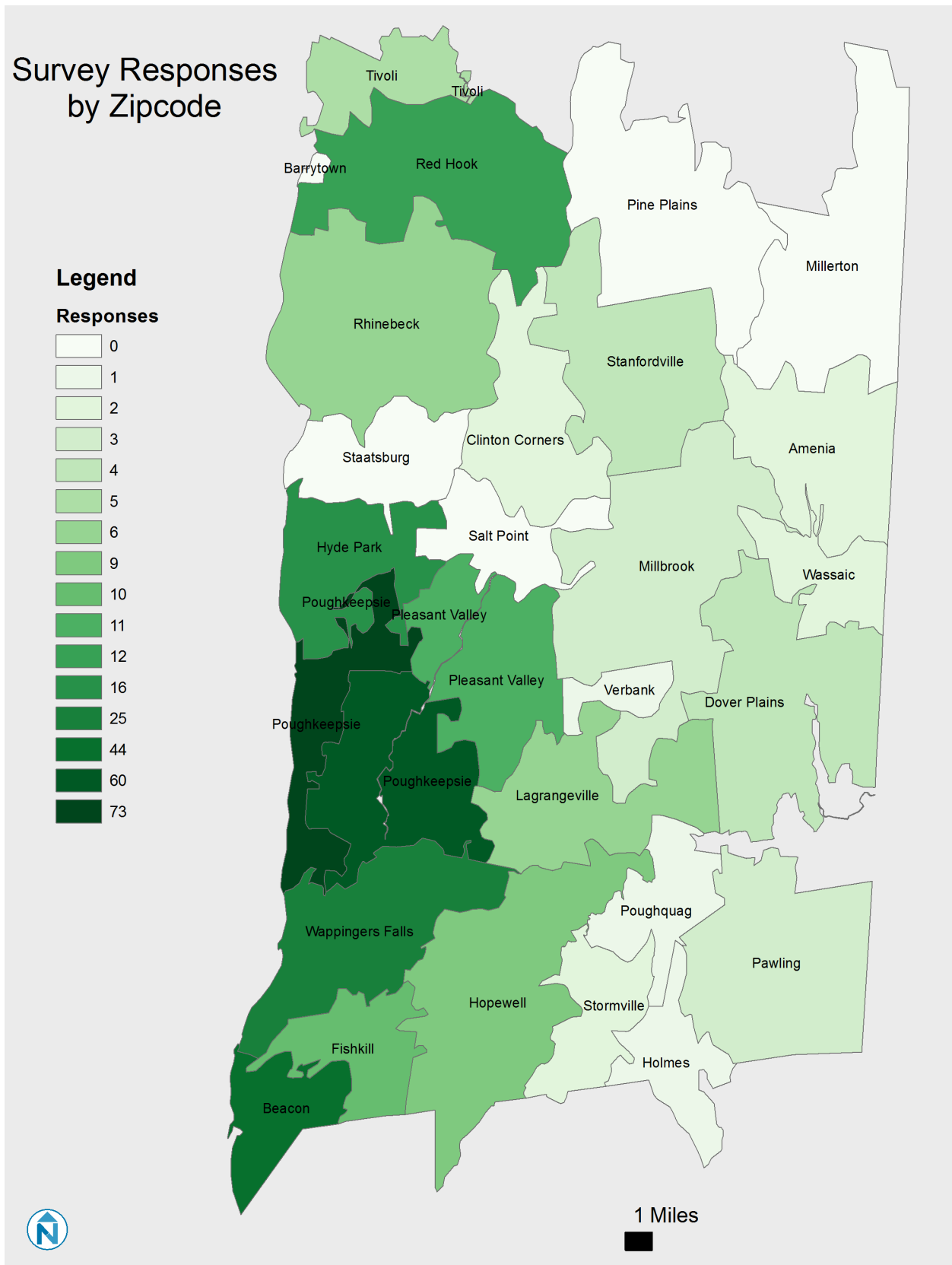
The survey was created online using SurveyMonkey and was available in English and Spanish. The survey was promoted through a press release, printed flyers on all DCPT vehicles, an e-blast to known contacts, and an announcement through County social media. In addition, users of the DCPT rider app were notified about the survey. The survey went live on March 8 and closed on March 31.

In total, 404 people responded, sharing information about their use of transit services, their priorities for improving service, and their satisfaction with the system's service and features. Specific comments were separately summarized and transmitted to DCPT. A separate technical memorandum contains the key survey results and a copy of the survey. Some of the key takeaways applicable to the development of recommendations include:

- Access to bus stops and good sidewalk infrastructure remains a challenge.
- Of those who commented about DCPT fixed-route service, comments about the schedule were most common.
- Only about half of bus riders who responded use the DCPT Bus Tracker app, and the primary reason for not using the app was not knowing about its existence.
- The survey asked: “Where in Dutchess County do you think buses or vans should go that they do not go today?” The region with the most responses was Northeast Dutchess County.
- Nine out of 10 respondents have a smartphone.

A summary of the survey results and a copy of the survey were provided to county staff as a separate project deliverable.

Figure 17. Dutchess County Public Transit Survey Respondent Home Addresses by Zip Code



## 5 Future Service Recommendations

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### 5.1 Introduction

This section presents recommendations for improving DCPT's fixed-route bus service, addressing current challenges with DCPT's Dial-A-Ride and Flex services, and addressing unmet transportation needs in Dutchess County. Additional recommendations cover technology, vehicles, and funding.

The consultant team's recommendations for DCPT-operated services are stand-alone recommendations, that is, if no other service options are pursued, the team recommends that Dutchess County implement the suggested changes. Our recommendations reflect lingering inefficiencies from the expansion of the County's system into the City of Poughkeepsie when the city ceased operations in 2017, prior decisions and commitments made to maintain certain bus routes, and in the case of Dial-A-Ride, to maintain services at a constant subsidy level despite rising costs.

To account for recommended fixed-route service changes, changes to the Dial-A-Ride system, and to address unmet needs, recommendations for expanded demand-response services are also presented, including scheduled services and same-day shuttles (also known as microtransit).

#### 5.1.1 Fixed-Route Recommendations

The recommendations for each route are presented in the following pages. For each route discussed, existing characteristics for 2019 are summarized, including:

- Route location (start and end points, including other areas served on certain trips).
- Ridership rank (number of average daily riders compared to other system routes).
- Span (start and end times).
- Average headway (amount of time between bus arrivals at a stop).
- Round trip travel times.
- Current issues and consultant observations.

Recommendations include whether a route should be discontinued or if a new route should be added. Recommended routes include mapping configurations, suggested span, headway, and schedule changes. For proposed routes, the map figures show the individual route and nearby routes to present the overall context.

Figure 18 shows the overall recommended fixed-route bus network including the discontinued routes. Figure 19 shows the routes in Poughkeepsie. Table 7 summarizes the route-by-route recommendations.

Overall, the team recommends addressing headway irregularities by having more uniform 60-minute and some combined 30-minute headways. Uniform spans will permit more pulsing at the Transit Hub (but within the capacity of the hub and adjacent curbside areas). Although the number of all-day routes is reduced by about 33% to 10 (excluding school-oriented trips open to the public), the revenue vehicle hours (RVH) are reduced by about 15%. This is because the recommended routes would run more frequently and for longer hours of the day than the routes they replace. The team recommends investing the savings in countywide demand-responsive services, including possible microtransit, discussed later in the report.

**Figure 18. Proposed Dutchess County Public Transit Fixed-Route Bus Network**

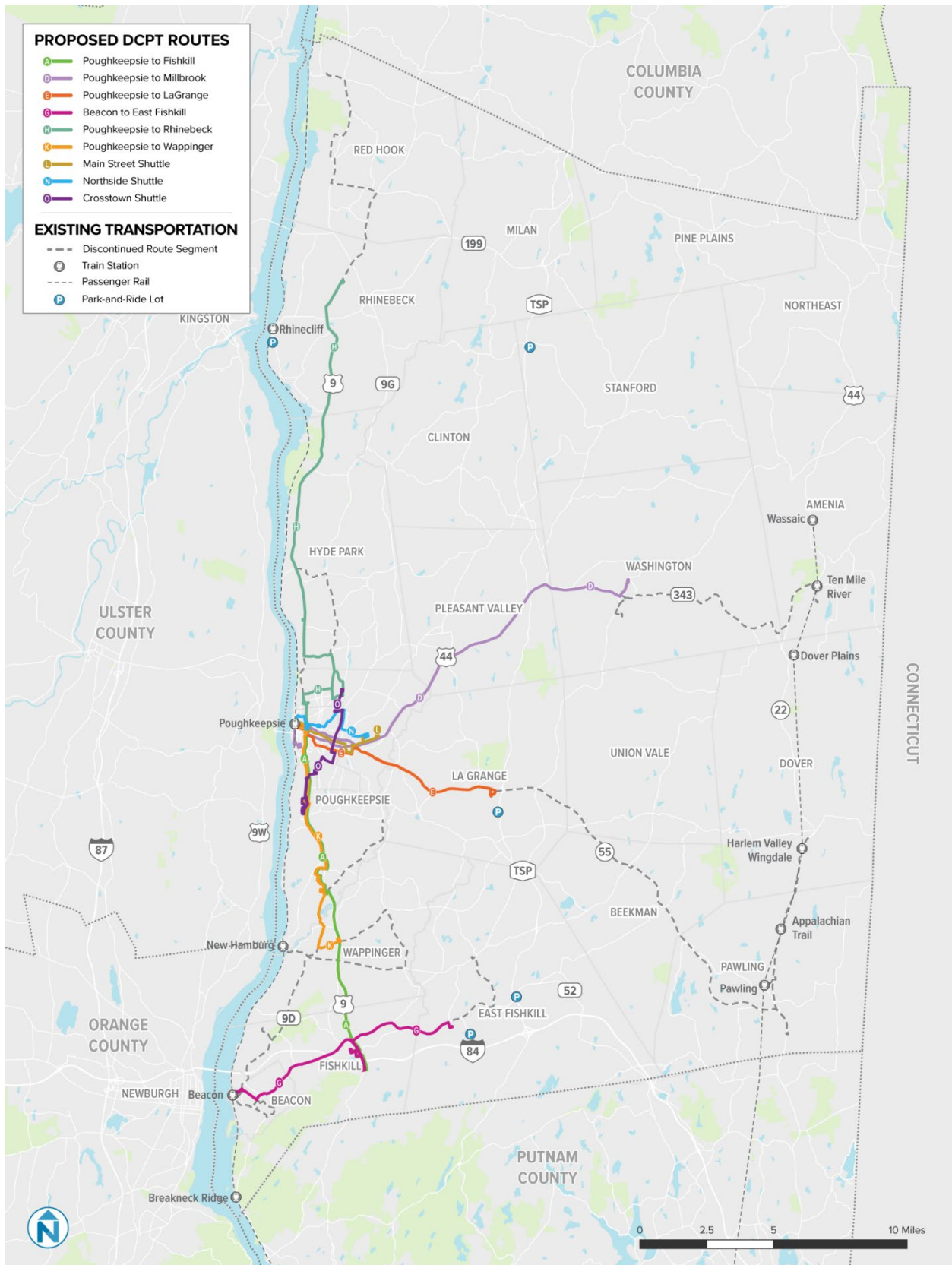




Figure 19. Proposed Dutchess County Public Transit Fixed-Route Bus Routes in Poughkeepsie



**Table 7. Route-by-Route Bus Network Recommendations**

<b>Route</b>	<b>Current Route Name</b>	<b>Proposed Route</b>	<b>Principal Changes</b>
A	Poughkeepsie–Fishkill	Poughkeepsie–Fishkill	No service to Beacon; streamlined routing through shopping centers
B	Poughkeepsie–Beacon	N/A	Discontinued; See Routes A, K, F
C	Poughkeepsie–Tivoli	N/A	Discontinued; See Route H-Long
D	Poughkeepsie–Wassaic	Poughkeepsie–Millbrook	Shortened; serves Vassar Hospital
E	Poughkeepsie–Pawling	Poughkeepsie–LaGrange	Shortened
F	Beacon–Hopewell Junction	N/A	Replaced by Route G
G	Beacon Free Loop	Beacon–East Fishkill	Combined Routes F and G
H - Short	College Connection Shuttle	Poughkeepsie–DCC	Streamlined DCC service; directly serves Mid-Hudson Hospital
H - Long	N/A—new route	Poughkeepsie–Rhinebeck	Combined Routes C, H, and J
J	Northside Shuttle	N/A	Replaced by Routes H-short and H-long
K	Southside Shuttle	Poughkeepsie–Wappinger	With Route A, provides 30-minute service along Route 9
L	Main Street Shuttle	Main Street Shuttle	No longer serves rail station
M	Eastside Shuttle	Eastside Shuttle Limited	Limited service for H.S.; weekdays only; see new Routes N and O
N	N/A—new route	Northside Shuttle	See route page
O	N/A—new route	Crosstown Shuttle	See route page
P	Westside Shuttle	Westside Shuttle Limited	Limited service for H.S.; weekdays only; see new Routes N and O
PRL	Poughkeepsie RailLink	N/A	Discontinued; served by other routes
NHRL	New Hamburg RailLink	N/A	Discontinued; possible microtransit location

Note: Route names are listed to enable comparisons with current services. It is suggested that new route names be adopted upon implementation.

## 5.1.2 Route A (Streamlined)

### Existing Service

- **Route:** Between the Transit Hub and Walmart & Dutchess Mall in Fishkill via Route 9. Also provides a few daily trips from Fishkill to Beacon.
- **2019 Weekday Ridership Rank:** 1st of 15 routes (471 average daily riders).
- **Span:** Monday–Saturday 6 a.m.–9:30 p.m.; Sunday 10:15 a.m.–5:30 p.m.
- **Average Headway (minutes):** Weekdays-58, Saturdays-66, Sundays-145.
- **Round Trip Time (minutes):** Weekdays-120, Saturdays-120, Sundays-120.
- **Issues and Observations:**
  - Low ridership between Fishkill and Beacon.
  - Travel through certain shopping plazas is needed, but the running time impact can be reduced.
  - This can be accomplished by simplifying alignment through Route 9 plazas and Poughkeepsie Galleria.
  - Similarly, there is a need to serve the Dutchess Community College (DCC) South Campus more directly.

### Proposed Service

- **Route:** Between the Transit Hub and Walmart/Dutchess Mall/DCC in Fishkill via Route 9; also serves Gap Distribution Center at Route 9.
- **Changes:**
  - Discontinue trips to Beacon; Route F provides this connection.
  - Streamline service to Galleria and DCC South; Route K will provide more access to shopping plazas.
- **Span:** Monday–Friday 6 a.m.–9 p.m.; Saturday 7 a.m.–8 p.m.; Sunday 10 a.m.–6 p.m.<sup>5</sup>
- **Headway (minutes):** Weekdays (60), Saturdays (60); Sundays (20).
- **Round Trip Time (minutes):** Weekdays (120), Saturdays (120), Sundays (120)\*
- **Scheduling:**
  - Route A schedule will be offset from Route K by 30 minutes to create a 30-minute corridor at most points on Route 9.
  - Route A trips pulse with other routes at the Transit Hub as well as Route G (F) outbound trips at Dutchess Mall.

Figure 20. Proposed Route A

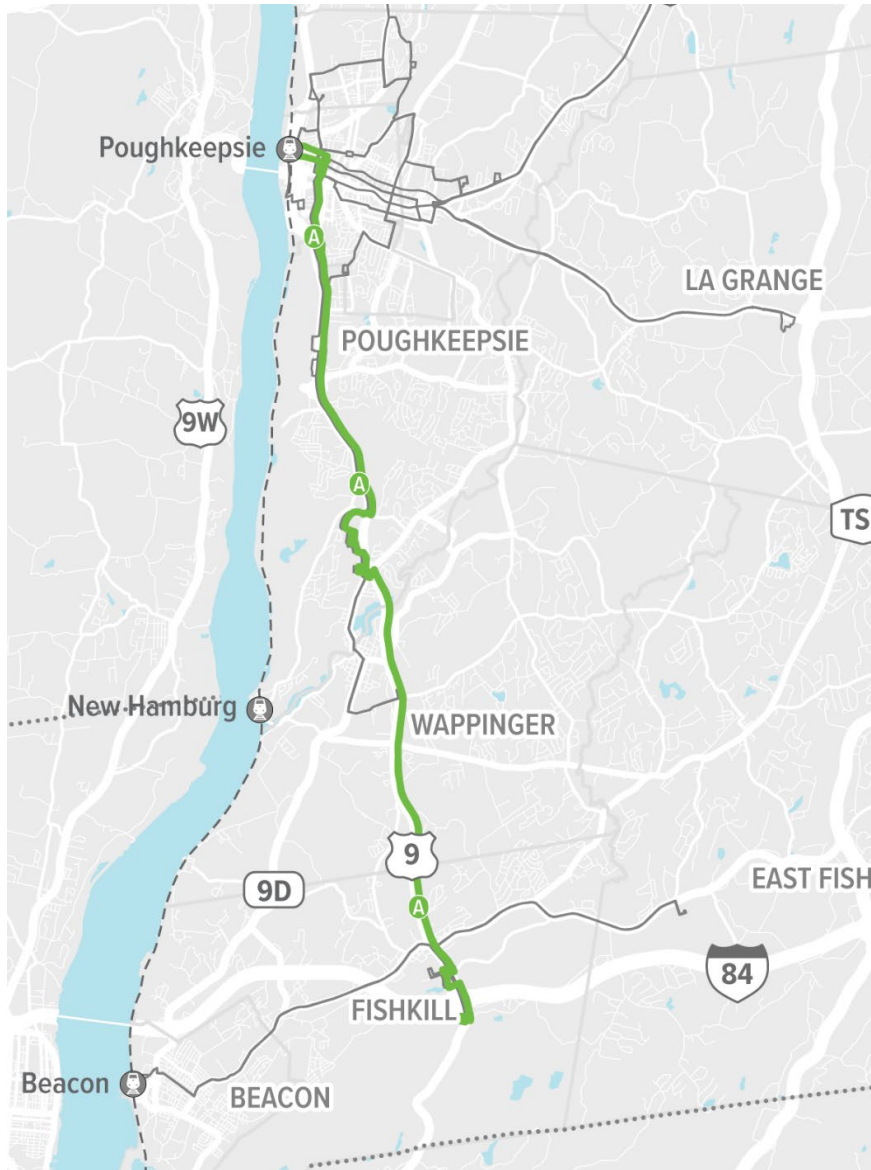
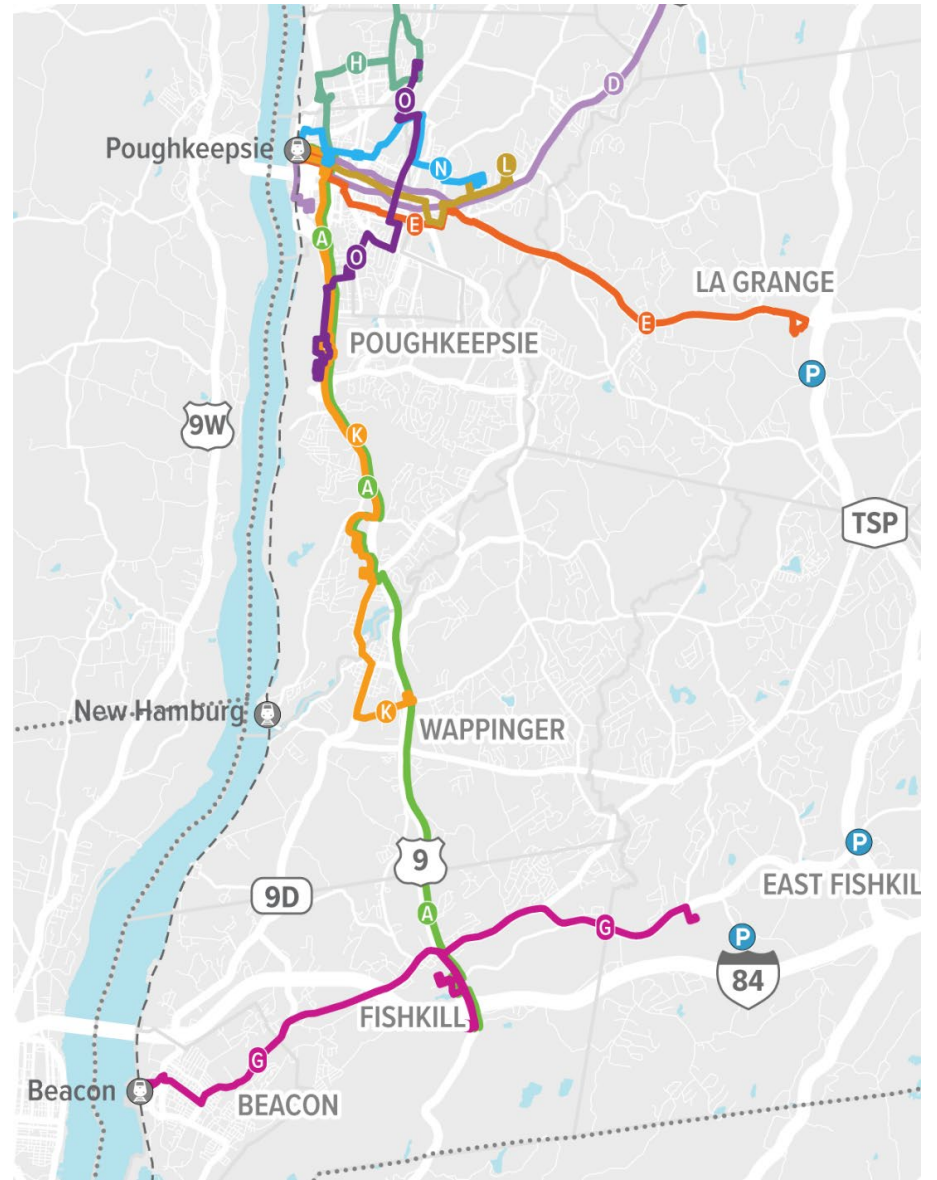


Figure 21. Route A with Nearby Routes



### 5.1.3 Route B (Discontinued)

#### Existing Service

- **Route:** Between the Transit Hub and Beacon via Route 9 and 9D.
- **2019 Weekday Ridership Rank:** 3rd of 15 routes (386 average daily riders).
- **Span:** Monday–Saturday 5:30 a.m.– 8 p.m.; Sunday 9:15 a.m.–4:45 p.m.
- **Average Headway (minutes):** Weekdays (65), Saturdays (65), Sundays (150).
- **Round Trip Time (minutes):** Weekdays (120), Saturdays (120), Sundays (120).
- **Issues and Observations:**
  - Low ridership between Galleria/South Hills and Beacon.
  - This route is redundant with Routes A, G, and K.
  - Route ridership is strong from Poughkeepsie to Wappinger but weak from Wappinger to Beacon.

#### Service Recommendation: Discontinue Route; Replace with A, K, G

- **Changes:**
  - Route A and Route K will serve the strong Poughkeepsie to Wappinger corridor with combined 30-minute service.
  - Route G (formerly F) will provide a connection to Beacon.
  - See discussion of proposed primary microtransit zone in the Future Demand-Response Service Model section later in this section.

### 5.1.4 Route C (Replaced)

#### Existing Service

- **Route:** Between the Transit Hub and Tivoli via Route 9 serving DCC, Hyde Park, Rhinebeck, and Red Hook.
- **2019 Weekday Ridership Rank:** 9th of 15 routes (209 average daily riders)
- **Span:** Monday–Saturday 5:35 a.m.–8:45 p.m.
- **Average Headway (minutes):** Weekdays (86), Saturdays (101).
- **Round Trip Time (minutes):** Weekdays (150), Saturdays (150).
- **Issues and Observations:**
  - There are redundancies with Routes H and J in Hyde Park.
  - Ridership is exceptionally low between Hyde Park and Rhinebeck.

#### Service Recommendation: Replace service to Rhinebeck with Route H-Long.

- **Changes:**
  - Route H-Long will serve Poughkeepsie to Rhinebeck.
  - Evaluate microtransit to serve northern section of route.

### 5.1.5 Route D (Shortened Route)

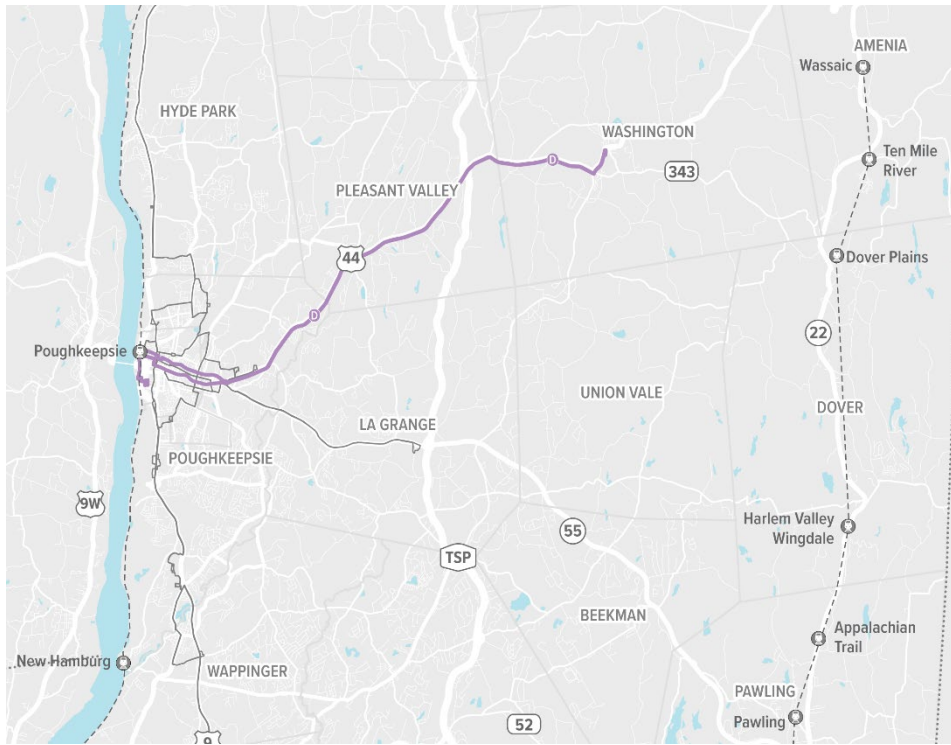
#### Existing Service

- **Route:** Between the Poughkeepsie Transit Hub and Wassaic via Routes 44 and 343.
- **2019 Weekday Ridership Rank:** 11th of 15 routes (89 average daily riders).
- **Span:** Monday–Saturday 5:45 a.m.–8 p.m.
- **Average Headway (minutes):** Weekdays–103, Saturdays–103.
- **Round Trip Time (minutes):** Weekdays–80, Saturdays–80.
- **Issues and Observations:**
  - Very low ridership between Millbrook and Wassaic/Amenia

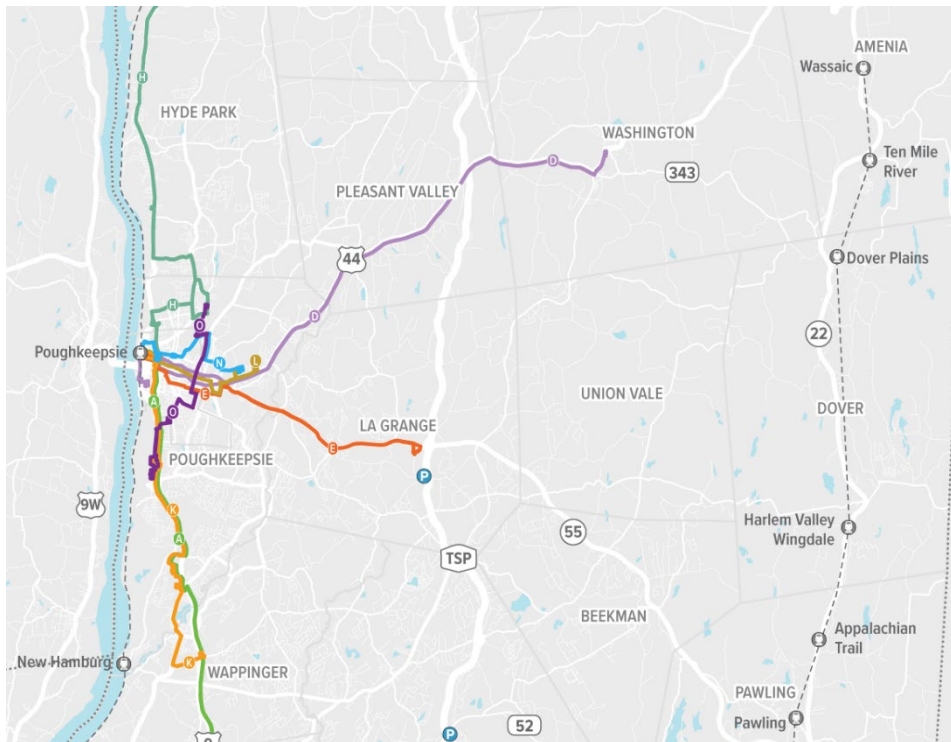
#### Proposed Service

- **Route:** Between the Transit Hub and Millbrook Village via Route 44
- **Changes:**
  - Discontinue service east of Millbrook due to low ridership.
  - Add segment in Poughkeepsie to serve Rinaldi Blvd and Vassar Brothers Medical Center.
  - Terminate in Millbrook to meet possible microtransit service from eastern county/Harlem Valley, discussed in the Future Demand-Response Service Model section later in this section.
- **Span:** Monday–Saturday 6:20 a.m.–7:20 p.m.
- **Headway (minutes):** Weekdays–60, Saturdays–60.
- **Round Trip Time (minutes):** Weekdays–120, Saturdays–120.
- **Scheduling:** Route D inbound trips pulse with other routes at the Transit Hub

**Figure 22. Proposed Route D**



**Figure 23. Route D with Nearby Routes**



## 5.1.6 Route E (Shortened Route)

### Existing Service

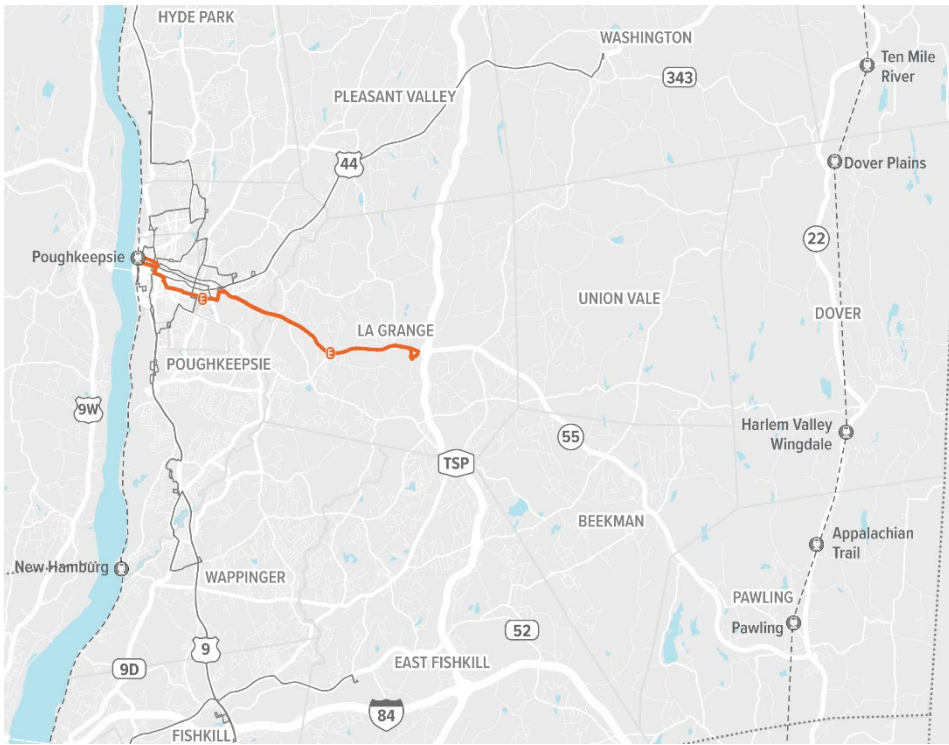
- **Route:** Between the Transit Hub and Pawling via Route 55. Also provides limited service to Wingdale.
- **2019 Weekday Ridership Rank:** 5th of 15 routes (255 average daily riders)
- **Span:** Monday–Friday 5:30 a.m.–12:10 a.m.; Saturday 5:30 a.m.–11:47 a.m.; Sunday 5:56 p.m.–7:34 p.m.
- **Average Headway (minutes):** Weekdays–184, Saturdays–184, Sundays–53
  - Weekday & Saturday, complete route data; Sunday, only short route runs.
- **Round Trip Time (minutes):** Weekdays–159, Saturdays–159, Sundays–35
  - Weekday & Saturday, complete route data; Sunday, only short route runs.
- **Issues and Observations:**
  - Ridership east of LaGrange is low.
  - Consistent service pattern and headways would greatly improve service.
  - Redundancy with Route D on East-West Arterial in Poughkeepsie.
  - Route ridership strongest from Poughkeepsie to LaGrange.

### Proposed Service

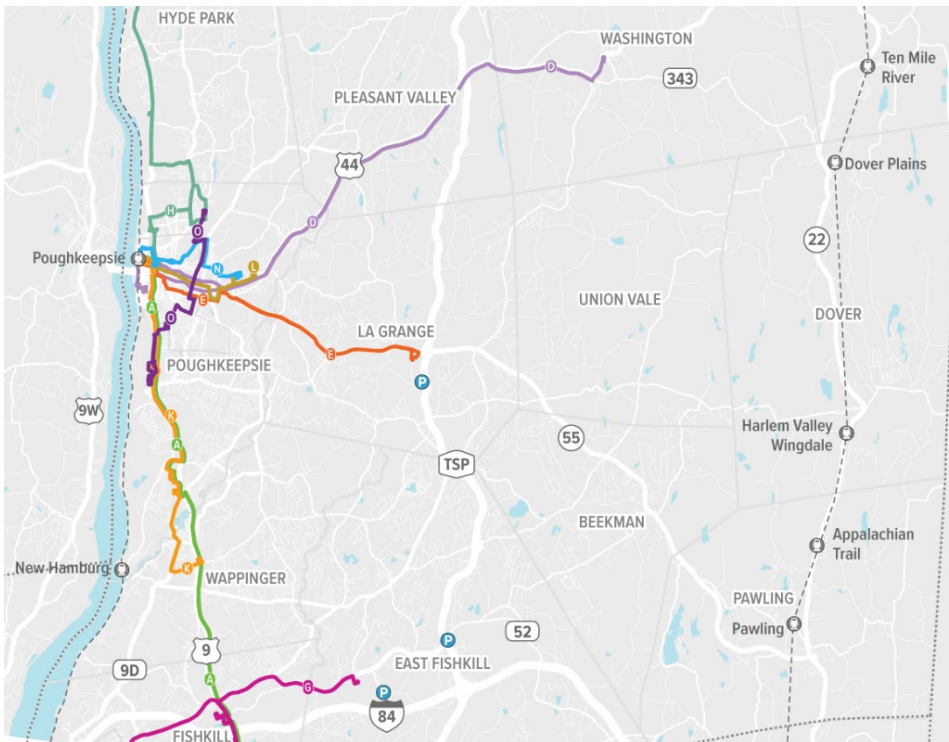
- **Route:** Between the Transit Hub and Tops Supermarket in LaGrange via Route 55.
- **Changes:**
  - Discontinuation of service east of LaGrange due to low ridership.
  - Add segment in Poughkeepsie on Forbus St and Fulton Ave to serve Middle School, High School, Vassar College.
  - Terminate in LaGrange to meet possible microtransit from eastern county/Harlem Valley, discussed in the Future Demand-Response Service Model section later in this section.
- **Span:** Monday–Friday 6 a.m.–8 p.m.; Saturday 8 a.m.–7 p.m.
- **Headway (minutes):** Weekdays–60, Saturdays–60.
- **Round Trip Time (minutes):** Weekdays–80, Saturdays–80.
- **Scheduling:** Route E outbound trips pulse with other routes at the Transit Hub.



**Figure 24. Proposed Route E**



**Figure 25. Route E with Nearby Routes**



### 5.1.7 Route F and Route G (Combined Routes)

#### Existing Route F Service

- **Route:** Between Beacon and Hopewell Junction via Routes 52 and 376. Serves Fishkill Walmart and Business Park.
- **2019 Weekday Ridership Rank:** 13th of 15 routes (70 average daily riders).
- **Span:** Monday–Friday 8 a.m.–3:05 p.m.; Saturday 8 a.m.–4:30 p.m.
- **Average Headway (minutes):** Weekdays–53, Saturdays–260.
- **Round Trip Time (minutes):** Weekdays–60, Saturdays–30.
- **Issues and Observations:**
  - Very low ridership in East Fishkill.
  - Limited-service hours and low frequency make route inconvenient.
  - Route ridership strongest from Beacon to Fishkill.

#### Existing Route G Service

- **Route:** Operates as a local loop route within Beacon. Also provides limited service to Red Oaks Mill via Fishkill.
- **2019 Weekday Ridership Rank:** 12th of 15 routes (87 average daily riders).
- **Span:** Monday–Saturday 6 a.m.–8:48 p.m.
- **Average Headway (minutes):** Weekdays–33, Saturdays–33, Sundays–145.
- **Round Trip Time (minutes):** Weekdays–50, Saturdays–50.
- **Issues and Observations:**
  - Low ridership on limited-service segment.
  - Redundant with Routes A, B, and F.
  - Confusing service outside of Beacon.
  - Ridership is highest in Fishkill and northwest Beacon; minimal ridership outside that corridor.

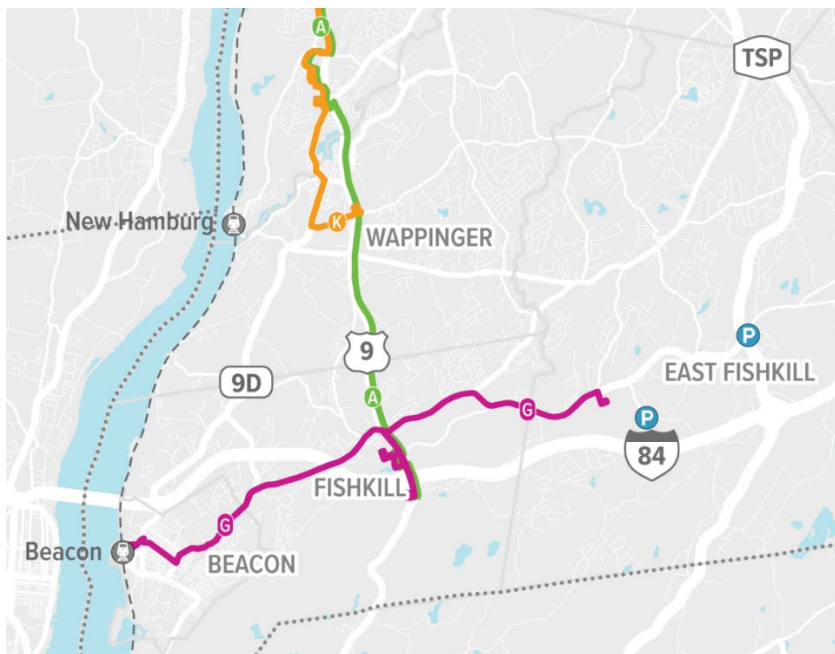
#### Proposed Combined Service: Route G (formerly F)

- **Route:** Between Beacon and East Fishkill Business Park via Route 52.
- **Changes:**
  - Service through Beacon—terminates at Beacon train station.
  - Discontinue Hopewell Junction service due to low ridership.
  - Add segment in Fishkill to serve Dutchess Mall/DCC South.
  - Terminate in East Fishkill Business Park to meet possible microtransit, discussed in the Future Demand-Response Service Model section later in this section.
- **Span:** Monday–Friday 6:30 a.m.–7:30 p.m.; Saturday 8:30 a.m.–7:30 p.m.
- **Headway (minutes):** Weekdays–60, Saturdays–60.
- **Round Trip Time (minutes):** Weekdays–120, Saturdays–120.
- **Scheduling:** Route G outbound trips pulse with Route A trips at Dutchess Mall.

Figure 26. Proposed Route G (formerly F)



Figure 27. Route G with Nearby Routes



## 5.1.8 Route H (Long and Short Variants)

### Existing Service

- **Route:** Between the Transit Hub and Dutchess Community College. Serving Mid-Hudson Regional Hospital and Marist College.
- **2019 Weekday Ridership Rank:** 6th of 15 routes (243 average daily riders).
- **Span:** Monday–Saturday 7:07 a.m.–8:07 p.m.
- **Average Headway (minutes):** Weekdays–60, Saturdays–60.
- **Round Trip Time (minutes):** Weekdays–40, Saturdays—40.
- **Issues and Observations:**
  - Redundancies with Routes C and J in Hyde Park.
  - Strong route would benefit from better integration with corridor north of Poughkeepsie.

### Proposed Service: Route H-Short

- **Route:** Between the Transit Hub and Dutchess Community College.
- **Changes:**
  - Directly serve the roundabout in front of Mid-Hudson Regional Hospital (similar to Route J).
  - Streamline service through DCC (discontinue Gallery Circle stop).
- **Span:** Monday–Friday 7:30 a.m.–5:30 p.m.
- **Headway (minutes):** Weekdays–60.
- **Round Trip Time (minutes):** Weekdays–60.
- **Scheduling:** Route H-Short schedule will be offset from Route H-Long by 30 minutes to provide 30-minute service to DCC (see Route C).

### Proposed Service: Route H-Long

- **Route:** Between the Transit Hub and Rhinebeck via Route 9; Terminates at Tops Market
- **Changes:**
  - Combines Routes C, H, and J.
  - Discontinues service north of Rhinebeck; replace with possible microtransit.
  - Potential to meet possible microtransit, discussed in the Future Demand-Response Service Model section later in this section.
- **Span:** Monday–Friday 6 a.m.–7 p.m.; Saturday 7 a.m.–7 p.m.
- **Headway (minutes):** Weekdays–60, Saturdays–60.
- **Round Trip Time (minutes):** Weekdays—120, Saturdays–120.
- **Scheduling:**
  - Route H-Long schedule will be offset from Route H-Short by 30 minutes to provide 30-minute service to DCC.
  - Route H-Long trips pulse with other routes at the Transit Hub.

Figure 28. Proposed Route H-Short



Figure 29. Route H-Short with Nearby Routes

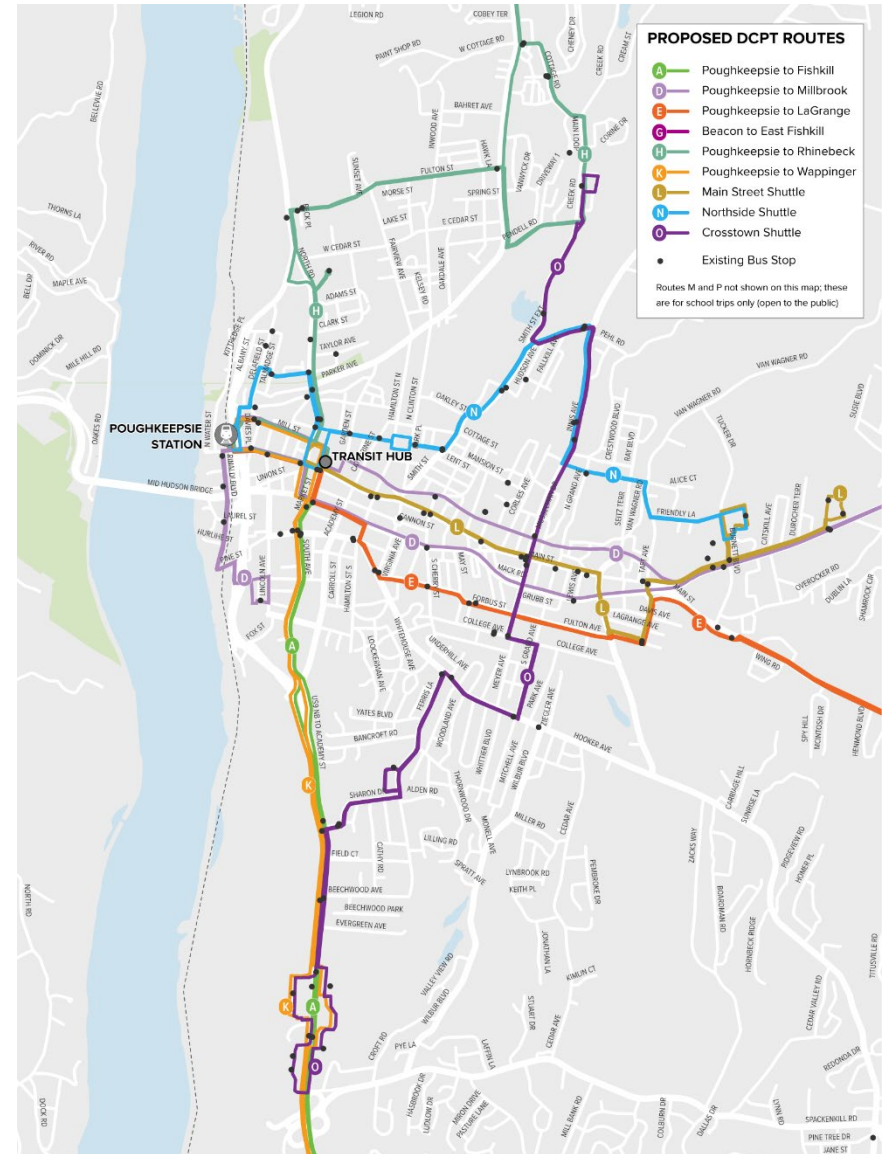


Figure 30. Proposed Route H-Long

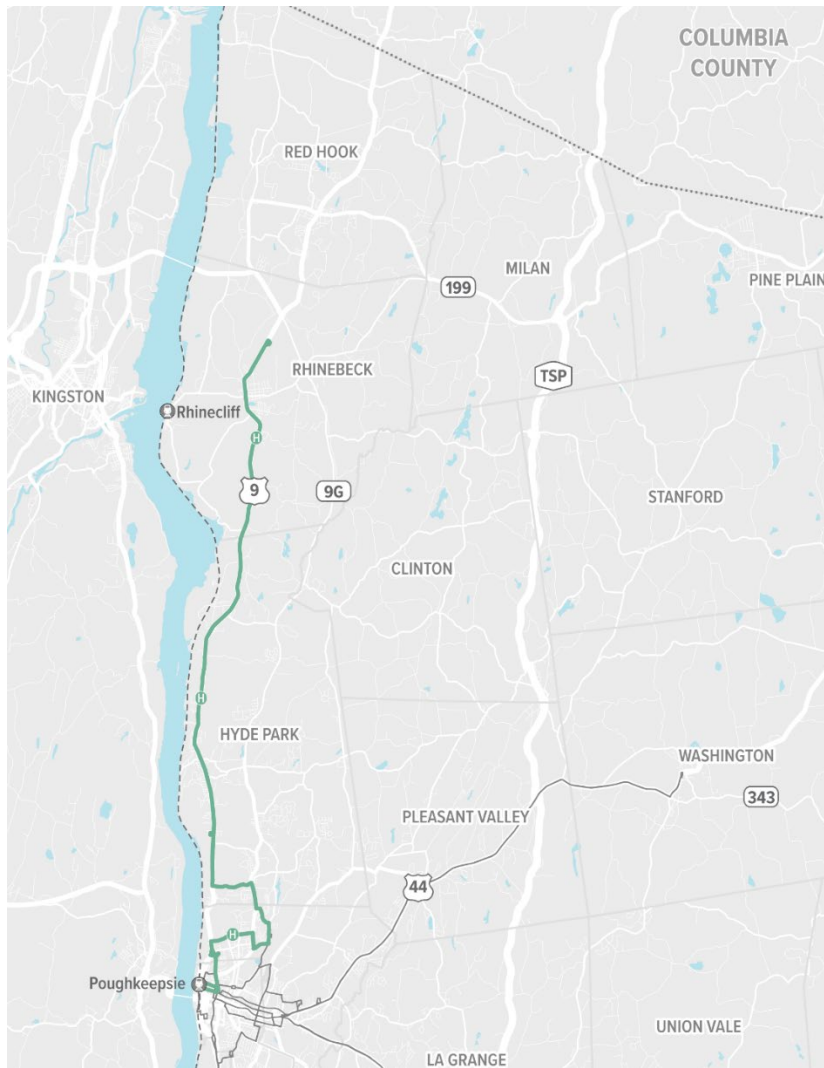
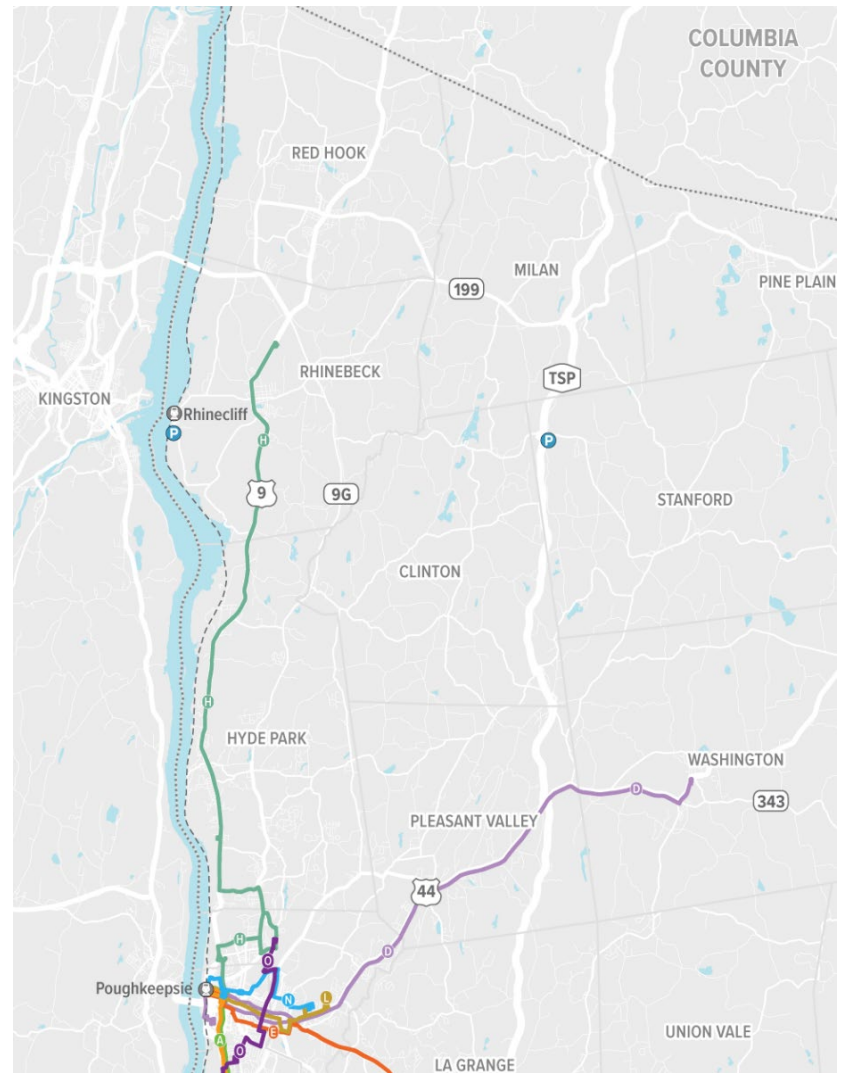


Figure 31. Route H-Long with Nearby Routes



### 5.1.9 Route J (Discontinued)

#### Existing Service

- **Route:** Between the Transit Hub and Hyde Park via Route 9.
- **2019 Weekday Ridership Rank:** 10th of 15 routes (112 average daily riders).
- **Span:** Monday–Saturday 6:15 a.m.–7:15 p.m.
- **Average Headway (minutes):** Weekdays–60, Saturdays–60.
- **Round Trip Time (minutes):** Weekdays–50, Saturdays–50.
- **Issues and Observations:**
  - Highest ridership segment is in City of Poughkeepsie.
  - Redundancies with Routes C and H in Hyde Park.
  - Provides opportunity to simplify corridor service.

#### Service Recommendation: Discontinue Route; Replace with H

- Route H-Short and H-Long will serve Mid-Hudson Regional Hospital, with H-Long also continuing north on Route 9.

### 5.1.10 Route K (Streamlined)

#### Existing Service

- **Route:** Between the Transit Hub and The Shoppes at South Hills in the Town of Poughkeepsie. Also serves Vassar Brothers Medical Center and St. Simeon.
- **2019 Weekday Ridership Rank:** 4th of 15 routes (305 average daily riders).
- **Span:** Monday–Friday 7:15 a.m.–10:15 p.m.; Saturday 7:15 a.m.–9:15 p.m.
- **Average Headway (minutes):** Weekdays–60, Saturdays–60.
- **Round Trip Time (minutes):** Weekdays–120, Saturdays–120.
- **Issues and Observations:**
  - Provides front-door service at Poughkeepsie Plaza and Hudson Plaza on Route 9.
    - Identified as important route for seniors.
  - Redundancies with Routes A and B on Route 9.
  - Indirect service to/from downtown Poughkeepsie.

#### Proposed Service

- **Route:** Between the Transit Hub and Wappingers Falls via Route 9 and a portion of Route 9D
- **Changes:**
  - Discontinue service to Vassar Brothers Medical Center (served by Route D).
  - Discontinue service to St. Simeon (served by Route O).
  - Streamline service through Poughkeepsie Plaza.
  - Add segment from South Hills to Wappingers Falls.

- **Span:** Monday–Saturday 8:30 a.m.–7:30 p.m.
- **Headway (minutes):** Weekdays–60, Saturdays–60.
- **Round Trip Time (minutes):** Weekdays–120, Saturdays–120.
- **Scheduling:**
  - Route K schedule will be offset from Route A by 30 minutes to create a 30-minute frequency corridor along most of Route 9.



Figure 32. Proposed Route K

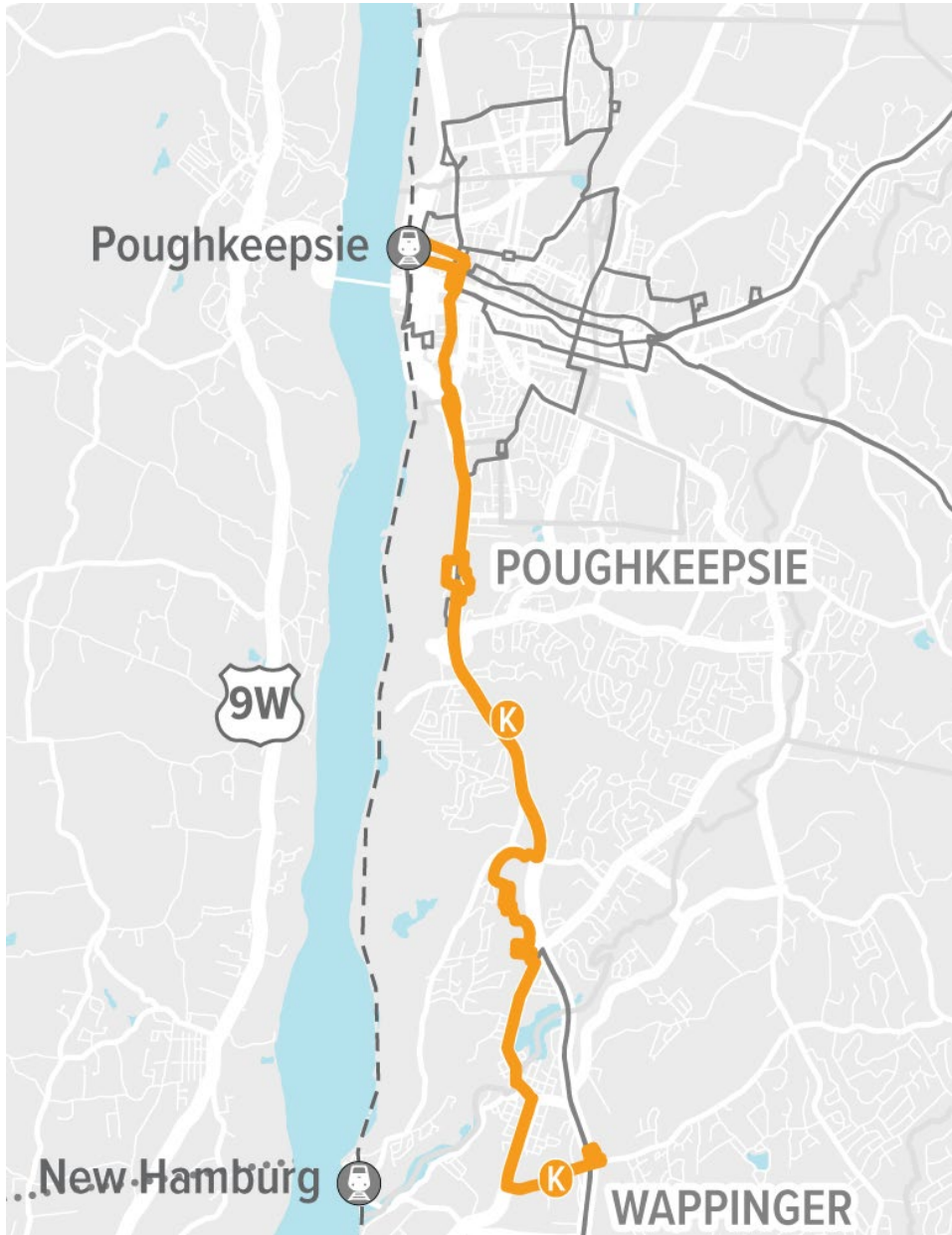
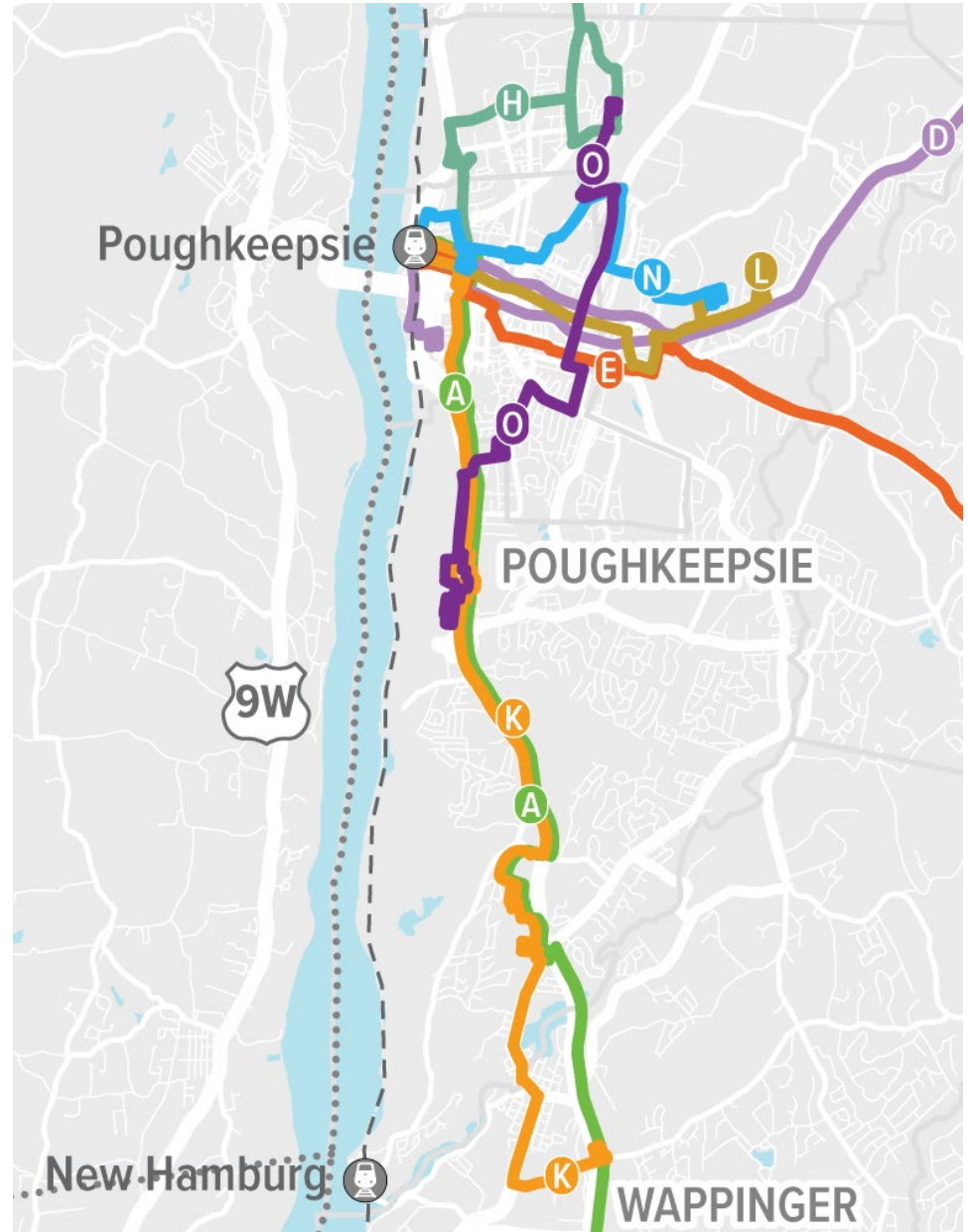


Figure 33. Route K with Nearby Routes



### 5.1.11 Route L (Streamlined)

#### Existing Service

- **Route:** Between the Transit Hub and Adams Fairacre Farms on Route 44.
- **2019 Weekday Ridership Rank:** 2nd of 15 routes (451 average daily riders).
- **Span:** Monday–Friday 6:45 a.m.–10:15 p.m.; Saturday 7:15 a.m.–10:15 p.m.; Sunday 9:15 a.m.–5 p.m.
- **Average Headway (minutes):** Weekdays–31, Saturdays–37, Sundays–66.
- **Round Trip Time (minutes):** Weekdays–50, Saturdays–50, Sundays–50.
- **Issues and Observations:**
  - Central route for city, provides connections to most other routes.
  - Several deviations into shopping plazas.
  - More service provided than demand.

#### Proposed Service

- **Route:** Between the Transit Hub and Adams Fairacre Farms on Route 44
- **Changes:**
  - Streamline service to Plaza 44/Dutchess Shopping Center.
  - Discontinue service to Poughkeepsie Train Station due to redundancy with many other routes.
  - Change headway to match 60-minute pulse and other east-west grid routes. With new parallel 60-minute routes north and south, ridership on this route justifies similar service.
- **Span:** Monday–Friday 6 a.m.–8:30 p.m.; Saturday 8 a.m.–7 p.m.; Sunday 10 a.m.–6 p.m.\*
- **Headway (minutes):** Weekdays–60, Saturdays–60; Sundays–120.<sup>6</sup>
- **Round Trip Time (minutes):** Weekdays–60, Saturdays–60, Sundays–60.\*
- **Scheduling:**
  - Route L trips pulse with other routes at the Transit Hub.

Figure 34. Proposed Route L

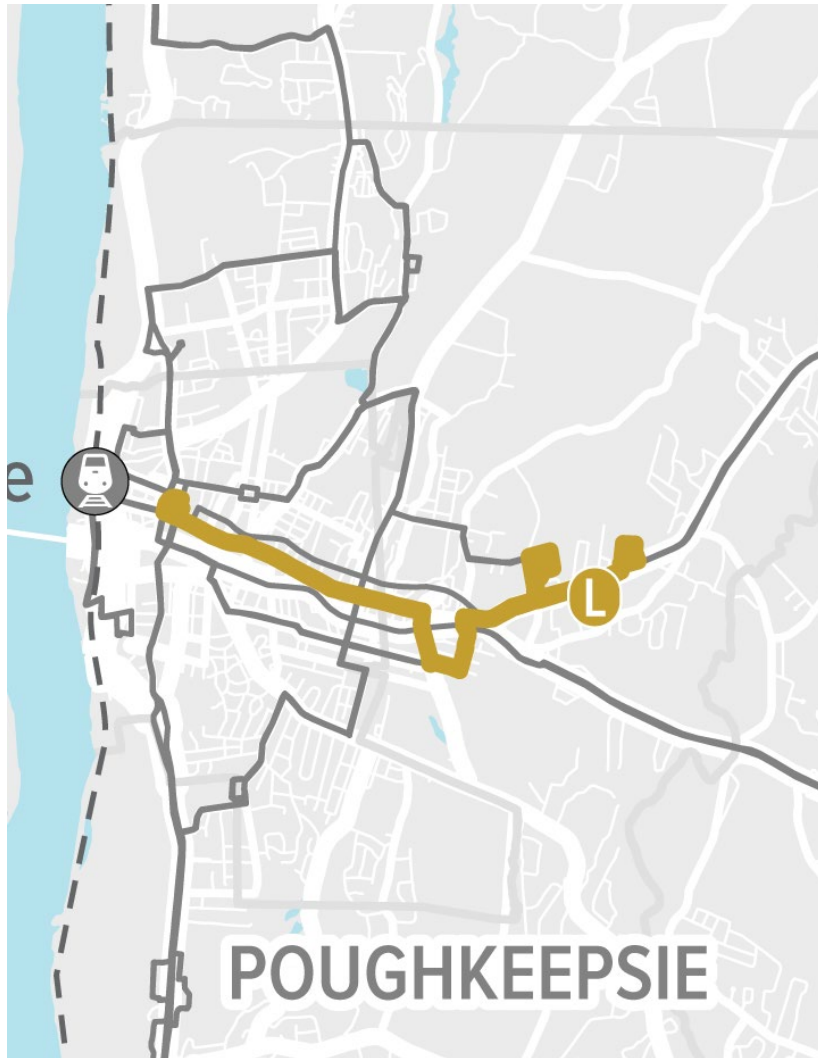


Figure 35. Route L with Nearby Routes



## 5.1.12 Route M (Limited Service)

### Existing Service

- **Route:** Between the Transit Hub and Grand Ave/Hooker Ave in Poughkeepsie.
- **2019 Weekday Ridership Rank:** 8th of 15 routes (212 average daily riders).
- **Span:** Monday–Friday 7:10 a.m.–8:15 p.m.; Saturday 8:15 a.m.–7:15 p.m.
- **Average Headway (minutes):** Weekdays–60, Saturdays–60.
- **Round Trip Time (minutes):** Weekdays–56, Saturdays–56.
- **Issues and Observations:**
  - Ridership low throughout route; especially along northern segment.
  - Very indirect alignment.
  - Provides some crosstown service in Poughkeepsie.
  - Most ridership is at school start/end hours.

### Proposed Service

- **Route:** Between the Transit Hub and Grand Ave/Hooker Ave in Poughkeepsie
- **Changes:**
  - Keep the same alignment.
  - Operate 2 trips per day to capture the school market (open to the public).
  - Discontinue service on Saturday.
  - Route O to provide all-day crosstown service in Poughkeepsie.
- **Span:** Monday–Friday 7 a.m.–3:05 p.m.
- **Headway (minutes):** Weekdays–2 trips per day.
- **Round Trip Time (minutes):** Weekdays–50.
- **Scheduling:**
  - Route M a.m. outbound trips pulse with other routes at the Transit Hub.

*Note: Route M map not shown due to unchanged routing.*

### **5.1.13 Route N (New Northside Route)**

- Existing routes serve north side of Poughkeepsie in an indirect and counter-intuitive way.
- Potential to link shopping, housing, services, and transportation destinations.

#### **Proposed Service**

- Route: Between the Poughkeepsie Train Station and Plaza 44/Dutchess Shopping Center via Dutchess Transit Hub.
- Service Design: Serves Delafield neighborhood, Poughkeepsie Housing Authority, Ridgefield & Royal Cove apartments, Plaza 44/Dutchess Shopping Center (Stop & Shop).
- Span: Monday–Friday 6:52 a.m.–7:52 p.m.; Saturday 7:52 a.m.–7:52 p.m.
- Headway (minutes): Weekdays–60, Saturdays–60.
- Round Trip Time (minutes): Weekdays–60, Saturdays–60.
- Scheduling:
  - Route N outbound trips pulse with other routes at the Transit Hub.

Figure 36. Proposed Route N

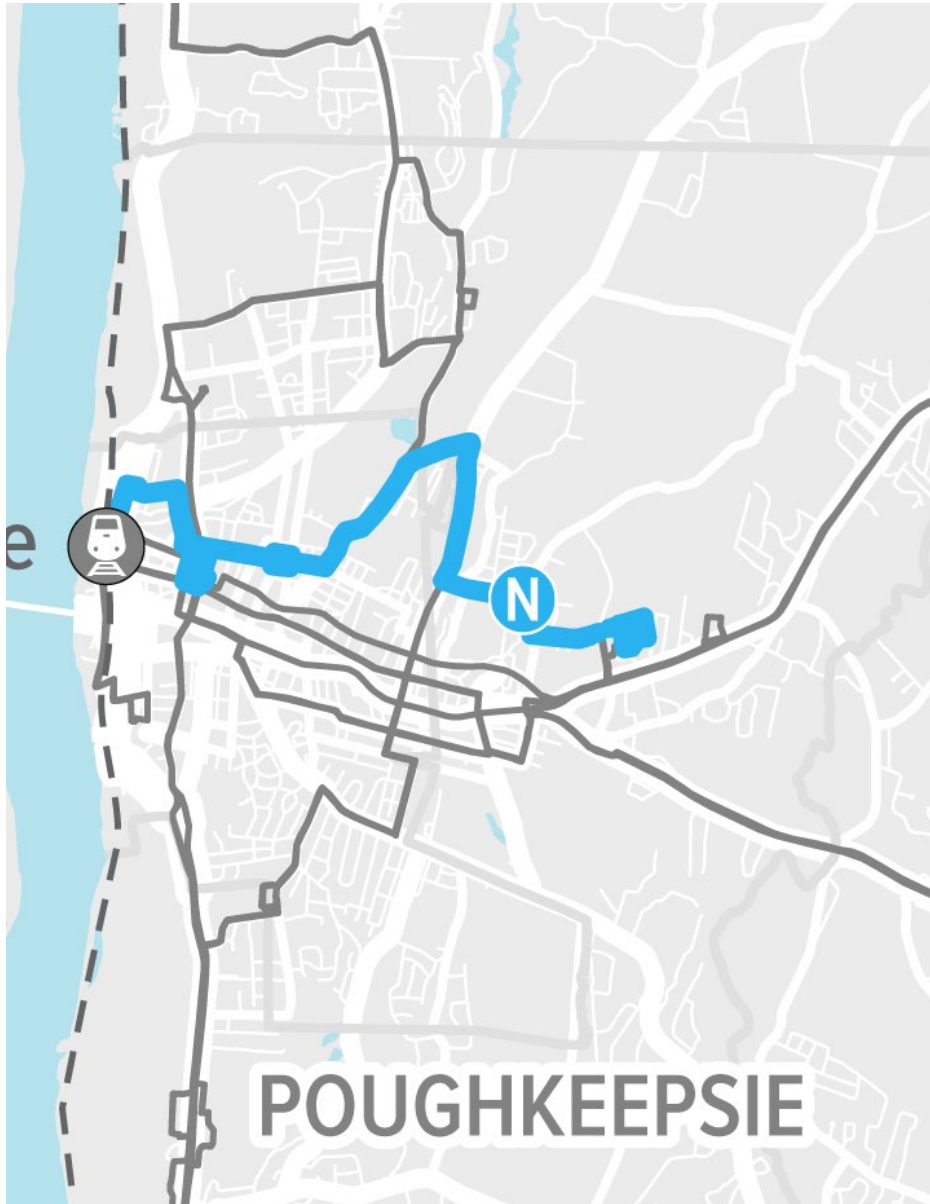
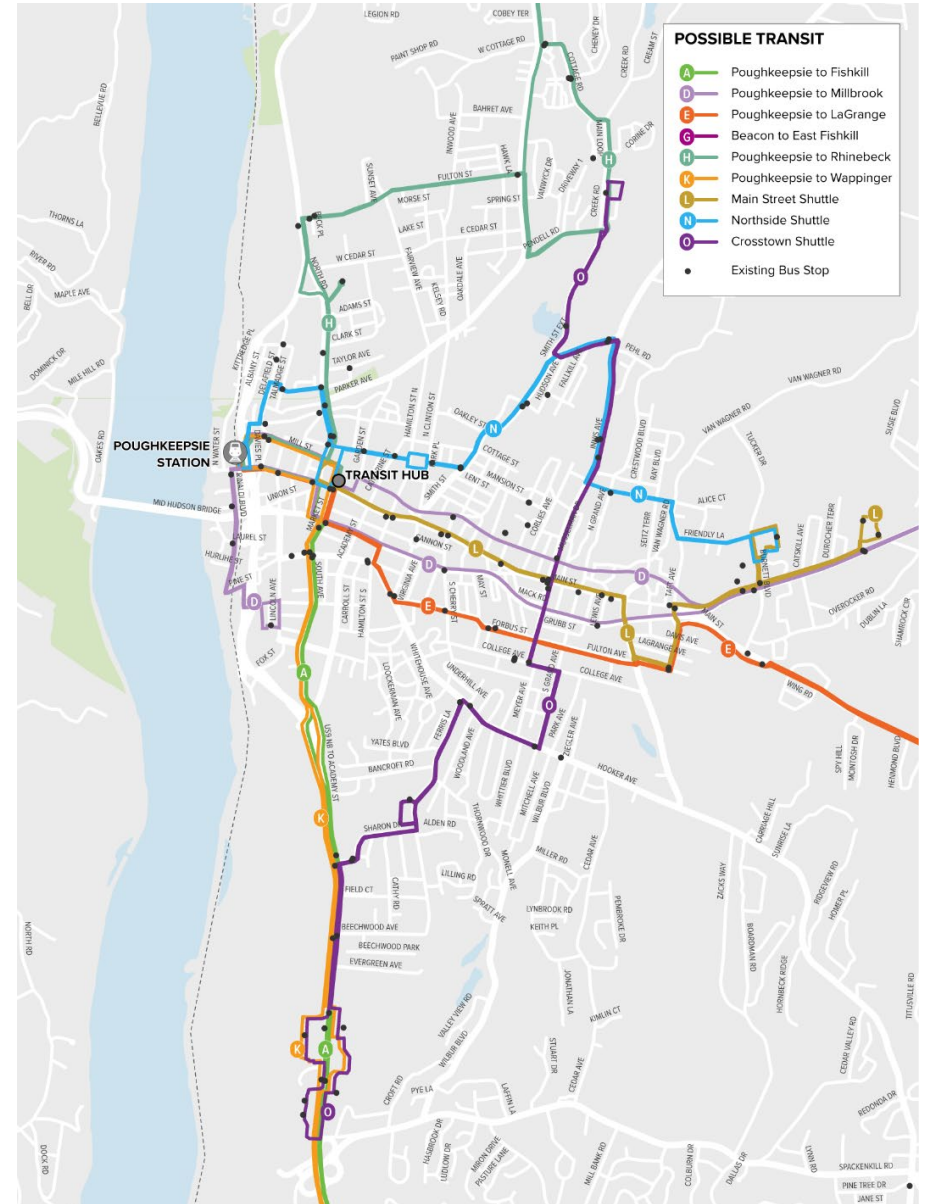


Figure 37. Route N with Nearby Routes



### **5.1.14 Route O (New Crosstown Route)**

- Existing routes provide limited north-south service within Poughkeepsie.
  - Hub-and-spoke network design requires most riders to transfer at Transit Hub to reach key destinations.
- Potential to link shopping, housing, services, and education destinations.
- Preserves link between St. Simeon and front-door service to shopping plazas.

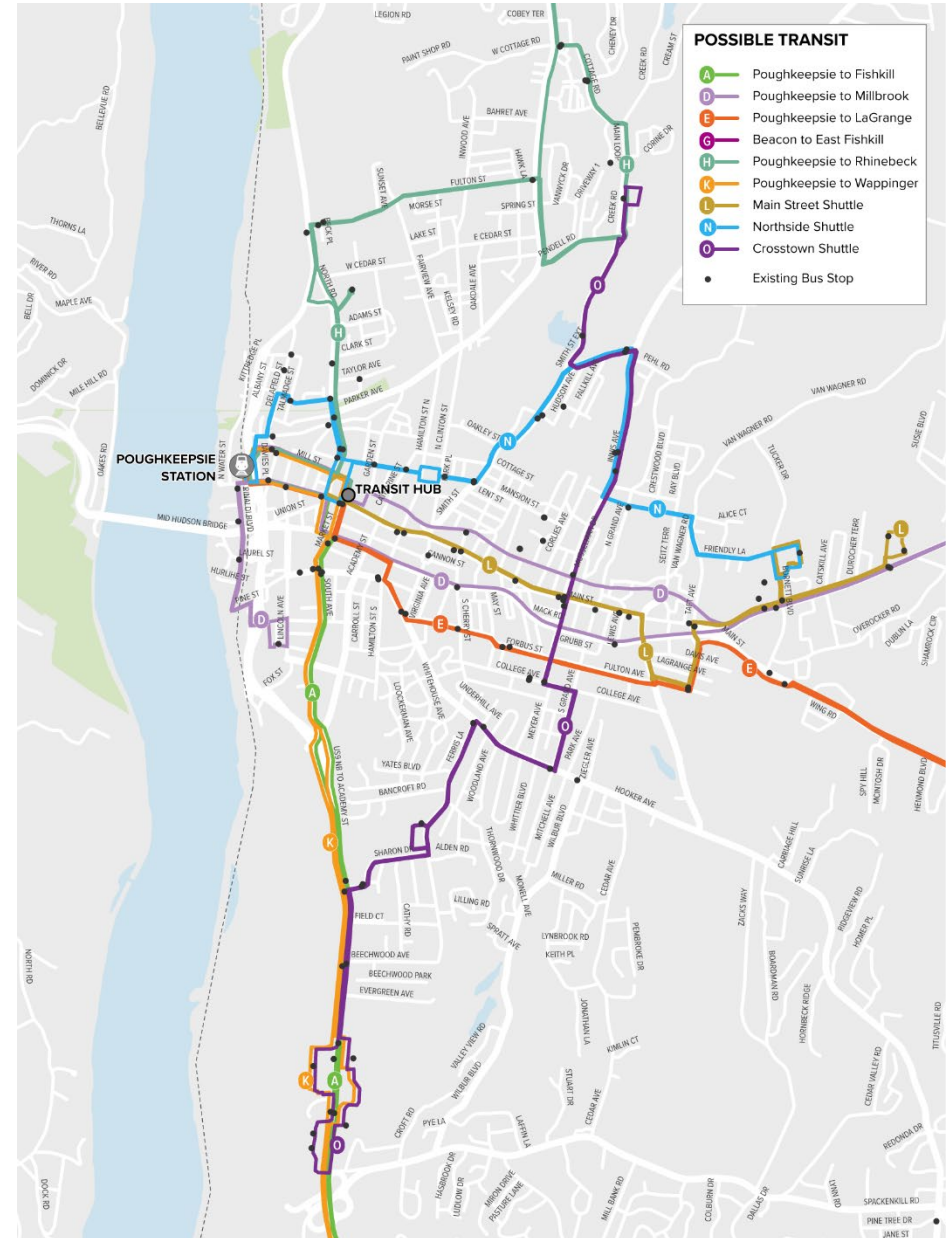
#### **Proposed Service**

- Route: Between Dutchess Community College, and Hudson and Poughkeepsie shopping plazas.
- Service Design: Serves DCC, Ridgefield Apartments, Royal Cove Apartments, Main St., Spring Manor Apartments, shopping plazas.
- Span: Monday–Saturday 7:45 a.m.–6:25 p.m.
- Headway (minutes): Weekdays–40, Saturdays–80.
- Round Trip Time (minutes): Weekdays–40, Saturdays–80.

Figure 38. Proposed Route O



Figure 39. Route O with Nearby Routes





### 5.1.15 Route P (Limited Service)

#### Existing Service

- Route: Between the Transit Hub and Poughkeepsie High School.
- 2019 Weekday Ridership Rank: 7th of 15 routes (231 average daily riders).
- Span: Monday–Friday 6:05 a.m.–7:15 p.m.; Saturday 8:15 a.m.–6:15 p.m.
- Average Headway (minutes): Weekdays–52, Saturdays–57.
- Round Trip Time (minutes): Weekdays–56, Saturdays–56.
- Issues and Observations:
  - Low ridership along the northern segment of alignment.
  - Ridership is mid-to-low for most of route.
  - Indirect alignment with several deviations and loops.
  - Most ridership is at school start/end hours.

#### Proposed Service

- Route: Between the Transit Hub and Poughkeepsie High School
- Changes:
  - Keep same alignment.
  - Operate 2 trips per day to capture school market (open to the public).
  - Discontinue service on Saturday.
- Span: Monday–Friday 7 a.m.–3:05 p.m.
- Headway (minutes): Weekdays–2 trips per day.
- Round Trip Time (minutes): Weekdays–60.
- Scheduling:
  - Route P a.m. outbound trips pulse with other routes at the Transit Hub.

*Note: Route P map not shown due to unchanged alignment.*

### 5.1.16 New Hamburg Rail Link (Discontinued)

#### Existing Service

- Route: Operates as a local loop route around Wappinger connecting to the New Hamburg Metro North Station.
- 2019 Weekday Ridership Rank: 15th of 15 routes (8 average daily riders)
- Span: Monday–Friday 5:45 a.m.– 6:45 p.m.
- Average Headway (minutes): Weekdays–199.
- Round Trip Time (minutes): Weekdays–64.

- Issues and Observations:
  - Redundancies with Routes A and B in Wappinger
  - Specialized service.
  - Indirect, looping alignment.
  - Few daily trips.
  - Minimal ridership.

**Service Recommendation: Discontinue Route**

- Notes: Possible microtransit service zone.

**5.1.17 Poughkeepsie Rail Link (Discontinued)**

**Existing Service**

- Route: Between the Poughkeepsie Train Station and Hudson River Housing Lodge in LaGrange.
- 2019 Weekday Ridership Rank: 14th of 15 routes (20 average daily riders)
- Span: Monday–Friday 4:55 a.m.–6:45 p.m.
- Average Headway (minutes): Weekdays–116.
- Round Trip Time (minutes): Weekdays–60.
- Issues and Observations:
  - Provides some crosstown service within Poughkeepsie.
  - Specialized service.
  - Indirect, zigzag alignment.
  - Few daily trips.
  - Minimal ridership.

**5.1.18 Service Recommendation: Discontinue Route**

- Notes: Area served by other bus routes, including Routes D and E.

**5.1.19 Recommended Fixed-Route Frequencies and Service Span**

Table 8, Table 9, and Table 10 present the recommended DCPT bus frequencies and service spans for weekdays, Saturdays, and Sundays. Detailed tables with route-by-route schedule recommendations are a separate work product. These recommendations are designed to ensure that future operations would produce savings proportionate to revenue vehicle hours and to verify that the intended pulse connections could be made at the Transit Hub and elsewhere making transfers easier. The frequencies are more consistent (generally at 60 minutes) than current schedules and the spans of service are also more consistent than current schedules. Spans of service for each route were adjusted by one or two trips based on the temporal profile of ridership on existing routes in the area served by the route. For most of the day, most of the 60-minute routes would meet at the Transit Hub to facilitate these transfers.

**Table 8. Recommended Weekday Bus Frequencies and Span**

<b>Route</b>	<b>Route Name</b>	<b>Frequency</b>	<b>Daily Trips</b>	<b>First Trip</b>	<b>Last Trip</b>
A	Poughkeepsie–Fishkill	60 mins.	16	6 AM	9 PM
D	Poughkeepsie–Millbrook	60 mins.	13.5	6:20 AM	7:20 PM
E	Poughkeepsie–LaGrange	60 mins.	14.5	6 AM	8 PM
G	Beacon–East Fishkill	60 mins.	14	6:30 AM	7:30 PM
H–short	Poughkeepsie–DCC	60 mins.	11	7:30 AM	5:30 PM
H–long	Poughkeepsie–Rhinebeck	60 mins.	14	6 AM	7 PM
K	Poughkeepsie–Wappinger	60 mins.	12	8:30 AM	7:30 PM
L	Main Street Shuttle	60 mins.	16	6 AM	8:30 PM
M	Eastside Shuttle Limited	N/A	1	7 AM	3:05 PM
N	Northside Shuttle	60 mins.	14	6:52 AM	7:52 PM
O	Crosstown Shuttle	40 mins.	17	7:45 AM	6:25 PM
P	Westside Shuttle Limited	N/A	1	7 AM	3:05 PM

**Table 9. Recommended Saturday Bus Frequencies and Span**

<b>Route</b>	<b>Route Name</b>	<b>Frequency</b>	<b>Daily Trips</b>	<b>First Trip</b>	<b>Last Trip</b>
A	Poughkeepsie–Fishkill	60 mins.	14	7 AM	8 PM
D	Poughkeepsie–Millbrook	60 mins.	12.5	7:20 AM	7:20 PM
E	Poughkeepsie–LaGrange	60 mins.	11.5	8 AM	7 PM
G	BeaconEast–Fishkill	60 mins.	12	8:30 AM	7:30 PM
H – long	Poughkeepsie–Rhinebeck	60 mins.	13	7 AM	7 PM
K	Poughkeepsie–Wappinger	60 mins.	12	8:30 AM	7:30 PM
L	Main Street Shuttle	60 mins.	12	8 AM	7 PM
N	Northside Shuttle	60 mins.	13	7:52 AM	7:52 PM
O	Crosstown Shuttle	40 mins.	9	7:45 AM	6:25 PM

No service offered on Routes H-Short, M, or P on Saturdays

**Table 10. Recommended Sunday Bus Frequencies and Span**

<b>Route</b>	<b>Route Name</b>	<b>Frequency</b>	<b>Daily Trips</b>	<b>First Trip</b>	<b>Last Trip</b>
A	Poughkeepsie–Fishkill	120 mins.	5	10 AM	6 PM
L	Main Street Shuttle	120 mins.	5	10 AM	6 PM

See discussion of Sunday service.

### 5.1.20 Considerations for Sunday Bus Service

As it does today, the proposed Sunday bus service accounts for approximately 15 revenue vehicle hours per week. However, the proportional overhead cost of providing Sunday service is considerably higher than the cost of providing service on other days. This is because four people and 32 hours of time are needed for maintenance, supervision, communications, and garage operations for limited service. As a result, Sunday is the only day where the labor cost of overhead would remain higher than the labor cost of providing bus service. By comparison, the labor cost of overhead is 5–10% of the cost of providing bus service Monday through Saturday.

By this standard, Sunday fixed-route service is a substantial financial burden compared to other days of the week and the two-hour headway that best reflects ridership will not be attractive to many riders. DCPT may wish to consider eliminating Sunday fixed-route service and reinvest the funds into demand-response services. Although such a replacement service would not cost dramatically less than operating fixed-route service, it would be more flexible and thus able to respond to actual demand. Further discussions with a microtransit vendor would be needed to refine this estimate.

### 5.1.21 Impacts of Recommendations on Bus Service Costs

Using the current schedule for fixed-route service, the project team estimated bus service costs, represented as revenue vehicle hours (RVH), a measure of the number of trips per route multiplied by the length of each trip. The current RVH is then available to compare with the recommended service changes to determine potential savings. Table 11 presents this information for weekdays (Monday-Friday), Saturdays, Sundays, and overall. As shown, the recommended route network and proposed schedules would reduce overall RVH by 15.5%.

**Table 11. Weekly Revenue Vehicle Hours for Existing and Proposed Bus Service**

	<b>Max Vehicles</b>	<b>Weekday (M-F) RVH</b>	<b>Saturday RVH</b>	<b>Sunday RVH</b>	<b>Total RVH</b>
Existing	33	1,319.6	211.1	24.1	1,554.7
Recommended	19	1,119.2	179.3	15.0	1,313.5
Difference	(14)	(200.4)	(31.8)	(9.1)	(241.2)
Percent	(42%)	(15.2%)	(15.1%)	(37.7%)	(15.5%)

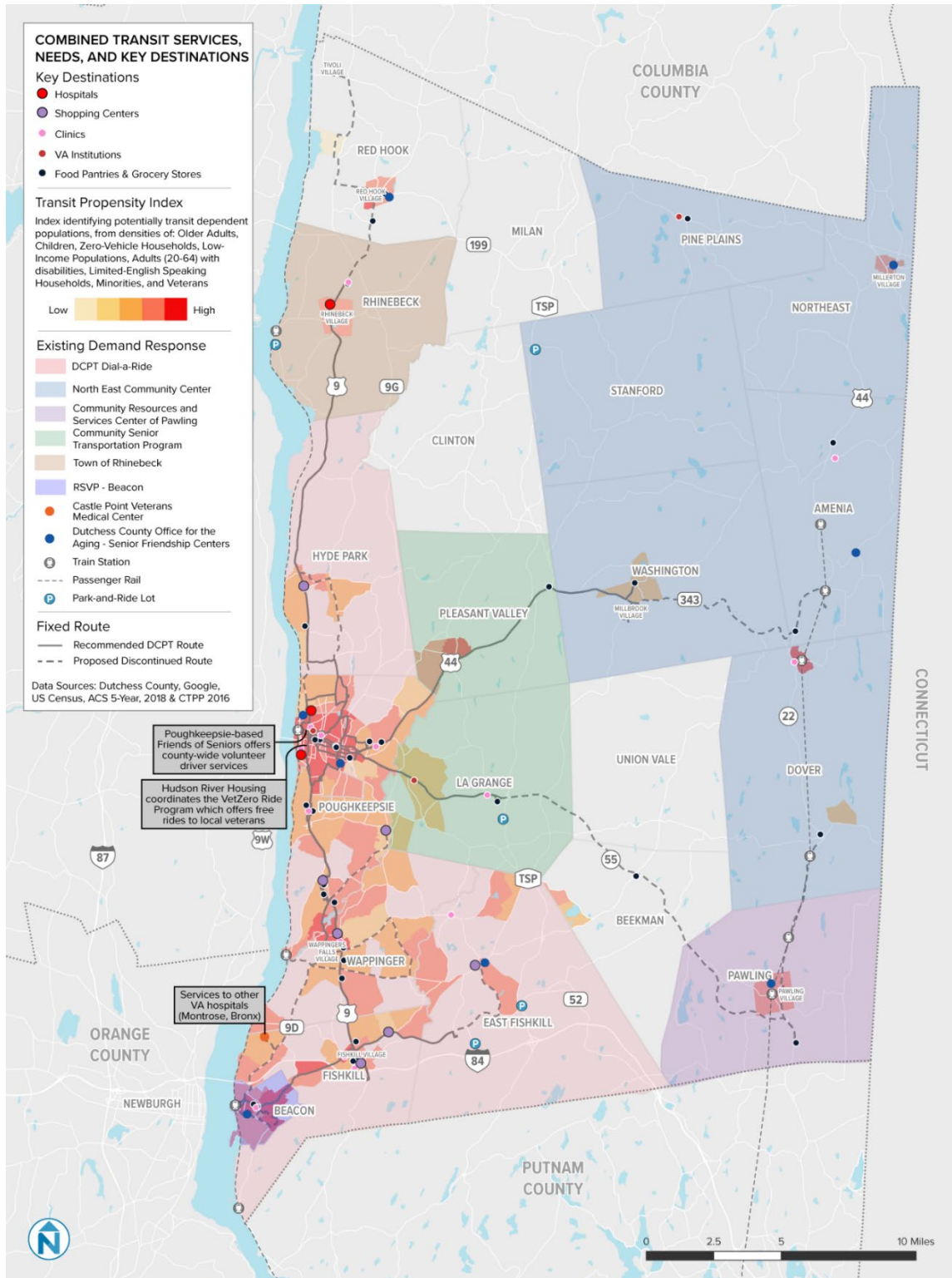
Max vehicles are for weekdays; existing as reported in 2019 FTA NTD; recommended as calculated.

The savings of 241.2 total RVH shown above at an estimated cost of \$100 per RVH translates to approximately \$1.25 million in annual savings. The elimination of all Sunday service is estimated to save an additional \$161,000 per year in fixed-route costs for a total of \$1.41 million in operating savings.

### **Countywide Context for Fixed-Route Recommendations**

The recommended changes to the fixed-route bus network would eliminate service in some communities. Not all communities proposed to lose fixed-route service have demand-response services in place, particularly for those who are able bodied or under age 60, since some services have limited eligibility. As envisioned, eliminated fixed routes would be replaced with expanded demand-response services offered in different forms as discussed in the next section. To set this context, Figure 40 presents a countywide overview of the recommended bus network and current demand-response services (before the expansion of demand-response opportunities) in the context of relative transit demand and key destinations. This context is also important to understanding what demand-response services are likely sustainable, particularly in the more rural parts of the county.

**Figure 40. Recommended Bus Network, Other Transportation Services, Areas of Demand, and Key Destinations**



## 5.2 Future Demand-Response Service Model

### 5.2.1 Introduction

A key impetus for this study is the desire to broaden public transportation services into parts of Dutchess County where services are either not available or are limited. For example, the towns of Clinton and Milan currently have neither fixed-route nor demand-response service. The Towns of Amenia, North East, Pine Plains, and Stanford and the Village of Millerton receive no fixed-route service but are served by North East Community Center's demand-response transportation. Further, implementing the proposed fixed-route service changes would result in the loss of the current infrequent fixed-route service in the towns of Beekman, Dover, Pawling, Red Hook, and Union Vale, and the villages of Pawling, Red Hook, and Tivoli.

Current best practice in bus-system design means providing well-organized routes and schedules where the market supports the service. Similarly, effective practice in demand-response service design means advancing solutions that match market characteristics, serve nearby destinations, and consider the roadway network on which services operate. This means where demand is low, publicly subsidized services are needed to offer a base level of service. In locations with higher populations, more destinations, and stronger roadway connections, other services such as on-demand transportation are more likely to succeed.

Given the characteristics of Dutchess County, the Nelson\Nygaard team has proposed a demand-response service plan with the following four components:

1. In rural areas, DCPT would provide reservation-based, demand-response service designed to facilitate next-weekday travel (e.g., call Monday to travel on Tuesday).
2. In areas where other entities operate service, DCPT would form partnerships to subsidize travel on partner vehicles, either with non-profit organizations,<sup>7</sup> other public agencies, or transportation network companies (TNCs) like Lyft/Uber.
3. To test the viability of microtransit service, (same-day, app-based service) DCPT would undertake pilots in up to three primary and two secondary zones, discussed further below.
4. DCPT could continue to offer limited municipally subsidized demand-response service similar to today's Dial-A-Ride program, albeit with more community funding than today and with new rules that restrict travel when a trip can be made on available fixed-route or microtransit.

Underpinning the plan is investment in a new software platform that enables DCPT to manage demand-response services, incorporate location-based data for fixed-route buses, and offer riders a user interface that facilitates better travel options. Software considerations are discussed below.

The full set of community-by-community recommendations for service options is presented in Table 12 in table form and graphically in Figure 41. Both show which communities are proposed to continue to have fixed-route bus service. The column titled minimum demand-response service lists which of the four options are recommended as the minimum service delivery option. For some communities with continued DCPT bus service, no minimum demand-response service is initially suggested, but that certainly could be altered during the implementation process. A secondary demand-response option is also shown and discussed below.

**Table 12. Recommended Transportation Options by Municipality**

<b>Municipality</b>	<b>Future DCPT Fixed-Route Service</b>	<b>Minimum Demand-Response Service</b>	<b>Secondary Demand-Response Service</b>
Amenia (town)		Partner with NECC	DCPT DAR
Beacon (city)	Yes	Partner with RSVP Beacon	Limited TNC
Beekman (town)		DCPT next-weekday DAR	
Clinton (town)		DCPT next-weekday DAR	
Dover (town)		Partner with NECC	Microtransit (secondary)
East Fishkill (town)	Yes	Microtransit (primary)	
Fishkill (town)	Yes	Limited TNC	
Fishkill (village)	Yes	Limited TNC	
Hyde Park (town)	Yes	Limited TNC	
LaGrange (town)	Yes	Partner with CSTP	Limited TNC; Microtransit hub
Milan (town)		DCPT next-weekday DAR	
Millbrook (village)	Yes	Microtransit hub (secondary)	Partner with NECC
Millerton (village)		Partner with NECC	DCPT DAR
North East (town)		Partner with NECC	DCPT DAR
Pawling (town)		Partner with Pawling Resource Center	Microtransit (secondary); DCPT DAR



**Table 12 continued**

<b>Municipality</b>	<b>Future DCPT Fixed-Route Service</b>	<b>Minimum Demand-Response Service</b>	<b>Secondary Demand-Response Service</b>
Pawling (village)		Partner with Pawling Resource Center	Microtransit (secondary); DCPT DAR
Pine Plains (town)		Partner with NECC	DCPT DAR
Pleasant Valley (town)	Yes	Partner with CSTP	
Poughkeepsie (city)	Yes	Limited TNC	
Poughkeepsie (town)	Yes	Limited TNC	
Red Hook (village)		Microtransit (primary)	
Red Hook (town)		Microtransit (primary)	
Rhinebeck (village)	Yes	Microtransit (primary)	
Rhinebeck (town)	Yes	Microtransit (primary)	
Stanford (town)		Partner with NECC	DCPT DAR
Tivoli (village)		Microtransit (primary)	
Union Vale (town)		DCPT next-weekday DAR	
Wappinger (town)	Yes	Microtransit (primary)	
Wappingers Falls (village)	Yes	Microtransit (primary)	
Washington (town)	Yes	Partner with NECC	DCPT DAR

Notes:

DAR: dial-a-ride.

NECC: North East Community Center and CSTP: Community Senior Transportation Program (where shown, NECC or CSTP currently serve these communities).

TNC: Transportation network company (e.g., Uber/Lyft).

## **5.2.2 Demand-Response Service Options**

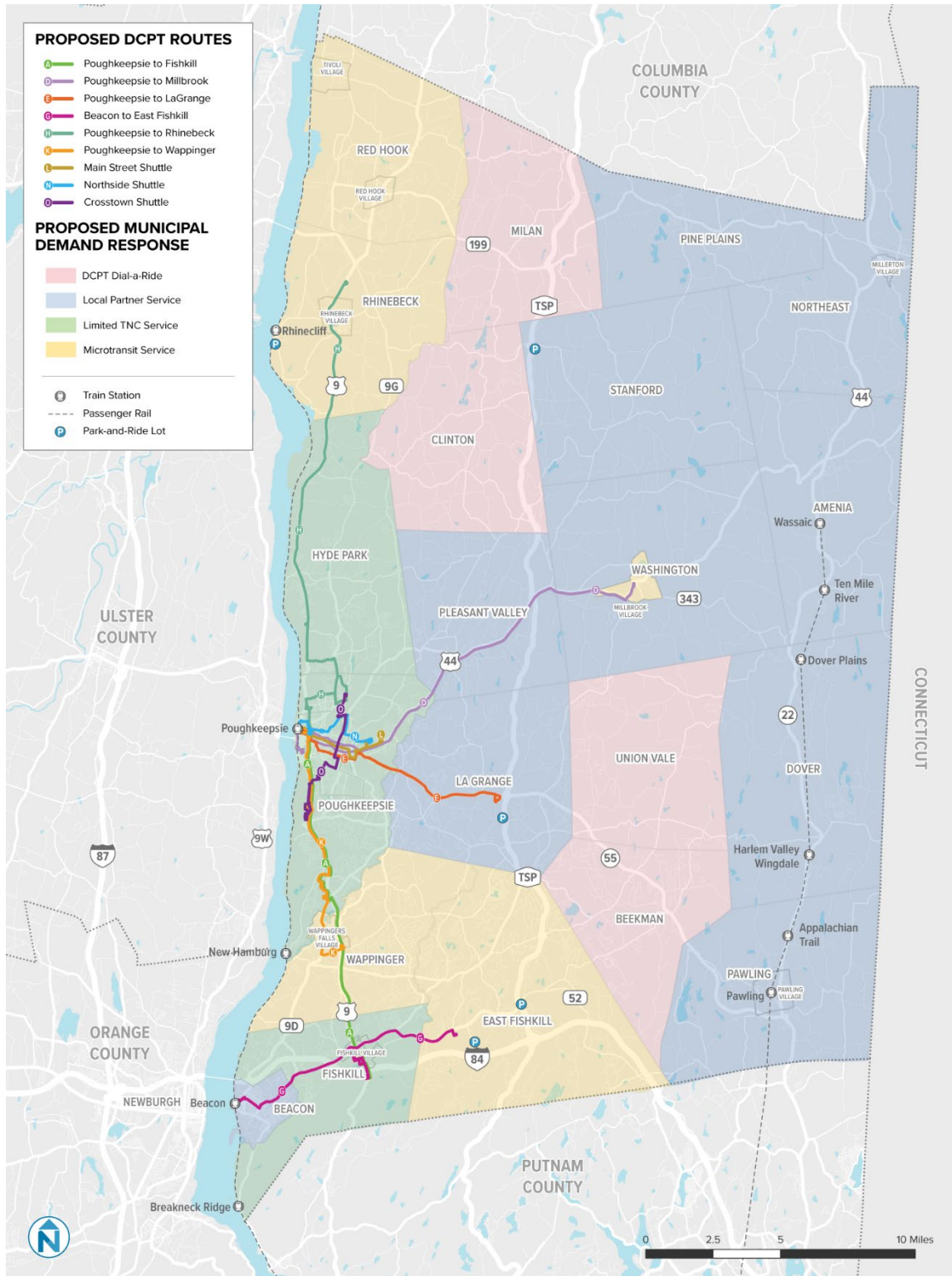
### **County-Provided, Demand-Response Service for Rural Communities**

Nelson\Nygaard recommends that DCPT offer demand-response services in certain municipalities that will not otherwise have any public transportation services. Initially, this includes those that do not have demand-response services provided by another entity. This includes the Towns of Beekman, Clinton, Milan, and Union Vale. Each is recommended to receive next-day demand-response service two days per week (listed in the table as “DCPT next-weekday DAR”). Clinton and Milan currently have no service and Beekman and Union Vale are proposed to lose fixed-route service under the plan.

In each of these communities, the recommendation is for DCPT to offer two days (eight operating hours per day) of service per week. It is assumed that two vehicles and drivers would be assigned to these areas. Advance reservations would be required up to the day prior to travel but would be accepted no more than one week in advance. To simplify service, a proposed schedule might operate Tuesday and Thursdays in Milan and Clinton, and Wednesdays and Fridays in Beekman and Union Vale. Travel would be restricted to within Dutchess County and up to 15 miles in each direction. Fares would be equivalent to the fixed-route fare. While trip requests would be guaranteed, pickup times would need to be negotiated to accommodate demand.

As discussed below, other rural communities in eastern Dutchess County are served by either North East Community Center or Pawling Resources Center. These communities are shown Figure 52 with the current provider recommended for the minimum demand-response service and with DCPT DAR as the secondary service should partnerships with these organizations to provide additional service not materialize.

**Figure 41. Proposed Dutchess County Public Transit Fixed Routes and Demand-Response Options**



## **Demand-Response Partnerships**

Demand-response partnerships fall into two categories, TNC partnerships and traditional demand-response provider partnerships. The general concept behind demand-response partnership is to broker trip requests and assign them to available service providers. The provider is compensated for the cost of providing the trip, which is typically far less costly than operating an all-day, demand-response service.

### ***Transportation Network Company (TNC) Partnerships***

Many transit agencies have explored such partnerships with TNCs to support customer travel during times or in locations when or where fixed-route service does not operate. Others have developed programs to offer same-day service to ADA riders with the aim of improving mobility and lowering operating costs. Lyft and Uber, the two main providers, have each developed platforms that enable clients to travel at a reduced price by using an agency-provided user code. The client pays for any travel costs above an established subsidy and the agency reimburses the TNC directly.

In Dutchess County, TNC partnerships are recommended as a limited service offering in municipalities where one can expect to be able to hail a ride, primarily in and around Poughkeepsie and southwestern parts of the county. In communities where DCPT bus service is available, rules can be established that limit travel between pickup and drop-off locations not within a half to three-quarters of a mile to a bus stop, or to a certain number of subsidized trips per month. These communities are shown Figure 52 as “Limited TNC” in the minimum demand-response service column. The towns of Beacon and La Grange also show Limited TNC as the secondary option in case the respective partnerships cannot be implemented. It should be noted that DCPT will likely need to operate a wheelchair-accessible vehicle (WAV) during the times when TNC service is also available to meet the equivalent service requirements of ADA.

### ***Agency Demand-Response Partnerships***

For those communities where other entities are providing demand-response services, it is recommended that DCPT establish operating partnerships in which the other entity provides the transportation service with a subsidy from the county. This would of course require each provider to agree to participate in the partnership. If there is interest, the partnership could include in software and even hardware such as tablets to enable seamless coordination and communications. Similar rules to the DCPT-operated DAR program would likely be needed in terms of travel distance, fares, and the amount of subsidy.

## **Microtransit Pilots**

Microtransit is a demand-response transportation option that takes advantage of advanced scheduling and dispatching software and the widespread adoption of smartphones. Microtransit operates in real time, meaning that same-day, “on-demand” trip requests can be accommodated. This is a key difference from traditional dial-a-ride services where riders book trips in advance. The ability for riders to book trips the same day and for agencies to dispatch vehicles more efficiently permits more efficient service delivery.

A more comprehensive discussion of microtransit is presented later in this section, but for the purposes of the demand-response service plan, primary and secondary microtransit service areas were identified. Primary microtransit areas are places where demand is likely to be higher and secondary microtransit areas are places where some demand is expected but at a lower level. In some instances, secondary areas will need to connect to fixed-route service.

### ***Communities Identified for Primary Microtransit Areas***

The towns of East Fishkill, Red Hook, Rhinebeck, and Wappinger and the Villages of Red Hook, Rhinebeck, Tivoli, and Wappingers Falls are proposed for one of three possible pilot microtransit areas.

### ***Communities Identified for Secondary Microtransit Areas***

The towns of Dover, La Grange, Pawling, and the Villages of Millbrook and Pawling were identified as secondary microtransit zones. With the exception of Millbrook, these secondary microtransit pilots are proposed as the secondary option because expanding the current demand-response service is preferable. A more detailed discussion of microtransit, including service design, estimated demand, and costs are presented later in this section.

## **Municipally Supported Dutchess County Public Transit-Dial-A-Ride**

The fourth element of the demand-response strategy is for DCPT to continue offering limited municipally supported demand-response service similar to today’s Dial-A-Ride program. For those communities where TNC partnerships are not viable or of interest, DCPT would offer service to the community at an agreed-upon price that reflects the current and anticipated cost of operations. In communities where DCPT bus service is available, rules can be established that limit travel between pickup and drop-off locations not within half to three-quarters of a mile to a bus stop.

### 5.2.3 Funding and Costs

In 2019, the year for which operational analysis was undertaken for this study, according to Federal Transit Administration (FTA) data, DCPT received just over \$11 million in total revenues, with \$4.3 million in State funding and \$3.9 million in federal assistance. The remaining \$2.7 million in revenues were generated locally (fares, municipal payments for Dial-A-Ride, and from budget transfers). Fixed route operating expenses were reported at \$7.4 million, while demand-response expenses (ADA, Dial-A-Ride, and Flex) were \$3.2 million. For purposes of evaluating the funding available for demand-response service options, we have made the following assumptions:

- The cost of ADA service would remain the same, even though the service area would be smaller.
- Fare revenues would be excluded from the budget to simplify the analysis.
- Municipal subscriptions for Dial-A-Ride service (\$230/day) would also be excluded.
- Available from the reduced fixed-route revenue, vehicle hours of service would be \$1.25 million, but Sunday service would continue. Use of fixed-route funds for demand-response services is permitted. New York State Transit Operating Assistance (STOA) funds may be used for both fixed-route and demand-response transportation. According to the current rules, Section 975.2 (Basic Eligibility Requirements) includes demand-response as eligible for STOA funding and requires that “demand-response services must have published service areas, hours of operations, fares, and phone number to arrange service.”<sup>8</sup>

Table 13 illustrates this analysis and shows the available non-local, non-ADA budget for demand-response service options is just over \$3.2 million.

**Table 13. Demand-Response Budget Analysis**

*Source: FTA NTD data for 2019, DCPT, Nelson\Nygaard analysis.*

<b>Budget Category</b>	<b>Amount</b>
Demand-response operating expenses, 2019	\$3,192,274
Remove fares	\$(50,664)
Remove ADA service	\$(820,930)
Remove municipal subsidies	\$(353,280)
Add fixed-route savings	\$1,250,000
<b>Amount available</b>	<b>\$3,217,400</b>

- The proposed concept of operations would reallocate the \$3.2 million so each of the 30 municipalities (cities, towns, and villages) would either receive a pilot microtransit service or a varying annual subsidy for demand-response service as follows:
- Service in communities proposed for DCPT next-weekday DAR service would be allocated the equivalent of two days per week (half of one vehicle two days per week).
- Service in communities where DCPT would fund partnerships with nonprofits would be funded at the equivalent of one day per week.
- In communities proposed for limited TNC service, the subsidy program, would cover the equivalent of half day of service.

For purposes of this analysis, one day of service is estimated at \$800 and the service year includes 252 weekdays. The recommended allocation is summarized in Table 14. A separate Excel file was provided to DCPT for making future adjustments. As shown, the annual cost of the program is approximately \$800,000, which would leave up to \$2.4 million for the microtransit pilots and use of a new software platform.

**Table 14. Recommended Demand-Response Service Funding Allocation by Municipality**

<b>Municipality</b>	<b>Future DCPT Fixed-Route Service</b>	<b>Proposed Service</b>	<b>Proposed Annual Allocation</b>
Amenia (town)		Partner with NECC	\$41,600
Beacon (city)	Yes	Partner with RSVP Beacon	\$41,600
Beekman (town)		DCPT next-weekday DAR	\$41,600
Clinton (town)		DCPT next-weekday DAR	\$41,600
Dover (town)		Partner with NECC	\$41,600
East Fishkill (town)	Yes	Microtransit (primary)	See discussion below
Fishkill (town)	Yes	Limited TNC	\$20,800
Fishkill (village)	Yes	Limited TNC	\$20,800
Hyde Park (town)	Yes	Limited TNC	\$41,600
LaGrange (town)	Yes	Partner with CSTP	\$41,600
Milan (town)		DCPT next-weekday DAR	\$41,600
Millbrook (village)	Yes	Microtransit (secondary) hub	\$20,800
Millerton (village)		Partner with NECC	\$41,600
North East (town)		Partner with NECC	\$41,600
Pawling (town)		Partner with Pawling Resource Center	\$41,600
Pawling (village)		Partner with Pawling Resource Center	\$41,600
Pine Plains (town)		Partner with NECC	\$41,600
Pleasant Valley (town)	Yes	Partner with CSTP	\$41,600
Poughkeepsie (city)	Yes	Limited TNC	\$20,800
Poughkeepsie (town)	Yes	Limited TNC	\$20,800
Red Hook (village)		Microtransit (primary)	See discussion below

<b>Municipality</b>	<b>Future DCPT Fixed-Route Service</b>	<b>Proposed Service</b>	<b>Proposed Annual Allocation</b>
Red Hook (town)		Microtransit (primary)	See discussion below
Rhinebeck (village)	Yes	Microtransit (primary)	See discussion below
Rhinebeck (town)	Yes	Microtransit (primary)	See discussion below
Stanford (town)		Partner with NECC	\$41,600
Tivoli (village)		Microtransit (primary)	See discussion below
Union Vale (town)		DCPT next-weekday DAR	\$41,600
Wappinger (town)	Yes	Microtransit (primary)	See discussion below
Wappingers Falls (village)	Yes	Microtransit (primary)	See discussion below
Washington (town)	Yes	Partner with NECC	\$41,600
<b>Total</b>			<b>\$811,200</b>
<b>Total estimated demand-response allocation</b>			<b>\$3,217,400</b>
<b>Estimated funding for microtransit pilots and new software platform</b>			<b>\$2,406,200</b>

Notes: DAR: Dial-a-Ride.

NECC: North East Community Center and CSTP: Community Senior Transportation Program (where shown, NECC or CSTP currently serve these communities).

TNC: Transportation network company (e.g., Uber/Lyft).

### 5.2.4 Microtransit Evaluation and Recommendations

As discussed in various parts of this report, microtransit is a demand-response transportation option that takes advantage of advanced scheduling and dispatching software and the widespread adoption of smartphones. Microtransit operates in real time, meaning that same-day “on-demand” trip requests can be accommodated. This is a key difference from traditional dial-a-ride services where riders book trips in advance.

#### Proposed Primary and Secondary Microtransit Zones

As a key task of this study, Nelson\Nygaard evaluated microtransit services in different parts of Dutchess County and identified primary and secondary microtransit areas. The team used a software tool to estimate demand, vehicle requirements, and costs for microtransit. As with the demand for regular bus services, areas where demand for microtransit is strongest tend to correspond with areas with concentrations of people and jobs, albeit at a lower demand threshold than for regular bus service. The



team identified primary and secondary microtransit zones. Primary microtransit zones are areas where demand is likely to be higher and secondary microtransit zones are areas where some demand is expected but at a lower level and would need to connect to other fixed-route transit. Figure 42 illustrates the locations of the three primary and two secondary microtransit zones evaluated by the team that are recommend for further investigation.

**Figure 42. Proposed Dutchess County Public Transit Routes and Microtransit Study Zones**

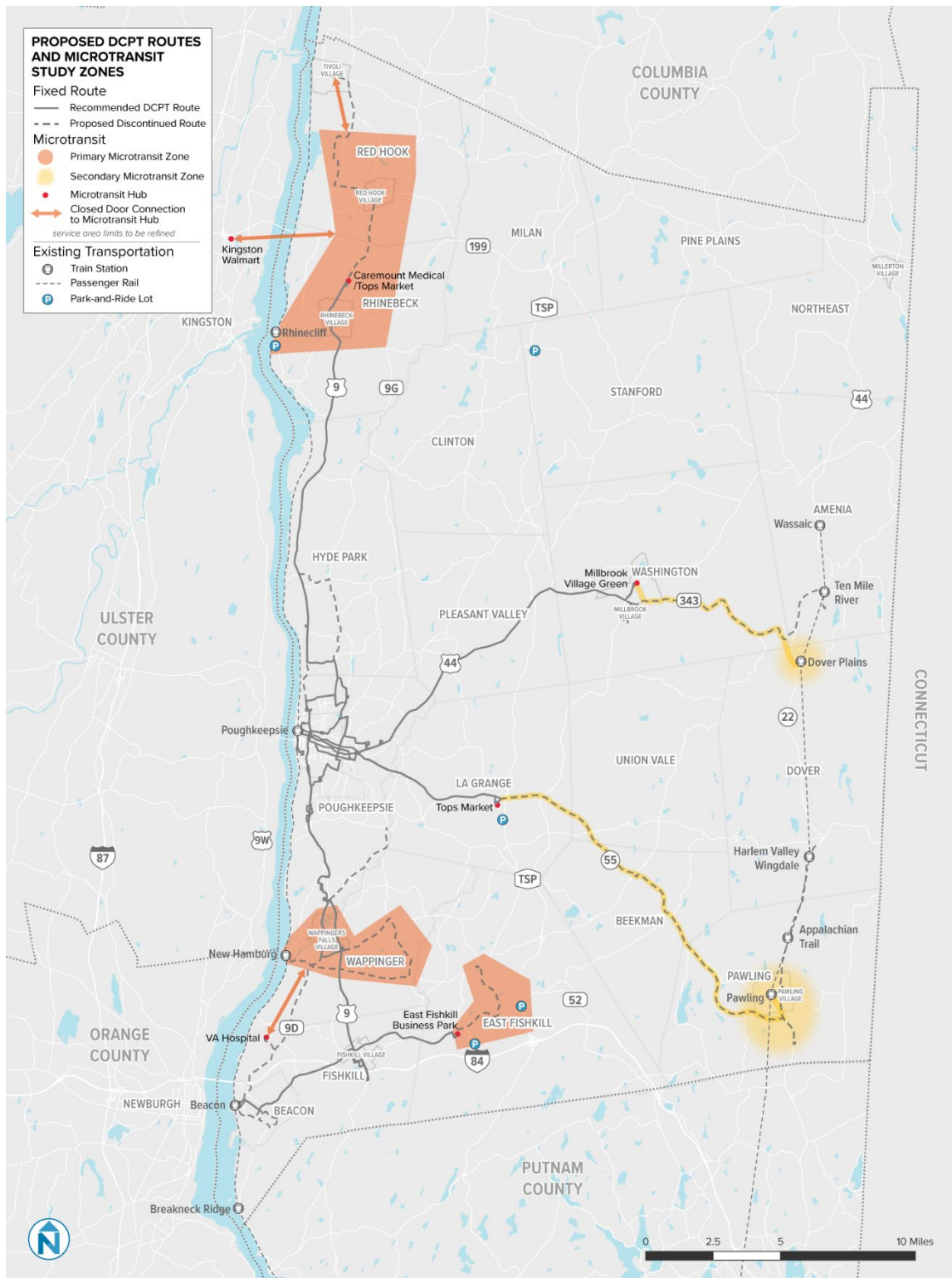


Table 15 summarizes the characteristics of each zone including the type of service, if and where it connects to fixed route, and a preliminary estimate of demand, median wait time, the number of vehicles assumed to be required for zone coverage, and daily operating hours (16 hours for primary zones and 12 hours for secondary zones). The size of each zone, fares, hours of service, vehicle requirements, and expected demand are all elements that DCPT should discuss further with potential vendors.

**Table 15. Proposed Microtransit Zone Characteristics**

*Source: Nelson\Nygaard analysis. Note: closed door implies that no pickups or drop-offs occur between the microtransit zone and the hub location.*

<b>Zone Name/Size</b>	<b>Vehicles/Hours</b>	<b>Description</b>	<b>Connections</b>	<b>Daily Riders</b>	<b>Comments</b>
<b>Primary Microtransit Zones</b>					
Northwest Dutchess, including Kingston Walmart 14 square miles	2 vehicles 16 hours/day	Serves Walmart in Kingston (closed door connection), Red Hook, and Tivoli along connecting corridors	Rhinecliff Station, Route H-Long route in Rhinebeck	41	This was recommended by the Mid-Hudson Study; would require agreement with Ulster County
Wappinger-Wappinger Falls 14 square miles	3 vehicles 16 hours/day	Serves VA hospital (closed door connection) and areas east of Route 9 corridor	New Hamburg Station, Routes A, K	114	Top priority zone for pilot
East Fishkill 17 square miles	2 vehicles 16 hours/day	Serves Hopewell Junction with link to bus service	Route G	48	
<b>Secondary Microtransit Zones</b>					
Pawling 24 square miles	2 vehicles 12 hours/day	Replaces areas losing fixed-route service and higher-density parts of Pawling; connection to La Grange	Route E in LaGrange	20	
Dover Plains 13 square miles	2 vehicles 12 hours/day	Replaces service to Dover Plains; connection to Millbrook	Route D in Millbrook	15	Could expand service in Town of Washington

### **Other Possible Microtransit Zones**

Other zones can be considered where transit propensity is higher, and no fixed-route services are provided. This includes parts of the towns of Beacon, Poughkeepsie, and Hyde Park. Microtransit is not initially recommended in rural communities with low transit propensity. The secondary zones in Pawling in Dover Plains could serve as test communities to determine demand for and cost to operate a service in a lower-population area with localized transit propensity. If testing of secondary zones proves successful, additional deployments should be considered. We recommend asking a microtransit vendor to conduct independent analyses and estimate costs for these communities.

In addition, a key advantage of microtransit is the ability to redesign service in response to demand, meaning a zone with certain service hours can be tested and refined as demand is better known. This requires ongoing marketing and communications to recruit and respond to rider interests. Some microtransit vendors (e.g., Rideco, Transloc, and Via) provide marketing support for this purpose.

### **Estimated Microtransit Service Costs**

For the purposes of estimating microtransit costs, the Nelson\Nygaard team assumed a minimum of two vehicles operating in each zone, which takes advantage of on-demand vehicle dispatching. Operating with one vehicle is possible, but the wait times and ability to accommodate trip requests limit the ability to respond to riders and take advantage of the dispatching advantages of microtransit.

The team used a software platform to estimate ridership and determine vehicle requirements for each of the five zones. Once vehicle requirements are known, the cost of operations can also be estimated. For simplicity, we used \$100 per revenue vehicle hour, a figure that assumes the use of DCPT drivers and vehicles and the cost of the software add-on. A turnkey operation, one in which vendor provides vehicles and software would likely be priced somewhat lower; however, for budgeting purposes, the \$100 hourly cost is a conservative estimate. Estimates are shown in Table 16 and range from \$604,800 for a 12-hour per weekday service in Dover Plains and Pawling, and \$1,209,600 for the 16-hour per weekday service in Wappinger-Wappinger Falls, the zone with the highest demand estimate and a three-vehicle operation. All services are estimated at five days per week.

As noted above, the proposed demand-response service plan would allocate approximately \$2.4 million in current funding to microtransit and the purchase of a new software platform for all demand-response scheduling and dispatching. With the assumed available resources, this amount would not fund all of the

microtransit proposals, but would certainly be sufficient to advance two to three options, depending upon which were selected.

**Table 16. Estimated Annual Microtransit Operating Costs**

*Source: Nelson\Nygaard analysis.*

<b>Zone</b>	<b>Vehicles/Hours</b>	<b>Annual Cost</b>
Northwest Dutchess Primary Zone	2 vehicles, 16 hours/day	\$806,400
Wappinger-Wappinger Falls Primary Zone	3 vehicles, 16 hours/day	\$1,209,600
East Fishkill Primary Zone	2 vehicles, 16 hours/day	\$806,400
Pawling Secondary Zone	2 vehicles, 12 hours/day	\$604,800
Dover Plains Secondary Zone	2 vehicles, 12 hours/day	\$604,800
		\$4,032,000

### **5.2.5 Other Microtransit Considerations**

The following discussion covers other things to consider should DCPT move forward with microtransit.

#### **Operating Microtransit in Place of Fixed-Route Service**

It might be possible to reduce the fixed-route service spans at times when buses are less productive (e.g., when per hour ridership is less than five). It is also possible to consider microtransit for Sunday operations, as discussed earlier in this section.

#### **Fixed-Route Transfer Policy**

Depending on the individual’s itinerary, DCPT could require riders to take all of their trip on a fixed route or to transfer to/from a fixed route. This is accomplished by integrating the GTFS feed so that DCPT and its riders would also be able to track the bus they need to meet. Such integration is offered by most microtransit software providers.

#### **Fares**

Microtransit fares should be designed to encourage use of and/or transfer to fixed route to the extent possible and to take shorter trips. For example, in suburban Detroit, SMART charges \$2 for microtransit trips up to 8 miles and increases the fare by \$0.50 for each additional mile with a maximum fare of \$12.

## 5.2.6 Other Recommendations

### Scheduling and Dispatching Software

It is recommended that DCPT invest in new scheduling and dispatching software that integrates all demand-response services. A number of software vendors offer features that enable combining these services into a single platform or have application programming interfaces (APIs) that permit seamless data transfer, including incorporating GTFS feeds to incorporate DCPT’s bus routes in real time. See appendix 3 for materials from an ongoing service in Durham, Ontario that integrates paratransit, microtransit, and TNC services in both urban and rural parts of the region.

Table 17 lists several of the software vendors for traditional demand-response scheduling and dispatching, as well as those that offer software for microtransit, and those that also operate vehicles under contract, discussed further below.

**Table 17. Demand-Response Scheduling and Dispatching Software Providers (Partial List)**

Vendor	Microtransit	ADA Paratransit	Operates Vehicles
DemandTrans	x	x	
Ecolane	x	x	
GMV Syncromatics / Mobilitat <sup>1</sup>		x	
HBSS (Qryde) / TSS Paratransit		x	
Moovit	x	x	
MTM		x	
Rideco	x		x
Uber/RouteMatch	x	x	
Spare Labs	x	x	
Transdev	x		x
Transloc <sup>2</sup>	x	x	
Trapeze		x	
Urban Mobility	x	x	
Via	x	x	x

<sup>1</sup> DCPT’s current vendor.

<sup>2</sup> Owned by Ford mobility.

The cost of a new demand-response scheduling and dispatching software application depend on the specifications established by Dutchess County and are likely comparable to the cost of the application currently in use. It is suggested that DCPT seek additional information from vendors on pricing options.

## **ADA Service**

The scope of ADA service is tied to the fixed-route service network. Given the relatively low number of riders and daily demand, there are no overall ADA service or policy recommendations. Should the county move forward with new scheduling and dispatching software, the ADA service would also benefit from having a more modern software tool.

## **Flex Service**

The Flex service has been constrained by insufficient funding, operating for less than five hours per weekday. Given the size of Dutchess County and the challenges in serving the eastern part of the county efficiently, it is not possible to provide a meaningful countywide demand-response service without increasing the number of vehicles, drivers, and service hours. It is recommended that this service be discontinued as currently constituted and merged into the proposed demand-response plan.

## **Dial-A-Ride Service in Overlapping Fixed-Route Area**

Dutchess County contracts with the City of Poughkeepsie, Town of Poughkeepsie, Town of Fishkill, Town of East Fishkill, Town of Hyde Park, and Town of Wappinger for DAR service. As discussed in section 3, a high percentage of DAR trips take place entirely within three-quarters of a mile from DCPT's fixed routes. According to staff, there are DAR riders who use fixed-route service on days when the DAR is not operating or when their trip request cannot be accommodated. This is most apparent in the City and Town of Poughkeepsie and in Fishkill.

DCPT provides complementary paratransit within three-quarters of a mile to/from its fixed-route service. Subsidizing Dial-A-Ride in overlapping service areas is inherently inefficient. Given that some of the Dial-A-Ride customers are capable of traveling on fixed-route buses, the consultant team believes that it does not make financial sense to offer demand-response services to these customers in instances where they can complete the trip on a fixed route. Where DAR riders are unable to access fixed-route service due to a disability, the ADA service could address their needs.

## **5.2.7 Vehicle Considerations**

### **Fixed Route**

The majority of the existing fleet consists of transit buses from manufacturers including Orion, Gillig, and El Dorado, in 30 feet, 35 feet and 40 feet lengths. The largest fleet is from El Dorado and is about 6 years

old as of late 2021. The team recommends retaining the fixed-route fleet in order to meet FTA requirements for replacement at 12+ years of age. Over time, ridership on the new routes will stabilize and the 30 feet, 35 feet and 40 feet buses can be matched to ridership.

There are additional reasons to retain a fleet of mostly transit buses, as opposed to cutaways. It is common, for example, for one or two trips per day to have a peak load, and a transit bus is best equipped to handle that load, compared to buying a second cutaway and hiring an additional driver to absorb that peak. The current practice of using cutaway buses as spares or on the lightest loaded trips should continue.

### **Demand Response**

The size of the future demand-response fleet will be tied to the service levels that DCPT continues to operate with its own (dedicated) vehicles. An important consideration with any countywide demand-response service using non-dedicated vehicles (i.e., vehicles provided by TNCs or other partners), is providing equivalent services for riders that need accessible vehicles. Where a turnkey operator is used for microtransit, DCPT will need to specify that a certain portion of the fleet be accessible. But if TNC partners are used, DCPT may wish to continue to operate its own accessible vehicles that it would dispatch. Depending on where customers are located, this could be challenging in terms of providing equivalent response times.

### **5.2.8 Summary**

With the implementation of the recommended plan, Dutchess County will operate a more market-responsive bus system that better serves its riders with schedules that are more convenient and where more transfers will be permitted. DCPT will be able to evaluate the feasibility of microtransit. All communities will have some form of publicly subsidized transportation, whether by DCPT bus, DCPT next-day Dial-A-Ride, a community-based service, a TNC provider, or a microtransit provider. The system will be managed with an integrated software platform that users can use to request trips and track vehicles (including fixed-route buses), and that DCPT, its partners, and vehicle operators will also be able to use. Such integrated services are available today in other cities (an example of one is provided in the report appendix), and the Nelson\Nygaard team believes such an approach will also work in Dutchess County.



# Appendix A. Dutchess County Public Transit Dial-A-Ride and Flex Services

**Figure A-1. Dutchess County Public Transit Demand-Response Services (Non-ADA)**

Source: Dutchess County Public Transit

Description	Dial-A-Ride	City of Poughkeepsie Dial-A-Ride	Flex
Service Area	Within the Towns of Hyde Park, Wappinger, Poughkeepsie, Fishkill, and East Fishkill and Villages of Fishkill and Wappingers Falls	Within the City of Poughkeepsie	Within cities, towns, and villages or between cities, towns and villages where there is no available fixed-route service, excluding City of Poughkeepsie
Eligibility	All passengers	All passengers	All passengers
One-way Fares	\$3.50 for general fare \$1.00 for seniors (60+), veterans and persons with disabilities.	\$3.50 for general fare \$7.00 same-day fare \$1.00 for seniors (60+), veterans, Medicare, persons with disabilities	\$5.00 within a city, town, village \$6.00 between city, town, and village
Service Hours	Mon-Fri 8:00 a.m. to 4:30 p.m.	Mon-Fri 8:00 a.m. to 4:30 p.m.	Mon-Fri 9:00 a.m. to 1:45 p.m.
Reservation Period	3 to 30 days in advance	Same day to 30 days in advance	3 to 30 days in advance
Application Process?	Yes	Yes – via telephone	Yes
Funding of Service	City, Town or Village	City and County	County
Mode	Origin to Destination	Origin to Destination	Origin to Destination
Trip Denials	Yes	Yes	Yes

**Figure A-2. Dutchess County Public Transit Dial-A-Ride Schedule**

Source: Dutchess County Public Transit.

Municipality	M	Tu	W	Th	F
<b>City of Poughkeepsie</b>					
Local, South Road Malls, Adams Fairacre Farms, 44 Plaza	✓	✓	✓	✓	✓
1 Bushwick Dr, LaGrange				✓	
Fishkill, 129 Clove Branch Road, East Fishkill		✓ 2nd Tu			
<b>Town of East Fishkill</b>					
Local	✓				✓
Beacon	✓				

<b>Municipality</b>	<b>M</b>	<b>Tu</b>	<b>W</b>	<b>Th</b>	<b>F</b>
Fishkill	✓		✓		✓
South Road Malls			✓		
<b>Town of Fishkill</b>					
Local & Beacon		✓		✓	
Poughkeepsie & South Road Malls		✓		✓	
<b>Town of Hyde Park</b>					
Local		✓			
City & Town of Poughkeepsie		✓			
South Road Malls		✓			
Fishkill		✓ Last Tu			
<b>Town of Poughkeepsie - North</b>					
Local, City & Town of Poughkeepsie	✓			✓	✓
Fishkill	✓ 1 <sup>st</sup> M				
<b>Town of Poughkeepsie - South</b>					
Local, City & Town of Poughkeepsie	✓		✓		✓
Fishkill			✓		
<b>Town of Wappinger</b>					
Local	✓	✓	✓	✓	✓
Poughkeepsie & South Road Malls		✓		✓	
Fishkill	✓		✓		
Castle Point		✓			✓

## Appendix B. Route Profiles

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SEE PDF for Route Profiles

## Appendix C. Microtransit Research

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Microtransit can take many forms, including using TNCs (e.g., Uber, Lyft), contracted vehicles and drivers, agency vehicles and drivers, or something in between. Nelson\Nygard’s research of different service models is summarized in Figure A-3.

**Figure A-3. Summary of Agencies and Alternative Service Delivery Methods Examined**

Agency	Microtransit Service Overview
King County Metro – King County, WA	<b>Via to Transit:</b> A program operated by Via offering first- and last-mile connectivity to transit service. Rides are requested on-demand and takes customers to/from transit stations in Southeast Seattle and Tukwila.
SacRT – Sacramento, CA	<b>SmaRT Ride:</b> On-demand service using SacRT vehicles and drivers with a third-party scheduling service that provides service within designated zones.
Marin Transit – Marin County, CA	<b>Connect:</b> On-demand service using agency vehicles operated by a third-party service provider. Riders can request trips anywhere in the service area.
LAVTA – Dublin-Pleasanton-Livermore, CA	<b>Go Tri-Valley:</b> Uber and Lyft subsidy program covering 50% of the cost for each ride within the defined service area, up to \$5. Riders must use the shared ride feature (UberPOOL or Lyft Line) to be eligible for the subsidy.

Highlights from each service are summarized below:

### C.1 King County Metro

- Via drivers are independent contractors.
- AVs are available on request.
- Trips can be booked via an app or by phone.
- Some riders are asked to walk to/from a designated meeting point to limit deviations.
- Free fixed-route transfers offered.
- Per trip agency cost was \$8 in 2019 (large metropolitan area).

### C.2 SacRT

- Uses Via software for trip booking only (app or phone).
- Uses agency drivers and vehicles for service delivery.
- Costs not known.
- Provides more trips per hour than ADA service.

### **C.3 Marin Transit**

- Fares for older adults and people with disabilities \$3 per trip or \$40 monthly pass.
- Fares for others: \$4/mile or \$80 monthly pass.
- Blended service for ADA and non-ADA.
- Uses Uber's software for trip booking (app or phone).
- Uses agency vehicles and contracted service provider.
- 2.4 passenger trips per hour in 2019.
- ADA trip costs-\$40; other trips-\$10.

### **C.4 LAVTA**

- Maximum \$5 subsidy covers half the fare; rider pays remainder.
- Program started with three providers (Lyft, Uber, and DeSoto Cab) but now only has Lyft and Uber.
- Wheelchair accessible vehicles are available through Uber WAV (urbanized region).
- Partners with a concierge service to book trips for riders without smartphones.
- Majority of users traveled to/from BART rail station.

# Appendix D. On-Demand Service in Durham, Ontario

## D.1 Durham Region Transit, Durham, Ontario

Durham Region Transit (DRT) is the public transport provider for the Reginal Municipality of Durham, Ontario, located east of Toronto. The region had 646,000 people in 2016 in an area of 974 square miles. DRT operates fixed-route and on-demand services, branded as urban and rural. The overall system map (shown below) illustrates the large area where rural services are provided (primarily the northern part of the region) with urban on-demand, primarily concentrated closer to Lake Ontario. The zoom view of the service area (below) shows fixed routes, urban on-demand (microtransit), and rural on-demand zones. The on-demand service descriptions from the system map are presented below.

Figure D-1. Durham Regional Transit System Map

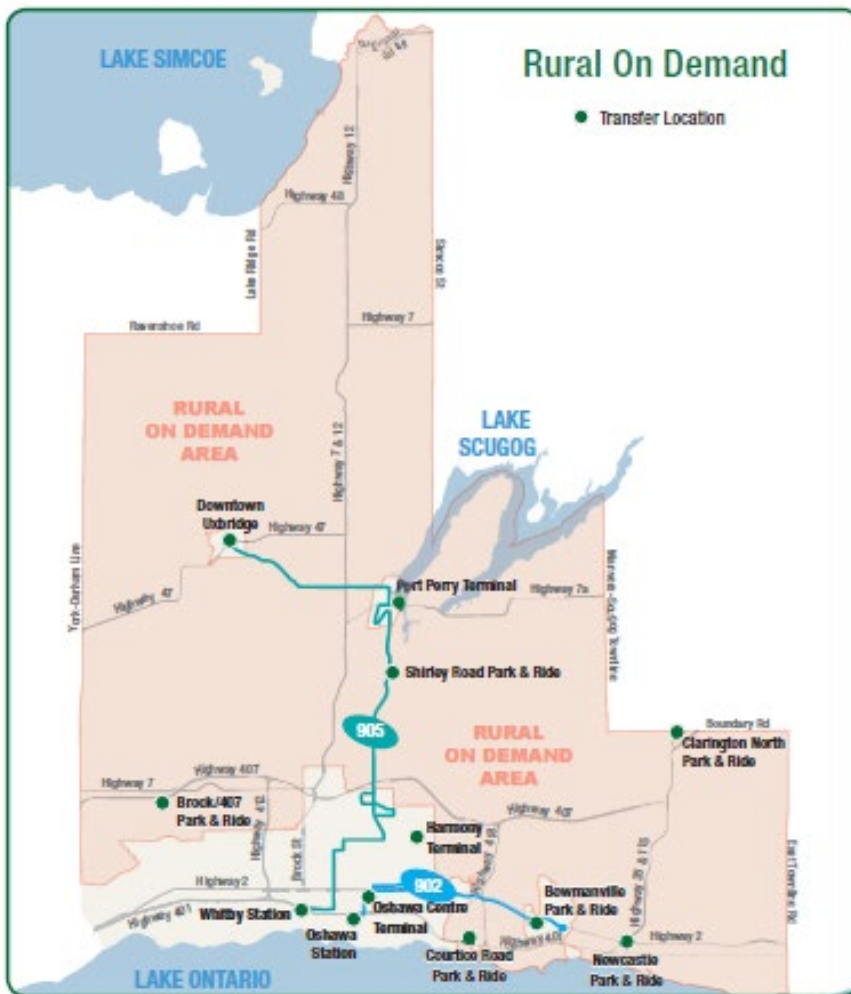
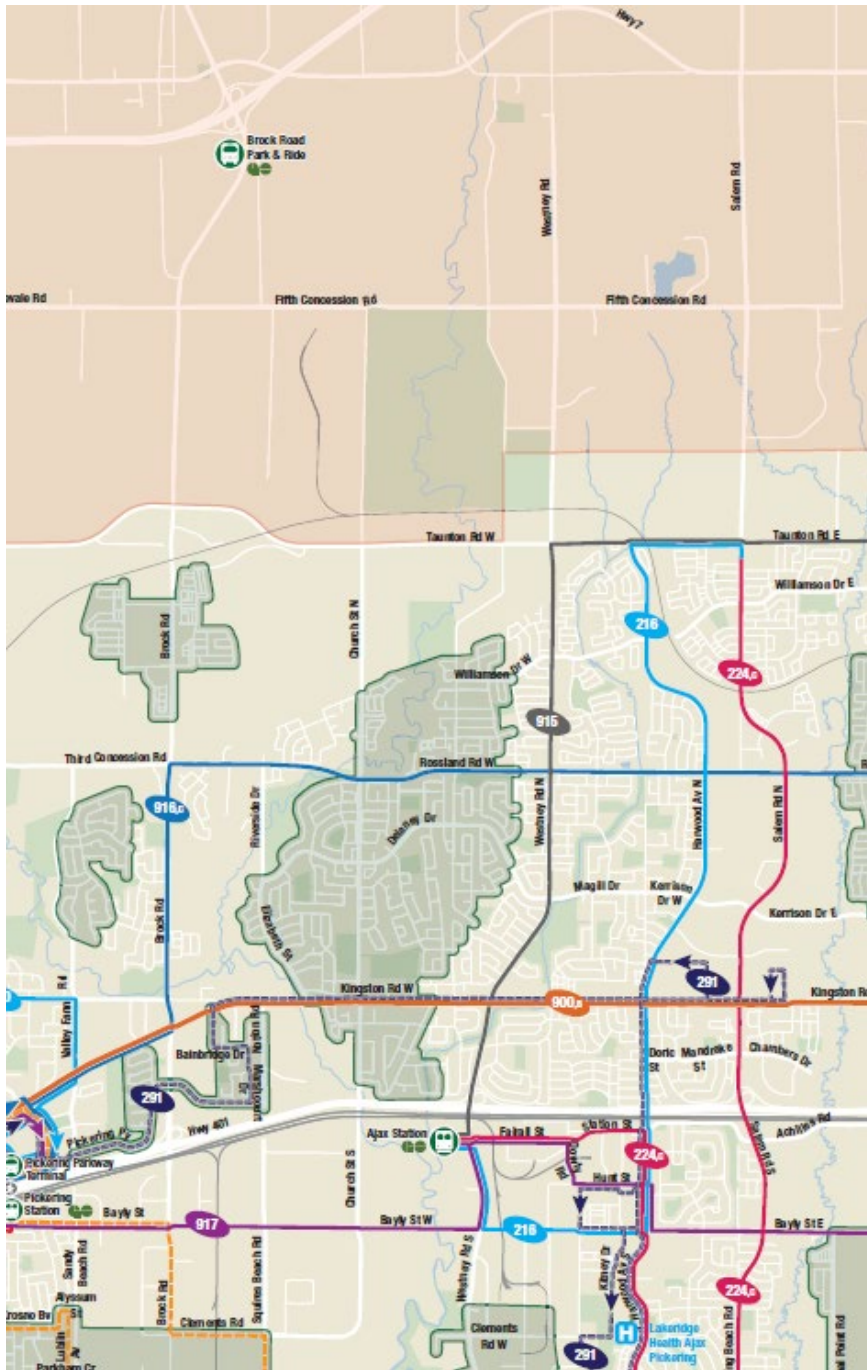


Figure D-2. Zoom View of Service Area



## **D.2 What is On Demand?**

On Demand is a flexible and convenient option in areas of our network that are not served by scheduled service. Customers can travel stop-to-stop within a zone, facilitate connecting to frequent and grid routes, or to the local GO station or bus terminal. Regular fares apply.

### **D.2.1 Urban On Demand**

- Access On Demand service at designated On Demand bus stops.
- Travel stop-to-stop within the On Demand area (minimum 800 meters), to connecting DRT and GO Transit bus service, and to nearby transit terminals and train stations.

### **D.2.2 Rural On Demand**

- Access On Demand service from designated On Demand bus stops in smaller communities, or from the end of your driveway in rural areas.
- Travel within the On Demand area and to connecting DRT and GO Transit bus service.

### **D.2.3 Booking On Demand**

You can book a trip by downloading the On Demand app or by calling 1-866-247-0055.

Visit [durhamregiontransit.com](https://www.durhamregiontransit.com) for more information.

See <https://www.durhamregiontransit.com/en/routes-and-schedules/resources/June-21-2021/DRT-South--Jun-2021.pdf>



# Endnotes

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- <sup>1</sup> Potential partners include North East Community Center and the Dutchess County Office for Aging, and community-based services such as those in Pawling, Rhinebeck, Beacon and Pleasant Valley and La Grange.
- <sup>2</sup> Microtransit is a demand-response transportation option that takes advantage of advanced scheduling and dispatching software and the widespread adoption of smartphones. Microtransit operates in real time, meaning that same-day “on-demand” trip requests can be accommodated. This is a key difference from traditional dial-a-ride services where riders book trips in advance.
- <sup>3</sup> This assessment focuses on areas with higher densities of people and jobs. Therefore, areas with the lowest densities are not included in this list.
- <sup>4</sup> Data from 2019 was used to understand travel patterns prior to the impact of COVID-19.
- <sup>5</sup> See discussion of economics of Sunday service.
- <sup>6</sup> See discussion of economics of Sunday service.
- <sup>7</sup> Potential partners include North East Community Center and the Dutchess County Office for Aging, and community-based services such as those in Pawling, Rhinebeck, Beacon and Pleasant Valley and La Grange.
- <sup>8</sup> <https://www.dot.ny.gov/divisions/policy-and-strategy/public-trans-repository/stoarr.pdf>



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**New York State  
Department of Transportation**

50 Wolf Road  
Albany, NY 12232

**telephone:** 518-457-6195

[dot.ny.gov](http://dot.ny.gov)

**New York State  
Energy Research and  
Development Authority**

17 Columbia Circle  
Albany, NY 12203-6399

**toll free:** 866-NYSERDA  
**local:** 518-862-1090  
**fax:** 518-862-1091

[info@nyserdera.ny.gov](mailto:info@nyserdera.ny.gov)  
[nyserdera.ny.gov](http://nyserdera.ny.gov)



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Marie Therese Dominguez, Esq., Commissioner