THE CITY OF HARRISONBURG VIRGINIA

TRANSIT STRATEGIC PLAN

Harrisonburg Department of Public Transportation (HDPT)

May 2024

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Chapter 1 – System Overview and Strategic Vision

Harrisonburg's ability to succeed depends significantly on having a well-performing transportation system, including public transportation. This Transit Strategic Plan (TSP) is a blueprint for implementing better transit, over a 10-year horizon, across the region's core area that is served by the Harrisonburg Department of Public Transportation (HDPT). Chapter 1 of the Transit Strategic Plan (TSP) provides an overview of the Harrisonburg Department of Public Transportation (HDPT) and the strategic vision for the agency.

1.1 System Overview

The system overview describes the HDPT service area, the services provided, and ongoing initiatives. Additional information is available in **Appendix A**.

1.1.1 Services Provided and Areas Served

HDPT operates fixed-route and paratransit services throughout the City of Harrisonburg, Virginia. Harrisonburg has a population of 53,162 and is the 12th largest city in Virginia. The service area is divided by Interstate 81 and features several institutions that drive the local economy, such as James Madison University and Sentara RMH Medical Center.

The existing HDPT fixed-route network includes 16 routes that operate within the city limits of Harrisonburg. Six of these routes serve the City of Harrisonburg itself, while 10 routes operate on James Madison University campus. HDPT has 42 heavy duty large buses, 10 cutaway buses, and 2 modified vans that provide year-round service.

Table 1: Existing HDPT Service

Route	Route Name	Operation Days	Span	Frequency
1	City Route 1	Monday – Saturday	6:34 a.m. – 6:20 p.m. (M-F) 8:34 a.m. – 5:20 p.m. (Sat)	60 minutes
2	City Route 2	Monday – Saturday	6:30 a.m. – 6:16 p.m. (M-F) 8:30 a.m. – 5:16 (Sat)	60 minutes
3	City Route 3	Monday – Saturday	6:32 a.m. – 6:15 p.m. (M-F) 8:32 a.m. – 5:15 p.m. (Sat)	60 minutes
4	City Route 4	Monday – Saturday	6:50 a.m. – 6:37 p.m. (M-F) 8:50 a.m. – 5:37 p.m. (Sat)	60 minutes
5	City Route 5	Monday – Saturday	6:28 a.m. – 6:14 p.m. (M-F) 8:28 a.m. – 5:14 p.m. (Sat)	60 minutes
6	City Route 6	Monday – Saturday	6:32 a.m. – 6:18 p.m. (M-F) 8:32 a.m. – 5:18 p.m. (Sat)	60 minutes
7	JMU - Inner Campus Shuttle	Monday – Saturday	7:00 p.m. - 10:50 p.m. (M-F) 9:00 a.m. – 10:50 p.m. (Sat)	5 minutes (M-F) 30 minutes (Sat)
8	JMU - Yellow Line	Monday – Saturday	7:00 a.m. – 10:49 p.m. (M-F) 10:00 a.m. – 10:49 p.m. (Sat)	30 minutes

Route	Route Name	Operation Days	Span	Frequency
9	JMU - Pink Line	Monday - Friday	7:00 a.m. – 6:45 p.m. (M-F)	30 minutes
10	JMU – Green and Red	Monday – Friday	7:00 a.m. – 7:11 p.m. (M-F)	20 minutes
11	JMU – Blue and Purple Line	Monday – Friday	7:00 a.m. – 6:44 p.m. (M-F)	40 minutes
12	JMU - Black Line	Monday – Friday	7:08 a.m. – 6:57 p.m. (M-F)	30 minutes
13	JMU - Shopper	Monday – Saturday	1:00 p.m. – 10:30 p.m. (M-Sat)	45 minutes
14	Gold Line	Monday – Saturday	7:00 p.m. – 10:50 p.m. (M-F) 10:20 a.m. – 10:50 p.m. (Sat)	40 minutes
15	Silver Line	Monday – Saturday	7:00 p.m. – 10:47 p.m. (M-F) 10:20 a.m. – 10:47 p.m. (Sat)	40 minutes
16	Sunday Shopper	Sunday	1:00 p.m. – 10:16 p.m. (Sun)	30 minutes
17	Summer Shuttle	Monday – Friday	6:34 a.m. – 6:20 p.m. (M-F)	60 minutes
18	Bridgewater/Dayton Shuttle	Tuesday & Thursday	8:30 a.m. – 12:15 p.m. (Tue) 8:30 a.m. – 12:20 p.m. (Th) Both days could run later depending on appointments	N/A

Table 1 lists Harrisonburg's fixed route service. The six routes that serve Harrisonburg operate six days a week, from Monday to Saturday. Generally, this service is operated on an hourly schedule from 6:30 a.m. to 6:30 p.m. on weekdays, and 8:30 a.m. to 5:30 p.m. on Saturdays. The ten routes that serve James Madison University (JMU) are offered during the fall and spring semesters. Seven of these routes operate from Monday to Friday, from 7:00 a.m. until 7:00 p.m. Generally, these routes operate on a twenty- to sixty-minute schedule. One route is offered only on Sundays and acts as a shuttle to nearby shopping areas. During the summer months, the JMU routes operate on a modified service schedule.

HDPT provides ADA complementary paratransit service. Paratransit services are available to people with a disability that prevents them from using regularly scheduled fixed-route service. Riders must apply and be approved to utilize the paratransit service. HDPT recommends a reservation the day before a trip. However, when this is not possible same day reservations are taken on a first come, first serve basis as the schedule permits.

Connecting Services

Several providers offer travel services to connect HDPT riders with local and regional destinations outside the HDPT network.

Brite

Brite provides fixed route public transit service in the Staunton and Waynesboro areas. Brite's Blue Ride Community College North shuttle route provides service connecting Harrisonburg and southern Rockingham County to the Blue Ride Community College campus in Augusta County. The service operates Monday through Friday from 7:00 a.m. to 7:00 p.m. with hourly frequency. Fare is $0.50.

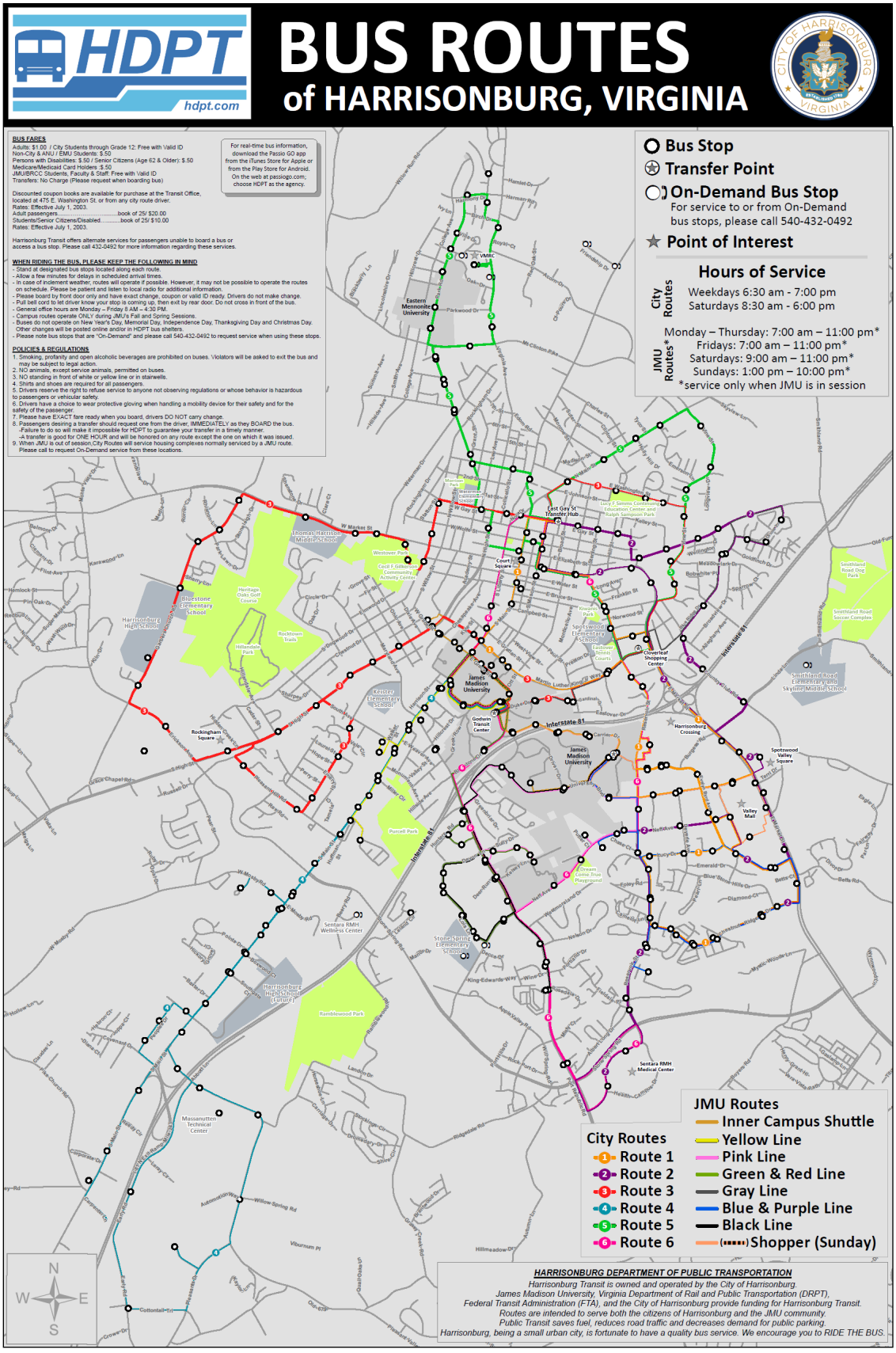
Amtrak

Amtrak service is available at the Staunton station, which can be reached from Harrisonburg via the Blue Ridge Community College Shuttle. The station is served by the Amtrak Cardinal, operating three times per week between Chicago and New York City, via Washington, DC.

Intercity Bus

Regional connections are provided by various intercity bus operators with stops throughout Harrisonburg.

- *Virginia Breeze* provides connections to Blacksburg, Washington D.C., Bristol, and cities in between via its Valley Flyer and Highland Rhythm routes.
- *Wanda Coach Bus* provides Harrisonburg-New York City, as well as Harrisonburg-Atlanta bus services.
- *OurBus* provides service along the I-81 corridor in Virginia, and to Harrisburg, PA and New York, NY.
- *CollegeTransit* departs directly from the JMU campus for Thanksgiving, Winter, and Spring Breaks. The typical destinations include Allentown (PA), Morris Plains (NJ), Teterboro (NJ), and Huntington (NY).
- *BreakShuttle* provides students with coach bus service to NYC and Philadelphia for Thanksgiving and Spring breaks.


HDPT
hdpt.com
BUS ROUTES
of HARRISONBURG, VIRGINIA
CITY OF HARRISONBURG VIRGINIA
BUS FARES
Adults: $1.00 / City Students through Grade 12: Free with Valid ID
Non-City & ANU / EMU Students: $.50
Persons with Disabilities: $.50 / Senior Citizens (Age 62 & Older): $.50
Medicare/Medicaid Card Holders: $.50
JMU/BRCC Students, Faculty & Staff: Free with Valid ID
Transfers: No Charge (Please request when boarding bus)
Discounted coupon books are available for purchase at the Transit Office, located at 475 E. Washington St. or from any city route driver.
Rates: Effective July 1, 2003.
Adult passengers.....book of 25/ $20.00
Students/Senior Citizens/Disabled.....book of 25/ $10.00
Rates: Effective July 1, 2003.
Harrisonburg Transit offers alternate services for passengers unable to board a bus or access a bus stop. Please call 432-0492 for more information regarding these services.
For real-time bus information, download the Passio GO app from the iTunes Store for Apple or from the Play Store for Android. On the web at passiogo.com; choose HDPT as the agency.
WHEN RIDING THE BUS, PLEASE KEEP THE FOLLOWING IN MIND
- Stand at designated bus stops located along each route.
- Allow a few minutes for delays in scheduled arrival times.
- In case of inclement weather, routes will operate if possible. However, it may not be possible to operate the routes on schedule. Please be patient and listen to local radio for additional information.
- Please board by front door only and have exact change, coupon or valid ID ready. Drivers do not make change.
- Pull bell cord to let driver know your stop is coming up, then exit by rear door. Do not cross in front of the bus.
- General office hours are Monday – Friday 8 AM – 4:30 PM.
- Campus routes operate ONLY during JMU's Fall and Spring Sessions.
- Buses do not operate on New Year's Day, Memorial Day, Independence Day, Thanksgiving Day and Christmas Day. Other changes will be posted online and/or in HDPT bus shelters.
- Please note bus stops that are "On-Demand" and please call 540-432-0492 to request service when using these stops.
POLICIES & REGULATIONS
1. Smoking, profanity and open alcoholic beverages are prohibited on buses. Violators will be asked to exit the bus and may be subject to legal action.
2. NO animals, except service animals, permitted on buses.
3. NO standing in front of white or yellow line or in stairwells.
4. Shirts and shoes are required for all passengers.
5. Drivers reserve the right to refuse service to anyone not observing regulations or whose behavior is hazardous to passengers or vehicular safety.
6. Drivers have a choice to wear protective gloving when handling a mobility device for their safety and for the safety of the passenger.
7. Please have EXACT fare ready when you board, drivers DO NOT carry change.
8. Passengers desiring a transfer should request one from the driver, IMMEDIATELY as they BOARD the bus.
-Failure to do so will make it impossible for HDPT to guarantee your transfer in a timely manner.
-A transfer is good for ONE HOUR and will be honored on any route except the one on which it was issued.
9. When JMU is out of session,City Routes will service housing complexes normally serviced by a JMU route. Please call to request On-Demand service from these locations.
Bus Stop
Transfer Point
On-Demand Bus Stop
For service to or from On-Demand bus stops, please call 540-432-0492
Point of Interest
Hours of Service
City Routes
Weekdays 6:30 am - 7:00 pm
Saturdays 8:30 am - 6:00 pm
JMU Routes*
Monday – Thursday: 7:00 am – 11:00 pm*
Fridays: 7:00 am – 11:00 pm*
Saturdays: 9:00 am – 11:00 pm*
Sundays: 1:00 pm – 10:00 pm*
*service only when JMU is in session
JMU Routes
Inner Campus Shuttle
Yellow Line
Pink Line
Green & Red Line
Gray Line
Blue & Purple Line
Black Line
Shopper (Sunday)
City Routes
Route 1
Route 2
Route 3
Route 4
Route 5
Route 6
HARRISONBURG DEPARTMENT OF PUBLIC TRANSPORTATION
Harrisonburg Transit is owned and operated by the City of Harrisonburg, James Madison University, Virginia Department of Rail and Public Transportation (DRPT), Federal Transit Administration (FTA), and the City of Harrisonburg provide funding for Harrisonburg Transit. Routes are intended to serve both the citizens of Harrisonburg and the JMU community. Public Transit saves fuel, reduces road traffic and decreases demand for public parking. Harrisonburg, being a small urban city, is fortunate to have a quality bus service. We encourage you to RIDE THE BUS.
N
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1.1.2 Current/Recent Initiatives

Service Planning Improvements

HDPT's priorities for service planning include schedule improvements, such as earlier and later weekday span, full schedule operation on Saturdays, and additional service on Sundays. HDPT also plans to modify route alignments to better serve the Harrisonburg population, better access activity centers, and avoid congested throughfares throughout the city.

Fare-free Service

HDPT has been operating fare-free fixed route and paratransit service since March 2020. Before the suspension of fares, the general public fare was $1.00, paratransit fare was $2.00, while adults 62 years and older, persons with disabilities, Medicare/Medicaid card holders, and non-city EMU/ANU students paid $0.50. City students through grade 12 and JMU/BRCC students and faculty rode for free.

Construct a Transit Center

HDPT aims to construct a new facility that would be built specifically as a bus transfer center, including covered passenger waiting, bicycle and pedestrian facilities, driver restroom, information kiosk, and security cameras. The addition of a park and ride to the facility will also be considered. The Harrisonburg Multimodal Transit Center Feasibility Study was complete in June 2022.

Develop Full System Map

In 2018, HDPT developed a full system map that can be viewed via computer or mobile device and downloaded/printed. Previously, HDPT had maps for each route and not as a system.

JMU Route Optimization

In 2019, HDPT redesigned the JMU routes to simplify the naming convention, switching from a number system to a color system and changing route's service areas. This was an effort to make the system more easily understood by JMU students to promote ridership. Changes also included having all JMU routes operate on the same schedule for weekdays.

Microtransit Feasibility Study

Microtransit Feasibility study for the City of Harrisonburg was completed in June 2023. HDPT's goal is to begin a pilot phase next year.

1.2 Strategic Vision

MISSION

Harrisonburg Department of Public Transportation strives to ease traffic congestion and provide alternative transportation to the citizens and students of Harrisonburg. Services provided are to be an asset to the community by being safe, clean, reliable, and cost-effective.

In May 2023, stakeholders met to inform the priorities for improvements to the HDPT system. Stakeholders that participated include the City of Harrisonburg, James Madison University, Central Shenandoah Planning District Commission (CSPDC), Rockingham County, Valley Associates for Independent Living, and Virginia Department of Rail and Public Transportation (DRPT). The following key themes were identified:

- **Increased coverage** was a top priority for the overall system, but **increased frequency** was especially important for city routes.
- Stakeholders agreed that **all-day service** was preferrable compared to peak service. This includes earlier and later hours on both weekdays and weekends, but most notably on weekends during non-University times.
- **Increasing transit access** is a priority for the community, especially for transit-dependent riders and zero-vehicle households.

1.2.1 Goals and Objectives

HDPT's priorities set in Harrisonburg's previous Transit Development Plan (TDP) were re-evaluated as part of the TSP process. **Table 2** outlines the four goals and associated objectives.

Table 2: Goals and Objectives

Goal	Objective
Provide an equitable, safe, and reliable transportation service that improves people's lives.	Provide reliable service.
	Improve service for need-based trips.
Improve quality of life and foster economic growth in the region.	Maximize access to major employment centers and development opportunities.
	Contribute to local and regional sustainability goals.
	Contribute to congestion mitigation and overall improved mobility.
Foster connections with local and regional stakeholders.	Improve service for K-12 schools and colleges/universities.
	Educate local and regional partners on how to use the HDPT system.
	Coordinate with nearby cities and counties for potential service connections.
Prioritize exceptional customer service.	Provide excellent customer service through timely service, well-trained drivers, and comfortable accommodations.

1.2.2 Service Design Standards

Service guidelines are intended to aid management in making service decisions. As such, they are part of the decision-making process and subject to ongoing review. **Table 3** summarizes HDPT's current service design standards.

Table 3: HDPT's Service Design Standards

Category	Standard
Frequency	City Routes: • 60 min on weekdays • 60 min on Saturdays
	Campus Routes: • 20-40 minutes daily
Hours of Operation	City Routes: • 6:30 a.m. - 6:30 p.m. on weekdays • 8:30 a.m. - 5:30 p.m. on Saturdays
	Campus Routes: • 7:00 a.m. - 11:00 pm on weekdays • 9:00am - 11:00 pm on Saturdays

1.2.3 Performance Standards

Table 4 summarizes HDPT's performance standards, including revenue hours, passenger trips. Operating cost, trips per hour, and cost per trip. HDPT will use these measures as a baseline when evaluating route performance.

Table 4: Performance Standards

Performance Standard Measure	Key Performance Indicator (KPI)	Benchmark	
		City	Campus
Service Effectiveness	Passengers per Rev Hour	10	15
Cost Efficiency	Cost Per Passenger	Within 1 standard deviation of the classification Avg	
Service Quality	On Time Performance	90%	
	Maximum Load Factor	1.2	2.2
	Missed Trips	2%	

HDPT has outlined a set of safety performance targets in accordance with the Federal Transit Administration regulations. The safety performance targets listed in **Table 5** serve as benchmarks to evaluate HDPT's overall safety performance.

Table 5: Safety Standards

	Fixed Route	Paratransit/Demand Response
Fatalities (total number of reportable fatalities per year)	0	0
Fatalities (rate per total vehicle revenue miles by mode)	0	0

	Fixed Route	Paratransit/Demand Response
Injuries (total number of reportable injuries per year)	3	1
Injuries (rate per total vehicle revenue miles by mode)	Less than .5 injuries per 100,000 vehicle revenue miles	Less than .5 injuries per 100,000 vehicle revenue miles
Safety events (total number of safety events per year)	7	2
Safety events (rate per total vehicle revenue miles by mode)	Less than 1 reportable event per 100,000 vehicle revenue miles	Less than 1 reportable event per 100,000 vehicle revenue miles
Distance between major failures	10,000 miles	10,000 miles
Distance between minor failures	3,200 miles	3,200 miles

Chapter 2 – System Performance and Operations Analysis

2.1 System and Service Data

This section provides a high-level overview of HDPT's fixed-route bus service and paratransit service. Level of service data and operating statistics describe the availability of service. Demographic data and operating costs detail the expense to provide service and the extent to which the service is utilized.

In 2022, total ridership for the fixed-route service was NTD FY2022 1,372,799. Fixed-route buses operated for 60,482 revenue hours and traveled 603,509 revenue miles. Demand-response passengers FY2022 vehicles operated for 32,274 revenue hours and 150,127 revenue miles.

Table 6 displays annual ridership for all HDPT fixed-routes for 2022, as well as average ridership for weekdays, Saturdays, and Sundays. The Inner Campus Shuttle transports the most riders in the entire system by a significant margin. City Route 1 has the highest ridership of the City routes. The last row, Special Services, includes ridership for the JMU Summer Shuttle, service to football games, choices, student orientation, and exam weeks.

Table 6: 2022 Fixed-Route Annual Ridership

Route	Annual Ridership	Average Weekday Ridership	Average Saturday Ridership	Average Sunday Ridership
City Route 1	47,316	212	171	-
City Route 2	38,741	141	105	-
City Route 3	30,969	120	80	-
City Route 4	12,703	88	45	-
City Route 5	47,391	192	134	-
City Route 6	25,324	114	91	-
JMU - Black Line	25,784	159	-	-
JMU - Blue and Purple Line	67,142	248	-	-
JMU - Green and Red Line	140,416	702	-	-
JMU - Inner Campus Shuttle	702,473	5,098	276	-
JMU - Pink Line	26,344	166	-	-
JMU - Shopper	51,988	217	306	374
JMU - Yellow Line	42,836	283	-	-
JMU - Gold Line	7,884	40	101	-
JMU - Silver Line	10,740	44	102	-
Special Services	93,490			

Table 7 shows average passengers per mile for weekdays, Saturdays, and Sundays. The JMU – Inner Campus Shuttle has the highest average passengers per mile for weekday service among all routes, 7.6 passengers. However, the JMU – Shopper transports the most

passengers per mile for Saturday service among JMU routes. City Route 1 transports the most passengers per mile for both weekday and Saturday service among City routes.

Table 7: 2022 Average Passengers Per Mile

Route Name	Average Weekday Passengers per Mile	Average Saturday Passengers per Mile	Average Sunday Passengers per Mile
City Route 1	1.6	1.7	-
City Route 2	0.9	0.9	-
City Route 3	0.8	0.7	-
City Route 4	0.5	0.3	-
City Route 5	1.5	1.4	-
City Route 6	0.9	0.9	-
JMU - Black Line	1.2	-	-
JMU - Blue and Purple Line	2.4	-	-
JMU - Green and Red Line	3.5	-	-
JMU - Inner Campus Shuttle	7.6	2.1	-
JMU - Pink Line	1.5	-	-
JMU - Shopper	3.2	4.4	2.4
JMU - Yellow Line	2.3	-	-
JMU - Gold Line	0.9	0.7	-
JMU - Silver Line	1.0	0.9	-

Table 8 shows average passengers per hour for weekdays, Saturdays, and Sundays. The JMU – Inner Campus Shuttle has the highest average weekday ridership, and the JMU – Shopper route transports the highest average passengers on Saturdays. City Route 1 has the highest average passengers for weekdays and Saturdays for City routes.

Table 8: 2022 Average Passengers per Hour

Route Name	Average Weekday Passengers per Hour	Average Saturday Passengers per Hour	Average Sunday Passengers per Hour
City Route 1	18.0	19.0	-
City Route 2	12.2	11.7	-
City Route 3	10.3	8.9	-
City Route 4	7.4	5.0	-
City Route 5	16.7	14.8	-
City Route 6	9.7	10.1	-
JMU - Black Line	13.5	-	-
JMU - Blue and Purple Line	21.2	-	-
JMU - Green and Red Line	30.9	-	-
JMU - Inner Campus Shuttle	55.1	10.2	-
JMU - Pink Line	13.9	-	-
JMU - Shopper	24.3	23.5	21
JMU - Yellow Line	18.8	2.7	-
JMU - Gold Line	10.5	5.3	-
JMU - Silver Line	11.5	5.4	-

Table 9 shows average passengers per trip for weekday, Saturday, and Sunday service. The JMU – Inner Campus shuttle transports the most passengers per trip for weekday service, 33 passengers. The JMU – Shopper route averages the highest passengers per trip for Saturday and Sunday service, 24 and 21 passengers, respectively. City Route 1 is the most productive City route per trip with 18 passengers for weekday service and 19 passengers for Saturday service.

Table 9: 2022 Average Passengers per Trip

Route Name	Average Weekday Passengers per Trip	Average Saturday Passengers per Trip	Average Sunday Passengers per Trip
City Route 1	18	19	-
City Route 2	12	12	-
City Route 3	10	9	-
City Route 4	7	5	-
City Route 5	16	15	-
City Route 6	9	10	-
JMU - Black Line	7	-	-
JMU - Blue and Purple Line	14	-	-
JMU - Green and Red Line	20	-	-
JMU - Inner Campus Shuttle	33	10	-
JMU - Pink Line	7	-	-
JMU - Shopper	17	24	21
JMU - Yellow Line	9	-	-
JMU - Gold Line	7	5	-
JMU - Silver Line	3	5	-

Table 10 displays each route and its directional mileage. Some routes, like the JMU – Shopper and JMU – Sunday Shopper, have different service patterns and different directional mileage.

Table 10: Route Directional Mileage

Route Name	Directional Mileage
City Route 1	11.12
City Route 2	13.61
City Route 3	12.81
City Route 4	15.21
City Route 5	10.99
City Route 6	10.99
JMU - Black Line	3.20
JMU – Blue and Purple Line	5.84
JMU – Green and Red Line	6.09
JMU - ICS	5.33
JMU - Pink Line	4.61
JMU - Shopper	5.63
JMU - Sunday Shopper	8.06
JMU - Yellow	3.97

The following data in figures 1 through 6 are based on information collected by a public survey of both riders and non-riders within Harrisonburg. The survey was available for fifty days from October 26th, 2023, to December 15th, 2023, and was able to be filled out online or on paper. The survey was distributed through QR codes on promotional material for the TSP, on social media, and at pop-up events. In total there were 764 responses to the survey. There were four different sections to the survey. Section 1 of the survey gathered information about respondents' travel patterns. Section 2 allowed respondents to rank their priorities for improving the HDPT bus system. Section 3 presented two alternative scenarios for the future bus network. The comments and responses to these scenarios were used to develop the network proposed in this TSP. Section 4 gathered option demographic data.

Figure 1: Age Distribution of Survey Respondents

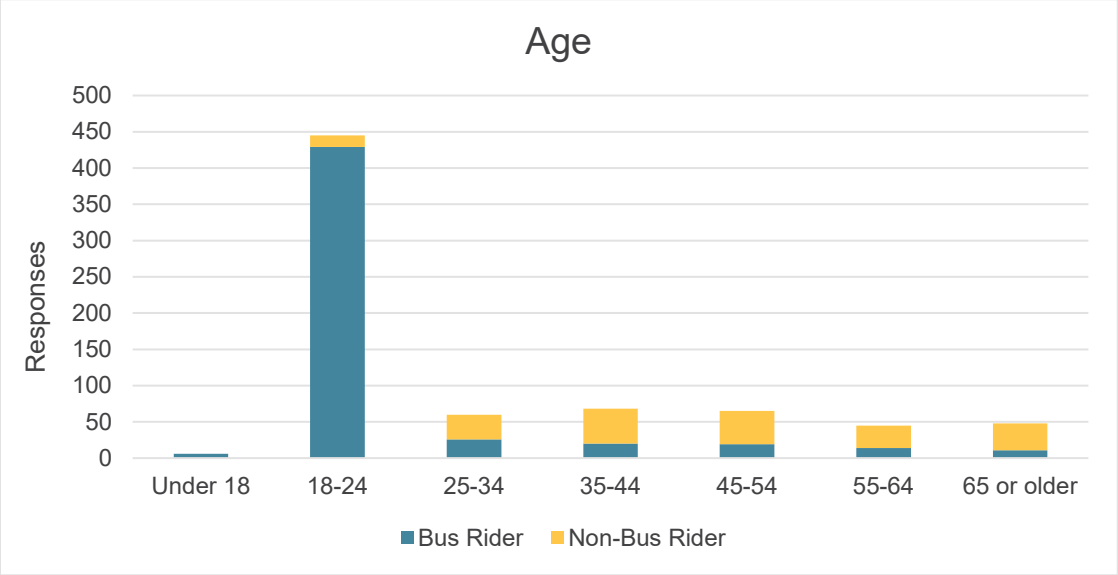


Figure 1 illustrates the age distribution of survey respondents. A majority of respondents are between the ages of 18 and 24, and the bus ridership rate is very high among 18-24-year-olds. Bus ridership rates significantly decline as the age of respondents increase. This pattern may in part be due to Harrisonburg's large student population which may be more transit reliant than other community groups.

Figure 2: College Enrollment of Survey Respondents

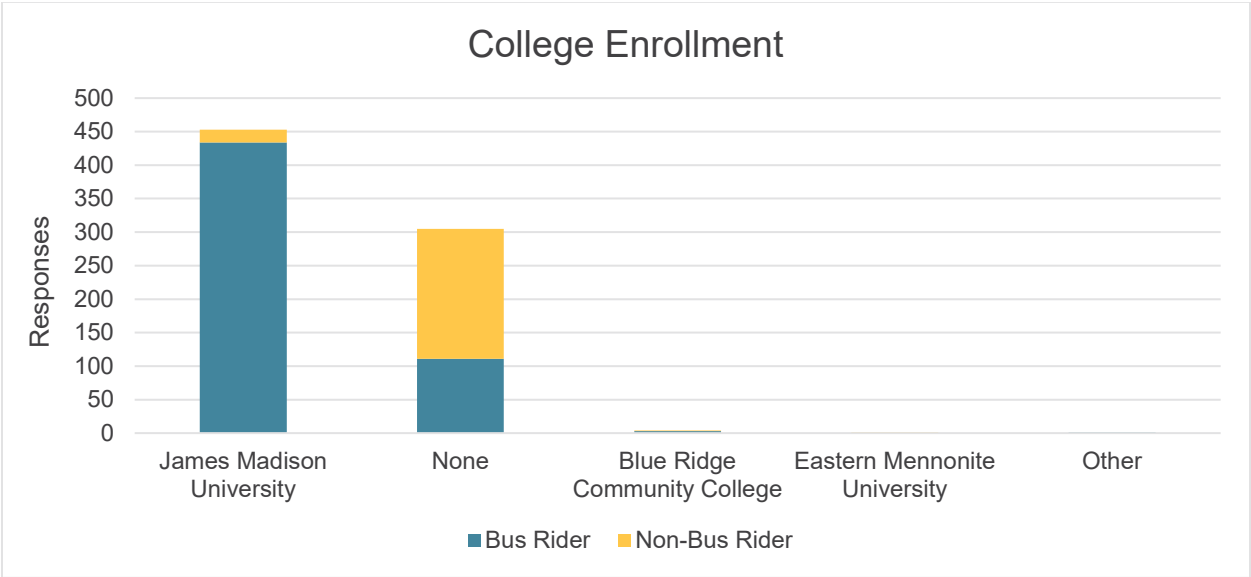


Figure 2 illustrates the results to the survey question, "Which college do you attend?". A majority of respondents specified they are current students at James Madison University. A sizeable portion of respondents indicated they are not college students, however, JMU student respondents have a substantially higher bus ridership rate. Blue Ridge Community College and Eastern Mennonite University students made up a smaller proportion of survey responses when compared to JMU, but also have significantly smaller student populations. In-person public

engagement events were located in several locations around Harrisonburg, including on JMU's campus, to ensure that surveys were completed by both college student and non-college student riders to gather sufficient comments on the proposed scenarios for both city and JMU bus routes.

Figure 3: Job Status of Survey Respondents

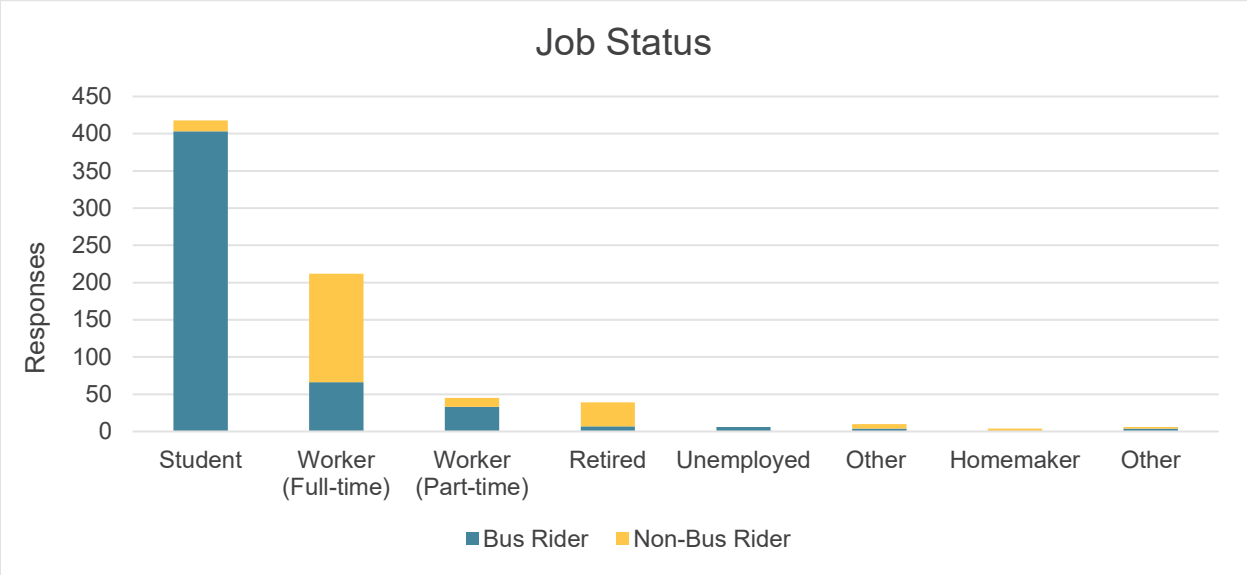


Figure 3 shows the job status of survey respondents. Students and part-time workers have significantly higher bus ridership rates than full-time workers and retirees. This information was gathered to better understand how HDPT bus routes serve employment centers.

Figure 4: Vehicle Access Distribution of Survey Respondents

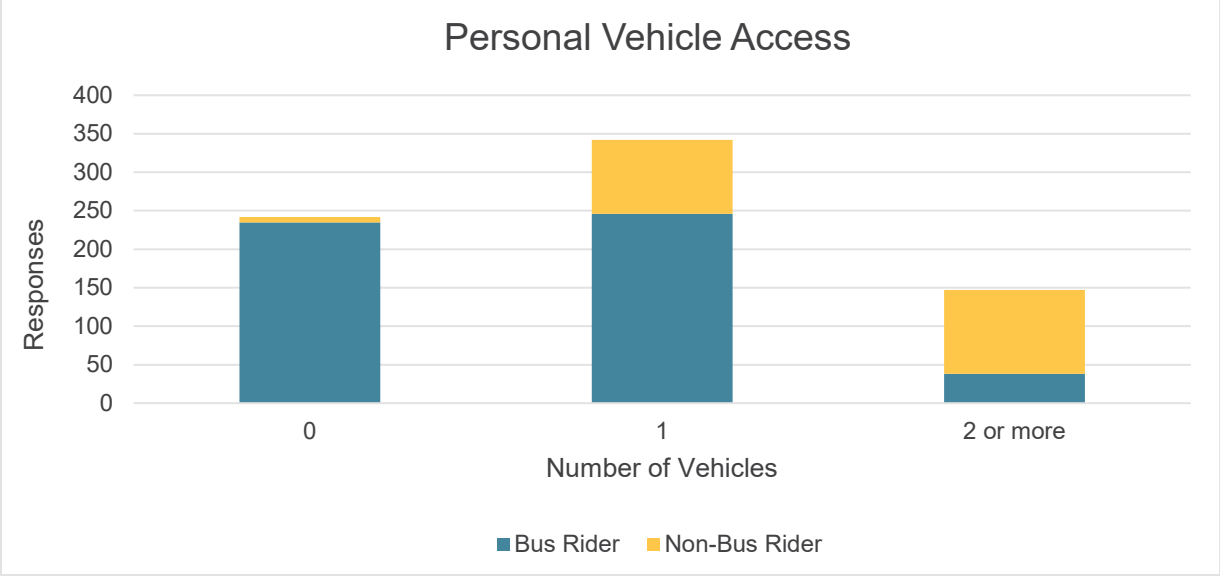


Figure 4 illustrates the results to the survey question "How many vehicles do you have access to?". The results indicate that as access to personal vehicles increases, bus ridership rates

decrease, and highlights that many riders are transit dependent with no alternatives to meet their mobility needs.

Figure 5: Household Annual Income Distribution of Survey Respondents

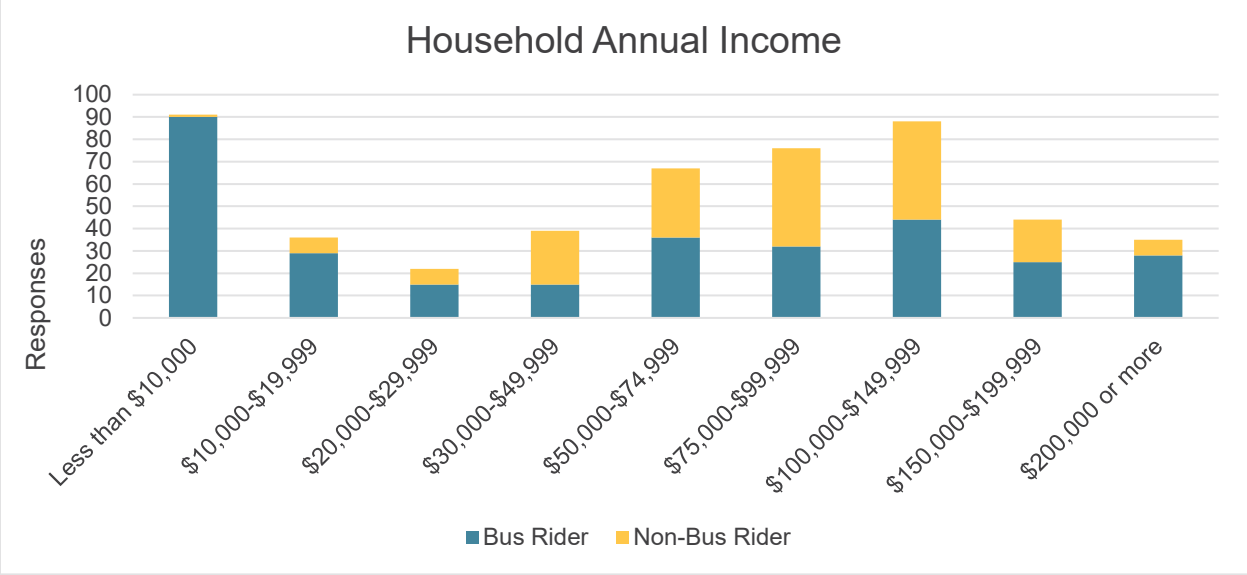


Figure 5 illustrates the annual household income distribution of survey respondents. Generally, as household income increases, bus ridership rates decrease. 29% of respondents did not know or did not wish to share their household annual income.

Figure 6: Areas of Dissatisfaction

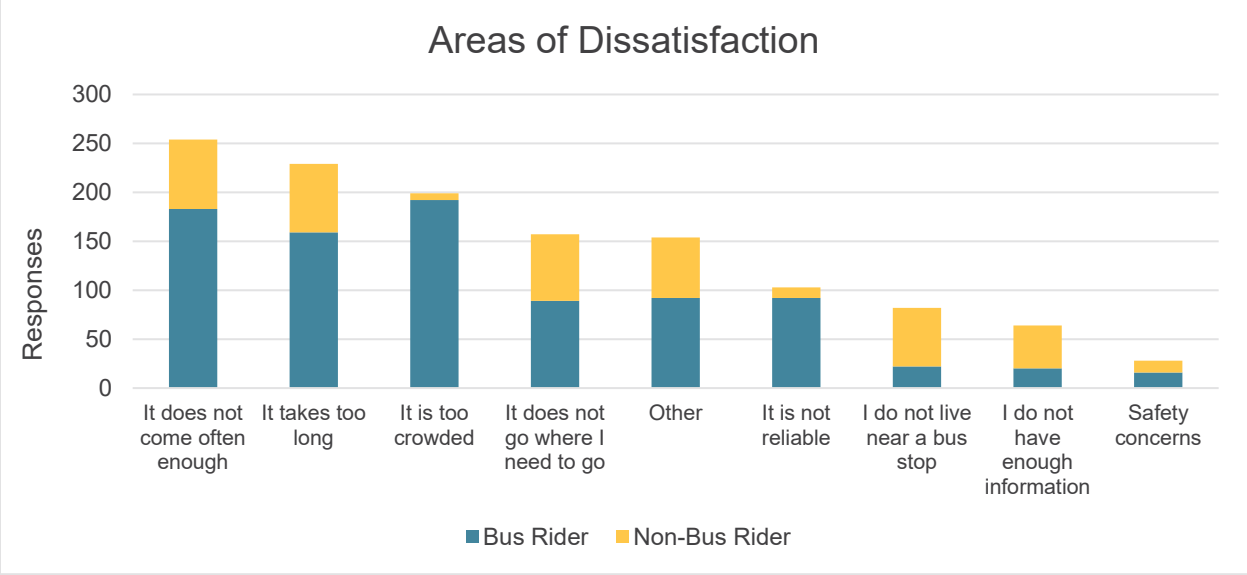


Figure 6, survey respondents were asked “Why do you not ride the bus?”. Respondents were able to select as many reasons as applicable out of the nine possible answer choices. The three most common responses, “It does not come often enough”, “It takes too long”, and “It is too crowded”, all relate to the frequencies and alignments of current bus routes.

The survey asked respondents to indicate if they currently rode HDPT. 72% of all responses came from riders. This diversity in ridership status captures both the views of current riders and non-riders. It also means the priorities for improvements for both riders and non-riders are represented in responses and identifies what improvements would convince non-riders to ride HDPT in the future.

2.2 Evaluation of Transit Market Demand and Underserved Areas

The purpose of this section is to assess how well current HDPT services align with transit demand, through an examination of Transit Potential and Transit Need. Transit Potential is an analysis of Harrisonburg's overall population and employment density, as density determines the effectiveness of public transportation more than any other factor. Transit Need focuses on specific socio-economic characteristics such as income, automobile availability, age, and disability status that are indicative of a higher propensity to use transit. Since transit use is also influenced by land-use and the built environment, all of the maps presented in this section also highlight the locations of key activity centers such as multifamily housing, major retail, medical facilities, educational institutions, and civic and community centers, that tend to be strong transit ridership generators.

2.2.1 Transit Demand and Underserved Area Evaluation

Fixed-route transit service is generally most effective in areas with high concentrations of residents and/or businesses. **Figure 7** and **Figure 8** show the distribution of population and employment in Harrisonburg, based on 2021 American Community Survey (ACS) five-year estimates.

Combining both residential and employment densities shows the locations with the highest potential to support fixed-route transit service and generate strong transit demand. **Figure 9** shows the Transit Potential, by Census Block Group, of the HDPT service area. As a general rule, a density of more than five people and/or jobs per acre is needed to support a base level (service every 60 minutes) of fixed-route transit service. Areas with higher density can support more robust service, and areas with lower densities may be more suitable for other service types such as microtransit or other demand response services.

In Harrisonburg, areas of high Transit Potential are mainly concentrated near JMU and close-in neighborhoods between I-81 and the SR 42 corridor. Other pockets of high transit potential include areas with high concentrations of multi-family housing, such as west of Port Republic Road, between Devon Lane and Peach Grove Avenue; south of Neff Avenue, east of Reservoir Street; and south of Chestnut Ridge Drive, between US 33 and SR 710.

Figure 7: Population per Acre

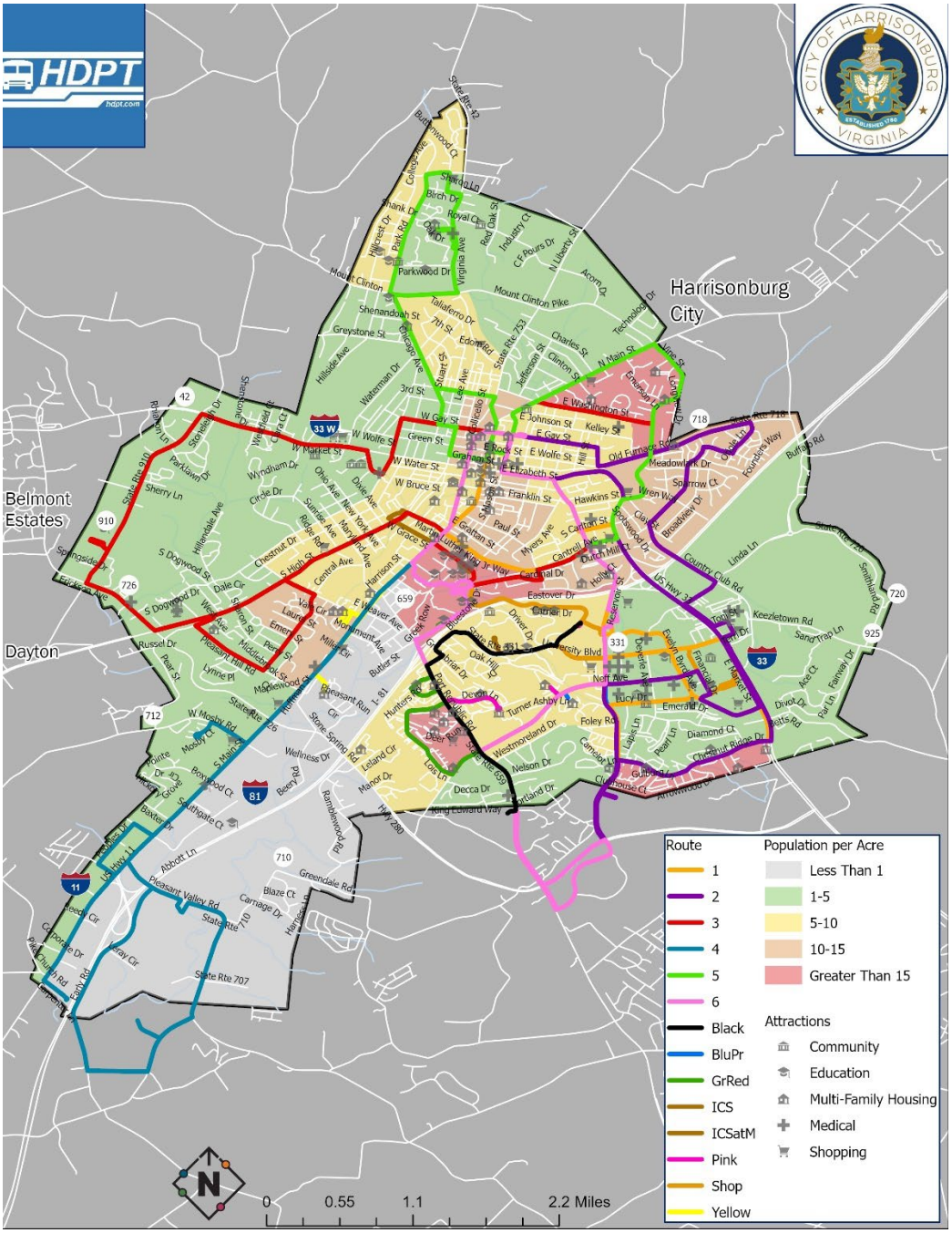


Figure 8: Jobs per Acre

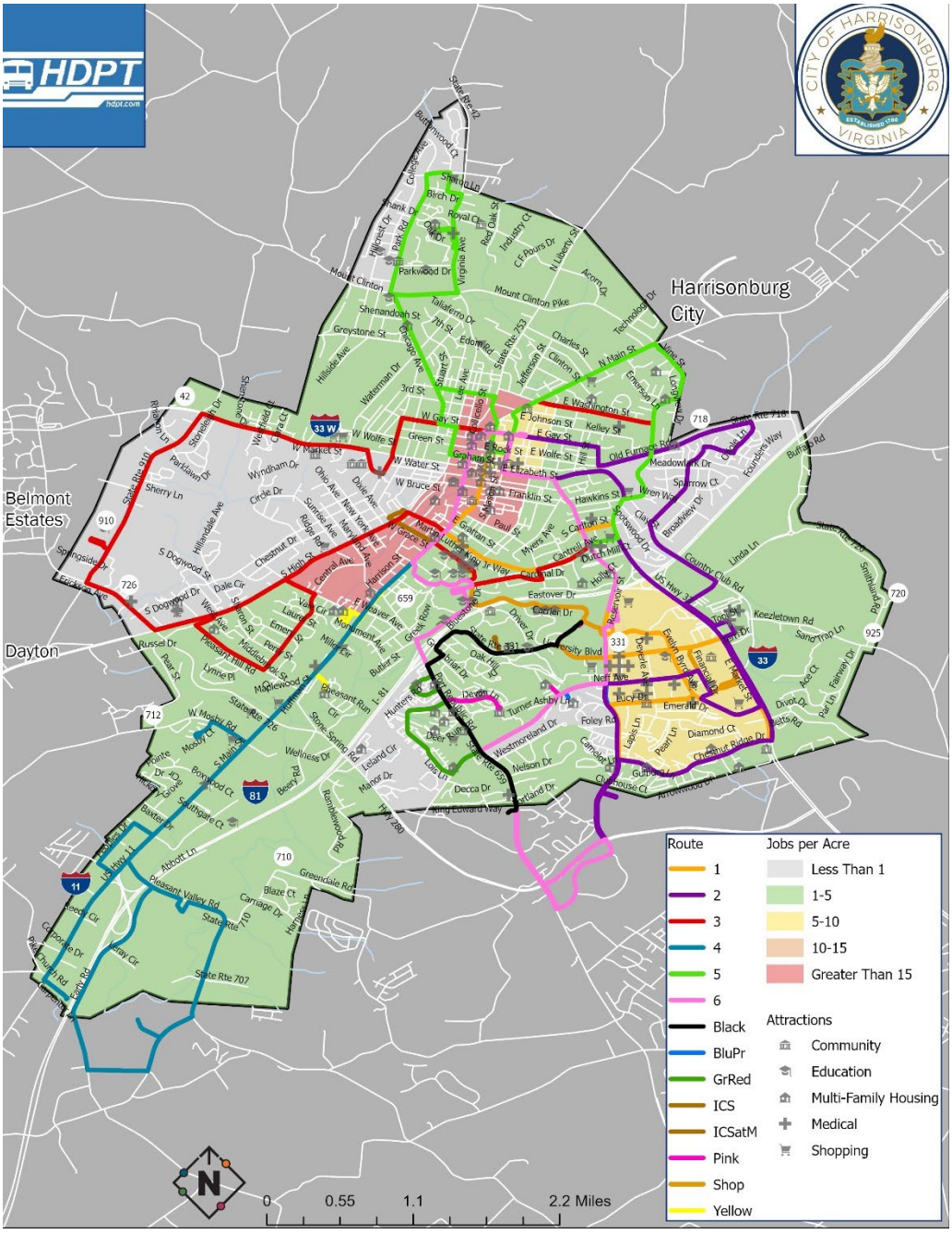


Figure 9: Transit Potential

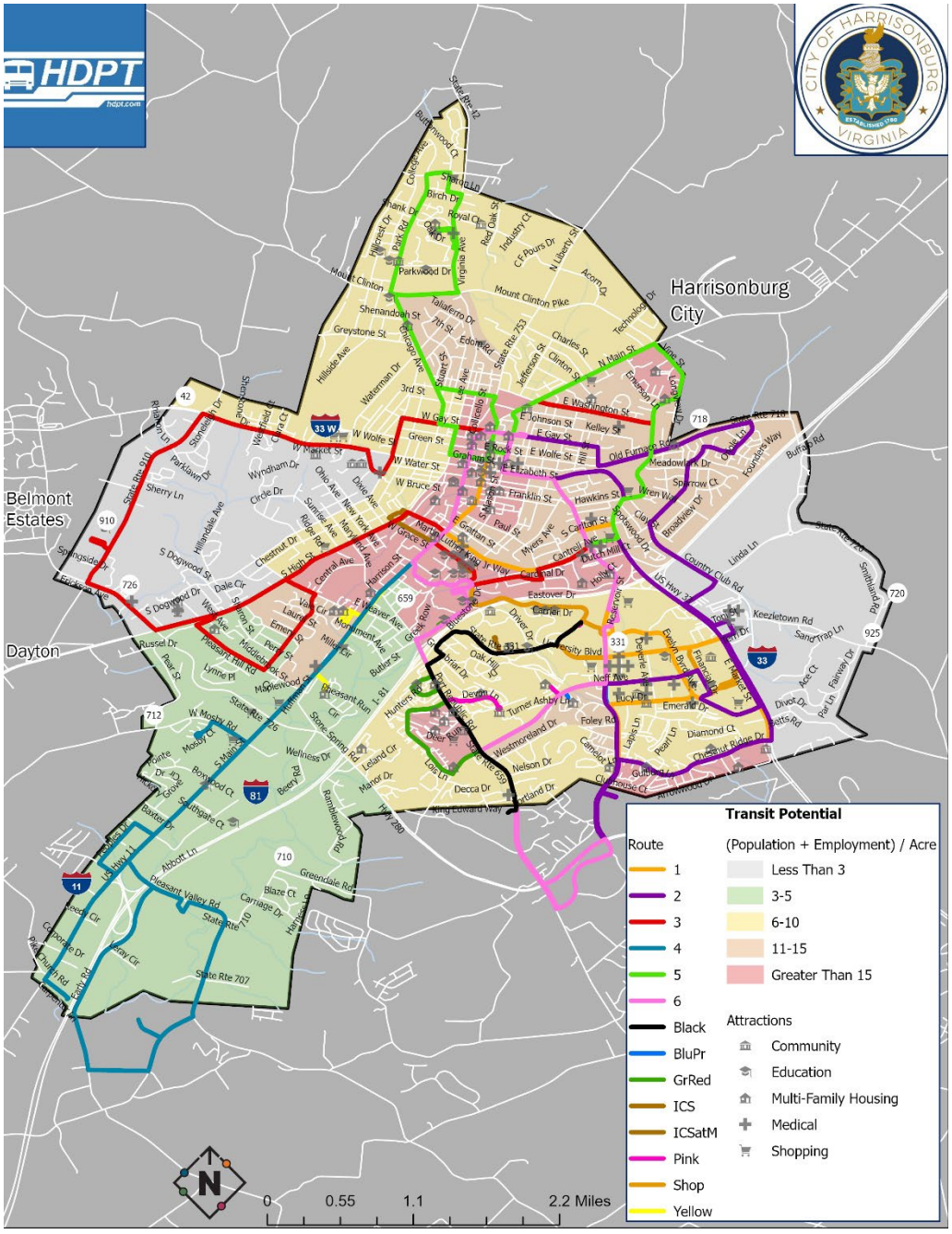


Figure 10, **Figure 11**, and **Figure 12** show the individual and combined population and employment forecasts for 2045, based on data from the Central Shenandoah Planning District Commission. This data is available only by Traffic Analysis Zone (TAZ), which is a different geographic unit than the Census Block Groups used to display the 2021 ACS data. With two different sets of geographic units, a comparative assessment of population and employment growth can only be done at the visual level. Compared to 2021, notable areas of projected population growth include central, southeast, and northeast Harrisonburg, as well as smaller pockets in northern Harrisonburg. In addition, population and employment projections for 2045 suggest that there will be moderate to high transit potential throughout the city. Transit potential is expected to be highest in the southeast of the city, as well as in the center, and some small sections to the north. The eastern and western parts of the city are projected to still have low transit potential in 2045.

Figure 10: Future Population per Acre

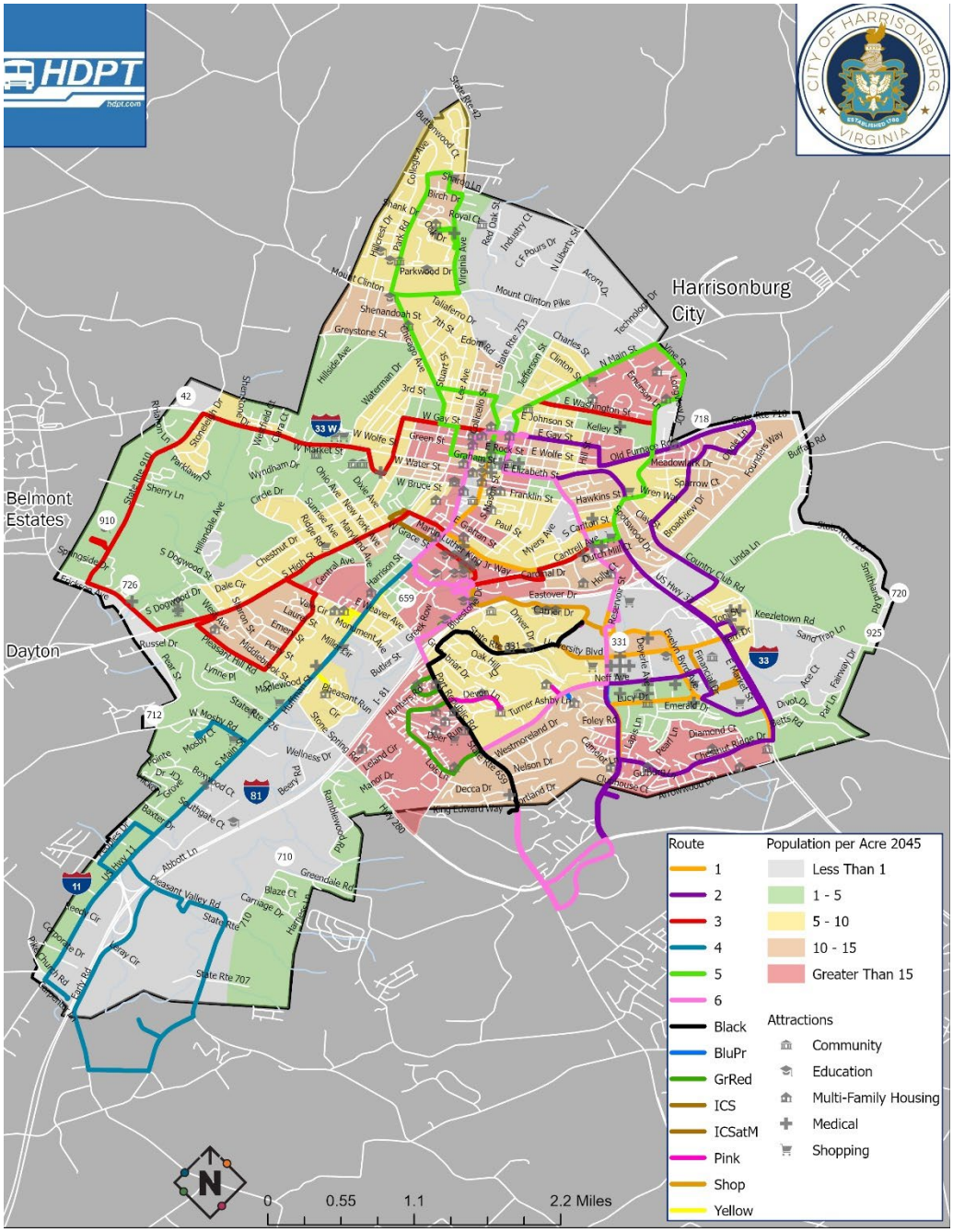


Figure 11: Future Jobs per Acre

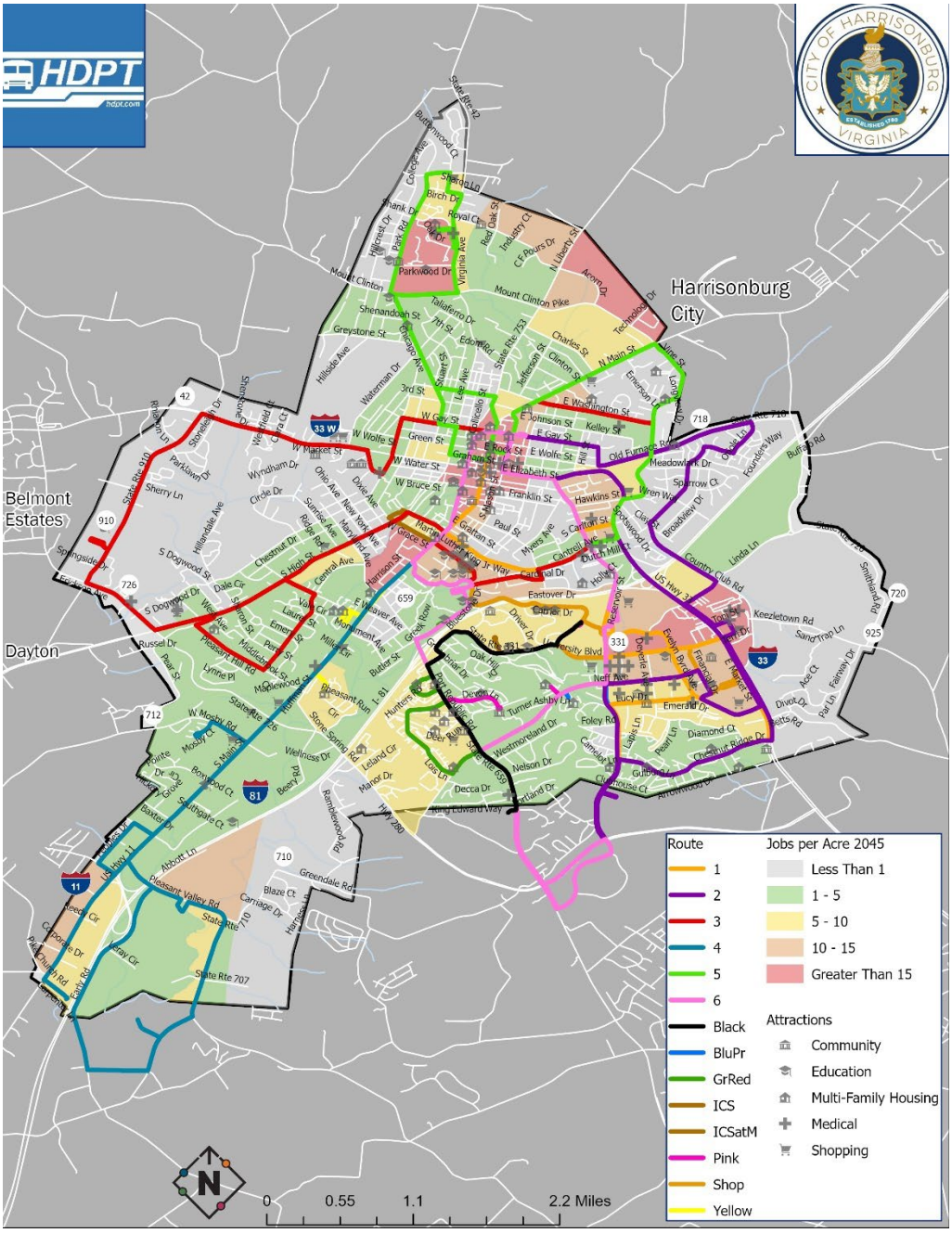
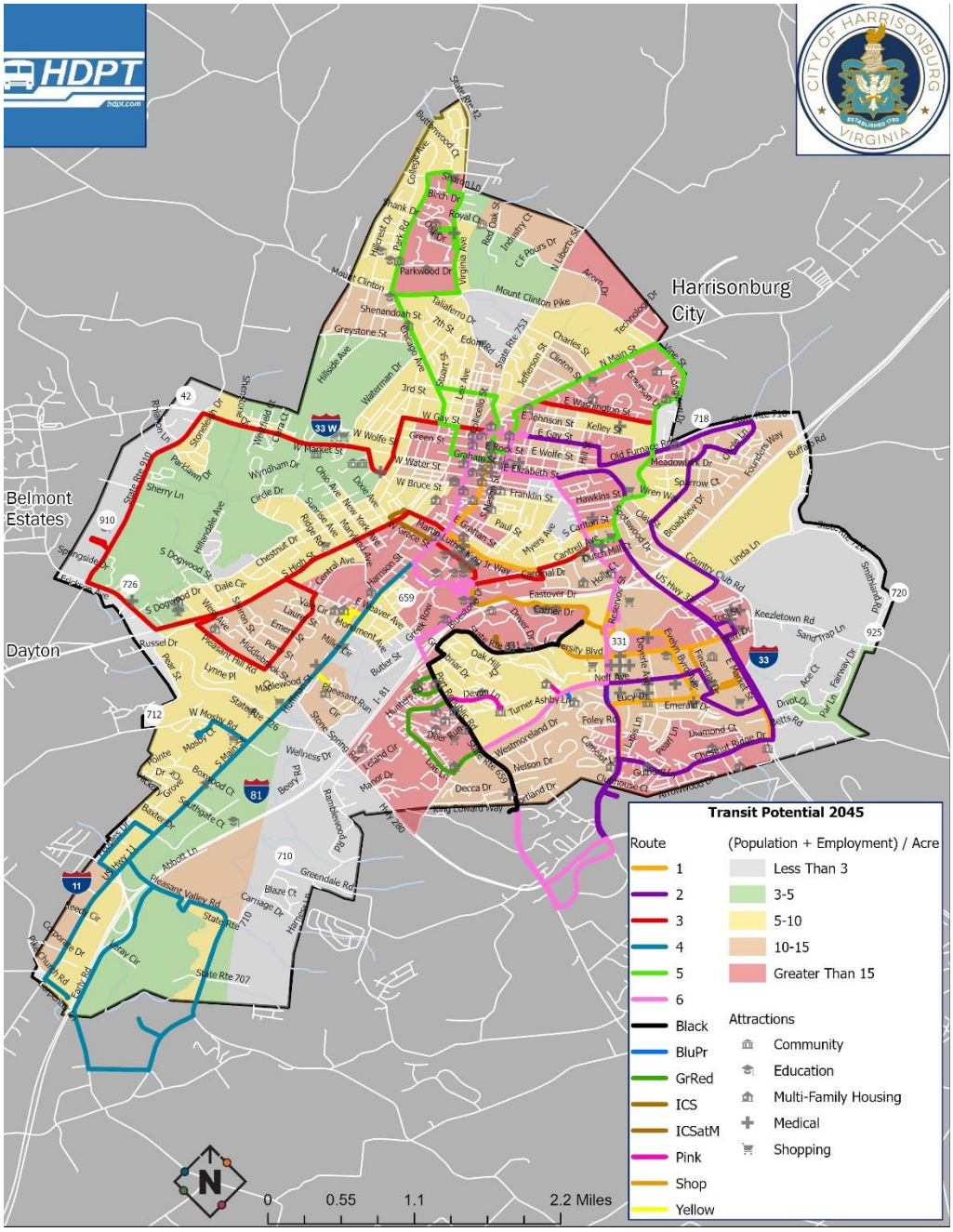


Figure 12: Future Transit Potential



In addition to population and employment density overall, the likely demand for transit service can be assessed by examining the demographics of an area. Certain population subgroups have a relatively higher propensity to use transit as their primary means of transportation than the population as a whole. These subgroups include:

- Households without access to a vehicle (**Figure 13**). Families that lack access to a vehicle either for financial or legal reasons often have few mobility options other than public transportation.
- Persons with disabilities (**Figure 14)**. Individuals who are unable to or have difficulty operating a motor vehicle are especially likely to use public transportation services.
- Low-income individuals (**Figure 15**). Because using transit is often less expensive than owning a car, individuals in low-income households are more likely to rely on transit.
- Young people (**Figure 16**). Individuals aged 15 to 24 may not have access to or the ability to operate a vehicle and tend to rely on transit and other alternatives for their mobility needs.
- Older adults (**Figure 17**). As individuals age, they may be less willing or able to operate a motor vehicle.

Areas with higher concentrations of these populations are also likely to have a higher need for transit services. **Figure 18** shows a composite Transit Need map based on the following methodology: For each demographic analysis, a Jenks Natural Breaks Classification Method was used to assign each Block Group to one of five density categories. A points system was employed by which 1 point was awarded to Block Groups with the lowest concentrations of the population subgroup being examined, and five points were given to Block Groups with the highest concentration of that particular demographic category. For example, if a Block Group falls in the highest density category for each of the five demographic analyses, it receives a Transit Need score of 25 (5+5+5+5+5). The lowest possible Transit Need score is 5 (1+1+1+1+1).

Figure 13: Zero-Vehicle Households per Acre

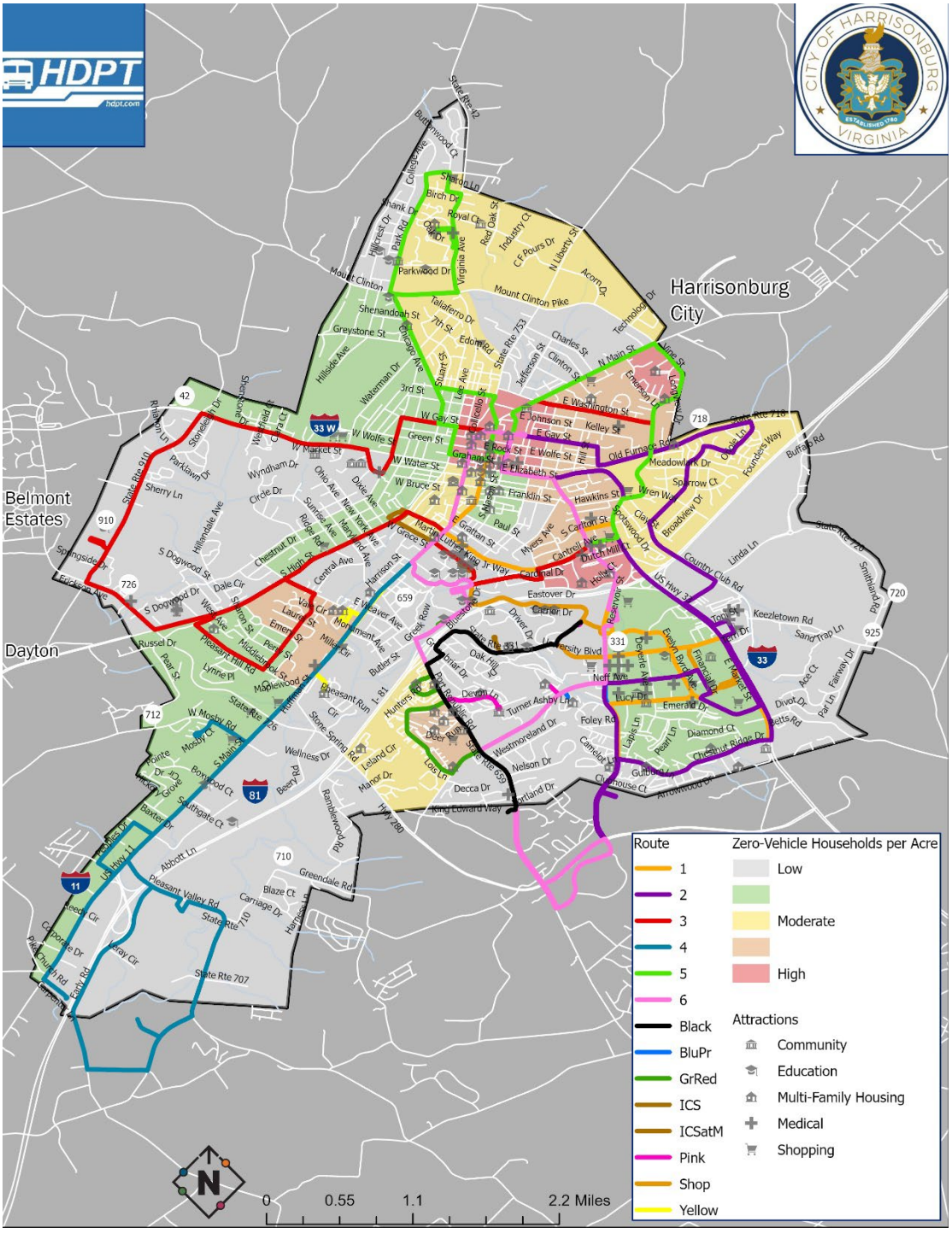


Figure 14: Population with Disabilities per Acre

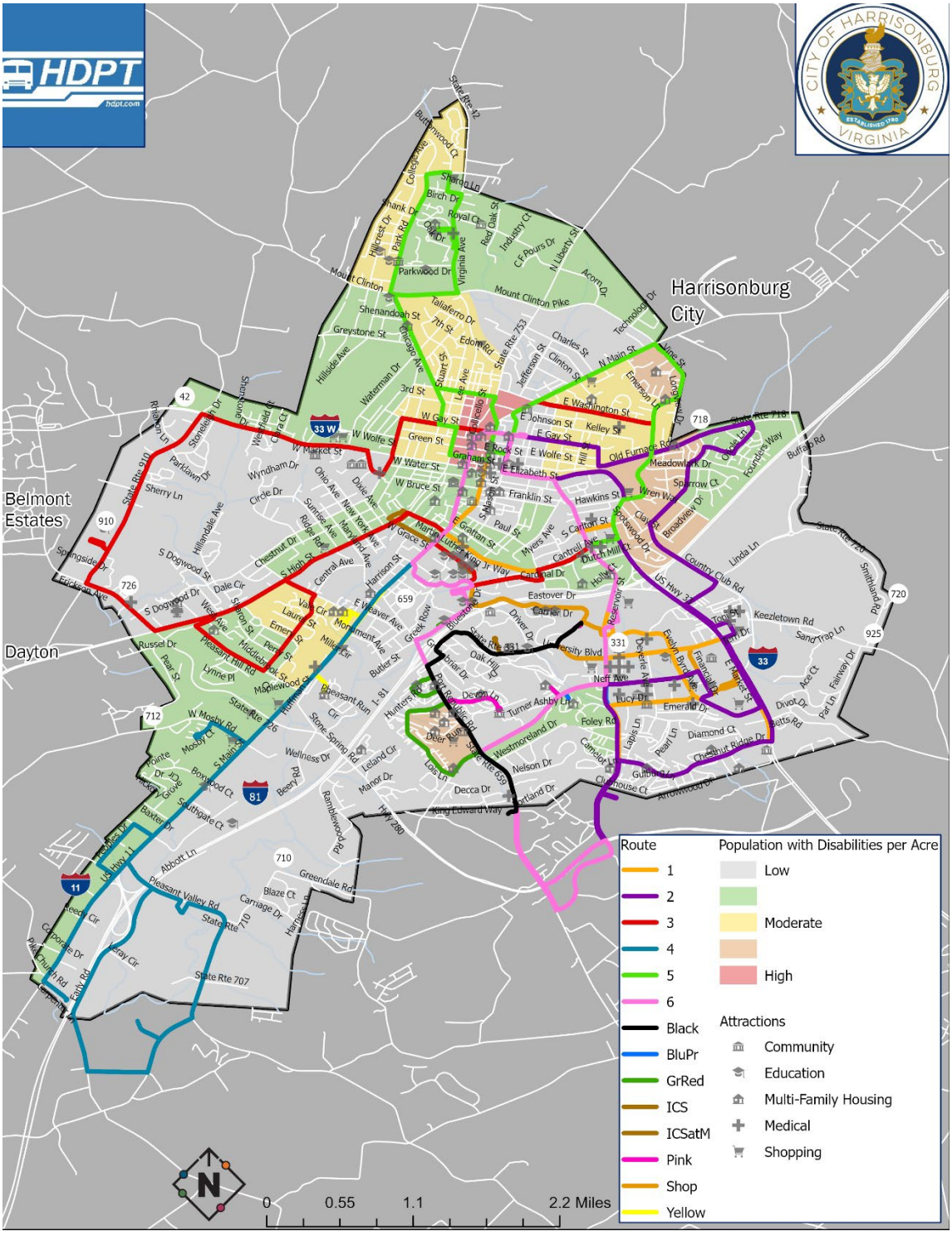


Figure 15: Low-Income Population per Acre

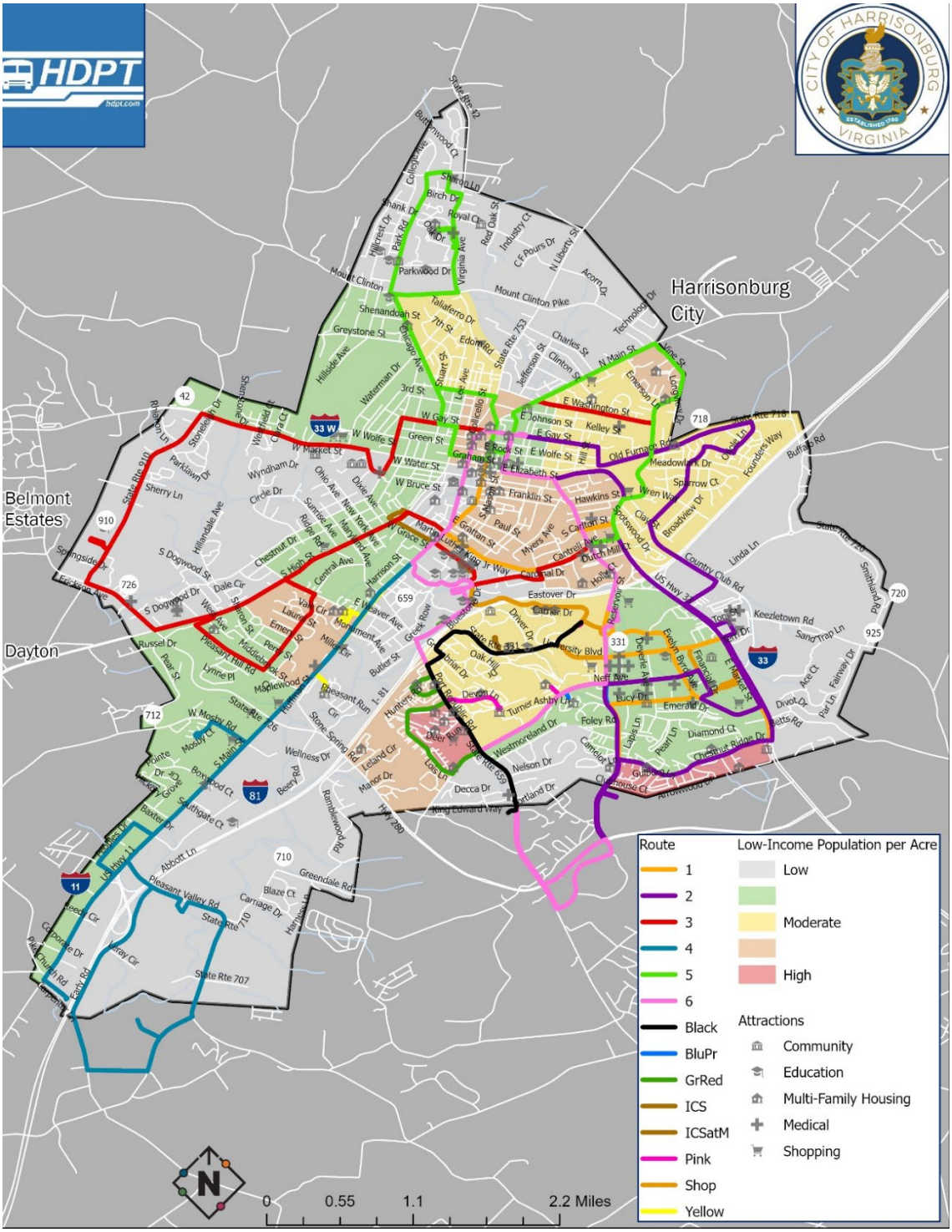


Figure 16: Age 18-24 Population per Acre

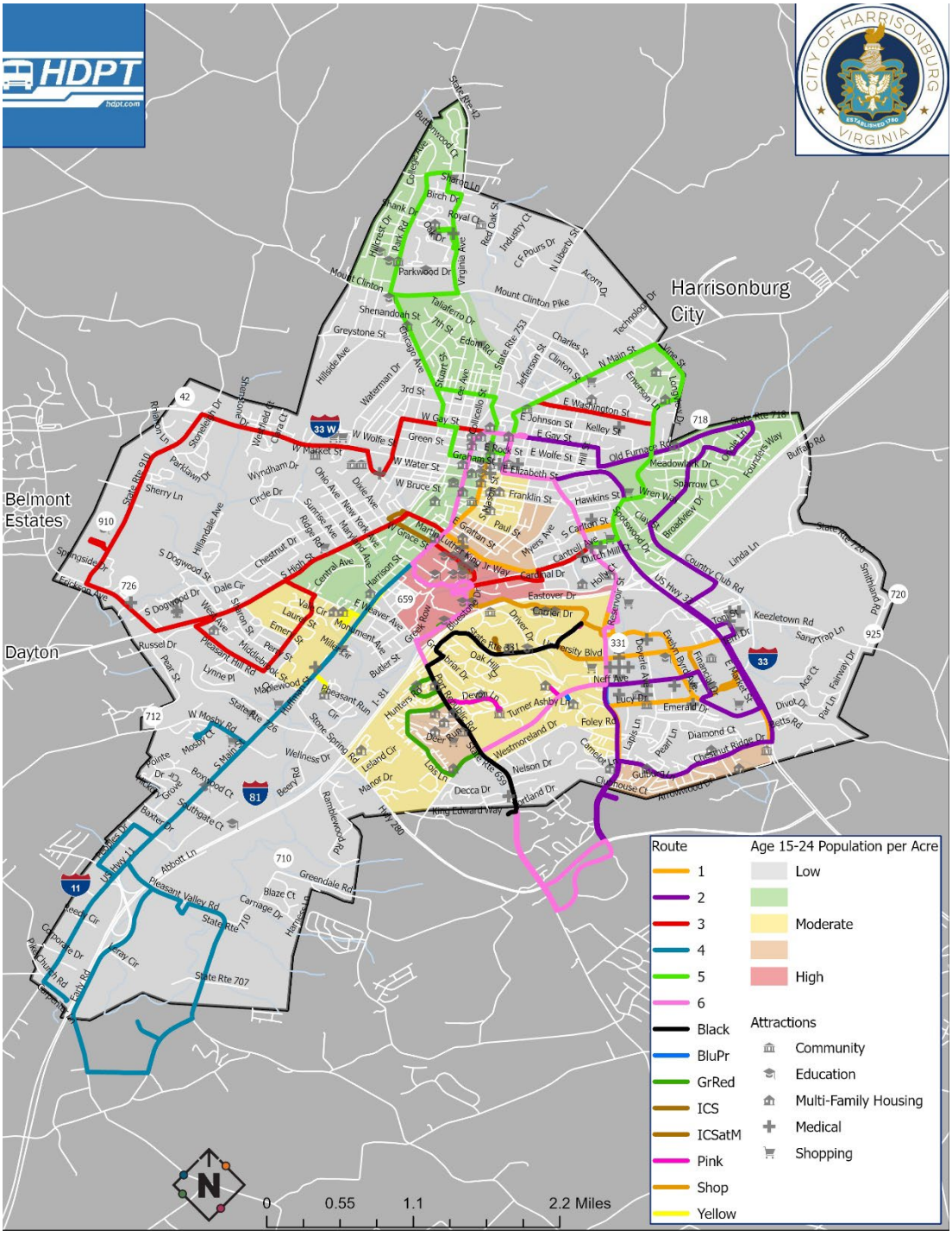


Figure 17: Senior Population per Acre

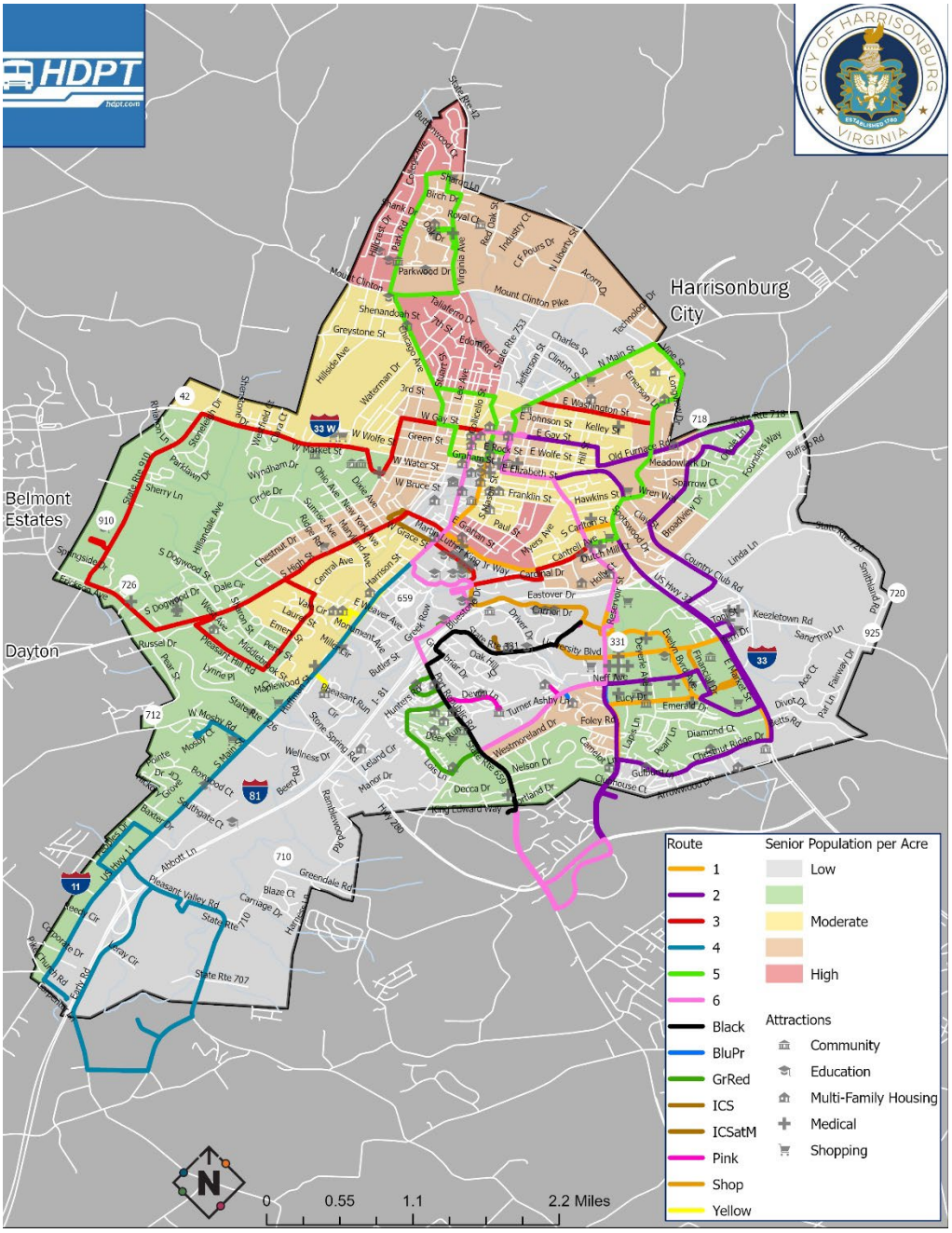
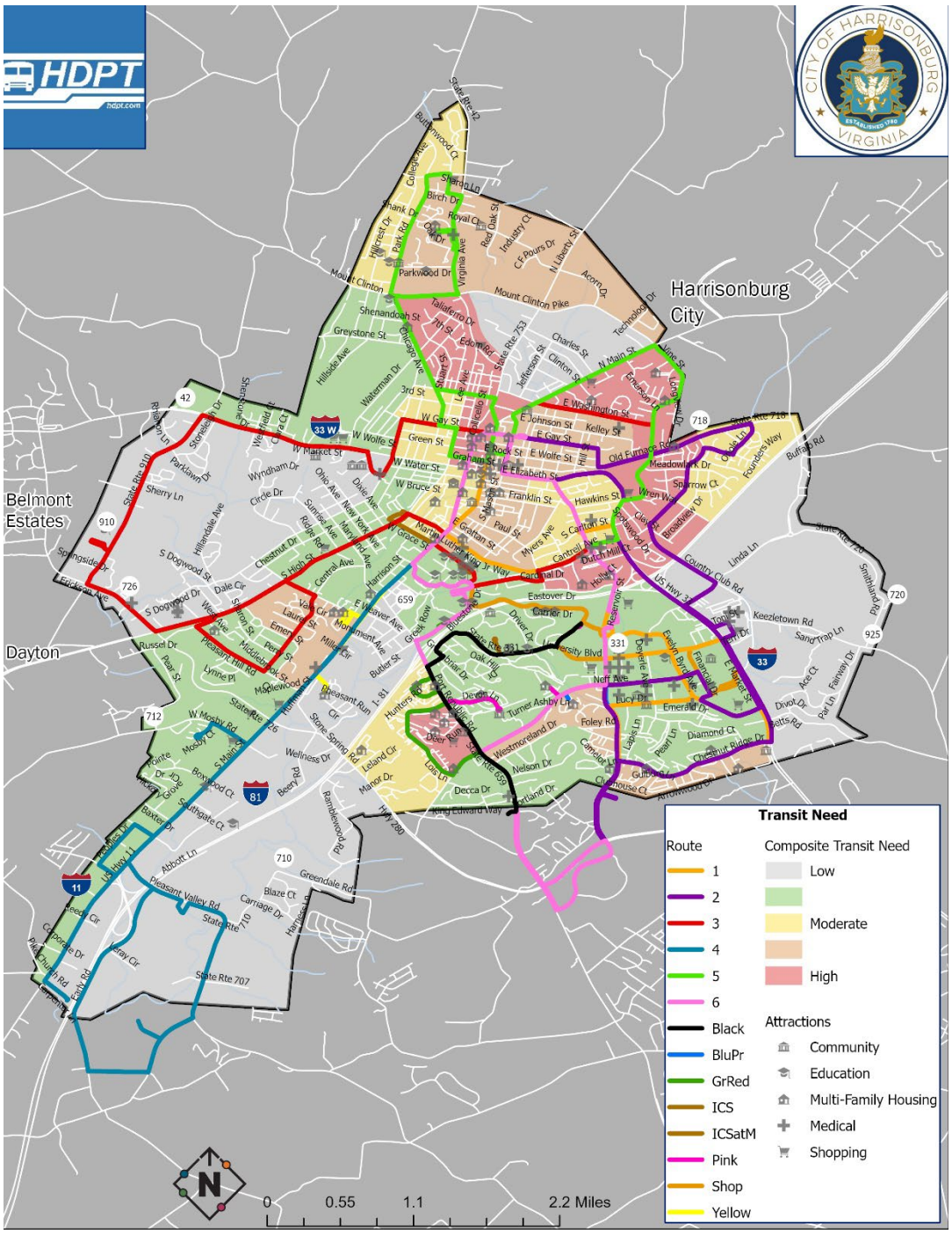


Figure 18: Transit Need



While Transit Potential is an absolute measure of density, Transit Need is a relative measure that compares how each block group stacks up to other block groups in the study area. Thus, an area with relatively high transit need, compared to other areas of the region, may still have low fixed-route transit potential because of its low density overall. In these cases, other transit modes, such as on-demand service may be a better fit for meeting local mobility demand.

Figure 18 shows that Transit Need in Harrisonburg is greatest in neighborhoods just west of downtown, as well as north of Washington Street and southeast of Main Street; and along the Vine Street and Blue Ridge Drive corridors, northwest of I-81. In addition, there is a pocket of high transit need west of Port Republic Road, between, Donavan Lane and Peach Grove Avenue.

While race and limited English proficiency (LEP) are not strong predictors of transit use on their own, many agencies include these demographic analyses for equity purposes. **Figure 19** and **Figure 20** show the percentage of the population that is LEP and minority, respectively, in each Census Block Group. While the maps appear to show relatively high percentages of both groups in far east Harrisonburg, where there is no HDPT service, much of this area is actually covered by a golf course. Larger Block Groups on the periphery of an urban area can create the appearance of certain demographic conditions that in reality only apply to a small section of the Block Group.

Figure 19: Percent Limited-English Proficiency Population

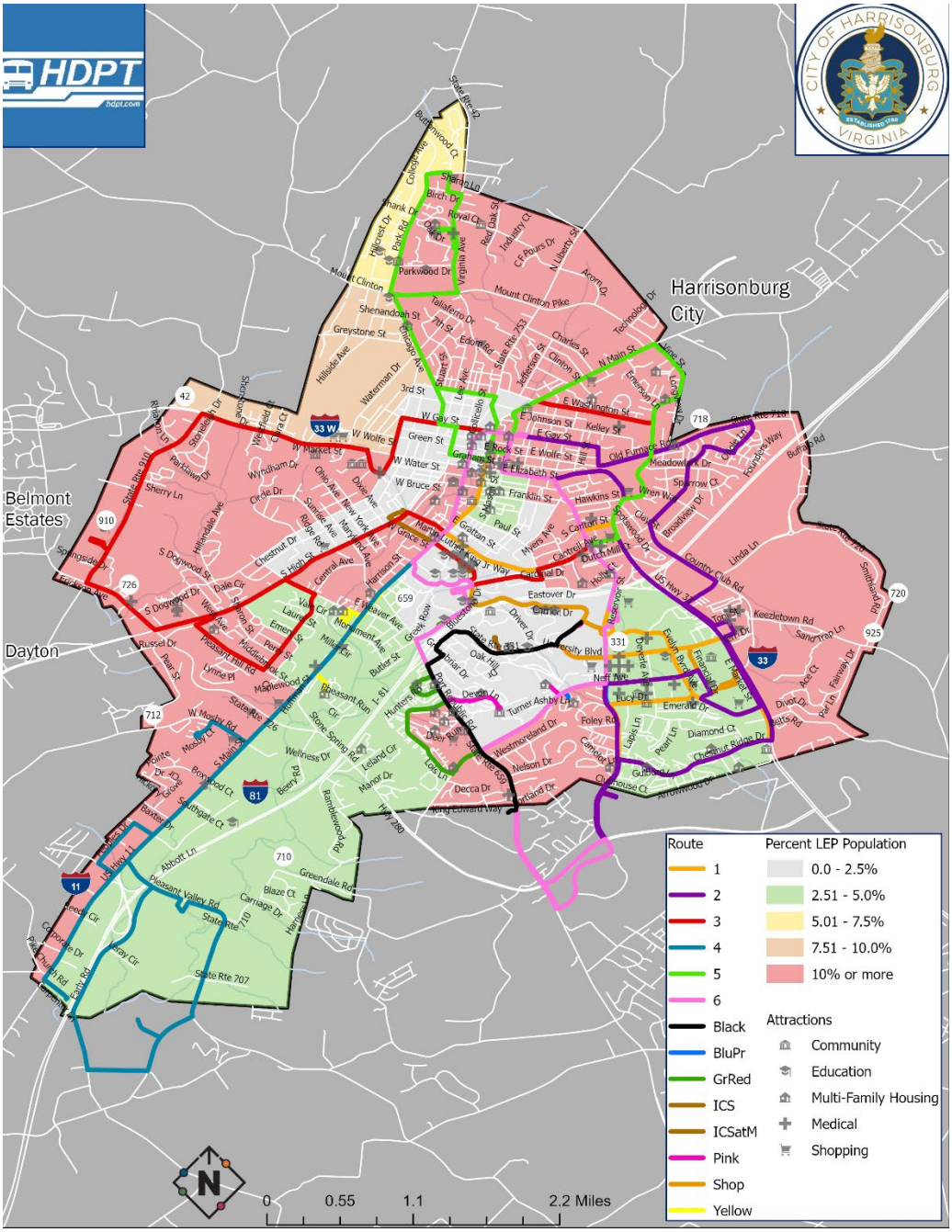
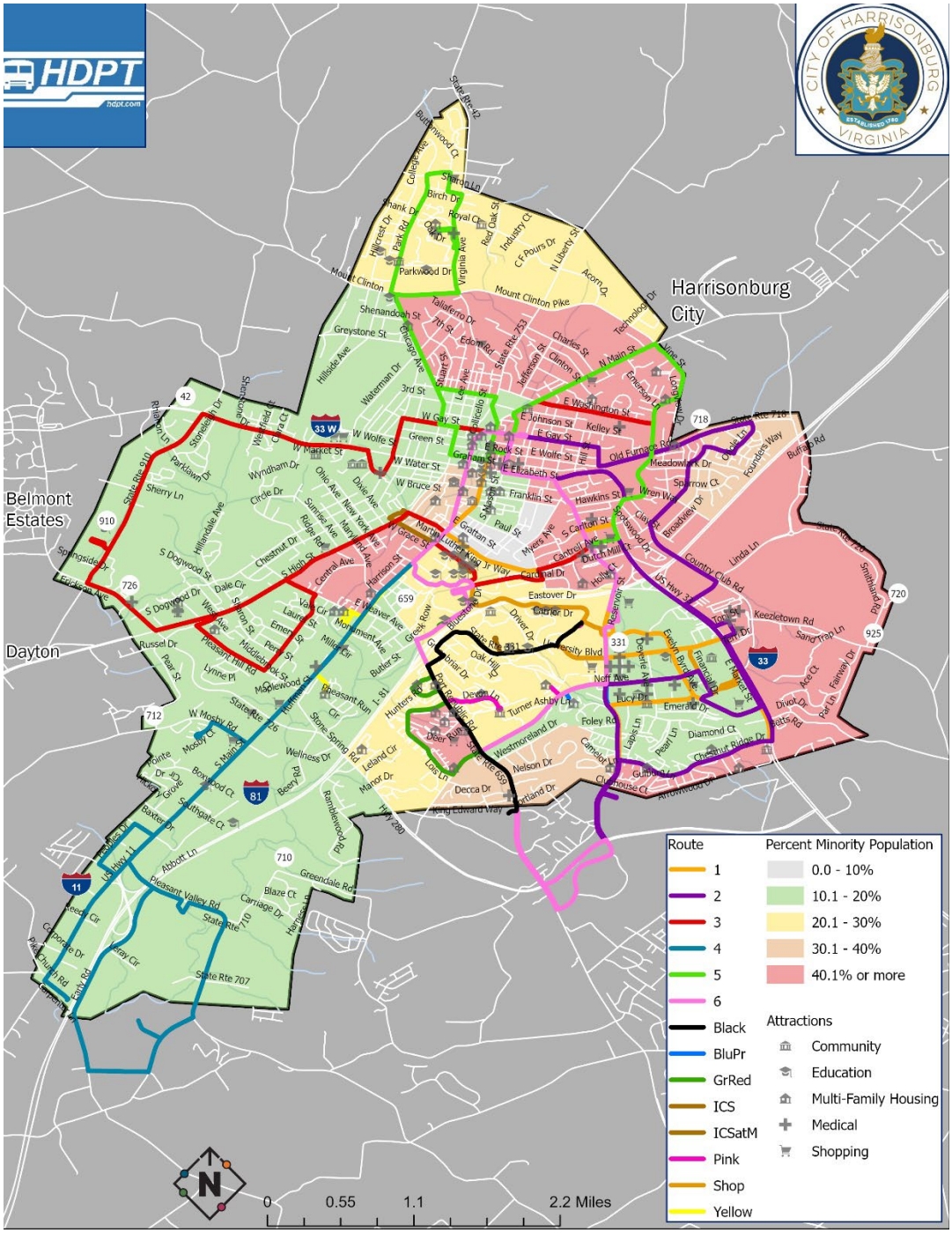


Figure 20: Percent Minority Population



2.2.2 Transit Demand and Underserved Area Opportunities for Improvement

Ideally, areas with high Transit Need will also have high fixed-route Transit Potential, allowing for fixed-route service to operate effectively where it is needed most. In Harrisonburg, all of the areas of highest Transit Need do also have high Transit Potential.

In general, the "footprint" of the current HDPT network is geographically well-aligned with the market for transit service in the city. However, other characteristics of service, including service span, frequency, reliability, and directness of service may not be optimized to the market. These characteristics are examined in detail is Section 2.4.

2.3 Performance Evaluation

The performance of a transit service can be assessed in a number of different ways, including ridership, productivity, and on-time performance. Section 2.4 presents a series of comprehensive diagnostic profiles covering every HDPT route. Section 2.3, however, focuses just on those performance metrics for which HDPT has adopted performance standards.

2.3.1 Performance Evaluation

Table 11 visualizes the performance of each HDPT route in relation to HDPT's adopted performance standards. Performance standards differ between JMU and City routes, so each route's performance for every metric is only assessed against the standard that is relevant for that individual route.

Performance values are color-coded with green indicating that a route is meeting or exceeding the standard for its route type, and red indicating that the route does not meet the standard for its route type. Standards for City routes and JMU routes are different for passengers per hour and maximum load, while both route types share standards for cost per passenger, on-time performance, and missed trips. Note that for maximum load, a standard 40-seat capacity bus is assumed, meaning that the maximum load standard for a City route is 48 passengers, and the maximum load standard for a JMU route is 88 passengers.

Table 11: HDPT Performance and Standards

Route	Passengers per Revenue Hour		Cost Per Passenger	On-Time Performance	Maximum Load	
	City	JMU	All Routes	All Routes	City	JMU
	10	12	$3.44-$9.80	90%	1.2	2.2
Route 1	18	N/A	$4.70	55%	Does not exceed	N/A
Route 2	12	N/A	$7.06	63%	Does not exceed	N/A
Route 3	10	N/A	$8.47	56%	Does not exceed	N/A
Route 4	6	N/A	$14.11	81%	Does not exceed	N/A
Route 5	16	N/A	$5.29	76%	Does not exceed	N/A
Route 6	10	N/A	$8.47	60%	Does not exceed	N/A
Black Line	N/A	13	$6.51	72%	N/A	Does not exceed.
Blue and Purple Line	N/A	21	$4.03	82%	N/A	Does not exceed
Gold Line	N/A	8	$10.58	72%	N/A	Does not exceed
Green and Red Line	N/A	31	$2.73	44%	N/A	Does not exceed
ICS	N/A	33	$2.57	77%	N/A	Does not exceed
Pink Line	N/A	14	$6.05	77%	N/A	Does not exceed
Shopper	N/A	23	$3.68	73%	N/A	Exceeds
Silver Line	N/A	8	$10.58	66%	N/A	Does not exceed
Yellow Line	N/A	19	$4.46	64%	N/A	Does not exceed

2.3.2 Performance Based Opportunities for Improvement

Based on the assessment shown in **Table 11,** on-time performance is a pervasive challenge for HDPT's services. To ensure reliable on-time performance, each route should have sufficient recovery time built into its schedule. As a best practice, recovery time should account for no less than ten percent of a route's cycle time.

Cycle time refers to the total running time (time needed to complete one round-trip without accounting for breaks), plus recovery time (non-driving time built into a bus driver's schedule). Recovery time, also known as layover time, acts as a buffer to ensure that if a driver is running behind schedule on one trip, the following trip is not impacted.

Recovery times below ten percent can often lead to poor on-time performance, as one late trip could result in late service on subsequent trips. On the other hand, recovery times above 19 percent indicate that resources are not being used efficiently, and vehicles are out of service for excessively long periods of time.

While on-time performance is clearly an issue for HDPT, there may be other opportunities for improvement as well, given the findings of Section 2.4. If HDPT staff chooses to pursue a comprehensive redesign of the HDPT network, then on-time performance can be addressed in the course of the redesign by adhering to the best practices described above when building schedules for the redesigned routes.

2.4 Operating Network Efficiency Evaluation

The evaluation of transit market demand, discussed in Section 2.2, provides context for the assessment of the strengths, weaknesses, and opportunities of each HDPT route. This section presents a series of diagnostic route profiles that describe each route's service characteristics, ridership patterns, productivity, and on-time performance. At the conclusion of each route profile is a list of potential service improvement options for the route, based on the quantitative findings of the profile and qualitative best practices such as the following:

Service Should Operate at Regular Intervals

In general, people can easily remember repeating patterns, but have difficulty remembering irregular sequences. Transit routes that operate less frequently than every 15 minutes should utilize clockface scheduling to the greatest extent possible. With a clockface schedule, each bus arrives at the same time or times each hour. For example, a bus route with 20-minute frequency might arrive at :00, :20, and :40 each hour throughout a service period. Clockface scheduling significantly enhances transit service usability, as it allows passengers to easily remember when their bus will come without having to rely on paper or online schedules.

Routes Should Operate Along a Direct Path

The fewer directional changes a route makes, the easier it is to understand. Circuitous alignments are disorienting and difficult to remember. Some deviations from the most direct path of travel are necessary and justifiable given that major destinations are sometimes located off major arterial roadways. However, frequent deviations from the most direct path of travel will increase travel times for the majority of passengers, and thus should be avoided unless there is a strong justification.

Routes Should be Symmetrical

Routes should operate along the same alignment in both directions to make it easy for riders to know where to catch the bus for their return trip. Providing service on different streets, depending on direction, is sometimes unavoidable due to one-way traffic patterns, but to the extent possible, bus stops for service in opposite directions should be across from one another on opposite sides of the same street. Large one-way loops can also frustrate riders by forcing out-of-direction travel on either the outbound or return leg of their trip. In most circumstances, transit riders prefer bi-directional services that they have to walk somewhat further to access, over a closer but one-way route.

Routes Should Serve Well-Defined Markets

The purpose of a transit route should be clear. Each route should include strong anchors and a mix of origins and destinations. Service duplication should be avoided unless it is for a specific purpose such as to increase effective frequency in a high-ridership "trunk" corridor, before two routes diverge.

2.4.1 Efficiency Evaluation

Appendix B contains profiles evaluating each of the routes operated by HDPT. Each profile includes operating characteristics and statistics, ridership data, and an analysis of the route highlighting strengths, weaknesses, and opportunities for improvement.

2.4.2 Efficiency Based Opportunities for Improvement

Using the opportunities identified in the route profiles as a starting point, two preliminary service redesign scenarios, presented in this section, were developed for HDPT. Both scenarios are aimed at streamlining and simplifying the transit network serving Harrisonburg and JMU.

Many of the existing HDPT routes are characterized by circuitous alignments and significant segments of one-way service. While this approach allows each route to provide broad coverage, it also forces out-of-direction travel for many riders.

To improve service for existing passengers and help attract new riders, all of the routes in the proposed scenarios are designed to be bi-directional to the greatest extent possible. This approach allows passengers to travel more directly from their homes to key activity centers, and then return home again along the same alignment but in the reverse direction (as opposed to riding out-of-direction along a one-way loop). Besides bi-directional service the proposed service scenarios include other key changes, as described below:

For the City routes, Scenario 1 envisions a redesigned network, consisting of strong individual routes. A strong route is one that is simple and intuitive to use and serves a robust mix of the types of destinations that tend to generate a high number of transit trips (multi-family housing, grocery and retail centers, medical facilities, academic institutions, etc.). Scenario 2 includes a mix of fixed-route and microtransit service. Microtransit is an app-based on-demand service that operates like Uber and Lyft but utilizes transit-specific vehicles. Microtransit can be an effective tool for serving lower-density and/or automobile-oriented environments. Where it is available, Microtransit can provide both local circulation within a designated zone and first/last-mile connections to the fixed-route network.

For the JMU routes, the two scenarios differ primarily in their approach to linking JMU's East and West campuses. Scenario 1 envisions a network in which nearly every JMU Route is extended across I-81, making stops on both the East and West Campus. This would facilitate one-seat rides for nearly all passengers traveling to JMU from off-campus locations. It would also eliminate the need for a stand-alone Inner Campus Shuttle (ICS), as riders could use nearly any route to travel between the East Campus and West Campus. In Scenario 2, nearly every JMU route terminates at either the Festival Lot in the East Campus or the Godwin Transit Center in West Campus. Service between the two campuses is then provided by the ICS Route, much as it is today.

While the scenarios presented in this section have some similarities and many differences between them, neither was intended to satisfy everyone. Rather, feedback on each scenario

was meant to identify the most popular elements of each, with the aim of incorporating these into a final recommended scenario.

The maps below show the current HDPT system map (**Figure 21**) and the proposed system maps for preliminary Scenario 1 (**Figure 22**) and Scenario 2 (**Figure 23**). These maps are followed by **Table 12** which describes the current service, and the proposed changes for Scenario 1 and 2 for each route.

Figure 21: Existing HDPT System

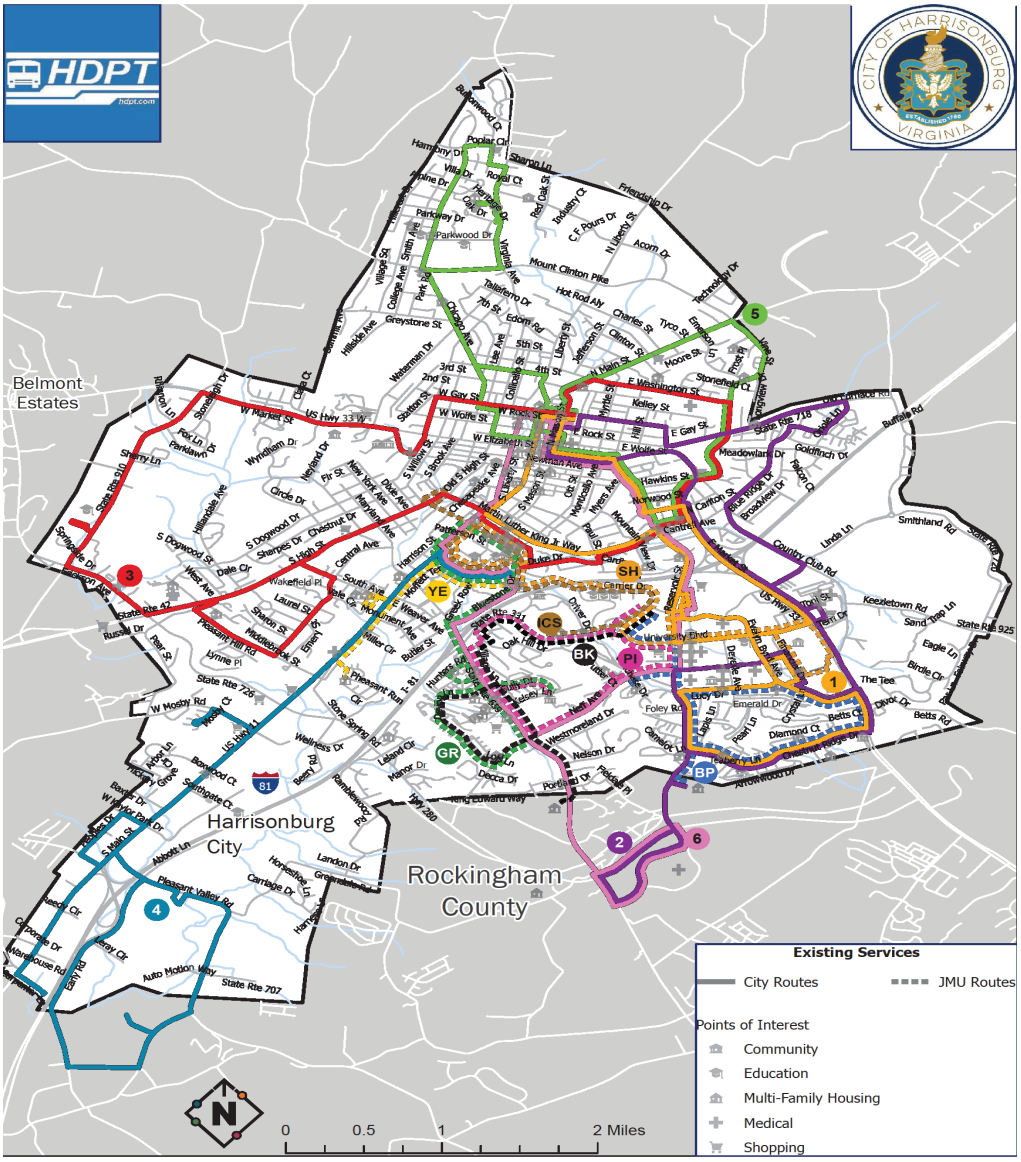


Figure 22: Future HDPT Service - Scenario 1

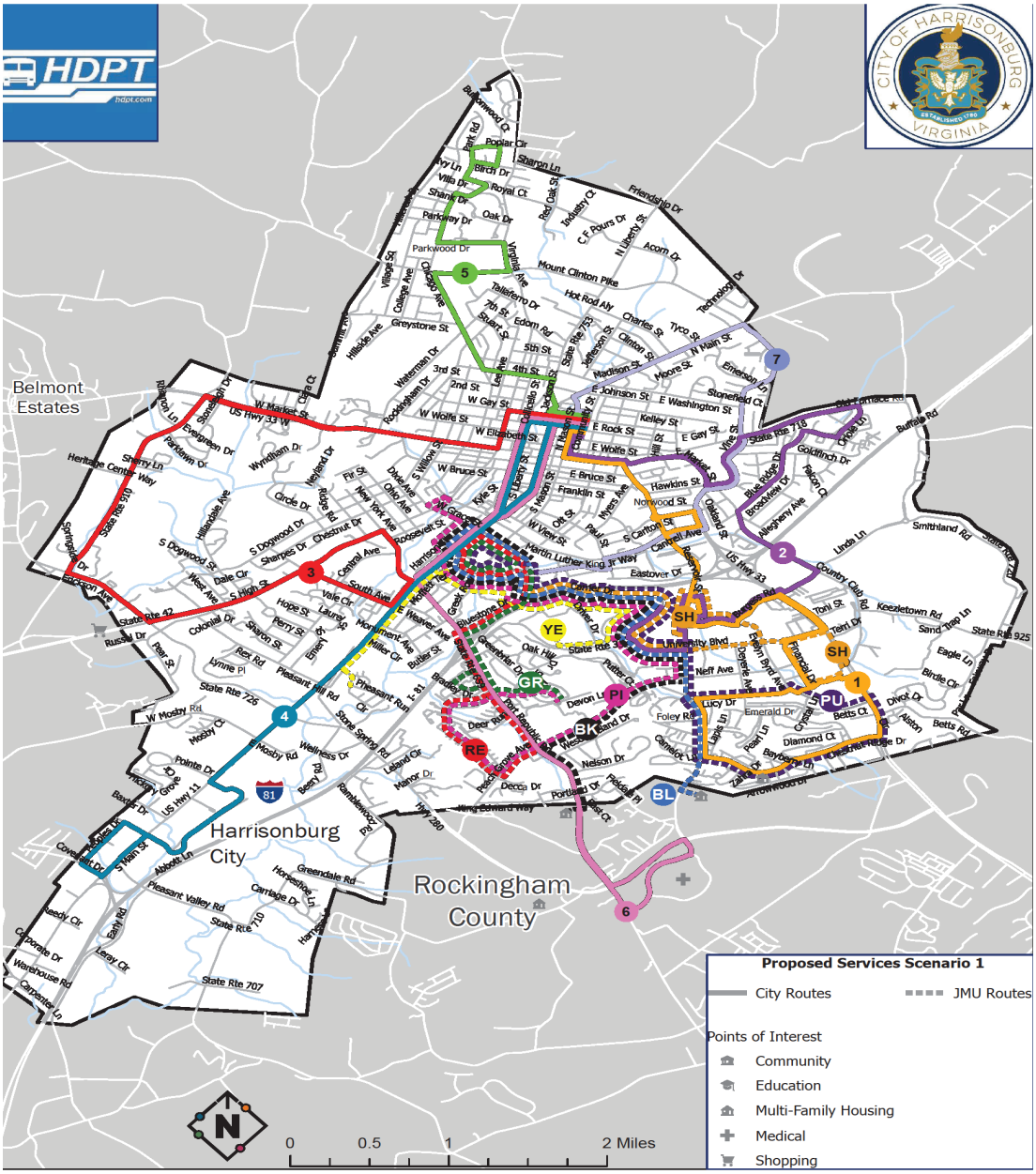


Figure 23: Future HDPT Service - Scenario 2

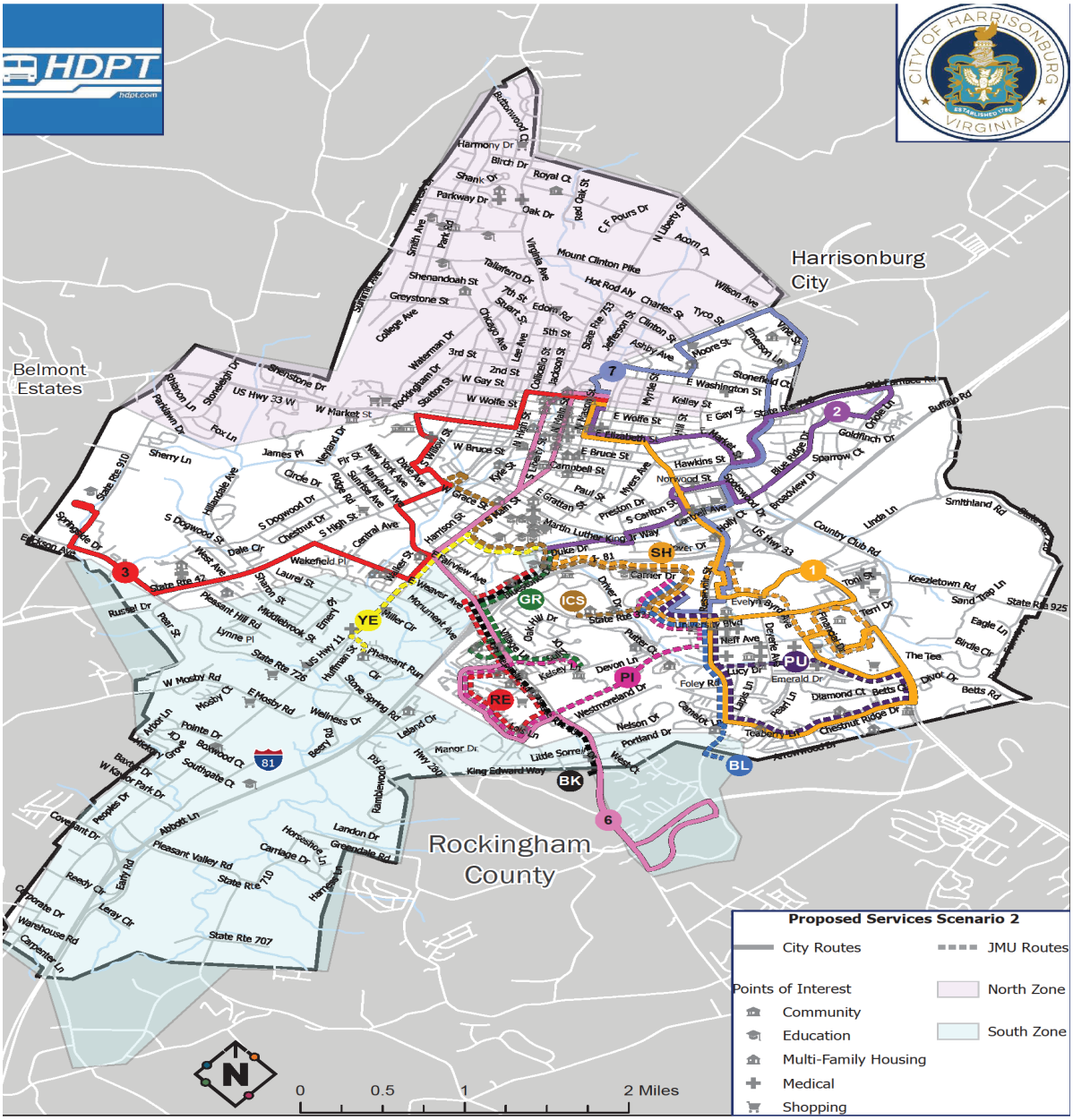


Table 12: HDPT Service Scenarios

Route	Existing Service	Scenario 1	Scenario 2
1	Mostly one-way service between E. Gay Street Transit Hub and Chestnut Ridge Drive, serving Food Lion and Kroger on Market Street, Walmart, Valley Mall, Target, and JMU.	Route 1 would be restructured to provided simplified bi-directional travel between residential areas and key retail and activity centers along the Reservoir and Market Street corridors. From the E. Gay Street Transit Hub, the route would travel south along Mason Street and Reservoir Street, serving Food Lion and Walmart, before continuing southeast to serve Valley Mall and Target. The route would then complete a clockwise end-of-line loop along Market Street, Chestnut Ridge Drive, Reservoir Street, and Lucy Drive before returning downtown along the same alignment as the southbound trip.	Route 1 would follow the same alignment as described in Scenario 1 from downtown to Walmart, but then procced with continued bi-directional service along Market Street, University Boulevard and Chestnut Ridge Drive, before terminating with a small end-of-line loop serving Valley Mall, Target, and Skyline Village Shopping Center. From Skyline Village, the route would return downtown along the same alignment as the southbound trip.
2	Mostly one-way service between E. Gay Street Transit Hub and Sentara RMH Medical Center. Southbound trips serve Market Street, Neff Avenue, and Reservoir Street, while northbound trips serve Chestnut Ridge Drive, Market Street, Country Club Road, Blue Ridge Drive, and Old Furnace Road.	Route 2 would be restructured to provide simplified bi-directional service between the E. Gay Street Transit Hub and the JMU Festival Lot, via Vine Street, Old Furnace Road, Blue Ridge Drive, Country Club Road, and Walmart. Return trips would operate along the same alignment as outbound trips to facilitate bi-directional travel between residential areas and key retail and activity centers.	Route 2 would be restructured to provide simplified bi-directional service between the E. Gay Street Transit Hub and the JMU Godwin Transit Center, via Vine Street, Old Furnace Road, Blue Ridge Drive, Carlton Street, and Duke Drive. Return trips would operate along the same alignment as outbound trips to facilitate bi-directional travel between residential areas and key retail and activity centers.
3	One-way clockwise loop between E. Gay Street Transit Hub and Harrisonburg High School. Outbound trips serve Washington Street, Vine	Route 3 would be restructured to provide bi-directional service between the E. Gay Street Transit Hub and the S. Main Street corridor, via W. Market	Route 3 would be restructured to provide bi-directional service between the E. Gay Street Transit Hub and Harrisonburg High School, via

Route	Existing Service	Scenario 1	Scenario 2
	Street, Cloverleaf Shopping Center, and JMU Godwin Transportation Center, High Street, Erickson Avenue, and Garbers Church Road. Inbound trips serve W. Market Street, Westover Park, Dogwood Drive, and Gary Street.	Street, Harrisonburg High School, Erickson Avenue, and High Street. The route would terminate with a clockwise end-of-line loop along Maryland Avenue, S. Main Street, and South Avenue, before returning to downtown along the same alignment as the outbound trip.	Westover Park, JMU Memorial Hall, Maryland Avenue, S. Main Street, South Avenue, S. High Street, and Erickson Avenue. Return trips would operate along the same alignment as outbound trips to facilitate bi-directional travel between residential areas and key retail and activity centers.
4	Mostly bi-directional service along the S. Main Street corridor with deviations serving Mosby Heights, the DMV on Peoples Drive, and an industrial area between Early Road and Pleasant Valley Road.	Route 4 would be restructured to provide simplified and streamlined service along the S. Main Street Corridor between the E. Gay Street Transit Hub and the DMV. From downtown, the route would travel south on Liberty Street to S. Main Street serving JMU and continuing south to Kaylor Park Drive to serve the new Rocktown High School before completing an end-of-line loop along Peoples Drive and Covenant Drive. Return trips would operate along the same alignment as outbound trips with the exception of Main Street, north of Gratten Street, which is the one-way street pair for southbound Liberty Street.	In Scenario 2, the coverage provided by Route 4 is replaced with an on-demand microtransit zone serving much of the S. Main Street corridor, as well as Sentara RMH Medical Center, JMU Godwin Transportation Center, and Walmart near Erickson Avenue.
5	Mostly one-way service linking the E. Gay Street Transit Hub with residential neighborhoods east and north of downtown Harrisonburg, as well as Eastern Mennonite University.	Route 5 would be split into two separate bi-directional routes. The new Route 5 would serve areas north of downtown along the Chicago Avenue and Park Drive corridors, including Eastern Mennonite University, Virginia	In Scenario 2, the coverage provided by Route 5 is replaced with an on-demand microtransit zone serving Eastern Mennonite University, Virginia Mennonite Retirement Community, and Food Lion near Harmony Drive,

Route	Existing Service	Scenario 1	Scenario 2
		Mennonite Retirement Community, and Food Lion near Harmony Drive. A new Route 7 would pick up Route 5 coverage east of downtown (see Route 7).	as well as additional neighborhoods east and west of downtown. A new Route 7 would pick up Route 5 coverage east of downtown (see Route 7).
6	Mostly one-way service between E. Gay Street Transit Hub and Sentara RMH Medical Center, via JMU. Southbound trips serve Liberty Street, Bluestone Drive, JMU Godwin Transit Center, and Port Republic Road. Northbound trips serve Port Republic Road, Neff Avenue, Reservoir Street, E. Market Street, and Mason Street.	Route 6 would be restructured to provided simplified bi-directional service between the E. Gay Street Transit Hub and Sentara RMH Medical Center, via the S. Main Street and Port Republic Road corridors. Return trips would operate along the same alignment as outbound trips with the exception of Liberty and Main Street, north of Grattan Street, which are one-way street pairs.	Route 6 would follow the same alignment as in Scenario 1, with one exception: The route would deviate from Port Republic Road onto Devon Lane, Lois Lane, and Peach Grove Avenue to provide closer bi-directional service for area residents.
7	**New Route**	Route 7 is one of two proposed routes that would emerge from splitting Route 5. Route 7 would provide bi-directional service between the E. Gay Street Transit Hub and JMU Godwin Transit Center, via N. Main Street, Vine Street, Clover Leaf Shopping Center, and Duke Drive. Route 5 would then focus on coverage north of downtown (see Route 5).	In Scenario 2, Route 7 would follow the same alignment as in Scenario 1 from downtown to Clover Leaf Shopping Center, but then proceed south to Walmart and the JMU Festival Lot. Return trips would follow the same alignment to downtown as the outbound trip. A proposed microtransit zone would replace Route 5 coverage north of downtown (see Route 5).
North Microtransit Zone	**New Service**	N/A	The North Microtransit Zone would provide app-based on-demand service to areas of northern Harrisonburg with lower ridership demand. The proposed microtransit zone would replace the coverage

Route	Existing Service	Scenario 1	Scenario 2
			provided by Route 5, including Eastern Mennonite University, Virginia Mennonite Retirement Community, and Food Lion near Harmony Drive, as well as additional neighborhoods east and west of downtown.
South Microtransit Zone	**New Service**	N/A	The South Microtransit Zone would provide app-based on-demand service to areas of southern Harrisonburg with lower ridership demand, The proposed microtransit zones would replace the coverage provided by Route 4, including the S. Main Street corridor, as well as Sentara RMH Medical Center, JMU Godwin Transportation Center, and Walmart near Erickson Avenue.
Black	Operates between the JMU Festival Lot and Aspen Heights apartments, via Port Republic Road. Devon Lane, The Harrison apartments, and University Park served in the northbound direction only.	The Black Route would be restructured to provide mostly bi-directional service between JMU and off-campus housing along the Neff Avenue and Port Republic Road corridors, including Arcadia, Sunchase, and The Cottages. The route would facilitate one-seat trips for most riders by operating across I-81 to service both the JMU East and West Campus.	The Black Route would be restructured to provide mostly bi-directional service between JMU Godwin Transit Center and off-campus housing along the Port Republic Road corridor, including The Hills Northview and the Cottages. West Campus circulation and East Campus connections would be provided by the ICS Route (see ICS Route).
Purple	Currently combined with the Blue Route to form a circuitous alignment linking the JMU Festival Lot to off-campus housing including Sunchase, Charleston Townes, The Pointe, and Redpoint.	The Purple Route would be restructured to provide mostly bi-directional service between JMU and off-campus housing along the Reservoir Street corridor, including Charleston Townes, Hillmont,	The Purple Route would follow the same alignment as described in Scenario 1 between the JMU Festival Lot and the Redpoint apartments, but would not cross I-81 to serve the JMU

Route	Existing Service	Scenario 1	Scenario 2
		Campus View, The Pointe, and Redpoint. The route would facilitate one-seat trips for most riders by operating across I-81 to service both the JMU East and West Campus.	West Campus. East Campus circulation and West Campus connections would be provided by the ICS Route (see ICS Route).
Blue	Currently combined with the Blue Route to form a circuitous alignment serving off-campus housing including Sunchase, Charleston Townes, The Pointe, and Redpoint.	The Blue Route would be restructured to provide simplified and streamlined service between JMU and off-campus housing along a loop consisting of Lucy Drive, Evelyn Bird Avenue, Market Street, and Chestnut Ridge Drive. The route would facilitate one-seat trips for most riders by operating across I-81 to service both the JMU East and West Campus.	The Blue Route would follow the same alignment as described in Scenario 1 between the JMU Festival Lot and Chestnut Ridge Drive, but would not cross I-81 to serve the JMU West Campus. East Campus circulation and West Campus connections would be provided by the ICS Route (see ICS Route).
Green	Mostly one-way service linking the JMU Quad and Godwin Transit Center with and off-campus housing including Hunters Ridge, Camden Townes, The Hills Southview, Foxhill Townhomes, 865 East, and The Harrison.	The Green Route would be split into two separate simplified routes. The new Green Route would serve the JMU Quad, Godwin Transit Center, Hunters Ridge, Camden Townes, The Harrison, and University Park, before returning to JMU along Port Republic Road. The route would not serve Bradley Drive or Hunters Road in the northbound direction until a traffic signal is installed at Bradley Drive to facilitate left turns onto Port Republic Road.	The Green Route would follow the same alignment as described in Scenario 1 between the JMU Godwin Transit Center and University Park, but would not circulate through the JMU West Campus. West Campus circulation and East Campus connections would be provided by the ICS Route (see ICS Route).
Red	**New Service**	The Red Route is one of two proposed routes that would emerge from splitting the Green Route. The new Red Route would serve the JMU Quad and Godwin Transit Center before continuing south	The Red Route would follow the same alignment as described in Scenario 1 between the JMU Godwin Transit Center and Peach Grove Avenue, but would not circulate through the JMU

Route	Existing Service	Scenario 1	Scenario 2
		along Bluestone Drive and Port Republic Road. The route would then complete a clockwise end-of-line loop along Peach Grove Avenue, Lois Lane, and Devon Lane, before returning to JMU via Port Republic Road.	West Campus. West Campus circulation and East Campus connections would be provided by the ICS Route (see ICS Route).
Pink	One-way clockwise loop linking the JMU Festival Lot with off-campus housing including Arcadia, The Harrison, and Hunters Village, as well as the Convocation Center and Jennings Hall at JMU.	The Pink Route would be restructured to provide bi-directional service between Memorial Hall and University Park, via Bluestone Drive, Carrier Drive, Neff Avenue, and Devon Lane. The route would facilitate one-seat trips for most riders by operating across I-81 to service both the JMU East and West Campus.	The Pink Route would follow the same alignment as described in Scenario 1 between the JMU Festival Lot and University Park but would not cross I-81 to serve the JMU West Campus. East Campus circulation and West Campus connections would be provided by the ICS Route (see ICS Route).
Yellow	Operates bi-directionally between the JMU Godwin Transit Center and Pheasant Run Townhomes, via S. Main Street and Bluestone Drive. The Mill apartments served in the southbound direction only.	The Yellow Route would follow a similar alignment to the current route but would be extended across I-81 to serve East Campus, via Carrier Drive and University Boulevard, ending at Jennings Hall/Convocation Center. The Mill apartments would be served from S. Main Street only.	The Yellow Route would follow the same alignment as in Scenario 1 between Pheasant Run Townhomes and Bluestone Drive but would terminate at the Godwin Transit Center instead of crossing I-81 to serve the JMU East Campus. East Campus circulation and West Campus connections would be provided by the ICS Route (see ICS Route).
ICS	Operates between Memorial Hall and Jennings Hall/Convocation Center, via the JMU Quad, Godwin Transit Center, Carrier Drive, and University Boulevard, to facilitate easy travel between JMU's East and West Campus. The Quad is served from Grace Street on westbound	In Scenario 1, there is no stand-alone ICS routes. Instead, connections between JMU's East and West Campus are facilitated by extending nearly every other JMU Route across I-81, resulting in frequent service between the two campuses.	The ICS would follow a similar alignment to the current route, but would operate bi-directionally along Bluestone Drive, rather than using Grace Street for westbound trips. This is meant to make service simpler and more consistent.

Route	Existing Service	Scenario 1	Scenario 2
	trips and from Bluestone Drive on eastbound trips.		
Shopper	Connects JMU to Valley Mall and Walmart at Harrisonburg Crossing. East Campus residence halls served on eastbound trips only.	The Shopper Route would follow a similar alignment to the current route, but would serve East Campus residence halls, via University Boulevard and Carrier Drive, on eastbound and westbound trips to make service more convenient for riders returning to JMU with bags and packages.	The Shopper Route would be restructured to provide more bi-directional service. Walmart would be served on outbound trips to Valley Mall, and again on inbound trips to JMU. This would reduce travel times for riders who currently must ride through Valley Mall before reaching Walmart.
Gold	Complements Blue/Purple Route by providing similar coverage at times when Blue/Purple is not running (weeknights and Saturdays).	No Change	In Scenario 2, the coverage provided by both the Gold and Silver routes is replaced with an on-demand microtransit zone serving the JMU campus and off-campus housing served by other JMU routes during regular weekday service.
Silver	Complements Black, Green, and Pink routes by providing similar coverage at times when other routes are not running (weeknights and Saturdays).	No Change	In Scenario 2, the coverage provided by both the Gold and Silver routes is replaced with an on-demand microtransit zone serving the JMU campus and off-campus housing served by other JMU routes during regular weekday service.

2.5 Analysis of Opportunities to Collaborate with Other Agencies and Stakeholders

The purpose of this section is to assess how HDPT has collaborated with other agencies and stakeholders during the public and stakeholder engagement process. Furthermore, this section will suggest opportunities for service improvement through collaboration. Relevant stakeholders and agencies include James Madison University, BRITE, and Virginia Breeze.

2.5.1 Collaboration Analysis

HDPT has been working with local partners to improve the rider experience both on and off the bus. As a department within the city government, HDPT collaborates with other departments and can benefit from their work. One example is the department of Public Works' plans to reconfigure and add sidewalks to University Boulevard and Evelyn Byrd Avenue which will improve pedestrian access to bus stops and will improve bus stops.

The JMU routes operated by HDPT are developed in collaboration with JMU. This partnership allows JMU to share trip generators such as specific apartment complexes for students with HDPT and routes can be designed to incorporate them. JMU also facilities public outreach with the student body, one such example is during the development of this TSP where JMU allowed a pop-up to be held on campus and distributed the online survey to students.

2.5.2 Collaboration Based Opportunities for Improvement

HDPT buses connect with the Blue Ridge Community College (BRCC) Shuttle and the Virginia Breeze at the JMU Godwin Transit Center. The BRCC is operated by BRITE and provides regional service between Harrisonburg, Bridgewater, Blue Ridge Community College, Staunton, and the Staunton Amtrak Station. The respondents in the public survey were tasked to rank six potential improvements, with 1 being their highest priority and 6 being their lowest priority. "Improve connection with other transportation services: Improve bus routes and schedules to better line up with the Blue Ridge Community College (BRCC) Shuttle and Virginia Breeze" received the least number of votes for top priority, and it had an average priority ranking of 5.1 out of 6. Although it is not a high priority among survey respondents, HDPT could evaluate City Route and JMU Route schedules to improve transfers between services. There is also the future opportunity for collaboration with Rockingham County if the county decides to pursue transit service which could extend transit service to nearby communities.

Chapter 3: Planned Improvements and Modifications

3.1 Introduction

The improvements proposed in this chapter were developed based on a consideration of a number of service planning inputs, including—but not limited to—the evaluation of the performance of the current transit routes and the service utilization patterns that the current network exhibits, as described in Chapter 2. These recommendations intend to improve the experience of existing and potential customers, expand the travel possibilities for passengers, and increase the efficiency and effectiveness of transit across the region.

The proposed service changes for HDPT are presented in two categories based on who those routes mostly serve:

- **City Routes:** HDPT routes which provide service to major destinations within Harrisonburg to all residents
- **JMU routes**: HDPT services which offer transit to university buildings and student housing

This document describes each service category first in terms of what is currently operated, and then as the network would look if all recommendations were fully implemented. This is done in order to provide a sense of comparison between what HDPT offers now versus the vision for HDPT transit future. Individual service recommendations are presented in this chapter, along with the expected ridership based on the implementation of those recommendations.

The recommendations are then presented in a prioritization plan, which intends to allow HDPT to implement the changes in a reasonable timeframe. However, it should be noted that elements of the mid-term and long-term plans would require additional transit funding and public and stakeholder acceptance before changes would be implemented.

A Service development plan is presented in order to share specific operating changes due to the HDPT TSP recommendations. This section presents the data necessary to move forward toward service implementation.

3.2 Overall Service Changes

The recommendations within the HDPT TSP are intended to simplify the operations and usage of transit services across the Harrisonburg region. As detailed in Chapter 2, and often described by current passengers, many of the current HDPT routes are long and windy, requiring passengers to ride fully through a loop to get to their destination and then home again. Many of these recommendations remove the large looping services that HDPT currently operates and replaces them with bi-directional services that will get passengers to and from their destinations more quickly, spending more time on what they want to, rather than riding transit. On-time performance and operational efficiencies will also be realized through the implementation of these service changes.

As a comparison, this section details the current City and JMU routes versus their recommended networks, respectively. Further details regarding the recommended service changes are found in subsequent sections of this chapter.

3.2.1 City Route Recommendations

All of the current City routes that HDPT operates (e.g., Route 1, Route 2, Route 3, Route 4, Route 5, and Route 6) originate and terminate each trip at the East Gay Street Transit Hub. This means that each service features single-directional loops for all or large portions of their current route alignment. This situation requires passengers to ride through an entire trip to get to and from their destination, and if a trip is missed, often long wait times are a result. **Figure 24** presents the HDPT City routes as they are currently offered.

The recommended City network (**Figure 25**) would reduce the portions of each route that operate as single-directional loops and eliminate service along corridors that currently have low or no ridership or that currently has overlapping service (i.e., potential locations where transit resources could be used elsewhere to provide more efficient service across the network). The recommendations include:

- **Route 1:** The restructured Route 1 serves many of the same corridors and destinations as the current alignment but does so as a bidirectional route rather than as a loop. Most notably, rather than returning to the E Gay St transit center via Martin Luther King Jr Way and S Main St, Route 1 will remain on Reservoir until E Market Street in the inbound direction.
- **Route 2:** Rather than leaving downtown via E Market Street, Route 2 will operate bidirectionally, leaving downtown via the same alignment used for the return trip, via Old Furnace Road, Blue Ridge Drive, and Country Club Road. Route 2 will terminate in the south at the JMU Festival Lot. Destinations currently served by the southern portion of Route 2 will be served by other routes. Valley Mall and residential complexes along Chestnut Ridge Drive and Reservoir Street will be served by Route 1. Setara RMH Medical Center will be served by Route 6.
- **Route 3:** Route 3 will no longer provide service along the eastern portion of the current alignment, instead providing more regular, bidirectional service along what is currently the “return” portion of the loop. Many destinations currently served by discontinued portion of Route 3 will be served instead by other City and JMU route combinations. Grace Street will continue to be served by the ICS.
- **Route 4:** The restructured Route 4 differs from current service in two major ways. First, rather than originating at the Godwin Transit Center, Route 4 will extend further north to the E Gay Street Transit Hub. Second, the loop at the southern end of the route, which follows Pleasant Valley Road and Pleasants Drive and returns north via Early Road, will be eliminated because ridership along that portion of the route did not justify service.
- **Route 5:** Route 5 serves Eastern Mennonite University as bidirectional service rather than as a loop, with most of the portion along Virginia Ave no longer receiving service. In addition, the loop along the eastern portion of the route is shortened, with the route returning to the Transit Hub at Old Furnace Road rather than Martin Luther King Jr Way. The Cloverleaf Shopping Center will not be served by Route 5 but will continue being served by Route 1.
- **Route 6:** Route 6 will return to the East Gay Transit center along the alignment it currently follows southbound. The return portion of the route’s current loop will be eliminated. Destinations currently served by the discontinued portion of Route 6 will be served instead by the following routes: Route 1 will continue to serve the Reservoir Street corridor; and Neff Ave will be served by the Pink and Purple Lines.


RT 6
RT 3
NO SMOKING
NO FUMAR
2009

Figure 24: Existing HDPT City Routes

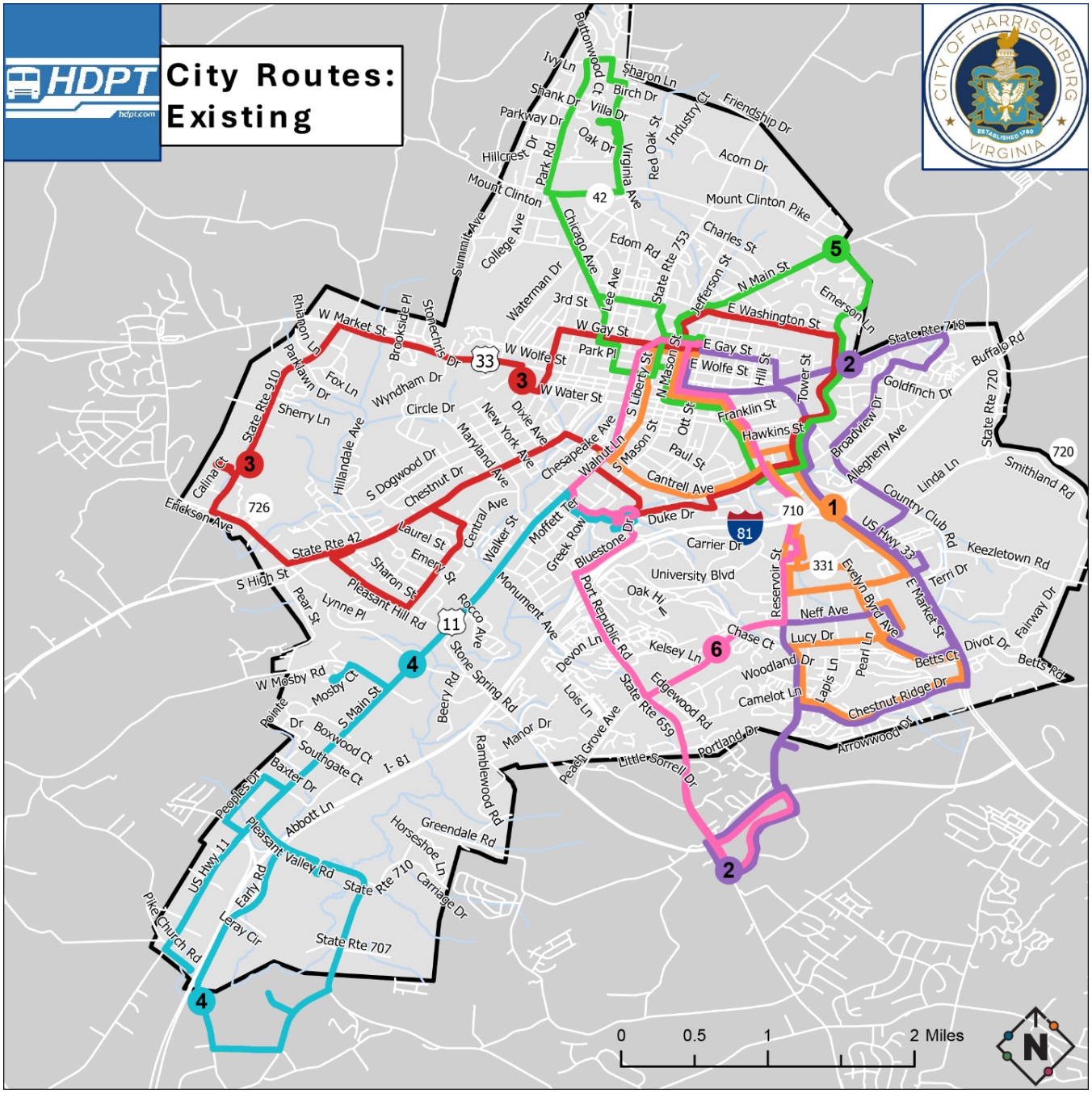
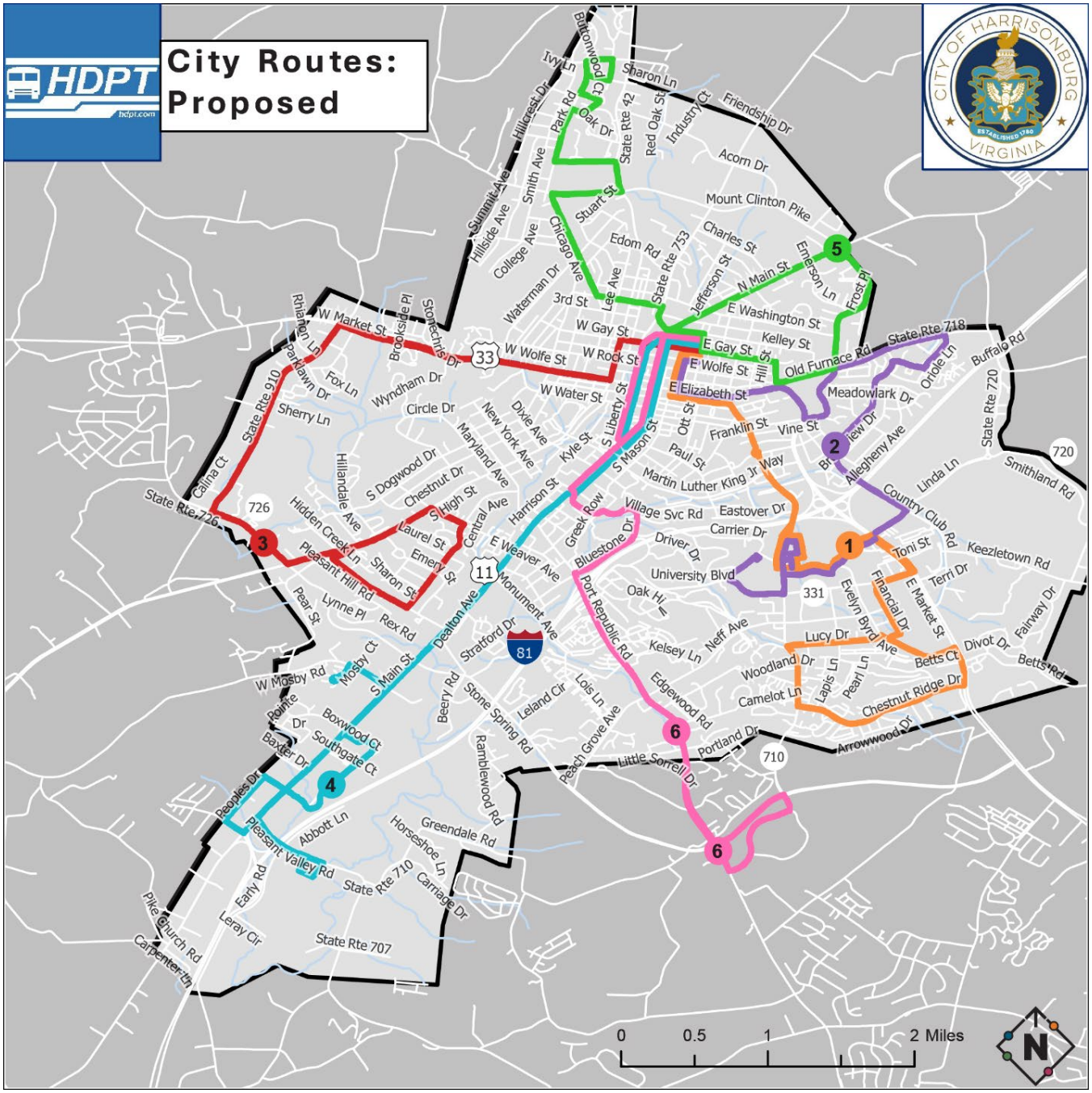


Figure 25: Recommended HDPT City Routes



3.2.2 JMU Route Recommendations

The color-named JMU routes provide service between the JMU campuses on both sides of I-81 with key destinations including student housing and shopping destinations. Each of the JMU routes (**Figure 26**) serves either the Godwin Transit Center, which is north of I-81 and across from JMU's Godwin Hall, or The Carrier Drive @ Festival (Shelter) bus stop, located south of I-81 and across from the Festival Conference and Student Center. The Inner Campus Shuttle, by far HDPT's most productive route, serves both.

The HDPT TSP recommendations (**Figure 27**) have fewer service change recommendations for JMU routes. The only alignment change is that, in the proposed system, the Blue/Purple Line is replaced by two separate routes, with the Purple Line proceeding south to the Redpoint apartment complex without deviating out to E Market St; that loop would be served by the Blue Line.

These changes recognize the success of the current JMU routes, while also providing some updates that will allow the network to operate more effectively for JMU passengers and Harrisonburg residents, alike. The specifics regarding the JMU route recommendations include:

- **Black:** No alignment changes.
- **Blue:** The restructured Purple and Blue Lines will replace the current hybrid Blue and Purple Line, which operates as a large loop, with two separate routes. The Blue Line will travel the eastern portion of the prior hybrid route, serving residential areas on Lucy Drive and Chestnut Ridge Drive.
- **Purple:** The restructured Purple and Blue Lines will replace the current hybrid Blue and Purple Line, which operates as a large loop, with two separate routes. The Purple Line will serve the western portion of the prior hybrid route, along the Reservoir Street corridor, as a bidirectional route.
- **Green:** No alignment changes.
- **Pink:** No alignment changes.
- **Yellow:** No alignment changes.
- **Shopper Shuttle:** No alignment changes.
- **ICS:** No alignment changes.
- **Gold:** The Gold Line will continue operating along its existing alignment in the short-term; HDPT will explore changes to the Gold Line in the mid-term and beyond.
- **Silver:** The Silver Line will continue operating along its existing alignment in the short-term; HDPT will explore changes to the Silver Line in the mid-term and beyond.

Figure 26: Existing JMU Routes

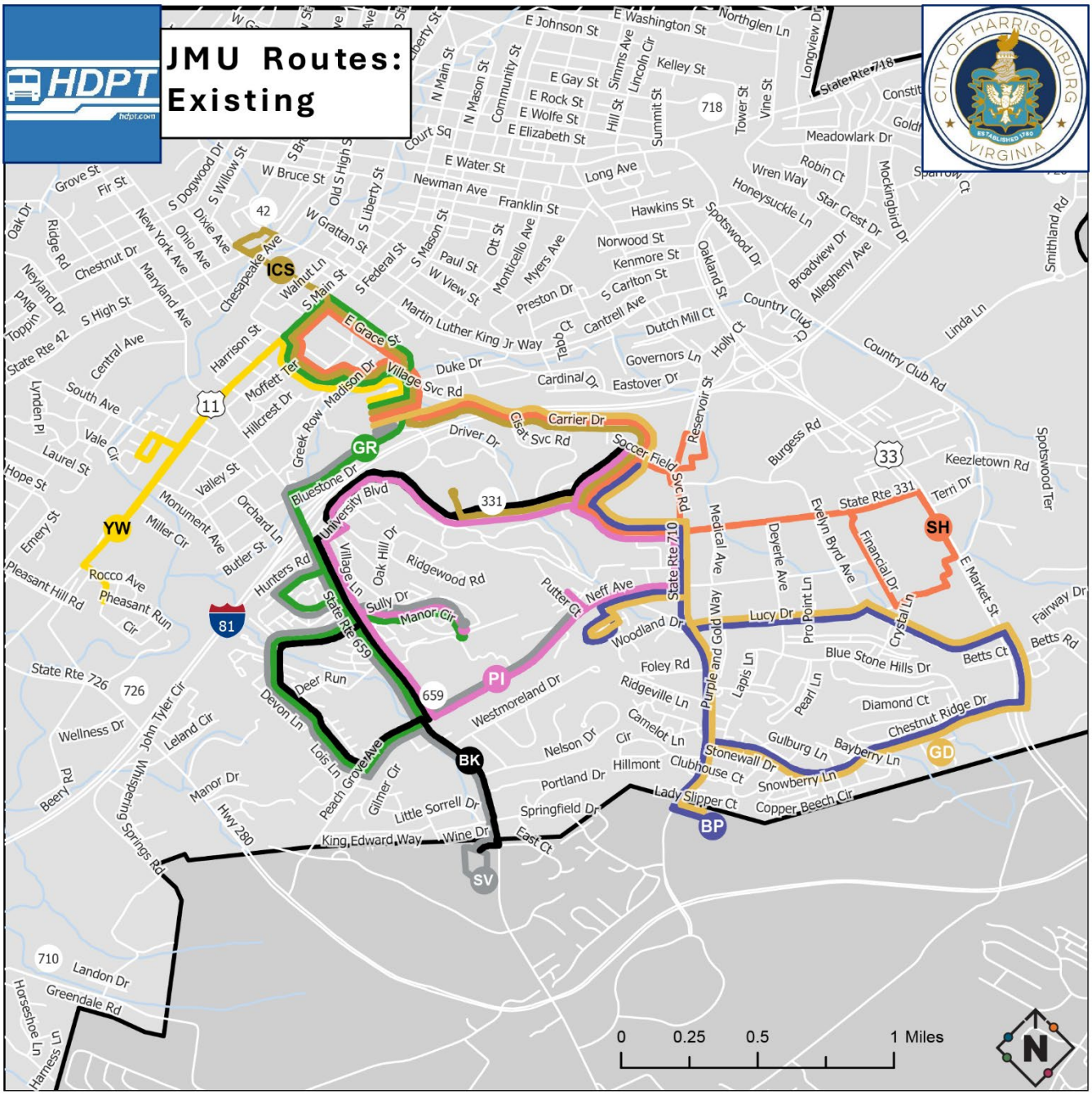
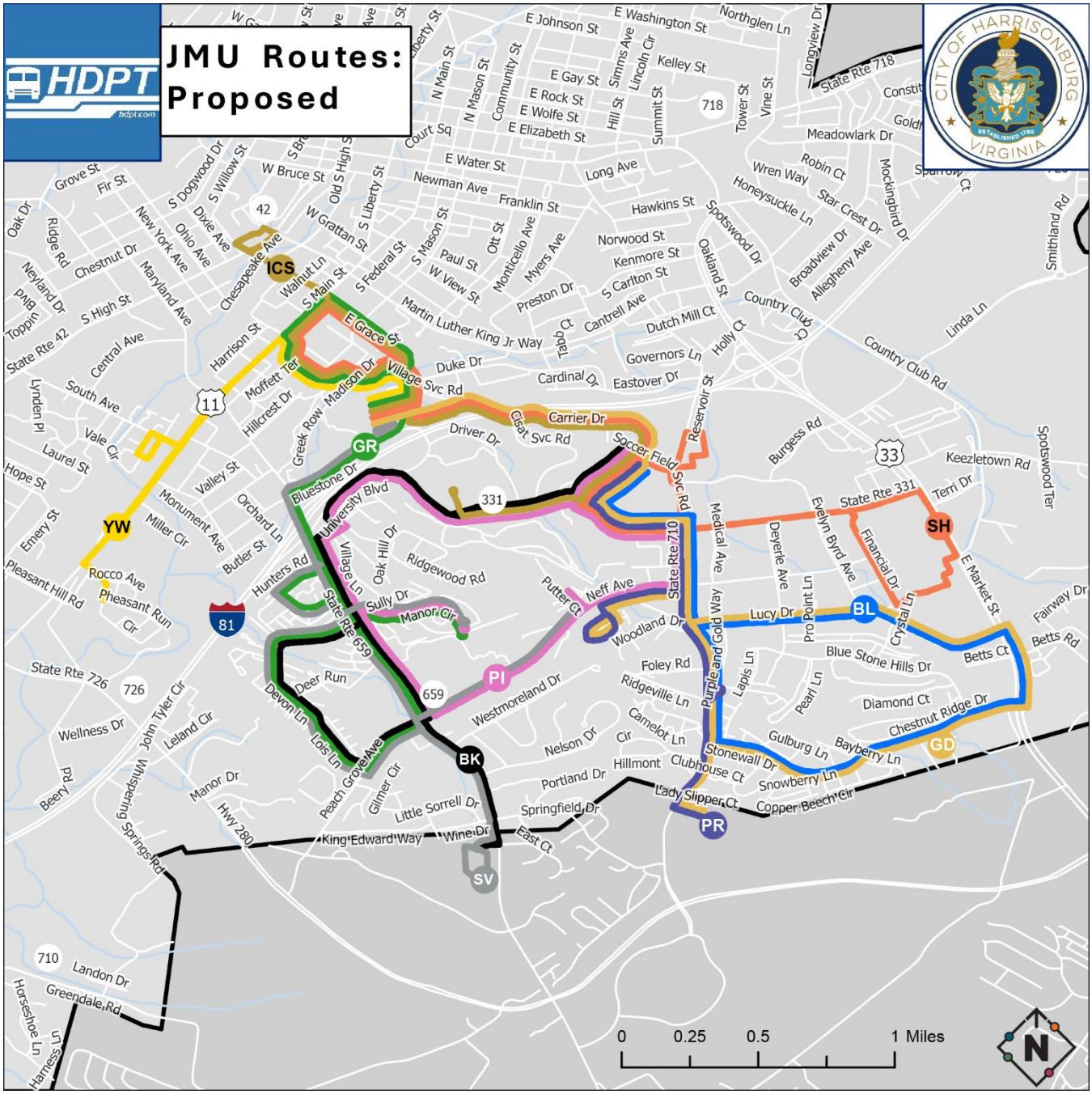


Figure 27: Recommended JMU Routes



3.3 Individual Service Recommendations

The recommendations associated with the HDPT TSP effort are intended to improve the operations of transit for HDPT, while also increasing the performance of the network so that the customer experience is maximized. These improvements will help the network grow in terms of service utilization, and to help meet regional economic growth and equity attainment goals.

The individual service recommendations are presented in **Appendix D**, with full details regarding route alignment, the changes that are being recommended, levels of service, and a route map, all information that will be important as HDPT moves toward implementing the changes.

3.4 Estimated Ridership Due to Improvements

Methodology

Future-year ridership was estimated for HDPT's fixed routes by forecasting the ridership impact for every service change between the existing and FY 2034 services. Three types of service changes were defined, with a separate estimation method for each:

- **Alignment Changes:** where the bus operates
- **Span Changes:** the hours between when the bus operates
- **Headway Changes:** how often the bus comes.

The impacts of these changes were estimated in order, starting with stop-level ridership adjustments caused by alignment changes, followed by the application of ridership demand elasticities for span and headway changes. Note that for routes 1, 2, 3, 4, and 6, the change from a single-direction loop service to bidirectional service effectively doubles the frequency to stops. This effect was represented by doubling the frequency to which the headway elasticity was applied.

First, the ridership impacts of alignment changes were estimated at the stop level. To reflect the stops newly served or no longer served by a route due to realignment, boardings were added or subtracted from each route's baseline ridership according to the following:

- Boardings at stops eliminated from a route were subtracted from the route's average daily ridership.
- When a stop is added to a route, boardings from other route(s) at that stop are partially assigned to the added route:
    - For a route that is replacing another route at that stop, the boardings from the removed route are added to the replacement route's average daily ridership.
    - For stops served by multiple routes, the boardings from all existing routes at that stop were combined and then split proportionally between the proposed routes according to the number of proposed daily trips (i.e., the number of proposed daily trips on each route divided by the total number of proposed daily trips across all routes at that stop).

Where the above methodology was not appropriate for the actual proposed changes in service, a different methodology was used.

First, seven JMU routes (the ICS, Pink Line, Black Line, Yellow Line, Gold Line, Shopper Shuttle, and Silver Line) are unchanged in the proposed system. Those routes were therefore

not subjected to the same ridership reallocation described above; instead, the projections assume no change in ridership on those routes.

Second, because Routes 1 and 6 do not currently operate on Sundays, the standard methodology provided an unreasonably low estimate for Sunday ridership. To address this issue, the ratio of Sunday ridership to Saturday ridership from a comparable transit system, Blacksburg Transit was used. That value, .64, was applied to projected Saturday ridership on Routes 1 and 6 to provide an estimate for projected Sunday ridership.

Note that these projections are an estimate of the change in ridership based on the effects of the proposed route changes; they do not attempt to estimate ridership growth based on projected population growth or other factors.

Ridership Estimates

Table 13 shows the estimated daily ridership growth based on the planned service improvements as described in the route sheets. Routes with substantial increases in span and/or headway (notably routes 1, 2, and 6) are projected to experience an increase in ridership. Route 3 and Route 5 are projected to have a decrease in ridership, owing to the reduction in the number of stops that those routes are expected to serve. Note that this process may somewhat undercount riders on those routes, since in some cases, riders will be able to walk to a nearby stop to catch the same bus.

Ridership on most JMU routes is not projected to change since many of these routes will remain unchanged in the proposed system. The newly created Blue and Purple Lines are projected to see an increase in ridership, since the total number of trips per day will exceed the number on the Blue and Purple Line, which is proposed to be eliminated.

Overall ridership is projected to increase, especially on Saturdays.

Table 13: Estimated Daily Ridership Growth for Fixed-Route Service

Route	Existing Average Daily Boarding (Feb. 2022)			Estimated Average Daily Boarding (FY 2033)			Percent Growth (%)		
	Weekday	Saturday	Sunday	Weekday	Saturday	Sunday	Weekday	Saturday	Sunday
1	185	149	-	373	191	122	101%	28%	-
2	160	137	-	259	294	-	62%	116%	-
3	134	66	-	111	76	-	-17%	16%	-
4	68	34	-	112	96	-	64%	179%	-
5	215	138	-	127	71	-	-41%	-49%	-
6	109	83	-	628	451	289	476%	445%	-
Blue Line	-	--	-	138	-	-	-	-	-
Green Line	873	-	-	692	-	-	-21%	-	-
Purple Line	-	-	-	251	-	-	-	-	-
Shopper	207	289	333	207	289	333	0%	0%	0%
ICS	3922	2667	-	3922	2667	-	0%	-	-
Black Line	136	-	-	136	-	-	0%	-	-
Blue and Purple Line	389	-	-	-	-	-	-	-	-
Pink Line	182	-	-	182	-	-	0%	-	-
Yellow Line	274	-	-	274	-	-	0%	-	-
Gold Line	30	60	-	30	60	-	0%	0%	-
Silver Line	54	92	-	54	92	-	0%	0%	-

3.5 Prioritization of Planned Service Improvements

3.5.1 Prioritization

The TSP guidelines require that each project be assigned a timeframe with estimated capital and operating costs:

- **Short-term** projects are those which are expected to be completed within one year.
- **Mid-term** projects are expected to continue through five years.
- **Long-term** projects are estimated to be completed in 10 years.

Table 14 displays project timeframes, along with estimated capital costs, routes impacted, and operational and capital needs over the short-term, mid-term, and long-term periods. The specific information regarding individual route recommendation timeframes is included in **Section 3.6.1**.

While HDPT plans to re-evaluate the Gold and Silver Lines in the mid-term and beyond, the Gold and Silver Lines are assumed to continue operating with the same alignment and level of service in the short, mid, and long-term scenarios described below.

Table 14: Project Timeframes and Estimated Capital Costs

Time Frame	Key Service Improvements	Routes Impacted	Operational Needs – Total Additional Revenue Hours (versus prior term)	Capital Needs – Total Additional Vehicles at Peak (versus prior term)
Short-Term (FY2025)	Extend the service span; Increase service frequency; Remove some services, including Bridgewater-Dayton Shuttle	Route 1; 6; Blue; Purple; Green; Shopper; ICS; Bridgewater-Dayton Shuttle	475	1
Mid-Term (FY2029)	Extend the service span for more routes; Increase service frequency for more routes	Route 1, 2, 3, 4,	5,936	1
Long-Term (FY2033)	Increase service frequency	Route 6	3,912	1

3.5.2 Impact on Transfer Facilities

In 2022, HDPT published a study analyzing the potential site locations for a permanent transfer facility. As of the writing of this plan, HDPT is exploring the possibility of building this permanent transfer facility in Harrisonburg. The future HDPT transfer facility would have a larger capacity, provide ADA accessibility, and have additional amenities to improve the experience of current passengers, town and university visitors, operators, and others.

3.5.3 Inclusion in Other Plans

HDPT currently provides a portion of its service outside the City of Harrisonburg in Rockingham County. Rockingham County completed a transit feasibility study in 2024 which determined that microtransit service could be used to meet existing transit demand in some areas of the county. As of the writing of this plan, Rockingham County has not moved forward with any of the

services proposed in the feasibility study. HDPT will continue to coordinate with the county on any future service Rockingham County implements.

3.6 Service Development

3.6.1 Operations Planning

Table 15 details the operational changes and needs by year and by route for implementing the service changes described in **Table 14** and in the route profiles in **Appendix D**. Changes to revenue hours by year by route are displayed and represent a change in hours from that route in the previous year. Additional peak vehicles needed by route are also included in **Table 15**. Short-term operational changes include actions like extending service spans, increasing frequency during peak periods, splitting routes, and removing services. Some of the changes in the short-term result in fewer revenue hours despite an increase in service frequency. This results from changes to the route alignment, which allows higher frequency to operate with fewer vehicles, thus reducing the revenue hours. Mid-term changes described include adding service in the late evening period during the weekday, adding weekend service, and increasing weekend service frequency. Long-term changes center around increasing the frequency of Route 6.

Table 15: Route Operating Impacts by Term

Term	Route	Description of Changes	Approximate Additional Annual Revenue Hours (versus prior term)	Additional Peak Vehicle Need (versus prior term)
Short-Term (FY2025)	Route 1	• Operate weekday and Saturday service later	1,760	1
	Route 6	• Increase service frequency to 40-minutes during AM Peak period	525	1
	Blue Line	• Split route from purple and increase frequency	22	0
	Purple Line	• Split route from Blue and increase frequency	22	-1
	Green Line	• Increase service frequency	-1,005	-1
	Shopper Shuttle	• Operate service hourly	--438	0

Term	Route	Description of Changes	Approximate Additional Annual Revenue Hours (versus prior term)	Additional Peak Vehicle Need (versus prior term)
	ICS Night/Saturday	• Increase Saturday service hours	100	1
Mid-Term (FY2029)	Route 1	• Increase frequency as 40-minutes for daytime service • Add Sunday service due to strong Saturday ridership • Further extend evening service	1,370	0
	Route 2	• Add weekday late evening service and Saturday service	150	0
	Route 3	• Add weekday late evening service and Saturday service	150	0
	Route 4	• Add weekday late evening service and Saturday service	150	0
	Route 6	• Increase service frequency to 30-minutes during full day • Add late evening service • Increase Saturday service to 40-minutes • Add Sunday service	4,110	1
Long-Term (FY2033)	Route 6	• Increase service frequency to 20-minutes during full day	3,910	1

Term	Route	Description of Changes	Approximate Additional Annual Revenue Hours (versus prior term)	Additional Peak Vehicle Need (versus prior term)
		• Increase Sunday service to 30-minutes		

3.6.2 Equity Evaluation

Impact of Proposed Service Changes

Where a proposed plan incorporates service reductions, DRPT requires agencies to assess the impact of proposed service changes on populations' access to transit. This plan proposes two types of service changes that involve service reductions to some routes. First, some routes that currently feature large loops will be restructured to offer bidirectional service. These changes provide shorter travel times and are more intuitive service for customers. In addition, the proposed plan would shorten some routes, eliminating service to areas with low ridership. These changes will allow HDPT to reallocate resources to provide service that benefits more riders. **Table 16** details the total trips per week by route under the current and proposed systems.

Table 16: Existing and Proposed Weekly Trips

Route	Existing Weekly Trips	Proposed Weekly Trips
Route 1	69	129
Route 2	69	82
Route 3	69	82
Route 4	69	82
Route 5	69	65
Route 6	69	258
Black Line	120	120
Blue/Purple Line	90	-
Blue Line	-	60
Purple Line	-	60
Green Line	180	120
Pink Line	120	120
Yellow Line	120	120
Shopper Shuttle	96	72
ICS	720	900
ICS Night/Saturday	68	72
Gold Line	49	49
Silver Line	49	49

While the redesigned system provides a similar level of coverage to the current system, some streets that currently receive service will not under the proposed system. To assess the impact

of the proposed service changes, the study team compared the level of service in each Census block group in Harrisonburg under the current and proposed bus system. A bus route was said to serve a block group if that route's alignment was within a quarter mile of any portion of the block group boundary. The total number of trips per week on any bus route were then added together. The difference between the current number of trips per week and the proposed number of trips per week is the change in level of service.

Block groups were then divided into three categories:

- Block groups where the number of trips per week changed by less than seven trips per week were said to experience **no service change.**
- Block groups where the number of trips per week increase by seven or more trips were said to experience a **service increase.**
- Block groups where the number of trips per week will decrease by seven or more were said to experience a **service decrease**.

Lastly, the total population, and the populations of several socio-economic and demographic groups of interest, were added together. This was performed for each service change category. The results of this analysis are presented in **Table 17.** Despite the reduction in service along some streets in Harrisonburg, the proposed system would increase service to more people than the number to which it would decrease service across all demographic categories that were evaluated.

Table 17: People Affected by a Change in Transit Service

	Service Decrease	No Service Change	Service Increase
Jobs	8,241	2,190	24,161
Population	17,265	5,223	31,070
Senior Population	1,462	1,090	2,340
Minority Population	8,106	1,701	8,796
No Car Households	465	138	664
Low-Income Persons	7,097	1,804	8,621
Low-English Proficiency Persons	2,765	372	3,069

While this analysis provides a comprehensive assessment of the impact of the proposed service changes, this analysis differs in several ways from service equity analyses (SEAs) required for major service changes under Title VI of the Civil Rights Act:

- **SEAs must evaluate the impact to areas within a set distance of bus stops, not routes.** The analysis presented here was conducted at the route alignment level, not the stop level.
- **SEAs typically assess the impact of individual changes, not system-level changes.** While this analysis looks at the cumulative change in the level of service across all routes, SEAs usually evaluate the effects of changes to a single route.

Due to the methodological differences between the equity analysis conducted for this report and SEAs, the findings in this report do not exclude the possibility that one or more of the proposed route changes could impose a disparate impact or disproportionate burden under Title VI, which HDPT would be required to address. In particular, the proposed changes to each of the six city routes, as well as the splitting of the Blue and Purple Line into two separate lines, might be substantial enough changes to trigger the agency's Major Service Change policy.

Changes Made in Response to FTA Requirements

DRPT requires agencies to "describe any planned service changes in response to the most recent federal Title VI report and/or FTA Triennial Review." HDPT has not made and does not plan to make any service changes related to either.

3.6.3 Other service types

In addition to fixed-route bus service, HDPT operates the Bridgewater-Dayton Shuttle, a hybrid fixed-route and on-demand transit service. The service attracts few riders, and costs more than HDPT's other service on a per mile, per passenger, and per hour basis. HDPT assessed the viability of the service in a memo, which is included as **Appendix C**. Based on the conclusions of that memo, HDPT is developing a process for eliminating the Bridgewater-Dayton Shuttle.

3.6.4 Factors Impacting Service Development

The ability of HDPT to implement the proposed changes will be dependent on the following factors:

- **Availability of Additional Resources.** The proposed service changes represent a 20 percent increase over current resources. To fund such an expansion, HDPT would require additional funding from the City of Harrisonburg, JMU, or other partners.
- **Ability to Hire and Retain Bus Operators.** In Virginia and across the country, transit agencies are struggling to hire and retain a sufficient number of bus operators. If that shortage persists or worsens, HDPT might not be able to implement all the proposed service changes without further increases in compensation for operators or other initiatives to recruit workers.
- **Vehicle Electrification.** Many transit agencies in Virginia and elsewhere are moving to adopt battery electric buses (BEBs), and some of HDPT's stakeholders have expressed support for the local adoption of the technology. While BEBs have no tailpipe emissions and thus do not directly worsen air quality or produce greenhouse gases, moving to BEBs can impose substantial costs on agencies. First, BEBs and the accompanying charging infrastructure are expensive. Second, such vehicles may have more limited ranges than conventional vehicles. To accommodate this limitation in range, some agencies have needed to expand the size of their fleets so that some vehicles can recharge while others are in service, which further increases the cost of deploying BEBs. While federal and state funds are available to support the transition to BEBs, acquiring those vehicles typically requires local resources as well. A transition to BEBs could thus absorb some of the additional resources that could otherwise be used to boost level of service in Harrisonburg.
- **Compliance with the Americans with Disabilities Act.** HDPT is committed to ensuring that its bus stops are accessible to customers with disabilities. HDPT will need to work with the city's Department of Public Works to identify where bus stops and pedestrian

infrastructure need to be upgraded. The level of resources HDPT dedicates to bus stop improvements will affect the availability of funds for other purposes.

Chapter 4 – Implementation Plan

This chapter provides the required steps for the Harrisonburg Department of Public Transportation (HDPT) to carry out the operations and services described in Chapter 3. Chapter 4 is organized as follows: **Section 4.1: Asset Management** describes the policies outlined in the Transit Asset Management plan.

Section 4.2: Capital Implementation provides a detailed implementation plan for meeting the capital needs of the agency.

4.1 Asset Management

HDPT participates in the Virginia Group Tier II Transit Asset Management (TAM) Plan. The purpose of the TAM Plan is to aid the Virginia Department of Rail and Public Transportation (DRPT) and the participating Tier II transit agencies in achieving and maintaining a State of Good Repair (SGR) for public transportation assets operated in the Commonwealth of Virginia.

4.1.1 Asset Inventory

HDPT must maintain and update its asset inventory data in DRPT's TransAM system. Specifically, HDPT records changes in condition, usage, value, and depreciation for its rolling stock (revenue vehicles), equipment, and facilities.

Fleet

The Federal Transit Administration (FTA) defines useful life benchmark (ULB) as the expected lifecycle of a capital asset for a transit provider's operating environment. Conversely, DRPT utilizes useful life (UL) standards as the minimum age an asset must be to receive full points for replacement through the Making Efficient and Responsible Investments in Transit (MERIT) scoring system. The ULB and UL standards for HDPT's vehicle assets are listed in **Table 18**. HDPT's spare ratio for revenue fleet should not exceed 20 percent of the number of vehicles operated in maximum fixed-route service per FTA's Rolling Stock Spare Ratio Policy.

Table 18: Useful Life Benchmarks (ULB) and Useful Life Standards in Years

Asset Class	Useful Life Benchmark (FTA)	Useful Life (DRPT)
Large Bus	14	12
Cutaway Bus, Heavy Duty	14	10
Cutaway Bus, Light Duty	10	4
Minivan	8	4
Automobile (Non-Revenue)	8	4

Facilities

Facility asset conditions are assessed using the FTA's Transit Economic Requirements Model (TERM). TERM ratings are based on available industry standard scales for non-vehicle equipment, and they are described in **Table 19**. The Tier II TAM Plan does not list the useful life

standards for facility assets; however, HDPT's policy is to renovate, upgrade, or replace its facilities before they fall below a 3.0 TERM rating.

Table 19: FTA TERM Scale

Rating	Condition	Description
5	Excellent	No visible defects, new or near new condition, may still be under warranty if applicable.
4	Good	Good condition, but no longer new, may be slightly defective or deteriorated, but is overall functional
3	Adequate	Moderately deteriorated or defective; but has not exceeded useful life
2	Marginal	Defective or deteriorated in need of replacement; exceeded useful life
1	Poor	Critically damaged or in need of immediate repair; well past useful life

4.1.2 Target Setting

DRPT sets annual TAM targets based on TransAM data inventories extracted in February of each calendar year. **Table 20** and **Table 21** show the TAM targets for revenue and service vehicles and equipment, where the target is the percentage of vehicles that have met their useful life benchmark (ULB).

Table 20: Revenue Vehicle Performance Targets

Asset Class	ULB - Years	Target
BU - Bus	14	15%
CU - Cutaway Bus	10	10%
MV - Minivan	8	20%

Table 21: Service Vehicle and Equipment Targets

Asset Class	ULB - Years	Target
AO - Automobiles (non-revenue)	8	30%

Facility performance targets are listed below in **Table 22**, where the target is the percentage of facilities with a condition rating below 3.0 on the FTA's Transit Economic Requirements Model (TERM).

Table 22: Facilities Performance Targets

Asset Class	TERM	Target
Administration Facilities	< 3	10%
Parking Facilities	< 3	10%

4.1.3 Investment Prioritization

The TAM Plan also informs how assets are prioritized. Revenue vehicle assets receive the highest priority, followed by facility needs, and then service vehicles and equipment. Within each of these categories, assets are tiered based on their age beyond the ULB or TERM rating. The prioritization tiers for vehicles and equipment are shown in **Table 23**, and the prioritization tiers for facilities are shown in **Table 24**.

Table 23: Vehicle and Equipment Prioritization Tiers

Prioritization Tiers	Age Beyond ULB
Tier 1	Over 6 years beyond ULB
Tier 2	3 to 6 years beyond ULB
Tier 3	1 to 2 years beyond ULB

Table 24: Facility Prioritization Tiers

Prioritization Tiers	TERM Ratings
Tier 1	1
Tier 2	2
Tier 3	3

4.1.4 Technology and Intelligent Transportation Systems

The Tier II TAM Plan does not include an inventory of technology and intelligent transportation systems (ITS) assets. Furthermore, the plan does not specify the process for updating technology and ITS assets such as Computer-Aided Dispatch/Automatic Vehicle Location (CAD/AVL) systems, automatic passenger counters (APCs), scheduling software, and data processing hardware or software. It may be necessary for HDPT to replace these assets every four to six years due to new requirements, outdated technology, or lost vendor support.

Funding for technological upgrades can be achieved through Minor Enhancement (MIN) grants available under DRPT's MERIT Capital Assistance Program. These grants apply to projects or programs that add new technology with a cost of less than $2 million.

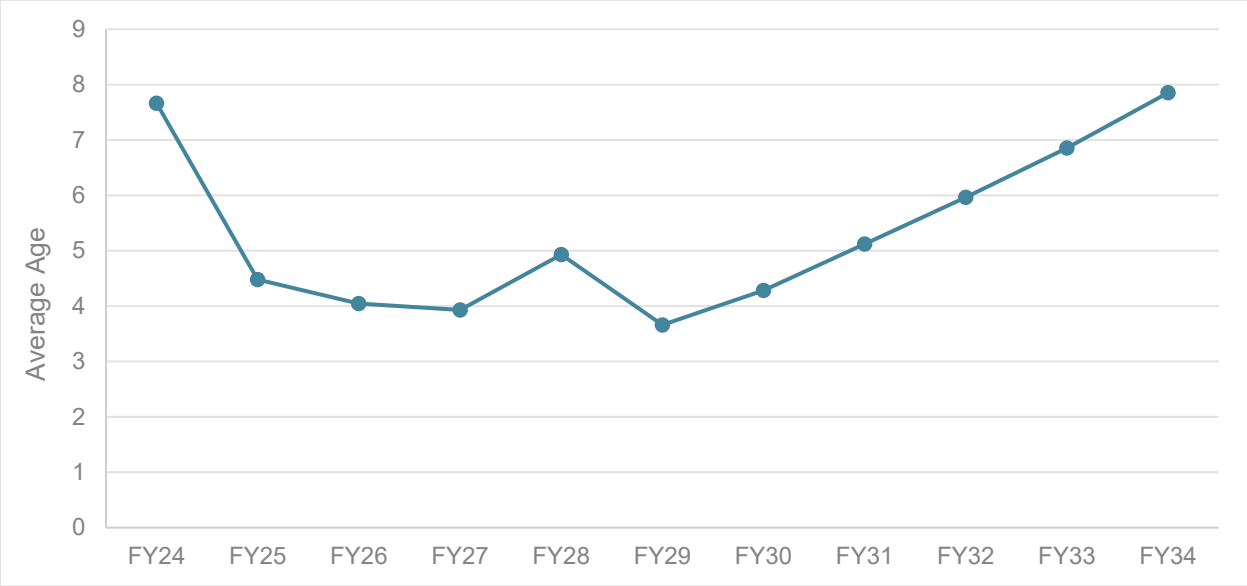
4.2 Capital Implementation Plan

The Capital Implementation Plan (CIP) provides an outline for HDPT to meet its capital needs over the next ten years. The CIP determines the need for replacing and expanding assets such as revenue vehicles, non-revenue vehicles, facilities, and equipment. Fleet replacement is based on the asset's DRPT useful life standard, and fleet expansion is directly related to the service improvements described in Chapter 3. Furthermore, the CIP describes possible transition to zero-emission buses and the accompanying infrastructure improvements to support a zero-emissions fleet. Funding avenues are detailed for asset replacement, expansion, and transition to zero-emissions.

4.2.1 Revenue Fleet

HDPT's 54 vehicle revenue fleet has an average age of 7.61 years in Fiscal Year 2024, as shown in **Figure 28**. The revenue fleet is comprised of 42 full-length diesel buses, four heavy duty cutaways, six light duty cutaways, and two minivans. Fifteen buses are currently beyond their useful life standard, and eight of those buses have exceeded their useful life benchmark. However, fifteen 35-foot transit buses are scheduled for delivery in September 2024. Additionally, the two minivans in the fleet have exceeded their useful life benchmark, missing the 2022 DRPT revenue vehicle performance target of 20 percent.

Figure 28: Revenue Fleet Average Age



As shown in **Table 25**, HDPT is scheduled to replace 45 revenue fleet vehicles and add nine expansion vehicles to its fleet throughout the ten-year Capital Implementation Plan. The replacement and expansion schedules are based on the Six-Year Improvement Program (FY 2024-FY2029) and the City of Harrisonburg Capital Improvement Program (FY 2025-FY 2029). The remaining vehicles are scheduled for replacement after they reach their useful life standard. Heavy duty revenue vehicles are scheduled for implementation two years after the procurement, and HDPT currently does not schedule midlife repowers for its revenue vehicle fleet. Funding sources for replacement revenue fleet vehicles include MERIT State of Good Repair grants and federal capital formula funding.

Six expansion vehicles were identified in the Six-Year Improvement Program and the City of Harrisonburg Capital Improvement Program. Additionally, one expansion vehicle was identified in each of the short-term (FY 2025), mid-term (FY2029), and long-term (FY 2033) service improvements from Chapter 3. The state funding source for revenue fleet expansion includes MERIT grants, and HDPT will identify federal funding from existing programs or discretionary programs.

Table 25: Revenue Vehicle Replacement Schedule by Year Vehicle Enters Service

	FY 24	FY 25	FY 26	FY 27	FY 28	FY 29	FY 30	FY 31	FY 32	FY 33	FY 34
Replacement – Large Bus	15	-	5	4	-	8	-	-	-	-	-
Replacement – Cutaway, Light Duty	2	-	-	2	-	4	-	-	2	-	-
Replacement – Minivan	-	-	2	-	-	-	-	2	-	-	-
Replacement – Total	**17**	**0**	**7**	**6**	**0**	**12**	**0**	**2**	**2**	**0**	**0**
Expansion – Large Bus	-	1	-	-	-	1	5	-	-	1	-
Expansion – Cutaway, Light Duty	-	-	-	-	-	1	-	-	-	-	-
Total Fleet Size	**54**	**55**	**55**	**55**	**55**	**57**	**62**	**62**	**62**	**63**	**63**

4.2.2 Non-Revenue Fleet

HDPT's non-revenue fleet includes fourteen automobiles, and these vehicles have a median age of 16.28 years in Fiscal Year 2024. All fourteen non-revenue vehicles will pass their useful life standard in Fiscal Year 2024, and thirteen non-revenue vehicles will exceed their ULB. Over 90 percent of non-revenue vehicles will have exceeded their ULB in Fiscal Year 2024, therefore HDPT misses the DRPT non-revenue vehicle performance target of 30 percent. Non-revenue replacement vehicles are not included in either the Six-Year Improvement Program (FY 2024-FY 2029) or the City of Harrisonburg Capital Improvement Program (FY 2025-FY29). The replacement schedule in **Table 26** prioritizes vehicles that are more than six years beyond their ULB. Vehicles three to six years beyond their ULB are in the second prioritization tier, and vehicles one to three years beyond their ULB are in the third prioritization tier. All fourteen non-revenue vehicles are scheduled for replacement over the next ten years. HDPT is not expected to expand its non-revenue fleet during that timeframe. Funding sources for replacement non-revenue fleet vehicles include MERIT State of Good Repair grants and federal capital formula funding.

Table 26: Non-Revenue Fleet Replacement Schedule by Year Vehicle Enters Service

	FY 24	FY 25	FY 26	FY 27	FY 28	FY 29	FY 30	FY 31	FY 32	FY 33	FY 34
Replacement	-	-	3	3	3	2	-	3	-	-	-
Expansion	-	-	-	-	-	-	-	-	-	-	-
Total Fleet Size	**14**	**14**	**14**	**14**	**14**	**14**	**14**	**14**	**14**	**14**	**14**

4.2.3 Facilities

HDPT owns and maintains one administration facility and one maintenance facility, which are located on E Washington Street. Neither facility has a rating below 3.0 on the TERM scale, and they are not in immediate need of repair. The City of Harrisonburg Capital Improvement Program lists a variety of planned facility improvements between Fiscal Year 2024 and Fiscal

Year 2028, including the purchase of mobile bus lifts at the central garage in Fiscal Year 2024 and a wash bay replacement in Fiscal Year 2025. The mobile lifts costs are funded through FTA, state, and local funds, while the wash bay replacement is covered entirely by local funds. Expansion of the employee parking lot at the administration and maintenance facility site is planned for Fiscal Year 2025, and funding is split between local and grants. HDPT plans to buy land for a new transit transfer center in Fiscal Year 2025. Local funds will cover the land acquisition, however, HDPT will need to allocate funding for the design and construction of the transfer facility.

4.2.4 Technology and Equipment

Technology and equipment improvements over the ten-year Capital Implementation Plan include the purchase of radios in Fiscal Year 2026, and new on-board intelligent transportation systems in Fiscal Year 2027. Both improvements are funded through State of Good Repair Grants.

4.2.5 Transition to Zero-Emissions

Federal climate change mitigation goals outlined in the FTA and Federal Highway Administration (FHWA) Planning Emphasis Areas include reducing greenhouse gases 50-52 percent below 2005 levels by 2030, and net-zero emissions by 2050. Accordingly, the City of Harrisonburg aims to achieve a carbon neutral transportation system by 2050.

The 2020 Harrisonburg Environmental Action Plan (EAP) instructs HDPT to develop an alternate fuel program and determine the viability and use of electric buses within the fleet by 2025. To date, HDPT has not established a transition plan for a zero-emission fleet. HDPT could take initial steps to transition to a zero-emission fleet by conducting a zero-emission bus feasibility study. Furthermore, HDPT could pilot hydrogen fuel cell or battery electric buses. A complete transition to zero-emissions would require significant investment in infrastructure improvements to support on-site hydrogen fueling or battery electric charging. Funding for zero-emission buses could be achieved through federal Low or No Emissions Grants.

Chapter 5: Financial Plan

Chapter 5 of the Transit Strategic Plan presents the financial plan and provides projections of the anticipated expenditures and revenues over the ten-year Transit Strategic Plan timeframe. This chapter is organized into two sections; the first section discusses the projected operating and maintenance costs and funding sources, and the second section discusses the projected capital costs and funding sources.

5.1 Operating and Maintenance Costs and Funding Sources

5.1.1 Revenue Assumptions

The values presented in each section are based on data provided by HDPT. Projections for future years are calculated using a combination of forecasts provided by the FY 2024 DRPT Six Year Improvement Program (SYIP), and standard escalation rates. As with any projection, it is important to note that the uncertainty increases through time. Therefore, values and figures are subject to change over time. All costs in this chapter have been inflated to year of expenditure dollars (YOE$), using the minimum three percent annual factor specified in the DRPT Transit Strategic Plan Guidelines.

HDPT is still determining whether to continue fare-free service as of the publishing of this document. As a result, HDPT's projected revenues were calculated under two scenarios: a scenario where HDPT maintains fare-free service indefinitely and a scenario where HDPT reintroduces fares. This was done for both the baseline service scenario and the service change scenario.

HDPT operating and maintenance revenue is grouped into six categories: farebox revenue, contract service, advertising revenue, federal funding, state funding, and local funding. Future years beyond the already budgeted FY 2024 are based on the following assumptions.

5.1.1.1 Farebox Revenue

Starting in March 2020 HDPT fixed route service began operating fare-free. HDPT is still determining whether to continue fare free service as of the publishing of this document. As a result, HDPT's projected revenues were calculated under two scenarios: a scenario where HDPT maintains fare-free service indefinitely and a scenario where HDPT reintroduces fares. This was done for both the baseline scenario and the service change scenario.

In the fare-free scenario, no farebox revenue is assumed for the duration of the ten-year TSP timeframe. This assumption was used in both the baseline and service change scenarios. Annual ridership projections for fare-free service are summarized in **Table 27**. Ridership is escalated 1.5 percent annually between the short-, mid-, and long-term service change scenarios to account for further ridership recovery.

Table 27: Projected Ridership for Each TSP Timeframe with Fare-Free Service

Scenario	Year	Baseline Ridership	Ridership Change	Service Change Ridership	Ridership Change
Short-Term	FY 2025	1,351,279	-	1,392,449	-
Mid-Term	FY 2029	1,434,198	82,919	1,504,770	112,322
Long-Term	FY 2033	1,522,206	88,007	1,575,885	71,113

In the reintroduction of fares scenario, fare collection is assumed to resume in FY 2027. Projected farebox revenues were calculated based on FY 2019's farebox recovery rate; FY 2019 was chosen as it was the last full fiscal year before the COVID-19 pandemic. FY 2019 had $130,809 in farebox revenue for 2,120,458 passenger trips, a farebox recovery rate of $0.06 per passenger trip. JMU students and faculty did not pay fares on HDPT buses in FY 2019, and this assumption is continued for the fare reintroduction scenario.

The reintroduction of fares in FY 2027 is expected to immediately decrease system ridership[1]. Since JMU students and faculty did not pay fares on HDPT buses in FY 2019, overall system ridership is anticipated to decrease by only 5 percent compared to the fare-free scenarios. HDPT's FY 2019 farebox revenue of $0.06 per trip was applied to projected ridership in each year to obtain the projected farebox revenue. **Table 28** shows the total projected ridership in each TSP timeframes with fare reintroduction in FY 2027.

Table 28: Projected Ridership for Each TSP Timeframe with Fare Reintroduction in FY 2027

Scenario	Year	Baseline Ridership	Ridership Change	Service Change Ridership	Ridership Change
Short-Term	FY 2025	1,351,279	-	1,392,449	-
Mid-Term	FY 2029	1,362,488	11,209	1,429,532	37,083
Long-Term	FY 2033	1,446,095	83,607	1,517,254	87,721

Source: HDPT TSP Chapter 3

5.1.1.2 Contract Service

HDPT provides contracted service to James Madison University (JMU) and two apartment complexes in Rockingham County. JMU service is negotiated annually. The budgeted revenue from JMU is $2,108,927 in FY 2024, and the two apartment complexes have a total budgeted revenue of $282,220 in FY 2024. In the baseline scenario, both payments are expected to remain at FY 2024 levels with 3 percent escalation year over year to account for inflation.

In the service change scenario, JMU is projected to increase their payment due to service improvements on JMU routes. JMU's contribution percentage from FY 2024 was applied to the estimated increase in the JMU routes' operating expenses, and contributions were also escalated by 3 percent annually.

[1] *Implementation and Outcomes of Fare-Free Transit Systems.* Transit Cooperative Research Program, 2012

5.1.1.3 Advertising Revenue

HDPT's revenues from advertising have steadily decreased since the COVID-19 pandemic. In FY 2019, advertising revenues were $97,800, but HDPT's adopted FY 2024 budget accounts for $80,000 advertising revenue. In the baseline scenario, advertising revenue is projected to remain at FY 2024 levels with 3 percent escalation year over year to adjust for inflation. In the service change scenario, advertising revenue is projected to increase at the same rate as ridership growth, and 3 percent escalation is factored in year over year to account for inflation.

5.1.1.4 Federal Funding

Federal operations assistance funding for HDPT comes from two sources: FTA Section 5307 and Coronavirus Aid, Relief, and Economic Security (CARES) Act (2020) funding. DRPT apportions 5307 funding among small, urbanized transit agencies, including HDPT, based on their respective operating expenses. HDPT's FTA Section 5307 allocation in FY 2024 is $4,691,830, approximately 50 percent of total O&M costs in FY 2024. FTA 5307 operating funding is assumed to be consistent and remain at 50 percent of total operating and maintenance costs for FY 2025 – FY 2034 in both the baseline and service changes scenarios.

HDPT received a significant influx of federal funding during the COVID-19 pandemic and the years following due to the public transit allocations in the CARES Act. The additional federal funding from CARES was allocated through the 5307 apportionments, and the FY 2024 budget contains the last remaining $284,206 in CARES funding. FY 2025 through FY 2034 will receive no CARES funding, thus federal operations funding is expected to decrease immediately in FY 2025.

HDPT also received $168,000 in metropolitan transportation funding through FTA Section 5303 in FY 2024. Section 5303 funding is distributed through the Central Shenandoah Planning MPO, and it is projected to increase 3 percent year over year.

5.1.1.5 State/DRPT Funding

HDPT's state funding is comprised of DRPT Operating Assistance. The FY 2025 DRPT operating funding is from the DRPT Draft FY 2025 Six-Year Improvement Plan (SYIP). FY 2026 – FY 2034 DRPT Operating Assistance funding is based on the change of total Operating Assistance funding estimated in the DRPT FY 2024 SYIP shown in **Table 29.** In the baseline scenario, FY 2026 – FY 2029 DRPT Operating Assistance funding is anticipated to change at the same rate of total state funding. From FY 2030 - FY 2034, DRPT Operating Assistance funding is assumed to increase by an average of 2.0 percent annually.

Table 29: Annual Change in DRPT Operating Funding Estimates

Year	Percent Change from Previous Year
FY 2025 to FY 2026	2.0%
FY 2026 to FY 2027	2.1%
FY 2027 to FY 2028	1.9%
FY 2028 to FY 2029	1.6%

Source: DRPT 2024 SYIP

The projected state operating assistance funds in the FY 2024 budget provide a basis to project HDPT's future state funding. The exact allocation from the state will vary year to year, but it will not exceed 30 percent of an agency's operating budget. This is due to a Virginia statute requiring transit grant funding allocations based on performance[2]. Performance-based allocation of state transit operating funding, which began in FY 2020, accounts for both the size of the agency and the most recent three years of performance data. Sizing metrics are used to correlate funding allocations with the size of the agency and include operating cost (50 percent), ridership (30 percent), revenue vehicle hours (10 percent), and revenue vehicle miles (10 percent). The sizing allocation is then adjusted based on a comparison of the performance data of the agency to other Virginia transit agencies for five performance metrics:

- Passengers per Revenue Vehicle Hour
- Passengers per Revenue Vehicle Mile
- Operating Cost per Revenue Vehicle Hour
- Operating Cost per Revenue Vehicle Mile
- Operating Cost per Passenger

As the allocation of performance-based funding is dependent on HDPT's performance relative to the performance of all transit agencies statewide, reliably projecting state funding allocation is difficult. As a result, the analysis presented in this chapter in the baseline scenario assumes that the state funding received by HDPT is proportional to the statewide operations funding increases projected in the FY 2024 SYIP.

In the service change scenario, the DRPT Operating Assistance was calculated using DRPT's MERIT allocation formula. HDPT's planned service increases in ridership, revenue miles, revenue hours, and operating costs in each TSP timeframe (short-term, mid-term, and long-term) were input into the formula. As previously stated, DRPT Operating Assistance is based on a performance-based allocation, so the future performance of Virginia's other transit agencies needed to be calculated. Future performance was calculated using each agency's FY 2022 input variables and escalated them by the assumptions listed in **Table 30**.

Table 30: Escalation Assumptions for DRPT's MERIT Inputs

Input	Annual Assumption
Ridership	1.5% increase
Revenue Miles	3% increase
Revenue Hours	3% increase
Operating Cost	3% increase
Operating Cost Sizing	2021's Split

Ridership is a major variable in the DRPT MERIT allocation formula, and it is predicted that the reintroduction of fares will decrease ridership. The DRPT MERIT allocation formula was rerun for the fare reintroduction scenario but with HDPT's predicted ridership being reduced by 5

[2] Section 33.2-1526.1 of the Code of Virginia

percent beginning in FY 2027. Consequently, the allocation formula reduced HDPT's operating assistance by 2.5 percent. The 2.5 percent reduction was applied to the DRPT Operating Assistance allocations in fare reintroduction scenario for both the baseline and service change scenarios.

5.1.1.6 Local Funding

Local funding projections are estimated annually for inclusion in the City of Harrisonburg's operating budget produced by the City Manager and City staff and approved by Harrisonburg City Council. Localities in Virginia are required by law to maintain a balanced budget; therefore, local funding for operations for all years was assumed to cover the remaining balance of costs after all other revenue sources are applied. If revenue sources exceed operating costs, no local funding is required.

5.1.2 Ten-Year Financial Plan Scenarios

Four ten-year financial plan scenarios were developed, as illustrated in **Table 31**. The baseline scenario assumes no service changes are implemented during the TSP timeframe, whereas the service change scenario assumes the service changes discussed in Chapter 3 are implemented. HDPT's revenue hours were held constant in the baseline scenario, while the service change scenario has HDPT's revenue hours increasing based on the planned service improvements and their proposed year of implementation. Projected operating expenses reflect an assumed 3 percent escalation rate each year, as well as additional operating expenses associated with any increased service.

Table 31: Ten-Year Financial Plan Scenarios

	Baseline Service	Service Changes (Chapter 3)
Fare-Free	Baseline Service, Fare-Free	Service Changes, Fare-Free
Fares Reintroduced	Baseline Service, Fares	Service Changes, Fares

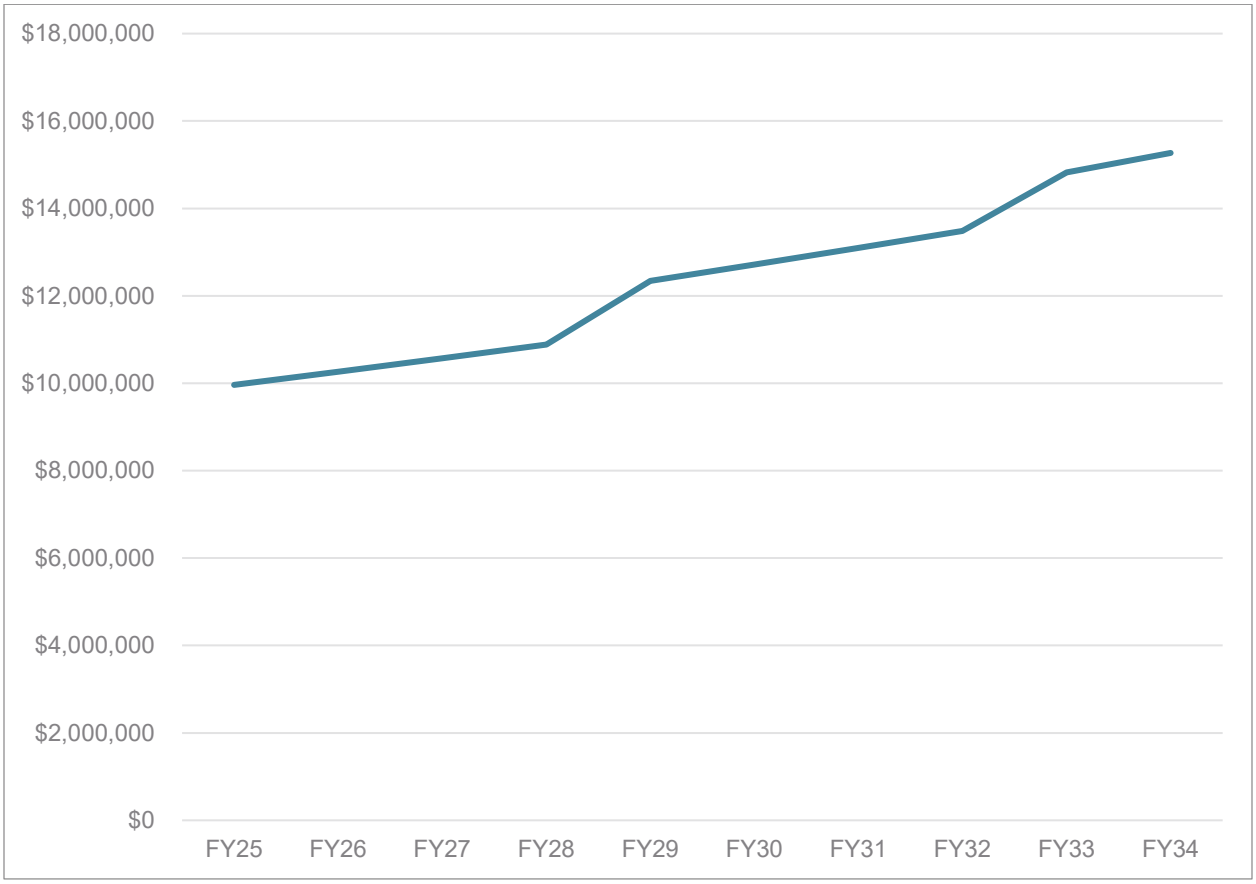
5.1.2.1 Baseline Scenario

Table 32 shows the baseline operations scenario. Operating costs are projected to increase by $2,894,000 over the ten-year TSP timeframe due to inflation. The end of CARES funding will decrease the amount of federal operations assistance HDPT receives in FY 2025. Assuming consistent levels of Section 5307 funding, HDPT's federal funding will remain at a similar level over the ten-year TSP horizon. The reintroduction of fares could offset a portion of the decrease in federal funding, but a reintroduction of fares could decrease HDPT's ridership which would in turn negatively affect HDPT's state operating allocation.

5.1.2.2 Service Change Scenario

The service change scenario, shown in **Table 33,** has higher operating costs due to the expansion of service from the proposed improvements detailed in Chapter 3 of the Transit Strategic Plan. **Figure 29** shows the annual costs of Chapter 3's proposed improvements over the Transit Strategic Plan timeframe.

Figure 29: HDPT's Annual Operating Expenses Over Ten-Year Transit Strategic Plan Timeframe



Source: HDPT Transit Strategic Plan Chapter 3

HDPT will need to secure additional funding to implement the proposed service improvements. As HDPT's service grows, HDPT will become eligible for increased state funding due to the increase in their service and agency size. However, if additional funding is not procured, local funding would increase to $933,000 per year by FY 2034 to maintain a balanced budget; the amount of additional local funding needed would be $916,000 if fares were reintroduced.

Table 34 compares the total revenue hours and operating costs of the baseline and service changes scenarios. The proposed service improvements increase HDPT's total revenue hours by 23 percent to 62,197 revenue hours. HDPT's operating expenses are projected to increase by 66 percent to $15,269,000.

Table 32: Projected HDPT operation Costs and Revenues Under the Baseline Scenario ($1,000s, YOE$)

	FY25	FY26	FY27	FY28	FY29	FY30	FY31	FY32	FY33	FY34
Revenue Hours	50,461	50,461	50,461	50,461	50,461	50,461	50,461	50,461	50,461	50,461
Total Operating Cost	$9,494	$9,779	$10,073	$10,375	$10,686	$11,007	$11,337	$11,677	$12,027	$12,388
Expected Operating Revenue Sources										
Fare Free										
Farebox	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
JMU	$2,172	$2,237	$2,304	$2,374	$2,445	$2,518	$2,594	$2,672	$2,752	$2,834
Rockingham Apartments	$291	$299	$308	$318	$327	$337	$347	$358	$368	$379
Advertising	$82	$85	$87	$90	$93	$96	$98	$101	$104	$108
Federal	$4,920	$5,068	$5,220	$5,376	$5,538	$5,704	$5,875	$6,051	$6,233	$6,420
State	$1,974	$2,013	$2,055	$2,094	$2,128	$2,170	$2,214	$2,258	$2,303	$2,349
Harrisonburg	$55	$77	$97	$123	$156	$182	$209	$237	$267	$298
Reintroduction of Fares										
Farebox	$0	$0	$79	$81	$82	$83	$84	$85	$87	$88
JMU	$2,172	$2,237	$2,304	$2,374	$2,445	$2,518	$2,594	$2,672	$2,752	$2,834
Rockingham Apartments	$291	$299	$308	$318	$327	$337	$347	$358	$368	$379
Advertising	$82	$85	$87	$90	$93	$96	$98	$101	$104	$108
Federal	$4,920	$5,068	$5,220	$5,376	$5,538	$5,704	$5,875	$6,051	$6,233	$6,420
State	$1,974	$2,013	$2,004	$2,042	$2,075	$2,116	$2,159	$2,202	$2,246	$2,291
Harrisonburg	$55	$77	$69	$94	$127	$153	$180	$208	$238	$268

1. Revenue hours remain constant under baseline scenario.
2. Total operating costs are based on HDPT's FY 2024 budget. Future year operating costs are escalated 3 percent annually.
3. All costs are based on the year of expenditure in $1,000s.
4. If revenue sources exceed operating costs, no local funding is required.

Table 33: Projected HDPT Operation Costs and Revenues Under the Service Change Scenario ($1000s, YOE$)

	FY25	FY26	FY27	FY28	FY29	FY30	FY31	FY32	FY33	FY34
Revenue Hours	52,949	52,949	52,949	52,949	58,285	58,285	58,285	58,285	62,197	62,197
Total Operating Cost	$9,962	$10,261	$10,569	$10,886	$12,343	$12,713	$13,095	$13,487	$14,824	$15,269
Expected Operating Revenue Sources										
Fare Free										
Farebox	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
JMU	$2,226	$2,293	$2,361	$2,432	$2,631	$2,710	$2,792	$2,875	$3,061	$3,153
Rockingham Apartments	$291	$299	$308	$318	$327	$337	$347	$358	$368	$379
Advertising	$85	$89	$91	$94	$105	$108	$111	$115	$124	$127
Federal	$5,154	$5,309	$5,468	$5,632	$6,366	$6,557	$6,754	$6,956	$7,631	$7,860
State	$2,239	$2,284	$2,332	$2,379	$2,518	$2,568	$2,621	$2,673	$2,761	$2,816
Harrisonburg	$0	$0	$8	$31	$395	$432	$470	$510	$879	$933
Reintroduction of Fares										
Farebox	$0	$0	$82	$83	$86	$87	$88	$90	$91	$92
JMU	$2,226	$2,293	$2,361	$2,432	$2,631	$2,710	$2,792	$2,875	$3,061	$3,153
Rockingham Apartments	$291	$299	$308	$318	$327	$337	$347	$358	$368	$379
Advertising	$85	$89	$88	$92	$98	$103	$107	$112	$117	$123
Federal	$5,154	$5,309	$5,468	$5,632	$6,366	$6,557	$6,754	$6,956	$7,631	$7,860
State	$2,239	$2,284	$2,274	$2,319	$2,455	$2,504	$2,555	$2,606	$2,692	$2,746
Harrisonburg	$0	$0	$0	$10	$379	$415	$451	$490	$864	$916

1. Revenue hours remain constant under baseline scenario.
2. Total operating costs are based on HDPT's FY 2024 budget with increases in operating costs sourced from Chapter 3 of the Transit Strategic Plan. Future year operating costs are escalated 3 percent annually.
3. All costs are based on the year of expenditure in $1,000s.
4. If revenue sources exceed operating costs, no local funding is required.

Table 34: Projected Operating and Maintenance Costs for Service Additions ($1000s, YOE$)

	FY25	FY26	FY27	FY28	FY29	FY30	FY31	FY32	FY33	FY34
Existing System										
Revenue Hours	50,461	50,461	50,461	50,461	50,461	50,461	50,461	50,461	50,461	50,461
Existing Operating Cost	$9,494	$9,779	$10,073	$10,375	$10,686	$11,007	$11,337	$11,677	$12,027	$12,388
Service Additions										
Additional Revenue Hours	2,488	N/A	N/A	N/A	5,336	N/A	N/A	N/A	3,912	N/A
Additional Operating Costs	$468	N/A	N/A	N/A	$1,130	N/A	N/A	N/A	$932	N/A
Totals										
Total Revenue Hours	52,949	52,949	52,949	52,949	58,285	58,285	58,285	58,285	62,197	62,197
Total Operating Costs	$9,962	$10,261	$10,569	$10,886	$12,343	$12,713	$13,095	$13,487	$14,824	$15,269
Difference										
Operating Cost Difference	$468	$482	$497	$512	$1,657	$1,707	$1,758	$1,810	$2,797	$2,881

1. Costs are stated in year of expenditure dollars, with the assumed annual escalation rate of 3 percent.
2. Operational changes include only changes that incur additional operating costs.
3. All costs in $1,000s.

5.2 Capital Costs and Funding Sources

The anticipated capital costs presented in this section are informed by the implementation plan presented in Chapter 4 and are grouped into vehicle purchase costs, facility costs, and other capital costs. Chapter 4 should be referenced for additional information regarding the planning of these capital purchases.

5.2.1 Vehicle Purchase Costs and Funding Sources

HDPT's vehicle replacement schedule discussed in Chapter 4 shows the anticipated new vehicle needs for each year in the Transit Strategic Plan timeframe. The anticipated vehicle costs by year are shown in **Table 35.** HDPT will spend an average of $1,776,000 annually over the ten-year Transit Strategic Plan timeframe. FY 2028 will incur the highest single-year capital costs for vehicle purchases as $5,886,000 is expected for the purchase of the necessary vehicle expansion and replacements.

The capital funding for vehicle purchases will be split between federal, state, and local sources. HDPT's replacement bus purchases will be placed in the State of Good Repair category for DRPT's Making Efficient and Responsible Investments in Transit (MERIT) capital assistance funding, and each years' expansion purchases will be placed in the Minor Enhancements category. For State of Good Repair funding, total capital funding for these purchases is divvied between the three funding sources with 28 percent of funding coming from federal, 68 percent from state, and 4 percent from local. For Minor Enhancement funding, total capital funding for these purchases is divvied between the three funding sources with 80 percent of funding coming from federal, 16 percent from state, and 4 percent from local. No single year in the TSP timeframe is planned for a purchase of more than five expansion vehicles, so all expansion vehicle purchases are classified under the Minor Enhancement category.

Table 35: Financial Plan for Funding Vehicle Purchases ($1000s, YOE$)

Vehicle Classification[3]	FY25	FY26	FY27	FY28	FY29	FY30	FY31	FY32	FY33	FY34
35-ft Diesel	$3,526	$2,424	-	$5,785	$3,310	-	-	$702	-	-
Cutaway Diesel	-	-	$291	-	$772	-	-	$337	-	-
Minivan	-	$64	-	-	-	-	$74	-	-	-
Support Vehicles	-	$95	$98	$101	$70	-	$111	-	-	-
Total Vehicle Costs[4]	**$3,526**	**$2,583**	**$389**	**$5,886**	**$4,152**	**$0**	**$184**	**$1,061**	**$0**	**$0**
Anticipated Funding Source										
Federal	$987	$723	$109	$1,648	$1,162	-	$52	$297	-	-
State	$2,398	$1,756	$265	$4,003	$2,823	-	$125	$721	-	-
Local	$141	$103	$16	$235	$166	-	$7	$42	-	-

Source: Vehicle costs identified in Chapter 4 of the Transit Strategic Plan

5.2.2 Facility Improvement and Other Capital Costs and Funding Sources

In addition to vehicle costs, HDPT has capital needs to improve facilities, passenger amenities, and technology over the course of the Transit Strategic Plan life cycle. As mentioned in Chapter 4, The City of Harrisonburg Capital Improvement Program lists a variety of planned facility improvements between Fiscal Year 2025 and Fiscal Year 2029, including the purchase of a wash bay replacement in Fiscal Year 2025 covered entirely by local funds. Expansion of the employee parking lot at the administration and maintenance facility site is planned for Fiscal Year 2026, and funding is expected to be split between local funding and federal grants. HDPT plans to buy land for a new transit transfer center in Fiscal Year 2026. Local funds will cover the land acquisition, however, HDPT will need to allocate funding for the design and construction of the transfer facility. Additional improvements include the purchase of radios in Fiscal Year 2026, and new on-board intelligent transportation systems in Fiscal Year 2027. Both improvements are funded through State of Good Repair Grants.

Table 36 shows the anticipated capital cost by category by year, as well as anticipated revenue from federal, state, and local funding sources. The greatest local funding need occurs in FY 2026, where a need of $1,345,000 in local funding is estimated, primarily due to buying land for a transfer center in addition to the employee parking lot expansion. Facility improvements and other capital costs are funded by a combination of federal, state, and local dollars.

[3] Vehicle purchases through State of Good Repair funding assumes 28% funding through FTA (Section 5339 program), 68% from State, and the remaining 4% from local. Minor Enhancement funding assumes 80% funding through FTA (Section 5339 program), 16% from State, and the remaining 4% from local

[4] All costs assume a 3% escalation rate.

Table 36: Facilities Costs ($1000s, YOE$)

	FY25	FY26	FY27	FY28	FY29	FY30	FY31	FY32	FY33	FY34
Anticipated Costs[5]										
Facilities										
Purchase Land for Transfer Center		$1,000								
Wash Bay Improvement	$450									
Employee Parking Lot Expansion		$650								
Passenger Amenities										
Passenger Shelters and Benches	$105			$85						
Technology										
ITS On Board System			$3,000					$4,000		
Purchase Radios		$15								
Total	$450	$1,665	$3,000	$85	$0	$0	$0	$0	$0	$0
Funding Sources										
Federal		$318	$2,040	$68						
State		$2	$840	$14						
Local	$450	$1,345	$120	$3						

Source: Costs identified in the FY 2024 DRPT Six Year Improvement Program and the City of Harrisonburg Capital Improvement Program (FY 2025-FY 2029).

[5] Purchases through State of Good Repair funding assumes 28% funding through FTA (Section 5339 program), 68% from State, and the remaining 4% from local.