

APPENDIX D

On-Demand (Microtransit) Service



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Appendix D: On-Demand Microtransit Service

D.1 Overview

Appendix D documents how on-demand microtransit has been an integral part of the *Transit Transformation Project* and Transit Strategic Plan process and the next steps toward future implementation through initial pilot projects.

The transportation marketplace is continuously evolving. Reliable fixed-route bus service is the centerpiece of public transportation in communities across the United States. This will continue to be essential for Hampton Roads. At the same time, it is essential for agencies to adapt and innovate to meet the needs of current and would-be customers as the mobility landscape changes.

One of the specific goals of the *Transit Transformation Project* was to “think outside the box to propose solutions to operational, service provision, and financial issues: consider testing and revisiting new service/service changes, pilots for new technologies and mobilities, different service patterns for different areas, etc.”

HRT embraces this concept as part of its vision to function as a **progressive mobility agency** and to fulfill its mission to **connect Hampton Roads with transportation solutions that are reliable, safe, efficient, and sustainable.**

HRT believes that achieving this vision and mission must include exploring new partnerships, service models, and leveraging new technologies. Exploring on-demand “microtransit” operations is an example of this.

Figure D-1: Example of On-Demand Shuttle Vehicle



The new regional standards outlined in **Chapter 1** will guide the design and operation of different types of services in the years ahead. This includes “On-Demand” as one of five new classifications of HRT route types. Another term for this is “microtransit.” In contrast to fixed-route bus services, microtransit is characterized by flexible on-demand scheduling, routing, and customer experiences that resemble private industry ride-hailing, ride-sharing activities. This will be a new type of service in Hampton Roads. **Table D-1** shows the characteristics of the On-Demand service classification.

Table D-1: On-Demand Classification

Route Classification	Description	Interjurisdictional	Population / Job Density
On-Demand	On-Demand transit service will operate in specified zones, connecting lower-density areas to local destinations and transfer opportunities to fixed-route service.	Can operate within a jurisdiction or cross jurisdictional boundaries.	Densities warrant transit service but are low enough that regular fixed route service would be less effective

D.2 Strategic Approach

HRT believes on-demand service is an important innovation that needs testing in Hampton Roads. Microtransit may effectively serve multiple goals and objectives (e.g., new transit usage, more cost-effective operations to replace lesser-performing service, etc.). A pilot project(s) approach would be ideal to assess this. This would allow

for experimentation so that microtransit's viability can be evaluated in different use cases. The objective is to empirically determine how on-demand service characteristics and performance may work as a sustainable new travel option, especially as compared to fixed-route bus service.

The specific approach for piloting microtransit would be to use small- or medium-size vehicles to operate within a pre-defined zone or zones to provide transit trips based on passenger requests. Results of pilot projects would ultimately inform broader planning and implementation efforts, which in turn would be included in updates to HRT's Transit Strategic Plan.

D.3 Background: Preliminary Planning Snapshot

As part of a potential bus system redesign and implementation of new services, the *Transit Transformation Project* planning team identified several "flex zones" in which new on-demand services could potentially be deployed. Seven zones were initially identified. At HRT's direction, an additional zone was subsequently analyzed for the City of Newport News using other professional service resources, bringing the number of zones to eight, with at least one in each HRT member city.

The basic concept was for on-demand transit service to potentially operate in these specified zones, connecting lower-density areas to local destinations and transfer opportunities to fixed-route service (for example, connecting to the Regional Backbone high-frequency bus system). As initially conceived, these zones were relatively small in size (an average of 8.6 square miles) and located strictly within a city's boundaries rather than crossing any jurisdictional boundaries.

As the planning process evolved, HRT recognized the need to consult more in-depth with experts who work directly in planning and operating microtransit. For this purpose, HRT contracted with RideCo.

D.4 Additional Due Diligence Planning

RideCo assisted HRT to further evaluate and improve upon the eight preliminary flex zones. This resulted in significant modifications and improvements for defining the most feasible operating scenarios in these areas.

D.4.1 Methodology

Each zone was evaluated and scored based on seven criteria. These high-probability success criteria included:

- **Local, limited stop, regional express, and seasonal bus**
- **Zone Size & Boundaries:** Ideal zone size spans from 10 to 35 square miles; rounded shape (not too long/narrow)
- **Population Density:** Population plus Jobs > 35,000; density to warrant transit, but low enough that high-quality fixed route is ineffective
- **Land Usage:** Combination of residential, commercial and sometimes industrial; not overly concentrated in any one of these; potential to serve many types of trips, e.g. commute, shopping, seniors, students
- **Major Points of Interest:** 1 to 5 major points of interest that serve many trips per day, e.g., high-quality transit hub, large mall, Costco, Target, Walmart; characteristics that typically drive repeat usage
- **Income Levels:** Best adoption is typically in areas of medium to medium-low wealth bracket; patrons that are price sensitive
- **Connection to Existing Transit:** High-quality transit connections that leave the zone (e.g. LRT, frequent bus); little overlap with transit within the zone
- **Community Trips:** Evaluated for strong intra-zone travel patterns; commutes, local trips, shopping, etc.

Empirical data was combined in a zone quality index. The index aggregated independent scores from the analysis of each high-probability success criteria, for each zone, resulting in a standardized score for zone strength. HRT provided route, cost, and ridership data for existing services, as needed, and population and employment data

based on U.S. Census. A workshop with HRT cities was conducted October 24, 2019, reviewing outcomes from this additional due diligence work and solidifying zones and use cases that fit best for a Regional Microtransit Demonstration Project.

Based on this methodology, initial zones identified in Hampton and Norfolk did not merit further consideration for an initial round of pilot projects.¹ The zones that were considered include:

- **Zone 1:** Portsmouth
- **Zone 2:** Virginia Beach West
- **Zone 3:** Virginia Beach East
- **Zone 4:** Chesapeake
- **Zone 5:** Hampton
- **Zone 6:** Norfolk
- **Zone 7:** Virginia Beach Salem
- **Zone 8:** Newport News

Meanwhile, as shown in **Table D-2**, Zone 2 (Virginia Beach West) and Zone 8 (Newport News) were highest rated by RideCo’s methodology. Follow up meetings with Newport News and Virginia Beach further scrutinized these zones to finalize initial planning to pilot on-demand (microtransit) service. In January 2020, HRT submitted a FY 2021 demonstration grant request to the Virginia Department of Rail and Public Transportation to help fund the Regional Microtransit Demonstration Project.

Table D-2: On-Demand Success Criteria

High-Probability Success Criteria	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8
	Portsmouth	Virginia Beach West	Virginia Beach East	Chesapeake	Hampton	Norfolk	Virginia Beach Salem	Newport News
Overall Average	4.9	5.6	4.0	2.9	-	-	5.3	5.4
Zone Boundaries	6	5	5	5	-	-	6	5
Population + Jobs	5	6	4	4	-	-	6	6
Land Usage Distribution	6	4	5	2	-	-	6	5
Major Points of Interest	4	6	2	3	-	-	6	5
Income Levels	4	6	3	2	-	-	4	5
Connection to Existing Transit	5	6	5	2	-	-	6	6
Community Trips	4	6	4	2	-	-	3	6

D.5 Pilot Project(s) Recommendation Summary

Based on consultation with experts, HRT expects average wait times of 15-20 minutes or less when deploying a fleet of small vehicles in each zone initially recommended for piloting on-demand microtransit. The innovation objective would be to leverage cloud-based route optimization technology and app-based booking of rides to move people around the defined zones with better frequency and shorter trip times than offered by some

¹ At Hampton’s request, Zone 5 was subsequently reevaluated, and a new Hampton East zone identified; this zone is subject to further scrutiny and HRT will work with the City of Hampton before the next annual TSP update to identify the correct demand responsive service to cover areas losing service due to the planned elimination of Route 118.

conventional fixed-route transit options, and in geographies traditionally harder to serve with conventional fixed-route transit efficiently.

D.5.1 Zone Descriptions

Newport News - Zone 8

The unique, elongated northwest-southeast shape of Newport News has over time lent to development and concentration of more commercial and mixed-use activities along in the middle portion of the city (westward), generally aligned along Jefferson Boulevard, and more residential and lower-density development generally aligned with Warwick Boulevard in areas eastward. Fixed-route bus services along major arterial roadways has effectively supported north-south travel. However, achieving effective east-west transit connectivity has been a challenge, which on-demand service could potentially help remedy. Employment and residential densities are shown in **Figure D-3** and **Figure D-4**.

Figure D-3: Zone 8 Employment Density

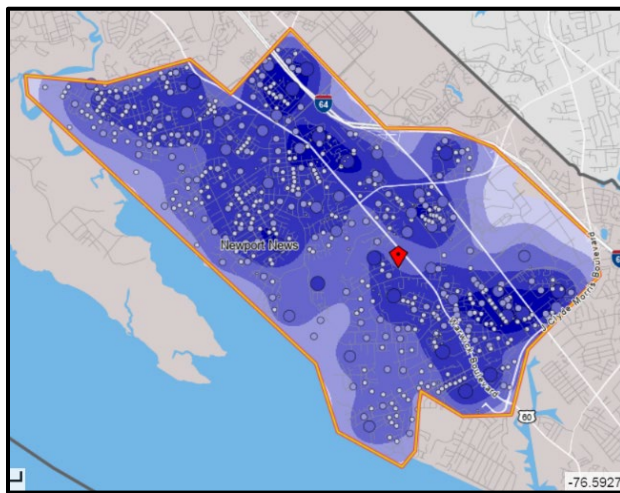


Figure D-6: Zone 8 Residential Density

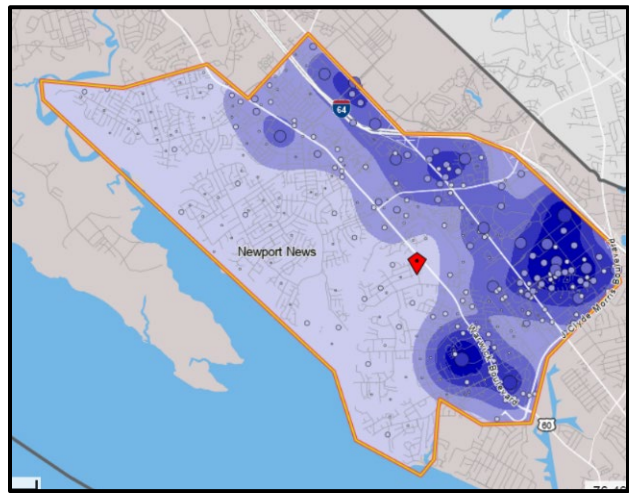
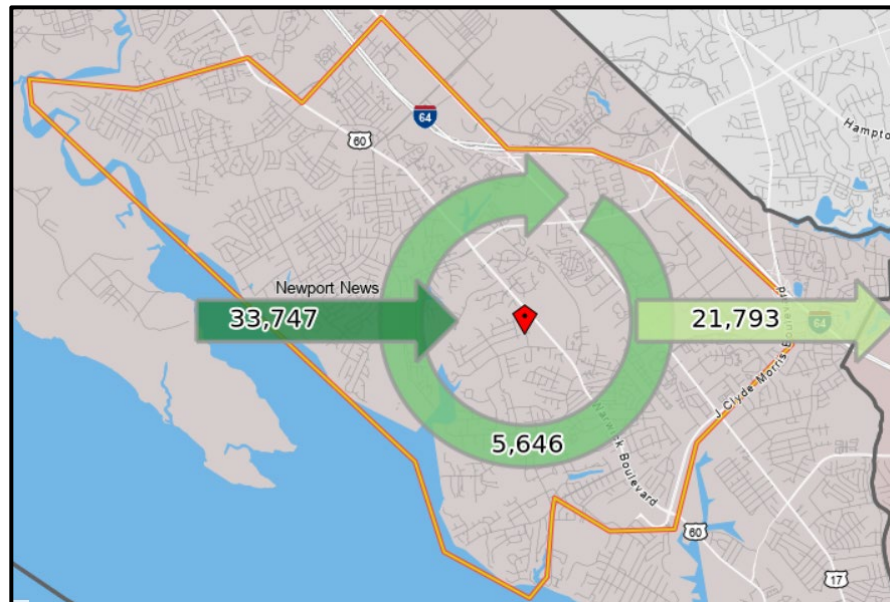


Figure D-5: Zone 8 Inflow, Outflow and Intra-Zone Commutes



Virginia Beach West – Zone 2

Zone 2 in Virginia Beach seeks to connect residents to the Newtown LRT terminus and other intra-zone points. This zone serves people who live in residential areas northward and directly connects to job centers via access to the commercial and economic activity concentrated along Virginia Beach Boulevard.

Figure D-5: Zone 2 Employment Density

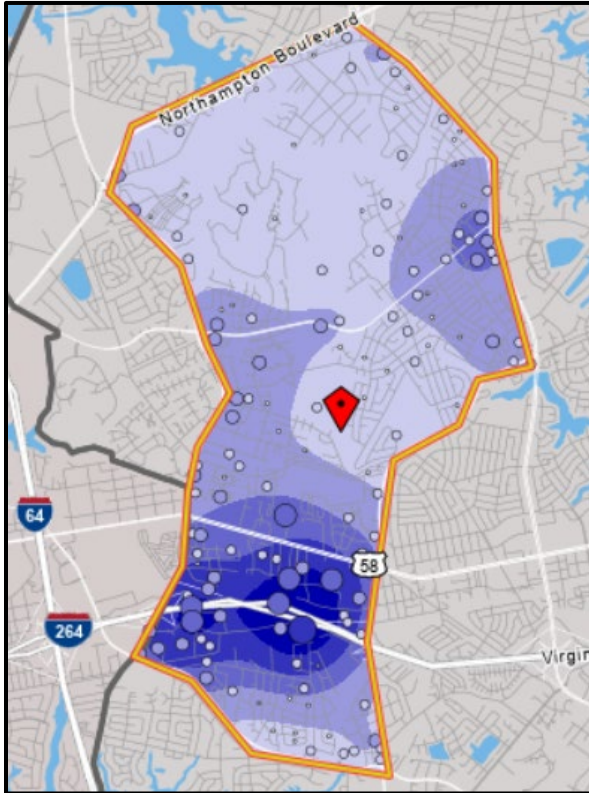


Figure D-6: Zone 2 Residential Density

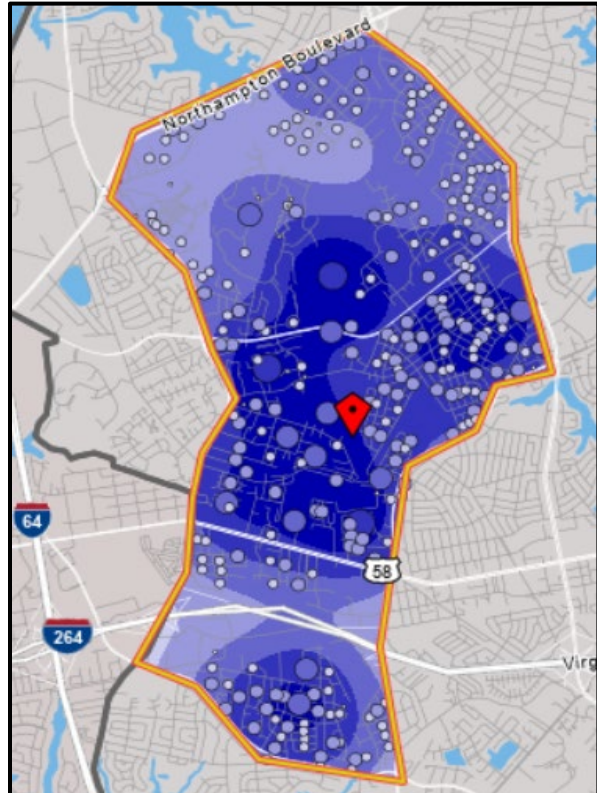
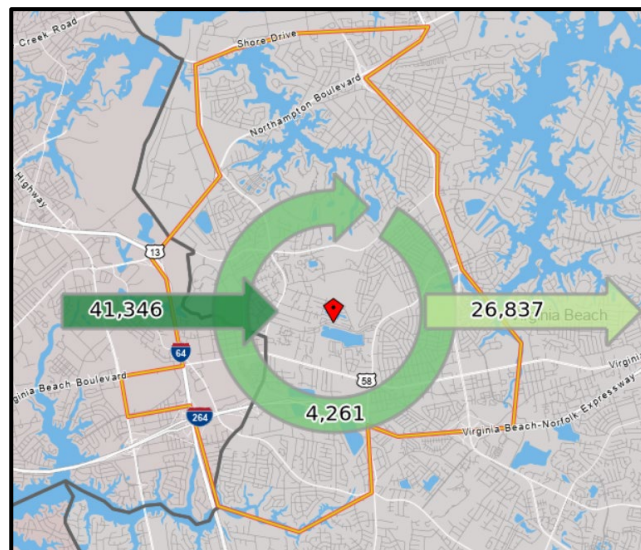


Figure D-7: Zone 2 Inflow, Outflow and Intra-Zone Commutes



D.5.2 Project Design

As noted above, microtransit could effectively serve multiple goals and objectives (e.g., new transit usage, more cost-effective operations to replace lesser-performing service, etc.). Unique factors will affect the success and lessons learned for new on-demand service in any particular zone.

Depending on costs and available resources, initially piloting services in only one zone may be warranted. An intentional two-city pilot design, however, would allow for clear differentiation and comparative post-hoc assessments to provide HRT and others with the richest possible data and learning to be shared.

D.6 Conclusion

The justifications and benefits for piloting on-demand transit services in the HRT service area include:

- Allowing the region to effectively determine microtransit as a feasible alternative and complement to fixed-route transit with respect to customer experiences, performance KPIs, and cost-effectiveness
- Exploring new markets for transit that could reduce reliance on single-occupancy vehicles
- Enabling HRT to enhance organizational capacities (i.e., human resources, organizational learning, etc.) for innovation, service planning, customer-centric operations, and responsiveness to the dynamic environment
- Supporting knowledge transfer to benefit other agencies as HRT partners with the Virginia Transit Association and others to document and share lessons learned via webinars, conference presentations, and other information sharing opportunities
- Informing updates to 10-year the Transit Strategic Plan that will further refine and potentially expand the use of on-demand services throughout the HRT service area, in accordance with new regional standards and route classifications
- Aligning with a mission and vision of becoming a progressive mobility agency that provides transportation solutions that are reliable, relevant and responsive to the needs of today's commuters.