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1. Overview of YVEDDI and Transportation Program

The Yadkin Valley Economic Development District, Inc. offers an array of services to a four-county area benefiting at-risk populations. YVEDDI was organized in 1965, and is “dedicated to improving the lives of individuals and families in Davie, Stokes, Surry, and Yadkin Counties through a variety of programs and partnerships to build stronger communities”. The YVEDDI Transportation Program provides transportation to the general public, along with several human services agencies throughout the four-county area. Many agencies are served by YVEDDI Transportation, and below is a list:

- Department of Social Services: Non-Emergency medical transportation for Medicaid eligible clients
- Headstart: A preschool program that assists children with developmental learning and preparation for kindergarten
- Hugh Chatham, Willowbrook, Stokes Skilled, Elkin Health Care, and Bermuda Commons: Nursing facilities providing long-term care for the elderly, and disabled and rendering speech, physical, and occupational therapy.
- Lifespan: A day program, which provides work experience and organized activities for developmentally disabled adults, preparing them to live as independently as possible
- Senior Centers: Educational and social programs for senior adults
- Senior Nutrition Programs: Congregate meals for senior citizens at selected sites
- YVEDDI Inc.: Sponsors OAA, CSBG, Headstart, and migrant Headstart programs

These programs benefit the community at-large and YVEDDI plays an integral role in their operation and development.

YVEDDI Transportation has been operating since the 1970s. YVEDDI currently runs fixed-route circulator service throughout Elkin, with stops including Wal-Mart, and the Elkin Center. Figure 1, depicts the July 2017 Elkin Circulator Schedule.

Figure 1:

Stop Point NEW Schedule 10/8/18	Schedule Time										
	AM					PM					
Elkin Municipal/Town Hall 226 N. Bridge St. Elkin NC 28621	7:15	8:15	9:15	10:15	11:15	12:15	13:15	14:15	15:15	16:15	17:15
Walmart 548 C.C. Camp Road Elkin NC 28621	7:30	8:30	9:30	10:30	11:30	12:30	13:30	14:30	15:30	16:30	
Food Lion-Elkin 1526 N. Bridge St Elkin NC 28621	7:40	8:40	9:40	10:40	11:40	12:40	13:40	14:40	15:40	16:40	
Ingles-"Deviation Only" 2095 N Bridge St, Elkin, NC 28621	7:43	8:43	9:43	10:43	11:43	12:43	13:43	14:43	15:43	16:43	
Elkin Cr SCC- "Deviation Only" 1461 N Bridge St, Elkin, NC 28621	7:45	8:45	9:45	10:45	11:45	12:45	13:45	14:45	15:45	16:45	
Turner Court Apartments 202 Turner Ct. Elkin NC 28621	7:50	8:50	9:50	10:50	11:50	12:50	13:50	14:50	15:50	16:50	
Food Lion-Jville "Deviation Only" 101 Valley Dr. Jonesville, NC 28642		9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00		
Senior Center-Jville "Deviation Only" 121 Delos Martin Dr Jonesville NC 28642		9:10	10:10	11:10	12:10	13:10	14:10	15:10	16:10		

Deviation upon request only

Source: Yadkin Valley Economic Development District, Inc. (2018)

The YVEDDI transit service in the Town of Elkin is popular among a variety of people and sees frequent repeat ridership.

Current YVEDDI fixed route circulator service is analyzed, briefly, in this report and forms the basis as to why YVEDDI is considering converting this route to microtransit.

2. Previous Studies and Transportation and Transit Goals

This section discusses regional, county, and town-wide goals concerning transportation in the area of Elkin that the YVEDDI transit service area operates. Studies reviewed include the Piedmont Triad Area Agency on Aging – Four-Year Area Plan on Aging Update (2021-2024), Surry County Comprehensive Transportation Plan (2012), Surry County Coordinated Public Transit- Human Services Transportation Plan (2016), and Towns of Elkin and Jonesville Comprehensive Transportation Plan (2012). All of these plans provide a -snapshot of transportation goals and a vision for transportation services into the future. These goals will be analyzed and provide a basis for the YVEDDI Elkin Microtransit service.

2.1 Piedmont Triad Area Agency on Aging Plan (2021-2024) – Piedmont Triad Regional Council (PTRC)

Surry’s aging population constitutes a high percentage of riders in the YVEDDI transit service. Concepts such as ‘aging in place’ are essential to the wellbeing and quality of life of our older populations. To ‘age in place’, services often need to exist to facilitate adult independence and mobility. The services YVEDDI offers aid older adults in ‘aging in place’ and improve their access to essential services and recreational endeavors.

The *Well Informed Communities* section of the Aging Plan includes:

- Goal 3: Support and encourage older adults of all backgrounds and their support systems to access information that helps them make informed choices about support services at home or in the community.

In service to this goal is Objective 3.1, which states “Ensure older adults and the agencies who serve them are educated on the availability of services that foster independence, self-sufficiency, and enhanced planning for long-term needs.” YVEDDI transportation service aids this goal by offering a method for older adults to increase their mobility, thereby increasing their independence.

2.2 Surry County County Comprehensive Transportation Plan (2012)

The NCDOT and Surry County initiated a Comprehensive Transportation Plan for Surry County in April 2010. The CTP notes “Two fixed bus routes are recommended to circulate throughout Mount Airy, Dobson and Elkin”, for Public Transportation or Rail within it for Surry County. The CTP does mention YVEDDI serves needs in the Surry rural setting via on-demand public transportation service for general public and particular clients. Since the time of the CTP, YVEDDI implemented an updated fixed-route transit service serving the Town of Elkin. The CTP also indicates the existing and planned (at the time) fixed public transportation routes for the Surry area. They are: the Piedmont Authority for Regional Transportation (PART) operating a bus route into Mount Airy; and the Surry County Express Route, from Winston-Salem on US 52 to Mount Airy, with two Park-and-Ride Lots, located on S. Key Street (NC 268) and Golf Course Road (SR 2098) behind Surrey Bank. Given YVEDDI operates a multi-county transportation system, YVEDDI is fulfilling NCDOT goals through its transit operations in the rural Yadkin-Stokes-Surry-Davie region.

2.3 Surry County Locally Coordinated Public Transit- Human Services Transportation Plan (2016) (p.30)

The Locally Coordinated Public Transit – Human Services Transportation Plan for Surry County was created by the Northwest Piedmont RPO, and Piedmont Triad Regional Council. Yadkin Valley Economic Development District, Inc. has a section within this report, having a general overview of the available services YVEDDI provides. The Plan describes funding and policies regarding human services transportation and the populations the program serves. Through public outreach and stakeholder engagement, the Plan identified transportation needs throughout Surry County. These needs include:

- Improved logistics
- C-GAP Communications
- Expanded Partnerships
- Improved Marketing & Information
- Future Advanced Improvements

All of these needs were expanded upon by topic, with goals, and are depicted in Table 1, below with an ‘X’ indicating which goals and improvements YVEDDI has implemented or is working on.

Table 1: Surry County Transportation Needs

Improved Logistics		
Priority Strategies	Barriers to Implementation	
Expand municipal circulator routes	Funding	X
Extended routes to rural areas	Local Opposition	X
Extended service hours	Misinformation	
Improve network of connected routes	Lack of Local Support from Those Who Need It	X
Improve employment transportation options		X
Investigate additional funding options		X
C-GAP Communication		
Priority Strategies	Barriers to Implementation	
Improved Communication Between City and County Planners and Transit Providers	No Buy-in From Community Leaders	X
Improved Communications with Local Elected Officials	Apathy	X
Improved Communications Between Adjacent Transit Providers	Lack of Education	X
	Competition	
	Fear of Financial Obligations	
Expanded Partnerships		
Priority Strategies	Barriers to Implementation	
Provide Voluntary Driver Incentives	Inability to Find Willing Volunteers	
Organize Volunteer Uber Ride Sharing Service	Coordination and Planning Difficulties	
Utilize Church Transportation Services	Liability, Particularly As It Relates to Church Transportation	
	Attitudes and Stereotyping	
	Funding	
Improve Marketing & Information		
Priority Strategies	Barriers to Implementation	
Increase Overall Marketing	Funding	X
Additional Public Education Efforts, Especially to Older Adults	Reaching the Correct Demographics	X
Intentional Distribution, Especially Outside of Town Centers	Reaching Rural Areas	X
Improved Technology and Social Media	Making Sure the Message is Effective	X
Spanish Materials		X
Future Advanced Improvements		
Priority Strategies	Barriers to Implementation	
Improved Advanced Technology Including: Apps, GPS Services, and other technological improvements designed to improve cost effectiveness and services provided	Funding	X
	Lack of Community Vision	X

Improved Access to Fixed Routes Including: Bus shelters, Sidewalk/Bicycle Improvements Near Bus Stops	
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Source: Yadkin Valley Economic Development District, Inc.

Current YVEDDI service in the Town of Elkin is fixed route as described in Figure _ in the first section above. The transition to microtransit and further upgrade of YVEDDI software will better serve Elkin, as clients would be dropped off and picked up from any point, and scheduling updates would be captured by the software manifest en-route, so drivers would not have to manually keep track of out-of-system real-time updates to their routes, thereby making scheduling more efficient.

2.4 Towns of Elkin and Jonesville Comprehensive Transportation Plan (2012)

The Elkin and Jonesville Comprehensive Transportation Plan was created by the NCDOT, Town of Elkin, Town of Jonesville and Northwest Piedmont Rural Planning Organization. This long-range multi-modal transportation plan created a vision for town needs through the year 2040. The goals of this vision, concerning public transit in relation to YVEDDI service, are discussed below.

One proposed route was included in the Plan regarding fixed route transit in Elkin. The Piedmont Authority for Regional Transportation (PART) 2010 Regional Transit Development Plan recommended three fixed-route bus service routes. For purposes of this study, the route in relation to YVEDDI service is the Dobson-Elkin Circulator Route. The fixed-route was proposed to extend west from Dobson to Exit 93 on I-77 and continue south along I-77 to Elkin. Deviating from YVEDDI service, this route was proposed as a park-and-ride facility circulator, offering service to the park-and-ride facility on Johnson Ride Road (SR 1144) serviced by an extension of Route 13, Yadkin County Express and the proposed Yadkin County NC 67 Express. This route related to YVEDDI service by categorization as fixed-route service, but YVEDDI offers fixed-route service in Elkin to match the current needs of town residents. This service fills the gap of this CTP, in which it states “currently, there are no fixed public transportation routes serving the area”. YVEDDI has served the Town of Elkin with fixed-route service for quite some time, thereby fulfilling area-wide goals of PART and the NCDOT.

3. Existing Elkin Transit Service

Current Elkin transit service was updated in 2020 to cope with the effects of the COVID-19 pandemic. Rather than a fixed circulator route with static bus stops, YVEDDI utilized its existing technology to upgrade to demand-response service, in which passengers call the dispatcher and arrange to be picked-up and dropped off at a certain time. This service has been in operation since the start of the pandemic and has been widely well received throughout the community. The following sub sections detail existing YVEDDI transit service in the Town of Elkin.

3.1 System Trips Data

The System Trips section of the report explains current YVEDDI service at a close-up view. Day-to-day operations are discussed to give an idea of what regular service looks like and how riders utilize current YVEDDI service. This is a snapshot of the pandemic response demand-response YVEDDI transit service in Mocksville.

Methodology

This section of the report discusses the process used to gather data on YVEDDI transit system trips for the Elkin transit routes. Trip data was gathered over the course of one week, from September 27th through October 1st. Trip reports were compiled from transit software and analyzed in Microsoft Excel (see Appendix A for entire dataset). Reports for each trip, vehicle, and driver were analyzed with driver identification information omitted. Data gathered include pickups (PU), drop-offs (DO) (Trip Type), number of trips (# of Trips, time of day of pickup and drop-off (Time of Day), duration of each trip leg (Duration), and trip purpose and or location (Trip End (Purpose)). An example of a Trip Number and Vehicle Number report for Monday, August 23, 2021 is depicted in Figure 2 below.

Figure 2:

Trip #	Veh. #	Trip Type	# of Trips	Time of Day	Duration	Trip End (Purpose)	Miles Travelled	
6129	4434							
		PU-1a	1	7AM-10AM	0:30	Home - Dialysis Davie	5	
		PU-2b	1	10AM-2PM	0:20	Home - Dialysis Davie	4	
		DO-1a	1	10AM-2PM	0:25	Home - Dialysis Davie	3	
		PU-3c	1	10AM-2PM	0:15	Home - Dialysis Davie	3	
		DO-2b	1	10AM-2PM	0:15	Home - Walmart	2	
		DO-3c	1	10AM-2PM	0:15	Home - Walmart	2	
		PU-4d	1	2PM-5PM	0:30	Dialysis Davie - Home	5	
		DO-4d	1	2PM-5PM	0:15	Dialysis Davie - Home	2	
		PU-5e	1	2PM-5PM	0:30	Dialysis Davie - Home	10	
		PU-6f	1	10AM-2PM	0:30	Home - Dialysis Davie	5	
		DO-5e	1	10AM-2PM	0:20	Home - Dialysis Davie	4	
		DO-6f	1	10AM-2PM	0:25	Home - Dialysis Davie	3	
		PU-8a	1	10AM-2PM	0:15	Home - Dialysis Davie	3	
		PU-9g	1	10AM-2PM	0:15	Walmart - Home	2	
		DO-9g	1	10AM-2PM	0:15	Walmart - Home	2	
		DO-8a	1	2-5PM	0:30	Dialysis Davie - Home	2	
		PU-10d	1	2-5PM	0:15	Dialysis Davie - Home	5	
		DO-10d	1	2-5PM	0:30	Dialysis Davie - Home	10	
			9				36	
				2 repeat riders; so 2 trips per rider, from 'a' to 'b' to 'a'.				

Source: Yadkin Valley Economic Development District, Inc.

Clients (riders)

The YVEDDI transit service has a broad range of clients (riders), of all walks of life, with various reasons for riding transit. The vast majority of riders are repeat riders, traveling to repeat destinations with great frequency. Rider age groups range from child to adult; middle aged to senior. Children typically ride with an older family member, and older riders typically utilize transit to avoid driving, or because they can no longer drive. On Monday, September 27, 2021, there were approximately 37 distinct different riders of the Elkin YVEDDI transit service. Throughout the week, these same riders will utilize the Elkin YVEDDI

transit service, and other distinct riders ride throughout the week to join in the total beyond the 37 indicated above for just Monday.

Trips

The types of trips, frequency of trips, and purpose and or location of trips are discussed in this section of the report. The vast majority of riders use the YVEDDI transit service for the same trip purposes, repeatedly. Popular destinations include CVS (as both an employer and shopping destination), Big Lots (as both an employer and shopping destination), Yadkin Dialysis Center (for routine and essential medical procedures), Surry Community College (for students), and Nursing Home Center (for seniors).

Type and Frequency

Typically, YVEDDI sorts type of trips and frequency in such a manner that given vehicles and drivers service certain trips often by frequency of those trips. As an example, Figure 3 depicts YVEDDI trip number 54021, on Monday, September 27, 2021 in vehicle number 5207. In this trip number 54021, five people (children) were picked up from Headstart (pre-school program). Then all dropped off individually, consecutively, at their homes. This type of trip happens regularly each week, throughout the week. The letters 'a', 'b', 'c', 'd', and 'e', after PU and DO, indicate a rider. Repeat letters indicate that same rider. Therefore, PU-1a says one rider was picked up from a location, while DO-1a indicates the same rider was dropped-off at another destination. Whereas, PU-10a indicates that same rider 'a' was picked up from a location, and then DO-10a, indicates that same rider was dropped off at a different destination. In this scenario, rider 'a' took two trips, from point 'x' to 'y', then from 'y' back to 'x'. The '1' and the '10' in this scenario indicate that '1' was the first trip leg the vehicle made, and '10' indicates that was the 10th trip leg the vehicle made. Legs are paired, 'pick up and drop off', but sometimes one person goes to multiple destinations using our service, which is indicated in Figure 4, below in orange, with an asterisk, indicating how.

Most YVEDDI transit service trips are medical in nature. Yadkin Dialysis Center is the most frequented medical establishment by YVEDDI and its riders. Other medical establishments include family medicine offices, dental offices, and medical facilities in Winston-Salem, North Carolina. Riders schedule their trips ahead of time, but are not always on time as how originally scheduled, so the software permits the driver to pick up and drop off other riders until the rider is ready to be picked up, not according to the original schedule. This often happens with medical trips, where a rider undergoes dialysis, but the medical facility is running late, and the driver has to return, at a later time, to pick the rider up and return them home.

Employment trips range from small businesses to large chains like Vitro Pittsburgh Glass Works and CVS. While most people are dropped off at and picked up from these establishments, some people are only picked up after work to be taken home.

Figure 3:

Trip #	Veh. #	Trip Type	# of Trips	Time of Day	Duration	Trip End (Purpose)	Miles Travelled
110	7104						
On this Trip#, the passenger were all picked up consecutively and dropped off together at the Senior CTR, then picked up together from the Senior CTR and dropped off at home consecutively (all are the same riders every instance throughout the week).							
		PU-1a	1	7AM-10AM	1:15	Home - Senior CTR Davie	8
		PU-2b	1	7AM-10AM	1:00	Home - Senior CTR Davie	7
		PU-3c	1	7AM-10AM	0:35	Home - Senior CTR Davie	3
		PU-4d	1	7AM-10AM	0:30	Home - Senior CTR Davie	1
		PU-5e	1	7AM-10AM	0:25	Home - Senior CTR Davie	1
		DO-5e	1	10AM-2PM	0:25	Home - Senior CTR Davie	1
		DO-3c	1	10AM-2PM	0:35	Home - Senior CTR Davie	3
		DO-2b	1	10AM-2PM	1:00	Home - Senior CTR Davie	7
		DO-4d	1	10AM-2PM	0:30	Home - Senior CTR Davie	1
		DO-1a	1	10AM-2PM	1:15	Home - Senior CTR Davie	8
		PU-6e	1	10AM-2PM	0:05	Senior CTR Davie - Home	1
		PU-7c	1	10AM-2PM	0:15	Senior CTR Davie - Home	3
		PU-8b	1	10AM-2PM	0:30	Senior CTR Davie - Home	7
		PU-9d	1	10AM-2PM	0:10	Senior CTR Davie - Home	1
		PU-10a	1	10AM-2PM	0:45	Senior CTR Davie - Home	8
		DO-6e	1	10AM-2PM	0:05	Senior CTR Davie - Home	1
		DO-7c	1	10AM-2PM	0:15	Senior CTR Davie - Home	3
		DO-8b	1	10AM-2PM	0:30	Senior CTR Davie - Home	7
		DO-9d	1	10AM-2PM	0:10	Senior CTR Davie - Home	1
		DO-10a	1	10AM-2PM	0:45	Senior CTR Davie - Home	8
			12				40

Source: Yadkin Valley Economic Development District, Inc.

Figure 4:

Trip #	Veh. #	Trip Type	# of Trips	Time of Day	Duration	Trip End (Purpose)	Miles Travelled	
101	4108							
		PU-1a	1	10AM-2PM	0:15	Work - Home	4	
		DO-1a	1	10AM-2PM	0:15	Work - Home	4	
		PU-2b	1	2PM-5PM	0:15	Work - Home	5	
		DO-2b	1	2PM-5PM	0:15	Work - Home	5	
		PU-3c	1	2PM-5PM	0:15	Medical - Home	4	
		PU-4d *	1	2PM-5PM	0:30	DSS - DCCC	7	
		PU-5e	1	2PM-5PM	0:15	Medical - Home	3	
		DO-3c	1	2PM-5PM	0:15	Medical - Home	4	
		DO-5e	1	2PM-5PM	0:15	Medical - Home	3	
		DO-4d *	1	2PM-5PM	0:30	DCCC - Walmart	7	
		PU-6f	1	2PM-5PM	0:15	Work - Home	4	
		PU-7g	1	2PM-5PM	0:28	Work - Home	6	
		DO-6f	1	2PM-5PM	0:15	Work - Home	4	
		DO-7g	1	2PM-5PM	0:28	Work - Home	6	
		PU-4d *	1	5PM-7PM	0:30	DCCC - Walmart	5	
		DO-4d *	1	5PM-7PM	0:30	DCCC - Walmart	5	
			9				38	
			1 rider took chained trips from point 'a', to 'b', to 'c'.					

Source: Yadkin Valley Economic Development District, Inc.

Time

This section discusses YVEDDI transit service as it pertains to the time of day of service and the duration of service. YVEDDI transit service operates between 6AM and 6PM, Monday – Friday. Service is available by appointment for weekends and holidays. The vast majority of rides are served before 10AM, Monday – Friday. The second most prevalent time-period is between 10AM – 2PM. Across the system, the average trip duration is 30 minutes per leg from pick-up to drop-off. While most trip legs are 15 to 30 minutes long, from pick-up to drop-off. The change in service from fixed-route to demand-response akin to microtransit is preferable. Because of the individualized service demand-response provides, system-wide, each trip is shorter. In particular, riders were enthused for not having to wait at an empty bus stop enroute to finally reaching their destination. As well, Tuesdays tend to have the least amount of trips and Wednesdays tend to have the most amount of trips, like most transit services given human travel behaviors and patterns.

Time of Day and Duration

Most clients (riders) that are picked up between 10AM – 2PM are dropped off between 10AM – 2PM, so the entire trip of pick-up and drop-off takes place in that same time-period. The time-period of 2PM – 5PM is the second most prevalent time-period. The before 10AM and between 2PM-5PM time periods include many people being picked up from home and dropped off at work, and picked up from work and dropped off at home. The most overlapping time-periods for trip-legs (for example pick-up and drop-off from home to a medical facility and then pick-up and drop-off from a medical facility to home) are between the time-periods of 7AM – 10AM and 10AM – 5PM. Much of this has to do with medical purpose trips, in which a person is going to a medical facility, including Yadkin Dialysis Center (for example picked up from home between 7AM – 10AM and dropped off at the medical facility between 10AM – 2PM, and dropped off at home between 2PM-5PM). Most riders interviewed indicated it is preferable to have medical appointments in the morning while utilizing YVEDDI transit service, and the earlier in the morning, the better.

The shortest trip durations tend to be those that are from home to work and from work to home. The longest trip durations tend to be those that are medical facilities other than Yadkin Dialysis Center (for example medical facilities in Winston-Salem, North Carolina are about one hour, one-way). Yadkin Dialysis Center trips are on average the shortest duration medical trips lasting about 30 minutes per leg from an individual's home to the facility, and 30 minutes for the trip-leg back home from the facility.

3.2 Public Survey Analysis

The YVEDDI Elkin Transit Public Survey was conducted for a little over one month, and advertised throughout electronic mediums. Institutional and government websites, social media, newspaper articles, and like media contained links to the public electronic survey. The survey was created in Survey Monkey online software and analyzed with that same software, while utilizing Excel to display the results of that analysis. The goal was to reach a broad sample of the population, who would likely utilize the YVEDDI transit service for various reasons, and capture their feedback about the service.

The raw survey data is in Appendix B. The survey overwhelmingly describes the current transit service as beneficial to the community, according to the public. The survey overwhelmingly describes the current transit service as beneficial to the community, according to the public. Eleven people responded to the

survey and all eleven answered every question. Most people surveyed live in North Elkin. The majority of respondents indicated reliability of service (does the service show up on time), availability (hours of operation, frequency (are there enough buses to take you/have you ever been denied service)), and service coverage area, as the most important aspect of them experiencing the YVEDDI Elkin transit service, as depicted in Figure 5, below.

Figure 5:



Source: Yadkin Valley Economic Development District, Inc.

The vast majority of respondents would prefer to pay for a \$10 weekly pass or a \$30 monthly pass, while the second largest percentage (36%) would pay the \$1 single rider pass, as shown in Figure 6, below.

Figure 6:



Source: Yadkin Valley Economic Development District, Inc.

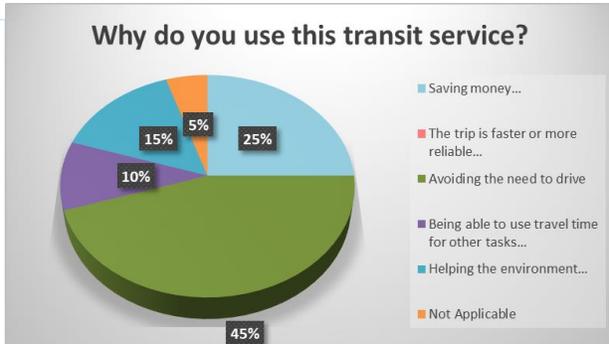
Medical and errands are the most prevalent purposes for why respondents would use YVEDDI transit service in Elkin at 72% votes each, followed by work (63%), as depicted in Figure 7. Comments for reasons people would use the service include "library", "probation office", and "shopping". Overwhelmingly, people would prefer to use their smartphone to schedule YVEDDI transit service (63%), then the website, then to call-in. This presents an opportunity for microtransit software upgrades to meet those wants and

needs. Moreover, respondents overwhelmingly indicated the reason for using YVEDDI transit service is to avoid the need to drive (81%), with saving money as the second most important reason among respondents (45%), as illustrated in Figure 8. A comment on this question revealed one respondent “can’t drive and needs to get around (visually impaired)”, as shown in Figure 8. This reveals that the majority of riders and the public who do and would use YVEDDI transit service are a captive audience in the sense that YVEDDI transit is among the most likely alternatives to driving themselves and their family around town and is essential to them saving money.

Figure 7:



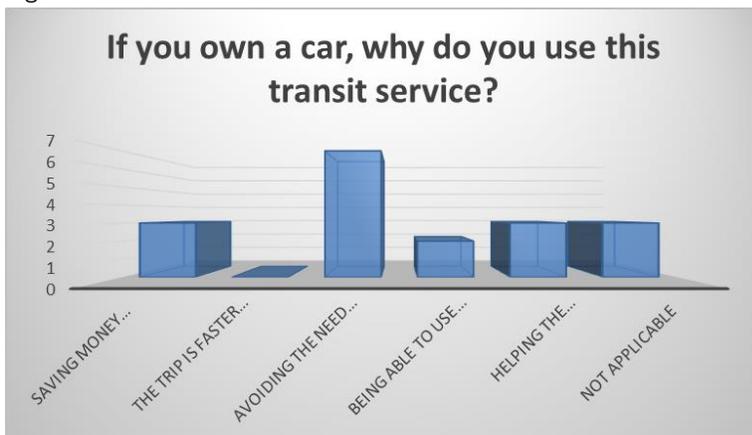
Figure 8:



Sources: Yadkin Valley Economic Development District, Inc.

Likewise, the vast majority of respondents own a car. Of those who own a car, avoiding the need to drive was the most prevalent reason as to why they would choose YVEDDI transit (63%). All other reasons were essentially equal in choice, as depicted in Figure 9, below.

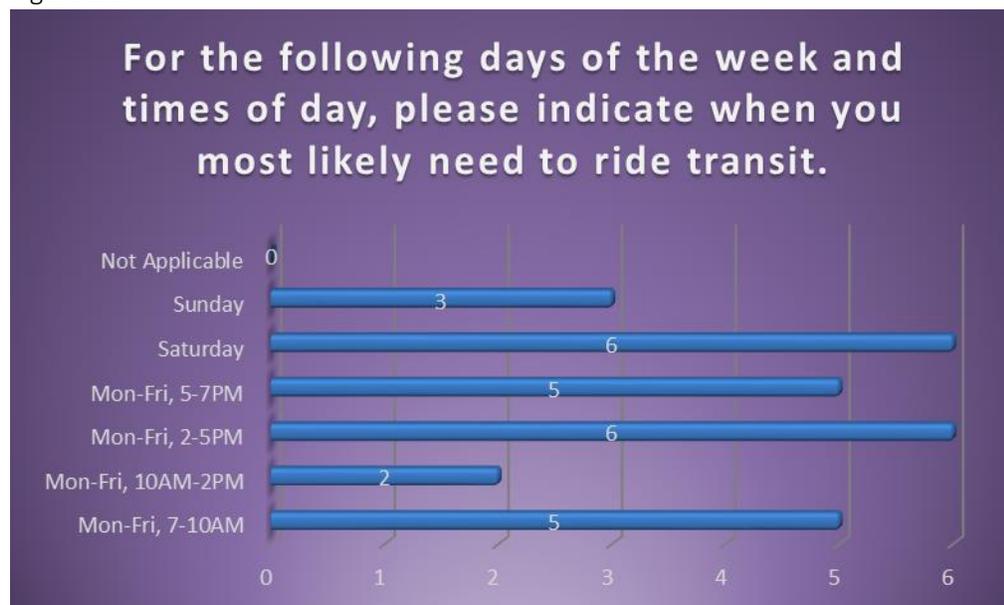
Figure 9:



Source: Yadkin Valley Economic Development District, Inc.

Slightly more respondents (six vs. five) said the current YVEDDI demand-response service is more preferable and better service than fixed route bus stop service, with one respondent saying, “I think both would have their uses”. Finally, the majority of respondents indicated 2PM-5PM as their preferred time to use the YVEDDI transit service, with Saturday being equally preferred. After that, 7AM-10AM and 5PM-7PM are the next most preferred times, with both having equal rank between each other, as showcased in Figure 10, below.

Figure 10:



Source: Yadkin Valley Economic Development District, Inc.

In all, YVEDDI currently offers service that is viewed favorably by most respondents. This information is paramount to determining if microtransit service would be ideal for the YVEDDI transit service in Elkin and provides incredible support to the software and operational upgrades such service would entail.

4. Microtransit System Case Studies

This section discusses microtransit systems across the USA as models for service to understand how microtransit could and could not operate if YVEDDI decides to implement microtransit service. The source of this information is primarily derived from the *Opportunities for State DOTs (and others) to Encourage Shared-Use Mobility Practices in Rural Areas* Final Report, prepared for the National Cooperative Highway Research Program Transportation Research Board of The National Academy of Sciences, Engineering, and Medicine. That report, institutionally referred to as NCHRP 20-65 Task 76, or Task 76, forms the basis of this document's microtransit concepts.

4.1 Model Microtransit Systems across the USA

Both the Town of Mocksville and the Town of Elkin have relatively small population sizes, and thus small densities. Therefore, transit systems of comparable sizes in comparable communities in studies showcasing microtransit are not plentiful. The majority of the systems discussed in this section of the report include communities of 10k to 400k population size. Each case study discusses key elements of the transit service area: population, problem/former service, population mobility needs, plan for service, interested stakeholders, funding, opportunities, and challenges. At the conclusion of this section of the report will be an area that discusses important elements of these systems in regards to YVEDDI and its future service.

1. RubyRide Ridesourcing Service in North Mankato, MN (rural demand-response case)

North Mankato, MN is a small community outside of Mankato, MN. An interview with the Program Technical Advisor detailed the operation and plans of their demand-response service. This information is below.

Population:

14,000

Nearby City: 40,000

Problem/Former service:

Former North Mankato service was contracted from nearby city (Mankato) which operated a fixed-route transit service that “was ineffective with many shortcomings such as low ridership, limited span of service, the aging/disabled population finding it difficult to walk to bus stops and wait in inclement weather, limited or no passenger amenities, etc. TNCs such as Uber and Lyft have a limited presence in the Mankato/North Mankato area, with operations more prevalent on weekend nights during bar closing hours during the academic school year for Minnesota State University.”

Population mobility needs:

Aging, disabled, immigrant, and post-secondary student, and community residents in general

Plan of service:

North Mankato created a plan that included reaching out to major ridesourcing providers, and contracted RubyRide with a city council-funded pilot project “to test and subsidize its proposed on-demand ridesourcing service.”

Interested stakeholders:

City residents, business community, non-profit community, and human services community

Funding:

The pilot program was funded by city dollars but North Mankato plans to “seek state, federal, non-profit, and private partners to move the project out of the “pilot” status to a model that is sustainable.”

Opportunities:

- 1) “Effectively meet mobility needs of rural community residents, and transportation disadvantaged population with an on-demand ridesourcing service by employing drivers.
- 2) “[There is] potential for local business community, non-profit communities/organizations, human service community to support and collaborate to resolve community’s transportation barriers and fill mobility gaps.”

Challenges:

- 1) “Funding for pilot ridesourcing implementation, as well as sustainable funding sources for continued operations;
- 2) “Finding a TNC (ridesourcing provider, ‘Transportation Network Company’) that is willing to engage with a smaller community on a contractual basis.”

2. Via Microtransit Service in the City of Arlington (urban microtransit case)

The City of Arlington is a medium sized community between the cities of Dallas and Fort Worth, Texas. Therefore, this is very much an urban microtransit case, even larger than the City of Wilson, which is an already commonly referenced Via microtransit case in North Carolina. For more information about the City of Wilson and their microtransit, please refer to the North Carolina Department of Transportation.

Population:

395,000

Nearby City: 1,304,000

Problem/Former service:

Arlington had previously contracted a fixed-route bus line, MAX, that ran between University of Texas at Arlington and a Dallas-Fort Worth airport commuter rail station (since 2013). With few stops and connections to the broader area, ridership was low. The “city’s Transportation Advisory Committee suggested new microtransit service as a flexible, right-sized service to replace the MAX.”

Population mobility needs:

Aging, disabled, immigrant, and post-secondary student, and community residents in general

Plan of service:

Via ride service provides vehicles (passengers vans (YVEDDI provides cutaway buses)), drivers, technology, and routing (all of which YVEDDI provides currently). The service “provides affordable transportation to key areas of Arlington by connecting riders to entertainment centers, shopping, dining options, work, school, medical appointments, etc.” The service utilizes cashless smartphone service (app) and dial-in. There is a \$3 flat rate per trip (3x YVEDDI price); without subsidies the cost per trip would be \$9, which was still less than the MAX trip. Weekly passes are \$15 (YVEDDI is \$10), for up to four rides each day, six days a week (YVEDDI allows 25 trips/week).

Via service in Arlington is available between 6 a.m. and 9 p.m. Monday through Friday, and between 9 a.m. and 9 p.m. Saturday. Passengers can book a Via trip on a six-seat Mercedes-Benz vehicle by providing their pick-up and drop-off locations using the free Via app (Figure 5.7). The Via vehicle will pick them up within a block or two of their doorstep with an average wait time of 10-12 minutes. Unlike traditional ridesourcing services, Via service in Arlington offers a flat fee of \$3 per trip. Further, Arlington’s Handitran, which is an already-existing door-to-door transportation service for the elderly and persons with disabilities, is still available to users (p.49, Task 76).

Interested stakeholders:

City residents, business community, tourism community, and human services community

Funding:

Funding through the City and FTA (1/3 vs 2/3) then increased as service grew.

Opportunities:

- 1) “Via microtransit service in Arlington operates with a fully dynamic and on-demand platform, allowing users to go from anywhere to anywhere within the city’s coverage zone.”
- 2) “The average number of rides per weekday is about 600, and the average number of rides on Saturdays is approximately 350. About 63 percent of the rides provided were shared rides, more than 70 percent of rides were from repeat customers, and more than 50 percent of the rides were from riders with weekly passes.”

3) “The customer satisfaction rate for Via microtransit operations was observed as 97 percent. In the first year of Via operation in Arlington, daily ridership doubled when compared to previous MAX fixed-route service. More than 14,000 Via accounts were created by users to use the microtransit service.”

As of March, 2019, Via service in Arlington has provided more than 137,000 rides since its launch. The average number of rides per weekday is about 600, and the average number of rides on Saturdays is approximately 350. About 63 percent of the rides provided were shared rides, more than 70 percent of rides were from repeat customers, and more than 50 percent of the rides were from riders with weekly passes. The customer satisfaction rate for Via microtransit operations was observed as 97 percent. In the first year of Via operation in Arlington, daily ridership doubled when compared to previous MAX fixed-route service. More than 14,000 Via accounts were created by users to use the microtransit service (p.51, Task 76).

Challenges:

- 1) Meeting demand: “To meet the service demand and increased driver hours for conducting operations, the contract budget for the second year was set at \$2.1 million, with \$800,000 of the budget amount coming from FTA JARC funds, \$300,000 from fare revenues, and about \$1 million from the city’s general budget. When the contract budget was increased for the second year of operations, the city was able to leverage additional FTA funds.”
- 2) “The City of Arlington plans for one more phase of service area expansion in its second year of operations by adding two more Metris vans for a total of 15 Metris microtransit vans. The city also plans to keep a \$3 flat fare for future operations.”

3. Michigan Mobility Challenge Grant to Improve Demand-Response and Healthcare Transportation Services in Rural Counties (rural demand-response case)

This case study has a likeness to YVEDDI given the multi-county rural jurisdiction of the demand-response service. At the time of publication of Task 76, the service was yet to be implemented. Therefore, the *Challenges* section does not have data.

Population:

Rural Michigan (three counties: Grand Traverse County, Benzie County, and Allegan County)

Nearby City:

State of Michigan

Problem/Former service:

The State of Michigan put out a call for local partnerships to take the initiative to “solve mobility gaps for seniors, persons with disabilities, and veterans using new technologies and innovative service models in urban, rural, and suburban communities throughout the state. Michigan DOT selected 13 projects for funding”. The goal was to improve interoperability between systems (that operate in their own unique way with various dispatch software) and “improve paratransit and healthcare transportation services in three rural Michigan counties: Grand Traverse County, Benzie County, and Allegan County”.

Population mobility needs:

Aging, disabled, and community residents in general

Plan of service:

To accomplish four different goals -

- 1) “Improve interoperability between rural transit agencies” which have different dispatch software/technologies that do not communicate with each other.
- 2) “Reduce no-shows and cancellations for scheduled rides”- the system will also generate enhanced reminders the evening before the ride, the morning of the ride, and when the ride is on the way. These strategies were proposed to reduce no-shows and cancellations.
- 3) “Develop a mobile application” to enroll additional riders, make trip reservations, and track the status and activity of reservations.
- 4) “Volunteer fleet coordination” which means better coordinate and run volunteer fleet on one platform rather than across spreadsheets and dial-ins.

Interested stakeholders:

City residents, business community, and human services community

Funding:

A \$990,000 grant from the \$8 million Michigan Mobility Challenge grant program to solve mobility gaps for seniors, persons with disabilities, and veterans using new technologies and innovative service models.

Opportunities: Metrics to gauge progress (service has yet to be launched)

- 1) 25 percent enrollments in new platform,
- 2) 20 percent reduction in trip cancellations,
- 3) 10 percent reduction in no-shows,
- 4) 10 percent increase in rides

Challenges:

Service yet to launch

4. Rural Mobility as a Service in Winnebago County, Wisconsin – Winnebago Catch-a-Ride (rural demand-response case)

With a focus on rural workers, the WCAR service aimed to provide rural mobility as a service (MaaS). The WCAR service is unique compared to YVEDDI given it uses volunteer drivers. It also aims to be a catch-all single platform for transit services in the countywide area.

Population:

170,000 (County)

Nearby City:

104,000 (Greenbay, WI)

Problem/Former service:

The need to fill rural mobility gaps was the paramount issue facing Winnebago County. “Winnebago County, Wisconsin received an Accessible Transportation Community Initiative grant of \$100,000 from Easter Seals Project Action (ESPA) Consulting to develop and implement recommendations to fill its rural mobility gaps. A rural mobility as a service (MaaS), Winnebago Catch-A-Ride (WCAR) program was created

to integrate all available transportation services on one single platform, as well as add a ridesourcing program with volunteer drivers on the Feonix Mobility Rising platform. The Greater Oshkosh Economic Development Corporation received a \$30,000 “Commute to Careers” grant from the Wisconsin Department of Workforce Development which was also used for the WCAR program to subsidize employment trips”

Population mobility needs:

Aging, unemployed, underemployed, disabled, and low-income worker, and community residents in general

Plan of service:

Significant mobility gaps to existing services prompted Winnebago County to utilize strategic planning tools to identify goals for service:

- 1) Improve employment and healthcare transportation,
- 2) Fill mobility gaps,
- 3) Improve independent mobility to rural residents (for one year as grant requirement)

Winnebago Catch-A-Ride (WCAR) was developed in October 2018 for a one-year pilot lasting until September 2019. WCAR does not intend to duplicate already-existing transportation services, but will fill any mobility gaps especially during nights and weekends. “WCAR uses the QRyde technology platform which implements low-cost transportation solutions and can be accessed by call center, website, and smartphone app.” The branding and managing of WCAR is conducted by Feonix Mobility Rising, utilizing their QRyde technology platform.

Interested stakeholders:

City residents, business community, non-profit community, and human services community

Funding:

2-year Accessible Transportation Community Initiative grant in 2017 from ESPA Consulting of \$100,000

Opportunities:

“Goals of WCAR program include (62):

1. Partner with Winnebago County employers to increase access to transportation for their employees,
2. Identify gaps in transportation and how they can be met in Winnebago County,
3. Partner with Winnebago County healthcare providers to increase access to transportation for their patients,
4. Coordinate existing transportation assets of Winnebago County, and
5. Expand the County’s Make the Ride Happen volunteer driver program”

Using the Feonix Mobility Rising platform and volunteer drivers, the program filled mobility gaps that were not filled before. Personal vehicles were used via ridesourcing-like trips on the platform. Riders were charged a \$2 booking fee and a federal mileage reimbursement rate of \$0.58 per loaded mile which makes the service affordable in rural communities (still more than YVEDDI). Riders call in to request rides and soon a smartphone app will be available for riders to request and pay for rides.

Challenges:

- 1) Hire 20 more volunteer drivers to meet the unmet transportation needs (currently has six drivers) by applying for additional grants for funding. Insurance for drivers is covered under the Feonix Mobility Rising Volunteer Insurance through CIMA, which is the largest volunteer drivers insurance program in the USA. In all, 84 rides were serviced by six drivers over a 2.5 month period.
- 2) The strength and coverage of internet service is not adequate for smartphone application. Better broadband internet coverage is needed for the rural communities.

4.2 How These Systems Compare to YVEDDI Pandemic Service

The majority of similar transit services for small towns and cities such as Elkin, are contracted out to private vendors such as Via, Lyft, and RubyRide, all at more than 3 times the cost of YVEDDI. Microtransit on such a robust scale as YVEDDI, as far as service area, cost, quality of service, and variety of clients is nearly unheard of (particularly apples: apples comparable). Unfortunately, the main challenge in operating broad rural microtransit coverage is obtaining outside funding, and for these particular case studies, finding a vendor willing to provide service long-term, contractually. In nearly all of the cases above, small and medium sized cities and towns could not afford to run their own service, and needed outside funding. Likewise, in nearly every case, the price of service in the private sector was cost prohibitive. To the contrary, YVEDDI presents a unique case in which everything is run by a non-profit, especially fleet management and infrastructure, and funding is pooled from many pots (which need deepening).

YVEDDI Pandemic Service

As a result of the announcement of the COVID-19 pandemic in March 2020, and the subsequent guidelines issued by the CDC in that same time period, YVEDDI changed its fixed-route circulator service in the towns of Mocksville and Elkin to call-in demand-response. This change in service allowed YVEDDI to comply with the six feet of personal space and distancing guidelines to curb the spread of COVID, as well to better manage passenger boarding, seating, and overall system use. This service has continued throughout 2021 and has seen broad public appeal and appreciation. Given the success of this model of service, YVEDDI is exploring upgrading to microtransit.

5. Programmatic Guidance and System Implementation (goals and metrics)

There are approximately 1,500 rural transit services throughout the USA and the majority of those systems are demand response. Likewise, while rural lands make up 70 percent of the land in the USA, the population on those lands only account for 17 percent of the US population (TCRP 136). Rural transit systems are more similar to urban transit systems than different, and therefore operate in a similar manner. YVEDDI operates more uniquely than most rural transit systems, however.

5.1 YVEDDI Compared to DRT Systems across the USA

This section contains a few characteristics of most DRT systems across the country as compared to YVEDDI transportation operation and service. Concerning characteristics of general public demand-response services, YVEDDI, again, has a unique disposition. Given population sizes served, YVEDDI is most similar to Nappa Valley Transportation Authority, and Kitsap Transit, each with populations under 300,000 persons. Kitsap Transit only offers call-a-ride transit service, operating with 90 buses, yet, NVTA operates call-a-ride and is contemplating offering first-mile/last-mile service, having only 24 buses in operation. Of course, YVEDDI offers services more akin to even larger transit systems, like Alameda-Contra Costa Transit District, and Des Moines Area Regional Transportation Authority. More detail can be found in Figure 11, below. Indeed, YVEDDI offers a plethora of services that not even larger transit systems offer, like first mile/last-mile, fixed route deviation, point deviation, call-a-ride. Likewise, YVEDDI has over 50 buses. Therefore, in the possibility of operating throughout a greater service area given the microtransit upgrade, an option would be to offer service in places like Coolemee and other jurisdictions on select days of the week/month only. In this manner, YVEDDI could expand its service area with dedicated buses and services, but only on days that benefit YVEDDI operation goals and resources.

5.2 Factors to Implementing New Transit Service

The last great changes to YVEDDI Transportation service occurred due to the COVID-19 pandemic in 2020. As discussed in section 4.2 of this document, YVEDDI switched to fixed route deviation and demand response service to better comply with CDC guidelines. This section of the report expands on how to view new service implementation.

When implementing new service and operation in a transit system it is imperative to understand the sphere of influence the transit agency has over various aspects of the system. Figure 12 lists the areas of 'control' by a DRT system. While this is DRT, rather than microtransit, the areas of control are alike. A few factors in the sphere of control YVEDDI could determine are in areas such as *Scheduling/Dispatch*, *Service Policies Related to*. These two areas can be influenced with technology upgrades such as system software, particularly when converting to a microtransit system. Likewise, it is imperative to implement new service in such a manner as to control effectiveness, cost-effectiveness, and cost-efficiency. As YVEDDI is a multi-county system, gauging service implementation would entail judging certain measures of service, such as passenger trips per vehicle-hour, operating cost per vehicle-hour, operating cost per vehicle-mile, and operating cost per passenger trip. These are just a few metrics, with controllable and uncontrollable factors, researched across rural DRT systems in TCRP Report 136, and depicted in Figure 13, below.

Figure 11:

Transit Agency	Number of fixed route buses	Population of service area	Total number of annual unlinked trips	Characteristics of general public demand–response service provided
Alameda–Contra Costa Transit District (AC Transit)	500	1,425,000	54,575,655	<ul style="list-style-type: none"> point deviation call-a-ride service first mile/last mile
Central Florida Regional Transportation Authority (LYNX)	312	2,400,000	27,387,837	<ul style="list-style-type: none"> call-a-ride service first mile/last mile
Salem Area Mass Transit District (Cherriots)	53	236,632	3,637,866	<ul style="list-style-type: none"> call-a-ride service point deviation first mile/last mile
Dallas Area Rapid Transit (DART)	533	2,380,530	66,799,954	<ul style="list-style-type: none"> fixed route deviation call-a-ride service first mile/last mile
Greater Dayton Regional Transit Authority (GDRTA)	124	559,062	9,973,237	<ul style="list-style-type: none"> some service for the entire service area some only in portions of the service area some during all hours some only during select hours point deviation call-a-ride service first mile/last mile
Denver Regional Transportation District (RTD)	873	2,920,000	103,340,797	<ul style="list-style-type: none"> point deviation call-a-ride service first mile/last mile
Des Moines Area Regional Transit Authority (DART)	113	374,910	4,775,768	<ul style="list-style-type: none"> fixed route deviation call-a-ride service first mile/last mile
Gwinnett County Transit (GCT)	63	907,135	1,496,448	<ul style="list-style-type: none"> in the planning phase
Hillsborough Area Regional Transit Authority (HART)	162	875,598	14,523,002	<ul style="list-style-type: none"> call-a-ride service first mile/last mile service
Metropolitan Transit Authority of Harris County (Houston METRO)	937	4,298,000	89,970,895	<ul style="list-style-type: none"> call-a-ride service first mile/last mile service
Kansas City Area Transportation Authority (KCATA)	179	788,748	14,220,399	<ul style="list-style-type: none"> call-a-ride service
Kitsap Transit	90	254,183	3,549,994	<ul style="list-style-type: none"> call-a-ride service
Los Angeles County Metropolitan Transportation Authority (LA Metro)	1,935	8,626,817	432,985,182	<ul style="list-style-type: none"> in the RFP phase
Maryland Transit Administration	907	7,811,145	110,727,565	<ul style="list-style-type: none"> in the planning stages
Monterey–Salinas Transit (MST)	75	433,898	4,406,784	<ul style="list-style-type: none"> call-a-ride service
Napa Valley Transportation Authority (NVTA or Vine Transit)	24	138,000	1,214,969	<ul style="list-style-type: none"> call-a-ride service contemplating first mile/last mile service
North County Transit District (NCTD)	137	849,420	12,005,664	<ul style="list-style-type: none"> point deviation fixed route deviation
Regional Transportation Commission of Southern Nevada (RTC)	341	2,008,655	67,346,272	<ul style="list-style-type: none"> in the planning phase for call-a-ride service
Sacramento Regional Transit District (SacRT)	162	1,031,946	24,330,247	<ul style="list-style-type: none"> call-a-ride service
San Joaquin Regional Transit District (SJRTD)	70	753,226	4,047,559	<ul style="list-style-type: none"> call-a-ride service fixed route deviation
Transit District of Utah (formerly the Utah Transit Authority)	440	1,883,504	45,521,914	<ul style="list-style-type: none"> fixed route deviation
VIA Metropolitan Transit (VIA)	378	1,825,502	39,363,491	<ul style="list-style-type: none"> in the RFP phase

Note: RFP = request for proposal.

Source: FY 2016 National Transit Database, Federal Transit Administration.

Source: TCRP Report 136 (2009)

Figure 12:

Factor	“Control” by DRT System?
<i>Operations</i>	
Hiring practices and training for vehicle operators	Controllable
Operator wages and benefits	Controllable / Partially Controllable
Timely vehicle pull-outs with back-up operator availability	Controllable
Relationship of paid operator-hours to vehicle-hours	Controllable
Wages and benefits for other operating staff	Controllable / Partially Controllable
Deadhead time and miles	Partially Controllable
Average system speed	Partially Controllable
<i>Scheduling/Dispatch</i>	
Skills in creating effective manifests	Controllable
Matching vehicle-hours to ridership demand	Controllable
<i>Service Policies Related to</i>	
No-shows and late cancellations	Controllable
Length of advance reservation period	Controllable
Service span: days and hours of service	Controllable
Rider assistance: door-to-door, curb-to-curb, packages, child car seat, etc.	Controllable
<i>Vehicles</i>	
Vehicle type and mix; vehicle specifications	Partially Controllable
Vehicle condition and maintenance practices	Controllable
Maintenance expenses	Controllable
<i>Administration</i>	
Staffing and administrative expenses	Controllable
<i>Safety</i>	
Safety policies and procedures	Controllable
System’s “culture of safety”	Controllable
<i>Service-Area Environment</i>	
Service-area size, roadway network, density, land use patterns, constraints (e.g., mountains, bridges, railroad crossings)	Uncontrollable
Strength of local economy/job market, affecting employment environment	Uncontrollable
Weather and “Acts of God”	Uncontrollable
<i>Other</i>	
Type of ridership: ADA only, limited eligibility, general public	Uncontrollable
Contractual constraints: rules imposed by human service agencies that contract for service (e.g., maximum ride time, etc.)	Partially Controllable
Type of operator (city/county, transit authority, private contractor, taxi co.)	Partially Controllable
Demand for DRT service	Partially Controllable
Riders’ no-shows and late cancellations	Partially Controllable
Riders’ dwell time	Partially Controllable

Source: TCRP Report 136 (2009)

Figure 13:

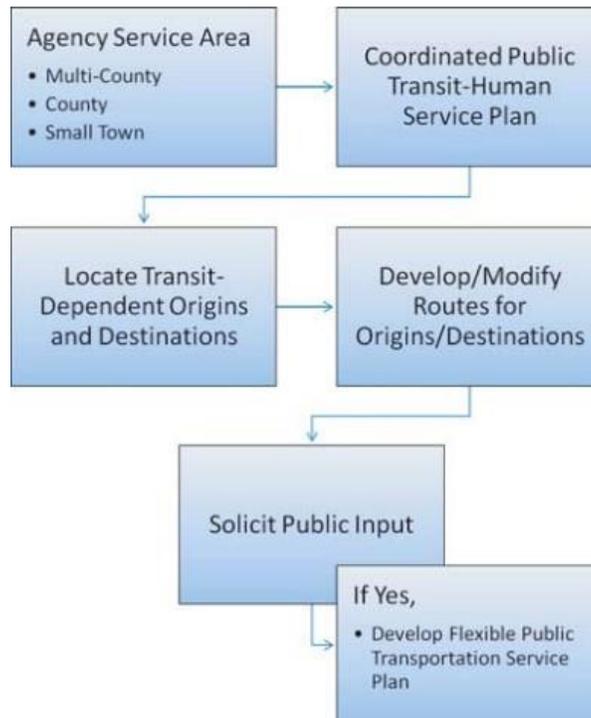
Representative Rural DRT System	Passenger Trips per Vehicle-Hour Effectiveness	Operating Cost per Vehicle-Hour Cost-Efficiency	Operating Cost per Vehicle-Mile Cost-Efficiency	Operating Cost per Passenger Trip Cost-Effectiveness
Primarily-Single-Municipality Systems (5 systems)	2.38–7.05	\$35.23–\$74.04	\$2.57–\$5.84	\$5.00–\$31.17
Primarily-Single-County Systems (10 systems)	2.06–6.23	\$32.47–\$78.05	\$1.49 –\$5.75	\$7.63 –\$30.76
Multi-County Systems (7 systems)	1.57–4.34	\$26.08–\$42.27	\$1.16–\$2.67	\$7.99–\$20.76
Factors Influencing Performance				
Controllable/ Partially Controllable	<ul style="list-style-type: none"> • Group trips for agency clients • Ability to group trips for unaffiliated riders, particularly for longer-distance trips • Use of AVL • Use of immediate response vs. advance reservation service • Extent of long-distance, out-of-primary-service-area trips • Characteristics of contracted service, in particular Medicaid • Measures to reduce deadhead • No-shows/late cancellations 	<ul style="list-style-type: none"> • Administrative/overhead costs • Costs for operator labor 	<ul style="list-style-type: none"> • Administrative/overhead costs • Costs for operator labor 	<ul style="list-style-type: none"> • Administrative/overhead costs • Costs for operator labor • Group trips for human service agency clients and ability to group trips for unaffiliated riders • Use of AVL • Use of immediate response vs. advance reservation service • Extent of long-distance, out-of-primary-service-area trips • Measures to reduce deadhead • No-shows/late cancellations
Uncontrollable	<ul style="list-style-type: none"> • Size of service area • Geographic constraints of service area • Requirements for long-distance, out-of-service-area trips • Type of ridership, i.e., ADA paratransit vs. non-ADA 	<ul style="list-style-type: none"> • Type of organization, i.e., transit district, city/county, private non-profit • Location in higher/lower labor-wage region of country • Type of ridership, i.e., ADA paratransit vs. non-ADA 	<ul style="list-style-type: none"> • Type of organization, i.e., transit district, city/county, private non-profit • Size of service area and its influence on miles traveled • Types of roadways traveled and operating speeds on those roadways • Weather conditions that impact operating speeds 	<ul style="list-style-type: none"> • Type of organization, i.e., transit district, city/county, private non-profit • Size of service area and geographic constraints • Requirements for long-distance, out-of-service-area trips • Type of ridership, i.e., ADA paratransit vs. non-ADA

Source: TCRP 136 Report (2009)

Rural Service Characteristics

For rural areas of less than 50,000 in population size, determining if, when, and how to upgrade transit service should include an assessment of various parameters related to service and operation. The following Figure 14, describes a process that should be followed in some manner to determine service changes. The process will produce a service plan that describes the operation of new microtransit service. This report is in support of such a service plan for YVEDDI microtransit conversions in Mocksville and Elkin. The findings in this document can also be used in developing a service plan document for YVEDDI microtransit service changes. Certain processes and sections in this document, including Rider Survey Analysis, Public Survey Analysis, and Public Engagement, can be followed to solicit new public input, or can be incorporated into the service plan as is.

Figure 14:



Source: TCRP Report 140

Benchmarks and Viability

Extensive research and studies have been conducted to determine the performance of transit systems. Rural transit systems can benefit from taking advantage of these studies, to plan their operations and operate more efficiently, with advanced knowledge of how their service may perform and under what conditions to expect maximum performance and quality of service, as well as utilization of service. Figure 15, describes the best scenarios for high performance rural transportation systems.

Figure 15:

Service Factors	Ranges
Population Served:	6,000–62,000
Area Served (Sq. Miles)	5–3,000
Vehicles:	1–34
Square Miles/Vehicle:	1–650
Persons Served/Vehicle:	650–7,200
Miles/Vehicle/Year:	11,500–29,000
Trips/Year:	8,200–210,000
Trips/Person/Year:	0.85–9
Trips/Vehicle/Year:	4,200–13,500

Source: TCRP Report 140

Comparing demographics to trip purpose, there are generalizations, from data, that give an idea which persons are likely to conduct what trip purpose by demographic. Figure 16 below, depicts a matrix of this data, having trip purposes of work, school, non-emergency medical, shopping/groceries, shopping/other, and social. Data such as this helps pinpoint processes such as marketing strategies and their campaigns for who and where to target service.

Figure 16:

Demographics/Trip Purpose	Youth < 18	Adult 18–64	Elderly 65 and over	Persons with Disabilities	Low-Income Persons
Work	Low Potential for Flexible Public Transportation				
School					
Non-Emergency Medical	High	Medium Potential	High Potential for Flexible Public Transportation		
Shopping/Groceries	Low				
Shopping/ Other	High	Low			
Social					

Source: TCRP Report 140

Another method to forecast and tailor service is to understand trip origins and destinations by purpose. With this information, and a map of the service area, including land uses and in particular commercial attractors and medical uses, trips can be forecast and planned before they are called in and reach the manifest. Figures 17, and 18 below, depict trip origin by purpose and trip destination by purpose.

Figure 17:

Trip Origin/ Trip Purpose	Activity Center	Landmark	Elderly Housing	Subsidized Housing	Single Family Home
Work	Low Potential for Flexible Public Transportation				
School					
Non-Emergency Medical	Medium Potential		High	Low	
Shopping/Grocery	High Potential for Flexible Public Transportation				
Shopping/Other					
Social					

Figure 18:

Trip Destination/ Trip Purpose	Major Shopping Center	Small City Center	Hospital/Clinic	Employment Center	School
Work	Low Potential for Flexible Public Transportation				
School	Not Applicable				Low
Non-Emergency Medical	Not Applicable		High Potential	Not Applicable	
Shopping/Grocery	High Potential	Low	Not Applicable		
Shopping/Other		High			
Social					

Source: TCRP Report 140

Improving Performance through Measures of Effectiveness

As YVEDDI implements microtransit service, a few areas of performance can be monitored to increase levels of service for riders. These actions go beyond operations and have been identified by rural DRT systems across the country as imperative for quality service. These areas are drawn from TCRP Report 136, and depicted in Table 2.

One measure of effectiveness of service is the “no-show policy”. YVEDDI has no-show riders, and effectively handling no-shows via a policy is a necessary procedure that positively influences rider behavior in relation to operation of service. A few no-show policy examples are given below, in Figure 19. An important detail to note is how to curtail the practice of no-shows, with proper enforcement. One method is to still charge a fare (if the fare is scheduled programmatically and can be auto-deducted from the account). Other methods include having a certain number of no-shows permitted per month before being barred from using transit service for that month, and then a lifetime bar should a policy be necessary.

Another measure of effectiveness is to include a fare collection enforcement policy, and to ensure fares are of the proper amount. Policies should be directed at both riders (the public), and drivers (collection methods and boxes). Creating a proper policy entails researching fare collection methods throughout transit systems in the nation, and comparing those methods to how YVEDDI collects fares. Secured fare boxes, electronic collection systems, and other methods are available should YVEDDI choose to upgrade its fare collection.

Measures of effectiveness also depend on accurate definitions of measurements. For example, in the TCRP 136 research, the vast majority of rural transit systems in the research project had a 14 day length of advance reservation time to book trips, while YVEDDI has a one day advance reservation period, it is imperative that as YVEDDI implements new service, these definitions of advanced registration are revisited and other definitions. Another example would be the on-time window (perhaps a 10-min. window rather than a promised time, and so on).

Table 2:

Actions to Improve Performance	
Aspect of Service	Actions
Service Design	
	Ensure service design "fits" community, revise as needed
	Use volunteers for long-distance one-to-one trips
	Use rural DRT as feeder service to rural inter-city routes
Policies and Procedures	
	Adopt and enforce no-show/late cancel policy
	Develop and enforce cancellation policy
	Shorten the advance reservation period
	Establish on-time pick-up window
	Establish wait time policy
	Establish policies/procedures for bad weather operations
	Educate riders on policies and procedures
Funding	
	Get involved in community, build relationships, and gain funding
	Establish effective payment schemes for human service agency clients/riders
	Sell advertising on vehicles
	Marketing, Public and Passenger Relations
	Focus marketing efforts on general public
	Advertise with campaigns/yard signs
	Identify key person at human service agencies to address rider-related issues
Operations	
	Improve vehicle operator compensation
	Establish comprehensive vehicle operator training program
	Use part-time drivers
	Schedule back-up operators
	Rotate demand-response and fixed-route operators
	Establish satellite parking areas for service vehicles
	Assign certain operators to take DRT vehicle home at night
	Align operator shifts to meet ridership demand
	Cross train staff
Scheduling/Dispatch	
	Implement computerized scheduling/dispatch system
	Implement AVL (automatic vehicle locator) and MDTs (mobile data terminals)
	Provide scheduled service to frequented destinations
	Provide immediate response service
	Professionalize scheduling/dispatch function
	Maximize use of subscription service
	Review, refine, tighten subscription trips on periodic basis
	Accept "will-calls" judiciously
	Obtain operator input on schedules on periodic basis
Safety	
	Monitor accident trends
	Involve operators in a safety committee

Source: Yadkin Valley Economic Development District, Inc. and TCRP Report 136

Figure 19:

No-Show Policy	Performance Effects
<p>Policy of multi-county rural system states: if 3 no-shows within a 2-month period, rider can be suspended for 1 week. Rider must pay for each no-show trip. If rider exceeds \$50 in unpaid no-shows, service is suspended until fares are paid. Policy strictly enforced starting in FY07.</p>	<p>No-show rate decreased from more than 15% to 1% after enforcement.</p>
<p>Policy of rural county-based system requires trips to be cancelled at least 1 hour before the scheduled trip; 3 no-shows in a 30-day period may result in service suspension.</p>	<p>Enforcement of policy implemented in 2000 has decreased no-shows by one-half, from an estimated 4% of trips to 2%.</p>
<p>Multi-county system's policy states that trips must be cancelled 24 hrs before trip pick-up time or by 4:00 P.M. the day prior to trip. If trip is not cancelled and rider does not appear for trip, it is counted as a no-show. Three no-shows in a 60-day period may result in suspension of service. System began strict enforcement with suspensions given to a small number of frequent offenders.</p>	<p>No-show rates decreased:</p> <ul style="list-style-type: none"> • FY05 3.7% • FY06 2.8% • FY07 2.6%
<p>Two-county rural system with about 60% subscription riders, many from human service agencies, states in "Riders Guide" that "excessive no-shows may result in suspension of service." A cancellation less than 2 hours before pick-up is counted as a no-show, unless dispatch can re-route the vehicle.</p> <p>Human service agencies charged the fare when one of their clients/riders no-shows, a practice that gets the attention of and help from the agency in dealing with the offending rider.</p>	<p>No-shows are not seen as a major problem, at 1% or less of total scheduled trips.</p>

Source: TCRP Report 136

5.3 Framework/Decision Matrix for Microtransit

The vast majority of places that operate flexible public transit, in the vein of YVEDDI service, are rural areas (up to 6,000 square miles) of low-density populations (5 to 100 persons per square mile), large jurisdictions (usually counties) of low-density, and small rural communities (e.g. towns) with low-density populations (100 to 500 persons per square mile), as discussed in TCRP Report 140. Other areas do operate flexible public transit, but are not as prevalent. The next subsections of this section provide various matrices to describe best implementation practices for transit service upgrades, including the YVEDDI microtransit service conversions. The YVEDDI Decision Matrix should guide implementation by highlighting the goals policies and actions should expand upon. These goals should be referenced when upgrading transit service.

Goals and Objectives

The goals and objectives of YVEDDI Transportation transit service must align with the goals and objectives of the state of North Carolina, and that of the federal government of the United States of America. The Federal Transit Administration and the North Carolina Department of Transportation have outlined the goals and objectives of their institutions for YVEDDI to incorporate within its service. Likewise, the 2021 Bipartisan Infrastructure Law brought forward many goals to move the country further in reaching the transportation vision of the USA. This section examines how the goals of all of these institutions and laws will be furthered by the upgrade of YVEDDI transit service to microtransit in Mocksville and Elkin.

2021 Bipartisan Infrastructure Law

The 2021 Bipartisan Infrastructure Law contains policy and funding for public transportation. Approximately \$108 billion is allocated for public transportation, as the largest federal investment in public transportation in the nation’s history. The goal is to advance public transportation in America’s communities via four essential priorities, as described in Table 3, below.

Table 3:

2021 Bipartisan Infrastructure Law	
Safety	Enhancing state safety oversight programs by strengthening rail inspection practices to protect transit workers and riders from injuries and ensure safe access to transit.
Modernization	Reducing the state of good repair investment backlog by repairing and upgrading aging transit infrastructure and modernizing bus and rail fleets.
Climate	Replacing thousands of transit vehicles, including buses and ferries, with cleaner, greener vehicles.
Equity	Improving transit service for communities that have historically had more limited access to transit and provide for substantial upgrades to station accessibility.

Source: Yadkin Valley Economic Development District, Inc.

North Carolina Department of Transportation Goals and Objectives

In the *NC Moves 2050 Plan*, the state of North Carolina outlines its vision for transportation in the state. With a goal to understand future transportation needs and develop modern strategies to meet those needs, the plan outlines five goals and eight objectives to meeting that vision. Table 4, below illustrates those goals and objectives.

Table 4:

Goal 1: Provide Transportation Access for All
Objective 1.1: Improve quality of life and multimodal access to regional jobs and services
Objective 1.2: Connect communities to statewide opportunities
Goal 2: Improve Transportation Through Technology
Objective 2.1: Enable smart and innovative statewide technology solutions
Goal 3: Ensure Safety & Security
Objective 3.1: Promote more multimodal safety and behavioral-based programs, policies and tools
Goal 4: Support a Strong Economy
Objective 4.1: Provide connections to new industry clusters and transportation terminals
Objective 4.2: Address air, sea and inland port capacity to handle freight demand
Objective 4.3: Identify future transportation workforce supply and demand
Goal 5: Maintain a High-Quality System
Objective 5.1: Develop and mainstream risk/resiliency practices

Source: *NC Moves 2050 Plan*

YVEDDI Decision Matrix

North Carolina Transportation Goals	Safety	Modernization	Environmental Sustainability	Equity	People Movement and Economic Viability
Provide Transportation Access for All	X	X	X	X	X
Improve quality of life and multimodal access to regional jobs and services	X	X	X	X	X
Connect communities to statewide opportunities	X	X	X	X	X
Improve Transportation Through Technology	X	X	X	X	X
Enable smart and innovative statewide technology solutions	X	X	X	X	X
Ensure Safety & Security	X	X	X	X	X
Promote more multimodal safety and behavioral-based programs, policies and tools	X	X	X	X	X
Support a Strong Economy		X			X
Identify future transportation workforce supply and demand		X		X	X
Maintain a High-Quality System	X	X			X
Develop and mainstream risk/resiliency practices	X	X	X	X	X

Town of Elkin Goals, X
<p>Community Character and Guidelines: Maintain Elkin's identity as a charming foothills town while developing design guidelines and overlay districts that establish the character of each district, as well as maintenance guidelines and code enforcement.</p> <p>Economic and Tourism Development: Promote a business-friendly environment that attracts a diverse range of industries, while continuing to support existing businesses, tourism opportunities, special events, riverfront connections and coordination with regional attractions.</p> <p>Land Use and Growth Management: Establish land development strategies that seek to promote economic development and diverse housing opportunities, while strengthening the community character, utilizing existing resources, and encouraging infill development and downtown revitalization.</p> <p>Transportation Connectivity and Gateways: Ensure that future town resources by contributing to improve bicycle/pedestrian connectivity, expanding public transportation opportunities, improving existing roadways, and establishing gateways at key town entrances.</p> <p>Infrastructure and Public Utilities: Parks, Trails and Natural Resources: Maintain the quality of life for residents and attract visitors by continuing to offer a wide variety of recreation opportunities, quality parks and facilities, a well-connected trail network, and access to natural resources such as the Yadkin River.</p> <p>Position Elkin to better accommodate future residential and commercial development by identifying infrastructure and utility needs and developing strategic plan for implementation of sustainable improvements.</p> <p>"Ensure that future residents and visitors have access to town resources by continuing to improve bicycle/pedestrian connectivity, expanding public transportation opportunities, improving existing roadways, and establishing gateways at key town entrances."</p>

Source: Yadkin Valley Economic Development District, Inc.

6. Marketing and Other Relations

Marketing rural transit systems extends beyond signage, brochures, and vehicle graphics. Public outreach and participation on civic boards and within civic organizations on a regular basis increases the transit system's overall presence in the community and can reap benefits when it comes to funding options through public-private partnerships and other avenues. Becoming involved in local community events, and positioning itself as a staple of the community through various outreach events can further gain high regard and civic engagement for the transit system. This section will discuss marketing strategies and how and for what reasons to develop a marketing toolkit. For more data, refer to Appendix D.

6.1 Developing a Marketing Strategy and a Toolkit

It is important to emphasize the need for community outreach, but also to develop and maintain a concise and purposeful marketing strategy. Rural transit agencies often rely on a small staff to implement marketing strategies, therefore developing a marketing plan and toolkit that serves their needs is fundamental to communication. Explaining to the public *what* the YVEDDI transportation system is and *what* the transit service does is essential to that communication. The core components of the marketing strategy should elaborate on this very concept: *What is YVEDDI Transit?*

Marketing Strategy

To answer the question of *What is YVEDDI?*, YVEDDI must develop a marketing strategy that explains its services and advertises them to the right audience, which for YVEDDI is the general public. Developing a marketing plan begins with forming goals and objectives and to satisfy those goals and objectives, the plan must elaborate on the areas below.

Branding

Branding is YVEDDI's awareness and public image. Branding is what comes to mind as the audience thinks of the organization, for example Starbucks, Google, or Amazon. Branding is identity; even the visuals that are associated with the organization. Therefore, branding entails the organization name, logo, packaging, signage, color scheme, and so on (Barlow, 2021). Visual examples are depicted in Figure 20, below.

Figure 20:



Source: Yadkin Valley Economic Development District, Inc.

Likewise, it is essential to have branded vehicles that display pertinent information about the transit system, including contact information, and the organization slogan, as depicted in Figure 21, below.

Figure 21:



Source: Bartow, 2021

Knowledge

The website is typically the main source for information about an organization. Websites present convenience, and ease-of-use is an essential component of website design and effectiveness. The website is where YVEDDI can answer questions about YVEDDI Transportation and its transit service, clearly and concisely. A few questions to answer include (Barlow, 2021):

- Where can I go on public transit?
- How do I get from here to there?
- When/how often does it run?
- How do I make a reservation?
- Where do I catch it?
- How much does it cost?
- How do I pay?
- What is different due to the pandemic?

For website design best practices, and social media best practices refer to Appendix _.

Promotion

Marketing campaign strategies are a method to increase ridership, by raising awareness of public transit in the community. An individualized marketing campaign can be used as a tool in an overall marketing plan to increase awareness of YVEDDI transit service changes, for example new microtransit service. Such a campaign can serve to dispel misconceptions about transit service changes, increase ridership, influence the community to support public transit, and satisfy funding requirements (NationalRTAP.org, 2021).

Creating an individualized marketing campaign also requires setting goals and objectives and taking stock of available resources. Gearing the campaign towards the appropriate audience is essential. Brochures, flyers, social media posts, social media ads, and other tools should be employed to reach the target audience and concisely explain the topic of campaign, and/or, refer the audience to a website or agent.

Passenger Experience

Understanding and improving passenger experience is key to retaining riders. YVEDDI has conducted ridership surveys, as discussed in section **Error! Reference source not found.**, and should be expanded upon in future marketing campaigns to improve passenger experience. Ridership survey data can yield insight into how to advertise YVEDDI transit service. Telling a story is the best method to capture the attention of the audience and using ridership data to give a glimpse into the life, and ride, of a passenger is a great method to explain YVEDDI service. Whether the story is told via a marketing campaign video, brochure, or presentation, relating how YVEDDI transit service impacts and improves an individual's quality of life is instrumental in marketing new transit service.

Constituency Building

Increasing engagement with the public and private sector is a fundamental pillar of marketing strategy. Capitalizing on existing connections and expanding YVEDDI's network to include new organizational partnerships can improve YVEDDI's stance across a broad range of areas, including ridership expansion and funding possibilities. Public and private partnerships have been the bedrock of YVEDDI operations, therefore expanding these partnerships will bring YVEDDI to new frontiers, matching its venture into microtransit.

Fast Marketing Campaign Tactics

Below are a few quick marketing tactics rural transit agencies have reported using to increase public awareness about transit service and increase ridership (TCRP Report 141, 2019):

- Distributing brochures, flyers, seat drops, and car cards.
- Placing ads at regional area stations and transit centers.
- Putting ads on bus exteriors and bus shelters.
- Advertising on digital media.
- Placing information on the transit agency website, including a new carousel image, social media, and eNews.
- Using bilingual brand ambassadors at stations and on buses affected by the change to help passengers understand and register for the service.
- Placing at-stop signage, including pole case inserts and Flex service signs.
- Distributing copies of Guides to Proposed Mobility Plan Changes at outreach sessions and on transit vehicles.
- Placing "Take-ones" on all fixed route buses identifying changes and locations of public open houses where people can provide feedback.
- Conducting employee meetings at the businesses and housing developments within the service area.
- Purchasing radio spots and television commercial time on English and Spanish channels.
- Providing information through the transit agency's customer service center.
- Conducting direct outreach to political jurisdictions, planning commissions, government agencies, and human services agencies.
 - Holding public meetings, public hearings, and making presentations at community centers and public spaces.
 - Advertising and placing a featured story in the local papers.
 - Mailing information brochures to large senior living facilities and mobile home parks.
 - Holding press conferences, issuing press releases, and arranging television news coverage.
 - Mailing introductory notices along with free ride coupons to residents living within 1.5 miles of newly established Flex Routes.
- Presenting the general public DRT/microtransit vehicles at an organized event with public officials in attendance drawing media coverage.
 - Having ribbon-cutting ceremonies at the start of the new service.