



CASE STUDY~WINTER 2021

EVALUATING THE POTENTIAL MICROMOBILITY BENEFITS OF SHARED DOCKLESS SCOOTERS IN FAYETTEVILLE, N. C.

Because we are a relatively small, closely held company, we can provide the personalized service that we feel is necessary for the optimal performance of a successful e-scooter sharing program in the Fayetteville, N.C. area. We are sensitive to the needs of the population to be served; workers, students, and residents alike, and through careful employee selection, in-service training programs and seminars, will instill this sensitivity in our team. We will provide a strong management team and resource persons experienced in the implementation, operation, and servicing of an electric scooter program such as that we are currently offering, which would be a great benefit to the city of Fayetteville. In addition, we are flexible enough to be able to work closely with the Contract Administrator to make whatever innovations are necessary to facilitate a smooth operation.

We conducted this study to examine the potential for public e-scooter sharing systems to fill mobility needs within and between Fayetteville, N.C. neighborhoods. It explores how availability of this micro-mode of transportation could influence travel time, cost, and the convenience of trips relative to other active and shared-use modes including walking, bicycling, bikeshare, and public transit. It further promotes the “green” solution for mobility of the shared dock-less standing e-scooter system that Spunk Scooters, LLC would like to establish in Fayetteville, N.C. The shared dock-less e-scooter is a short-term rental system of electric standing e-scooters that allows a user to pick up an e-scooter where it is located and drop it off wherever he/she chooses at the end of the ride.

The character of urban transportation in the United States has dramatically changed in recent years, due in part to the growing interest in active transportation and the explosive growth and continuous iteration of shared-use modes of travel, including bike-sharing, carsharing, ride-sourcing, and, more recently, electric (e-scooter) sharing. E-scooters and other novel forms of micro-mobility have already added to the growing menu of travel options available in cities by offering riders opportunities to experience urban environments in an unconventional way. Electric Scooters are popping up everywhere, and competition is increasing. The city of Washington, DC, with a population of 714,153 (2020), recently awarded permits to operate up to 19 different companies with dock-less scooters. With an estimated population in 2019 of 526,719 people, the Fayetteville metropolitan area is the largest in southeastern North Carolina, and the fifth largest in the state. In less than a month's time, the 213,475 people who, actually live in the city of Fayetteville would be able to easily, and affordably, move throughout their city.

The use of electric scooters can have a great impact on the reduction of pollution and traffic in Fayetteville. As their motor is electric, they have no tailpipe emissions during the trips, unlike any other modes of transportation that use a thermic motor. At the present time, the transport sector contributes as much as 15.5% to the total world-wide global warming potential (GWP). Specifically, urban mobility is an important contributor to GWP and, also causes other negative externalities, such as other air pollutants and traffic congestion.

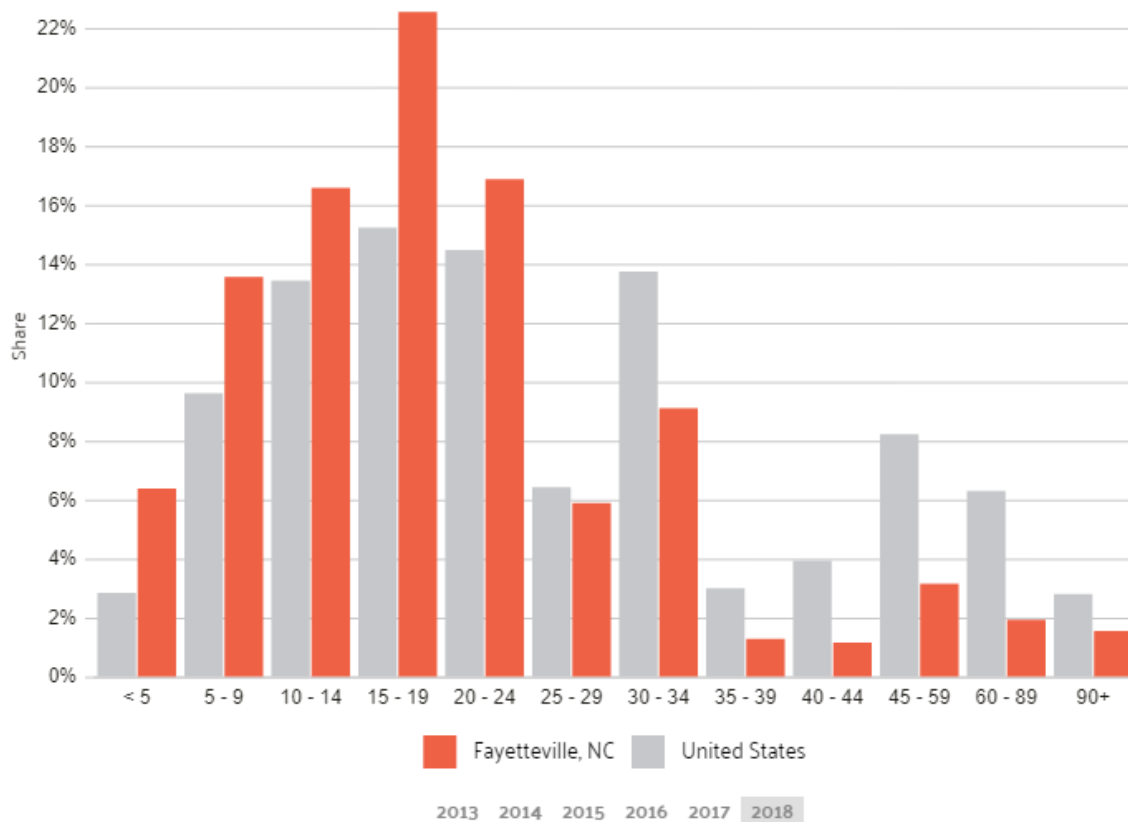
Although there has been considerable discussion about how to regulate e-scooters, dock-less bicycles, and the sharing economy more generally, relatively little has been done to better understand multifold interactions between transportation modes and how specific networked trip configurations can influence travel times and accessibility. This lack of fine-scale analysis is due to the complexity of modeling multimodal travel, which must take into consideration such factors as the variability in public transit schedules, configurations of street networks, and the characteristics of shared-use vehicles with discrete check-out (e.g., dock-less e-scooters and bikes) and check-in (e.g., docked bikeshare) locations.

E-scooter systems differ from bikeshare systems in several, key ways. E-scooters are smaller and typically not as fast as bicycles, especially lightweight touring bikes. However, because e-scooters have a smaller footprint compared to bicycles, they can be made available in more places, and therefore are less geographically constrained. Furthermore, unlike many city's docked bikeshare systems, e-scooters are free-standing and do not need to be returned to a designated station.

In 2018, the median age of all people in Fayetteville, N.C. was 30. Native-born citizens, with a median age of 29, were generally younger than foreign-born citizens, with a median

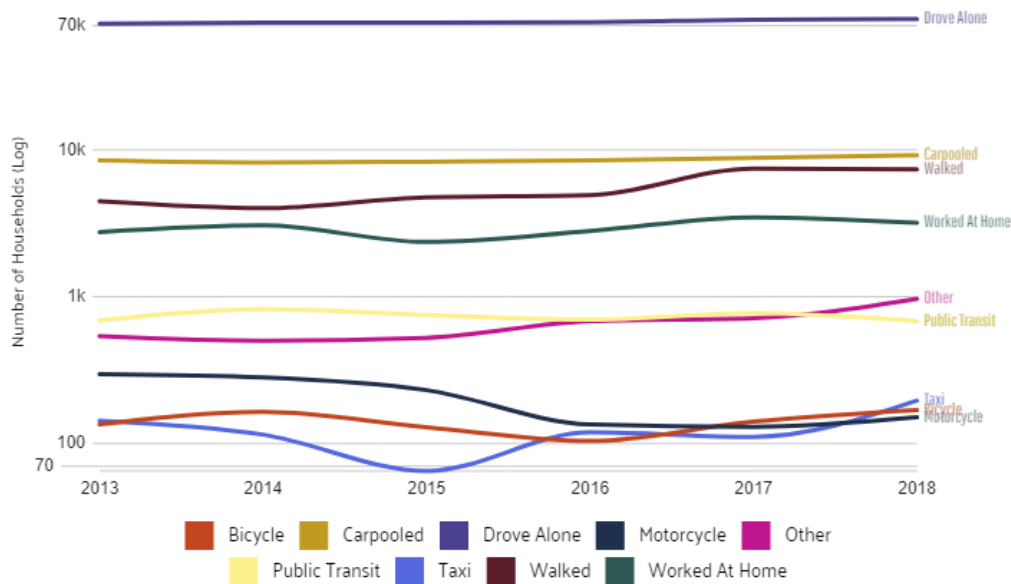
age of 41. In 2017, the average age of all Fayetteville, N.C. residents was 30. Our target rider age range is 16 – 60.

In 2018, most people in Fayetteville commuted by driving alone, and the average commute time was 18.5 minutes. The average car ownership was 2 cars per household. Using averages, employees in Fayetteville, NC have a shorter commute time (18.5 minutes) than the normal US worker (25.3 minutes). Additionally, 1.55% of the workforce in Fayetteville, NC have "super commutes", in excess of 90 minutes.



However, the Mean Commuting Time for Workers (5-year estimate) in Cumberland County, N.C. was expected to reach above 21.4 minutes by 2019, according to the Federal Reserve Bank of St. Louis, MO Mean Commuting Time for Workers, Annually: North Carolina (<https://fred.stlouisfed.org/series/Bo8oACSo37051>).

In 2018, the most common method of travel for workers in Fayetteville, NC was Drove Alone (78%), followed by those who Carpooled (9.21%) and those who Walked (7.41%). The following chart shows the number of households using each mode of transportation over time, using a logarithmic scale on the y-axis to help better show variations in the smaller means of commuting.



The 2019 U.S. Census' Means of Transportation to Work by Selected Characteristics for the entire state of North Carolina indicates that workers 16 – 19 years of age, making up 3.9% of the 4,937,952 participants in the study, drove alone in a car, truck or van only 3.4% of the time, compared with 9.3% of workers aged 20 – 24, compared with 42.9% of workers aged 25 – 44, compared with 21.5% of workers aged 45 – 54, compared with 9.8% of workers ages 55 – 59, and 13.1% of workers 60 and older.

Increased automobile ownership and continuation of the suburbanization of metropolitan areas have been partially responsible for changes in commuting patterns, with an increase from 1990 to 2000 in individuals driving alone to work. However, as compared to previous years, the period from 2000 to 2009 saw a decline in the percentage of individuals driving to work alone, possibly because higher fuel prices caused commuters to carpool and/or use public transportation. In addition, more employers may

Everyone does not want to drive to work, let alone to outside work activities. Everyone does not own an automobile. The minimum age for riding our e-scooters begins at 16. Many do not want to ride a bus in the current climate of the COVID pandemic. While commuting with Uber and Lyft and being provided with door-to-door service may be convenient, a 3.2 mile commute may average 45–60 minutes each way in some cities. Daily costs can range anywhere from \$30 to \$50. Most importantly, using gasoline powered modes of transportation contributes to the carbon footprint.

Since the release, in October 2018, of the UN Intergovernmental Panel on Climate Change (IPCC) report that estimates that mankind has 12 years to limit global warming to a 1.5C increase, we have been looking for ways to make an impact.

We use the EPA calculations for carbon content per gallon of gasoline. At <http://www.epa.gov/cleanenergy/energy-resources/refs.html> we can tell that there are 8,887 grams of CO₂ per gallon of gasoline, which is 19.59lbs of Carbon per gallon of gasoline. We then take the average fuel mileage used by the EPA on the same site of 21.4 miles per gallon. Using this information and the mileage you enter for your trip we can calculate how much fuel is saved and then how much carbon you have prevented from entering the atmosphere.

Our fleet of Acton M Pro Scooters delivers a maximum range of 30 miles, which is more than ample for most commutes, as well as for casual rides in and around the city. They are state-of-the art electric scooters with TOPSWAP batteries. These batteries are designed to be a quick reload for our charging team, swapping an empty Lithium-Ion battery with a fully charged unit in a matter of seconds. Spunk Scooters will not need to carry a huge operation team to pull the whole fleet of scooters off the street to get charged at the end of every night with vans that load in vehicles. The scooters have an IP rating of IP66, and a 12,000-mile lifespan, which means our scooters offer comfortable and confident rides, and are able to withstand any urban environment.



We are currently investing in Solar Powered Stations, that will eventually, *totally* eliminate the need for electricity in the charging of our batteries, and further spread our mission of lowering carbon emissions.

The state of North Carolina currently has six types of public transportation systems: human service transportation, community transportation, urban transit, regional transit, vanpool and carpool programs, and intercity buses. A seventh “public” mode of conveyance includes taxis and other “for hire” personal vehicles, such as limousines.

Human service agencies in every county provide some type of service to their clients to transport them to medical, educational, employment, or recreational facilities. Users of such services must be referred by human service agencies.

Community transit associations provide transportation for human service agency clients and, the general public by subscription rides, prearranged by an individual, group, or human service agency.

Urban transit systems provide fixed-route and, in some cases, dial-a-ride or “demand responsive” services.

In addition to carpool/vanpool services provided by the regional and urban transit systems, the NCDOT Central Office and various private vanpools and carpools across the state provide commuter services to employees.

Intercity bus services are privately owned and operated transportation systems. These companies provide fixed route intercity and interstate bus service.

Since congestion in urban areas typically is most severe during morning and afternoon “peak hours,” the most widely used measurement of congestion in American cities is the average time taken on the trip to work. These data are collected in the U.S. Census Bureau’s American Community Survey and in the Decennial Population Census. In 2019, the Average Commute Time to work in North Carolina’s counties was 27.5 minutes (which is shown in Figure 2. By analyzing commute times and patterns, it is possible to begin to examine the extent to which congestion has become more common in the larger urban areas. Commuting times are a function of the relative traffic density on the highway. Relative traffic density is the ratio of volume to road capacity.

Figure 1 portrays average commute times to work (in minutes) for North Carolina counties in the year 2019. A little more than half the State’s counties had an average commute time to work of between 20 and 30 minutes. Longer commute times (more than 30 minutes) were scattered around the state, including in some counties that are contiguous to major employment areas in adjacent counties. The northeastern part of the state also had high average commute times, the result of many residents commuting to Tidewater Virginia for employment. Lower commute times were experienced by residents in less urbanized counties in the mountains, the central Coastal Plain, and the Sandhills, as well as in the more highly urbanized counties in the northern Piedmont.

Most commutes are in-county commutes. In most cases, the largest commuting flow is within the county, meaning most people live and work in the same county. Within county commuting occurs among the majority of county residents in 75 of the North Carolina’s 100 counties.

While visitors to Fayetteville, North Carolina have several options for getting around the city and the rest of the country with public transportation, these methods mostly require being in close confines with others.

The Fayetteville Area System of Transit (FAST) operates a public bus service through the city of Fayetteville, which makes stops at major areas around the city. There are nine routes available. The Connector shuttle bus is a van service that has two routes to certain areas not serviced by the standard buses. Both services rely on schedules which may restrict people's time and ability to be mobile.

Taxis are another way of getting around the immediate city of Fayetteville, with fares are based on meters, which are standard in vehicles of all companies. But the best way to get a taxi is to call one of the agencies ahead of time to arrange for a pick-up. With dock less e-scooters no such advance planning is necessary.

AVOID THE RISK OF RIDING WITH OTHERS DURING THIS COVID-19 PANDEMIC

While the Governor has relaxed COVID-19 restrictions for North Carolina businesses, sports and event venues, Dr. Tony Moody, a Duke Health professor of pediatrics said that nearly 80 percent of people must be fully vaccinated to get the state where it needs to be. To have ideal herd immunity, vaccines will need to successfully cut down transmission and infection rates will have to continue to drop.

Moody added that it could take months to get the state vaccinated. A major concern for reaching herd immunity is variants of the virus. While experts, like Moody, believe vaccines will cover them to an extent, Centers for Disease Control director Dr. Rochelle Walensky said she doesn't want to give people false hope. "Please hear me clearly. At this level of cases with variants spreading, we stand to completely lose the hard-earned ground we have gained. These variants are a very real threat to our people and our progress," said Walensky in a White House Coronavirus Task Force briefing.

Moody said that while the state is heading in the right direction, masks and social distancing will be the new normal for a while. He added that masks could be a part of our culture moving forward.

More than 1.2 million people in North Carolina have received their first COVID-19 vaccine dose. Recipients need two doses of the shots, administered several weeks apart. In total, close to 2.2 million doses have been administered in the state. Despite the positive news, officials cautioned that variants of the virus could pose a unique threat as the state eases restrictions.

Recently, three employees who drive Fayetteville Area System of Transit buses tested positive for coronavirus, forcing the city to suspend six routes. In addition to the three drivers, 36 other FAST employees had to be placed in quarantine following contact tracing. The following bus routes had to be suspended indefinitely:

- Route 9 – Stacy Weaver Drive/Rosehill Road
- Route 10 – Strickland Bridge Road
- Route 11 – Country Club Drive/Pamalee Drive
- Route 15 – Cape Fear Valley Medical Center/Cross Creek Mall
- Route 19 – Yadkin Road
- Route 31 – Owen Drive/Gillespie Street (includes Enterprise Avenue)

Also, Route 7 – Raeford Road was caused to operate on a reduced service schedule. About **600 residents** depended on the suspended routes, according to FAST officials. While we are sure that FAST has taken steps to mitigate the transmission of the virus, using electric scooters guarantees the individual space, which equates to more safety from transmission of the virus.

SERVE FAYETTEVILLE’S COLLEGE COMMUNITIES THE CASUAL E-SCOOTER USER

The three largest universities in Fayetteville, Fayetteville Technical Community College (11,660 enrolled students in 2017), Fayetteville State University (6,226 enrolled students in 2017), and Miller-Motte College-Fayetteville (681 enrolled students in 2017) certainly would benefit from the availability of e-scooters for their transportation needs in and around the city.

Students need to be mobile. Whether gathering supplies for classes and projects, or socializing in the evenings and on weekends, they often find the methods of transportation not feasible for them. Zip-Car’s “Uni Plan” at Fayetteville State University offers “Standard” hourly rates from \$8.50/hr., with 180 miles included per day (\$0.45 per mile after that), a complimentary gas card in each car, and secondary insurance for all trips. But you have a fee of \$25.00 just to join.

Spunk Scooters, on the other hand, simply requires the downloading of its app to the user’s smart phone, a method of payment to be entered, a \$1.00 Unlock Fee, and rates beginning at \$0.30 per minute. We will also offer Daily Passes and other promotions throughout the school year.

THE DAILY COMMUTER ON AN E-SCOOTER

On trips between 0.5 and 2 miles, e-scooters would be a particularly strong alternative to private automobiles. In parking-constrained environments, the introduction of e-scooters could increase the number of trips in which non-auto options are competitive with driving from 47% to 75%. The cost of using an e-scooter, inclusive of tax, would likely be around \$1.00 for the unlock fee per trip plus \$1.32 per mile, making them cost-effective on short-distance trips.

The benefits of e-scooters can differ widely between geographic areas that are only a few blocks apart due to the differential access of these areas to transit lines and bus routes.

E-scooters would make more jobs reachable within 30 minutes compared to the number of employment opportunities currently accessible by public transit and walking alone.

“THE TOURIST E-SCOOTER USER”

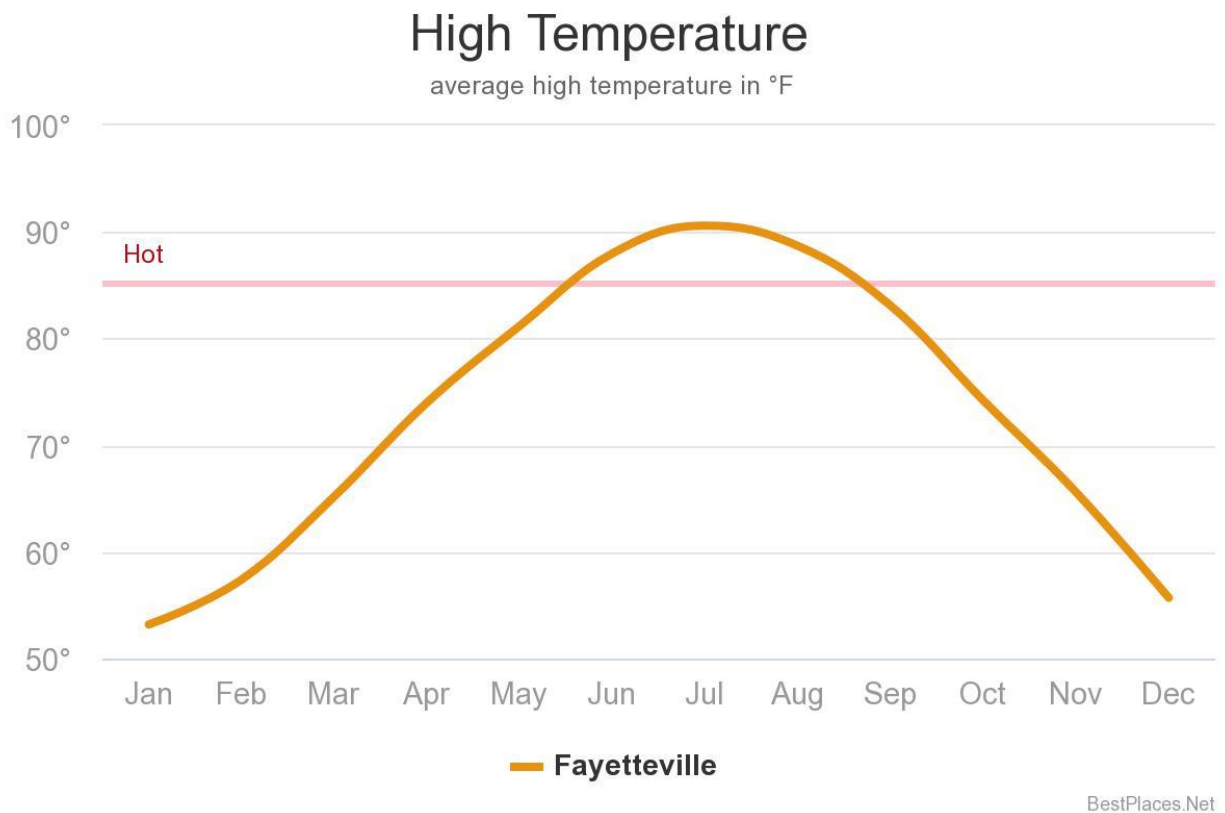
Fayetteville in North Carolina is a place filled with rich history coupled and southern hospitality. While Fayetteville may be a small community, it is abundant in tourist attractions that many want to see. As well as being a recognized Military Sanctuary Community as well as ‘America’s Most Pro-Military Town’ (as declared by TIME Magazine), Fayetteville is also a vibrant and modern city.

Imagine the sight of a family of tourists, travelling with ease to sights and sounds on e-scooters, such as the Airborne and Special Operations Museum, and all along Hay Street, or the Gilbert Theater, without the burden of looking for parking or walking long distances between attractions. Imagine tourists travelling between restaurants, art galleries and fine shopping venues without having to wait for taxis or busses. That is the mobility that Spunk Scooters would offer to the city.

As the USA Today stated in “Electric scooters add a buzz to city sightseeing” (Larry Bleiberg Special to USA TODAY Feb. 22, 2019) “The latest way to sightsee requires an app, a sense of balance and a thumb to operate a throttle. Dock less electric scooters are a great way to explore a city, says Paul DeMaio, who manages the bike- and scooter-share programs in Arlington, Virginia. “It can be a lot of fun.” In some areas the programs, which offer short-term rentals for just a few dollars, have been controversial: Parked scooters can block sidewalks, and inexperienced, unhelmeted riders have been injured. *But cities have adopted regulations, and the popularity is booming.* “It’s surprising how quickly they have caught on and spread,” says DeMaio.” The article further goes on to say “North Carolina’s largest city [Charlotte] has embraced the e-scooter, but bans them from sidewalks in the Uptown area and limits

vehicle speeds. Rental companies require riders to be over 18, and to have a driver's license."

With the necessary training, public awareness, advertising and placement of e-scooters, tourists are given the opportunity to visit more attractions in less time thus, bringing more dollars into the local economy. And with Fayetteville's sunny day average of 219 days a year, compared with the national average of 205 days, there is plenty to see.



In fact, the climate in Fayetteville is conducive to riding e-scooters most every day of the year.