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Going Beyond the Millennials: North Dakota Driver Ride Service Survey: Phase II: Non-Millennial Follow-Up Survey

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Acknowledgement

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Disclaimer

This research was supported by the North Dakota Department of Transportation. The contents presented in this report are the sole responsibility of the Upper Great Plains Transportation Institute and the authors.

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ABSTRACT

The rise of ride-sourcing services such as Uber and Lyft in recent years has revolutionized urban transportation across the globe. With the increased popularity of these services came negative impacts on industries such as taxi cab and public transit services. In an era when ride-sourcing companies are expanding rapidly in previously untouched markets, rural markets might soon face unexpected changes. North Dakota is highly rural with a median age of 35.2 years, with seniors making up nearly 20% of the adult population. Given this information, we anticipate the potential expansion of the ride-sourcing market in North Dakota. We intend to understand public perception of ride-sourcing services and identify key contributing factors and behavior patterns that may trigger the use of such services by those outside of the typical millennial, urban market. Moreover, we compare current results to those obtained from the previous year's survey to explore shifts in North Dakota's usage and perception of ride-sourcing services.

INTRODUCTION

Ride-sourcing services have grown significantly since the introduction of Uber in 2009 (Clewlow and Mishra, 2017). Since then, similar companies such as Lyft, Hailo, Sidecar, and others have entered the scene, while Uber continues to dominate the market in the United States. According to the Pew Research Center (2018), 36% of U.S. adults have participated in ride-sourcing services. By the year 2024, we can expect to see 1,588.2 million U.S. users of ride-sourcing services (Statistica, 2019c). These services act as negotiators of supply (driver) and demand (rider).

Service is accessed via a mobile app after the user creates a profile with contact information and payment information, as payments are typically automatically processed. A user will request a ride to a specific destination using the app, and will be provided with the estimated arrival time and trip cost for nearby drivers. This information is generated by the global positions system (GPS) in the users' mobile device. From here the user can accept a ride offer and a combination of technological features, such as GPS and digital maps, and routing features enable the user to monitor real-time information about the ride.

Vehicle sharing services, such as Zipcar, have been an alternative mobility option in the United States for more than a decade. As of May 2019, car-sharing was available in over 3,000 cities worldwide (Wagner, 2019). This type of transportation, however, is generally limited to urban cities or college campuses. Still, the model of shared mobility adopted by demand-based ride-sourcing services has grown by 47% in the past three years (Mazareanu, 2020).

OBJECTIVE

Although ride-sourcing has become and remains to be a popular transportation option in urban areas, the future of ride-sourcing services in rural regions is ambiguous. While ride-sourcing companies have made efforts to make services more accessible in rural and remote areas, the low population density and long travel distances limit potential for stable demand that typically attracts drivers (Pew, 2018). Moreover, it remains unclear whether people in rural areas would actually use these services, should they be available. Therefore, it is important to better understand factors that help facilitate and inhibit the growth of ride-sourcing services in rural communities; these factors include rider accessibility, viable driver pools, and dependable market mechanisms in the supply and demand components that comprise technology enabled ride transactions.

This research focuses on the demand factors in the ride-sourcing market, such as current methods of transportation, frequency and purpose of use, and other contributing factors which may have a significant impact on popularizing these services in the rural context. We surveyed North Dakota drivers over age 34 to understand their perceptions and practices. Due to the limited population base, it is anticipated that older drivers are an essential customer group for gauging market potential in a very rural state. As ride-source market segments have been successfully engaged in other demographics, understanding the potential demand-side market diversity of non-millennial adults is important in sustained market function and feasibility. In addition, the survey was completed by the same stratified random driver sample that was contacted to complete it in 2019.

We compare results between the two years in order to assess shifts in behaviors and attitudes toward ride-sourcing services.

METHODOLOGY

To collect information about North Dakotans' knowledge, perception, and usage of ride-source transportation, a mail survey method was employed. This phase in the investigation sought to investigate beyond the millennial driver group associated with the greatest propensity for ride-source use growth (Jiang, 2019). Therefore, a survey of the North Dakota licensed driver population, 35 years and older, was conducted. This mailing was the second occasion in which this survey was administered, the first being one year prior to the same driver group. As with the previous survey, appropriate weighting was factored into the statewide results to compensate for stratified random sampling.

We administered this *North Dakota Ride Service Survey* to a statewide sample of 3,840 licensed drivers in early February 2020. As noted, the first stage of this research was focused on obtaining responses from drivers over the age of 35. A subsequent phase of this survey will be proposed to extend the survey to the younger driver cohort. Due to resource constraints, this categorization was done to uniquely identify older generation characteristics compared with the more commonly prominent younger driver group as frequent users.

A disproportionate stratified random sample was used to select participants by region (east/west) and geography (urban/rural), using county jurisdictional boundaries to define both region and geography (Figure 1). Using these simple average responses, however, would provide skewed results in representing the statewide driver population. For example, participants ages 35 to 54 were 24.0% of the survey sample and account for 24.0% of the survey responses. However, this age cohort only accounts for 30.5% of the licensed driver population in the state (Federal Highway Administration, 2018). Therefore, a post-stratification weighting process is used to give an appropriate weight to responses for statewide estimates. Results from post-stratification consider the regional location and geographic environment of North Dakota registered drivers when weighting in the statewide driving population.

The regional definition was created by aggregating the state into two areas closely representing an east/west division of the state. The geographic environment definition is based on the urban/rural dichotomy that is based in population density and economic clusters. The sampling probabilities for the survey are displayed in Table 1.

Table 1: Sampling Rate

Region	Geography	Sampling Rate
East	Urban	41.0%
	Rural	12.0%
West	Urban	12.0%
	Rural	35.0%

Urban drivers are those from counties with the largest urban population according to the most recently published data estimates from the US Census Bureau. Six urban counties are located in the east and another six are located in the west. These counties represent the clear majority of the urban population in the state. Rural counties in North Dakota were divided into 19 east rural counties and 22 west rural counties (Figure 1).

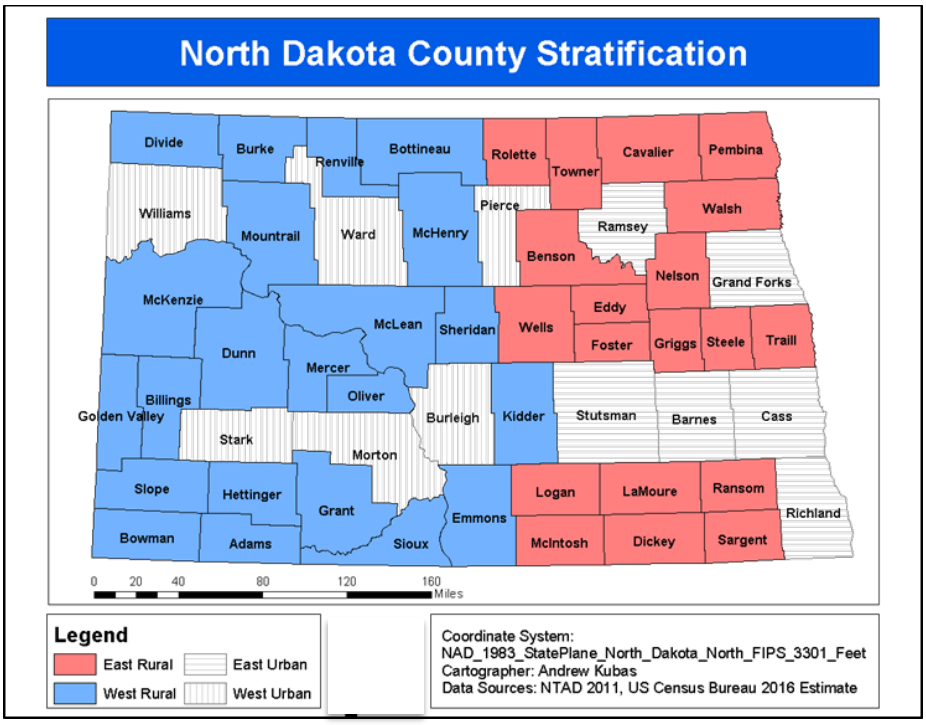


Figure 1: County Stratification

The initial mailing list included 3,840 addresses. After cleaning to remove out-of-state and incomplete addresses, 3,778 surveys were mailed. The mailing produced a return for 375 undeliverable surveys. The response window was open for three months in which the 747 valid responses were collected. The normal two-month window mail response window was expanded due to the COVID-19 pandemic, which was recognized by a federal emergency declaration on March 13, 2020. The response rate of 19.7% was lower than the 2019 survey at 24.0%, but well above the typical mail response rate of 10%.

The number of responses from each age group is sufficient for analysis. As anticipated due to the sampling procedure, representation of the state requires post-weighting of the sample response to more appropriately represent the associated driver population within the geographic and regional sampling frame. For example, 12.0% of the statewide driver population in the sampling frame resides in the west-urban region but it was over-represented with a 34.2% share of the survey responses (Table 2). The distribution of survey responses by region and geography was statistically similar at the 99th percentile.

Table 2: Survey Response by Region and Geography

Region	Geography		
	Rural	Urban	Total
East	195	179	374
	27%	24%	51%
West	195	163	358
	27%	22%	49%
Total	390	342	732
	53%	47%	100%
Frequency Missing = 15			

RESULTS

Ride-sourcing services, such as Uber and Lyft, have continued to gain widespread attention throughout recent years, due to their role in providing flexible transportation options for customers and for their unique method of quasi self-employment as an independent contractor. In this survey, the popularity of such ride-sourcing services among North Dakotans was investigated along with other factors, such as trip purpose and frequency for 2020 response. We also compared these results with those from the previous survey in order to investigate progress in ride-sourcing understanding and usage, as appropriate. The sample demographics were similar in both surveys, as expected, as population representation considering gender, age group, and smart phone ownership were statistically similar at the 99th percentile. The 2020 gender responses comprised 39.6% male and 60.5% female. Vehicle ownership, which may also influence ridesharing, was 3% in each year. The respondent age group was predominantly in the 55- to 74-year-old drivers (Figure 2).

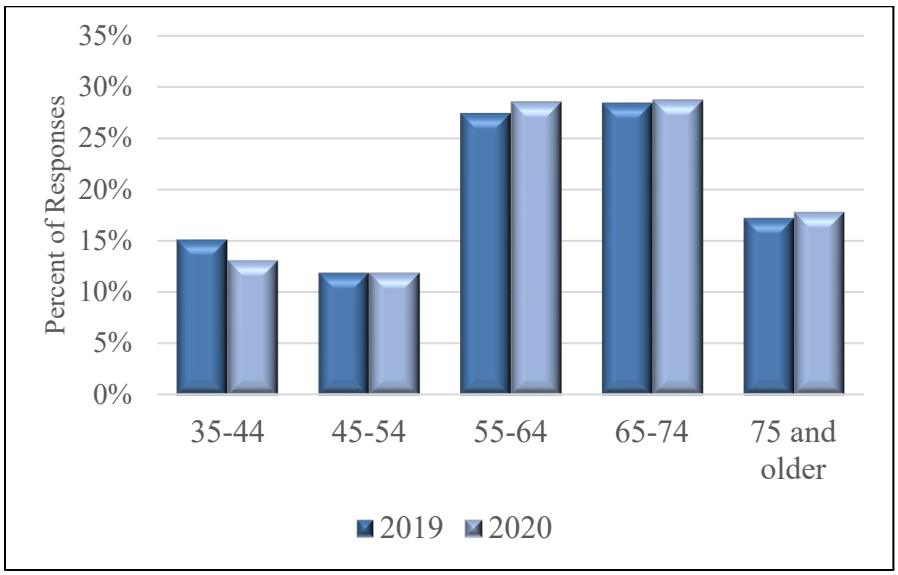


Figure 2: Respondent Age, by Year

Familiarity

As shown in Figure 3, in 2019, more than half (59.7%) of those surveyed were familiar with smartphone apps for ride-sourcing services such as Uber and Lyft. The share familiar with ridesharing in the urban region was significantly higher than the rural in both years (F=19.21, df=1, p=0.001). Statewide, this number increased significantly in 2020 at the 99th percentile, with 64.6% of participants reporting familiarity with such services.

Thus, the percentage of participants unaware of ride-sourcing services has decreased from 43.4% to 35.1% in 2020. We anticipated our results to be on trend with the national opinion, being that 97% of Americans surveyed were familiar with ride-sourcing services (Jiang, 2019). Based on our findings, familiarity with Uber and Lyft remains lower in North Dakota compared with the data collected nationally. With this in mind, we further investigated the demographics of recent participants unfamiliar with ride-source services.

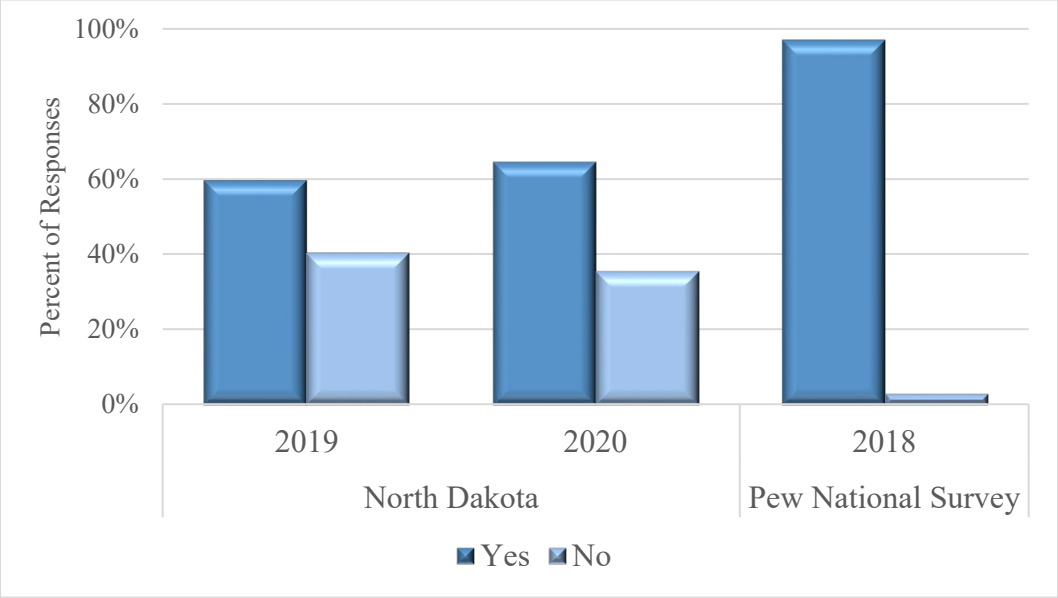


Figure 3: Familiarity by Year

The 2020 survey indicated that rural respondents had increased familiarity with ridesharing, compared with 2019 based on region at the 90th percentile (F=.0687, df=2, p=0.07). In 2020, 55.2% of rural respondents were familiar with ridesharing, compared with 47.6% in 2019 (Figure 4). The urban figures remained similar in 2019 and 2020 at 63.8% and 67.8%, respectively.

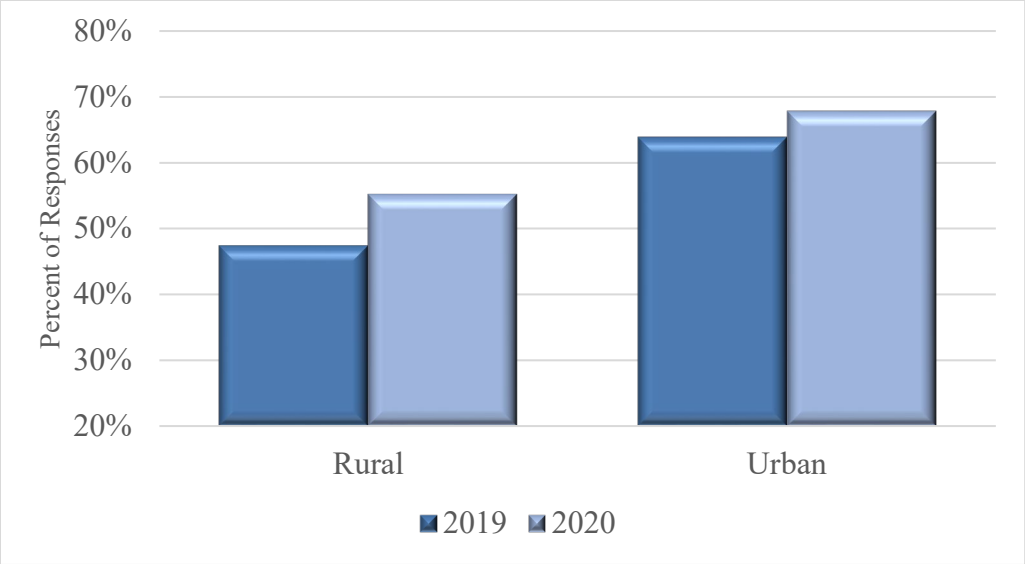


Figure 4: Familiarity by Geography, by Year

A similar pattern was found in 2019 and 2020 responses considering familiarity with ride-sourcing by age group but differences were statistically significant year to year (F=10.67, df=9, p=0.001). As anticipated, an inverse relationship was held in the relationship between age and familiarity. The 35- to 44-year-olds had the highest rate in familiarity rates for both years but it did not vary significantly from 2019 to 2020. Familiarity gains were most evident in the 55- to 64-year-old group with a statistically significant 14 percentage-point increase (t=6.90, df=1, ρ=0.01). The 45- to 54-year-old and 65- to 74-year-old groups had 7% and 15% increases, respectively, in the driver group shares, acknowledging their familiarity with the ridesharing services available via smartphone applications. These changes were not significant.

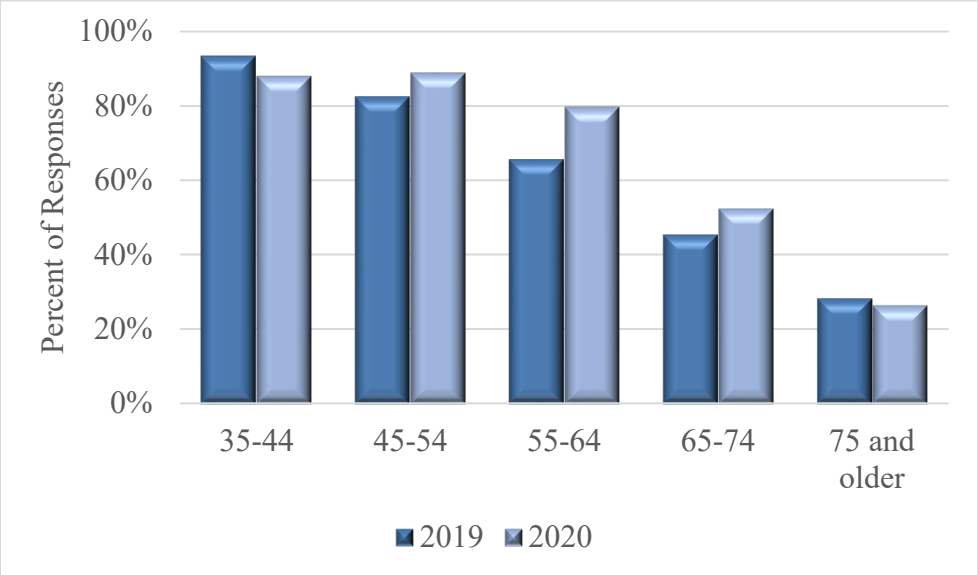


Figure 5: Familiarity by Age Group, by Year

Vouchers and Discounts

Although ride-sourcing services are popular among many demographics, the cost associated with such services may be higher than using a personal vehicle or public transportation. Many jurisdictions have promoted ride-sourcing as an alternative transport mode, especially with regard to alcohol impaired driving. Others have offered it as a last-mile alternative to accessing public transit systems. The discount and voucher programs are intended to incentivize demand that should, in turn, increase fares and attract drivers into the ride-sourcing market. Thus, in the current survey, the participants responded to the likelihood of using Uber and Lyft with a voucher or discount (Figure 6), and the results showed that 42.1% of participants would likely use Uber or Lyft with vouchers or discounts, while 57.9% would not among drivers responding to the question. The share interested in the voucher or discount is statistically significant compared with 46.8% that were receptive to the vouchers and discounts in 2019 (F=3.0912, df=1, p=0.08).

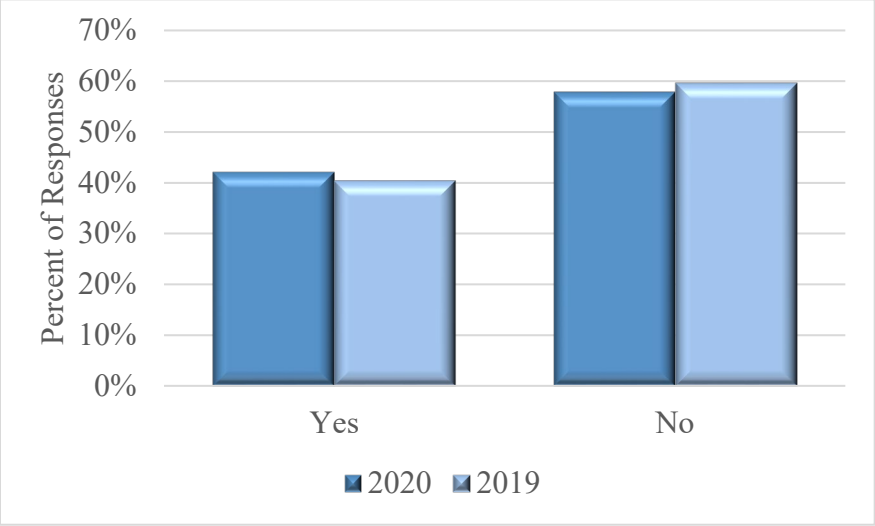


Figure 6: Using Ride-Sourcing with Discount, by Year

Using Ride-Sourcing with Discount, by Year

Receptiveness to ride-sourcing discounts varied significantly among age groups again in 2020 (F=27.50, df=4, p=0.001). The share interested in vouchers or discounts for ride-sourcing declined among most age groups in comparing the 2019 and 2020 responses, but the change was not significant (Figure 7). Because the receptiveness remains low, consistent with the previous study, the general use of vouchers or discounts may not be enough to entice more users. This finding suggests deterrents other than cost.

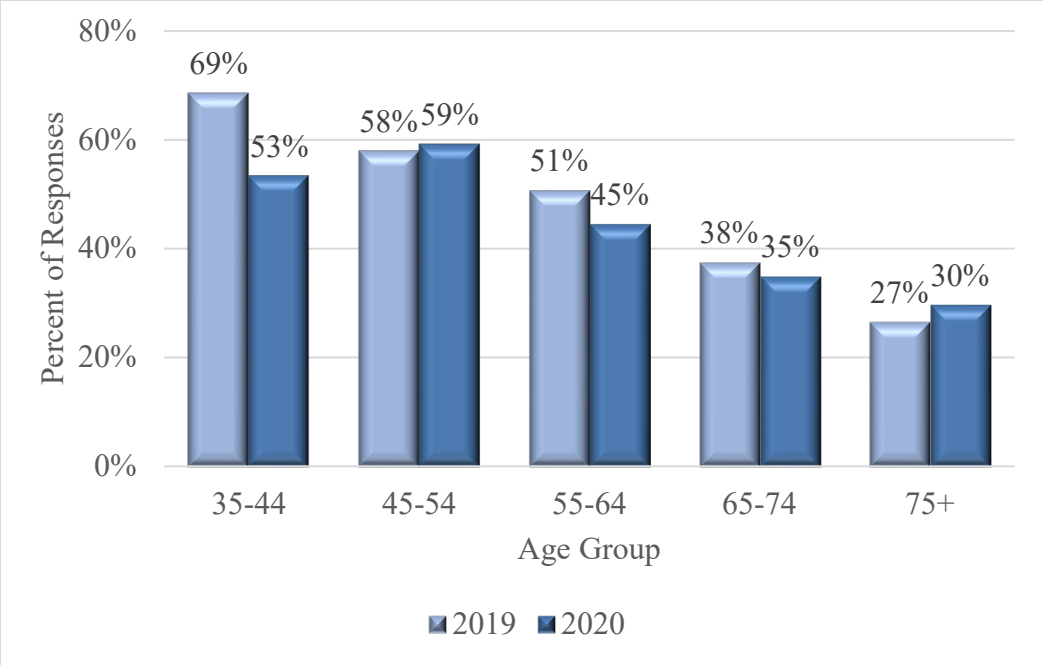


Figure 7: Ride-Sourcing with Discount Interest by Age Group, by Year

An important aspect in the survey is the potential interest among drivers reporting they currently consider ride alternatives after drinking alcohol. A positive with this group is their willingness to use ride-sourcing services increased significantly from 2019 to 2020 ($F=54.03$, $df=2$, $p=0.001$). Among this group receptiveness increased 19.6%, as 27.0% were responded positively in 2019 compared with 32.3% in 2020.

Service Availability

A major challenge in rural areas is deficiencies in technological infrastructure. Ride-sourcing services depend on adequate cellular service, which is commonly unreliable or unavailable in rural areas. Given that ride-sourcing is not as frequently used in North Dakota compared with major cities across the United States, a question regarding availability of such services was investigated Figure 8.

In comparison to last year's survey, in which one-third of the participants confirmed that Uber and Lyft were available where they live, half of this year's participants confirmed ride-sourcing services were available in their area. However, this also means that half of the respondents indicated that ride-sourcing services could not confirm availability.

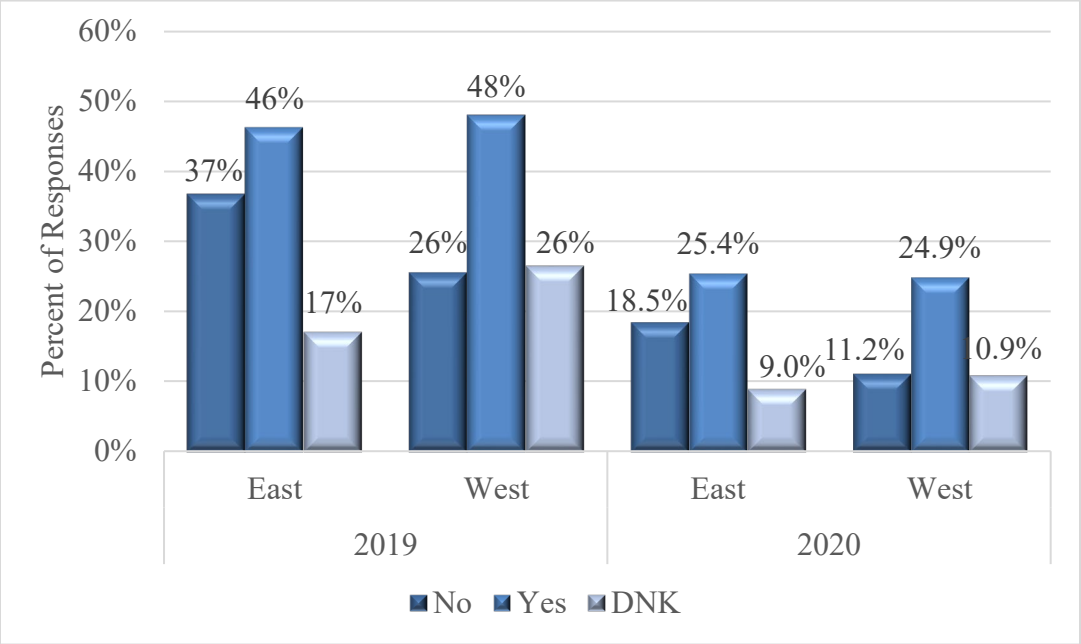


Figure 8: Ride-Sourcing Availability by Region and Year

Frequency and Potential of Use

The frequency of using ride-sourcing services, if available, and the potential to use such services, if they become available, was examined. We found that the majority of those surveyed, 67.9%, reported having never used available ride-sourcing services, which is consistent with previous responses from this driver group (65.2%). About 29% of those surveyed in 2020 used ride-sourcing services at least a few times a year, again reflecting little change from the previous survey. A breakdown of results is found in Figure 9,, and a breakdown of frequency of use by age group and year is found in Table 3.

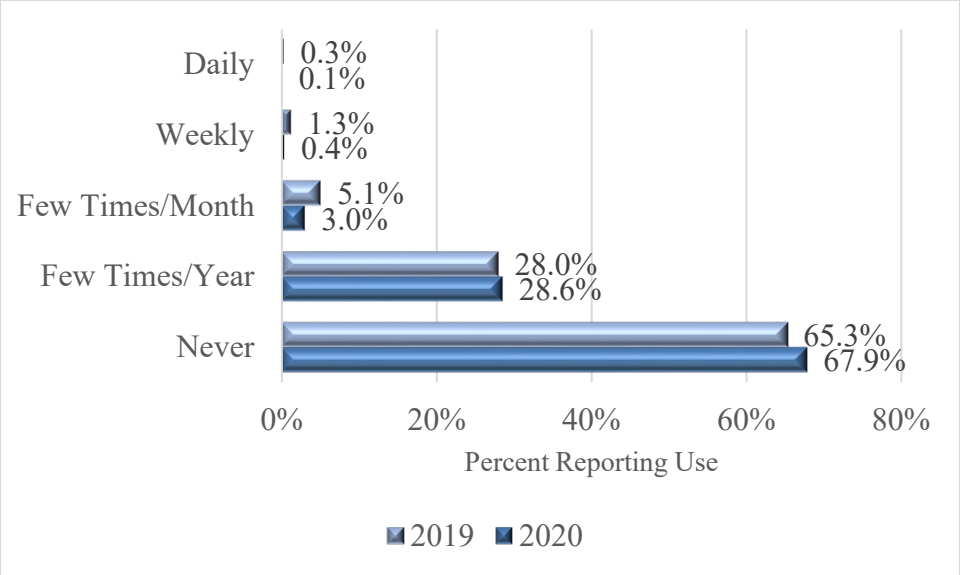


Figure 9: Frequency of Use, by Year

Table 3: Frequency of Use by Age Group and Geography, 2020

	Geography		Age Group					
Frequency of Use*	Rural	Urban	35	45	55	65	75	Total
Never	4.7%	63.2%	7.3%	6.7%	17.8%	23.0%	13.1%	67.9%
Few Times/Year	1.5%	27.1%	6.6%	5.1%	12.0%	4.1%	0.7%	28.6%
Few Times/Month	0.3%	2.7%	1.6%	0.5%	0.5%	0.4%	0.0%	3.0%
Weekly	0.0%	0.4%	0.4%	0.0%	0.0%	0.0%	0.0%	0.4%
Daily	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%
Total	6.6%	93.4%	16.0%	12.3%	30.3%	27.5%	14.0%	

*Figures may not total to 100% due to non-response or Do Not Know entries.

When asked whether they would utilize such services should they become available, about 18% of respondents claimed interest, 41% were not interested, and 41% were unsure. These figures reflect no significant change from the previous study, as shown in Figure 10. Further details of potential users can be seen in Table 4.

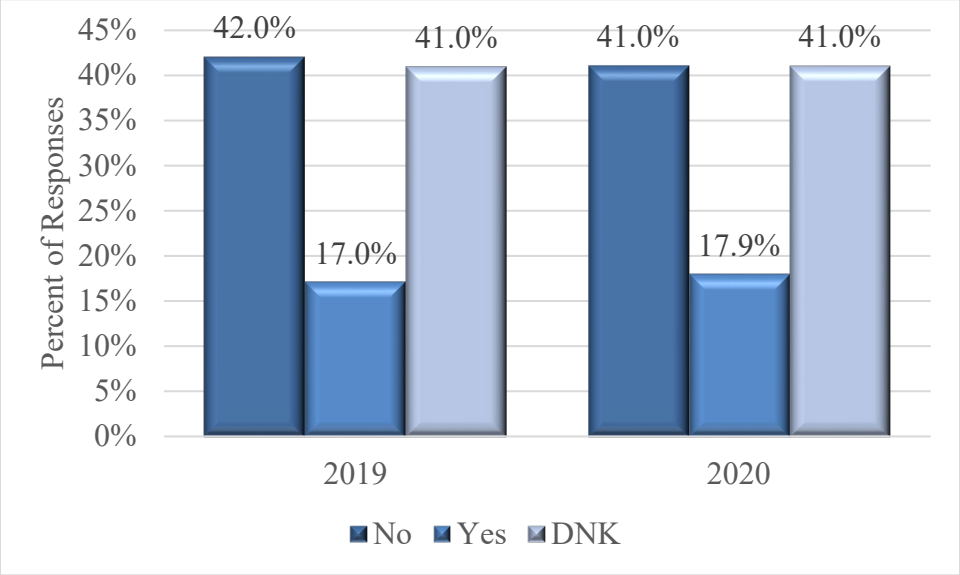


Figure 10: Potential Use by Year

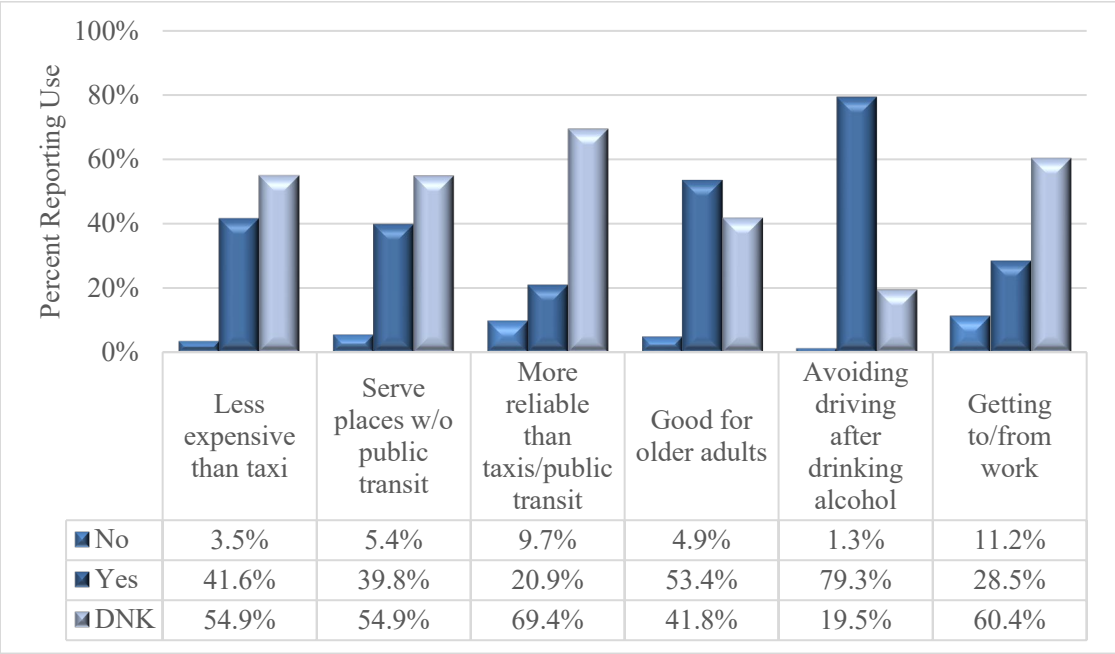
Table 4: Potential Use by Geography and Age Group, 2020

Use if Available*	Geography		Age Group					
	E	W	35	45	55	65	75	Total
No	22.7%	18.4%	2.3%	4.2%	10.6%	14.4%	9.5%	41.1%
Yes	10.8%	7.1%	2.3%	5.1%	4.9%	3.6%	1.9%	17.8%
DNK	21.2%	19.9%	2.3%	3.2%	10.0%	12.9%	12.7%	41.1%

*Figures may not total to 100% due to non-response or Do Not Know entries.

Perceptions & Attitudes

To investigate public opinion toward ride-sourcing services, participants were presented with a list of statements and were asked to indicate whether they agreed, as presented in Figure 11. Overall, opinions of ride-sourcing services remain consistent over time for all statements. When asked whether ride-sourcing services are less expensive than taking a taxi, 54.9% of participants selected "Do Not Know." Similarly, 54.9% of participants selected "Do Not Know," when asked whether such services serve neighborhoods without public transportation. Regarding reliability, 69.4% of participants did not know whether ride-sourcing services are more reliable than public transportation or taxi cabs. Among participants, 53.4% agreed that for older adults who limit driving, ride-sourcing is a good option. To avoid driving after drinking alcohol, 79.3% agree that ride-sourcing services are a good alternative. Lastly, 60.4% of participants did not know whether these services would be a good option for employees traveling to work.



	Less expensive than taxi	Serve places w/o public transit	More reliable than taxis/public transit	Good for older adults	Avoiding driving after drinking alcohol	Getting to/from work
No	3.5%	5.4%	9.7%	4.9%	1.3%	11.2%
Yes	41.6%	39.8%	20.9%	53.4%	79.3%	28.5%
DNK	54.9%	54.9%	69.4%	41.8%	19.5%	60.4%

Figure 11: Perceptions of Ride-Sourcing Services, 2020

It is important to point out the pattern that emerges when participant opinions are summarized. The most frequent response from both survey years was found to be "Do Not Know," accounting for 49.9% of all responses over time. This might suggest that respondents lack a general understanding regarding the nature of ride-sourcing services, further suggesting the possible benefits of raising awareness on the subject. This discovery reflects a need for knowledge improvement that, once satisfied, could bring positive change in a number of ways with regard to market development and stability.

Location of Use

Next, we asked participants to indicate where they have used a smartphone app for ride-sourcing services. While 61.3% of the sample have not used such services, the remaining 38.7% indicated using a service like Uber or Lyft in one or more of the following locations: Fargo, Bismarck,

Grand Forks, Dickinson, Minot, other North Dakota city, and other city outside of North Dakota. Of the participants who had used ride-sourcing, 28.2% used Uber or Lyft outside the state. Within the state, respondents most frequently reported using ride-sourcing services in Fargo (13.7%). Bismarck came in second (6.7%), followed by Grand Forks (3.9%). Minot (2.0%), other N.D. locations (0.9%), and Dickinson were associated with the least frequent usage (0.3%). Respondents could select as many sites as needed to reflect their use experiences. These figures closely resemble data from the previous year's survey. To note, Fargo remains the state's most populated city and was the first to market ride-sourcing as a transportation service option.

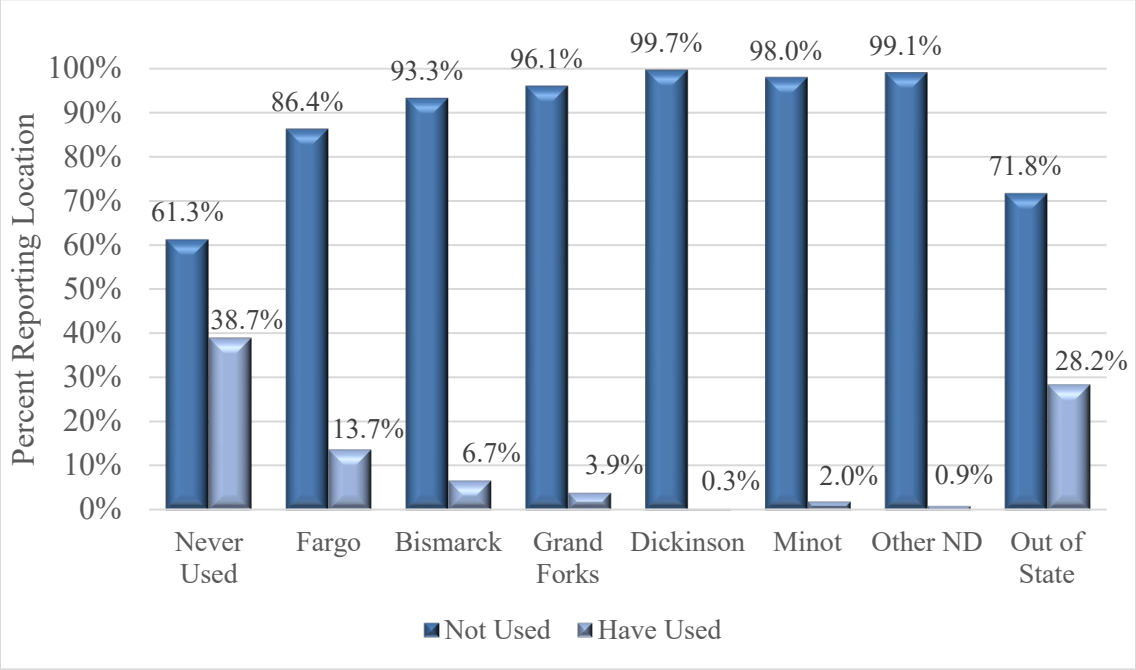


Figure 12: Location of Use, 2020

Purpose of Use

The survey investigated how consumers have utilized (or would utilize) ride-sourcing services (Figure 13). Given a list of options, the participants indicated whether they have used (or would use) ride-sourcing to travel to/from each location. Getting to and/or from the airport was selected by 44.3% of participants, followed by social events (dinner, parties, etc.) with 28.5%, and "other" events 21.7%. Interestingly, approximately 11% used Uber and/or Lyft for healthcare related travel. Less than 7% of drivers reported using such services to travel to work or shopping. The increases in use for work and shopping is particularly interesting considering the potential to establish a diverse customer base. In addition, Table 5 gives the region, geography, and age group for those participants that indicated using ride-sourcing for each purpose.

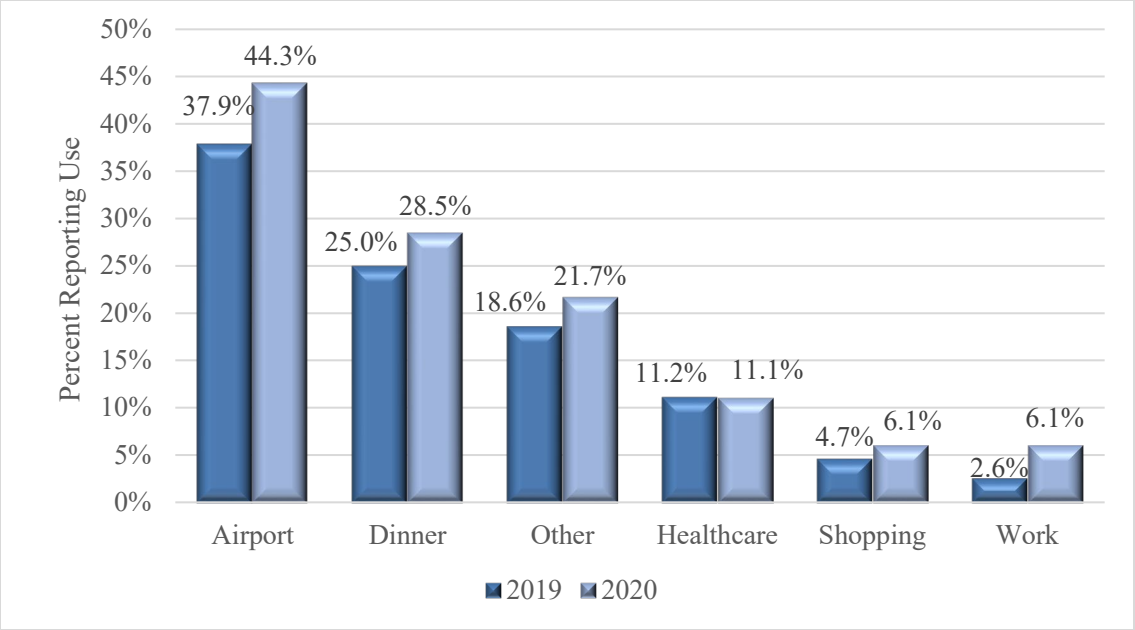


Figure 13: Purpose of Use by Year

Table 5: Purpose of Use Details, 2020

	Region		Geography		Age Group					
Purpose*	E	W	R	U	35	45	55	65	75	Total
Work	3.8%	2.3%	1.3%	4.9%	2.4%	1.1%	1.8%	0.5%	0.4%	6.1%
Healthcare	7.1%	4.0%	3.4%	7.7%	0.6%	0.6%	3.2%	3.8%	3.0%	11.1%
Airport	22.7%	21.7%	10.4%	33.9%	8.1%	7.7%	14.3%	11.1%	3.2%	44.3%
Dinner/Party	14.3%	14.1%	6.4%	22.1%	8.2%	5.3%	9.4%	5.0%	0.7%	28.5%
Shopping	2.7%	3.4%	2.6%	3.5%	0.3%	0.5%	1.9%	1.5%	1.9%	6.1%
Other	12.2%	9.5%	5.0%	16.7%	3.6%	3.3%	8.7%	4.2%	1.9%	21.7%

*Figures may not total to 100% due to non-response or Do Not Know entries.

Cost

To identify U.S. spending patterns for Uber and Lyft, Empower, a money-management app, looked at the transactions of 50,000 users in 32 major cities. San Francisco, CA, reported the highest monthly average of $110 spent on Uber and $89 on Lyft. Columbus, OH, reported the lowest monthly average of $26 spent on Uber, and $23 on Lyft (Elkins, 2018).

The current survey asked North Dakotans about their experiences with spending on ride-sourcing services. Participants who had used ride-sourcing services most frequently reported spending $6 to $15 for a typical ride (53.8%), and 34.2% spent between $16 and $25. These results show little change from the previous survey, where most participants (60.4%) reported spending $6 to $15. One noticeable change to note is the decrease in the $6 to $15 range, and an increase in the next upward price range, $16 to $25. Given these findings we can reasonably expect to spend under $25 per trip in North Dakota for current market trips (Figure 14: Cost Per Ride by Year).

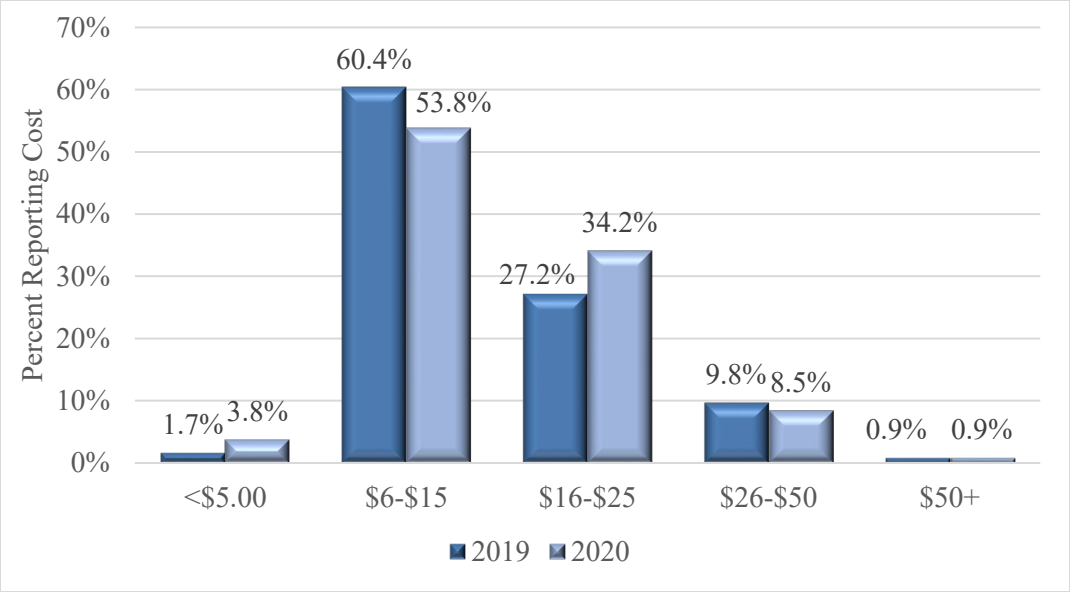


Figure 14: Cost per Ride by Year

The extended trip length and broader possibilities in rural market demand may, however, emerge if market segments, such as airport, medical care, and other urban-center linked destinations, become increasingly viable. Newer demand-based service options allow riders to schedule rides up to a week ahead, which may more easily facilitate market interactions for these longer, appointment-type trips. Table 6 shows results by region, geography, and age group.

Table 6: Cost per Ride Details, 2020

	Region		Geography		Age Group					
Cost*	E	W	R	U	35	45	55	65	75	Total
<$5.00	0.0%	3.8%	1%	3%	0.4%	1.7%	0.9%	0.9%	0.0%	3.8%
$6-$15	26.9%	25.6%	23%	30%	13.2%	12.4%	19.2%	7.7%	1.3%	53.8%
$16-$25	16.7%	17.5%	19%	15%	6.8%	9.0%	11.5%	6.0%	0.9%	34.2%
$26-$50	3.8%	4.7%	4%	4%	0.4%	1.7%	3.0%	3.0%	0.4%	8.5%
$50+	0.4%	0.4%	0%	0%	0.0%	0.0%	0.9%	0.0%	0.0%	0.9%

*Figures may not total to 100% due to non-response or Do Not Know entries.

Drinking & Driving

A key question in the survey intended to identify if ride-sourcing plays a role in reducing alcohol impaired driving. North Dakota was ranked 47th out of 50 states as most reported episodes of binge drinking by the CDC in 2018; so understanding ride-sourcing as a ride alternative is important. Therefore, we can assume that if Uber or Lyft were used as alternatives to driving after alcohol consumption, we would likely have fewer alcohol-related traffic crashes. The use of ride-sourcing services after alcohol consumption was investigated in depth as a potential traffic safety strategy.

Among participants, 20% indicated they do not drink alcohol, while the remaining participants reported whether they have used Uber, Lyft, taxi, public transportation, or other methods of getting home after drinking. Of those, 16.8% reported using Uber and 10.2% used Lyft after drinking. The most popular choice was Uber (16.8%) and the least popular option was public transportation (0.8%). A small percentage (1.2%) reported other means of transportation, which most commonly involved riding with a friend or family member who was a designated driver. Year-to-year comparisons indicate an increase in the use of both Uber and Lyft, and a decrease in taxi usage, as shown in Figure 15.

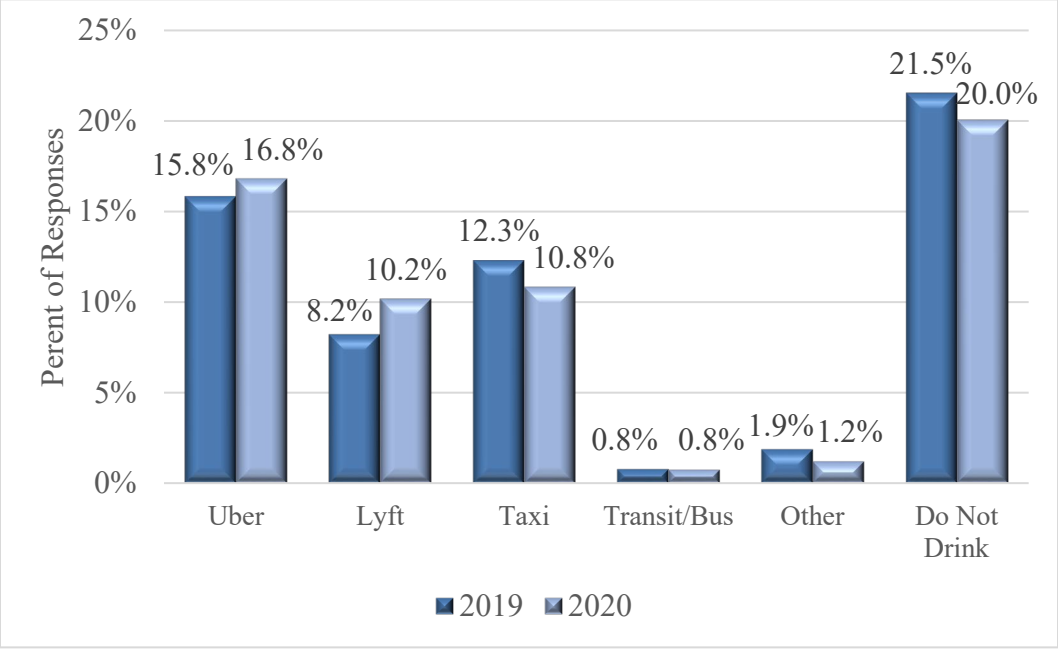


Figure 15: Methods Used to Avoid Drinking & Driving

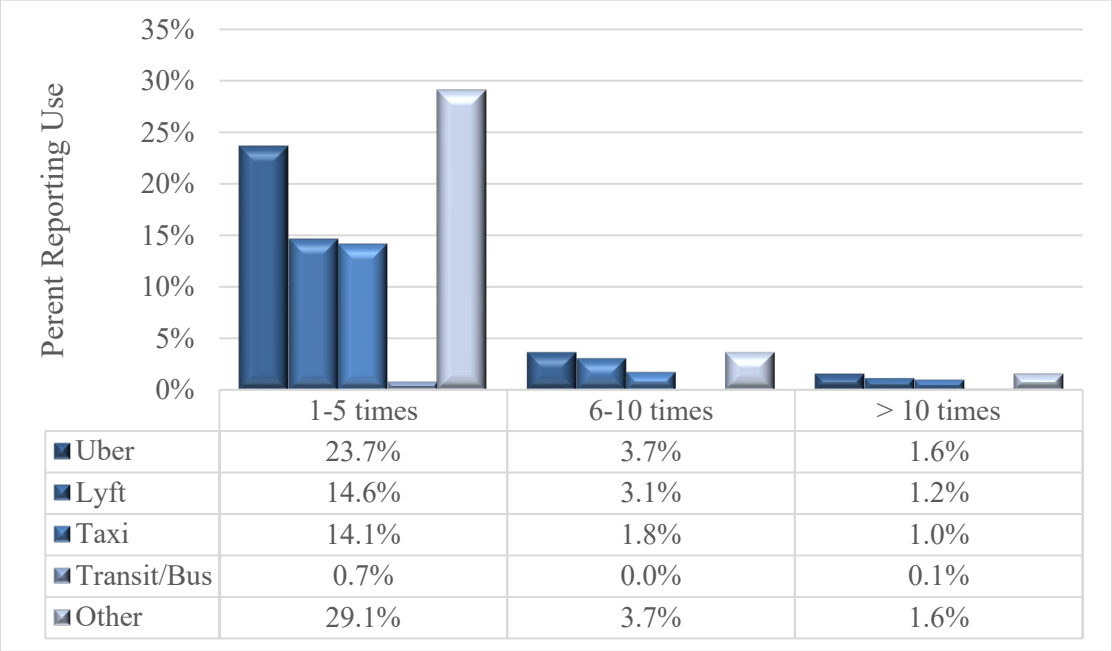
Detailed distribution for service responses are presented in Table 7. The information may be useful in focusing on encouraging ride alternatives based on current practices. It also provides insight regarding the more directed messaging/education regarding the specific services and users' subpopulations based on other cohort groups.

Table 7: Ride Alternatives Used to Avoid Drinking and Driving, 2020

	Region		Geography		Age Group					
Service Used*	E	W	R	U	35	45	55	65	75	Total
Uber	9.1%	7.7%	21.1%	62.1%	6.5%	3.3%	5.9%	1.1%	0.0%	16.8%
Lyft	5.8%	4.4%	22.5%	67.3%	4.6%	1.6%	3.3%	0.7%	0.1%	10.2%
Taxi	6.2%	4.6%	2.2%	8.6%	4.7%	1.6%	3.7%	0.8%	0.0%	10.8%
Transit/Bus	0.4%	0.3%	0.3%	0.4%	0.1%	0.4%	0.1%	0.1%	0.1%	0.8%
Other	0.9%	0.3%	0.0%	0.1%	0.0%	0.4%	0.4%	0.2%	0.2%	1.2%
Do Not Drink	9.7%	10.3%	4.1%	15.9%	1.7%	2.6%	5.2%	5.6%	5.0%	20.0%

*Figures may not total to 100% due to non-response or Do Not Know entries.

Of those who indicated using the aforementioned services to avoid driving after alcohol consumption, 82.2% reported using such services on between one and five occasions. Another 12.3% reported more frequent use at six to 10 occasions, with 5.5% using these services on more than 10 occasions after drinking. We further investigated which age groups were most likely to use Uber or Lyft after drinking. Adults aged 35 to 44 most frequently used Uber or Lyft after drinking at 34.5%, followed by adults aged 55 to 64 having used Uber or Lyft at 34.0%.



	1-5 times	6-10 times	> 10 times
Uber	23.7%	3.7%	1.6%
Lyft	14.6%	3.1%	1.2%
Taxi	14.1%	1.8%	1.0%
Transit/Bus	0.7%	0.0%	0.1%
Other	29.1%	3.7%	1.6%

Figure 16: Frequency of Ride Alternative Used to Avoid Drinking and Driving, 2020

It should be noted that out of 732 participants, approximately 20% indicated they do not drink alcohol, implying that 80% participants do. A total of 438 responses indicated either using one of the mentioned services, or not drinking alcohol. Because participants could select multiple options, it is fair to assume at least 40% of participants did not use any transportation options listed, nor did they indicate an alternative. It might be assumed that the remaining participants opted to drive under the influence.

Use of Traditional Ride-Sourcing Options

Responses were collected regarding how often participants used more traditional ride services, such as private taxi, public transit, bike share, and other such modes, in the past year (Table 8). For all four categories (private taxi, public transit, bike share, and other), the majority of participants responded that they have never used such modes of transportation. Of those who had used any of the options, 23.5% had used taxi services in the past year, followed by public transportation at 10.7%, bike share at 1.5%, and other unlisted options at 2.8%, all with the highest rates of use only a few times per year.

Table 8: Frequency of Traditional Ride-Sourcing Services Use

Frequency of Use*	Taxi	Public Transit	Bike Share	Other
Never	75.6%	88.6%	98.4%	94.0%
Few Times / Year	23.9%	10.9%	1.6%	5.2%
Few Times / Month	0.5%	0.1%	0.0%	0.3%
Weekly	0.0%	0.5%	0.0%	0.5%
Daily	0.0%	0.0%	0.0%	0.5%
Total Usage	23.5%	10.7%	1.5%	2.8%

*Figures may not total to 100% due to non-response or Do Not Know entries.

In analyzing the items listed in the "other" category, participants may have misunderstood the question at hand, as 15 of the 22 items were described as Uber or Lyft, three mentioned themselves or family members, one was a taxi, and one was public transit. The only response deemed fitting came from one participant who mentioned using an airport shuttle service. Future surveys might consider redefining the question in order to obtain more accurate information. Additionally, it should be noted that options such as taxi, public transit, or bike share may not be available in certain regions of North Dakota, especially in rural areas. Given the data, it is possible to assume that most North Dakotans use their own vehicle for transportation. Based on U.S. Census information on vehicle ownership, only about 5.3% of N.D. households are without a personal vehicle, compared with 8.6% nationally.

Technology

A primary necessity for the utilization of ride-sourcing services is access to a smartphone, and more particularly, having adequate cellular service. Thus, there is a digital divide as Uber and Lyft are tech-enabled ride services. Without these two components, ride-sourcing services such as Uber and Lyft cannot be used because requesting service, monitoring the driver, and other such activities are performed with a smartphone's GPS. With this in mind, participants were asked about the availability of reliable phone services in their area, and whether they owned a smartphone. These data can be seen in Figure 17.

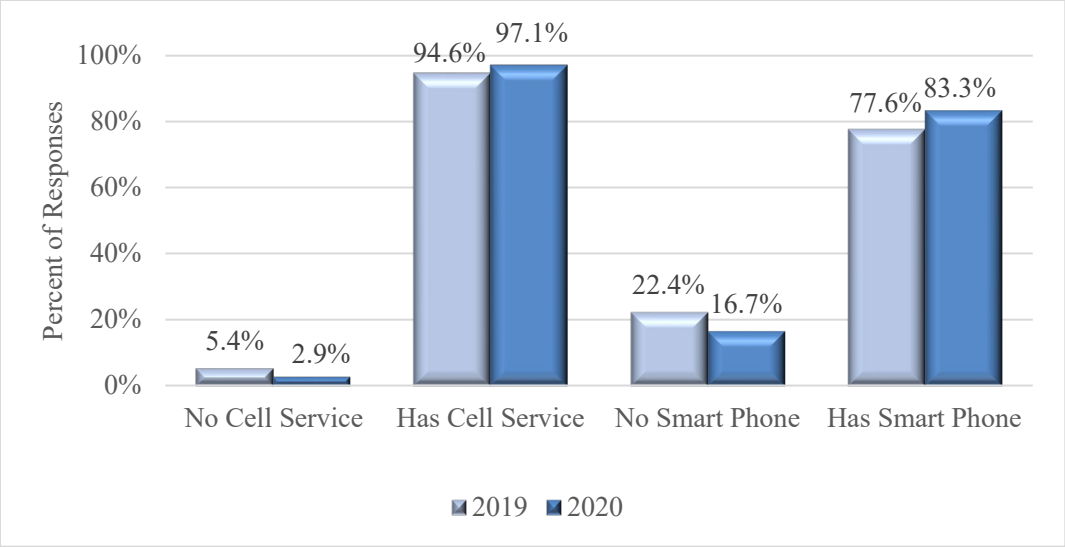


Figure 17: Access to Required Technology by Year

The data show that 83.3% of those surveyed own a smartphone, an increase from last year's survey (77.6%). Data from the Pew Research Center (2019) show 81% of adults in the United States own a smartphone, making for comparable local results. Moreover, 97.1% of participants confirmed having reliable cellphone service in their area, which is also a slight increase from the previous survey (94.65%). Thus, these findings suggest most North Dakotans have the ability to use ride-sourcing; however, as noted above, the 49.7% of respondents stated ride-sourcing is either not available or could not confirm availability.

Vehicle Ownership

Using a personal vehicle might be the only transportation option for Americans who live a considerable distance from urban centers. Among other options, however, ride-sourcing apps could help reduce users' dependence on owning and operating a personal vehicle, which is especially important for an elderly person seeking to stay mobile. The use of Uber and Lyft could be impacted by reasons such as access to a reliable vehicle or the age of potential consumers. In the present survey, participants responded whether their household owns (or leases) at least one reliable vehicle.

Results indicate a change from the previous study, which showed 97.5% of participants indicated their household currently owns or leases a reliable vehicle. This is relatively unchanged from the previous survey in which 96.7% of participants confirmed their household currently owns or leases a reliable vehicle.

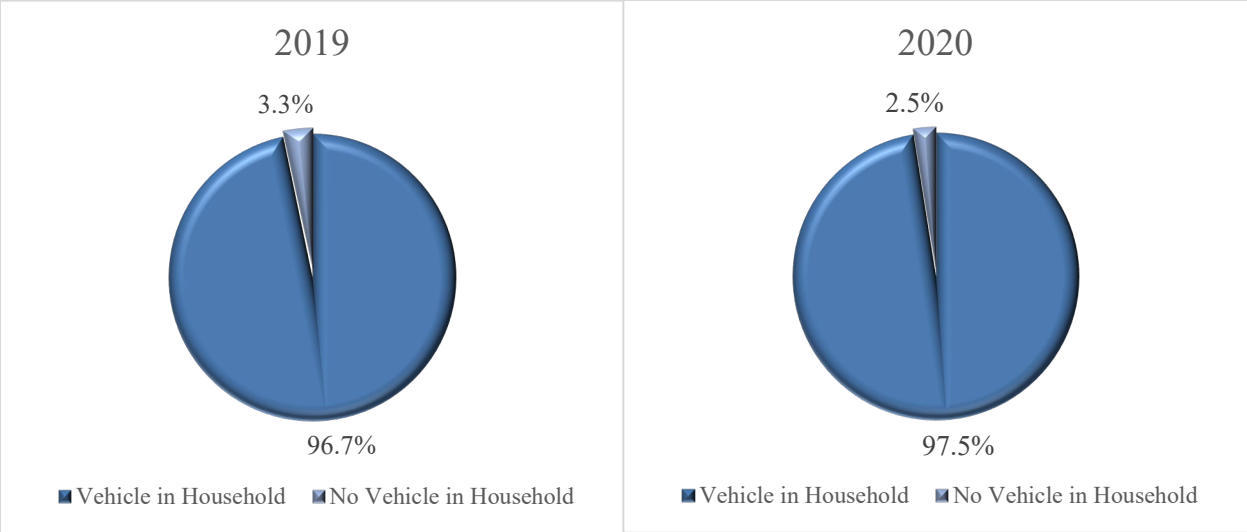


Figure 18: Vehicle Ownership by Year

Drivers

The survey inquired about the willingness to drive for a ride-sourcing service such as Uber or Lyft (Figure 19). In this case, the majority (78.0%) responded that they would not drive for a ride-sourcing service, whereas 9.3% would consider it, and 11.5% were unsure. Less than 1% are current drivers for Uber or Lyft. These results are relatively unchanged from the previous survey. With this in mind, it might be necessary to recruit new drivers through incentivizing the opportunity.

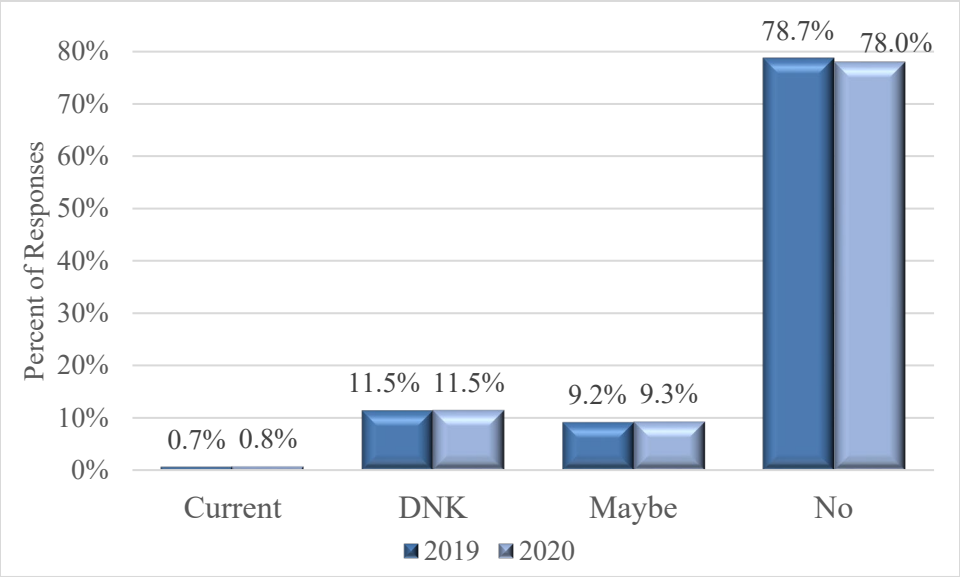


Figure 19: Current Driver or Willingness to Drive for Ride-Source Service Provider, by Year

CONCLUSION

While ride-sourcing has become and remains to be a popular transportation option in urban areas, the future of ride-sourcing services in rural regions is ambiguous. While ride-sourcing companies have made efforts to make services more accessible in rural and remote areas, the low population density and long travel distances limit potential for stable demand that typically attracts drivers. Moreover, it remains unclear whether people in rural areas would actually use these services, should they be more widely available. Therefore, the goal of this study was to better understand factors that facilitate and inhibit the growth of ride-sourcing services in rural communities. This research focused on the demand factors in the ride-sourcing market to determine which may have a significant impact on popularizing these services in the rural context.

We surveyed North Dakota drivers over age 34 to understand their perceptions and practices in a two-year survey effort. In 2020, rural participants' awareness of ride-sourcing increased by nearly eight percentage points from 2019. Only 3.5% of rural participants could confirm that these services were available in their area. Where services were available, 30.0% of rural participants claimed using ride-sourcing at least once in the past year. Among drivers that have used ride-sourcing, 41.7% of rural participants stated going to/from the airport as the most common purpose of use, and 56.5% most frequently paid $6 to $15 per trip. About 25% of rural ride-sourcing users had taken an Uber or Lyft home to avoid driving after drinking alcohol. If ride-sourcing became available, 20% of rural participants would be interested in using the services.

In future studies. we suggest further investigating the pattern that emerges when participant opinions are summarized, as the most frequent response from both survey years was found to be "Do Not Know." This might suggest that respondents lack a general understanding regarding the nature of ride-sourcing services, further suggesting the possible benefits of raising awareness on the subject. This discovery reflects a need for improvement that, once satisfied, could bring positive change in a number of ways. A significant difference appeared for those who would be receptive to using ride-sourcing with a voucher or discount, which was a decrease from 46.8% to 42.1%. This suggests the general use of vouchers or discounts may not be enough to entice more users, so deterrents other than cost should be investigated.

We also suggest redefining specific survey questions and available responses to ensure participants have a clear understanding of what they're being asked, as some responses relayed misunderstanding. We suggest retaining the underlying responses in a manner that can be linked to future surveys with these driver groups and also with the younger driver populations in the state. Moreover, when investigating methods of avoiding driving after drinking, we found that at least 40% of participants did not use any transportation options listed, nor did they indicate an alternative. Therefore, it might be presumed that the remaining participants opted to drive under the influence, so this area should be further investigated. We also suggest further investigating participant use of ride-sourcing by drivers outside of the state and if that may inform efforts to facilitate its development as a ride alternative, particularly in efforts to deter alcohol impaired driving.

In conclusion, overall results unveil few differences between survey years, which was to be expected when surveying the same population a short time apart. However, an annual survey of ride-sourcing awareness, opinions, and behaviors paired with a continuous campaign to inform the public about ride-sourcing will prove beneficial. This information will allow those interested to be informed of evolving transportation methods in North Dakota.

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APPENDIX. SURVEY INSTRUMENT

ND Driver Ride Service Survey, 2020

All Responses are Confidential

1. **Are you familiar with smartphone apps for ride-sourcing services such as Uber and Lyft?** □ Yes □ No

2. **Would you be more likely to use a ride-sourcing service with a voucher or discount offer?** □ Yes □ No

3. **Are ride-sourcing services, like Uber or Lyft, available where you live?** □ Yes □ No □ Do Not Know
   - **If 'Yes', how often have you used ride-sourcing services such as Uber or Lyft in the past year?**
     □ Never □ Few Times per Year □ Few Times per Month □ Weekly □ Daily
   - **If 'No', would you use this service if available?** □ Yes □ No □ Do Not Know

4. **Thinking about ride-sourcing services such as Uber or Lyft, how do you think the following statements describe them?**
   - **Are less expensive than taking a taxi** □ Yes □ No □ Do Not Know
   - **Are serving neighborhoods without public transportation** □ Yes □ No □ Do Not Know
   - **Are more reliable than taxis or public transportation** □ Yes □ No □ Do Not Know
   - **Are a good travel option for older adults who limit driving** □ Yes □ No □ Do Not Know
   - **Are a good option to avoid driving after drinking alcohol** □ Yes □ No □ Do Not Know
   - **Are a good travel option for employees traveling to work** □ Yes □ No □ Do Not Know

5. **Where have you used a smartphone app for ride-sourcing services such as Uber and Lyft? (Check all that apply)**
   □ None □ Fargo □ Bismarck □ Grand Forks □ Dickinson □ Minot □ Other ND □ Outside ND

6. **For what activities do/would you use ride-sourcing services such as Uber and Lyft? (Check all that apply)**
   □ None □ Work □ Healthcare □ Airport □ Dinner/Party □ Shopping □ Other Event/Appointment

7. **How much do you typically pay for a trip when using ride-sourcing services such as Uber and Lyft?**
   □ Never Used □ Less than $5 □ $6-$15 □ $16-$25 □ $26-$50 □ More than $50

8. **Have you ever used a ride service to avoid driving after drinking alcohol? (Check all that apply)**
   □ Never Used □ Uber □ Lyft □ Taxi □ Transit/Bus □ Other _____ □ Do Not Drink
   - **If you have used a ride service to avoid driving after drinking alcohol, how often in the past year?**
     □ 1 – 5 times □ 6 – 10 times □ more than 10 times □ None

9. **Would/do you drive for a ride-sourcing service like Uber or Lyft?** □ Current Driver □ Maybe □ No □ Do Not Know

10. **How often have you used the following ride services in the past year? (Check all that apply)**

Private Taxi	□ Never	□ Few Times per Year	□ Few Times per Month	□ Weekly	□ Daily
Public Transit	□ Never	□ Few Times per Year	□ Few Times per Month	□ Weekly	□ Daily
Bike Share	□ Never	□ Few Times per Year	□ Few Times per Month	□ Weekly	□ Daily
Other _____	□ Never	□ Few Times per Year	□ Few Times per Month	□ Weekly	□ Daily

11. **Do you have reliable cellular phone service where you live?** □ Yes □ No □ Do Not Know

12. **Do you own a smartphone?** □ Yes □ No

13. **Does your household currently own or lease at least one reliable vehicle?** □ Yes □ No

14. **Your age:** □ 18 – 24 □ 25 – 34 □ 35 – 44 □ 45 – 54 □ 55 – 64 □ 65 – 74 □ 75 or Older

15. **Your Gender:** □ Male □ Female

16. **In which North Dakota county do you live?** _____

Thank you for your time and participation.