

Encouraging public transportation to increase active commutation in Manhattan, KS

by

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Abstract

Transportation is a means of commutation for goods and people and is also an indicator of socioeconomic status of a community. Recently, there has been much debate and research on the impact of transportation on the health care of a community. Lately, it has been proved that increased dependence of people on cars has led to lack of exercise in their daily life. This lack of exercise has been identified as the root cause of severe cardiovascular ailments like high blood pressure, hypertension and even several types of cancers. As a solution, many planners are now proposing public transit (which forces people to walk to and from transit stations) and other active modes of transport like bikes etc. as alternative transportation options to improve community health and reduce dependence on cars. These options not only help people incorporate exercise in their daily life but a reduction in car usage reduces the demand for parking spaces, traffic congestions, carbon footprints of communities and is fuel efficient. This project based in the City of Manhattan is aimed at suggesting measures to enhance the use of public transit among students at Kansas State University to help incorporate more exercise in their daily lives. The project encompassed an observational study to identify the options currently available for transit and factors which affected transit ridership in the city. The observational study was followed by discussion with a focus group to draw views and opinions. These opinions and views were included in a questionnaire for an online survey to identify areas or measures which were most likely to enhance transit ridership positively and cost effectively. This project provides suggestive guidelines regarding students' opinion about transit in Manhattan. These suggestions could be used to guide policies and strategies for enhancing transit ridership in the city.

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Chapter 1 - Introduction

Like every other development in human history transportation has also affected community health and well-being. Transportation has made life faster and easier especially since the beginning of the electric street car 'revolution' era in the 1890s. It enabled people to live away from a polluted core of the city in the cleaner suburbs. The following freeway era beginning in 1945 was no less than a miracle in human history (Rodrigue, 1998). Improved transportation also made health care facilities widely and easily accessible. In the developing world, hospitals and health centers were mainly clustered in urban areas and therefore transportation played a huge role in saving people's lives by connecting remote communities to the main town (Broni et al., 2014).

However, like most things it also has a flip side. Transportation has led to an increased number of vehicles in the past century urging planners to plan and build a dense network of roads. An increase in private ownership of vehicles has led to an increased demand for parking lots. Thus, there has been depletion of green space and agricultural land thus, reducing the quality of living and causing tremendous pressure on the existing land resources (Cavin, 2003; Bento et. al., 2005; Walljasper, 2007). Furthermore, automobile emissions have led to serious air pollution problems resulting in health issues like asthma, bronchitis and lung cancer (Rossman, 2016).

Another drawback of modern transportation is that it makes people lethargic by providing comfortable and effortless transit. There has been lack of walking habit in people lately. Most people in the 21st century prefer passive commuting (cars) over active commuting (walking, bicycling and skating) (Milne et al., 2014). All this has led to a reduction in much needed exercise, increased obesity and other cardiovascular ailments among people in the late 20th and 21st centuries. Based on these findings planners and transportation experts are now diverting

economic and design investments towards active transportation e.g. more pedestrian spaces and bike lanes (Drinan, 2016). Bigger cities like Denver and Chicago tend to invest in rail lines and public transport (Best, 2016; Yerak, 2016). Through these measures these cities intend to reduce the use of cars and force people to walk to train stations and bus stops thus promoting active transport. Cities like Washington D.C., New York and many others have bike rental services to promote active commutation (Bleiberg, 2015).

Manhattan, Kansas has launched its free bike rental service called Green Apple Bikes to encourage people to commute actively (Downtown Manhattan Inc., 2011). Manhattan has also laid down bike lanes and redesigned its downtown to make it more walkable. Thus, our community (Manhattan) wants to adopt a healthier lifestyle through active commutation. However, not all students could use bikes at all times. Hence it is important to provide an option for active commutation to all strata of student population. Public transit is one such option. Through my work, I aim to determine:

How can public transportation system in Manhattan, KS be improved to encourage more students to use it?

In the process of answering this question I aim to find out the reason why a portion of the student population doesn't use public transit? What kind of students in Manhattan use public transit and why? And what are the limitations and advantages of the current public transit system in Manhattan?

Before answering these question, it is important to understand in more detail the role of public transportation in impacting active commutation in communities and to review efforts made by other communities and institutions to enhance public transit use.

1.1 Rationale

There are 26 bus stops in the City of Manhattan. As observed, the bus stops lack basic amenities like a shade to stand beneath while waiting for the bus. The frequency of the bus is as low as 1 bus per hour between two stops in several cases and there is a lack of alternative public modes of transit. The problem is worse during night time and on Sundays in the absence of bus service. Some people while waiting for the bus were seen to stand beneath trees to escape the scorching sun in the summer. Providing alternative means of transit like a subway or tram can be highly expensive and controversial to implement. Advocating more and more green apple bikes, would not make it any easier for senior citizens, mothers with children and many other people with disabilities. Thus, we need to focus on improving what we already have: the bus system. It is very important to make the option of bus transport attractive to students in Manhattan to make them chose it over their cars. Apart from rectifying the demerits of the current bus system incentivization can be an effective means to boost ridership.

Chapter 2 - Background

While the number of people dying each year due to traffic accidents and air pollution problems taken together is around 50,000 physical inactivity leads to multiple health issues amounting to 200,000 deaths each year in USA (USDHHS, 1996). Public transit persuades people to choose an active mode of commutation to reach a bus stop or a subway station thereby helping people to incorporate exercise in their lives (Sallis et al., 2004). The following paragraphs elaborate on the role of public transportation in improving community health and measures that can encourage the use of public transit.

2.1 Relationship between public transit and active commutation

Recent studies on working adults suggest that the use of public transit leads to active commutation (Bopp et al., 2015). As per a report issued by Victoria Transport Policy Institute, communities with greater reliance on public transport have 32% lower medical bills and 25% lower deaths (Litman, 2010). These ideas were further validated in a study conducted in Seattle City where researchers found that obesity and ambient air pollution levels were found to be positively correlated with the dependence on cars in the area, i.e. car riders were found to be more obese as compared to non-riders and car use was also associated with higher air pollution levels having further health implications. A reduction in body mass index was found to be associated with walkability and reduced dependence on cars. This research established a connection between community development, transportation and general health of the community (Frank et al., 2007). Another study conducted in New York City, proved that people in a community who choose to use public transit tended to use all kinds of active commutation e.g. walking and bicycling resulting in more physical activity which generated more health benefits for them (Morabia et al., 2010). Introduction of public transport in Ontario, Canada

made a group of office workers avail the facility and thus incorporate an average of eighty minutes of physical activity per week due to the use of public transit. This study demonstrated that public transit ridership offers opportunities for active commutation and thus provides physical exercise to riders (Collins and Agarwal 2015). Another research conducted in Australia on the impact of community health, demonstrated that public transit contributed to better health by providing active commutation especially in low income communities (Chrisl et al., 2009). The Flint Hills Wellness Coalition, an organization dedicated to improving health care in the Flint Hills (eastern Kansas) region that includes Riley County and Manhattan has a workgroup specifically dedicated to active transportation. The Riley County Health Department in collaboration with the Flint Hills Wellness Coalition identified transportation as one its top three priorities along with mental health and communication and coordination of systems and services in its 2017 Community Health Improvement Plan (Green, 2017).

Thus, it is established that public health is positively influenced by public transportation as it provides opportunities for active commutation. Unfortunately, the scenario is not very clear cut when it comes to the choice of using public transit. The latest U.S. household travel survey recorded that merely 2% of daily trips across US are taken by public transport (Carlson et al., 2015). A host of factors are responsible when it comes to choosing means of transport for travelling. Commuters want comfortable, easy, quick and reliable means of transport (Cantwell et al., 2009; Heshner et al., 2010; Redman et al., 2013). Some have an inherent tendency to be in control of the situation. This is offered by a private mode of transportation as it puts the rider behind the steering wheel. Private modes of transport also happen to be luxurious (a pre-requisite for image conscious students) apart from being comfortable and a reliable means of reaching our

destination. However, to improve student and community health, planners must wean them off private means of transport and motivate them to use public transit.

2.2 Strategies to encourage transit ridership

To encourage transit ridership, planners and policy makers need to develop effective strategies targeted at habitual car drivers and students who are willing to use public transit but cannot do so due to the lack of infrastructure suitable to their needs. Some initial steps may include one or more of the following:

1. Making student commuters aware of the benefits of public transit (Ogilvie et al., 2004)
2. Making public transit competitive to attract student commuters (Wener et al., 2003; Cantwell et al., 2009)
3. Improving amenities (Froidh, 2005; Tang et al., 2012)
4. Incentivizing public transit use (Cervero, 2006)
5. Making policy changes (Cervero, 2010)
6. Transit-oriented development
7. Reducing the number of parking lots and introducing mandatory bus fees
8. Other factors affecting transit ridership

2.2.1 Making student commuters aware of the benefits of public transit

To make commuters aware of the benefits of public transit several awareness programs, financial incentives, car-pooling and mass media campaigns are working across the country aimed at bringing change (US department of Education, 2011; USDA 2015). Also, literature published by researchers has provided valid and convincing arguments in favor of public transit use. Behavior changing awareness programs targeted to motivate communities towards active transportation have resulted in 5% of all household trips changing to active commutation around the world

(Ogilvie et al., 2004). Similar awareness programs directed at students in the Manhattan community can also be initiated.

2.2.2 Making public transit competitive to attract student commuters

To make public transit as competitive as private modes of transit, efforts need to be directed at making public transport smooth, hassle free, timely, frequent, reliable and fast. Several researchers in the past decades have conducted research to find out factors that affect the competitiveness of public transit as a mode of commutation and quantitatively influence public transit ridership (Wener et al., 2003; Cantwell et al., 2009).

A study conducted in Dublin, Ireland using online survey as a research tool to survey commuters to Dublin City Centre concluded that less crowded, timely and reliable public transit systems were the desires of the people. Less crowded buses and trains with reliable services made people chose public transport over cars. These services also resulted in more satisfied public transit users. The researchers also observed a preference for trains over buses among commuters (Cantwell et al., 2009). Another study conducted in New Jersey and New York City concluded that smooth and reliable transit service where commuters were required to change less routes were highly favored by commuters as their means of commutation. This was proved by doing a comparative study of stress levels of commuters of two services available for commutation between New Jersey and New York City. The newer direct and faster service resulted in more satisfied and relaxed commuters (Wener et al., 2003). Thus, making public transit reliable and convenient is likely to make it more desirable for students among other commuters.

2.2.3 Improving amenities

Research has also been done to find out amenities that can enhance bus ridership. A study conducted by researchers in Australia revealed that turnout locations which enable trains to pass

one another, play a significant role in the design of bus replacement service and are a cost-effective means of minimizing the cost of bus usage and operation. Turn out locations particularly close to a disruption location were found to be most cost effective in attaining the above-mentioned purpose (Pender et al., 2011). Another study conducted in Chicago established that a real-time bus information system could improve bus ridership in modest amount (Tang et al., 2012). In an eye-opening study conducted in Sweden in 1997 it was observed that the newly established Svealand line boosted train commutation to seven times the original number by offering faster commutation. It resulted in an increase in market share of public transportation from 6 to 30%. The researchers concluded that high speed rail services could impact the transport market and commuter behavior in a significant way (Froidh, 2005). Research conducted on commuter satisfaction in England concluded that enhancement in the quality of bus services provided to commuters improved their satisfaction levels and could contribute to an increase in ridership. The study emphasized the need to find out exactly which measures contribute towards making the bus experience positive to effectively steer the resources in the requisite direction i.e. improve ridership and the resulting revenues (Hensher et al., 2010). Cervero (2006) in his research concluded that introduction of high quality feeder buses can promote public transit use among office goers. These studies need to be kept in mind while determining amenities to improve student ridership in Manhattan.

2.2.4 Incentivizing public transit use

Incentives can be a quick fix towards achieving enhancement in public transit ridership (Cervero, 2006). In an interesting study conducted in Japan it was observed that a one-month free bus ticket could change the behavior of habitual car drivers and steer them to public transit (Fujii and Kitamura 2003). In a similar study conducted in Denmark a free one month travel card

could improve bus ridership. The incentive resulted in behavioral change in commuters which lingered on even after 5 months of expiration of the incentive period (Thogersen, 2009).

2.2.5 Making policy changes

A research review on active transportation illustrated how policies can encourage active commutation. The review refers to data related to lack of active commutation among Americans and their respective health status. The lack of physical activity was found to result in health problems accounting for \$117 billion which is about 9-11% of total healthcare cost in the U.S (Carlson et al., 2015). The authors reviewed 10 studies pertaining to active commutation and found that transport related walking provided the benefits of physical activity and that car driving was highly correlated with obesity. To promote active commutation, making provisions for safe, convenient cycling and walking infrastructure well connected to public transportation systems was recommended along with limiting vehicular speed, separating cycling lanes and pedestrian side-walks and cross walks. In general, it was observed that areas with amenities for biking and walking e.g. sidewalks and bike lanes promoted active commutation among school kids (Buehler et al., 2016). Density of housing, design of the built environment in communities and proximity to modes of transit also affected public transit use (Cervero, 2010).

2.2.6 Transit Oriented Development

Transit oriented development is a type of community development where housing, offices and retail are all integrated in one neighborhood and located within half a mile of a transit stop. In the latest guidebook for best practices issues by Victoria Transport Policy Institute, 2016 it has been recommended that increasing system efficiency, transit-oriented development and incentives could be important measures to improve public transit ridership (Litman, 2016). It was observed that residents of transit-oriented developments tended to have half the number of vehicles owned

in comparison to other communities and were much more likely to use public transit (Arrington and Sloop 2009). Thus, steering Manhattan towards transit-oriented development could be key to improving student ridership.

2.2.7 Reducing the number of parking lots and introducing mandatory bus fee

Available parking makes it easy on student commuters to use personal vehicles since they do not need to worry about where to park them. A lack of parking spots would make it inconvenient for students to park their cars. This is likely to make them look for alternative modes of commutation that does not need parking, i.e. the bus. Also, introduction of a mandatory transportation fee would force students to use the bus service since they paid for it. The money generated through the fee could be used to improve the bus service and make it more desirable by students and other commuters.

2.2.8 Other factors affecting transit ridership

A landmark study summarizing the research works in Europe, North America and Australia revealed that land use density, car ownership and income levels were the primary determinants of bus usage and that increasing the frequency, speed and reliability of bus service improved ridership (Currie and Wallis 2008).

Apart from amenities, policies and incentives that promote the use of public transport, there are certain quality attributes of public transport that may attract car users. Some of these attributes include service reliability and frequency. A change in these quality attributes is likely to encourage car users to opt for public transit (Redman et al., 2013).

Apart from that, personal attitudes, perceptions and behavior also determine the choice of transportation (Cane et al., 2009, Stradling et al., 2007). A study in Netherlands revealed the role of social value orientations in influencing commutation choices. It was observed that prosocial

individuals (people primarily concerned with collective welfare) preferred using public transit when it was expected from everyone while pro-self individuals (people primarily concerned with their own welfare) preferred public transit when others were expected to use cars. The behavior of pro-self people stemmed from their concern for their well-being (Vugt et al., 1995). Residential location and travel choices have also been found to be correlated. A quantitative study in the San Francisco Bay Area reported that neighborhood type inconsistency was positively correlated with the choice of commutation mode. Residents living in inconsistent (not well-planned) neighborhoods were more likely to use private mode of commutation. The analysis demonstrated that the effect of neighborhood type dissonance (incompatibility) interfered with commuter's beliefs about automobile use (Schwanen and Mokhtarian, 2004). Apart from other factors certain uncontrollable factors like weather elements also act as deciding factors for commuters (Guo et al., 2014).

A wide range of factors such as fares, quality of service, community income and car ownership are found to affect public transit ridership. Walk time, wait time and real-time transit information systems can be key attributes in determining public transit use along with reliability, comfort level of vehicle and waiting environment (Paulley et al. in 2006). A survey conducted in UK on people living close to quality bus service revealed 68 factors negatively affecting the choice to use public transit. Eight basic factors were lack of security, preference for walking instead of using a bus to go short distances, lack of direct routes, crowdedness, personal transportation, expensive fares, discomfort and self-image (Stradling et. al., 2007).

2.3 Steps taken by other universities to improve transit ridership

There are universities located in New York, Boston and Chicago which have a high transit ridership owing to the nature of these cities. Several universities like University of Minnesota,

Florida State University, University of Tennessee and others forced students to use the bus service by reducing parking on campus. Among other steps, these universities either introduced a bus pass system or included the bus fee in their tuition (University of Minnesota, 2018). Florida State University introduced a mandatory per credit hour transportation access fee for their main campus students to cover the cost of parking permits and fund the campus bus system (Florida State University 2018). This solved the dual problem of lack of users for the bus service as well as lack of funding for maintenance and upkeep of the bus service. The University of Tennessee made its bus service attractive by making it exceptionally frequent. This made a bus schedule redundant (The University of Tennessee, 2018). University of Miami offers discounted transit passes to its full-time students, staff and faculty. The pass provides access to the metrorail, metrobus and the park and ride shuttle (University of Miami, 2018). Miami University, Oxford, Ohio provides free bus service to its students and limited parking on campus. The parking has a fee of \$200 annually while the bus being free makes it an attractive option (Miami University, 2018). Portland State University provides discounted student passes which are valid for all types of transit in the region and last for 3 months. The standard cost of such a pass when purchased through TriMet (Tri-County Metropolitan Transportation District of Oregon) is \$180 while the same pass costs \$100 when purchased through the University using a student ID (Portland State University, 2018). A mobile app is a very popular tool used by students in the twenty first century. Several of these universities have developed mobile apps for their transit systems. These apps give real-time information about the current location and arrival time of buses. The City of Manhattan needs to consider similar tools to make the bus system more student friendly.

2.4 Status of transit ridership in the United States in the 21st Century

Despite several deterring factors and unresolved issues, it is reassuring to know that the efforts of planners and policy makers and research work from across the globe is bearing fruits. Communities are beginning to see the benefits of public transit use and be attracted by the amenities and incentives offered to them. This clearly shows a change in their perceptions and behaviors. Data from American Physical Therapy Association (APTA) and Federal Highway Administration (FHWA) prove that U.S. population is getting more and more inclined towards public transit in the 21st century (APTA, 2014; FHWA, 2014). There was a 14% increase in transit ridership between 2004 and 2012 while motor vehicle travel declined by 1%.

2.4.1 Public transit in Manhattan, KS

The ATA bus service is the only form of mass transit in Manhattan, KS. It has been in operation ever since 1976. Initially, the company offered only demand-response service. The fixed routes in Manhattan became operational since 2012 when Kansas State University started to fund the service (¹Flint Hills MPO, 2018). The University pays a fixed amount annually for the bus service. For the current fiscal year (2018-19) it is \$336,400 (¹Singh, 2018). The ATA bus also receives direct funding from the Federal Transit Agency (²Singh, 2018). This fiscal year, the ATA Bus has received funds from the general fund of the City of Manhattan (Richardson, 2017). From the year 2012 to date, the bus service had 42% of the city's residential area within a quarter mile. With the new yellow routes, this percentage will go up to 83% (¹Singh, 2018). The general bus fare is a dollar per ride for adults and thirty cents for children between six to eighteen years of age. Children below six can ride the bus for free. The purple route that goes all around the University campus including the dorms and Jardine Apartments is free for all students and faculty. Students at Kansas State University can buy a monthly bus pass for \$30. ATA Bus has

also launched new 4 day and 5-day bus passes for fixed routes in Manhattan and Junction City. The bus pass entitles them to avail all the fixed bus routes for free. There is also the Half Fare Program which allows senior citizens, physically challenged and people below the poverty line to avail the bus facility for half the fare. Students living in the University Crossing Apartment Complex need not pay any fare or buy a pass as their bus fee is included in their rent (²Flint Hills MPO, 2018).

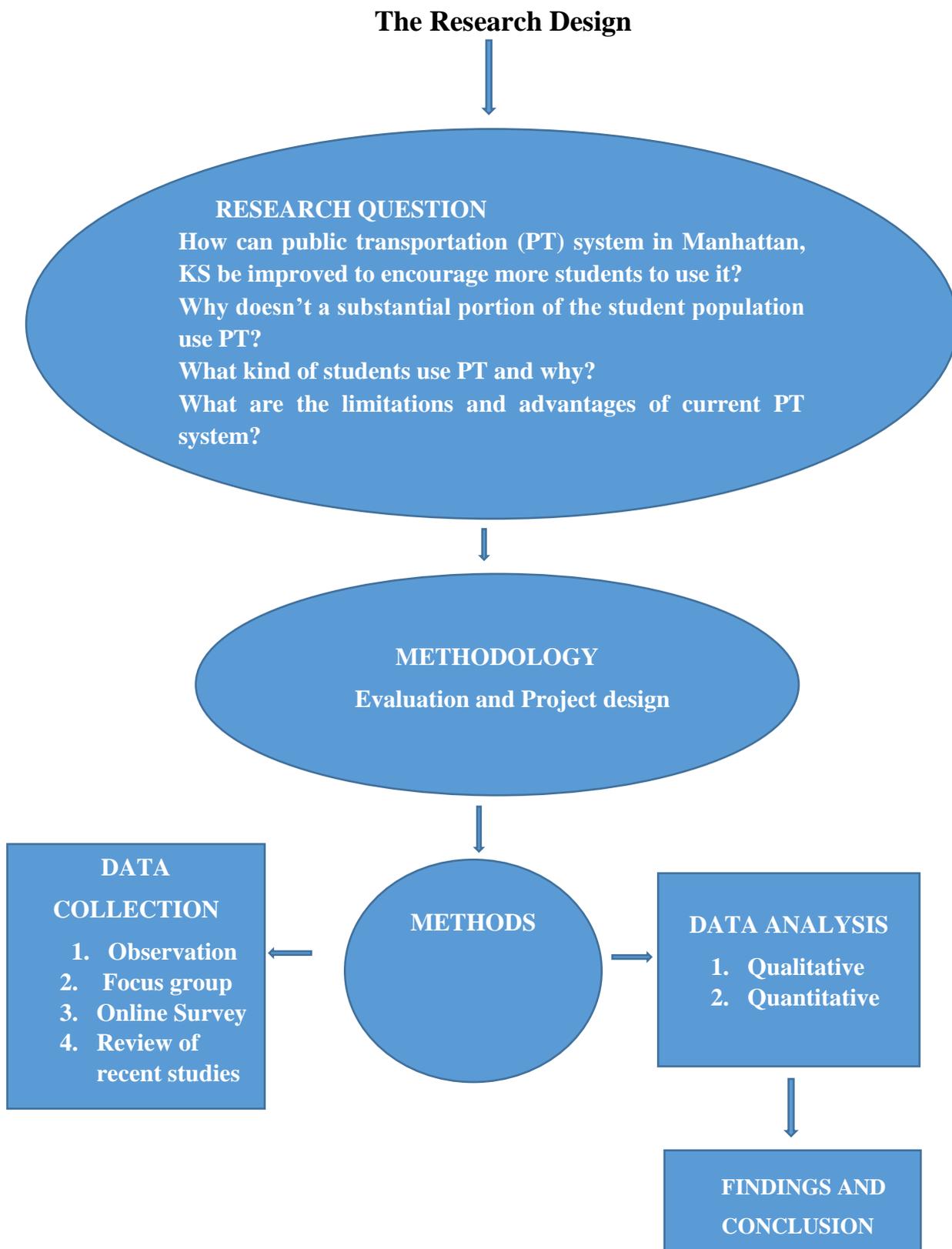
Till December 2017 there were 26 bus stops on the fixed routes. With the implementation of the new bus routes, the number of bus stops is likely to increase by 35-40%. The new bus routes are strategically designed to increase the service area but reduce the vehicle miles travelled. Besides there are two bus shuttles available for students at Kansas State University. One shuttle, called the Union Express take students from the Student Union to Jardine Apartments and another one is park and ride shuttle. There are four bus routes viz. red, orange, blue, green. The fifth one, to be implemented soon is the yellow line. Apart from Manhattan, ATA buses have fixed routes in Junction City ever since 2016. It also provides demand-response services in Manhattan, Ogden, Wamego and Junction City in Riley, Pottawatomie and Geary counties (²Flint Hills MPO, 2018; Sellman, 2017). ATA bus provides zone services in northern Riley County on Mondays and Tuesdays. It also provides a country run to and from Leonardville, Riley, and Randolph areas on second and fourth Fridays. Besides, a door to door service is offered to the physically impaired in Ogden (²Flint Hills MPO, 2018).

The focus for my master's project is to formulate a plan to bring about a positive change in public transit use among students in the City of Manhattan, Kansas. Since the City of Manhattan offers only one type of mass public transit i.e. ATA Bus, through this project I aim to devise a plan to enhance bus ridership among the students of Kansas State University. Students, staff and

faculty of Kansas State University together constitute about 50% of the total ridership of ATA bus. The University is a major contributor to employment and revenues to the city and home to 24,766 students i.e. 24,766 prospective bus riders.

Chapter 3 - Methodology and work plan

Figure 3.1 The Research Design



1. In the first step we identified a list of factors which currently favor or hinder the use of public transit e.g. amenities, bus frequency and reliability.

This step was accomplished by generally talking to people and conducting a focus group interview with people at Kansas State University and the City of Manhattan. The focus group interview was conducted on October 5, 2017. A group of seven people including students from architecture and planning backgrounds and a professor from Kansas State University and staff from the Department of Community Development, City of Manhattan participated to give their inputs and opinions. Some of the deterring factors were lack of proper information on bus stops, reliability and low frequency of buses (Copy of focus group questionnaire is attached).

2. Eventually, a questionnaire was prepared, and an online survey was conducted using the questionnaire to pinpoint the factors most desired by the students who wanted to use the bus or were willing to use the bus service once those factors were in place. The Qualtrics link for the online survey was requested from the Hale Library IT staff (Copy of online survey questionnaire is attached).
3. In the third step we analyzed the survey results qualitatively.
4. Eventually, a map showing the most desired locations for bus stops was developed along with other suggestive measures to improve transit ridership in Manhattan.

Tools used: Questionnaire for focus group and online survey, Statistical tools for analysis of survey results, GIS for developing maps.

Chapter 4 - Results and discussion

Table 4.1 Focus group interview response

Response	Respondent 1	Respondent 2	Respondent 3	Respondent 4	Respondent 5	Respondent 6	Respondent 7
Age	26-35	26-35	26-35	26-35	26-35	>56	46-55
Residence	Near KSU	Jardine complex	Near KSU	Near KSU	Near KSU	West side of the city	Near downtown
Occupation	Student	Student	Student	Student	Student	Salaried job	Salaried job
Income	<\$15,000	<\$15,000	<\$15,000	\$15,001- 25,000	\$15,001- 25,000	>\$45,000	>\$45,000
Means of commutation	Combination of all	Bus	Bus and walk	Walk and other means	Walk and other means	Car	Bike
Concern	Reliability and timeliness	Frequency, reliability, bus pass, bus stops	Frequency	Reliability, timeliness & amenities	Reliability, timeliness & amenities	Bus pass	Frequency, amenities
Desired bus frequency	Every 15 minutes	Every 15 minutes	Every 15 minutes	Every 15 minutes	Every 20 minutes	Not answered	Every 15 minutes
Maximum desirable bus service charge	<\$50	<\$50	<\$50	\$90	<\$50	\$90	>\$90
Bus over car	Maybe	Yes	Yes	Yes	Yes	Yes	Yes

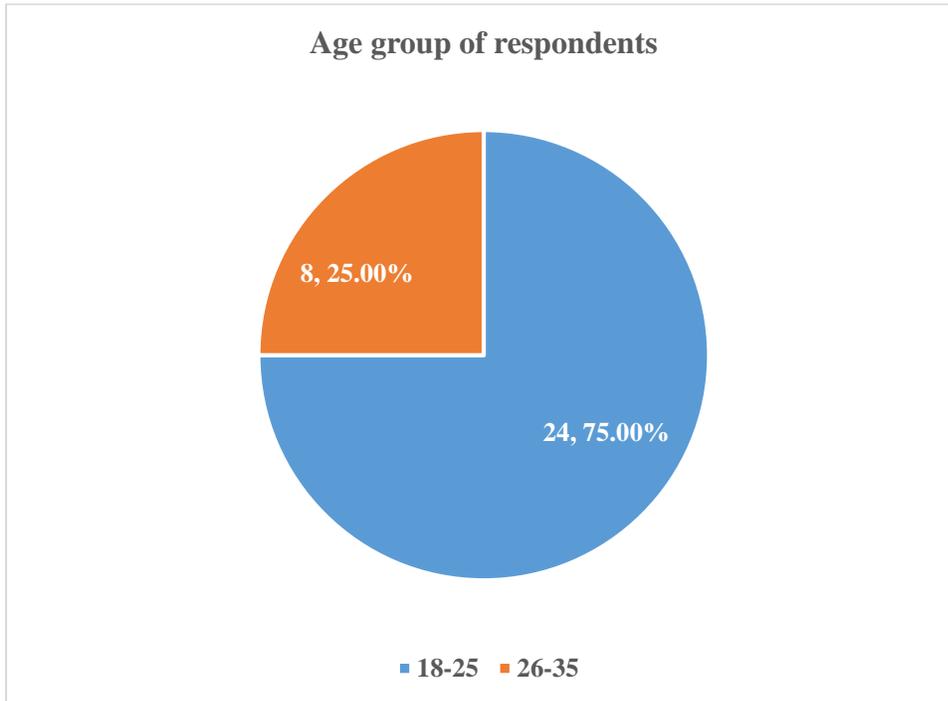
Demerits of ATA Bus	Reliability	Reliability, inadequacy	Inadequacy	Infrequent, lack of outreach	Invisible, lack of outreach	Infrequent, lack of info.	Invisibility
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From the focus group interviews it became clear that students were not willing to pay more than \$90 and most would not want to pay more than \$50. People with salaried jobs were willing to pay more than students. The low frequency of bus service, lack of amenities like a shade, inadequate bus service on weekends and after 6:30 in the evening on weekdays were some of the concerns raised by participants. Some participants felt like there is insufficient information in the public about the bus service and the bus stops are not conspicuous. Also, the bus routes are not clearly displayed on the bus stops. One of the respondents having a salaried job felt that living in the downtown made it easy to be in the range of the bus service for his daily needs. For others who were not in the range of the bus service, it was more of a land use issue than a bus service issue. One respondent felt that Manhattan could be better designed in terms of land use to increase density, incorporate more mixed use and TOD for the bus system to serve the community and students living farther away from the KSU campus and downtown better. Most respondents supported the bus service for it was cheap.

4.1 Online survey response

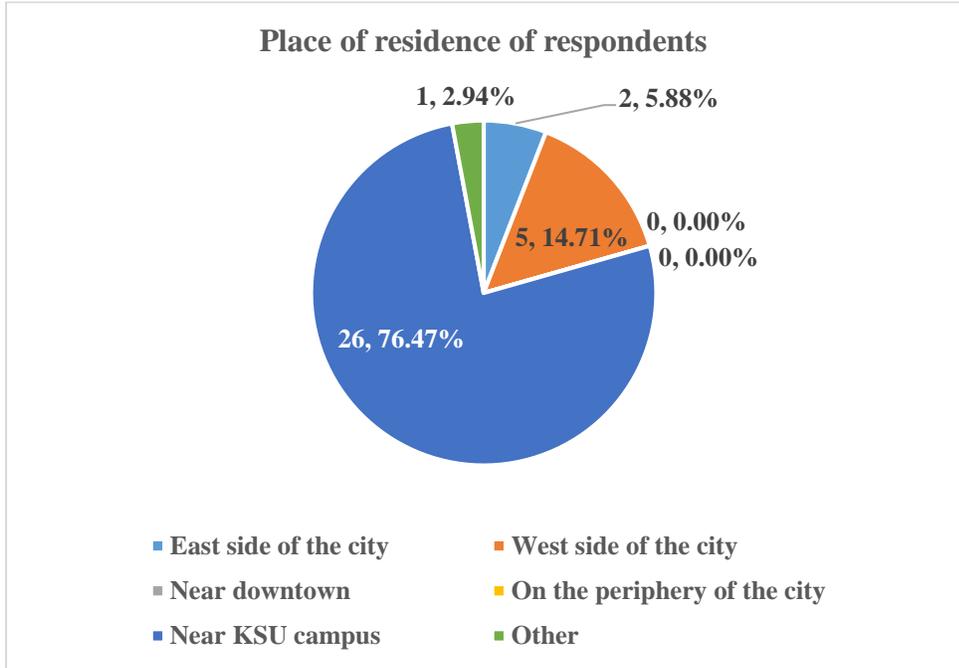
A sample of 250 students across various disciplines in the Manhattan campus of Kansas State University was provided by the registrar’s office for this survey. The survey was disseminated via email. Of the 250 students 33 (13.2%) responded. Their response to each question is presented and discussed as follows:

Figure 4.1 Age group of respondents



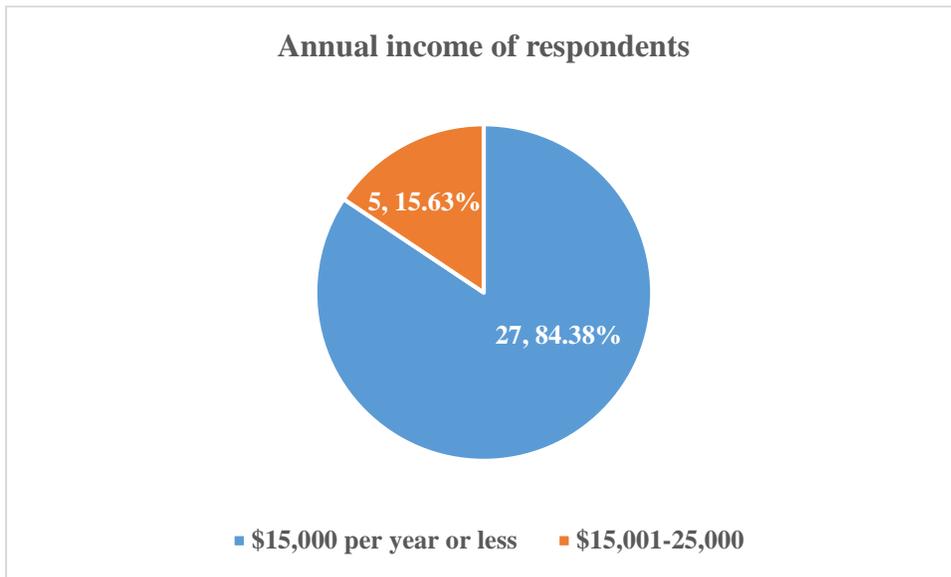
75% of the student respondents were in the age group of 18 to 25. These students were most probably masters and bachelors in various disciplines. 25% were in the age group of 26 to 35 (Figure 4.1). These may be masters or PhD students. Younger students have responded more to the survey. It could be a possibility that students in this age group care more for the bus service or the sample consists of a greater percentage of younger students.

Figure 4.2 Place of residence of respondents



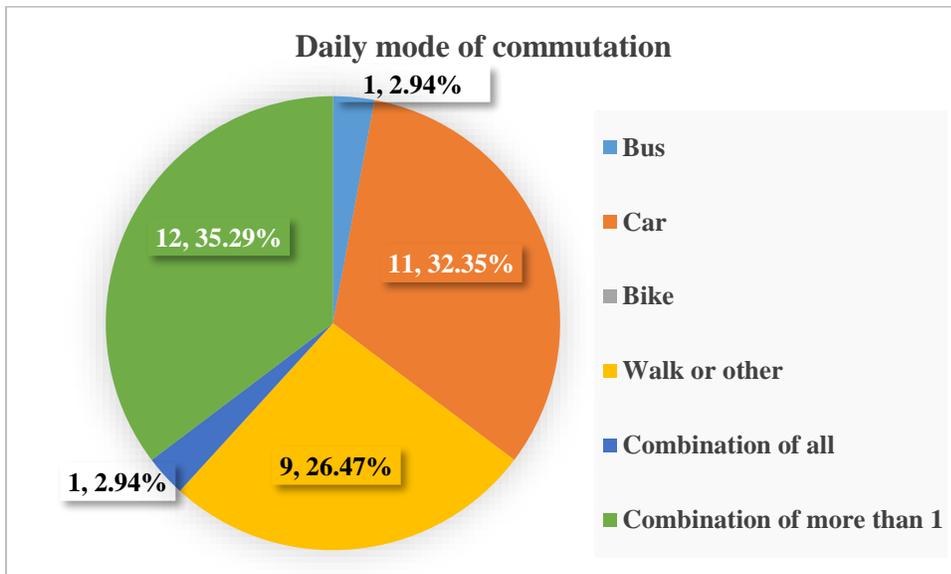
Most (76.47%) of the respondents lived near the campus (Figure 4.2). These are the students who have cared to respond to this survey related to the bus service in larger numbers. This indicates that these students want the bus service or maybe use it proportionally more than others. It might also be possible that they own less cars than those who live farther away from the university. None of the students respondents live near downtown and one student does not live in Manhattan.

Figure 4.3 Annual income of respondents



Most students (84.38%) had annual income less than \$15,000. A small percentage (15.63%) had annual income in the range of \$15,000-\$25,000.

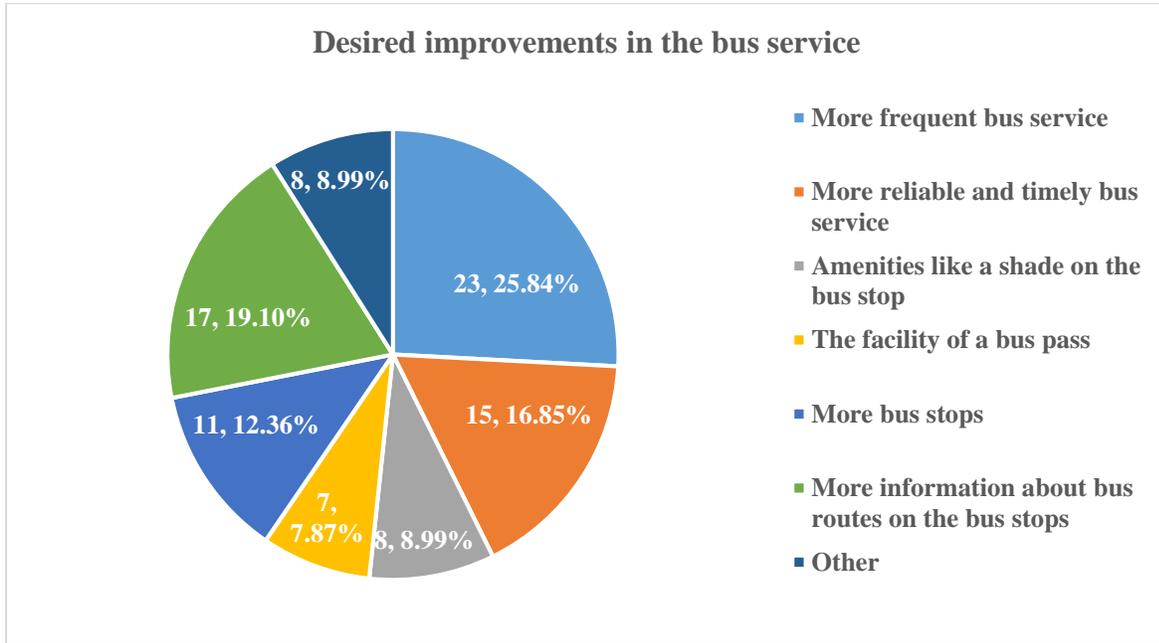
Figure 4.4 Daily mode of commutation of respondents to work or school



Maximum number of students (35.29%) used a combination of more than one mode to commute to work or school. 11 students (32.35%) used a car to commute (Figure 4.4). This demonstrates that Manhattan is a car-oriented city. 9 students walked, skated or used other similar means to

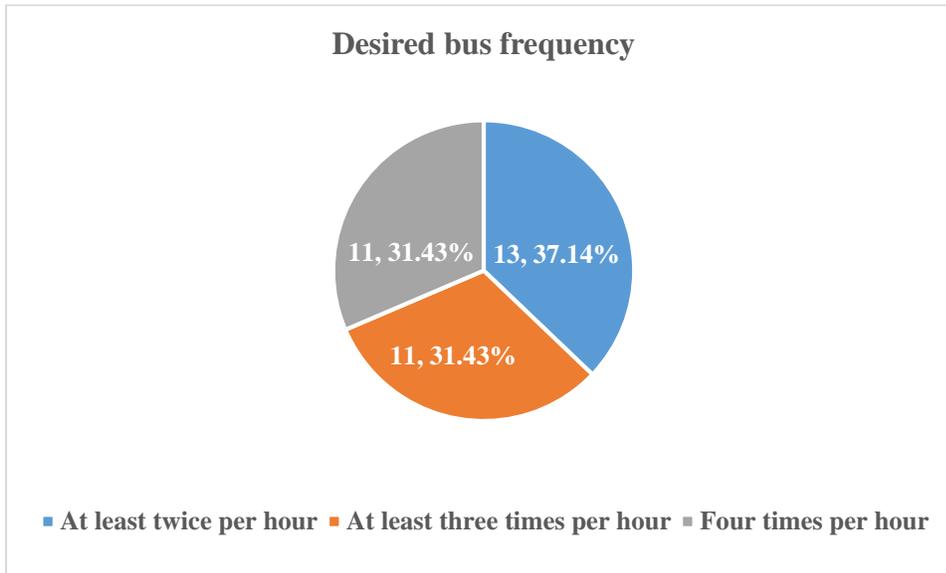
commute to work or school. One student was a bus rider and one used the bus occasionally with all other modes of commutation. One student using a combination of more than one mode of commutation specifically mentioned the bus. Hence, out of 32 student respondents at least 3 used the bus either occasionally or daily (Figure 4.4).

Figure 4.5 Improvements in the bus service desired by respondents



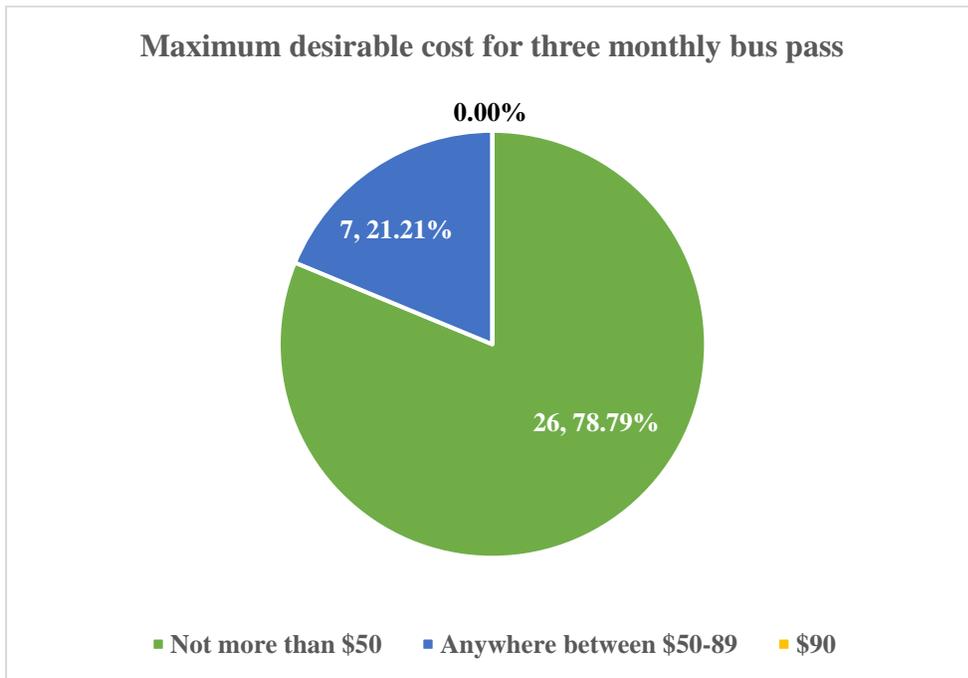
In response to the question regarding the desirable improvements in the bus service (Figure 4.5), 25.84% said they wanted it to be more frequent and 16.85% said the service needs to be more timely and reliable. There were other desired improvements like more information about bus routes on the bus stops (19.10%), more bus stops (12.36%), bus pass (7.87%), amenities like shade on bus stop (8.99%) and other improvements (8.99%) in the bus service such as larger buses, wider time schedules till late night, a digital app, more bus stops to the west side of the town and cheaper bus pass. This response made it clear that frequency, information about bus routes on the bus stops and reliability were the three most desirable features of the bus system.

Figure 4.6 Minimum bus frequency desired by students to make the service good enough to use.



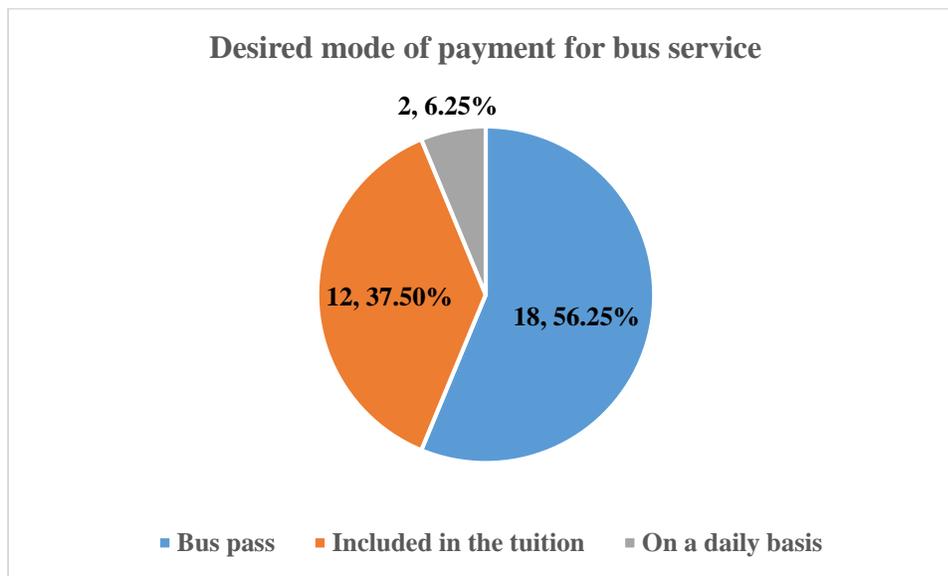
Upon being asked if students wanted the bus service to be more frequent and how frequent should it be for them to be useful, all of them responded that it should be more frequent. More students said they would use it even if the frequency becomes double i.e. twice per hour and equal number of students wanted it to be three times or four times an hour (Figure 4.6).

Figure 4.7 Maximum desirable cost for a three-monthly bus pass



We asked the students regarding their willingness to pay for the bus pass and the maximum amount they would be willing to pay (Fig. 4.7). Most students (78.79%) were not willing to pay more than \$50. A small percentage (21.21%) said they could pay anywhere between \$50-\$89. None of the students were willing to pay \$90 or more. This data does not help us conclude that students would not pay more than \$50 for the three-monthly pass. It might be possible that students simply quoted the minimum price. It might also be possible that if the bus frequency and other desired criteria are fulfilled, students would pay more than \$50. Limiting the number of parking spots on KSU campus might steer students towards the bus service and change these statistics.

Figure 4.8The desired mode of payment for the bus service by students.



We expected that most students would want the bus fee to be included in their tuition rather than own a bus pass. However, the results show that an overwhelmingly larger percentage (56.25%) were willing to buy a bus pass rather than have the bus fee included in their tuition (Fig. 4.8). The students probably wanted to have a choice in the use of the bus service rather than being forced to pay a mandatory fee along with tuition. This seems reasonable as most students having student loans would not want to increase it in any way.

Most desirable locations for a new bus stop/stops.

Near grocery stores

Downtown and Dillions West

Aggieville and downtown

International Court , Ackert Hall , Library, Jardine West End

Aggieville, popular locations in college neighborhoods

Aggieville, Jardine Apartments, Richards Drive, Fort Riley Boulevard (near Ban Thai)

Campus, mall, health centers, shopping centers

West side shopping centers, i.e. Target

Further from campus like towards Aggieville

Aggieville

Near engineering building. (Improve routes)

West side

on sunset near the cemetery and near some main apartment complexes

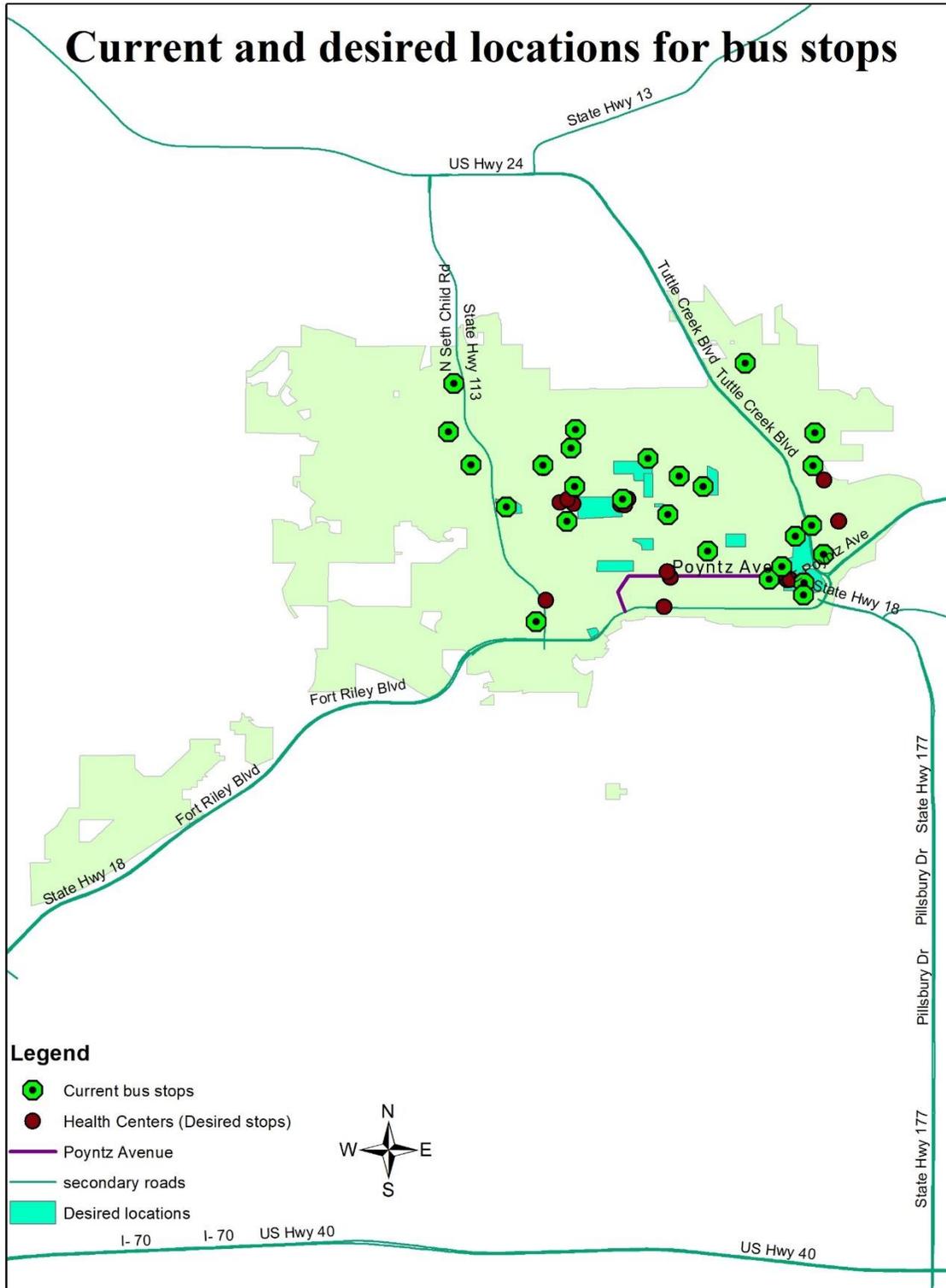
Jardine

On the periphery of campus

Around the city, not inside campus.

Bus stops near the sorority and fraternity housing would be AMAZING for members of Greek life at K-State! (Which 1 in 4 K-Staters are involved in Greek life, so this would be a somewhat significant portion of the population!)

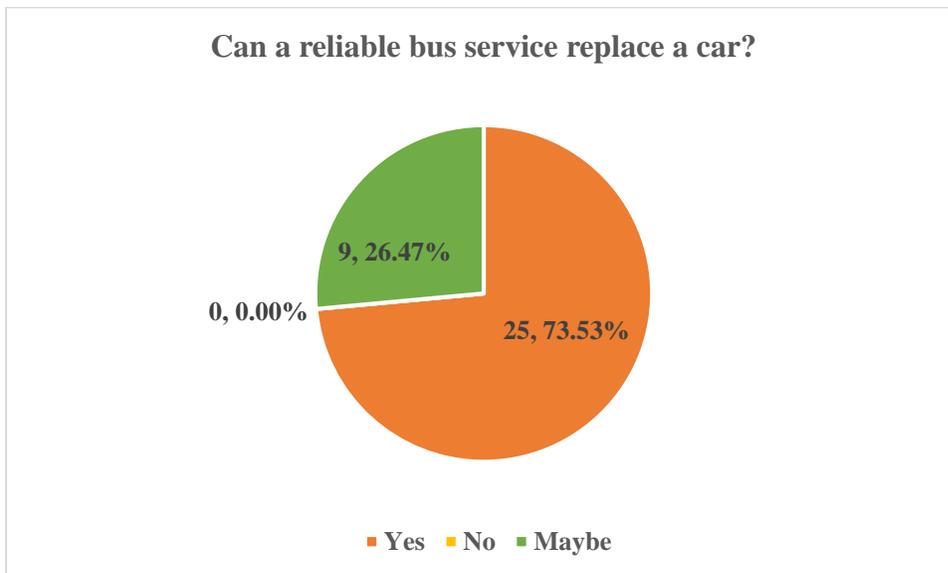
Figure 4.9: Current and desired locations for bus stops



The desired locations (polygons for areas and dots for specific addresses) as suggested by students for bus stops were plotted on the map of Manhattan, along with the locations of the existing bus stops. It was found that bus stops already existed at several locations suggested by students e.g. the Mall, near Aggieville, Jardine Apartments, some sorority and fraternity houses and most health centers. This shows that there is a lack of information among students regarding the existing locations of bus stops. This could be one of the causes for low transit ridership among students.

Also, the locations for bus stops suggested by students e.g. health centers, sorority and fraternity houses, the mall and restaurants etc. gave an idea of the various places that students needed to go to using the bus.

Figure 4.10 Response on the relative utility of the bus as a viable alternative to a car.



Upon being asked if a reliable bus service would eliminate the use for cars as an alternative mode of transport, only nine respondents (26.47%) said maybe. The other 25 (73.53%) respondents said yes. None of them said no (Figure 4.9). This response ignites the hope that we

might be able to get sufficient transit ridership if the bus service meets the needs of the students. This result helps overcome the fear that an empty bus moving around town is even more problematic than a car.

Reasons for the answer to the previous question.

would be a cheap alternative for student.

If adequate service is provided, primarily timely routes with coverage of the majority of the population, then a bus service can be an alternative.

Being able to get where I need when I need.

If the service was more frequent and easier to use, it would work as a car rather than using personal vehicles.

If the buses run frequently and are large, people will use them instead of their car to get to downtown and to Aggieville.

if the bus had stopped in Jardine west end or in the international court!

Manhattan suffers from a poor public system and therefore students prefer to use their own car.

This means that if one has no car one has no choice to get to the mall or Dillon's.

Bus systems save time, money, emissions, etc. They are environmentally friendly (to some extent) and can be a great asset if they work well.

More frequent bus service will reduce the dependency on car. It will reduce fuel/gas cost and parking cost for one who daily travels by car. Also, it would be helpful during storms.

If the bus goes everywhere I need to go and I don't have to time my schedule out by the hour, I would ride the bus instead of driving everywhere.

I think a reliable bus service is actually better than a car because you don't have to deal with parking.

Cause sometimes, you just don't feel like taking a car around town.

I'd love to be able to have a drink with friends and not have to drive or pay for an Uber or taxi.

Because it can get you to where you need to go but you don't have to walk everywhere.

There is no need to buy a car when you have a reliable bus service to substitute temporarily.

Parking on campus is the worst.

If I could spend \$50 over three months instead of \$50 weekly on gas, and still conveniently and reliably get to and from my destinations in a timely manner, I would use the bus service.

There is no need for cars on a small city like this, public transportation should be the default for people. For commuting, going shopping, everything.

I answered maybe because I think it would solve the problem of not being able to find a parking spot on campus. However, not knowing which buses are going where is a problem because I never know if I have time to get on the bus and make it to class, or if the bus is not going where I need to go in a timely manner.

I have lived in India and I survived without a car.

When asked why they thought a reliable bus service could replace a car and, we got some interesting and unexpected responses. These responses revealed several needs of the students apart from getting to work or school e.g. recreational needs, grocery shopping and the need to avoid parking hassles. Insufficient student parking on campus necessitates the need for the bus service. It was interesting to note that students not only needed the bus for their daily needs but also to spend a carefree evening with friends at Aggieville. Most importantly, the bus would help prevent drunk driving.

Limitations of the current public transit system in Manhattan, KS according to students of KSU.

Public Transportation is not frequent.

Timings are not friendly.

The culture and infrastructure of the United States are centered around automobile ownership and use. For generations, public transit has been widely dismissed as something only for the poor. The largest challenge will be to overcome cultural stigma towards public transit in the Midwest.

Infrequent stops and lack of knowledge of system.

Sometimes some buses run too late!

Coverage

think the system is too limited in terms of routes, bus stops, ridership, etc. I'm not sure if the need in Manhattan warrants a larger system, maybe just a more effective one.

Limited number of bus stops. One needs to walk a lot, if he/she wants to go somewhere by bus.

Limited time schedule. It only works till 6/6.30 pm, and again it doesn't work on Sundays. So, people who don't have a car, or can't drive are left with no option to go anywhere after 6 or on Sundays. Also, very limited bus routes when the school is off, for example in winter or summer break. The frequency of service is very low. One need to wait for every hour for the bus. If someone misses the schedule time for one-two minute, she/he needs to wait again for one more hour.

Does not run frequently enough, not enough information readily available, does not go where I need to go.

Too infrequent.

Late and not many bus stops.

I don't know anything about the public transport in Manhattan.

Not enough information.

Not enough bus pick-up times.

Unreliable times that are inconvenient for class schedules. It takes the same or longer amount of time to ride the bus versus walking.

They are primarily focused on getting Jardine Students to campus as opposed to all KSU students.

Time.

Not very many people are aware of this service and there is no easy access to information of the bus routes. An application with routes and times would be nice. An app with GPS bus location would be best.

Doesn't go to residential areas on the west side of town.

There are not many stops outside campus.

I'm never sure which buses are going where!

Low frequency, reliability and lack of amenities on the bus stop. Also, many people do not know of the bus service or the timing of it.

The abovementioned question brought the numerous drawbacks of the current ATA bus service including unreliability, lack of information regarding bus routes, low frequency, low number of bus stops in the west side of town, lack of amenities on the bus stop and longer and fewer bus

routes. Someone suggested a software application (app) on the mobile phone that would provide information through GPS in real-time regarding the timing and location of the bus.

Specific improvements suggested by students for the ATA Bus service in Manhattan, Kansas.

More frequent service. If they can run late in the evening that would be good for students working late.

I am aware of the changes the ATA Bus has just made to the system in January - I am interested to see how these changes pan out and do not have any specific changes I would like to see at this time.

If possible maybe develop an app of some sort, so students know where the bus is and what time they will make it to campus. Ata busses are unreliable because you never know what time they will arrive at the stop. Sometimes they are very early or running very late.

Larger buses- actual bus size like a real city.

Just increase the number of stops and do not be late!

To cover more points throughout the town. To send more information about bus routes.

More bus routes and stops covering most of the important places of the town. Increased frequency, 2-3 times an hour is good.

Increasing the working hour of the bus.

Provide information about the bus routes at the bus stops.

Bus pass system and more frequency at stops.

Make more bus stops and make it easier to get information!

More info, better routes

A new route going the opposite direction around campus for better use for all majors. Also, more easily accessible info on where/when the stops are.

More stops in general areas, not specific ones (takes less time).

More frequent if possible.

Make an application with bus times and routes! This would make it easier for people to use this service.

Go to the residential areas on the west side of town.

It would be awesome if there was an app that you could use to find out which buses were where and when a bus would be at a particular stop and how long it would take you to get to another stop on the route! It would also be awesome if more stops were made near sorority and fraternity housing!

Frequency must be improved along with reliability and some amenities like a bench and shade on the bus stop.

There were a host of improvements that students suggested for the ATA bus service. The suggestions included, more information regarding the buses on bus stops, greater frequency, an app for mobile phones and more bus stops on the west side of town etc.

The results of the survey revealed that most student respondents lived near the university campus. It is likely that a substantial portion of these students lived in the Jardine Complex. These students have the facility of the Union Express bus that goes to and from the Jardine Complex and the student Union every five minutes. They also have the park and ride shuttle that goes from Jardine to all around the campus and to the Student Union. A substantial portion of students living near the university said they wanted a bus stop at or near Aggieville. There is a bus stop at the City park which is a few minutes' walk from Aggieville. Another bus stop exists at the Mariana Kistler Beach Museum of Art which is located immediately north of Aggieville with just a street separating Aggieville from the bus stop. These responses indicate that the student respondents either want a bus stop within Aggieville or do not know of bus stops that are already located in the vicinity. There are students who live on the west side of the city and want a bus stop there. There are already three bus stops in this part of the city. Two being along the Candlewood and Kimball Crossing and one at the Manhattan Area Technical College (MATC). The bus from MATC drops students to the Derby Dining Centre and buses from the other two bus stops drop students to the Student Union. When students responded that they wanted a bus stop on the west side of the city it either shows a lack of information among students regarding

the location of bus stops or the inadequacy in the number of stops. Lack of information could be due to lack of public outreach or lack of visibility of bus stops that students could not spot them and think there are none.

Chapter 5 - Conclusion

The bus service is specifically designed to bring students to campus i.e. academic purpose. While the bus does serve its purpose to some extent, this survey revealed some other needs and expectations of students from the bus service. These needs have been categorized as follows:

1. Academic needs-Students wanted bus stops near various buildings housing various departments.
2. Daily needs- Students wanted bus service for grocery shopping to Dillon's and Walmart.
3. Recreational needs- Students wanted buses to and from Aggieville and other parts of town. This is one need that was desired by a maximum number of student respondents. Some students gave the exact location of a bus stop, e.g. Ban Thai Restaurant. It is reasonable for students without a personal car to expect the bus to take them to places to meet their recreational needs. This most popular need of students that came out in this survey had so far been hidden in plain sight and hence ignored while designing a bus route. These needs can be further explored through other surveys and public outreach. An exploration and inclusion of these needs is likely to enhance bus ridership.
4. Parking needs-Another thing that came out in the survey was the lack of convenient parking on the university campus. Several student respondents felt that the problem of lack of convenient parking could be solved through a frequent and reliable bus service as it will help them get rid of the hassle of parking. This is an indication that we might learn from universities like Florida State University which tore down parking lots to build departments and included a per credit hour bus fee in their tuition to pay for a good bus service.

Increased bus frequency was desired as the single most important factor by students. This might cost more money that has to come from somewhere. One way could be a mandatory bus fee. Once implemented, the mandatory bus fee will force the students to use the bus since they paid for it in advance. However, looking at the survey this was not desired by most students who opted for a bus pass system. A bus pass may or may not solve the problem of funding a frequent bus service since it is not mandatory, and all students would not buy it. There are several factors that need to be weighed in before designing new routes. Cost being the most important one. Vehicle miles travelled, number of bus drivers, staff, fuel are some others. It should also be noted that most students were in the lowest income group of \$15,000-\$25,000 per year and favored the bus system for it would be cheaper than maintaining a car. Hence, a mandatory bus fee might seem harsh immediately but would be a cheaper option for students if the bus is able to fulfill all their transportation needs that the car currently provides i.e. academic, daily and recreational needs.

This study suggests that a substantial portion of the student population does not use a bus due to the service being low in frequency, less reliable, inadequacy during night time and weekends. There is also a lack of information about bus routes, stops and schedule among students. Students are the most frequent riders of the bus (about 50% of the total ridership) especially those living in the Jardine Complex and near the KSU campus. The service being most frequent in this location makes it convenient for students to use the bus. However, students living here have several needs e.g. recreational, and other daily needs that they want fulfilled by the bus service. Low coverage and less number of bus stops in the west side of town are some of the factors apart from low frequency and reliability that limits bus usage by students living in this part of town. These facts should be taken into consideration in future plan of Kansas State

University Transit Policy, ATA Bus and Flint Hills MPO to improve the public transportation system and encourage more students to use it.

5.1 Future directions

This work brings out interesting findings about student's perception of the ATA bus. However, it does not include the entire community of Manhattan. The survey could be extended to reach the entire community to understand what Manhattanites think about the bus service. The study can also be extended to the three counties that the bus service currently serves. It would help determine if an extensive bus service is needed by the residents of those counties. Also, some of the solutions suggested by students such as a digital app to give real time information about the bus, more information on the bus stops and greater coverage should be considered by the ATA bus to improve the bus service. Conversations with people associated with Flint Hills Regional Council and the Flint Hills Metropolitan Organization have revealed that some of these options are already being considered. Once the new bus routes with more bus stops and improved bus frequency (to be operational soon) are put in place another survey can be conducted to determine the satisfaction levels of students with the improved system.

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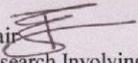
Appendix A-IRB approval letter

KANSAS STATE
UNIVERSITY

University Research Compliance Office

TO: Dr. John Keller
Landscape Architecture/Regional and Community Planning
301D Seaton Hall

Proposal Number: 8914

FROM: Rick Scheidt, Chair 
Committee on Research Involving Human Subjects

DATE: 09/01/2017

RE: Proposal Entitled, "Encouraging public transportation to increase active commutation in Manhattan, KS"

The Committee on Research Involving Human Subjects / Institutional Review Board (IRB) for Kansas State University has reviewed the proposal identified above and has determined that it is EXEMPT from further IRB review. This exemption applies only to the proposal - as written - and currently on file with the IRB. Any change potentially affecting human subjects must be approved by the IRB prior to implementation and may disqualify the proposal from exemption.

Based upon information provided to the IRB, this activity is exempt under the criteria set forth in the Federal Policy for the Protection of Human Subjects, **45 CFR §46.101, paragraph b, category: 2, subsection: ii.**

Certain research is exempt from the requirements of HHS/OHRP regulations. A determination that research is exempt does not imply that investigators have no ethical responsibilities to subjects in such research; it means only that the regulatory requirements related to IRB review, informed consent, and assurance of compliance do not apply to the research.

Any unanticipated problems involving risk to subjects or to others must be reported immediately to the Chair of the Committee on Research Involving Human Subjects, the University Research Compliance Office, and if the subjects are KSU students, to the Director of the Student Health Center.

Appendix B- Focus group questionnaire

Welcome to the focus group interview about public transit system of Manhattan, KS. The interview deals with inviting opinions to improve the current transit system (ATA buses) in the city of Manhattan, KS. Your participation is entirely voluntary. You can choose to opt out of it any time you feel. Your identity would be kept confidential and will not form a part of the published data.

Question 1: What is your age?

- a. 18-25 b. 26-35 c. 36-45 d. 46-55 e. 56 and above

Question 2: Where in Manhattan, KS do you live?

- a. East side of the city
- b. West side of the city
- c. Near downtown
- d. On the periphery of the city
- e. Near KSU campus

Question 3: What is your occupation?

- a. Student b. Education c. Entrepreneur d. Salaried job Question

4: What is your income group?

- a. \$15,000 per year or less b. \$15001-25,000 c. \$25,001-45,000 d. more than \$45,000

Question 5: What kind of vehicle do you use to commute to work or school?

- a. Bus
- b. Car
- c. Bike
- d. Walk or other
- e. Combination of all

Question 6: Would you choose to use the ATA bus for your daily activities if one or more of the following improvements are made? Please pick at least one. You can pick all that apply.

- a. More frequent bus service
- b. More reliable and timely bus service
- c. Amenities like a shade on the bus stop
- d. The facility of a bus pass
- e. Other

Question 7: If you chose to use the bus if it becomes more frequent; how frequent should it be for you to use it?

- a. At least twice per hour

- b. At least three times per hour
- c. Four times per hour

Question 8: In case you are a student of K-State, what is the maximum amount you are willing to pay for a three- monthly bus pass?

- a. Not more than \$50
- b. Anywhere between \$50-89
- c. \$90

Question 9: In case you have a salaried job at or anywhere other than K-State, what is the maximum amount you are willing to pay for a three- monthly bus pass?

- a. \$90
- b. Not more than \$50
- c. Anywhere between \$50-90
- d. More than \$90

Question 10: Do you think a reliable bus service can be an alternative to a car?

- a. Yes
- b. No

Question 11. Describe the reasons for your answer? If yes, why? If no, why not?

Question 12. What do you think are the limitations of the current public transit system in Manhattan, KS?

Appendix C- Online survey questionnaire

Online survey questionnaire

Hello K-Staters,

This survey is being conducted by Annapurna Singh, a graduate student in the Department of Landscape Architecture and Regional and Community Planning for her master's project entitled "Encouraging public transportation to increase active commutation in Manhattan, KS". The purpose of this study is to gather information about bus ridership in the city of Manhattan. The information you provide will help inform planners and policy makers about the expectations of people regarding the bus service. This will help them improve the bus service to meet these expectations and better serve our community.

Your response to this survey would be anonymous. This survey has been approved by KSU Institutional Review Board (IRB#8914). The IRB approval letter is attached to this email. The survey will not take more than 5-8 minutes to complete. It is available at this anonymous link.

https://kstate.qualtrics.com/jfe/form/SV_9Yc38qbRW1xQ4Ch

Your time and participation are invaluable.

Question 1: What is your age?

- a. 18-25
- b. 26-35
- c. 36-45
- d. 46-55
- e. 56 and above

Question 2: Where in Manhattan, KS do you live?

- a. East side of the city
- b. West side of the city
- c. Near downtown
- d. On the periphery of the city
- e. Near KSU campus
- f. Other

Question 3: What is your income group:

- a. \$15,000 per year or less
- b. \$15,001-\$25,000

Question 4: How do you commute to work or school?

- a. Bus
- b. Car
- c. Bike
- d. Walk or other
- e. Combination of all

Question 5: Would you choose to use the ATA bus for your daily activities if one or more of the following improvements are made? Please pick at least one. You can pick all that apply.

- a. More frequent bus service
- b. More reliable and timely bus service
- c. Amenities like a shade on the bus stop
- d. The facility of a bus pass
- e. More bus stops
- f. More information about bus routes on the bus stop
- g. Other

Question 6: If you chose to use the bus as the service becomes more frequent; how frequent should the service be for you to use it?

- a. At least twice per hour
- b. At least three times per hour
- c. Four times per hour

Question 7: What is the maximum amount you are willing to pay for a three- monthly bus pass?

- a. Not more than \$50
- b. Anywhere between \$50-89
- c. \$90

Question 8: How would you like to pay for the bus service?

- a. Included in tuition fee
- b. Buss pass
- c. On a daily basis

Question 9: Where do you think a new bus stop/stops are most needed?

Question 10: Do you think a reliable bus service can be an alternative to a car?

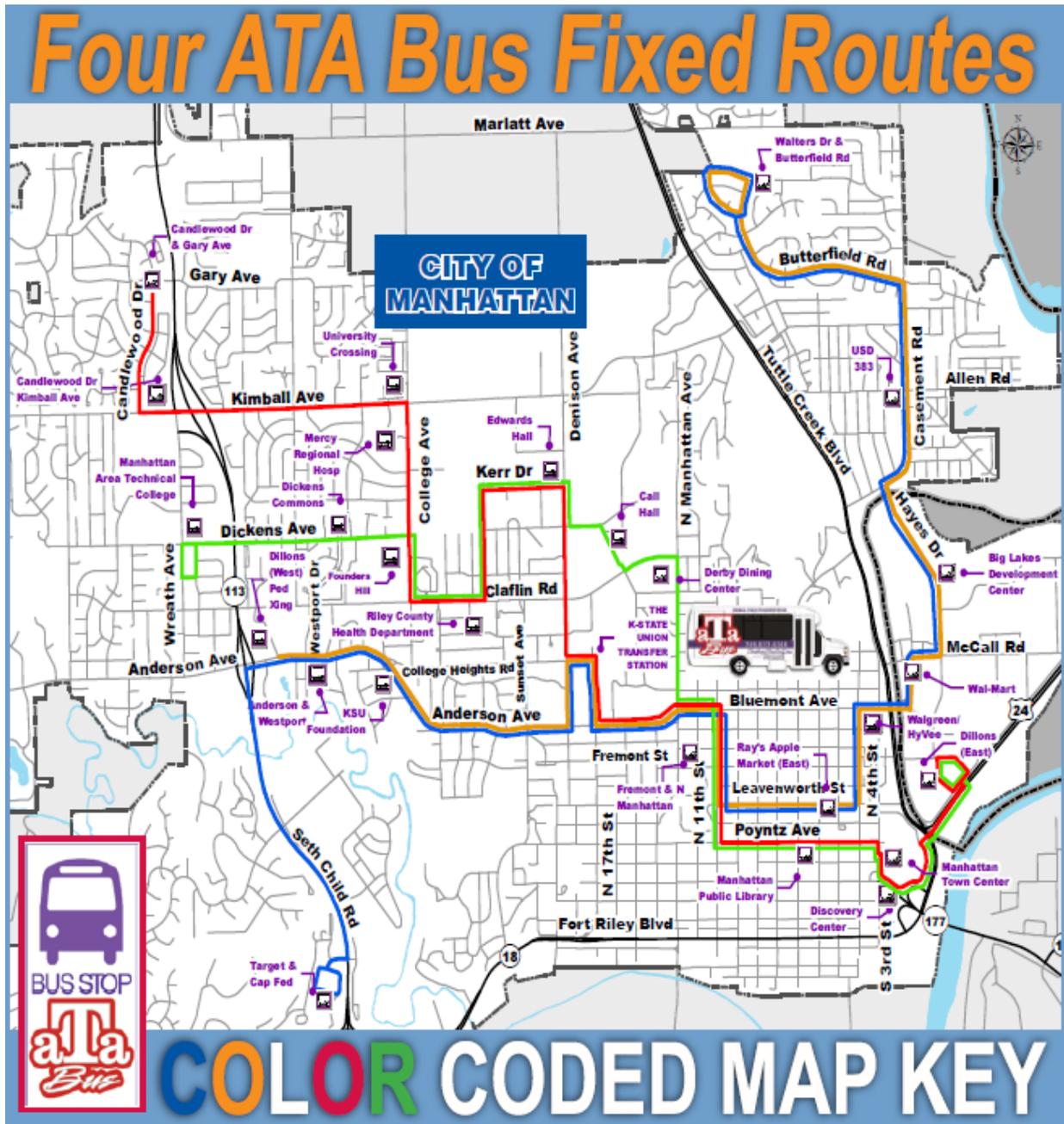
- a. Yes
- b. No

Question 11. Describe the reasons for your answer? If yes, why? If no, why not?

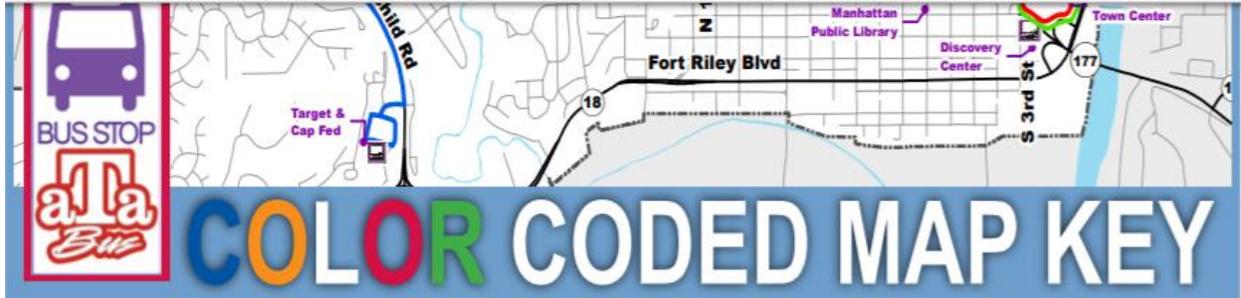
Question 12. What do you think are the limitations of the current public transit system in Manhattan, KS?

Question 13. What specific improvements would you suggest for the ATA Bus service Manhattan, KS if any? (Optional)

Appendix D- Current ATA Bus fixed routes



Appendix E - Current ATA bus stops and their timing



BLUEMONT All Year	
WB/Walters/Butterfield/START TIME 6:55 am WkDay	
WB/Walters/Butterfield/START TIME 7:55 am SAT	
EB/Walters/Butterfield/END TIME 6:55 pm WkDay	
EB/Walters/Butterfield/END TIME 7:55 pm SAT	
WESTBOUND	HOURLY
Walters/Butterfield	:55 am/pm
USD 383/Casement&Allen	:59 am/pm
Big Lakes	:02 am/pm
Wal-Mart@Hostetler	:05 am/pm
Hy-Vee/Walgreens	:07 am/pm
Ray's Apple Mkt/Leavenworth	:10 am/pm
Fremont/N.Manhattan	:13 am/pm
KSU Union	:15 am/pm
KSU Foundation	:20 am/pm
Target/CapFed	:26 am/pm
EASTBOUND	HOURLY
Target/CapFed	:26 am/pm
Walgreens West	:30 am/pm
KSU Foundation	:32 am/pm
KSU Union	:37 am/pm
Fremont/N.Manhattan	:39 am/pm
Ray's Apple Mkt/Leavenworth	:44 am/pm
Hy-Vee/Walgreens	:46 am/pm
Wal-Mart@Hostetler	:47 am/pm
Big Lakes	:49 am/pm
USD 383/Casement&Allen	:51 am/pm
Walters/Butterfield	:55 am/pm

FREMONT/OSAGE K-State In Session	
WB/Walters/Butterfield/START TIME 6:25 am WkDay	
EB/Walters/Butterfield/END TIME 7:25 pm WkDay	
WESTBOUND	HOURLY
Walters/Butterfield	:25 am/pm
USD 383/Casement&Allen	:29 am/pm
Big Lakes	:32 am/pm
Wal-Mart@Hostetler	:35 am/pm
Hy-Vee/Walgreens	:39 am/pm
Ray's Apple Mkt/Leavenworth	:41 am/pm
Fremont&No.Manhattan	:43 am/pm
KSU Union	:46 am/pm
KSU Foundation	:50 am/pm
Dillons West/Ped-Xing	:56 am/pm
EASTBOUND	HOURLY
Dillons West/Ped-Xing	:56 am/pm
Walgreens West	:00 am/pm
KSU Foundation	:02 am/pm
KSU Union	:07 am/pm
Fremont&No.Manhattan	:09 am/pm
Ray's Apple Mkt/Leavenworth	:13 am/pm
Hy-Vee/Walgreens	:14 am/pm
Wal-Mart@Hostetler	:18 am/pm
Big Lakes	:21 am/pm
USD 383/Casement&Allen	:22 am/pm
Walters/Butterfield	:25 am/pm

CANDLEWOOD All Year	
EB/Candlewood/START TIME 6:55 am WkDay	
EB/Candlewood/START TIME 7:55 am SAT	
WB/Candlewood/Gary/END TIME 6:55 pm WkDay	
WB/Candlewood/Gary/END TIME 7:55 pm SAT	
EASTBOUND	HOURLY
Candlewood&Gary	:55 am/pm
Candlewood&Kimball	:56 am/pm
University Crossing	:00 am/pm
Mercy Regional Hosp	:02 am/pm
Founder's Hill	:04 am/pm
Edwards Hall	:07 am/pm
KSU Union	:12 am/pm
Manhattan Public Library	:16 am/pm
Mall@Houston&3rd	:19 am/pm
Discovery Center	:20 am/pm
Dillons Eastside	:25 am/pm
WESTBOUND	HOURLY
Dillons Eastside	:25 am/pm
Discovery Center	:30 am/pm
Mall@Houston&3rd	:31 am/pm
Manhattan Public Library	:34 am/pm
KSU Union	:38 am/pm
Edwards Hall	:42 am/pm
Founder's Hill	*
Mercy Regional Hosp	:48 am/pm
University Crossing	:51 am/pm
Candlewood&Kimball	:53 am/pm
Candlewood&Gary	:55 am/pm

DICKENS K-State In Session	
EB/MATC/START TIME 6:29 am WkDay	
WB/MATC/END TIME 6:29 pm WkDay	
EASTBOUND	HOURLY
MATC	:29 am/pm
Dickens Commons	:32 am/pm
Founder's Hill	:34 am/pm
Riley County WIC Office	:36 am/pm
Edwards Hall	:40 am/pm
Call Hall	:43 am/pm
Derby Dining Center	:45 am/pm
Manhattan Public Library	:51 am/pm
Mall@Houston&3rd	:54 am/pm
Dillons Eastside	:59 am/pm
WESTBOUND	HOURLY
Dillons Eastside	:59 am/pm
Mall@Houston&3rd	:03 am/pm
Manhattan Public Library	:05 am/pm
Derby Dining Center	:11 am/pm
Call Hall	:14 am/pm
Edwards Hall	:16 am/pm
Riley County WIC Office	:21 am/pm
Dickens Commons	:25 am/pm
MATC	:29 am/pm



Flint Hills ATA buses will stop at designated bus stops only if passengers are waiting at the stops. It is recommended that you arrive at the bus stop 10 minutes early to ensure you do not miss the bus. Buses will not come back for you. Times vary due to traffic. Pull the Stop Card one block before you want to de-board.

0215

Appendix G- Image of an ATA bus stop on KSU Campus

