Chapel Hill Transit Rider Survey

Executive summary
In the face of growing concern about climate stability, greenhouse gas (GHG) reduction is a pressing priority for our local community—as well as for the state, nation and world. Building on the work of a previous team that conducted a GHG emissions baseline for Chapel Hill Transit (CHT), this capstone sought to assess community-level benefits resulting from increased transit ridership, understand how transit riders make travel decisions, and develop marketing strategies aimed at increasing ridership and thereby reducing community-level greenhouse gas emissions from single occupancy vehicles (SOV). The results of the project are intended to support Town and University pledges to reduce carbon emissions, with the ultimate goal of climate neutrality.

Chapel Hill Transit is a partnership between the University of North Carolina and the towns of Carrboro and Chapel Hill, serving 25 mi² with a population of over 100,000 people. In 2007, it provided 6.6 million rides, averaging 25,000 per day. Since CHT switched to a fare-free system in 2002, ridership has increased dramatically. Although the number of displaced auto trips is not known precisely, the fare-free system is believed to encourage ridership and help limit emissions from private vehicles. The earlier team found that while CHT has become more fuel efficient over time, the expansion of service has lead to an increase in the total amount of GHG emissions.

This team worked with Chapel Hill Transit and the Town of Chapel Hill to develop and conduct an onboard survey that contributes to a “rider profile” to help the Town understand transit rider preferences and travel choices, and better gauge the benefits of increased ridership within the community. The team developed and piloted a survey instrument, then collected data from nearly 500 transit riders. They performed preliminary analysis on the data, with descriptive statistics and marketing recommendations.

The team characterized the sample by several demographic measures, travel behavior (mode choice, frequency of transit use, trip type), and attitudes and preferences (reasons for choosing transit, desired changes), in addition to stated rider preference for second-choice mode (what mode they would choose if not transit), comparative bus/auto trip length, and recent switch to frequent bus use.

The team’s final products include
- a survey instrument
- Excel workbook with data dictionary, and cleaned data on 480 respondents
- this final report outlining the goals, methods, findings, and recommendations
- a powerpoint file prepared for a public presentation
Chapel Hill Transit Ridership Survey

Environmental Studies Capstone
Spring 2009

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I. INTRODUCTION

In 2005, the Town of Chapel Hill and the University of North Carolina launched the Town of Chapel Hill CRed (Carbon Reduction) Pledge with the intent of reducing carbon emissions in Chapel Hill. The document, introduced by Dr. Douglas Crawford-Brown (former director of the Institute for the Environment) and a spring 2005 undergraduate capstone team, pledges a 60% reduction in carbon emissions (from the base year of 2005) by the year 2050. Since then, the town and university have embraced even more ambitious carbon-reduction goals.

Approximately 24% of the Town’s emissions come from the bus system, second only to 25% contributed by public buildings. Strategies adopted to achieve the carbon reduction goals include fare-free buses and energy efficiency measures in municipal buildings, and bio-fuels in some fleet vehicles. The fare-free system went into effect January of 2002, with Chapel Hill Transit witnessing a near doubling in ridership the first three years. The drastic increase in ridership does not necessarily reduce total emissions related to transit, considering the expanded service required to meet demand. However, from a community-wide perspective on transportation emissions, there may be a net reduction in emissions resulting from fewer auto miles traveled and reduced congestion.

In the fall of 2008, the Chapel Hill Transit Carbon Reduction capstone study conducted a greenhouse gases baseline emissions inventory and quantified carbon emissions per rider, assuming every transit trip was replacing a vehicle trip. However, given other available modes of transportation such as carpooling and cycling, this assumption may not be accurate. The Town is interested in better understanding the trade-offs between increased transit operations, with associated fuel consumption and greenhouse gas emissions, and possible reductions in emissions and fuel consumption from displaced auto trips.

This study aims to develop a ridership profile through a survey of transit users with the intent of assessing reasons for ridership and using them to encourage more trips made by public transit rather than private vehicle. Recognizing and acting on these rider motivations may

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advances the objective of decreasing Chapel Hill’s carbon emissions by increasing bus ridership. This study investigates the reasons behind the choice to ride with Chapel Hill Transit, with the intent of providing improved services that satisfy rider preferences and meet their travel needs. The key objective is to explore why riders select public transit over other modes of transportation, and how such motivating factors vary among riders. Of particular interest is the ‘mode-switching’ demographic comprising individuals who recently switched to using public transportation. Analysis of survey responses from this group may be useful in better developing future marketing strategies to increase ridership. Another goal of the survey is to determine what modes of transportation the rider would use if not riding the bus. The goal here is to get a better idea of how many private vehicle trips Chapel Hill Transit services actually are displacing, and consequently make a more accurate estimate of reduced carbon emissions.

A rider profile may be useful towards understanding who is riding transit, how a rider would travel if not on transit, and (for those who use transit in place of private auto) how long the displaced auto trip is relative to the transit trip. This latter question about qualitative differences (longer/shorter/about the same) in bus and auto trip lengths may be a first step in understanding the true displacement of private auto miles and reductions in emissions. More sophisticated analysis, including geospatial data on origins and destinations, is required for a reliable quantitative estimate of displaced auto trips and reduced greenhouse gas emissions.

Results from this study may be useful to the Town of Chapel Hill in understanding how and why travelers choose to use transit in the Chapel Hill/Carrboro/UNC area, and in developing a marketing campaign to increase ridership.

II. BACKGROUND

Dillman’s text *Mail and Internet Surveys: The Tailored Design Method* served as a guide for developing the survey instrument. The literature indicates that in developing a survey, questions should be written such that every potential responder will interpret them in the same way and be able to answer accurately through response options. Question-writing takes into account many competing concerns, but broadly aligns with the following criteria: a good question requires an answer from each person of whom the question is asked, elicits ready-made responses, keeps recall simple and recent, elicits information that subjects are willing to reveal, employs
motivational features through simplicity and incentives, avoids vagueness in question and answer categories, follows comparable modes of administration for a single survey, and accounts for political and contextual considerations in defining question and answer options.\(^3\)

An on-board rider survey was determined to be the most effective for meeting the above criteria and the study goals, and the design of such a tool was guided by the Transit Cooperative Research Program’s report #63, *On-Board and Intercept Transit Survey Techniques*.\(^4\) On-board surveys include “self-administered surveys distributed on board buses and trains and in stations,”\(^4\) and are employed by transit agencies to obtain opinions and information from a cross-section of riders. They typically provide higher response rates and involve lower costs than phone, mail or on-line surveys, but they are limited to addressing only users and must be complemented by other methodologies when non-user response is of interest.\(^4\) Survey projects of a larger scale (5,000-10,000 surveys) are typically conducted by consultants, while smaller-scale projects are implemented by transit personnel.\(^4\)

Collected data may include “trip characteristics, travel behavior, demographic characteristics, and customer attitudes about service,”\(^4\) providing information about user characteristics, reasons for and frequency of use, customer satisfaction, and the potential for increasing ridership. Results then may be useful for “travel modeling, long-range and area-wide planning, route planning and scheduling, service design, marketing, and customer communications,”\(^4\) which aligns with the objectives of this study, particularly in its aims to better understand riders and develop improved marketing strategies. While those instrument questions relating to demographic information and ridership frequency are typically consistent across agencies, such questions relating to transit use and frequency and customer satisfaction may differ between administrations. Accordingly, this survey instrument adapted applicable questions from previous studies and drafted new ones appropriate to addressing specific objectives.

The TCRP report indicated that half of agencies report response rates for on-board and intercept surveys between 33% and 67%. Rates were influenced by factors including attitudes of survey administrators, rider interest, questionnaire length and complexity, and use of incentives.

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\(^3\)Dillman, Don A. “Writing Questions.” *Mail and Internet Surveys; The Tailored Design Method*. John Wiley and Sons (2000); 32-40.

III. METHODS

Survey Objectives
This study uses descriptive statistics to characterize the sample in terms of work or school status, gender, and access to private vehicles and transit information, as well as travel behavior such as how they access bus stops, and the nature of origins and destinations (e.g., work, home, school, entertainment). This survey collected stated preferences on why riders chose to use public transit, and what might encourage them to ride more often. Of notable interest were those respondents who self-identified as recent mode-switchers (who went from zero or infrequent bus use to regular riding in the last year) and how their responses differed from those who have a longer or more frequent history of riding.

A key question probed how bus riders would travel if not by Chapel Hill Transit for the current trip (emphasis added), and compared the relative distance of transit and auto trips. Interest in this question springs from the conclusion of a fall 2008 environmental capstone team that an average of 6 riders is the break-even point, after which a bus mile is more efficient (in terms of fuel consumption) and preferable (in terms of greenhouse gas emissions) than a private auto mile. That estimate assumed that a traveler’s transit and auto miles are equivalent, which is not necessarily true. The anonymous surveys (no names, addresses, or other personal information collected) provide qualitative information relevant to this question, by asking those who have left private autos behind to ride transit whether their auto trips are shorter, longer, or about the same as the bus trip. Although this self-reported data is strictly qualitative, it may inform future work with a survey of travelers for whom we have objective geo-spatial data for trip origins and destinations. Published literature on fleet composition, fuel consumption, and emissions may provide data that would support a model to estimate how transit and SOV miles are substituted and affect emissions.

In addition to the question of travel mode choice, the survey solicited respondents’ opinions of several aspects of Chapel Hill Transit service. This information was intended to inform a marketing plan intended to increase ridership on Chapel Hill Transit, by exploring what motivates various types of travelers, depending on age or trip purpose (work, school, pleasure, etc.), and inviting suggestions on improved service.
Survey Design and Layout (Appendix A)

A 2003 transit rider survey, conducted by a consultant for the Town of Chapel Hill, collected information from over 5100 Chapel Hill Transit riders with a stated purpose of characterizing travel patterns and preferences in order to plan new and enhance existing services. This current study adapted some of those 2003 survey questions, and added additional items to answer the key questions regarding alternative travel modes (if not on Chapel Hill Transit), as well as qualitative comparison of the trip distance by transit compared to auto. Drawing from the earlier survey gave us a measure of confidence in the validity of these field-tested questions and consistency of language in presenting the findings. However, this study does not attempt to build on the 2003 survey to generate a longitudinal dataset; rather, this is a new, stand-alone cross-sectional survey that provides a snapshot of current riders.

Guided by the literature relating to effective survey design, we developed a clean and concise 1-page survey that fits on a single 8.5 by 11” sheet. Simplicity was another consideration; we elected a simple two-sided (front-and-back) format, rather than the booklet of the 2003 survey, with a larger font and shading of every other question to improve readability and clarity. Arrows and brackets were used to connect related questions. The survey was printed on stiff paper so that it could be filled out without the use of a hard writing surface (See Appendix A).

Sample Size and Distribution

Sample size was determined using the Raosoft Sample Size Calculator. With Chapel Hill Transit’s ridership used as the baseline population, we determined that 380 or more returned surveys would yield a 95% confidence level and a 5% margin of error. We rounded this number up to 400 as our target for returned surveys. Then, assuming that not every distributed survey would be returned, we projected an 80% return, suggesting the need to print and distribute 500 surveys. In reality, over 98% of the surveys were returned, yielding a slightly higher confidence level and lower margin of error than originally sought.

All routes of the Chapel Hill Transit system were surveyed so as to obtain a representative sample of bus riders. Using the Chapel Hill Transit ridership report for April 2008, the target numbers of 500 distributed and 400 returned surveys were divided among the routes, proportional to the April 2008 ridership by route. From this, individual targets for
distributed and returned surveys were determined for each route and rounded as necessary. (Appendix C).

**Survey Implementation**

Since this project involved human subjects, the study was submitted to UNC’s Institutional Review Board and the study was approved in an expedited review. Based on published literature concerning transit surveys and rider behavior, weekdays of administration were limited to Tuesday, Wednesday and Thursday, because ridership patterns are more variable on Mondays and Fridays and data from those days is less likely to be representative of transit use as a whole. The survey period began on Tuesday, March 31, and continued through Wednesday, April 8, to avoid collecting data on April 9.\(^5\) Weekend data was collected on Saturday, April 4 and Sunday, April 5. In all, data was collected on seven different days.

Data also was collected during peak and off-peak hours to increase representativeness. We specified peak hours as 6 to 9 a.m and 3 to 7 p.m., with off-peak hours being all other times in the day. A larger, more extensive survey might have attempted to collect both peak and non-peak data for every route. However, due to the smaller size and scope of this study and its focus on system-wide behavior rather than route-by-route breakdowns, the researchers simply attempted to gather data from some routes during peak hours and from others during off-peak hours. Taken together, then, the data represents a mix of peak and off-peak activity.

Surveys also were administered on both inbound and outbound trips, with inbound trips coming from the periphery of Chapel Hill/Carrboro to the central downtown areas, and outbound trips going from the central areas to the periphery. As with our peak/non-peak hour approximation, the goal was to obtain a mix of data types for the system as a whole, rather than collecting both inbound and outbound data for each route. Survey trips were planned so that approximately half would be inbound and half outbound, and for some routes surveys were obtained from both inbound and outbound data.

A survey schedule was drafted, taking into account the route schedule, and dividing the days into blocks and assigning each block a route and one or two researchers. Route schedules were spaced so that some would be surveyed during peak hours and some during off-peak, and

\(^5\) Friday, April 10 was Good Friday. Since Friday was a holiday, transit behavior on that Thursday could be anticipated to resemble usual Friday transit behavior.
so that some trips would be inbound and some outbound. The goal was to have two researchers on board each bus, but this was not always possible, due to researchers’ other obligations and the need to sometimes survey multiple buses at once. We do not believe that survey administration proceeded much differently with one researcher than with two; having two people simply made the surveying process faster.

Any English-speaking bus rider was a potential subject, with no other exclusionary criteria used. The administration method (detailed below) endeavored to collect a random sample of all transit riders. Since no identifying information was collected, adults and minors alike were targeted for survey.

Survey administrators arrived at a target bus stop shortly before bus arrival, identified by badges with “Chapel Hill Transit Ridership Survey,” Administrators carried blank surveys pre-labeled by route and numbered in order, up to the targeted number of participants; pencils printed with the Town of Chapel Hill logo were provided to fill out the surveys and also as an incentive for survey completion. Administrators, who were last to board the bus so as not to block the path of other riders, systematically asked riders, beginning with the front left rider, if s/he wanted to participate, and progressing in a clockwise manner from front left, to back left, to back right, to front right. If the bus was very full and two researchers were on board, the second researcher would begin at the back of the bus and both researchers would move in a clockwise manner through the bus. This covered the same people but made the process faster. If additional surveys were needed, the researchers sat near the front of the bus and asked every boarding passenger if they would like to participate. Following this pattern on every bus reduced sampling bias introduced by surveyors.

In the planning stage of this project, an introductory speech was prepared to preface survey administration. (Appendix B). However in the implementation stage this longer version was used when the buses were close to empty, but on very full buses the full speech was unnecessarily cumbersome. The abridged introduction used on more crowded buses was, “Hi, would you like to take a survey for Chapel Hill Transit and the Institute for the Environment?”

Subjects who agreed to take the survey were presented with a blank copy of the survey and with a Town of Chapel Hill pencil. They were instructed to return the survey to the surveyor on the bus, and encouraged to keep the pencil. The team considered using dollar bills as incentives to increase the response rate, but safety concerns as well as a limited budget dictated
the choice of pens as a safer and cheaper incentive. Chapel Hill Transit could not obtain pens, but provided pencils, which were distributed along with the surveys. This was both a practical measure, intended to provide subjects with a means to fill out the survey, and an incentivizing measure. Practically, the pencils were a good idea. Many riders likely did not have a writing implement with them. However, we believe that they failed as an incentive, because most people returned the pencils along with the surveys rather than choosing to keep them. In general, it took between five and ten minutes for the participants to complete the surveys.

**Data Entry**

Survey results were compiled into an Excel spreadsheet. Answers to categorical questions were entered as codes for categories. The translation of these code numbers can be found in the “Data Dictionary” sheet of the compiled Excel workbook. Yes/no answers were assigned binary codes (usually 1/0), as was the question referring to sex (female=1). Incomplete responses were noted; as were questions that elicited an appropriate skip (“not applicable”).

After data entry, several levels of quality control were employed. First, groups of surveys were exchanged and each row of data was compared to the corresponding survey by a different member of the team. Second, each column of the compiled spreadsheet was sorted and examined to ensure that there were no values too high or too low for the allowed response (for example, a “2” in a 0/1 binary response question).

To clean the data, some changes were made where appropriate. For question 1, responses of “I don’t know” and “TTA” or “P2P” were coded as “Other.” Surveys that had marked car trip length as both “longer” and “shorter” in question 1a were changed to “I don’t know.” For both questions 3a and 6a, referring to minutes-walked answers of “0” and “less than one minute” were rounded up to one minute. Responses with fractions of minutes were also rounded up to the nearest whole number. Where responses gave a range of minutes, the median of the range was taken. Responses from students who wrote in “dorm” for origin or destination were changed to “home.” For those who answered question 6 with multiple modes, answers were considered and then changed where appropriate; for example, an answer of “walk” and “transfer to another bus” were changed to simply “transfer to another bus”. Question 9 offered several categories for why people choose to ride the bus and a blank space for other reasons. Where these write-in answers clearly fit into a designated category, the appropriate category was marked. Question 10, which
allowed only for “male” and “female” gender choices, was often left blank or received write-in comments. Future surveys should consider including another category.

For several questions left blank, assumptions were made where reasonable. With regard to student status, grad students were considered full-time students. For questions 4 and 5, several respondents marked both “work” and “UNC-CH” under the same question, so answers were changed to simply “work.” This is due to a survey design issue, so it should be remembered that data may be slightly skewed on these questions where respondents who work at UNC-CH checked only “UNC-CH.” Where question 12 was left blank, it was assumed that the respondent was a UNC student if they marked that they work or go to school on the UNC-CH campus and also reported being unemployed in question 11. It was assumed that these respondents were full-time students because the majority of student respondents were full-time students. Although this report does not compare these two populations in detail, this assumption may not be completely accurate; this should be noted when looking at data. Another assumption was made for questions 14 and 15. In cases where 14 or 15 were marked “no” and the corresponding break-out question was left blank, it was assumed that the answer also would be “no.” For example, if someone reported being unaware of the text-messaging service, it was assumed that they do not use it.

Survey questions often limited the number of answers allowed, but respondents sometimes marked too many responses for certain questions. Rather than throw out interesting data, we decided to keep these extra responses and create extra columns in the spreadsheet for them. Although Question 9 (main reason for riding the bus) called for one response, we logged up to three. Question 18, regarding possible improvements to the transit system and asking for top three choices, was handled differently. Each option was given its own column, with a binary yes/no answer to allow for many responses. After consulting with statistics experts, we decided not to weight these answers any differently, because the importance of each answer is not known. This means that the respondent’s relative preference for various response options could not be inferred, and perhaps suggests the need for clearer instructions.
IV. LIMITATIONS

A small number of people declined to complete the survey, despite expressing interest in taking it, because they expected to be leaving the bus too soon to complete it. Others accepted the survey, but were unable to answer every question because of time constraints. Several surveys were received with the last few questions left blank. This represents a threat to validity, since people riding the bus for only a short time may have different travel patterns; for instance, they may have been less likely to make their short trip by car.

This problem was considered in the planning stages of this project, and we discussed providing pre-paid envelopes so that people could complete them at home and mail them back. This proposal was rejected for budgetary reasons, but future, better-funded surveys should consider providing a mail-in option.

Because of time and budgetary concerns, the survey instrument was printed and administered in English only. This limited the demographic of respondents to English-speakers. However, while this study was limited to an English version, Spanish speakers comprise a substantial share of riders on Chapel Hill Transit. We recommend that future studies take this fact into account and endeavor to provide Spanish-language surveys.

The original response rate estimate was 80%, prompting us to distribute 125% of the surveys needed. However, the response rate was 100% on some routes, with every survey returned. For other routes, the goal of an 80% response rate was barely satisfied. For this reason, the responses are not proportionately distributed across all routes, with routes that achieved a higher response rate overrepresented in the data. However, the decision to survey all routes was intended to provide the broadest possible cross-section of the population of transit users, and not to illustrate differences between routes. Because of this, the slight overrepresentation of some routes does not constitute a major problem.

While it would have been preferable to count the number of riders who refused to answer the survey for every route, and compare those numbers to the number who accepted the survey, this proved difficult on very crowded buses and was not consistently collected for analysis.

This study was interested particularly in the behavior of mode-switchers. One survey question asked whether the subject had in the last twelve months switched from riding never or infrequently to riding frequently. However, people who had switched modes the other way, from riding to not riding, could not be captured with the instrument, because they would not have been
on buses where surveys were distributed. Data from those individuals might be useful for attracting new riders and recovering lost riders, since the motivation for switching away from riding on Chapel Hill Transit could be examined and possibly addressed. A different sampling frame and survey instrument would be required to address such travelers.

Limitations of Specific Questions

**Question 1:** Forty-eight people gave multiple responses to Question 1, which asked how people would make their trip if not riding Chapel Hill Transit. The survey sought a single answer to Question 1, although the survey failed to state this explicitly. Rather than disregard these multiple answers, we flagged the respondents who gave multiple answers for Question 1, logged the responses, and set them aside for later analysis.

**Question 2:** Some people indicated that they did not have a car available for their trip in Question 2, but indicated in Question 4 or Question 5 that they were coming from or going to a Park-and-Ride lot. This would seem to imply that these people did have cars available to them for their trip, which they left at the Park-and-Ride lots. It is possible that they were dropped off at the lots or walked to them, but this was probably not the case for all of these people. We suspect that some respondents misinterpreted the phrase ‘available to you for making this trip.’

**Questions 4 and 5:** Thirty-seven people selected the ‘home’ option for both Question 4 and Question 5, indicating that they were travelling from home to home. It is unlikely that 37 people not only have multiple homes in Chapel Hill, but were travelling between them at the time they were surveyed. These people may have thought the survey was asking about round trips, rather than individual trips.

**Question 12:** Fifty-three people, more than for most other questions, failed to answer Question 12, which asked about student status. It is possible that these people were not students, and failed to notice the ‘not a student’ option, which was the last option on the list. However, it cannot be assumed that everyone who failed to answer Question 12 is not a student.

**Questions 15 and 16:** Forty people indicated in Question 15 that they used the Next Bus text-message service, but then failed to mark the ‘text message service’ choice in Question 16, which asked where they received bus service information. This discrepancy seems to indicate confusion on the part of those people. It is possible that they read ‘Next Bus text messaging service’ and interpreted it as referring to Next Bus in general. Next Bus has a web site and on-street vehicle
arrival boards in addition to its texting service; the people who gave conflicting answers to these questions may have been attempting to indicate that they use the Next Bus system.

V. RESULTS

Demographics

Most Chapel Hill Transit riders live in Chapel Hill and Carrboro, but a substantial portion of riders come in from other areas. Of those who provided a response to the question about city of residence, fifty percent live in Chapel Hill, 23% reside in Carrboro, 11% live in Durham, and 5% are Raleigh residents. Nine percent of riders come from surrounding areas; the full list of residences can be found in Figure 1.

<table>
<thead>
<tr>
<th>Residence</th>
<th>#</th>
<th>%</th>
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<tbody>
<tr>
<td>Chapel Hill</td>
<td>232</td>
<td>47</td>
</tr>
<tr>
<td>Carrboro</td>
<td>104</td>
<td>21</td>
</tr>
<tr>
<td>Durham</td>
<td>52</td>
<td>11</td>
</tr>
<tr>
<td>Raleigh</td>
<td>24</td>
<td>5</td>
</tr>
<tr>
<td>Cary</td>
<td>11</td>
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</tr>
<tr>
<td>Pittsboro</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td>Other</td>
<td>31</td>
<td>6</td>
</tr>
<tr>
<td>No Response</td>
<td>30</td>
<td>6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>491</td>
<td>10</td>
</tr>
</tbody>
</table>

Figure 1: Residency of transit riders (Question 17)

Fifty-eight percent of the respondents are female, 32% are male, and 9% did not answer Question 10 (Figure 2). The majority of sampled Chapel Hill transit riders are workers and students (which are overlapping categories).

Respondents were:

<table>
<thead>
<tr>
<th>Respondents were:</th>
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<tbody>
<tr>
<td>58% female</td>
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<tr>
<td>68% employed</td>
</tr>
<tr>
<td>65% students</td>
</tr>
<tr>
<td>83% affiliated w/UNC-CH</td>
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<tr>
<td>58% have access to a car</td>
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Figure 2: Profile of rider sample

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6 Areas with fewer than 5 residents were combined into the "Other" category; they include High Point, Graham, Apex, Burlington, Hillborough, Liberty, Morrisville, Cameron, Creedmor, Eli Whitney, Fearrington Village, Holly Springs, Knightdale, Lillington, Rural Orange County, Siler City, Timberlake, and Wendell.
Figure 3 illustrates the breakdown of respondents by work and student status. The most common response was employed full-time (36% of those who responded to Question 11), while 32% are employed part-time, 30% are unemployed, and 2% are either homemakers or retired. Meanwhile, full-time college students dominate the sample at 52% (or 59% of those who responded to this question). Adding in part-time students pushes this share to 55% (or 62% of those who answered). The vast majority of self-identified students attend UNC-CH (259 riders, or 93%), while 20 student riders reported affiliations with other schools. Thirty-one percent of riders were not students (34% of those who answered); 53 respondents failed to answer Question 12. It is likely that non-student respondents skipped over the student status question entirely, but no inferences can be made as to how many of the non-respondents were in fact non-students.

![Bar chart showing employment status](chart1)

![Bar chart showing student status](chart2)

**Figure 3: Employment and student status of riders (Questions 11 and 12)**

Service to UNC-CH is especially important for those affiliated with the university. Of those who responded to Question 13 (UNC-CH affiliation), 83% of riders either work or attend school (or both) on the UNC-CH campus. Because many of the residents of Chapel Hill and
Carrboro attend UNC-CH, where parking is scarce and expensive, it is not surprising that the majority of transit riders were found to be UNC-CH students.

**Behavior**

Most passengers surveyed were frequent riders, with 39% of respondents to Question 7 riding 4 to 5 days per week and 35% riding 5 or more days per week (Figure 4). Twelve respondents reported that it was their first time using Chapel Hill Transit, and several reported being visitors to Chapel Hill.

![Figure 4: Reported rider frequency (Question 7)](image)

Of the 466 subjects that responded to Question 8, 144 reported to have changed from using transit never or infrequently to riding frequently in the past 12 months. This group, which we refer to as ‘mode-switchers,’ is of particular interest to this report because of the opportunity their answers give for analyzing the characteristics and motivations of new riders, and finding ways to encourage higher ridership. This group will be examined further in the *Points of Interest* section.

Riders in our sample used Chapel Hill Transit mainly for home-based travel rather than trips between destinations during the day. Home-based work commuters make up 20%, and
home-based UNC commuters make up 35% of those sampled (Figure 5). Such riders may be more likely to ride frequently to and from work or school, because they may have a fixed daily schedule and route that allow them to easily plan their transit trips. Twenty-four percent of riders were making trips categorized as home-based other, trips that may involve activities such as eating a meal or shopping, and may also be relatively easy to plan from a familiar trip end (at the home). The last category, non-home-based, accounted for 21% of trips, and is of interest because these riders are using transit to get between destinations during their day.

Figure 5: Types of trips: origin and destination pairs (Questions 4 and 5 combined)

The low occurrence of these riders could suggest that planning trips on unfamiliar routes is difficult, or that midday destinations are not easily accessed by transit, or that walking among destinations in Chapel Hill (a common work-related trip end) is fairly convenient, among other possible reasons. It may be difficult to access bus stop information for non-home-based travel, especially considering that 356 riders report accessing service information online. A total of 75 riders requested “More available route information” in question 18 (suggested improvements), and 8 riders wrote in the comments section that they would like pamphlets with information for all routes included. More available route information or the use of a single booklet could help riders use transit for spontaneous and non-routine travel.
**Points of interest**

For Question 1, “If you were not riding Chapel Hill Transit, how would you make this trip?” “Car or Truck” was the most common response (among those who gave only one response, as requested). Forty-three percent of respondents to this “other mode” question indicated they would make the trip by personal motor vehicle were it not for the bus, and another nearly 4% by carpool; 33% said they would walk and 10% said they would ride a bike (Figure 6). The high number who responded that they would drive alone or (many fewer) carpool suggests that Chapel Hill Transit replaces a substantial number of motor vehicle trips, although nearly half would be by non-motorized modes.

![How would you make this trip?](image)

*if you were not riding Chapel Hill Transit

Figure 6: Respondent’s alternative mode of transportation if not on Chapel Hill Transit (Question 1)

Of those who replied that they would drive if not on the bus, the most common reply to the question of how the bus and drive trip distances compare was “about the same” (Figure 7), although both “longer than” and “shorter than” claimed substantial and similar shares.
Figure 7: Comparison of trip distances on bus and in a car when a car was stated second-choice mode (Questions 1 and 1a)

Figure 8 shows the results for Question 9, “What is the most important reason you ride Chapel Hill Transit?” The dominant reasons cited for riding transit were lack of convenient parking (30%) and convenience (29%) of the bus, followed by “bus is economical” (12%).

Figure 8: Reported reasons for riding transit (Question 9)
This question is interesting to consider in relation specifically to riders whose 2nd-choice mode is car/truck (Figure 9). It is especially important from an emissions standpoint to increase transit use by otherwise car/truck drivers, and less desirable to increase ridership from walkers and bikers; carpoolers are a gray area. Encouraging those who walk/bike to instead use the bus could have a counter effect as it raises demands on bus services and could lead to increases in emissions, even while reducing healthful physical activity among citizens. Figure 9 compares those riders who otherwise would use their cars (single-occupancy) against those who would not, and their most important reasons for riding Chapel Hill Transit. Recall (Figure 6) that of those who responded to the question of how they would travel if not on the bus, 43% said they would drive, 47% would carpool, walk or bike, and 8% said they would not make the trip at all.

![Figure 9: Cited reasons for using transit compared with use of single-occupancy vehicle as 2nd-choice mode (Questions 1 and 9), percent of respondents](image-url)
Among those who otherwise would not drive, twice as many indicated “Bus is convenient” as their major reason for taking transit compared to those whose second choice would be driving a single-occupancy vehicle. Not surprisingly, “No car in household” and “I don’t drive” also were far more frequently cited by those would not otherwise drive than by those who would. For the otherwise car/truck drivers, their single most common reason for riding the bus was “No convenient parking,” followed by “Bus is convenient” and “Bus is economical.” These results suggest that transit use by those who would not otherwise drive are motivated by convenience and lack of auto access and may care less about time of day, whereas car/truck drivers’ responses indicate they are sensitive to parking, convenience and cost, such that daytime travel to campus is time when the bus looks particularly appealing.

Vehicle availability also presents interesting results when combined with Questions 4 and 5 (trip type). Figure 10 shows the difference in origin and destination type between those riders with vehicle access and those without. Among riders with vehicle access, more were making “home-based work” and “home-based UNC” trips than riders without vehicle access. On the other hand, those without vehicle access were making more “home-based other” and “non-home-based” trips than those with vehicle access. These results imply that people without vehicle access use the bus for errands and non-UNC related trips. Riders whose other mode is car/truck most often use transit for UNC/work related commutes. This may be relevant for marketing, as the town strives to encourage transit ridership in place of personal vehicle trips.

![Transit Trip Type by Vehicle Availability](image)

Figure 10: Trip types (origin/destination pairs) by auto availability (Questions 2, 4 and 5)
One of the survey goals was to determine the mode switcher’s main motivations for riding transit (Question 9). The data revealed only minor differences between mode switchers and those who have been frequent riders for over a year. Mode switchers and non-mode switchers alike claimed “bus is convenient” and “no convenient parking” as their most important reason for riding Chapel Hill Transit (Figure 11).

![Figure 11: Reasons for using transit compared between Mode-Switchers and Non-Mode Switchers (Questions 8 and 9)](image)

We compared mode-switchers and non-mode switchers in terms of vehicle availability, and again found only minor differences, with 58% of both switchers and non-switchers having access to a vehicle. This suggests that marketing need not attempt to distinguish between these groups.

Respondents were asked to check up to three items that would encourage them to ride more frequently. The most common replies related to quantitative measures of service volume: more frequent service, more weekend/evening service, and more bus routes (Figure 12).
Figure 13 shows the same question (“Which of the following would make you ride the bus more often?”), broken out by ridership frequency. This is interesting as it shows what incentives would encourage riders who use transit once per week or less to ride more often. There is little variation between the groups, although a slightly higher response for “more stops” and “more areas served” by infrequent riders is worth noting. Frequent riders cited “better on-time performance” and “more evening and weekend service” as reasons for riding more. “Better on-time performance” could be due to the fact that low-frequency riders cannot actively judge the on-time performance of Chapel Hill Transit. Overall, riders cited “more frequent service,” “more evening and weekend service,” and “more bus routes” at 252, 216, 152 responses respectively, as the most important motivation for increasing ridership.

We also compared responses to the question of improvements that would increase riding between males and females (Figure 14). Here too the differences were minimal.
Figure 13: Responses to “Which of the following would make you ride the bus more often?” by frequency of riding (Questions 7 and 18)

Figure 14: Responses as in Figure 13 by gender (Questions 10 and 18)
**Marketing**

With regards to the goals of this study, the purpose of marketing Chapel Hill Transit is to promote the use of the transit system as an alternative to driving. If more people choose to leave their cars at home and use the bus instead, the town of Chapel Hill will be brought closer to its goal of reducing carbon community-wide, even if Chapel Hill Transit emissions might increase with intensified service.

The data has been analyzed only briefly with regards to marketing; a robust and thorough marketing plan could be produced using this data, following more extensive analysis. However, the analysis to date allows a general discussion of the most important questions for marketing. In analyzing the data for marketing purposes, three general themes emerge:

First, Chapel Hill Transit should emphasize those services that people frequently mentioned in positive terms. This will both reinforce positive brand image in people who already like and use Chapel Hill Transit, and inform potential riders of features that they might value. Secondly, in areas where many people reported dissatisfaction, Chapel Hill Transit should either downplay that feature in advertisements, or address the deficiencies and promote the changes through advertising. Negative impressions could be countered by correcting misconceptions, or by emphasizing positive things about the transit system. Making broadly desired changes and promoting them would improve brand image and potentially increase the number of riders. Finally, where many people are unaware of available services or features, those options should be communicated through advertising.

**Rider Preferences**

The most pertinent questions in terms of assessing rider preferences and concerns are Question 9 (What is the most important reason you ride Chapel Hill Transit?); Question 18 (Which of the following would make you ride the bus more often?); and Question 19 (Do you have any comments you’d like to share with Chapel Hill Transit?).

For Question 9, the majority of people, 58%, chose either ‘bus is convenient’ or ‘no convenient parking’ as their answer (See Figure 11). ‘Bus is economical’ was a distant third choice, followed by ‘no car in household’ and ‘I don’t drive.’ This heavy emphasis on convenience should be a cornerstone of any future marketing initiatives. The convenience of the bus, as well as the inconvenience and cost of driving and parking, should be highlighted.
For Question 18, the answers reveal which potential changes would be most popular with riders (Figure 12). If a larger budget became available to make changes to transit service, the answers to Question 18 could be considered when deciding which changes would be most likely to attract new riders. For instance, requests for more frequent bus service were made by 52% of respondents, and requests for more evening and weekend service were made by 44% of respondents. These were by far the most common answers.

For Question 19, comments were grouped into categories for analysis (Figure 15). Question 19 is vital for understanding rider preferences; because it contains unprompted opinions, we can infer that riders care strongly about these statements.

It is encouraging that the most common type of comment was a compliment about the transit service. This shows a high positive brand image among riders.

Requests for more frequent or more extensive service, often mentioning a specific route, were also common, as were requests for more evening and weekend service. Because of the high costs associated with making these changes, such features need not be prominent in marketing—unless the town adds routes or extends services. In that case an extensive marketing campaign advertising that fact would be beneficial.

![Figure 15: Written comments grouped into similar categories (Question 19)](image-url)
Eight people specifically requested that the full schedule pamphlets be brought back, replacing the current system of individual route pamphlets. This is one area where a relatively simple adjustment in Chapel Hill Transit’s business plan could make a big difference in ridership, especially given that approximately 15% of people noted in Question 18 that they would ride more if route information was more available. If this change was implemented and promoted, it might lead people to ride more frequently than they currently do.

A general observation about Question 19 is that people sometimes find it useful, or just cathartic, to comment on their transit experiences. A comment form on the Chapel Hill Transit website could be a useful tool for both riders and Chapel Hill Transit.

Other, more specific questions could inform a marketing plan. For example, Question 1 asked how riders would make their trip if not using Chapel Hill Transit (Figure 6). Since the target market segment for this study is people with access to cars, careful attention should be paid to the preferences and concerns of car users, where they differ from non-car users. To identify these differences, comparisons could be made between Question 2, which asks if a motor vehicle available for making their trip, and the aforementioned Questions 9 (main reason for riding transit), 18 (suggested improvements) and 19 (written comments).

For example, cross-tabulating Questions 1 (2nd-choice mode) and 9 (main reason for transit use) shows that half of those who otherwise would drive use Chapel Hill Transit because there is no convenient parking (See Figure 9). This suggests that, in targeting non-riders who use cars, the inconvenience of parking could be presented as a major selling point. Drivers could be reminded of the hassle of parking before hearing a compelling message about the more convenient option of riding the bus.

Questions 4 and 5 asked where transit users were coming from and going to during their bus trips. These questions were combined and the responses were sorted into four categories of origin/destination pairs: home-based work, home-based UNC, home-based other, and non-home-based (See Figure 5). This shows what types of trip transit is being used for most. We found that almost 79% of trips were home-based, that is, they began or ended at the rider’s home. Only 21% of trips were between two non-home destinations. In light of this, one potentially rich marketing area could be encouraging people to use transit for non-home-based trips. Making route information more available at stops is one potential way to do this. The prevalence of UNC-
based trips is also notable. Since UNC is smaller than Chapel Hill as a whole, yet 35% of trips begin or end there, marketing on the UNC campus could be very fruitful.

Question 8 asked whether transit users “had changed from riding never or infrequently to riding frequently in the past 12 months.” The 30% of people who had switched to riding more frequently, whom we designated as ‘mode switchers,’ are an important population to consider. The goal of the marketing plan is to convince more people to do what the mode switchers have already done, so their opinions and concerns about Chapel Hill Transit should be examined carefully. Areas where they differ from non-mode switchers could become key aspects of a marketing plan.

Question 14 asked whether transit users were aware of and used UNC’s Commuter Alternative Program (CAP), which rewards students, staff and faculty who forego a parking permit with certain privileges (Figure 16, left). Most people were unaware of CAP; of those who were aware of it, the majority did not use it. Although superficially discouraging, this finding, when taken together with the 80% of respondents with a UNC-CH affiliation, suggests a large untapped market of potential CAP users riding Chapel Hill Transit, whose transit habits may be reinforced with CAP participation.

![Figure 16: Awareness and use of Commuter Alternative Program (Question 14) on left, and of NextBus text-messaging service (Question 15) on right](image-url)
Question 15 asked whether transit users were aware of, and used, the Next Bus text messaging service (Figure 16, right). Answers to this question followed a similar pattern to the answers for Question 14. More people were unaware of the service than were aware of it, and an even larger majority of those who were aware of it did not use it. It is important to note that this service is not yet available to the entire population served by Chapel Hill Transit. Once it is fully launched, it would benefit from the same suggestions as for CAP: increase awareness of the service for current and potential transit users. In the case of this particular service, which can be difficult to use correctly, education is key to convincing people to use the service. Since a different code is required for every bus stop, one possible solution could be to post the exact message that must be sent to the service on bus stop signs. This would make using the service easier and more people would be likely to use it.

Question 16 asked ‘Where do you receive bus service information?’ (Figure 17). This information is useful from a marketing perspective because it shows which media channels already are consulted by transit users. A marketing plan could take that into account, focusing on the most widely-used media. The ‘online’ choice was by far the most common, used by almost 73% of respondents. This is good news from a marketing perspective. Since Chapel Hill owns the Chapel Hill Transit website, the town could place ads on the site for free and reach three-quarters of its ridership.

![Figure 17: Where rider receives bus service information (Question 16)](image-url)
The second most popular source of information, ‘at the bus stop,’ was used by almost 49% of people. This is a potential source of inexpensive improvement. Stops with posted route information are more liable to be used for spontaneous trips, with resulting increases in ridership.

**Rider Characteristics**

Demographic data also should be carefully examined for differences of opinion between various demographics. A multi-faceted marketing initiative might target males versus females, students versus non-students, frequent versus infrequent riders, and so on, with messages directed to the unique concerns of those demographics. Cross-tabulating responses to travel behavior questions with traveler characteristics may provide insights into potentially fruitful marketing efforts.

**VI. CONCLUSIONS**

The key objective of this study was to determine why riders select public transit over other modes of transportation, and how such motivating factors vary among riders of public transportation so that better marketing strategies can be developed to increase ridership. Another survey goal was to determine what modes of transportation the rider would use if not riding the bus, intended to get a better idea of how many vehicle trips Chapel Hill Transit services actually are displacing, and consequently make a more accurate estimate of reduced carbon emissions. Results indicate that only 43% of bus riders replaced a single-occupancy vehicle (SOV) trip with the bus trip, with another 4% replacing a carpool trip (which does not represent a one-to-one replacement of vehicle miles with bus-rider miles). Further quantitative analysis is necessary to estimate the emissions Chapel Hill Transit is replacing or adding. It would be beneficial to determine the minimum number of riders necessary per bus mile to make Chapel Hill Transit more fuel-efficient or lower-emissions than individual vehicle trips. To that end, it would be useful to collect additional data from other seasons, to better understand differences between seasonal and year-round riders. The survey was administered in spring; the generally pleasant weather in April might either deter or promote transit ridership, depending in part on the travel conditions for the mode otherwise used for these trips.
The fall 2008 calculations assumed that personal vehicle trip distance would be the same as a bus trip. The most common response of riders with vehicle availability was that their trip by car/truck was the same distance as the bus trip (42%). However, the survey found that 24% of people said their bus trip was shorter than their car trip, and 30% stated their bus trip was longer. There is enough variation in trip distance that the use of quantitative analysis and GIS tools to quantify differences may be warranted.

The fall 2008 report determined transit emissions to be fuel-efficient (with attendant benefits of reduced emissions) if each bus mile replaces 6 personal-vehicle miles. Based on overall ridership numbers, the report assumed this was true. The current survey results found that only 43% of riders actually replaced SOV trips, a surprisingly low share that indicates the 6-rider number needs deeper testing. A quantitative analysis of origin-destination vehicle trip length versus bus trip length, combined with an accurate calculation of otherwise car/truck drivers per mile, would be a major step in determining the effectiveness of Chapel Hill Transit in carbon reduction, and will help the Town reach its emissions reduction goal outlined.

This survey focused on bus riders, their characteristics, and preferences, including their stated 2\textsuperscript{nd}-choice mode and the relative lengths of bus and auto trips for the origin and destination in question. When considered in light of community-wide carbon reduction and environmental goals, this research may usefully be extended in the future to more accurately assess the savings in fuel consumption and reduced carbon emissions tied to such trip substitution (that is, from private autos to bus).

**Future Research**

This data may inform future, more quantitative efforts to understand the travel that bus trips are replacing. Some of this travel is pedestrian or bike trips, which is not necessarily a preferred source of increased ridership, given public health goals of active travel as part of a healthy routine. Future efforts might seek a more precise estimate of these comparative trip lengths using origin/destination and route data and employing GIS tools. Such research could draw on published literature about fleet composition and average trip-making to better understand riders and their travel behavior and more accurately estimate emissions per auto trip. Rather than determining emissions directly (asking the make, model, fuel efficiency and emissions of the autos left at home), such a study might use aggregate fuel consumption data and emissions...
factors, to sketch out a model estimating how transit miles relate to foregone auto trips. Such data may be useful for modifying the estimate of net change in carbon emissions effected by mode switching from private vehicle to public transit. Results from such an effort would offer a useful dataset that could be utilized in the future for more detailed analysis.

Our results may contribute to development of a comprehensive marketing strategy to increase ridership and support service improvements in accordance with rider suggestions. A future survey could be made more inclusive by offering a Spanish version of the instrument to yield a more representative sample of the population and to compare usage patterns between the two language groups. Analysis of survey findings by route may be useful towards marketing strategies and future route planning.

Acknowledgments
The capstone team would like to thank Elizabeth Shay for her guidance and support throughout the planning, implementation and analysis stages of this project, and John Richardson and Mike Callahan for their collaboration on behalf of the Town of Chapel Hill and Chapel Hill Transit. We also would like to thank Dr. Cathy Zimmer of the Odum Institute for her assistance during the data analysis stage of this project.
APPENDIX A - Survey Design

We are interested in your Chapel Hill Transit experience.

This brief survey was designed by a UNC-Chapel Hill student team as a capstone project with the Institute for the Environment, in cooperation with Chapel Hill Transit. Your responses will help us understand the motivating factors behind bus use, and to determine how transit service can be improved and marketed effectively.

These surveys are anonymous and do not ask for personal identifying information.

There is no personal benefit or harm to you.

Please return completed surveys to the researchers on board your bus.

For more information, contact transitsurvey@unc.edu

1. If you were not riding Chapel Hill Transit, how would you make this trip?
   - Car or Truck
   - Motorcycle or Scooter
   - Bike
   - Walk
   - Other

   If you chose "car or truck," the distance of your trip on the bus is:
   - Shorter than my drive
   - Same as my drive
   - Longer than my drive
   - I don't know

2. Was a motor vehicle available to you for making this trip?
   - Yes
   - No

3. How did you get to this bus?
   - Walked ___ minutes
   - Drove and parked
   - Some other way (specify)

4. Where did you COME FROM before getting on this bus? (Check only one)
   - Home
   - Work
   - Shopping
   - Eating a meal
   - Other school
   - UNC-CH
   - Personal business
   - Other

5. Where are you GOING TO after you get off this bus? (Check only one)
   - Home
   - Work
   - Shopping
   - Eating a meal
   - Other school
   - UNC-CH
   - Personal business
   - Other

6. How will you GET TO where you are going after leaving this bus?
   - Walk ___ minutes
   - Drive
   - Some other way (specify)
   - Get picked up
   - Transfer to another bus

7. HOW MANY DAYS A WEEK do you usually ride the bus? (Check only one)
   - Less than 1 day per week
   - 1 day per week
   - 2-3 days per week
   - 4-5 days per week
   - 5 or more days per week
   - This is my first time
8. In the past 12 months, have you changed from riding never/infrequently to frequently?  
☐ Yes ☐ No

9. What is the MOST IMPORTANT REASON you ride Chapel Hill Transit (CHT)? (check only one)  
☐ No car in household ☐ Avoid traffic congestion  
☐ I don't drive ☐ Bus is convenient  
☐ Bus is economical ☐ No convenient parking  
☐ Someone else uses the car ☐ Other (specify) ____________________________

10. Are you:  
☐ Female ☐ Male

11. What is your EMPLOYMENT STATUS?  
☐ Employed full-time (35 hours or more) ☐ Retired/Homemaker  
☐ Employed part-time ☐ Unemployed

12. What is your STUDENT STATUS?  
☐ Middle / Jr. High School student ☐ High School student  
☐ Full-time college student ☐ Part-time college student  
☐ Not a student  
What is the name of the school you attend?  
☐ UNC-CH ☐ Other (write in school name) ____________________________

13. Do you work or go to school on the UNC-CH campus?  
☐ Yes ☐ No

14. Have you heard of the UNC Commuter Assistance Program (CAP)?  
☐ Yes ☐ No  
Do you use the UNC Commuter Assistance Program (CAP)?  
☐ Yes ☐ No

15. Have you heard of the Next Bus text messaging service?  
☐ Yes ☐ No  
Do you use the Next Bus text-messaging service?  
☐ Yes ☐ No

16. Where do you receive bus service information? (check all that apply)  
☐ On the bus ☐ Online  
☐ Telephone ☐ At bus stop  
☐ Work ☐ Text message service

17. In which city/town do you LIVE? (Write in city/town)

18. Which of the following would make you ride the bus more often? (check top three choices)  
☐ More bus routes ☐ More available route information ☐ Safer on-board environment  
☐ More stops ☐ Better on-time performance ☐ Safer environment at stops and shelters  
☐ More areas served ☐ More evening and weekend service ☐ Safer pedestrian access to/from stops  
☐ More frequent bus service ☐ More shelters/benches at stops  
☐ Other ____________________________

19. Do you have any comments you’d like to share with Chapel Hill Transit?
APPENDIX B - Script

Script for soliciting participation in Chapel Hill Transit survey

"Good [morning] [afternoon] [evening]. My name is ________, and I'm here with my team-mate ______________. We're part of a UNC environmental capstone team surveying Chapel Hill Transit riders. The results of this study will help Chapel Hill Transit understand why people choose to ride the bus, and how service can be improved and marketed.

Would you be willing to answer some questions about your experience using Chapel Hill Transit? The single-page survey is anonymous, and you can complete it in just a few minutes while on-board the bus."

If the answer is "no":

"Thank you"

If the answer is "yes":

"Thank you. Here is the survey, which you can see is printed on the front and back. This pencil, provided by Chapel Hill Transit, is yours to keep.

Do you have any questions?

We appreciate your time and interest. Thanks for helping make our project a success."
APPENDIX C – Survey Distribution by Route

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<td><strong>390.00</strong></td>
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**WEEKEND ROUTES**

<table>
<thead>
<tr>
<th>ROUTE</th>
<th>RIDERSHIP #</th>
<th>PRIOR YEAR RIDERSHIP #</th>
<th>share total trips</th>
<th>target # survey</th>
<th>rounded target #</th>
<th>over-sample</th>
<th># returned</th>
<th>share of returned weekend sample</th>
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<tbody>
<tr>
<td>CM/CW</td>
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<td>0.8</td>
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<td>2</td>
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<td>4</td>
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</tr>
<tr>
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<td>964</td>
<td>837</td>
<td>0.002</td>
<td>0.8</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>0.087</td>
</tr>
<tr>
<td>JN</td>
<td>992</td>
<td>823</td>
<td>0.002</td>
<td>0.8</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>0.087</td>
</tr>
<tr>
<td>T</td>
<td>1,120</td>
<td>817</td>
<td>0.002</td>
<td>1.2</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>0.130</td>
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<tr>
<td>U sat/sun</td>
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<td>0.008</td>
<td>3.2</td>
<td>3</td>
<td>6</td>
<td>6</td>
<td>0.261</td>
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<tr>
<td>NU sat/sun</td>
<td>3,856</td>
<td>0.006</td>
<td>2.4</td>
<td>2</td>
<td>4</td>
<td>4</td>
<td>0.174</td>
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</tr>
<tr>
<td><strong>total</strong></td>
<td><strong>14,496</strong></td>
<td><strong>4,322</strong></td>
<td><strong>0.024</strong></td>
<td><strong>10</strong></td>
<td><strong>10</strong></td>
<td><strong>20</strong></td>
<td><strong>23</strong></td>
<td><strong>1.000</strong></td>
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## APPENDIX D

### Selected Rider Comments

<table>
<thead>
<tr>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>I think it's a great service to the community and a real asset for the citizenry.</td>
</tr>
<tr>
<td>I wouldn't be able to get some places without the buses.</td>
</tr>
<tr>
<td>My family almost always rides the bus to places off MLK.</td>
</tr>
<tr>
<td>Some drivers are really rude and don't even wait till you are seated before they start driving which is unsafe for everyone.</td>
</tr>
<tr>
<td>Bring back the book with all routes and weekend service. When you don't know what routes and times but want to just get around it helps to have a book of all times and routes for spur of the moment travel.</td>
</tr>
<tr>
<td>I wish more of the buses were hybrids.</td>
</tr>
<tr>
<td>The bus service here is very efficient and safe, I am constantly frustrated by the lack of late night and weekend service. I would use my car even less if there were more service available.</td>
</tr>
<tr>
<td>I'd like more frequent stops to and from the Friday Center from 10am-2pm (when the FCX does not run).</td>
</tr>
<tr>
<td>Stan Norwood is the most outstanding bus driver in Orange County- he goes out of his way to help commuters.</td>
</tr>
<tr>
<td>Don't set bus stop along highway!</td>
</tr>
<tr>
<td>The J route should use the bigger buses in the morning during peak times. I feel like a rat in a cage in the mornings!</td>
</tr>
<tr>
<td>I wish arrival time info on the electronic boards were more reliable. I have, on more than one occasion, been waiting for the CW in front of the HSL watching the estimated arrival time go down to just a few minutes. Then CW doesn't appear anymore and the bus doesn't show up.</td>
</tr>
<tr>
<td>NextBus online makes it easy to check next bus.</td>
</tr>
<tr>
<td>If it weren't for CHT, I would have no way to get from place to place at this time.</td>
</tr>
<tr>
<td>I often do not commute on the route next to my house due to the service stopping at 6:30pm. I've been stuck before with no service to get back to my house and had to walk at night. Did not feel safe.</td>
</tr>
<tr>
<td>One of the best things about Chapel Hill.</td>
</tr>
<tr>
<td>Easier use of text messaging system. I am happy with the bus system but would like to utilize the text messaging system if it were less complicated. I would also like to see more electronic route information at stops.</td>
</tr>
<tr>
<td>Lights in the bus stops. I like using the bus because I don't have a car.</td>
</tr>
</tbody>
</table>